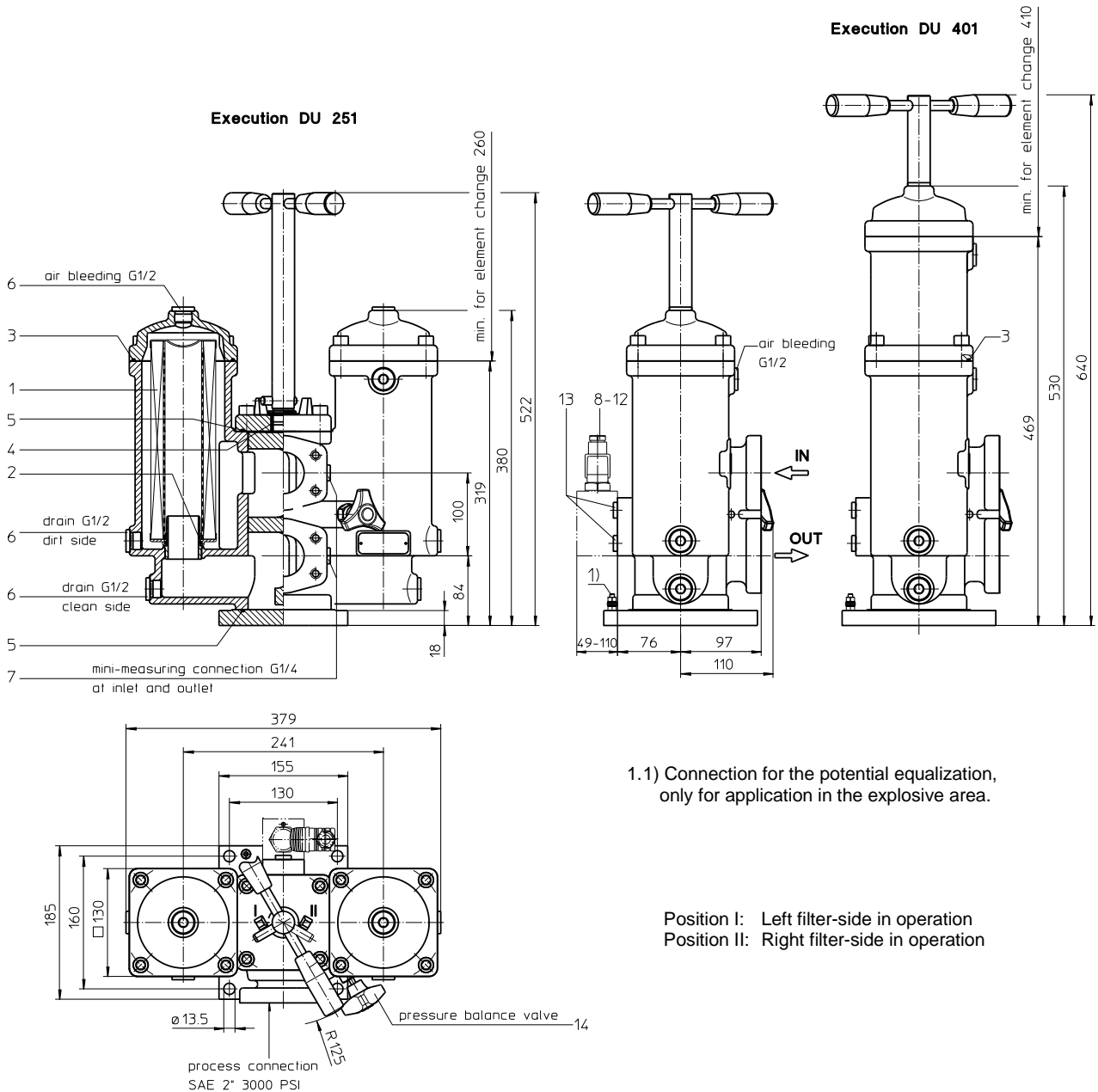


# Series DU 251-401

## DN50 PN32



Weight DU251: approx. 39 kg  
 Weight DU401: approx. 49 kg

Dimensions: mm

Designs and performance values are subject to change.

# Pressure Filter, change over Series DU 251-401 DN50 PN32

## Description:

Pressure filter changeover series DU 251-401 have a working pressure up to 32 bar. Pressure peaks can be absorbed with a sufficient safety margin.

A three-way-change-over 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 stainless steel mesh element (see special leaflets 21070-4 and 39448-4) or changing the filter 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 can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.

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	13
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- |    |   |
|----|---|
| 1  | <b>series:</b><br>DU = pressure filter, change over   |
| 2  | <b>nominal size:</b> 251, 401   |
| 3  | <b>filter-material:</b><br>130G, 80G, 40G, 25G stainless steel wire mesh<br>25VG, 16VG, 10VG, 6VG, 3VG microglass<br>25API, 10API microglass according to API<br>10P paper  |
| 4  | <b>filter element collapse rating:</b><br>30 = Δp 30 bar  |
| 5  | <b>filter element design:</b><br>E = single end open<br>S0,3 = with bypass valve Δp 0,3 bar<br>S = with bypass valve Δp 2,0 bar<br>S1 = with bypass valve Δp 3,5 bar  |
| 6  | <b>sealing material:</b><br>P = Nitrile (NBR)<br>V = Viton (FPM)  |
| 7  | <b>filter element specification:</b><br>- = standard<br>VA = stainless steel<br>IS06 = for HFC application, see sheet-no. 31601   |
| 8  | <b>process connection:</b><br>FS = SAE-flange connection 3000 PSI   |
| 9  | <b>process connection size:</b><br>8 = 2" (standard)<br>7 = 1 1/2" (with counter flange BFS.8.A.48,3x3,7.ST.P.3000)   |
| 10 | <b>filter housing specification:</b><br>- = standard<br>IS12 = internal parts of change over armature stainless steel, see sheet-no. 41028  |
| 11 | <b>pressure vessel specification:</b><br>- = standard (PED 2014/68/EU)<br>IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217 (max. operating pressure 16 bar)<br>IS14 = calculation pressure vessel parts acc. to EN 13445, see sheet-no. 69828 (max. operating pressure 10 bar)<br>IS63 = for operating pressure to 63 bar, see sheet-no. 68796 |
| 12 | <b>internal valve:</b><br>- = without   |
| 13 | <b>clogging indicator or clogging sensor:</b><br>- = without<br>AOR = visual, see sheet-no.1606<br>AOC = visual, see sheet-no.1606<br>AE = visual-electric, see sheet-no.1609<br>OP = visual, see sheet-no.1628<br>OE = visual-electric, see sheet-no.1628<br>VS5 = electronic, see sheet-no.1641   |

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. 250. 10VG. 30. E. P. -**

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

- |   |   |
|---|---|
| 1 | <b>series:</b><br>01NL = standard filter element according to DIN 24550, T3 |
| 2 | <b>nominal size:</b> 250, 400   |
| 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 resp. 1659
- SAE-counter flanges, see sheet-no. 1652
- shut-off valve, see sheet-no. 1655

## Technical data:

operating temperature:	-10°C to +100°C
operating medium:	mineral oil, other media on request
max. operating pressure:	32 bar
test pressure:	64 bar
max. operating pressure with IS20:	16 bar
test pressure with IS20:	32 bar
max. operating pressure with IS14:	10 bar
test pressure with IS14:	20 bar
max. operating pressure with IS63:	63 bar
test pressure with IS63:	126 bar
process connection:	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:	G ¼
drain- and bleeder connections:	G ½
volume tank DU251:	2x 2,5 l
DU401:	2x 3,7 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  $\Delta p$  and the element  $\Delta p$  and is calculated as follows:

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

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

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

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

[www.eatonpowersource.com/calculators/filtration/](http://www.eatonpowersource.com/calculators/filtration/)

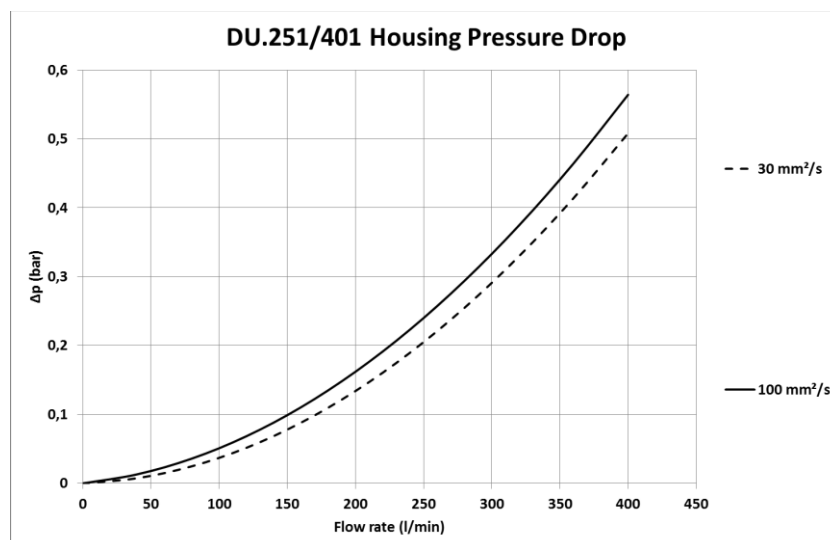
### Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in mbar/(l/min) apply to mineral oil (HLP) with a density of 0,876 kg/dm<sup>3</sup> and a kinematic viscosity of 30 mm<sup>2</sup>/s (139 SUS). 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	130G	10P	10API	25API
251	0,931	0,646	0,414	0,360	0,246	0,0277	0,0258	0,0177	0,0131	0,189	0,212	0,097
401	0,571	0,397	0,254	0,221	0,151	0,0169	0,0158	0,0108	0,0080	0,099	0,130	0,059

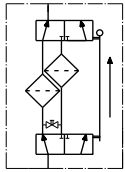
### $\Delta p = f(Q)$ – characteristics according to ISO 3968

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0,876 kg/dm<sup>3</sup>. The pressure drop changes proportionally to the density.

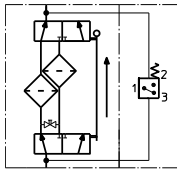


## Symbols:

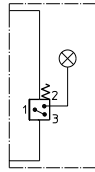
without indicator



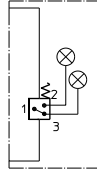
with electric indicator  
AE 30 and AE 40



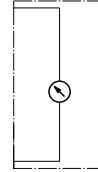
with visual-electric indicator  
AE 50 and AE 62



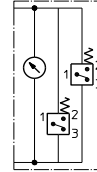
with visual-electric indicator  
AE 70 and AE 80



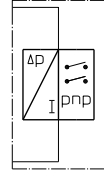
with visual indicator  
AOR/AOC/OP



with visual-electric indicator  
OE



with electronic sensor  
VS5



## Spare parts:

item	qty.	designation	dimension		article-no.	
			DU 251	DU 401		
1	2	filter element	01NL250...	01NL400...		
2	2	O-ring	40 x 3		304389 (NBR)	304391 (FPM)
3	2	O-ring (DU251)	115 x 3		303963 (NBR)	307762 (FPM)
	4	O-ring (DU401)	115 x 3		303963 (NBR)	307762 (FPM)
4	1	O-ring	24 x 3		303038 (NBR)	304397 (FPM)
5	2	O-ring	95 x 3		305808 (NBR)	304828 (FPM)
6	8	screw plug (DU251)	G 1/2		304678	
	10	screw plug (DU401)	G 1/2		304678	
7	2	screw plug	G 1/4		305003	
8	1	clogging indicator, visual	AOR or AOC		see sheet-no. 1606	
9	1	clogging indicator, visual	OP		see sheet-no. 1628	
10	1	clogging indicator, visual-electric	OE		see sheet-no. 1628	
11	1	clogging indicator, visual-electric	AE		see sheet-no. 1609	
12	1	clogging sensor, electronic	VS5		see sheet-no. 1641	
13	2	screw plug	G 1/4		305003	
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

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