

DIN EN ISO 5167-2:2023-08 (E)

Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 2: Orifice plates (ISO 5167-2:2022)

Contents	Page
European foreword	4
Foreword	5
Introduction	6
1 Scope	7
2 Normative references	7
3 Terms, definitions and symbols	7
4 Principles of the method of measurement and computation	8
5 Orifice plates	8
5.1 Description	8
5.1.1 General	8
5.1.2 General shape	8
5.1.3 Upstream face A	9
5.1.4 Downstream face B	10
5.1.5 Thicknesses E and e	10
5.1.6 Angle of bevel, α	11
5.1.7 Edges G, H and I	11
5.1.8 Diameter of orifice, d	11
5.1.9 Bidirectional plates	12
5.1.10 Material and manufacture	12
5.2 Pressure tappings	12
5.2.1 General	12
5.2.2 Orifice plate with D and $D/2$ tappings or flange tappings	12
5.2.3 Orifice plate with corner tappings	14
5.3 Coefficients and corresponding uncertainties of orifice plates	17
5.3.1 Limits of use	17
5.3.2 Coefficients	18
5.3.3 Uncertainties	19
5.4 Pressure loss, $\Delta\varpi$	20
6 Installation requirements	21
6.1 General	21
6.2 Minimum upstream and downstream straight lengths for installation between various fittings and the orifice plate	22
6.3 Flow conditioners	27
6.3.1 General	27
6.3.2 19-tube bundle flow straightener (1998)	27
6.3.3 The Zanker flow conditioner plate	33
6.4 Circularity and cylindricality of the pipe	34
6.5 Location of orifice plate and carrier rings	35
6.6 Method of fixing and gaskets	36
7 Flow calibration of orifice meters	36
7.1 General	36
7.2 Test facility	37
7.3 Meter installation	37

7.4	Design of the test programme	37
7.5	Reporting the calibration results	37
7.6	Uncertainty analysis of the calibration	38
7.6.1	General	38
7.6.2	Uncertainty of the test facility	38
7.6.3	Uncertainty of the orifice meter	38
Annex A (informative) Tables of discharge coefficients and expansibility [expansion] factors.....		39
Annex B (informative) Flow conditioners.....		53
Bibliography.....		58