Series EDU 251-401
464 PSI

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

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

Weight EDU251: approx. 90 lbs.
Weight EDU401: approx. 117 lbs.

Dimensions: inches

Designs and performance values are subject to change.
Description:

Stainless-steel-pressure filter changeover series EDU 251-401 have a working pressure up to 464 PSI. 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 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)

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**series:**
EDU = stainless steel-pressure filter, change over

**nominal size:** 251, 401

**filter material:**
- 80G, 40G, 25G stainless steel wire mesh
- 25VG, 16VG, 10VG, 6VG, 3VG microglass
- 25API, 10API microglass according to API
- 10P paper

**filter element collapse rating:**
- 30 = Δp 435 PSI

**filter element design:**
- E = single end open
- S = with bypass valve Δp 29 PSI
- S1 = with bypass valve Δp 51 PSI

**sealing material:**
- P = Nitrile (NBR)
- V = Viton (FPM)

**filter element specification:**
- VA = stainless steel
- ISO6 = for HFC application, see sheet-no. 31601

**process connection:**
- FS = SAE-flange connection 3000 PSI

**process connection size:**
- 8 = 2"

**filter housing specification:**
- VA = stainless steel

**pressure vessel specification:**
- IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet-no. 55217 (max. operating pressure 232 PSI)

**internal valve:**
- = without

**clogging indicator or clogging sensor:**
- = without
- AOR = visual, see sheet-no. 1606
- AOC = visual, 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/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)

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**series:**
01NL = standard filter element according to DIN 24550, T3

**nominal size:** 250, 400

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<tbody>
<tr>
<td>3</td>
<td>7</td>
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</tbody>
</table>

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 flanges, 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
- **test pressure:** 900 PSI
- **max. operating pressure with IS20:** 232 PSI
- **test pressure with IS20:** 464 PSI
- **process connection:** SAE-flange connection 3000 PSI
- **housing material:** EN10213-1.4581
- **sealing material:** Nitrile (NBR) or Viton (FPM), other materials on request
- **installation position:** vertical
- **measuring connections:** BSPP ¼
- **drain- and bleeder connections:** BSPP ½
- **volume tank**
  - **EDU251:** 2x .66 Gal.
  - **EDU401:** 2x .97 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 \( \Delta p \) and the element \( \Delta p \) and is calculated as follows:

\[
\Delta p_{\text{assembly}} = \Delta p_{\text{housing}} + \Delta p_{\text{element}}
\]

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

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

For ease of calculation our Filter Selection tool is available online at [www.eatonpowersource.com/calculators/filtration/](http://www.eatonpowersource.com/calculators/filtration/)

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

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

<table>
<thead>
<tr>
<th>EDU</th>
<th>VG</th>
<th>G</th>
<th>P</th>
<th>API</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>3VG</td>
<td>6VG</td>
<td>10VG</td>
<td>16VG</td>
</tr>
<tr>
<td>251</td>
<td>1.140</td>
<td>0.792</td>
<td>0.507</td>
<td>0.441</td>
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<tr>
<td>401</td>
<td>0.700</td>
<td>0.486</td>
<td>0.311</td>
<td>0.271</td>
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</tbody>
</table>

\( \Delta p = f(Q) - \text{characteristics according to ISO 3968} \)

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.

![EDU.251/401 Housing Pressure Drop](image)
Symbols:

- **without indicator**
  - AE 30 and AE 40
  - AE 50 and AE 62
- **with electric indicator**
  - AE 70 and AE 80
- **with visual-electric indicator**
  - AE 50 and AE 62
  - AE 70 and AE 80
- **with visual indicator**
  - AOR/AOC/OP
- **with visual-electric indicator**
  - OE
- **with electronic sensor**
  - VS5

Spare parts:

<table>
<thead>
<tr>
<th>Item</th>
<th>qty.</th>
<th>designation</th>
<th>dimension</th>
<th>article-no.</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>filter element</td>
<td>EDU 251 01NL250...</td>
<td>304389 (NBR) 304391 (FPM)</td>
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<tr>
<td>2</td>
<td>2</td>
<td>O-ring</td>
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<td>303963 (NBR) 307762 (FPM)</td>
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<td>O-ring (EDU251)</td>
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<td>305686 (NBR) 304625 (FPM)</td>
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<td>O-ring</td>
<td>Ø76 x 4</td>
<td>305699 (NBR) 310291 (FPM)</td>
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<td>O-ring</td>
<td>Ø32 x 2.5</td>
<td>306843 (NBR) 308268 (FPM)</td>
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<td>8</td>
<td>8</td>
<td>screw plug (EDU251)</td>
<td>BSPP ½</td>
<td>306966</td>
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<tr>
<td>9</td>
<td>2</td>
<td>screw plug</td>
<td>BSPP ½</td>
<td>306866</td>
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<td>clogging indicator, visual</td>
<td>AOR or AOC</td>
<td>see sheet-no. 1606</td>
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<td>OP</td>
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<tr>
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<td>OE</td>
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<td>see sheet-no. 1641</td>
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<td>pressure balance valve</td>
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**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