2.2.2 AFM-Q

Air Flow measuring station

AirConcepts

AIRFLOW MEASUREMENT AND CONTROL

Application

The Air Flow Measuring stations type AFM-Q consists of one or more FloXact™ air velocity probes, factory mounted in a rigid galvanized steel casing. Multiple sets of total and static pressure sensing points, positioned along the length of each FloXact™ probe on an equal area basis, traverse the airstream and average the sensed pressures. Factory installed static and total pressure signal tubing connect the individual FloXact™ probes together, terminating at the galvanized casing for field connection. The AFM-Q is suited for installations in ductwork, fan inlets, etc.,
The AFM-Q can be used in applications ranging from commercial building HVAC to laboratory, pharmaceutical and electronics production, and health care institutions.

Air-Trac™ System

AFM units are often used in combination with VAV systems to monitor supply air volume in a large area or floor. The supply air volume signal is used to control / balance a VAV terminal in the corresponding return air duct. This means that the system is balanced in all load conditions which ensures a quit operation and the most energy efficient installation.

Design features

Casing

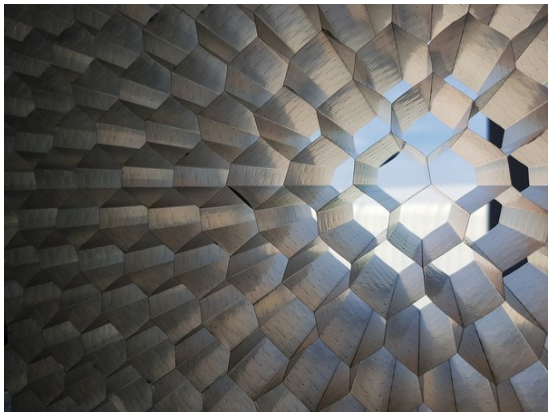
- Ridged galvanised steel construction (1,2mm).
- Flanges: 30mm, corner holes ø10x17mm
- Operating temperature +10 to 50°C
- Storage temperature 0 to 70°C, max R.H. 95%
- Optional double wall construction (25mm insulation).
- Optional with airflow straightener, 99,5% free area.
- Other construction available upon request.

Air flow sensor

- Multi point averaging sensor type FloXact™. The unique shape creates an amplified signal (at least 2.5x Pdyn) with a very low pressure drop and noise level

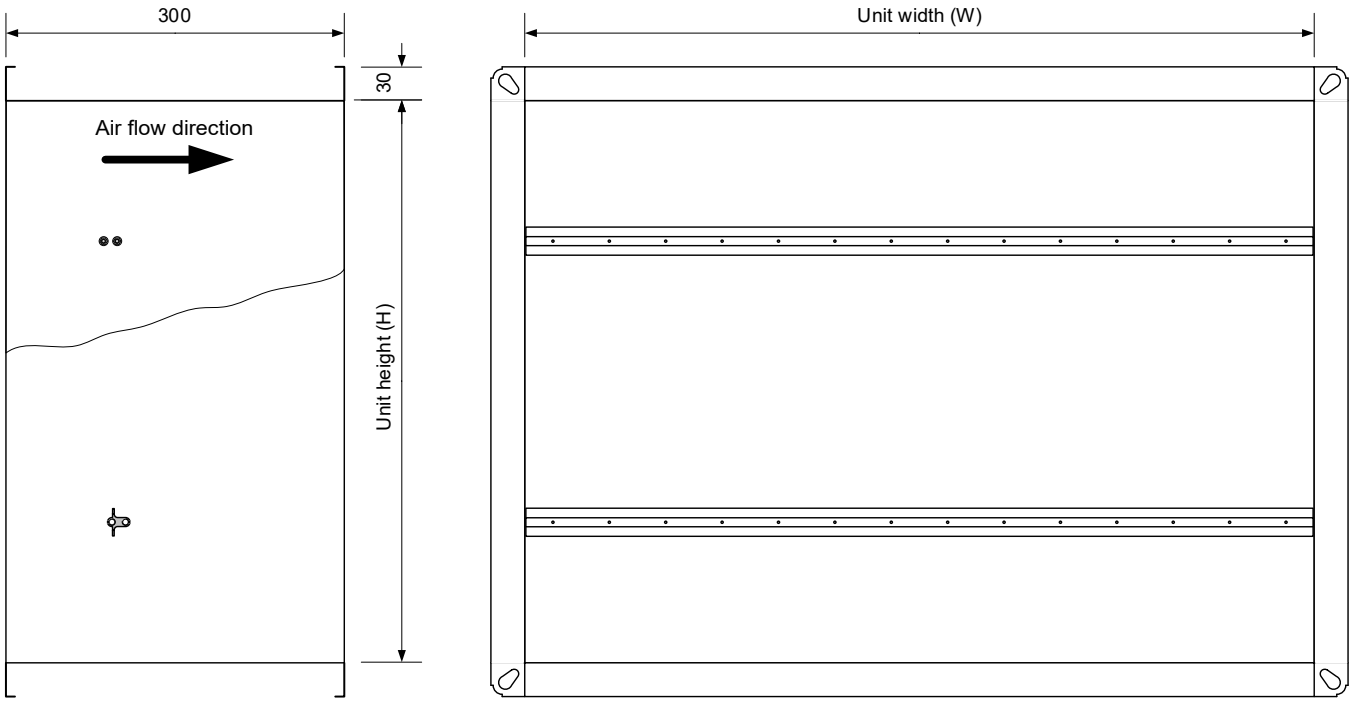
- Controls
  All controls fitted are pressure independent and factory calibrated.
- When units are ordered with controls '"free-issued" by 3rd party, wiring diagrams, calibration instructions, calibration tools and mounting instructions must be provided free of charge.
- All controls will be mounted, as standard, on the right hand side of the unit when looking in the direction of airflow, unless otherwise requested.

Air Flow Measuring station type AFM-Q

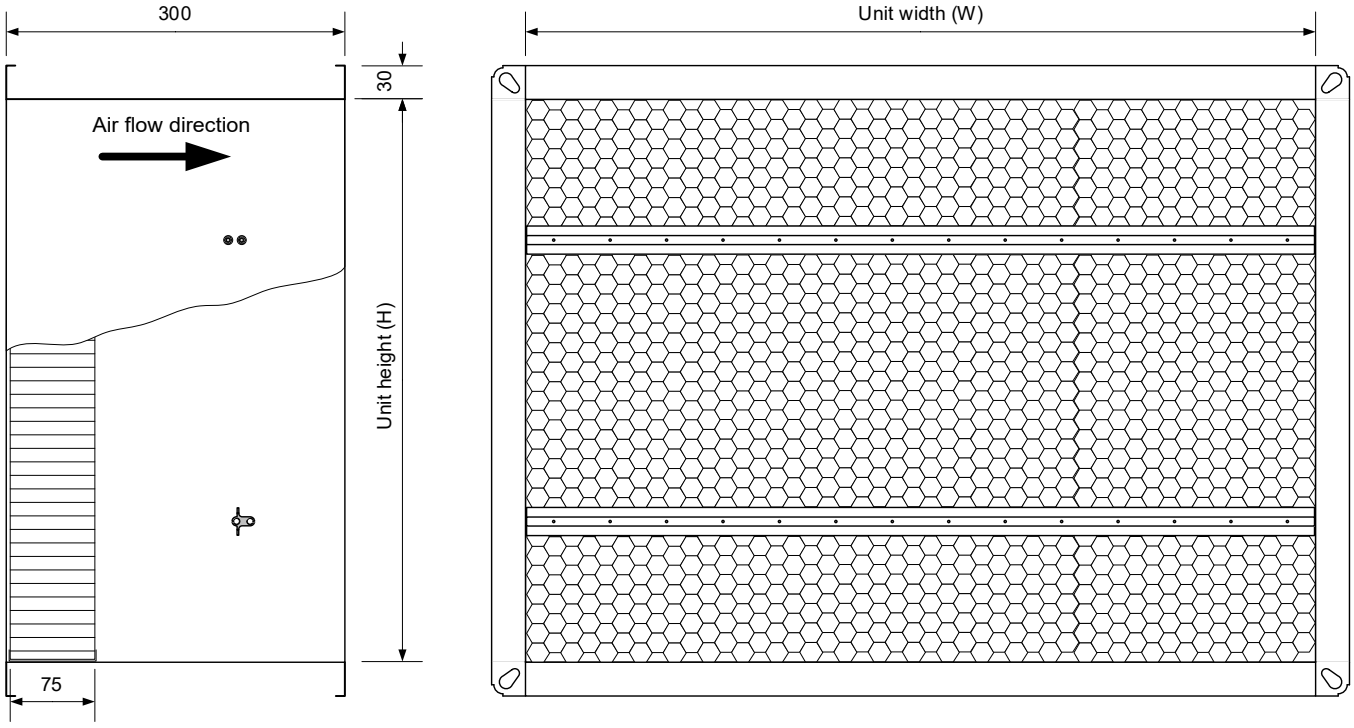


Optional airflow straightener. Free area 99.5%

DPT-Flow pressure transducer. Factory fitted and calibrated, when ordered together.



Type AFM-Q (single wall construction)



Type AFM-QS (single wall construction incl. Air Flow Straighten-

The FloXact sensors are usually fitted horizontally in the duct. Sensor length = duct width.
The K_v value is related to the net (free) duct area.
The width of the FloXact - L sensor is always 25mm and for accuracy, in every 300mm duct height 1 sensor needs to be fitted.
The K_v value can be calculated with the formula below:

K_v = 920.7 x free area in m^2 = ... l/s.Pa

Or

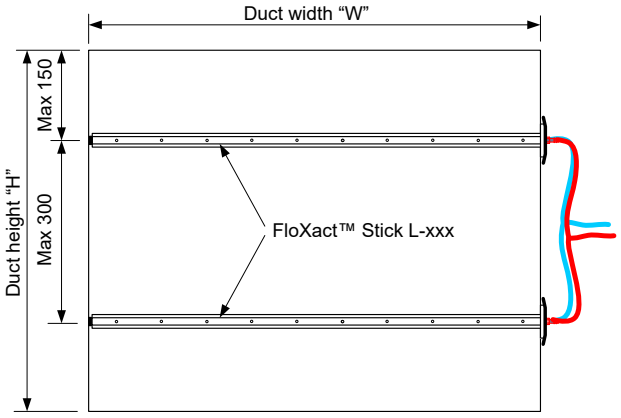
K_v = 920.7 x (L x (H - n x 0.025)) = ... l/s.Pa

L = sensor length (usually duct width)
H = Duct height
n = N° of FloXact probes (1 every 300mm)

The air volume can be determined with the following formula:

$$Q = K_v \times \sqrt{P_{fx}}$$

Q = air volume in l/s or m^3/h
K_v = K_v value in l/s.Pa or $m^3/h.Pa$
P_{fx} = pressure difference measured by the

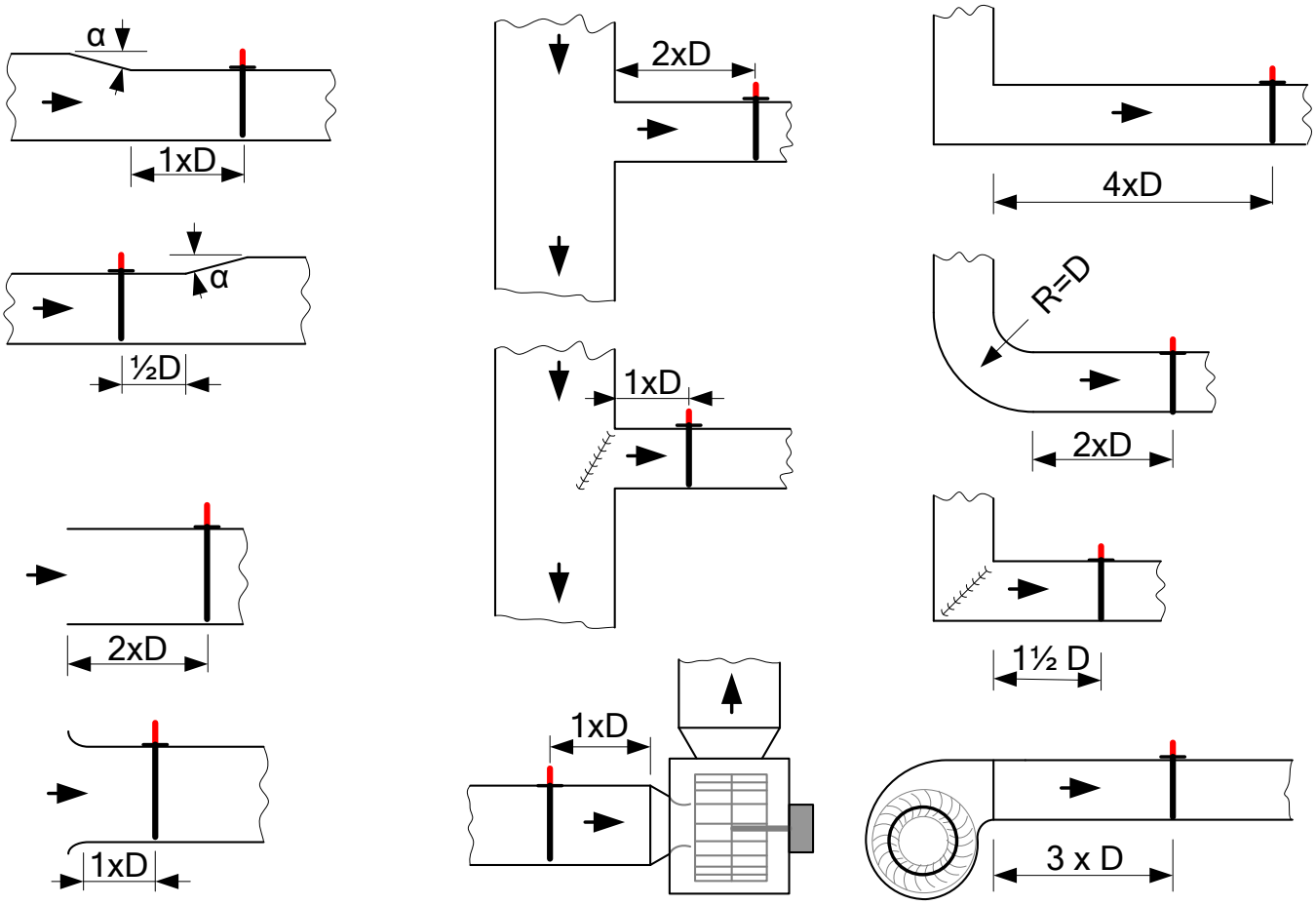


Kv values for most common duct dimensions

		Duct width (W) = FloXact - L length													
Duct	N° off	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
height (H)	sensors (n)	K_v value in l/s/Pa													
150	1	23,0	34,5	46,0	57,5	69,1	80,6	92,1	104	115	127	138	150	161	173
200		32,2	48,3	64,4	80,6	96,7	113	129	145	161	177	193	209	226	242
250		41,4	62,1	82,9	104	124	145	166	186	207	228	249	269	290	311
300		50,6	76,0	101	127	152	177	203	228	253	279	304	329	354	380
350	2	55,2	82,9	110	138	166	193	221	249	276	304	331	359	387	414
400		64,4	96,7	128,9	161	193	226	258	290	322	354	387	419	451	483
450		73,7	110	147	184	221	258	295	331	368	405	442	479	516	552
500		82,9	124	166	207	249	290	331	373	414	456	497	539	580	621
600		101	152	203	253	304	354	405	456	506	557	608	658	709	760
700	3	115	173	230	288	345	403	460	518	575	633	691	748	806	863
800		133	200	267	334	400	467	534	601	667	734	801	868	934	1001
900		152	228	304	380	456	532	608	684	760	836	911	987	1063	1139
1000	4	166	249	331	414	497	580	663	746	829	911	994	1077	1160	1243
1100		184	276	368	460	552	644	737	829	921	1013	1105	1197	1289	1381
1200		203	304	405	506	608	709	810	911	1013	1114	1215	1317	1418	1519
1300	5	216	325	433	541	649	757	865	974	1082	1190	1298	1406	1515	1623
1400		235	352	470	587	704	822	939	1056	1174	1291	1409	1526	1643	1761
1500		253	380	506	633	760	886	1013	1139	1266	1393	1519	1646	1772	1899

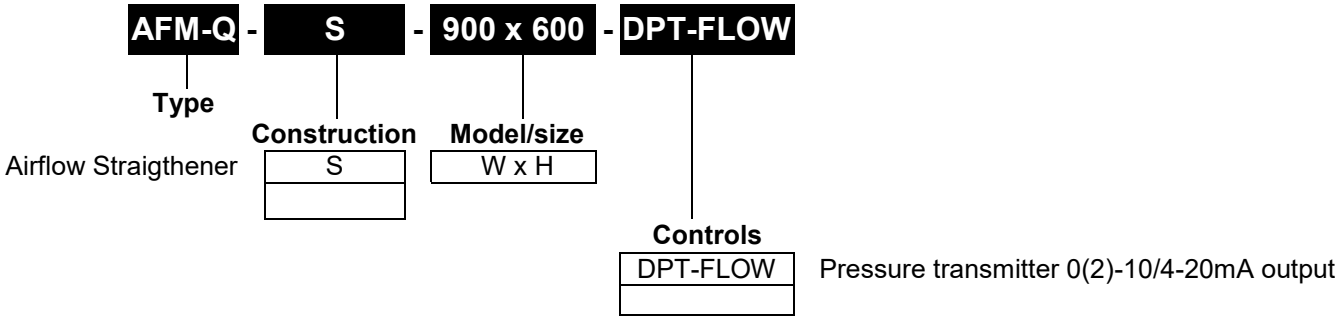
- The table above is for air with 1.20 kg/m^3 density (20°C, 50% r.h. and 1013 mbar).
- The correction for different densities is determined with the following formula : **Corr = $\sqrt{(\rho/1.20)}$**

Mounting instructions



Round ducts : **D = duct diameter**
Rectangular ducts : **D = 2 x (H x W) / (H + W)**
Example:
W = 600, H = 300
D = 2 x (600 x 300) / (600 + 300) = 400 mm

Production Airflow Measuring Stations



Specify as:

Example:
Supply and install, Air Flow Measuring station, single wall construction, from 1.2mm thick galvanized sheet steel, with 30mm duct flanges. Casing leakage rate to class II, VDI 3803/ DIN 24 194. The units should have an averaging air-flow sensor type FloXact® with brass fittings on outside of unit, no tubing allowed inside unit.
For:

Air volume	.... l/s
Unit size	.... X .... mm
Kv value	..... l/s.Pa
Transmitter	DPT-FLOW with 0(2)-10Vdc (4-20 mA) output signal. Factory fitted and calibrated
Manufacturer	AIR-CONCEPTS BV
Type	AFM-Q-xxx-xxx+DPT-FLOW

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