

ISO 748:2021-11 (E)

Hydrometry - Measurement of liquid flow in open channels - Velocity area methods using point velocity measurements

Contents		Page
Foreword		v
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Principle of the methods of measurements	1
5	Site selection	2
5.1	Selection of site	2
5.2	Demarcation of site	3
6	Measurement of cross-sectional area	3
6.1	General	3
6.2	Measurement of width	3
6.3	Measurement of depth	3
7	Measurement of mean velocity	4
7.1	Determination of mean velocity using point velocity measurements	4
7.1.1	General	4
7.1.2	Measurement procedure	4
7.1.3	Oblique flow	5
7.1.4	Determination of the mean velocity in a vertical	5
7.1.5	Integration method	8
7.1.6	Errors and limitations	8
7.2	Determination of mean velocity from surface velocity	8
7.2.1	General	8
7.2.2	Non-contact systems	9
7.2.3	Surface one-point method by current meter	9
7.2.4	Measurement of velocity using floats	9
7.2.5	Exceptions	9
7.2.6	Main sources of error	9
8	Computation of discharge	10
8.1	Arithmetic methods	10
8.1.1	General	10
8.1.2	Mean-section method	10
8.1.3	Mid-section method	10
8.1.4	Bathymetric verticals	11
8.2	Independent vertical method	11
8.3	Mean-section method -- Horizontal planes	13
9	Uncertainties in flow measurement	13
9.1	General	13
9.2	Method of calculating the uncertainty in discharge by measurement of velocity by current meter	14
9.2.1	General	14
9.2.2	Contributory uncertainties	14

9.3	Method of calculating the uncertainty in discharge by measurement of velocity using floats	16
9.3.1	General	16
9.3.2	Contributory uncertainties	16
9.3.3	Combined uncertainty in discharge	17
9.4	Limitations	18
9.5	Interpolated variance estimator (IVE)	19
9.6	Q+	19
9.7	Flaure	19
Annex A (informative) Use of point velocity current meters		20
Annex B (informative) Surface velocity measurement using floats		23
Annex C (informative) Example surface velocity systems		27
Annex D (informative) Uncertainties in the velocity-area measurement		29
Annex E (informative) Velocity measurement under ice conditions		32
Annex F (informative) Corrections for wetted length of wire when measuring depths with wire not normal to surface		38
Bibliography		41