

# DIN EN ISO 5167-5:2016-10 (E)

## Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 5: Cone meters (ISO 5167-5:2016)

---

<b>Contents</b>		<b>Page</b>
European foreword .....		3
Foreword .....		4
Introduction .....		5
<b>1</b>	<b>Scope</b> .....	<b>6</b>
<b>2</b>	<b>Normative references</b> .....	<b>6</b>
<b>3</b>	<b>Terms and definitions</b> .....	<b>6</b>
<b>4</b>	<b>Principles of the method of measurement and computation</b> .....	<b>7</b>
<b>5</b>	<b>Cone meters</b> .....	<b>8</b>
5.1	Field of application .....	8
5.2	General shape .....	9
5.3	Material and manufacture .....	12
5.4	Pressure tappings .....	13
5.5	Discharge coefficient, $C$ .....	13
5.5.1	Limits of use .....	13
5.5.2	Discharge coefficient of the cone meter .....	13
5.6	Expansibility (expansion) factor, $\epsilon$ .....	14
5.7	Uncertainty of the discharge coefficient, $C$ .....	14
5.8	Uncertainty of the expansibility (expansion) factor, $\epsilon$ .....	14
5.9	Pressure loss .....	14
<b>6</b>	<b>Installation requirements</b> .....	<b>15</b>
6.1	General .....	15
6.2	Minimum upstream and downstream straight lengths for installations between various fittings and the cone meter .....	15
6.2.1	General .....	15
6.2.2	Single 90° bend .....	16
6.2.3	Two 90° bends in perpendicular planes .....	16
6.2.4	Concentric expander .....	16
6.2.5	Partially closed valves .....	16
6.3	Additional specific installation requirements for cone meters .....	16
6.3.1	Circularity and cylindricity of the pipe .....	16
6.3.2	Roughness of the upstream and downstream pipe .....	16
6.3.3	Positioning of a thermowell .....	16
<b>7</b>	<b>Flow calibration of cone meters</b> .....	<b>17</b>
7.1	General .....	17
7.2	Test facility .....	17
7.3	Meter installation .....	17
7.4	Design of the test programme .....	17
7.5	Reporting the calibration results .....	18
7.6	Uncertainty analysis of the calibration .....	18
7.6.1	General .....	18
7.6.2	Uncertainty of the test facility .....	18
7.6.3	Uncertainty of the cone meter .....	18
<b>Annex A (informative) Table of expansibility (expansion) factor</b> .....		<b>19</b>
<b>Bibliography</b> .....		<b>20</b>