DIN EN ISO 5167-5:2023-08 (E)

Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 5: Cone meters (ISO 5167-5:2022)

Contents

Page

European foreword ... **3**

Foreword ... **4**

Introduction ... **5**

1 Scope ... **6**

2 Normative references ... **6**

3 Terms and definitions ... **6**

4 Principles of the method of measurement and computation ... 7

5 Cone meters ... 8
- 5.1 Field of application ... 8
- 5.2 General shape ... 8
- 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, ε ... 14
- 5.7 Uncertainty of the discharge coefficient, C ... 14
- 5.8 Uncertainty of the expansibility (expansion) factor, ε ... 14
- 5.9 Pressure loss ... 14

6 Installation requirements ... **15**
- 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 cylindricality of the pipe ... 16
  - 6.3.2 Roughness of the upstream and downstream pipe ... 16
  - 6.3.3 Positioning of a thermowell ... 16

7 Flow calibration of cone meters ... **17**
- 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 discharge coefficient of the cone meter ... 18

Annex A (informative) **Table of expansibility (expansion) factor** ... **19**

Bibliography ... **20**