

AS ultrasonic flow sensor – Needed straight pipe length

According to highly accurate measurement, AS ultrasonic flow sensor needs following straight pipe length under various installation condition.

1) Fig. 1 shows recommended straight pipe lengths with respective piping conditions.

	Up stream	Down stream
90° Elbow pipe / Full bore valve open	<p>Thread type (DN 25, 32): > 2D Flange type (DN 40, 50, 80): > 10D</p>	<p>> 5D</p>
Confluence	<p>> 20D</p>	<p>> 10D</p>
Expanding pipe	<p>> 20D</p>	<p>> 5D</p>
Reduction pipe	<p>> 10D</p>	<p>> 10D</p>

Fig. 1 Recommended straight pipe lengths (D: Diameter) example 1

2) In case of mounting ultrasonic flow sensor near regulator flow adjustment valve there may occur supersonic noise in piping. Keep the needed straight pipe length (L).

Especially when AS flow sensor is mounted at down stream of regulator, it may have huge fluctuations in measurement.

(The measurement may fail in case of not satisfying proper sensor mounting conditions.)

Needed straight pipe (mm) = $1 \text{ OD} + \text{DF} \cdot (\text{kPa}) \times \text{D} \times \frac{\text{Max flow rate (m/s)}}{20 \text{ (m/s)}} \times (0.8)^{\text{Elbow number}}$ (DF: Differential pressure)
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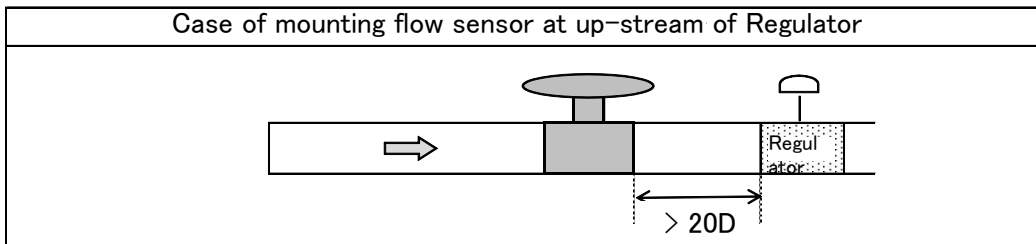
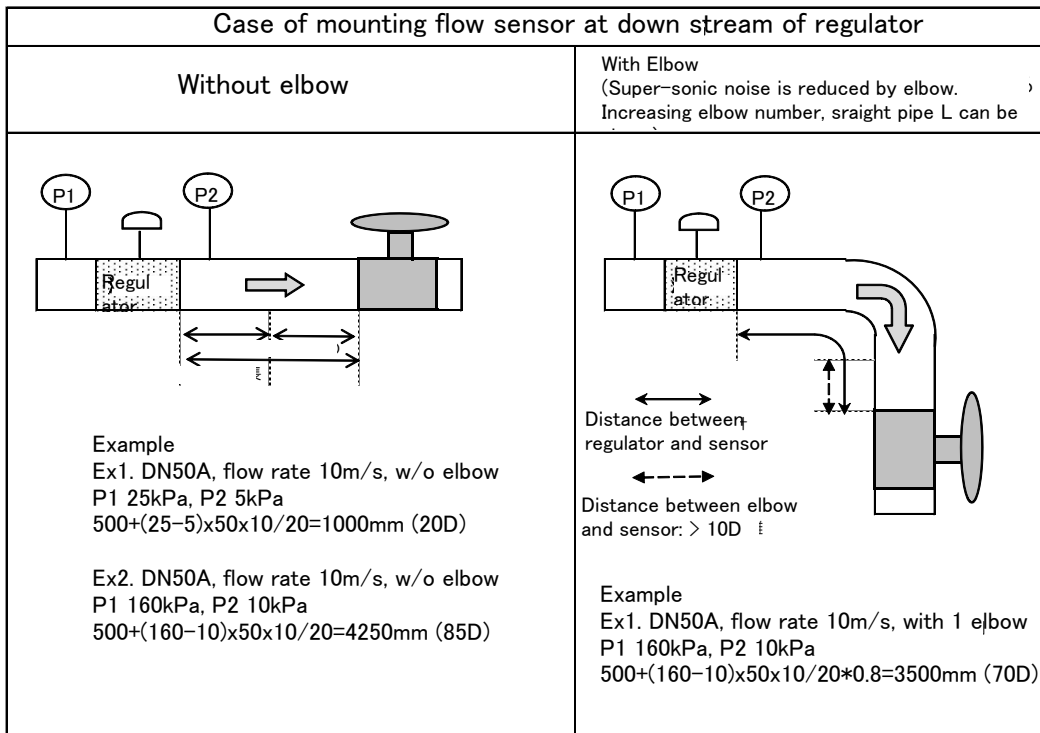


Fig 2. Recommended straight pipe length (D: Diameter) example 2
 (Case of ultrasonic sensor being mounted near regulator or flow adjustment valve.)