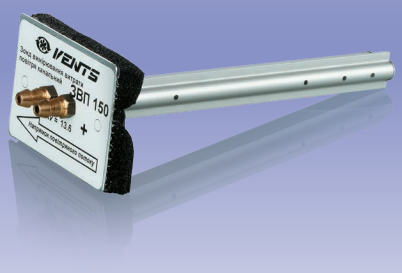
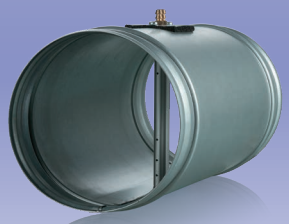
Air flow probe



Air flow measurement module



Application

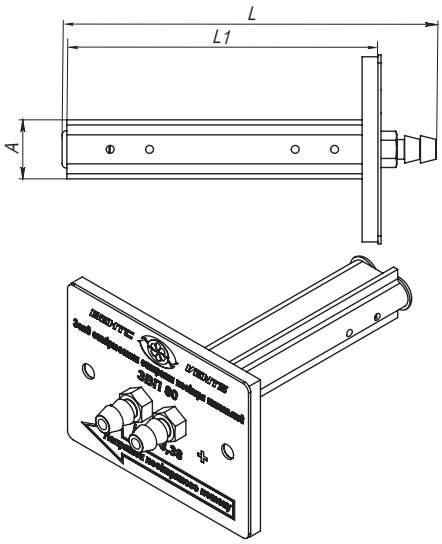
- ZVP probes are designed to measure air flow in air ducts. Operating on the pitot tube principle, ZVP probes measure the total and static pressure values, which allows calculating air flow.

Design

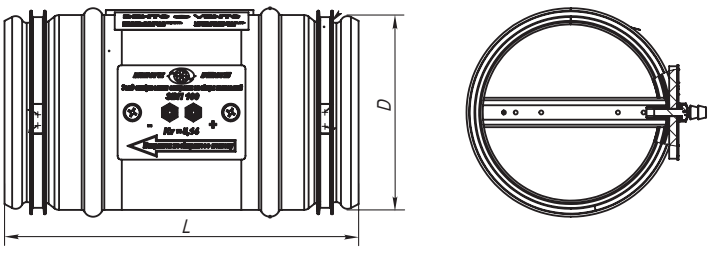
- The special profile of the probe neutralises the influence of back eddies, which can affect the static pressure measurement.
- The precisely calculated number and positioning of the nozzles gives the highest possible accuracy of 98% already at 1 m/s.
- The simple design makes it easy to install the probes yourself.
- The sealed seat prevents air leaks.

Overall and mounting dimensions [mm]

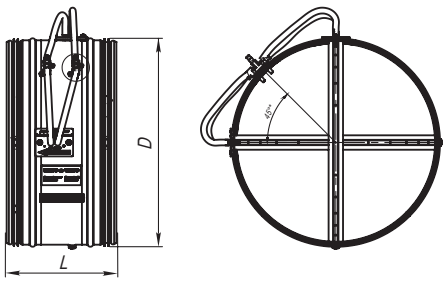
	A	L	L1	Weight [kg]
ZVP 80		95	79	0.056
ZVP 100		115	99	0.062
ZVP 125	15	140	124	0.07
ZVP 150		165	149	0.078
ZVP 160		175	159	0.081
ZVP 200		215	199	0.093
ZVP 250		265	249	0.275
ZVP 315		330	314	0.339
ZVP 355		380	355	0.156
ZVP 400	25	425	400	0.177
ZVP 450		475	450	0.189
ZVP 500		525	500	0.212
ZVP 560		585	560	0.227
ZVP 630		655	630	0.257



	D	L	Weight [kg]
MVP 100	99	180	0.45
MVP 125	124	180	0.56
MVP 150	149	180	0.67
MVP 200	199	180	0.88
MVP 250	249	180	1.27
MVP 315	314	180	1.6
MVP 355	354	190	2.55
MVP 400	399	190	3.08
MVP 450	449	190	3.16
MVP 500	499	190	3.5
MVP 560	559	190	3.92
MVP 630	629	190	4.41

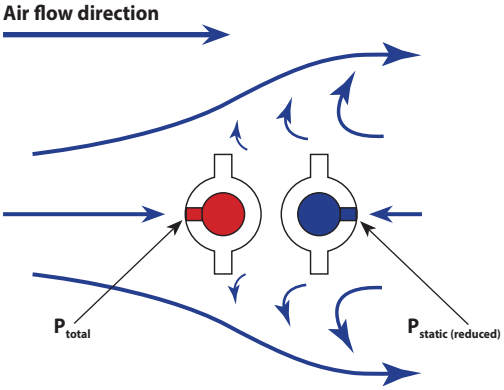


MVP 100-315



MVP 355-630

Air flow direction



ZVP probes operate on the pitot tube principle. The total pressure P_{total} is measured on one of the surfaces of the probe. The static pressure P_{stat} is measured on the opposite side. The difference between these pressures is velocity pressure P_{vel}, which is expressed by the following formula:

$$P_{vel.} = ½ \times \rho \times v^2$$

$P_{vel.}$ = velocity pressure in Pa
ρ – density of the gas (air) in kg/m^3
v – velocity in m/s

Air volume can be determined with this formula:

$$Q = KV \times \sqrt{dP}$$

Q – air volume in l/s
KV – KV value
dP – pressure difference measured by the ZVP probe in Pa

Determining duct air flow

Model	ZVP 100	ZVP 125	ZVP 150	ZVP 160	ZVP 200	ZVP 250	ZVP 315	ZVP 355	ZVP 400	ZVP 450	ZVP 500	ZVP 560	ZVP 630
Kv	5.14	8.94	13.07	18.5	24.1	36.49	61.7	81.88	130.32	164.68	174.93	198.38	274.6
S. m^2	0.008	0.012	0.018	0.020	0.031	0.049	0.078	0.099	0.126	0.159	0.196	0.246	0.312
dP [Pa]	Air flow [m^3/h]												
1	19	32	47	67	87	131	222	295	469	593	630	714	989
2	26	46	67	94	123	186	314	417	663	838	891	1010	1398
3	32	56	81	115	150	228	385	511	813	1027	1091	1237	1712
4	37	64	94	133	174	263	444	590	938	1186	1259	1428	1977
5	41	72	105	149	194	294	497	659	1049	1326	1408	1597	2210
6	45	79	115	163	213	322	544	722	1149	1452	1543	1749	2421
7	49	85	124	176	230	348	588	780	1241	1569	1666	1890	2615
8	52	91	133	188	245	372	628	834	1327	1677	1781	2020	2796
9	56	97	141	200	260	394	666	884	1407	1779	1889	2143	2966
10	59	102	149	211	274	415	702	932	1484	1875	1991	2258	3126
12	64	111	163	231	301	455	769	1021	1625	2054	2182	2474	3424
14	69	120	176	249	325	492	831	1103	1755	2218	2356	2672	3699
16	74	129	188	266	347	525	888	1179	1877	2371	2519	2857	3954
18	79	137	200	283	368	557	942	1251	1990	2515	2672	3030	4194
20	83	144	210	298	388	587	1001	1318	2098	2651	2816	3194	4421
25	93	161	235	333	434	657	1111	1474	2346	2964	3149	3571	4943
30	101	176	258	365	475	720	1217	1615	2570	3247	3449	3912	5415
35	109	190	278	394	513	777	1314	1744	2776	3507	3726	4225	5848
40	117	204	298	421	549	831	1405	1864	2967	3749	3983	4517	6252
45	124	216	316	447	582	881	1490	1977	3147	3977	4224	4791	6631
50	131	228	333	471	613	929	1571	2084	3317	4192	4453	5050	6990
60	143	249	364	516	672	1018	1721	2283	3634	4592	4878	5532	7657
70	155	269	394	557	726	1099	1858	2466	3925	4960	5269	5975	8271
80	166	288	421	596	776	1175	1987	2636	4196	5303	5633	6388	8842
90	176	305	446	632	823	1246	2107	2796	4451	5624	5974	6775	9378
100	185	322	471	666	868	1314	2221	2948	4692	5928	6297	7142	9886
125	207	360	526	745	970	1469	2483	3296	5245	6628	7041	7985	11052
150	227	394	576	816	1063	1609	2720	3610	5746	7261	7713	8747	12107
175	245	426	622	881	1148	1738	2938	3899	6206	7843	8331	9448	13077
200	262	455	665	942	1227	1858	3141	4169	6635	8384	8906	10100	13980
225	278	483	706	999	1301	1970	3332	4422	7037	8893	9446	10713	14828
250	293	509	744	1053	1372	2077	3512	4661	7418	9374	9957	11292	15631
275	307	534	780	1104	1439	2178	3683	4888	7780	9831	10443	11843	16393
300	320	557	815	1154	1503	2275	3847	5106	8126	10268	10908	12370	17122

Determining air velocity inside the air duct

Model	ZVP 100	ZVP 125	ZVP 150	ZVP 160	ZVP 200	ZVP 250	ZVP 315	ZVP 355	ZVP 400	ZVP 450	ZVP 500	ZVP 560	ZVP 630
Kv	5.14	8.94	13.07	18.5	24.1	36.49	61.7	81.88	130.32	164.68	174.93	198.38	274.6
S. m^2	0.008	0.012	0.018	0.020	0.031	0.049	0.078	0.099	0.126	0.159	0.196	0.246	0.312
dP [Pa]	Velocity [m/s]												
1	0.67	0.72	0.74	0.93	0.77	0.74	0.79	0.83	1.04	1.04	0.89	0.81	0.88
2	0.92	1.04	1.05	1.3	1.09	1.05	1.12	1.17	1.47	1.46	1.26	1.14	1.25
3	1.13	1.27	1.27	1.59	1.33	1.29	1.37	1.43	1.8	1.79	1.54	1.4	1.53
4	1.31	1.45	1.48	1.84	1.54	1.49	1.58	1.66	2.07	2.07	1.78	1.61	1.76
5	1.45	1.63	1.65	2.06	1.72	1.66	1.77	1.85	2.32	2.32	1.99	1.8	1.97
6	1.59	1.79	1.81	2.25	1.88	1.82	1.94	2.03	2.54	2.54	2.18	1.97	2.16
7	1.73	1.92	1.95	2.43	2.03	1.97	2.1	2.19	2.74	2.74	2.36	2.13	2.33
8	1.84	2.06	2.09	2.6	2.17	2.11	2.24	2.34	2.93	2.93	2.52	2.28	2.49
9	1.98	2.2	2.22	2.76	2.3	2.23	2.38	2.48	3.11	3.11	2.67	2.42	2.64
10	2.09	2.31	2.34	2.92	2.42	2.35	2.5	2.62	3.28	3.28	2.82	2.55	2.79
12	2.26	2.51	2.56	3.19	2.66	2.58	2.74	2.87	3.59	3.59	3.09	2.79	3.05
14	2.44	2.72	2.77	3.44	2.88	2.79	2.96	3.1	3.88	3.88	3.33	3.02	3.3
16	2.62	2.92	2.96	3.68	3.07	2.97	3.17	3.31	4.15	4.14	3.57	3.22	3.53
18	2.8	3.1	3.15	3.91	3.26	3.15	3.36	3.51	4.4	4.39	3.78	3.42	3.74
20	2.94	3.26	3.3	4.12	3.43	3.32	3.57	3.7	4.64	4.63	3.99	3.6	3.94
25	3.29	3.65	3.7	4.6	3.84	3.72	3.96	4.14	5.19	5.18	4.46	4.03	4.41
30	3.57	3.99	4.06	5.05	4.2	4.08	4.34	4.53	5.68	5.67	4.88	4.41	4.83
35	3.86	4.3	4.37	5.45	4.54	4.4	4.69	4.9	6.14	6.13	5.27	4.77	5.21
40	4.14	4.62	4.69	5.82	4.86	4.7	5.01	5.23	6.56	6.55	5.64	5.1	5.57
45	4.39	4.89	4.97	6.18	5.15	4.99	5.31	5.55	6.96	6.95	5.98	5.41	5.91
50	4.64	5.16	5.24	6.51	5.42	5.26	5.6	5.85	7.34	7.33	6.3	5.7	6.23
60	5.06	5.64	5.72	7.13	5.94	5.76	6.14	6.41	8.04	8.02	6.9	6.24	6.83
70	5.48	6.09	6.2	7.7	6.42	6.22	6.63	6.92	8.68	8.67	7.46	6.74	7.37
80	5.87	6.52	6.62	8.24	6.86	6.65	7.09	7.4	9.28	9.27	7.97	7.21	7.88
90	6.23	6.91	7.01	8.74	7.28	7.05	7.51	7.85	9.84	9.83	8.46	7.64	8.36
100	6.55	7.29	7.41	9.21	7.68	7.44	7.92	8.28	10.38	10.36	8.91	8.06	8.81
125	7.32	8.15	8.27	10.3	8.58	8.32	8.85	9.25	11.6	11.58	9.97	9.01	9.85
150	8.03	8.92	9.06	11.28	9.4	9.11	9.7	10.14	12.71	12.69	10.92	9.87	10.79
175	8.67	9.65	9.78	12.18	10.16	9.84	10.48	10.95	13.73	13.71	11.79	10.66	11.66
200	9.27	10.3	10.46	13.02	10.85	10.52	11.2	11.71	14.67	14.65	12.61	11.4	12.46
225	9.84	10.94	11.1	13.81	11.51	11.15	11.88	12.42	15.56	15.54	13.37	12.09	13.22
250	10.37	11.53	11.7	14.56	12.14	11.76	12.52	13.09	16.41	16.38	14.09	12.74	13.94
275	10.86	12.09	12.27	15.26	12.73	12.33	13.13	13.72	17.21	17.18	14.78	13.36	14.62
300	11.32	12.61	12.82	15.95	13.3	12.88	13.72	14.34	17.97	17.94	15.44	13.96	15.27