Weld-In Nozzle (ISA 1932) EDUB 800 / EDUA 800

Application
Weld-in ISA 1932 nozzles are used as flow elements for flow measurement of aggressive and non-aggressive gases, steam and liquids.

Design
Weld-in ISA 1932 nozzles are mainly used for high pressure, high temperature applications, especially in power plants.

The pressure tappings can be designed as single bore holes (EDUB 800) or as a ring chamber (EDUA 800). If needed, we can weld inlet and outlet pipe sections to the nozzle. These pipe sections are usually provided by the customer. The welding seams are mechanically processed in order to meet the surface roughness requirements of the respective calculation standard.

Advantages
Weld-In flow elements are the recommended choice for high pressure and high temperature appliances because they avoid any kind of leakage.

The single bore tappings (EDUB 800) are easy to clean and thus suitable for process fluids which may accumulate, become resinous or for plants which are not operating constantly. The ring chamber design (EDUA 800) ensures that the pressure values are averaged over the cross section. This results in a steady measurement signal.

Measuring Uncertainty
ca. 0.8% - 1.2% of the discharge coefficient C, depending on the use case

Pressure Loss
The pressure loss depends on the diameter ratio $\beta (d/D)$ and amounts to ca. 30 - 80% of the differential pressure.

Nominal Diameter (ISO 5167)
DN 50 to DN 500 / DN 2" to DN 20" (if requested other sizes are possible)

Pressure Rating
PN 40 to PN 400 / 150# to 2500# (ASME)

Connection Type
Weld preparation according to EN ISO 9692 (DIN 2559), ASME B16.25 or customer standard.
Standard Installation Lengths L (similar to DIN 19215)
The total length includes welded inlet and outlet pipe sections, often provided by the customer.

If longer inlet and outlet pipe sections are needed we recommend our ring chamber design EDUA 800 to ensure proper mechanical processing of the welding seams according to the requirements of ISO 5167.

Bore Diameter "d"
The calculation of the bore diameter is based on the supplied process data. All relevant standards and regulations will be considered. The calculation is part of the scope of supply.

Pressure Taps
Pressure taps will be designed according to customer requirements. Typical tap designs are:
- plain ends for fittings
- butt weld ends
- threaded ends
- flanged ends

The typical tapping length is ca. 100 mm.

Marking
Tag no. of flow element
Pressure rating "PN"
Pipe inner diameter "D"
Bore diameter "d"
Material, direction of flow and tagging of pressure tappings with "+" and "−"

Materials
The following table shows a selection of typical materials utilized for weld-in nozzles. The material is chosen based on process medium, pressure and temperature. The pressure tap material is selected to be equivalent to the pipe material.
<table>
<thead>
<tr>
<th>Material nozzle</th>
<th>short name</th>
<th>DIN material no.</th>
<th>ASTM / UNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>non-alloy steels</td>
<td>P 250GH (C22.8)</td>
<td>1.0460</td>
<td>~A105</td>
</tr>
<tr>
<td></td>
<td>A105</td>
<td>~1.0432</td>
<td>A105</td>
</tr>
<tr>
<td>heat resistant/alloyed steels</td>
<td>16Mo3</td>
<td>1.5415</td>
<td>A182 Gr. F1</td>
</tr>
<tr>
<td></td>
<td>13CrMo45</td>
<td>1.7335</td>
<td>A182 Gr. F11</td>
</tr>
<tr>
<td></td>
<td>10CrMo910</td>
<td>1.7380</td>
<td>A182 Gr. F22</td>
</tr>
<tr>
<td></td>
<td>15 NiCuMoNb 5</td>
<td>1.6368</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>X10CrNiMoNb91</td>
<td>1.4903</td>
<td>A182 Gr. F91</td>
</tr>
<tr>
<td>stainless steels</td>
<td>X2CrNiMo17-12-2</td>
<td>1.4404</td>
<td>316L</td>
</tr>
<tr>
<td></td>
<td>X6CrNiMoTi 17 12 2</td>
<td>1.4571</td>
<td>316Ti</td>
</tr>
<tr>
<td>high corrosion-resistant alloys</td>
<td>Hastelloy C276</td>
<td>2.4819</td>
<td>N 10276</td>
</tr>
<tr>
<td></td>
<td>Monel 400</td>
<td>2.4360</td>
<td>N 04400</td>
</tr>
</tbody>
</table>

**Example Designs**

**Single bore tappings**
(EDUB 800)

![Diagram of single bore tappings](image)

**Ring chamber design**
(EDUA 800)

![Diagram of ring chamber design](image)
Installation
To be welded to pipes on construction site.

Quality Control
Manufacture and Test work is done according to the relevant codes and standards such as AD 2000, EN 13480, ASME Codes (without stamp) or customer specifications.
Inspection certificates according to EN 10204 3.1 and 3.2. may be furnished. Special inspections are also possible.

Accessories
Tap valves, condensate pots, manifolds, mounting accessories may be offered for additional charges.