

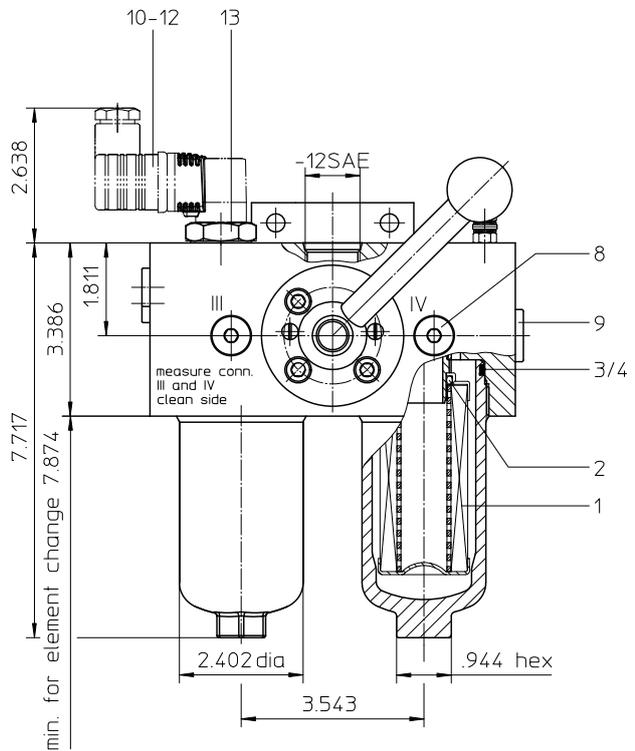
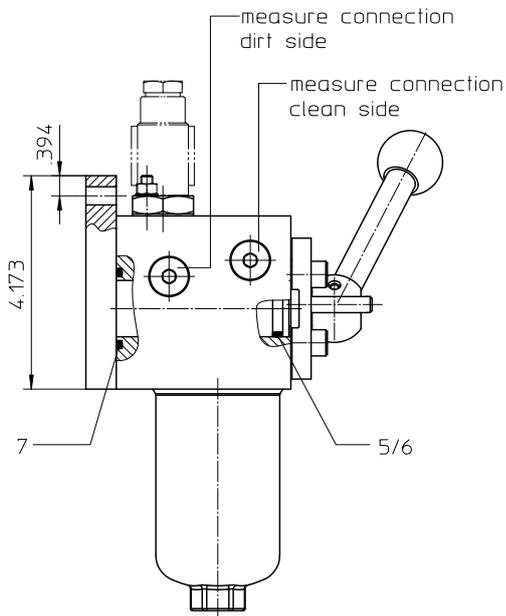
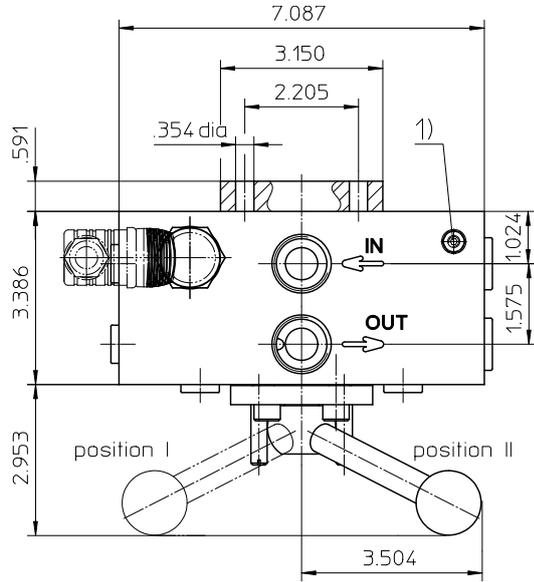
Series DU 40

914 PSI

1) Connect the stand grounding tab to a suitable earth ground point.

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

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



Dimensions: inches

Designs and performance values are subject to change.

Pressure Filter

Series DU 40

PN 63

Description:

Pressure filters changeover series DU 40 are suitable for operating pressure up to 914 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-changeover valve which allows to change-over the flow from the dirty filter-side to the clean filter-side without interrupting the operation. The changeover procedure does not lead to a cross sectional contraction. The closed filter-side has to be air-bleed by vent III respectively by vent IV. Then change filter element.

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

For filtration finer than 25 µm, use the disposable elements made of microglass. Filter elements as fine as 3 µm are available; finer filter elements are 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 are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.

Type index:

Complete filter: (ordering example)

DU. 40.	10VG. 30.	E. P.	-.	UG. 4.	-.	-.	AE
1	2	3	4	5	6	7	8
9	10	11	12				

- | | |
|----|--|
| 1 | series:
DU = pressure filter changeover |
| 2 | nominal size: 40 |
| 3 | filter material:
80G, 40G, 25G, 10G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
25API, 10API microglass according to API
10P paper |
| 4 | filter element collapse rating:
30 = Δp 435 PSI |
| 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 application, see sheet-no. 31601 |
| 8 | process connection:
UG = thread connection |
| 9 | process connection size:
4 = -12 SAE |
| 10 | filter housing specification:
- = standard |
| 11 | specification pressure vessel:
- = standard (DGRL 2014/68/EU) |
| 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)

01NL. 40. 10VG. 30. E. P. -
1 2 3 4 5 6 7

- | | |
|---|---|
| 1 | series:
01NL = standard filter element according to DIN 24550, T3 |
| 2 | nominal size: 40 |
| 3 | - 7 see type index-complete filter |

Accessories:

- gauge port- and bleeder connections, 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:	914 PSI
test pressure:	1300 PSI
standard process connection:	thread connection
housing material:	AL, carbon steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
measure- and bleeder connections	BSPP ¼
volume tank:	2x .05 Gal.

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:

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

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

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

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

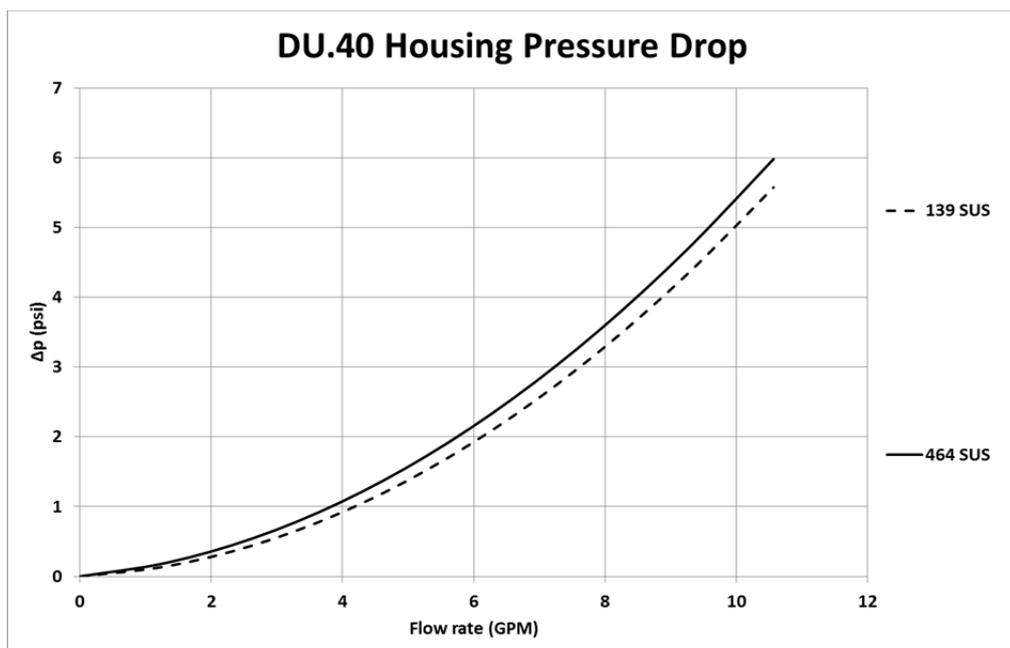
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

DU	VG					G				API		P
	3VG	6VG	10VG	16VG	25VG	10G	25G	40G	80G	10 API	25 API	10P
40	9.591	6.991	4.853	3.107	2.705	0.2553	0.1893	0.1766	0.1210	1.54	1.78	0.81

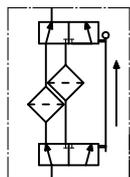
$\Delta p = f(Q)$ – characteristics according to ISO 3968

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.

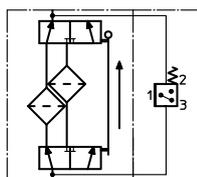


Symbols:

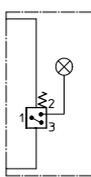
without indicator



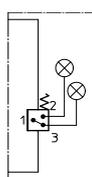
with electric indicator
AE 30 and AE 40



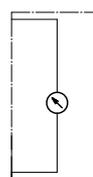
with visual-electric indicator
AE 50 and AE 62



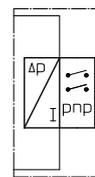
with visual-electric indicator
AE 70 and AE 80



with visual indicator
AOR/AOC



with electronic sensor
VS5



Spare parts:

item	qty.	designation	dimension	article-no.	
1	2	filter element	01NL.40...		
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	1	O-ring	23 x 3	307285 (NBR)	311019 (FPM)
6	1	support ring	28 x 23,6 x 1	350525	
7	1	O-ring	32,9 x 3,53	318850 (NBR)	338231 (FPM)
8	4	screw plug	BSPP 1/4	305003	
9	2	screw plug	BSPP 1/2	304678	
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	

item 13 execution only without clogging indicator or clogging sensor

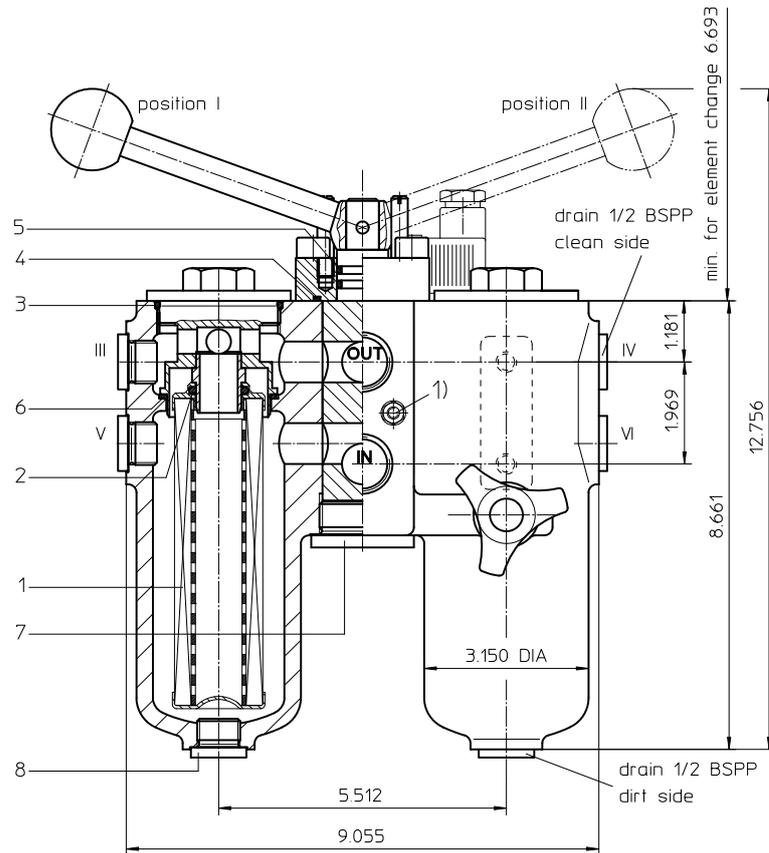
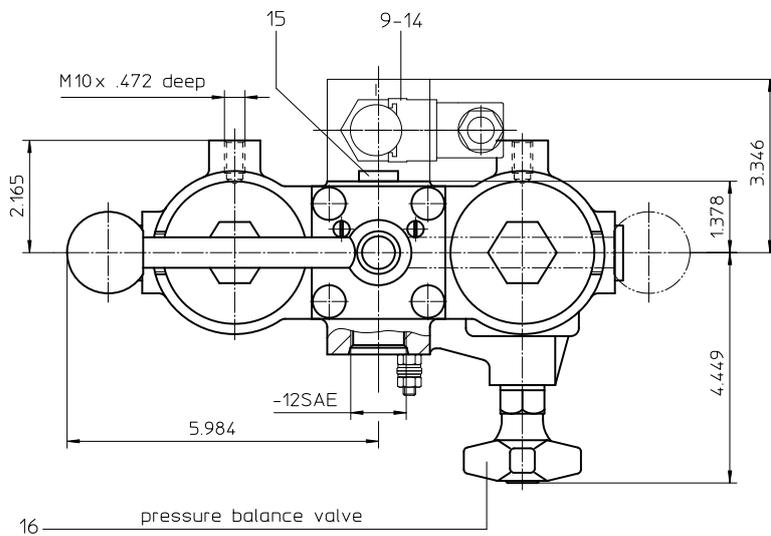
Test methods:

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

Series DU 63

464 PSI



Position I: Left filter-side in operation
 Position II: Right filter-side in operation

1) Connect the stand grounding tab to a suitable earth ground point.

Measure connection III, IV: Air bleeding, pressure relief 1/2 BSPP - clean side
 Measure connection V, VI: Air bleeding, pressure relief 1/2 BSPP - dirt side

Weight: approx. 33 lbs.

Dimensions: inches

Designs and performance values are subject to change.

Pressure Filter

Series DU 63

464 PSI

Description:

Duplex filter series DU63 have a working pressure up to 464 PSI. Pressure peaks can be absorbed with a sufficient safety margin.

A rotary slide valve integrated in the middle of the housing makes it possible to switch from the dirty filter-side to the clean filter-side without interrupting operation. These filters can be installed as suction filters.

The filter element consists of star-shaped, pleated filter material, which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside.

For cleaning the mesh element or changing the microglass element, remove the cover and take out the element. The mesh elements are not guaranteed to maintain 100% performance after cleaning.

For filtration finer than 40 µm, use the disposable elements made of microglass. Filter elements as fine as 5 µm(c) are available; finer filter elements are available upon request.

Eaton-filter elements are known for a 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.

The bypass valve is integrated in the filter cover. After reaching the bypass pressure setting, the bypass valve will send unfiltered partial flow around the filter.

Ship classifications available upon request.

Type index:

Complete filter: (ordering example)

DU. 63. 10VG. 30. E. P. -. UG. 4. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----

- 1 series:**
DU = pressure filter, change over
- 2 nominal size:** 63
- 3 filter-material and filter-fineness:**
80G, 40G, 25G, 10G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
25API, 10API microglass according to API
10P paper
- 4 filter element collapse rating:**
30 = Δp 435 PSI
- 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:**
UG = thread connection
- 9 process connection size:**
4 = -12 SAE
- 10 filter housing specification:**
- = standard
- 11 internal valve:**
- = without
S1 = with bypass valve Δp 51 PSI
- 12 clogging indicator or clogging sensor:**
- = without
AOR = visual-electric, see sheet-no.1606
AOC = visual-electric, see sheet-no.1606
AE = visual-electric, see sheet-no.1615
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.

Filter element: (ordering example)

01NL. 63. 10VG. 30. E. P. -

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- 1 series:**
01NL. = standard filter element according to DIN 24550, T3
- 2 nominal size:** 63
- 3 - 7** see type index complete filter

Accessories:

- gauge port and bleeder connection, see sheet-no. 1650
- drain- and bleeder connection, see sheet-no. 1651

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:	464 PSI
test pressure:	900 PSI
process connection:	thread connection
housing material:	EN-GJS-400-18-LT
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
measure connections:	BSPP ¼
drain- and bleeder connections:	BSPP ½
volume tank:	2x 0.17 Gal.

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 Δp and the element Δp and is calculated as follows:

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

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

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

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

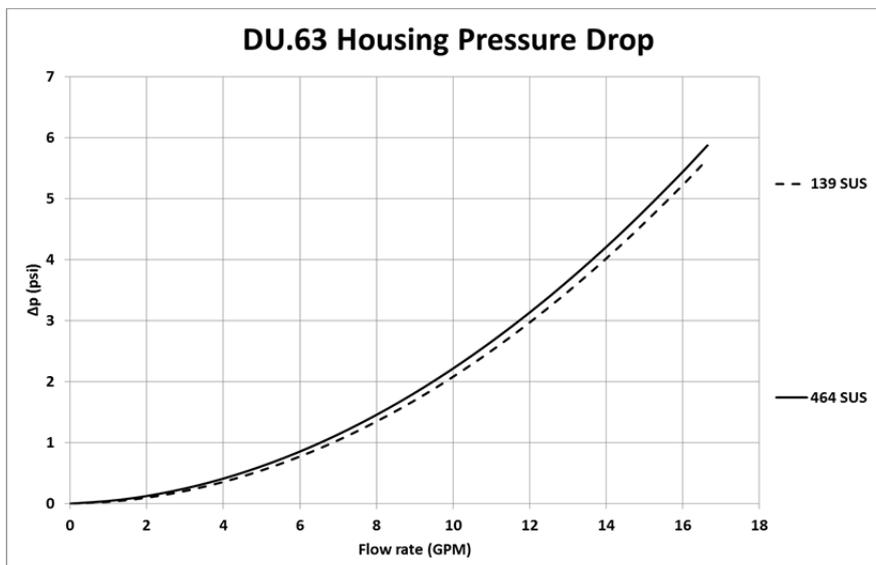
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

DU	VG					G			P	API	
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G	10P	10API	25API
63	4.214	2.926	1.873	1.631	1.114	0.1131	0.1056	0.0723	0.946	0.993	0.455

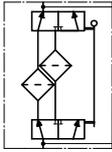
$\Delta p = f(Q)$ – characteristics according to ISO 3968

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.

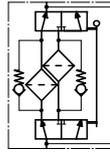


Symbols:

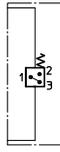
without indicator



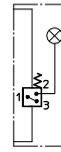
with by-pass valve



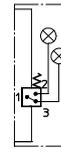
with electric indicator
AE 30 and AE 40



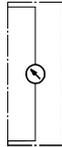
with visual-electric indicator
AE 50 and AE 62



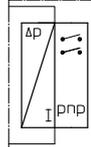
with visual-electric indicator
AE 70 and AE 80



with visual indicator
AOR/AOC



with electronic clogging sensor
VS5



Spare parts:

item	qty.	designation	dimension	article-no.	
1	2	filter element	01NL.63...		
2	2	O-ring	22 x 3,5	304341 (NBR)	304392 (FPM)
3	2	O-ring	56 x 3	305072 (NBR)	305322 (FPM)
4	1	O-ring	42,52 x 2,62	304352 (NBR)	304393 (FPM)
5	2	O-ring	18 x 3	304359 (NBR)	304399 (FPM)
6	2	O-ring	48 x 3	304357 (NBR)	304404 (FPM)
7	1	screw plug	1 ¼ BSPP	308530	
8	6	screw plug	½ BSPP	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	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)
13	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)
14	3	O-ring	14 x 2	304342 (NBR)	304722 (FPM)
15	2	screw plug	¼ BSPP	305003	
16	1	pressure balance valve	3/8"	305000	

item 15 execution only without clogging indicator or clogging sensor

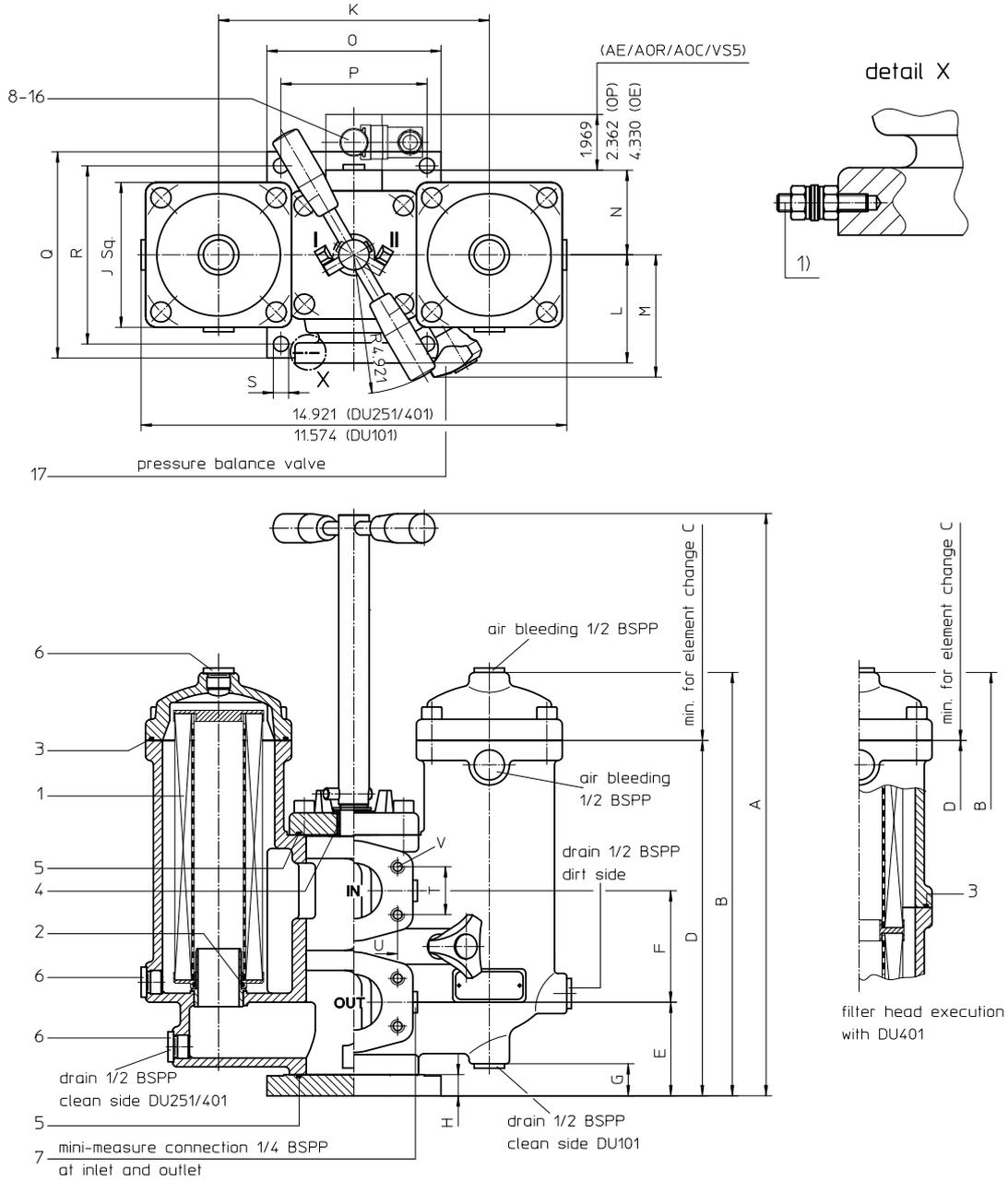
Test methods:

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

Series DU 101-401

464 PSI



Position I: Left filter-side in operation
 Position II: Right filter-side in operation

1) Connect the stand grounding tab to a suitable earth ground point.

Dimensions:

type	SAE-connection	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	weight
DU 101	SAE 1 1/4 ¹⁾	18.23	12.20	8.27	10.43	2.17	3.15	.87	.63	3.74	7.09	2.36	3.94	1.96	5.51	4.53	5.51	4.53	.47	1.19	2.31	M10/.75 dp.	51 lbs.
DU 101	SAE 1 1/2 ²⁾	20.55	14.97	10.23	12.56	3.31	3.94	-	.75	5.12	9.45	3.82	4.33	2.99	6.10	5.12	7.28	6.30	.53	1.69	3.10	M12/.71 dp.	88 lbs.
DU 251	SAE 2 ²⁾	24.88	20.87	16.14	18.46	3.31	3.94	-	.75	5.12	9.45	3.82	4.33	2.99	6.10	5.12	7.28	6.30	.53	1.69	3.10	M12/.71 dp.	110 lbs.

¹⁾ by counter flange BFS.6.A.33,7x2,6.St.P.3000

²⁾ by counter flange BFS.8.A.48,3x3,7.St.P.3000

Dimensions: inches

Designs and performance values are subject to change.

Pressure Filter

Series DU 101-401

464 PSI

Description:

Duplex filter series DU 101-401 have a working pressure up to 464 PSI. Pressure peaks can be absorbed with a sufficient safety margin.

A three way changeover valve which is integrated in the middle of the housing makes it possible to switch from the dirty filter-side to the clean filter-side without interrupting operation. These filters can be installed as suction filters.

The filter element consists of star-shaped, pleated filter material, which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside.

For cleaning the mesh element or changing the microglass element, remove the cover and take out the element. The mesh elements are not guaranteed to maintain 100% performance after cleaning.

For filtration finer than 40 µm use the disposable elements made of microglass. Filter elements as fine as 5 µm(c) are available; finer filter elements on request.

Eaton filter elements are known for a 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.

Ship classifications available upon request.

Type index:

Complete filter: (ordering example)

DU. 251. 10VG. 30. E. P. - . FS. 8. - . - . AE
1 2 3 4 5 6 7 8 9 10 11 12

- 1 | **series:**
DU = pressure filter, change over
- 2 | **nominal size:** 101, 251, 401
- 3 | **filter-material and filter-fineness:**
80G, 40G, 25G, 10G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
25API, 10API microglass according to API
10P paper
- 4 | **filter element collapse rating:**
16 = Δp 232 PSI (01N.100)
30 = Δp 435 PSI (01NL.250/400)
- 5 | **filter element design:**
E = single end open
S = with by-pass valve Δp 29 PSI
S1 = with by-pass valve Δp 51 PSI
- 6 | **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 | **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = for HFC application, see sheet-no. 31601
- 8 | **process connection:**
FS = SAE-flange 3000 PSI
- 9 | **process connection size:**
6 = 1 ¼" (DU 101)
8 = 2" (DU 251/401)
- 10 | **filter housing specification:** (see catalog)
- = standard
IS12 = for stainless steel ball valve, see sheet-no. 41028
IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217 (operating pressure max. 232 PSI)
- 11 | **internal valve:**
- = without
- 12 | **clogging indicator or clogging sensor:**
- = without
AOR = visual-electric, see sheet-no.1606
AOC = visual-electric, see sheet-no.1606
AE = visual-electric, see sheet-no.1609
OP = visual, see sheet-no.1628
OE = visual-electric, see sheet-no.1628
VS5 = electronic, see sheet-no.1641

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.

Filter element: (ordering example)

01NL. 250. 10VG. 30. E. P. -
1 2 3 4 5 6 7

- 1 | **series:**
01N. = standard filter element according to EATON specification
01NL. = standard filter element according to DIN 24550, T3
- 2 | **Nominal size:** 100 (01N.), 250,400 (01NL.)
- 3 | - | 7 | see type index for complete filter

Accessories:

- gauge port and bleeder connection, see sheet-no. 1650
- drain- and bleeder connection, see sheet-no. 1651
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

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:	464 PSI
max. operating pressure at IS20:	232 PSI
test pressure:	900 PSI
test pressure at IS20:	464 PSI
process connection:	SAE-flange 3000 PSI
housing material:	EN-GJS-400-18-LT
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
measure connections:	BSPP ¼
drain- and bleeder connections:	BSPP ½
volume tank DU 101:	2x .23 Gal.
DU 251:	2x .66 Gal.
DU 401:	2x .97 Gal.

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 Δp and the element Δp 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/

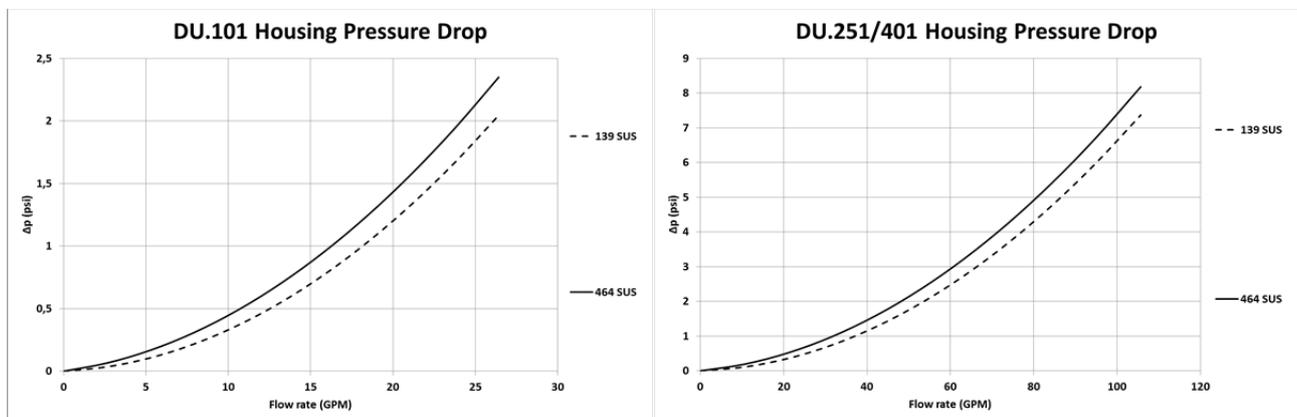
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

DU	VG					G			P	API	
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G	10P	10API	25API
101	2.473	1.717	1.099	0.957	0.654	0.0651	0.0607	0.0416	0.504	0.582	0.266
251	1.140	0.792	0.507	0.441	0.301	0.0339	0.0316	0.0217	0.231	0.260	0.119
401	0.700	0.486	0.311	0.271	0.185	0.0207	0.0194	0.0133	0.121	0.159	0.073

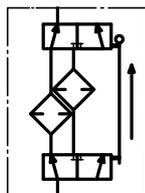
$\Delta p = f(Q)$ – characteristics according to ISO 3968

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.

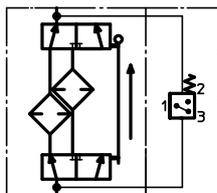


Symbols:

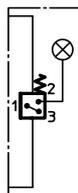
without indicator



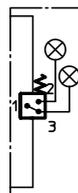
with electric indicator
AE 30 and AE 40



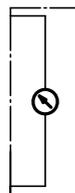
with visual-electric indicator
AE 50 and AE 62



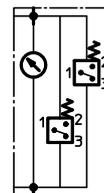
with visual-electric indicator
AE 70 and AE 80



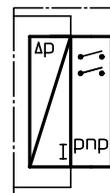
with visual indicator
AOR/AOC/OP



with visual-electric indicator
OE



with electronic sensor
VS5



Spare parts:

item	designation	qty.	dimension/article no. DU 101	qty.	dimension/article no. DU 251	qty.	dimension/article no. DU 401
1	filter element	2	01N.100...	2	01NL.250...	2	01NL.400...
2	O-ring	2	32 x 3,5 304378 (NBR) 304401 (FPM)	2	40 x 3 304389 (NBR) 304391 (FPM)	2	40 x 3 304389 (NBR) 304391 (FPM)
3	O-ring	2	76 x 4 305599 (NBR) 310291 (FPM)	2	115 x 3 303963 (NBR) 307762 (FPM)	4	115 x 3 303963 (NBR) 307762 (FPM)
4	O-ring	1	24 x 3 303038 (NBR) 304397 (FPM)	1	24 x 3 303038 (NBR) 304397 (FPM)	1	24 x 3 303038 (NBR) 304397 (FPM)
5	O-ring	2	60 x 2,5 305601 (NBR) 310267 (FPM)	2	95 x 3 305808 (NBR) 304828 (FPM)	2	95 x 3 305808 (NBR) 304828 (FPM)
6	screw plug	8			1/2 BSPP 304678		
7	screw plug	2			1/4 BSPP 305003		
8	clogging indicator, visual				AOR or AOC see sheet-no. 1606		
9	clogging indicator, visual	1			OP see sheet-no. 1628		
10	clogging indicator, visual-electric	1			OE see sheet-no. 1628		
11	clogging indicator, visual-electric	1			AE see sheet-no. 1609		
12	clogging sensor, electronic	1			VS5 see sheet-no. 1641		
13	O-ring	1			15 x 1,5 315537 (NBR) 315427 (FPM)		
14	O-ring	1			22 x 2 304708 (NBR) 304721 (FPM)		
15	O-ring	2			14 x 2 304342 (NBR) 304722 (FPM)		
16	screw plug	2			1/4 BSPP 305003		
17	pressure balance valve	1			3/8" 305000		

item 16 execution only without clogging indicator or clogging sensor

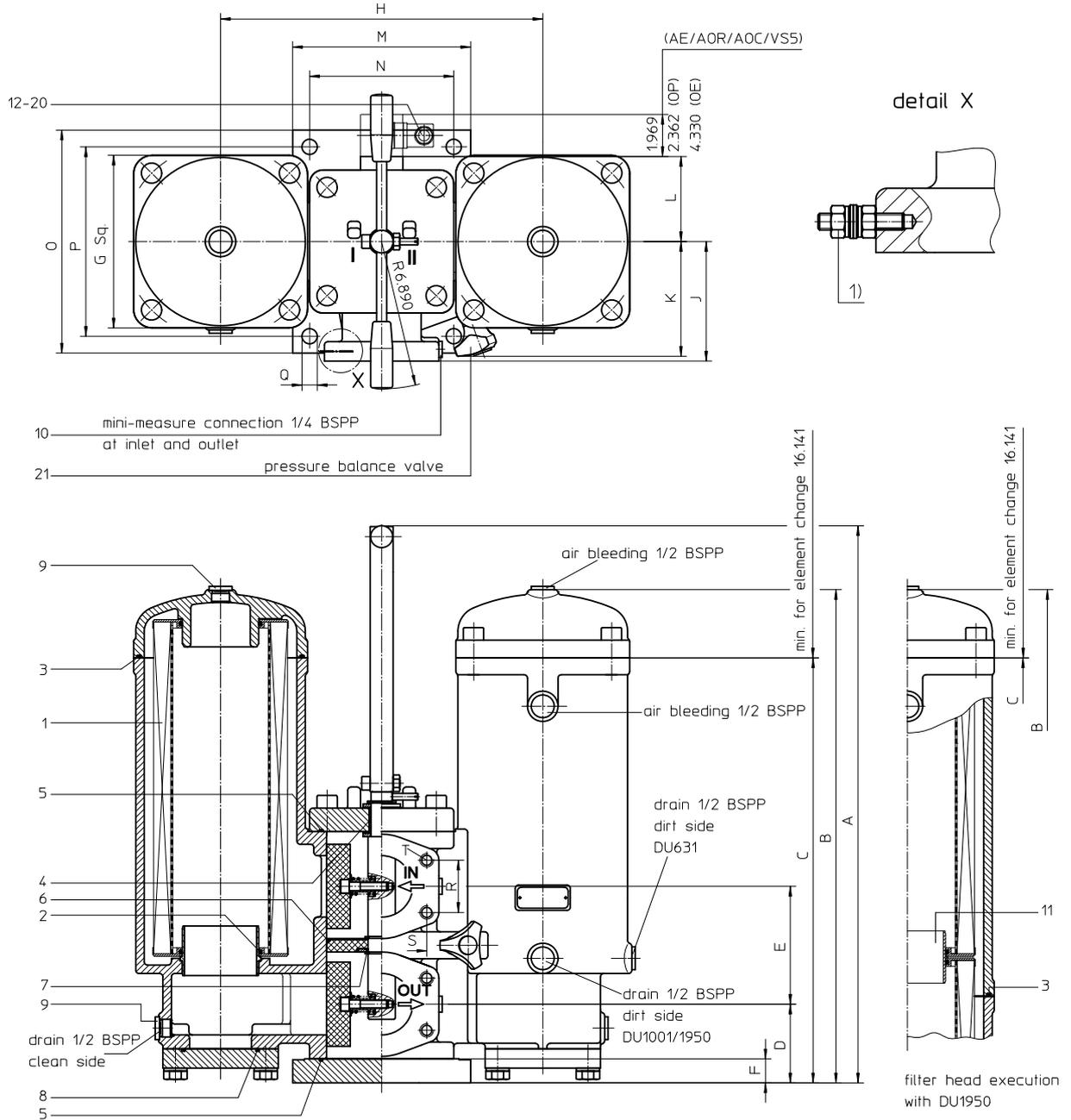
Test methods:

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

Series DU 631-1950

464 PSI



Position I: Left filter-side in operation
 Position II: Right filter-side in operation

1) Connect the stand grounding tab to a suitable earth ground point.

Dimensions:

type	SAE-connection	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	weight
DU 631	SAE 2 1/2"	27.28	22.36	19.56	4.33	4.52	.94	6.29	11.29	3.26	4.76	5.23	5.51	4.52	8.26	7.28	.53	2.00	3.50	M12, .71 dp.	198 lbs.
DU 1001	SAE 3"	28.22	23.07	19.88	3.68	5.51	1.12	8.07	14.96	3.97	5.39	5.94	8.26	6.69	10.43	8.85	.70	2.44	4.18	M16, .91 dp.	255 lbs.
DU 1950	SAE 3"	44.05	38.89	35.70	3.68	5.51	1.12	8.07	14.96	3.97	5.39	5.94	8.26	6.69	10.43	8.85	.70	2.44	4.18	M16, .91 dp.	374 lbs.

Dimensions: inches

Designs and performance values are subject to change.

Pressure Filter

Series DU 631-1950

464 PSI

Description:

Duplex filter series DU 631-1950 have a working pressure up to 464 PSI. Pressure peaks can be absorbed with a sufficient safety margin.

A three way changeover valve integrated in the middle of the housing makes it possible to switch from the dirty filter-side to the clean filter-side without interrupting operation. These filters can be installed as suction filters.

The filter element consists of star-shaped, pleated filter material, which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside.

For cleaning the mesh element or changing the microglass element, remove the cover and take out the element. The mesh elements are not guaranteed to maintain 100% performance after cleaning.

For filtration finer than 40 µm use the disposable elements made of microglass. Filter elements as fine as 5 µm(c) are available; finer filter elements on request.

Eaton filter elements are known for a 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.

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

Ship classifications available upon request.

Type index:

Complete filter: (ordering example)

DU. 631. 10VG. 30. E. P. -. FS. 9. -. -. AE

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----

- 1 series:**
DU = pressure filter, change over
- 2 nominal size:** 631, 1001, 1950
- 3 filter-material and filter-fineness:**
80G, 40G, 25G, 10G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
25API, 10API microglass according to API
10P paper
- 4 filter element collapse rating:**
30 = Δp 435 PSI (01NL.630)
10 = Δp 146 PSI (01NR.1000/1001)
- 5 filter element design:**
E = single end open (01NL.630)
S = with bypass valve Δp 29 PSI (01NL.630)
S1 = with bypass valve Δp 51 PSI (01NL.630)
B = both sides open (01NR.1001)
- 6 sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = for HFC applications, see sheet-no. 31601
IS07 = for oil/amonia mixtures (NH₃), see sheet-no. 31602
- 8 process connection:**
FS = SAE-flange 3000 PSI
- 9 process connection size:**
9 = 2 1/2" (DU 631)
A = 3" (DU 1001/1950)
- 10 filter housing specification:** (see catalog)
- = standard
IS06 = for HFC applications, see sheet-no. 31605
IS12 = for stainless steel ball valve, see sheet-no. 41028
IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217 (operating pressure max. 232 PSI)
- 11 internal valve:**
- = without
S = with bypass valve Δp 29 PSI (DU 1001/1950)
S1 = with bypass valve Δp 51 PSI (DU 1001/1950)
- 12 clogging indicator or clogging sensor:**
- = without
AOR = visual-electric, see sheet-no.1606
AOC = visual-electric, see sheet-no.1606
AE = visual-electric, see sheet-no.1609
OP = visual, see sheet-no.1628
OE = visual-electric, see sheet-no.1628
VS5 = electronic, see sheet-no.1641

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.

Filter element: (ordering example)

01NL. 630. 10VG. 30. E. P. -

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- 1 series:**
01NL. = standard filter element according to DIN 24550, T3
01NR. = standard-return-line filter element according to DIN 24550, T4
- 2 nominal size:** 630 (01NL.), 1000 (01NR.)
- 3 - 7** see type index for complete filter

Accessories:

- gauge port and bleeder connection, see sheet-no. 1650
- drain- and bleeder connection, see sheet-no. 1651
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

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:	464 PSI
max. operating pressure at IS20:	232 PSI
test pressure:	900 PSI
test pressure at IS20:	464 PSI
process connection:	SAE-flange 3000 PSI
housing material:	EN-GJS-400-18-LT
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
measure connections:	BSPP ¼
drain- and bleeder connections:	BSPP ½
volume tank DU 631:	2x 1.5 Gal.
DU 1001:	2x 3.4 Gal.
DU 1950:	2x 6.1 Gal.

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 Δp and the element Δp and is calculated as follows:

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

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

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

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

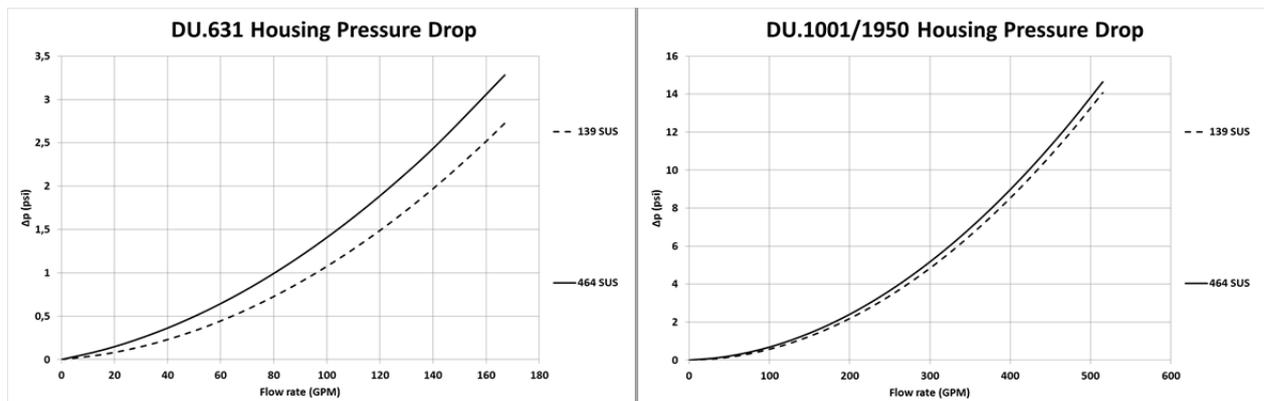
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

DU	VG					G			P	API	
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G	10P	10API	25API
631	0.534	0.371	0.237	0.207	0.141	0.1735	0.1619	0.1109	0.112	0.121	0.056
1001	0.237	0.165	0.105	0.092	0.063	0.0061	0.0057	0.0039	0.051	0.053	0.024
1950	0.118	0.082	0.053	0.046	0.031	0.0030	0.0028	0.0019	0.026	0.027	0.012

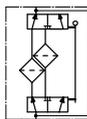
$\Delta p = f(Q)$ – characteristics according to ISO 3968

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.

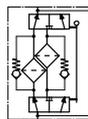


Symbols:

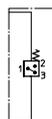
without indicator



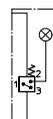
with by-pass valve



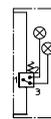
with electric indicator
AE 30 and AE 40



with visual-electric indicator
AE 50 and AE 62



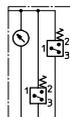
with visual-electric indicator
AE 70 and AE 80



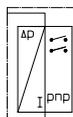
with visual indicator
OP/AOR/AOC



with visual-electrical indicator
OE



with electronic clogging sensor
VS5



Spare parts:

item	designation	qty.	dimension and article-no. DU 631	qty.	dimension and article-no. DU 1001	qty.	dimension and article-no. DU 1950
1	filter element	2	01NL.630...	2	01NR.1000...	4	01NR.1000...
2	O-ring	2	60 x 3,5 304377 (NBR) 304398 (FPM)	4	90 x 4 306941 (NBR) 307031 (FPM)	8	90 x 4 306941 (NBR) 307031 (FPM)
3	O-ring	2	125 x 3 306025 (NBR) 307358 (FPM)	2	185 x 4 305593 (NBR) 306309 (FPM)	4	185 x 4 305593 (NBR) 306309 (FPM)
4	O-ring	1	24 x 3		304038 (NBR)	304397 (FPM)	
5	O-ring	2	115 x 3	303963 (NBR)	307762 (FPM)	140 x 3	304604 (NBR) 307541 (FPM)
6	O-ring	1	96 x 4	305190 (NBR)	308148 (FPM)	120 x 4	305300 (NBR) 307991 (FPM)
7	O-ring	1	32 x 2,5	306843 (NBR)	308268 (FPM)	32 x 2,5	306843 (NBR) 308268 (FPM)
8	O-ring	2	69,45 x 3,53 305868 (NBR) 307357 (FPM)			85,32 x 3,53 305590 (NBR) 306308 (FPM)	
9	screw plug	8	½ BSPP	304678		10	½ BSPP 304678
10	screw plug	2			½ BSPP	305003	
11	connecting pipe	2			-		3.543 dia 313233
12	clogging indicator, visual	1			AOR or AOC	see sheet-no. 1606	
13	clogging indicator, visual	1			OP	see sheet-no. 1628	
14	clogging indicator, visual-electric	1			OE	see sheet-no. 1628	
15	clogging indicator, visual-electric	1			AE	see sheet-no. 1609	
16	clogging sensor, electronic	1			VS5	see sheet-no. 1641	
17	O-ring	1	15 x 1,5	315357 (NBR)	315427 (FPM)		
18	O-ring	1	22 x 2	304708 (NBR)	304721 (FPM)		
19	O-ring	2	14 x 2	304342 (NBR)	304722 (FPM)		
20	screw plug	2			½ BSPP	305003	
21	pressure balance valve	1			3/8"	305000	

item 20 execution only without clogging indicator or clogging sensor

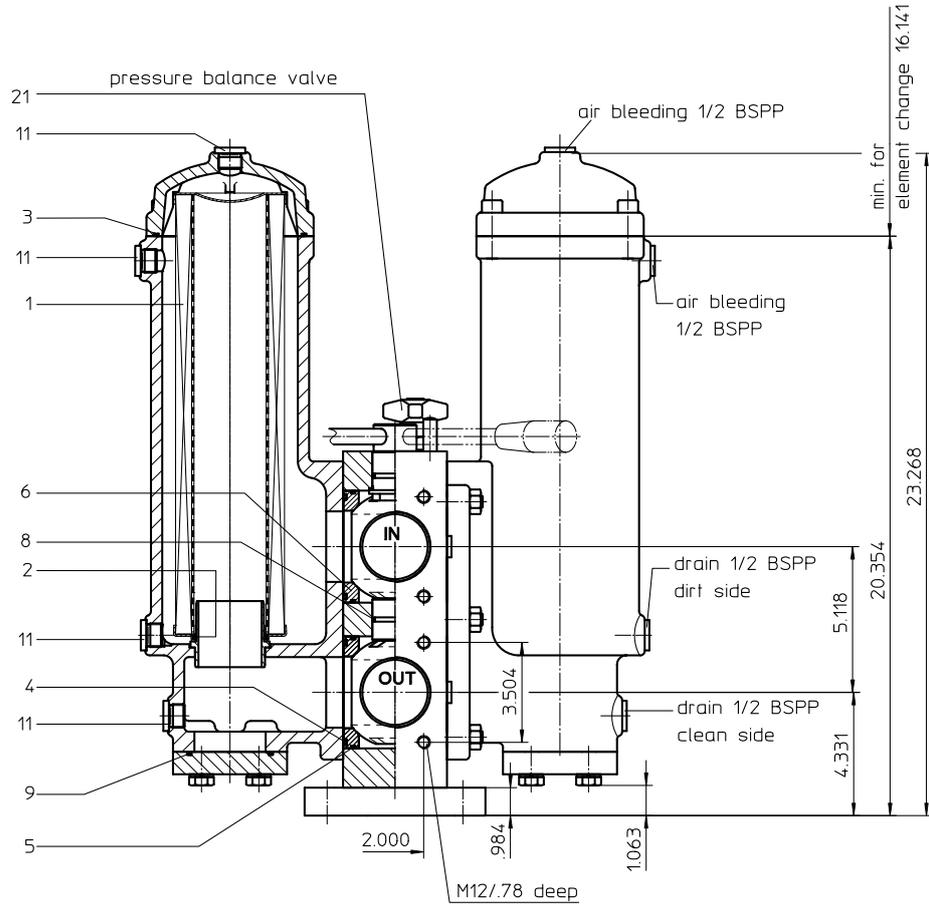
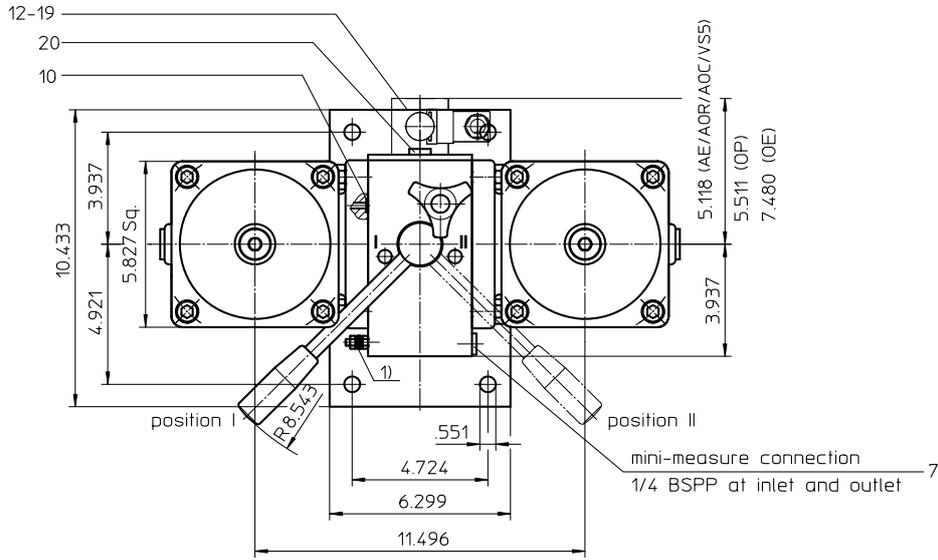
Test methods:

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

Series DU 635

464 PSI



Position I: Left filter-side in operation
 Position II: Right filter-side in operation

1) Connect the stand grounding tab to a suitable earth ground point.

Weight: approx. 200 lbs.

Dimensions: inches

Designs and performance values are subject to change.

Pressure Filter

Series DU 635

464 PSI

Description:

Duplex filter series DU635 have a working pressure up to 464 PSI. Pressure peaks can be absorbed with a sufficient safety margin.

Change-over ball valve between the two filter housings makes it possible to switch from the dirty filter-side to the clean filter-side without interrupting operation. These filters can be installed as suction filters.

The filter element consists of star-shaped, pleated filter material, which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside.

For cleaning the mesh element or changing the microglass element, remove the cover and take out the element. The mesh elements are not guaranteed to maintain 100% performance after cleaning.

For filtration finer than 40 µm, use the disposable elements made of microglass. Filter elements as fine as 5 µm(c) are available; finer filter elements are available upon request.

Eaton-filter elements are known for a 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.

Ship classifications available upon request.

Type index:

Complete filter: (ordering example)

DU. 635.	10VG.	30.	E.	P.	-.	FS.	9.	-.	-.	AE	
1	2	3	4	5	6	7	8	9	10	11	12

- 1 | **series:**
DU = pressure filter, change over
- 2 | **nominal size:** 635
- 3 | **filter-material and filter-fineness:**
80G, 40G, 25G, 10G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
25API, 10API microglass according to API
10P paper
- 4 | **filter element collapse rating:**
30 = Δp 435 PSI
- 5 | **filter element design:**
E = single end open
S = with by-pass valve Δp 29 PSI
S1 = with by-pass valve Δp 51 PSI
- 6 | **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 | **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = for HFC applications, see sheet-no. 31601
IS07 = for oil/amonia mixtures (NH3), see sheet-no. 31602
- 8 | **process connection:**
FS = SAE-flange 3000 PSI
- 9 | **process connection size:**
9 = 2 1/2"
- 10 | **filter housing specification:** (see catalog)
- = standard
IS06 = for HFC applications, see sheet-no. 31605
IS12 = for stainless steel ball valve, see sheet-no. 41028
IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217 (operating pressure max. 232 PSI)
- 11 | **internal valve:**
- = without
- 12 | **clogging indicator or clogging sensor:**
- = without
AOR = visual-electric, see sheet-no.1606
AOC = visual-electric, see sheet-no.1606
AE = visual-electric, see sheet-no.1609
OP = visual, see sheet-no.1628
OE = visual-electric, see sheet-no.1628
VS5 = electronic, see sheet-no.1641

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.

Filter element: (ordering example)

01NL.	630.	10VG.	30.	E.	P.	-
1	2	3	4	5	6	7

- 1 | **series:**
01NL. = standard filter element according to DIN 24550, T3
- 2 | **nominal size:** 630
- 3 | - 7 | see type index complete filter

Accessories:

- gauge port and bleeder connection, see sheet-no. 1650
- drain- and bleeder connection, see sheet-no. 1651
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

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:	464 PSI
max. operating pressure at IS20:	232 PSI
test pressure:	900 PSI
test pressure at IS20:	464 PSI
process connection:	SAE-flange 3000 PSI
housing material:	EN-GJS-400-18-LT
switching housing material:	S355J2 + N
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
measure connections:	BSPP ¼
drain- and bleeder connections:	BSPP ½
volume tank:	2x 1.5 Gal.

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 Δp and the element Δp and is calculated as follows:

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

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

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

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

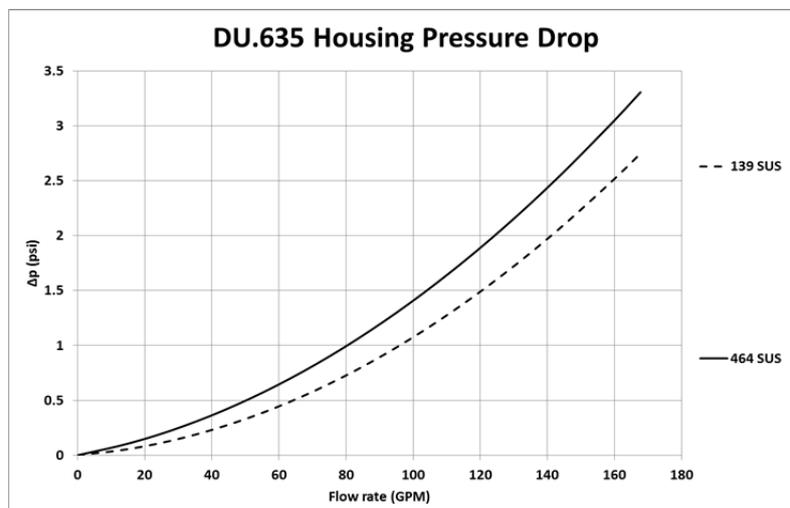
Material gradient coefficients (MSK) for filter elements

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

DU	VG					G			P	API	
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G	10P	10API	25API
635	0.534	0.371	0.237	0.207	0.141	0.1735	0.1619	0.1109	0.112	0.121	0.056

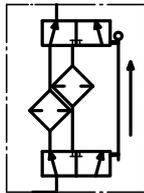
$\Delta p = f(Q)$ – characteristics according to ISO 3968

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.

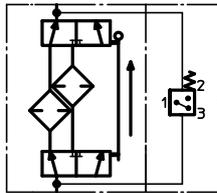


Symbols:

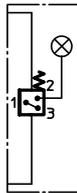
without indicator



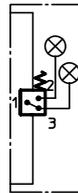
with electric indicator
AE 30 and AE 40



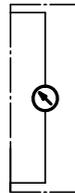
with visual-electric indicator
AE 50 and AE 62



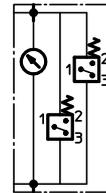
with visual-electric indicator
AE 70 and AE 80



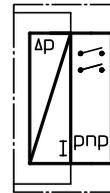
with visual indicator
AOR/AOC/OP



with visual-electric indicator
OE



with electronic sensor
VS5



Spare parts:

item	qty.	designation	dimension	article-no.	
1	2	filter element	01NL.630...		
2	2	O-ring	60 x 3,5	304377 (NBR)	304398 (FPM)
3	2	O-ring	125 x 3	306025 (NBR)	307358 (FPM)
4	4	O-ring	85 x 4	305685 (NBR)	310285 (FPM)
5	4	O-ring	95 x 3	305808 (NBR)	304828 (FPM)
6	4	gasket		317651	
7	2	screw plug	¼ BSPP	305003	
8	2	O-ring	32 x 3	304368 (NBR)	311020 (FPM)
9	2	O-ring	69,45 x 3,53	305868 (NBR)	307357 (FPM)
10	4	O-ring	8 x 2	310004 (NBR)	316530 (FPM)
11	8	screw plug	½ BSPP	304678	
12	1	clogging indicator, visual	AOR or AOC	see sheet no. 1606	
13	1	clogging indicator, visual	OP	see sheet no. 1628	
14	1	clogging indicator, visual-electric	OE	see sheet no. 1628	
15	1	clogging indicator, visual-electric	AE	see sheet no. 1609	
16	1	clogging sensor, electronic	VS5	see sheet no. 1641	
17	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)
18	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)
19	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)
20	2	screw plug	¼ BSPP	305003	
21	1	pressure balance valve	3/8"	305000	

item 20 execution only without clogging indicator or clogging sensor

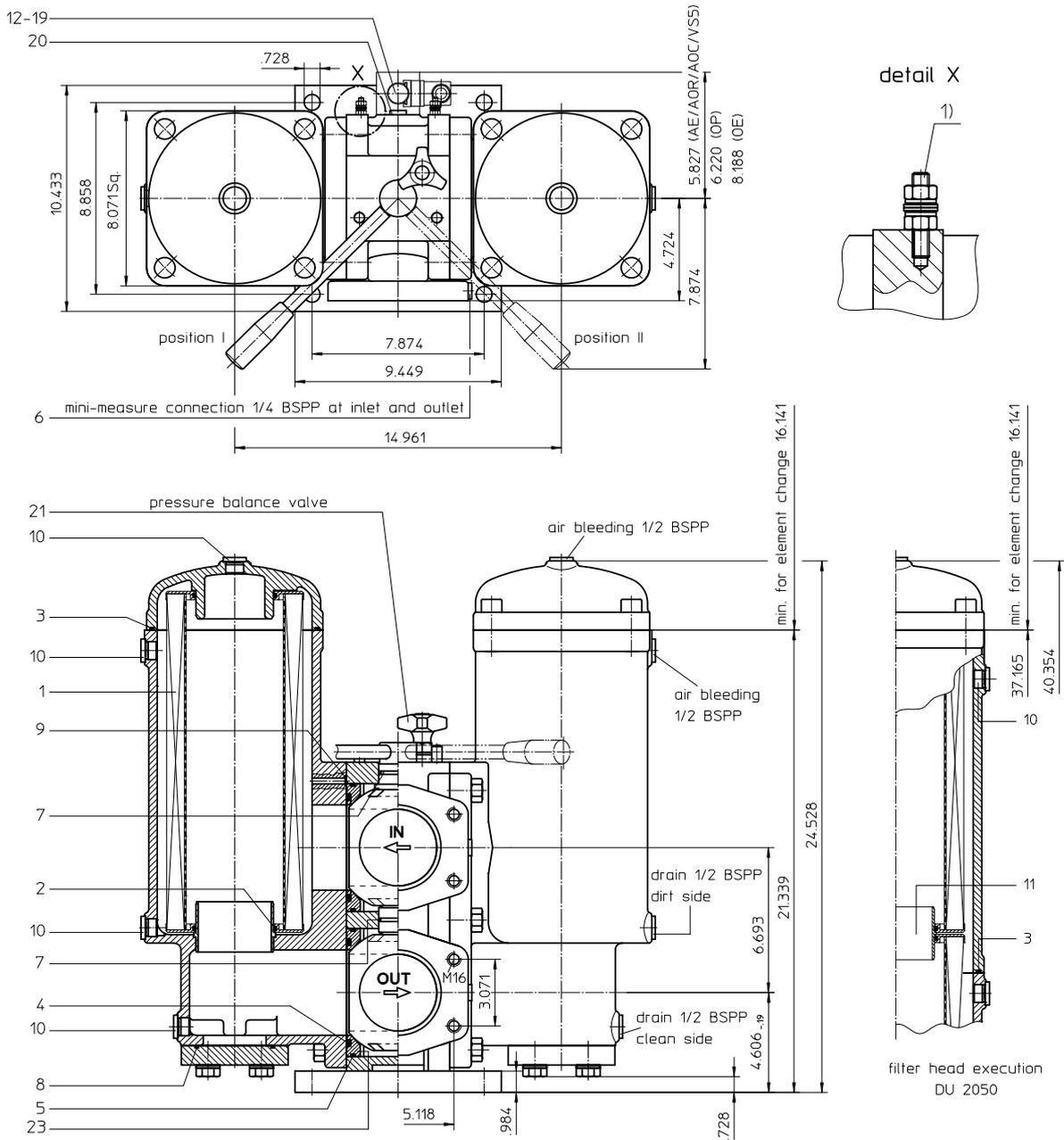
Test methods:

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

Series DU 1050-2050

464 PSI



Position I: Left filter-side in operation
 Position II: Right filter-side in operation

1) Connect the stand grounding tab to a suitable earth ground point.

Dimensions:

type	connection	SAE-connection size	weight
DU 1050	SAE 3" ¹⁾	SAE 4" 3000 PSI	330 lbs.
DU 1050	SAE 4"	SAE 4" 3000 PSI	330 lbs.
DU 2050	SAE 3" ¹⁾	SAE 4" 3000 PSI	440 lbs.
DU 2050	SAE 4"	SAE 4" 3000 PSI	440 lbs.

¹⁾ with reducing flange BFS.B.E.88,9x3,2.St.P.3000 / V (Viton) can be used instead P (Nitrile)

Dimensions: inches

Designs and performance values are subject to change.

Pressure Filter

Series DU1050-2050

464 PSI

Description:

Duplex filter series DU1050-2050 have a working pressure up to 464 PSI. Pressure peaks can be absorbed with a sufficient safety margin.

A changeover ball valve between the housings makes it possible to switch from the dirty filter-side to the clean filter-side without interrupting operation. These filters can be installed as suction filters..

The filter element consists of star-shaped, pleated filter material, which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside.

For cleaning the mesh element or changing the microglass element, remove the cover and take out the element. The mesh elements are not guaranteed to maintain 100% performance after cleaning.

For filtration finer than 40 µm, use the disposable elements made of microglass. Filter elements as fine as 5 µm(c) are available; finer filter elements are available upon request.

Eaton-filter elements are known for a 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.

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

Ship classifications available upon request..

Type index:

Complete filter: (ordering example)

DU.	1005.	10VG.	10.	B.	P.	-.	FS.	B.	-.	-.	AE
1	2	3	4	5	6	7	8	9	10	11	12

- 1 | **series:**
DU = pressure filter, change over
- 2 | **nominal size:** 1050, 2050
- 3 | **filter-material and filter-fineness:**
80G, 40G, 25G, 10G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
25API, 10API microglass according to API
10P paper
- 4 | **filter element collapse rating:**
10 = Δp 145 PSI
- 5 | **filter element design:**
B = both sides open
- 6 | **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 | **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = for HFC applications, see sheet-no. 31601
IS07 = for oil/amonia mixtures (NH₃), see sheet-no. 31602
- 8 | **process connection:**
FS = SAE-flange 3000 PSI
- 9 | **process connection size:**
B = 4"
- 10 | **filter housing specification:** (see catalog)
- = standard
IS06 = for HFC applications, see sheet-no. 31605
IS12 = for stainless steel ball valve, see sheet-no. 41028
IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217 (operating pressure max. 232 PSI)
- 11 | **internal valve:**
- = without
S = with bypass valve Δp 29 PSI
S1 = with bypass valve Δp 51 PSI
- 12 | **clogging indicator or clogging sensor:**
- = without
AOR = visual-electric, see sheet-no.1606
AOC = visual-electric, see sheet-no.1606
AE = visual-electric, see sheet-no.1609
OP = visual, see sheet-no.1628
OE = visual-electric, see sheet-no.1628
VS5 = electronic, see sheet-no.1641

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.

Filter element: (ordering example)

01NR.	1000.	10VG.	10.	B.	P.	-
1	2	3	4	5	6	7

- 1 | **series:**
01NR. = standard-return-line filter element according to DIN 24550, T4
- 2 | **nominal size:** 1000
- 3 | - 7 | see type index complete filter

Accessories:

- gauge port- and bleeder connection, see sheet-no. 1650
- evacuation- and bleeder connection, see sheet-no. 1651
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

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:	464 PSI
max. operating pressure at IS20:	232 PSI
test pressure:	900 PSI
test pressure at IS20:	464 PSI
process connection:	SAE-flange 3000 PSI
housing material:	EN-GJS-400-18-LT
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
measure connections:	BSPP ¼
drain- and bleeder connections:	BSPP ½
volume tank DU 1050:	2x 3.6 Gal.
DU 2050:	2x 6.3 Gal.

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 Δp and the element Δp and is calculated as follows:

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

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

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

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

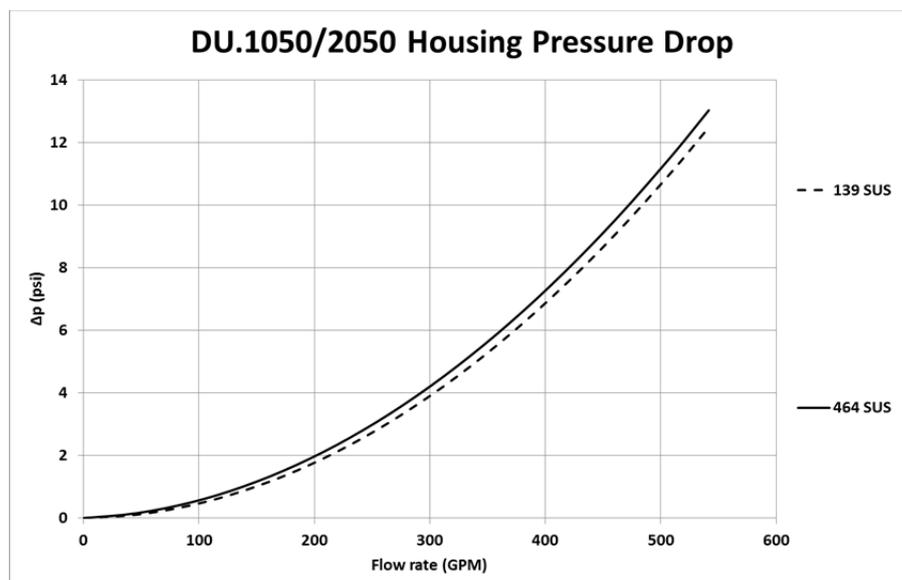
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

DU	VG					G			P	API	
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G	10P	10API	25API
1050	0.237	0.165	0.105	0.092	0.063	0.0061	0.0057	0.0039	0.051	0.053	0.024
2050	0.118	0.082	0.053	0.046	0.031	0.0030	0.0028	0.0019	0.026	0.027	0.012

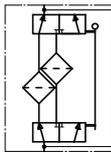
$\Delta p = f(Q)$ – characteristics according to ISO 3968

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.

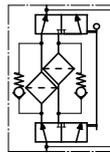


Symbols:

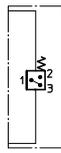
without indicator



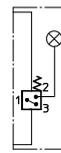
with by-pass valve



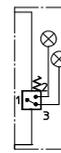
with electric indicator
AE 30 and AE 40



with visual-electric indicator
AE 50 and AE 62



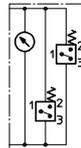
with visual-electric indicator
AE 70 and AE 80



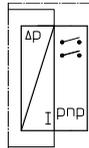
with visual indicator
OP/AOR/AOC



with visual-electrical indicator
OE



with electronic clogging sensor
VS5



Spare parts:

item	designation	qty.	dimension and article-no.				qty.	dimension and article-no.			
			DU 1050					DU 2050			
1	filter element	2	01NR.1000...				4	01NR.1000...			
2	O-ring	4	90 x 4	306941 (NBR)	307031 (FPM)	8	90 x 4	306941 (NBR)	307031 (FPM)		
3	O-ring	2	185 x 4	305593 (NBR)	306309 (FPM)	4	185 x 4	305593 (NBR)	306309 (FPM)		
4	O-ring	4	114 x 6	314419 (NBR)	316531 (FPM)	4	114 x 6	314419 (NBR)	316531 (FPM)		
5	O-ring	4	140 x 4	305145 (NBR)	305201 (FPM)	4	140 x 4	305145 (NBR)	305201 (FPM)		
6	screw plug	2	1/4 BSPP	305003		2	1/4 BSPP	305003			
7	O-ring	2	38 x 3	304340 (NBR)	317013 (FPM)	2	38 x 3	304340 (NBR)	317013 (FPM)		
8	O-ring	2	85,32 x 3,53	305590 (NBR)	306308 (FPM)	2	85,32 x 3,53	305590 (NBR)	306308 (FPM)		
9	O-ring	4	8 x 2	310004 (NBR)	316530 (FPM)	4	8 x 2	310004 (NBR)	316530 (FPM)		
10	screw plug	8	1/2 BSPP	304678		10	1/2 BSPP	304678			
11	slip coupling	-	-			2	3,543 dia	313233			
12	clogging indicator visual	1	AOR or AOC	see sheet-no. 1606							
13	clogging indicator visual	1	OP	see sheet-no. 1628							
14	clogging indicator visual-electric	1	OE	see sheet-no. 1628							
15	clogging indicator visual-electric	1	AE	see sheet-no. 1609							
16	clogging sensor electronic	1	VS5	see sheet-no. 1641							
17	O-ring	1	15 x 1,5	315357 (NBR)			315427 (FPM)				
18	O-ring	1	22 x 2	304708 (NBR)			304721 (FPM)				
19	O-ring	2	14 x 2	304342 (NBR)			304722 (FPM)				
20	screw plug	2	1/4 BSPP	305003							
21	pressure balance valve	1	3/8"	305000							
22	gasket	4	DN 90	312275							

item 20 execution only without clogging indicator or clogging sensor

Test methods:

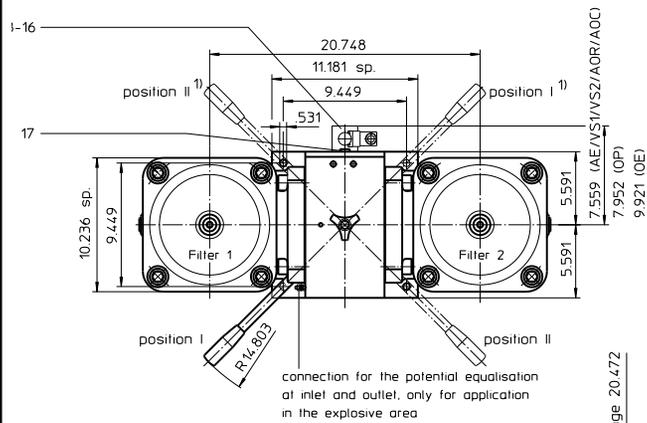
Filter elements are tested according to the following ISO standards:

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

PRESSURE FILTER, change-over ball valve

Series DU 2005-4005 464 PSI

Sheet No
2153 B



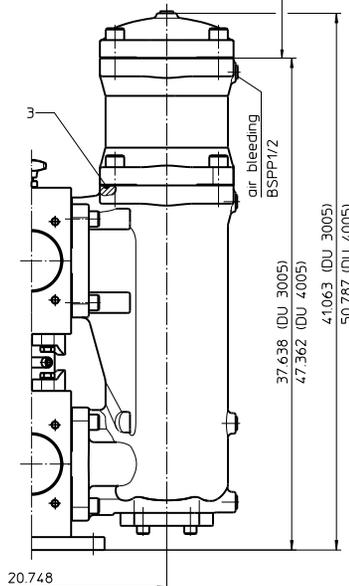
Pos. I: left filter-side in operation
Pos. II: right filter-side in operation

1) On request: Switch lever backside opposite to inlet and outlet.

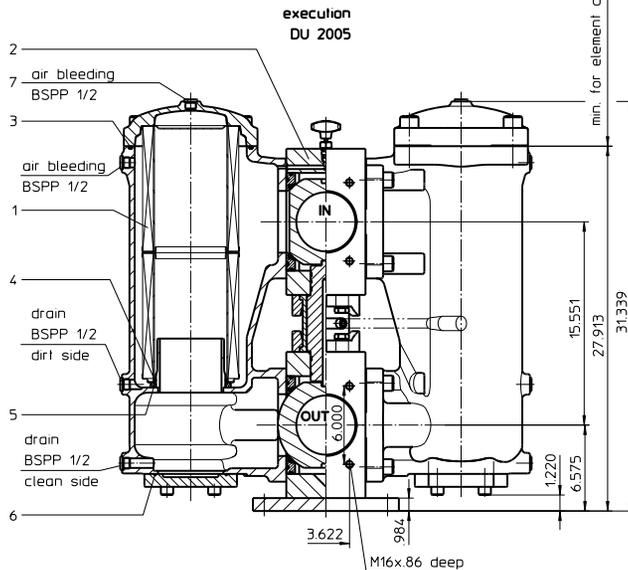
Please specify on order !

execution
DU 3005/DU 4005

min. for element change
30.118 (DU 3005) and 40.157 (DU 4005)



filter	weight lbs.
DU 2005	750
DU 3005	886
DU 4005	961



1. Type index:

1.1. Complete filter: (ordering example)

DU. 2005. 10VG. 10. E. P. -. FS. C. -. AE

1	2	3	4	5	6	7	8	9	10	11
---	---	---	---	---	---	---	---	---	----	----

- 1 **series:**
DU = pressure filter, change-over
- 2 **nominal size:** 2005, 3005, 4005
- 3 **filter-material and filter-fineness:**
80 G = 80 µm, 40 G = 40 µm, 25 G = 25 µm stainless steel wire mesh
25 VG = 20 µm_(c), 16 VG = 15 µm_(c), 10 VG = 10 µm_(c), 6 VG = 7 µm_(c), 3 VG = 5 µm_(c) Interpor fleece (glass fiber)
25 API = 20 µm, 10 API = 10 µm Interpor fleece (glass fiber) according to API
10 P = 10 µm paper
- 4 **resistance of pressure difference for filter element:**
10 = Δp 145 PSI
- 5 **filter element design:**
E = without by-pass valve
S = with by-pass valve Δp 29 PSI
S1 = with by-pass valve Δp 51 PSI
- 6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 **filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = see sheet-no. 31601
- 8 **connection:**
FS = SAE-flange connection 3000 PSI
- 9 **connection size:**
C = 5"
- 10 **filter housing specification:** (see catalog)
- = standard
IS06 = see sheet-no. 31605
IS12 = see sheet-no. 41028
- 11 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electrical, see sheet-no. 1609
OP = visual, see sheet-no. 1628
OE = visual-electrical, see sheet-no. 1628
VS1 = electrical, see sheet-no. 1607
VS2 = electrical, see sheet-no. 1608

1.2. Filter element: (ordering example)

01E. 2001. 10VG. 10. E. P. -

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- 1 **series:**
01E. = filter element according to company standard
- 2 **nominal size:** 2001, 3001, 4001
- 3 - 7 see type index complete filter

2. Accessories:

- measure-and bleeder-connection, see sheet-no. 1650
- evacuation- and bleeder-connection, see sheet-no. 1651
- counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

Changes of measures and design are subject to alteration!

3. Spare parts:

item	designation	qty.	dimension and article-no. DU 2005	dimension and article-no. DU 3005	dimension and article-no. DU 4005
1	filter element	2	01E. 2001	01E. 3001	01E. 4001
2	change over	1	5"		
3	O-ring (DU 2005)	2	240 x 5		
	O-ring (DU 3005/4005)	4	307592 (NBR) 328793 (FPM)		
4	O-ring	2	135 x 10		
			306016 (NBR) 307045 (FPM)		
5	O-ring	2	125 x 10		
			304388 (NBR) 306006 (FPM)		
6	O-ring	2	136,12 x 3,53		
			320162 (NBR) 320163 (FPM)		
7	screw plug (DU 2005)	8	BSPP ½		
	screw plug (DU 3005/4005)	10	304678		
8	clogging indicator visual	1	AOR or AOC	see seet-no. 1606	
9	clogging indicator visual-electrical	1	OE	see seet-no. 1628	
10	clogging indicator visual	1	OP	see seet-no. 1628	
11	clogging indicator visual-electrical	1	AE	see seet-no. 1609	
12	clogging sensor electrical	1	VS1	see seet-no. 1607	
13	clogging sensor electrical	1	VS2	see seet-no. 1608	
14	O-ring	1	15 x 1,5	315357 (NBR) 315427 (FPM)	
15	O-ring	1	22 x 2	304708 (NBR) 304721 (FPM)	
16	O-ring	2	14 x 2	304342 (NBR) 304722 (FPM)	
17	screw plug	2	BSPP ¼	305003	

item 17 execution only without clogging indicator or clogging sensor

4. Description:

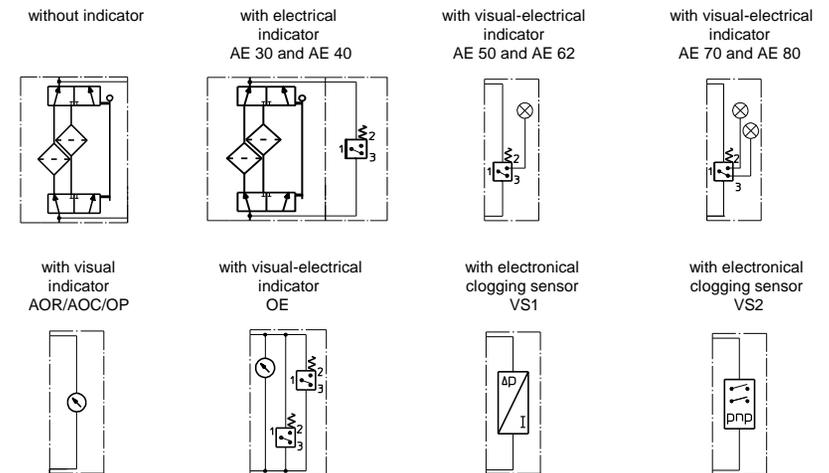
Pressure filters, change-over series DU 2005-4005 are suitable for operating pressure up to 464 PSI. Pressure peaks can be absorbed with a sufficient margin of safety. Change-over ball valve between the two filter housings makes it possible to switch from the dirty filter-side to the clean filter-side without interrupting operation. These filters can be installed as suction filters. The filter element consist of star-shaped, pleated filter material which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to the inside. For cleaning (see special leaflet 21070-4 and 34448-4) the mesh element respectively to change the glass fibre element remove the cover and take out the element. Filter finer than 40 µm should use throw-away elements made of paper or Interpor fleece (glass fiber). Filter elements as fine as 5 µm_c are available; finer filter elements on request. Internormen Product Line filter elements are known as elements with a high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life. Internormen Product Line filters are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils. Approvals according to TÜV, and the major „Shipyards Classification Societies“ D.N.V.; B.V.; G.L.; L.R.S.; R.I.N.A.; A.B.S. and others are possible.

5. Technical data:

temperature range: + 14°F to + 176°F (for a short time + 212°F)
operating medium: mineral oil, other media on request
max. operating pressure: 464 PSI
test pressure: 900 PSI
connection system: SAE-flange connection 3000 PSI
housing material: EN-GJS-400-18-LT
sealing material: Nitrile (NBR) or Viton (FPM), other materials on request
installation position: vertical
measuring connections: BSPP ¼
evacuation-or bleeder connections: BSPP ¼
volume tank DU 2005: 2x 8 Gal
DU 3005: 2x 10 Gal
DU 4005: 2x 12 Gal

Classification according to the Pressure Equipment Directive 97/23/EG for mineral oil (fluid group 2) -article 3, paragraph3.
Classified under ATEX Directive 94/9/EC according to specific application (see questionnaire sheet-no. 34279-4).

6. Symbols:



7. Pressure drop flow curves:

Precise flow rates see 'Interactive Product Specifier', respectively Δp-curves; depending on filter fineness and viscosity.

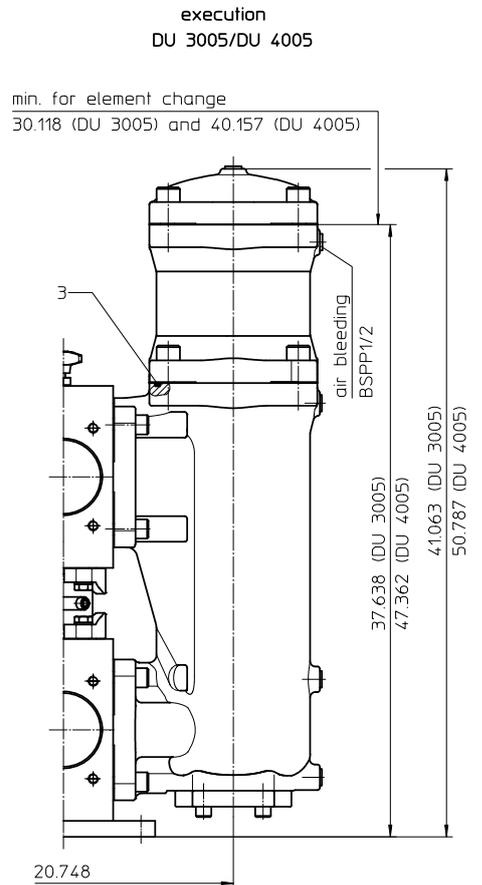
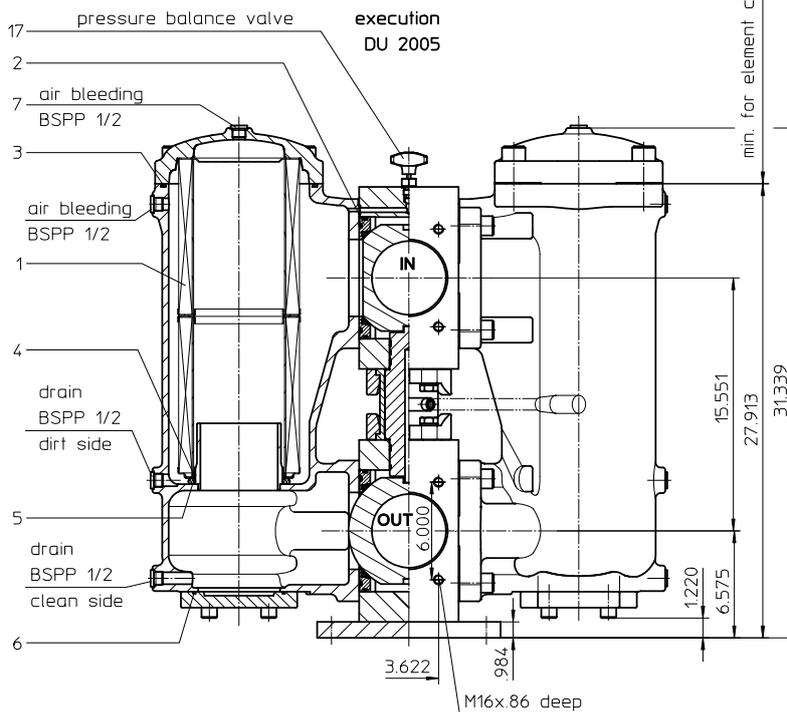
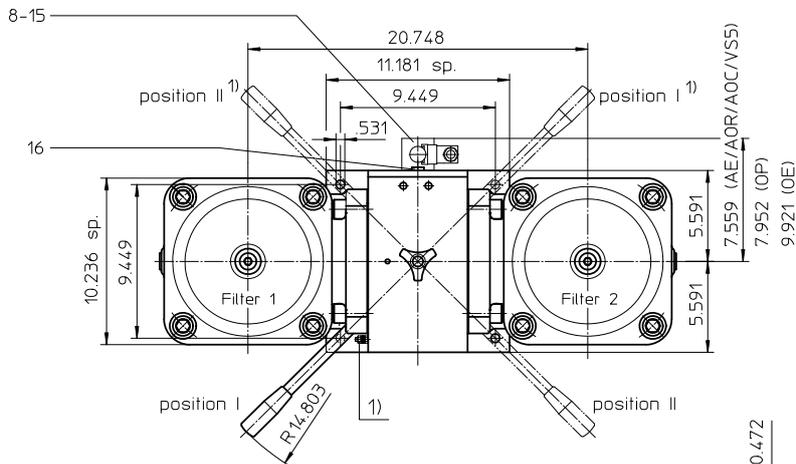
8. Test methods:

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

Series DU 2005-4005

464 PSI



Position I: Left filter-side in operation
 Position II: Right filter-side in operation

1) Connect the stand grounding tab to a suitable earth ground point.

Weight DU 2005: approx. 750 lbs.
 Weight DU 3005: approx. 886 lbs.
 Weight DU 4005: approx. 961 lbs.

Dimensions: inches

Designs and performance values are subject to change.

Pressure Filter

Series DU2005-4005

464 PSI

Description:

Duplex filter series DU 2005-4005 have a working pressure up to 464 PSI. Pressure peaks can be absorbed with a sufficient safety margin.

A changeover ball valve between the housings makes it possible to switch from the dirty filter-side to the clean filter-side without interrupting operation. These filters can be installed as suction filters.

The filter element consists of star-shaped, pleated filter material, which is supported on the inside by a perforated core tube and is bonded to the end caps with a high-quality adhesive. The flow direction is from outside to inside.

For cleaning the mesh element or changing the microglass element, remove the cover and take out the element. The mesh elements are not guaranteed to maintain 100% performance after cleaning.

For filtration finer than 40 µm, use the disposable elements made of microglass. Filter elements as fine as 5 µm(c) are available; finer filter elements are available upon request.

Eaton-filter elements are known for a 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.

Ship classifications available upon request.

Type index:

Complete filter: (ordering example)

DU.	2005.	10VG.	10.	E.	P.	-.	FS.	C.	-.	AE
1	2	3	4	5	6	7	8	9	10	11

- 1 series:**
DU = pressure filter, change over
- 2 nominal size:** 2005, 3005, 4005
- 3 filter-material and filter-fineness:**
80G, 40G, 25G, 10G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
25API, 10API microglass according to API
10P paper
- 4 filter element collapse rating:**
10 = Δp 145 PSI
- 5 filter element design:**
E = without by-pass
S = with by-pass valve Δp 29 PSI
S1 = with by-pass valve Δp 51 PSI
- 6 sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 filter element specification:** (see catalog)
- = standard
VA = stainless steel
IS06 = for HFC applications, see sheet-no. 31601
- 8 process connection:**
FS = SAE-flange 3000 PSI
- 9 process connection size:**
C = 5"
- 10 filter housing specification:** (see catalog)
- = standard
IS06 = for HFC applications, see sheet-no. 31605
IS12 = for stainless ball valve, see sheet-no. 41028
IS20 = ASME VIII Div.1 with ASME equivalent material,
see sheet-no. 55217 (operating pressure max. 232 PSI)
- 11 clogging indicator or clogging sensor:**
- = without
AOR = visual-electric, see sheet-no.1606
AOC = visual-electric, see sheet-no.1606
AE = visual-electric, see sheet-no.1609
OP = visual, see sheet-no.1628
OE = visual-electric, see sheet-no.1628
VS5 = electronic, see sheet-no.1641

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.

Filter element: (ordering example)

01E.	2001.	10VG.	10.	E.	P.	-
1	2	3	4	5	6	7

- 1 series:**
01E. = filter element according to company standard
- 2 nominal size:** 2001, 3001, 4001
- 3 - 7** see type index complete filter

Accessories:

- gauge port- and bleeder connection, see sheet-no. 1650
- drain- and bleeder connection, see sheet-no. 1651
- SAE-counter flange, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

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:	464 PSI
max. operating pressure at IS20:	232 PSI
test pressure:	900 PSI
test pressure at IS20:	464 PSI
process connection:	SAE-flange 3000 PSI
housing material:	EN-GJS-400-18-LT
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
measure connections:	BSPP ¼
drain- and bleeder connections:	BSPP ½
volume tank DU 2005:	2x 8 Gal.
DU 3005:	2x 10 Gal.
DU 4005:	2x 12 Gal.

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 Δp and the element Δp and is calculated as follows:

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

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

$$\Delta p_{element} (PSI) = Q (GPM) \times \frac{MSK}{1000} \left(\frac{PSI}{GPM} \right) \times v (SUS) \times \frac{\rho}{0,876} \left(\frac{kg}{dm^3} \right)$$

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

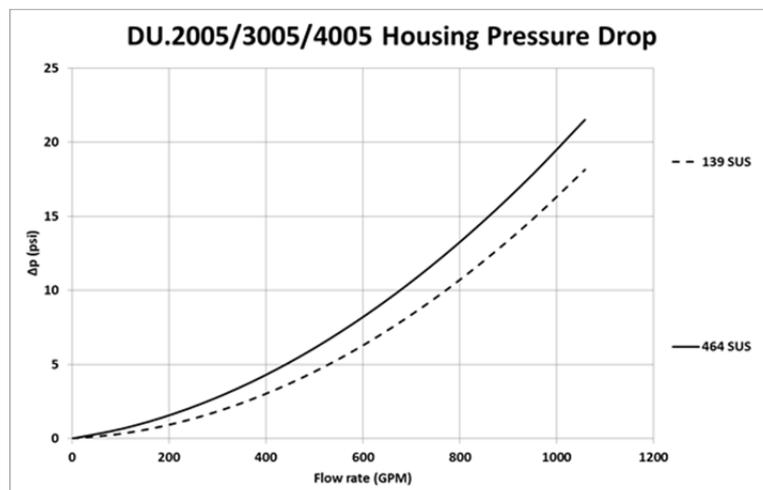
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm³ and a kinematic viscosity of 139 SUS (30 mm²/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

DU	VG					G			P	API	
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G	10P	10API	25API
2005	0.177	0.123	0.079	0.068	0.047	0.0059	0.0055	0.0038	0.041	0.040	0.018
3005	0.118	0.082	0.052	0.046	0.031	0.0040	0.0037	0.0025	0.027	0.027	0.012
4005	0.088	0.061	0.039	0.034	0.023	0.0030	0.0028	0.0019	0.020	0.020	0.009

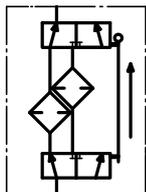
$\Delta p = f(Q)$ – characteristics according to ISO 3968

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.

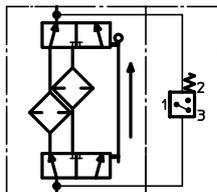


Symbols:

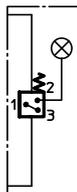
without indicator



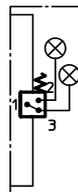
with electric indicator
AE 30 and AE 40



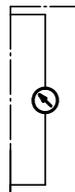
with visual-electric indicator
AE 50 and AE 62



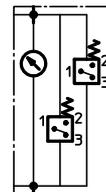
with visual-electric indicator
AE 70 and AE 80



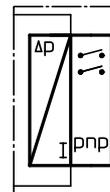
with visual indicator
AOR/AOC/OP



with visual-electric indicator
OE



with electronic sensor
VS5



Spare parts:

item	qty.	designation	dimension and article-no. DU 2005	dimension and article-no. DU 3005	dimension and article-no. DU 4005
1	2	filter element	01E.2001...	01E.3001...	01E.4001...
2	1	gasket kit of change over	5"		
3	2	O-ring (DU 2005)	240 x 5	322726 (NBR)	322727 (FPM)
	4	O-ring (DU 3005/4005)		307592 (NBR)	328793 (FPM)
4	2	O-ring	135 x 10	306016 (NBR)	307045 (FPM)
5	2	O-ring	125 x 10	304388 (NBR)	306006 (FPM)
6	2	O-ring	136,12 x 3,53	320162 (NBR)	320163 (FPM)
7	8	screw plug (DU 2005)	BSPP 1/4	304678	
	10	screw plug (DU 3005/4005)			
8	1	clogging indicator visual	AOR or AOC	see seet-no. 1606	
9	1	clogging indicator visual-electric	OE	see seet-no. 1628	
10	1	clogging indicator visual	OP	see seet-no. 1628	
11	1	clogging indicator visual-electric	AE	see seet-no. 1609	
12	1	clogging sensor electronic	VS5	see seet-no. 1641	
13	1	O-ring	15 x 1,5	315357 (NBR)	315427 (FPM)
14	1	O-ring	22 x 2	304708 (NBR)	304721 (FPM)
15	2	O-ring	14 x 2	304342 (NBR)	304722 (FPM)
16	2	screw plug	BSPP 1/4	305003	
17	1	pressure balance valve	3/8"	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

Manual and maintenance instructions

for INTERNORMEN pressure filters, change-over
DU 63, 101, 251, 401, 631, 635, 1001, 1950, 1050, 2050, related specifications

Sheet No.

20320-4E

Page 1/3

This manual is effective for all filters of the type DU 63, 101, 251, 401, 631, 635, 1001, 1950, 1050, 2050 and related specifications. It contains certain requirements and instructions which ensure unobjectionable operation of the filter. It can be completed with specific additional instructions by the operator himself if necessary.

1. Safety instructions

- Prior to operating the filter, manual and maintenance instructions have to be read carefully.
- Follow the instructions of this manual under any circumstances!
- The manufacturer does not assume liability for any damage, which occurs due to disregarding these instructions.
- If operations are carried out differently, the safety of the pressurized device can not be assured!
- Operating conditions given in the data sheet, especially excess pressure, temperature range and operating fluid, have to be followed unconditionally. Variation of these parameters can cause damage to important pressure holding parts and sealing. Also take in consideration the compatibility of filter components with the operating fluid.
- Under working conditions the filter housing is pressurized. Do not try to loosen or remove any part of the filter or the filter housing during operation. The operating fluid could escape at high pressure and high temperatures.
This does not apply for parts of the decompressed or the turned off side of the filter (see „Maintenance“).
- Leaking operating fluid always bears the danger of injuries and burns!
- Do not open the filter housing until you made sure it is not pressurized any more!
- Touching parts of the filter may cause burning, depending on the operating temperature.
- When exchanging the filter keep in mind that it might have operating temperature. Danger of burning!
- Always wear safety goggles and gloves when working on the filter!
- If you come into contact with the operating fluid please follow the instructions of the fluid manufacturer!!
- Only use original spare parts.

For filters being used in hazardous locations the INTERNORMEN documentation N° 41269 "Supplementation of the Operating Manual for the use of filters in potential explosive areas.

2. Installation

Note safety instructions!

When removing a new filter from its box it is ready for installation. It is placed on a level area and attached (DU 63) or screwed (DU 101-2050) to it.

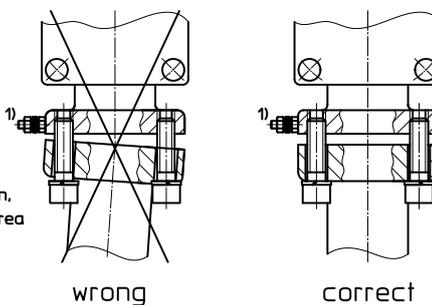
Afterwards remove protective caps from connections and connect those to the present pipe work.

Appropriate pipe work (pipes, hoses) ensures that drain and air-bleed valves are connected to proper containers. For these purposes original INTERNORMEN drain and air-bleed valves can be used.

When installing the filter please make sure, that:

- sufficient fixation of the filter is assured
- the clogging indicator is accessible and can be checked easily.
- the connections for draining, air-bleeding and pressure measurements can be accessed easily.
- there is enough room above the filter to remove and replace elements.
- no dirt, particles, other contamination or fluids enter the filter.
- both inlet and outlet of the filter are connected to the pipe work correctly.
- counterflanges or screw joints of the pipe system and the filter have to be angled precisely and connected that same way (if counterflanges or pipe joints are canted or under tension switching filters can be aggravated and it might harm pressure tightness)

Fitting the counterflanges for DU 101-2050



1) connection for the potential equalisation,
only for application in the explosive area

- the following torques have to be applied when fastening the counterflanges

Type	DU 63*	DU 101	DU 251	DU 401	DU 631/635	DU 1001/1950	DU 1050/2050		
Connection	3/4"	1"	1 1/4"	1 1/2"	2"	2"	2 1/2"	3"	4"
Moment [Nm]	100 ±15	10 ±2	12,5 ±3	25 ±5	28 ±6	28 ±6	40 ±8	71 ±15	100 ±25

- sufficient measures were taken to prevent corrosion.
- the filter is protected from other mechanical influences (such as impacts and hits).

3. Initial operation

3.1 Prior to initial operation

Prior to the initial operation of the system or the machine, which means prior to filling in any fluid, check the internal condition of the filter. Proceed as follows:

- Open the filter housing by removing the lid. Check the cleanness of the housing, the presence of an element, the sealing, etc..
- Close the housing tight.

3.2 Filling and air-bleeding

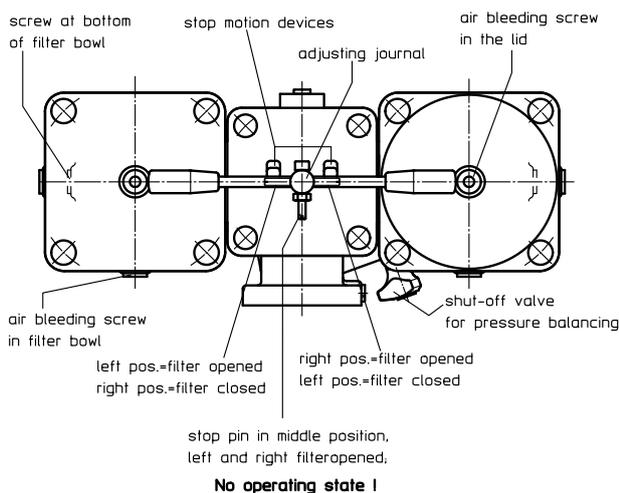
Prior to the initial operation, the filter has to air-bleed as follows:

- Turn the switch of the filter to the middle position. The lever of the DU 63/635/1050/2050 is right in the middle between the two stops. The stop-pin of the DU 101-1950 also is positioned right between the two stops.
- Fill both sides of the filter using the regular operating fluid flow.
- Open the locking screws on the side of the top edge of the filter (DU 63) or on top the filter lid (DU 101-2050). Wait until it leaks fluid without any bubbles and there is no more sound of air escaping.
- afterwards tighten the locking screws again.

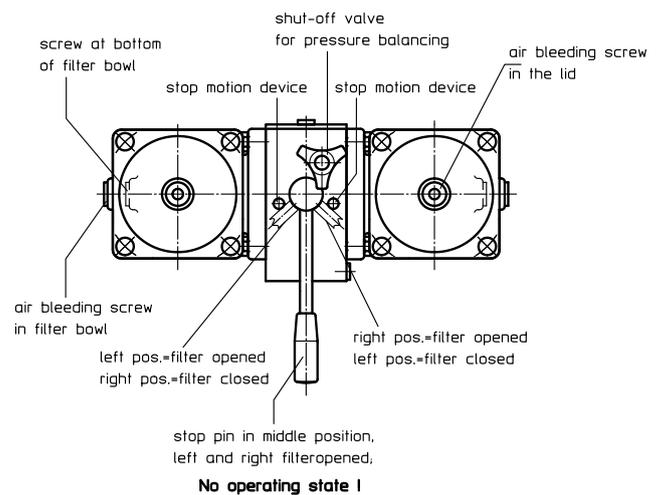
After this process you can direct the flow of the fluid, which is supposed to be filtered, to pass through either side of the filter. This is done simply by turning the lever or the switch. To recognize which side is operating at the moment, just note the following:

DU 101/251/401/631/1001/1950: The stop-pin of the switch is pointing at the side which is operating at the moment.
DU 63/635/1050/2050: The lever itself points at the side which is operating at the moment.

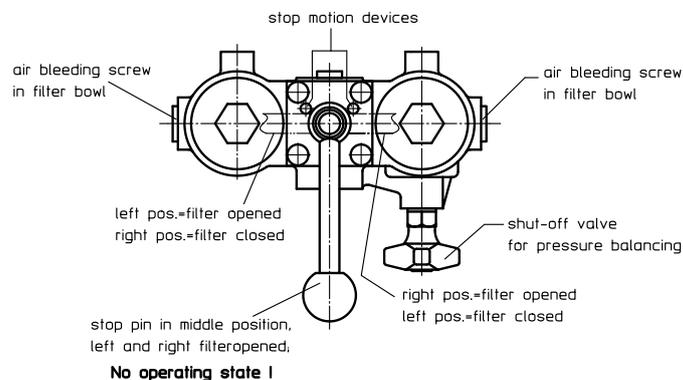
the illustration corresponds to DU 101/251/401/631/1001/1950



the illustration corresponds to DU 635/1050/2050



the illustration corresponds to DU 63



4. Maintenance / Inspection

Also please note all particular site-related instructions for inspection.

Using filters equipped with clogging indicators it is necessary to exchange or clean the element if the signal "Clogged filter" is emitted (also note the data sheet or the instructions of the clogging indicators). Contaminated elements have to be replaced as soon as possible! If a clogged element is not removed it may cause severe damage to the entire system!

Attention!

Always exchange elements with sealing. If a cleaned metal mesh element type „G“ is reused replace its sealing. The exact markings can be found in spare part lists for each element.

4.1 Replacing the filter element

Maintenance or the exchange of contaminated filter elements has to be performed as follows:

- Open the shut-off valve for pressure equalization.
- Switch the filter to the opposite side.
- Close the shut-off valve.
- Open the air-bleed valve of the discharged side of the housing in order to equalize the pressure with the surrounding atmosphere.
- Open the drain-valves to drain the filter
- Open the lid of the discharged side of the filter housing.
- Loosen and remove the element by light swaying and pulling.
- If necessary cover or close the adaptor end inside the housing and clean the entire inside.
- Close the drain valve and remove the cover of the adaptor end if present.
- Check the sealing of the filter lid and replace the O-ring if necessary.
- Take the replacing element, make sure the serial number matches the number of the old element, and insert it into the housing (prior check if the elements sealing are undamaged and tighten them)
- Close the filter with it's lid.
- finally perform the steps described in 3.2 "Filling and air-bleeding"

4.2 Cleaning the filter element

Filter elements with filter materials such as glass fibre (VG) or paper (P) are not cleanable. They have to be replaced after the dirt retention capacity has been reached. Filter elements with filter materials such a wire mesh (G) are cleanable and could be used again.

The cleaning of the filter elements has to be carried out according to the cleaning specification for INTERNORMEN-Filter elements (metal), shett-no. 21070-4 and 39448-4.

When removing and reinserting the element please proceed as described in 4.1 "Replacing the filter element".

The maintained side of the filter is now ready to operate at full strain again.

In addition to that it is possible to maintain or replace the clogging indicator if necessary. Both the DU 101 and the DU 251 separate this device from the pressurized system when it's switch is brought into the middle position.

Attention!

Independent from a necessary change of the element, the switching armature has to be actuated at least once per three weeks in order to maintain full operability.

5. Additional information

In addition to the regular clogging indication, the pressure drop, which is evidence for contamination, can be monitored and checked. On filters DU 101-2050 certain miniature measuring devices with a G ¼ A inside thread can be connected to the flanges. For this purpose it is necessary to install measuring connections with M16 screw joints.

6. Service

The service will be performed by

EATON Technologies GmbH
Friedensstr. 41
D-68804 Altlusheim
Germany

phone: +49(0)6205-2094-0
fax: +49(0)6205-2094-40

Special questions about the operation of the filter will also be answered within this area.

Spare parts respectively wearing parts have to be ordered according to the spare part list of the filter-data-sheet.