

# DIN EN 16211:2025-08 (E)

## Ventilation for buildings - Measurement of air flow rates on site - Methods

---

<b>Contents</b>		<b>Page</b>
European foreword .....		4
Introduction .....		5
1	Scope .....	6
2	Normative references .....	6
3	Terms and definitions .....	6
4	Symbols and abbreviated terms .....	7
5	Expression of air flow rate and parameters of influence .....	10
5.1	Hydraulic diameter .....	10
5.2	Flow disturbances .....	11
5.3	Stability of the air flow rate .....	11
5.4	Air density .....	11
5.5	Conversion of dynamic pressure into air velocity .....	11
5.6	Correction and conversion of measured air flow rate .....	12
5.6.1	General .....	12
5.6.2	Correction of the air flow rate .....	12
5.6.3	Conversion of the air flow rate .....	13
6	Measuring instruments requirements .....	14
6.1	General .....	14
6.2	Air flow rate measuring instruments .....	14
6.3	Differential pressure measuring instruments (manometers) .....	14
6.4	Air velocity measuring instruments .....	14
6.4.1	General .....	14
6.4.2	Anemometers .....	14
6.4.3	Pitot static tubes .....	14
6.5	Temperature measuring instruments (thermometers) .....	15
6.6	Atmospheric pressure measuring instruments (barometers) .....	15
7	Methods for measurement of air flow rates .....	16
7.1	Overview of described methods .....	16
7.2	Multi-point measurement in the duct cross-section - with measurement plane criteria (ID1) .....	17
7.2.1	Principle .....	17
7.2.2	Apparatus .....	17
7.2.3	Measurement procedure .....	18
7.2.4	Expression of results .....	23
7.3	Multipoint measurement in the duct cross-section - without measurement plane criteria (ID2) .....	25
7.3.1	Principle .....	25
7.3.2	Apparatus .....	25
7.3.3	Measurement procedure .....	26
7.3.4	Expression of results .....	32
7.4	Fixed devices for air flow rate measurement (ID3, ST1 and ET1) .....	37
7.4.1	Principle .....	37
7.4.2	Apparatus .....	38
7.4.3	Measurement procedure .....	38

7.4.4	Expression of results .....	38
7.5	Air flow rate measurement with tight bag at supply ATDs (ST2) .....	39
7.5.1	Principle .....	39
7.5.2	Apparatus .....	40
7.5.3	Measurement procedure .....	40
7.5.4	Expression of results .....	40
7.6	Air flow rate measurement with flow hood (ST3 and ET2) .....	40
7.6.1	Principle .....	40
7.6.2	Apparatus .....	41
7.6.3	Measurement procedure .....	43
7.6.4	Expression of results .....	44
<b>Annex A (informative) Additional methods .....</b>		<b>45</b>
A.1	Tracer gas measurement (ID4) .....	45
A.1.1	Principle .....	45
A.1.2	Apparatus .....	45
A.1.3	Measurement procedure - Conditions for homogeneous mixing of tracer gas .....	46
A.1.4	Expression of result - Calculation of air flow rate .....	47
A.2	Measurement using anemometer at air intake (IN1) or air exhaust (EX1) .....	48
A.2.1	Principle .....	48
A.2.2	Apparatus .....	48
A.2.3	Measurement procedure .....	48
A.2.4	Expression of results .....	49
A.3	Point measurements using thermal anemometers on rectangular intake (IN2) and extract (ET3) grilles on walls .....	49
A.3.1	Principle .....	49
A.3.2	Measurement instruments/Apparatus .....	50
A.3.3	Measurement procedure .....	50
A.3.4	Standard measurement uncertainty .....	52
<b>Annex B (informative) Measurement uncertainty .....</b>		<b>53</b>
B.1	Uncertainty of the result of a measurement .....	53
B.2	Type B evaluation of standard uncertainty .....	53
B.3	Combined standard uncertainty .....	55
B.4	Expanded uncertainty .....	55
B.5	Examples .....	56
<b>Bibliography .....</b>		<b>61</b>