

## PROCEDURE AND DATA FOR BALANCING ALL ROTACORE GRILLES AND REGISTERS

Balancing area factors for all Rotacore grilles and registers – both supply and return – have been determined by tests conducted in the Anemostat Laboratory.

The balancing procedure is similar for all Rotacore grilles and registers – both supply and return – and for each of the air meters used.

Measure the velocity at several locations near the face of the register or grille. (Typical locations are shown in Fig. 1. Enough locations should be chosen to assure measurement of representative velocities.) Hold the air meter sensing device against the grille face. When using the Alnor Velometer with No. 2220A jet, rotate the probe until the maximum velocity is obtained at each location.

Calculate the average face velocity using the maximum velocity measured at each location.

From the applicable table, determine the balancing area factor (Ak) using the width and height of the grille. Be certain that the correct table is used. There is a separate table for each type of air meter (Alnor Velometer, and 4-in. Vane Anemometer), for each type of grille (supply or return), and for each spread angle setting.

Calculate the air volume by multiplying the average velocity by balancing area factor.

$$CFM = \text{Average Velocity} \times Ak$$

Even though all balancing area factors were measured in exactly the same way, the velocities indicated by each instrument – the numbers read on the instrument dials – were different. It is therefore essential that the correct table be used when balancing, for each table applies only to one instrument and one type of grille.

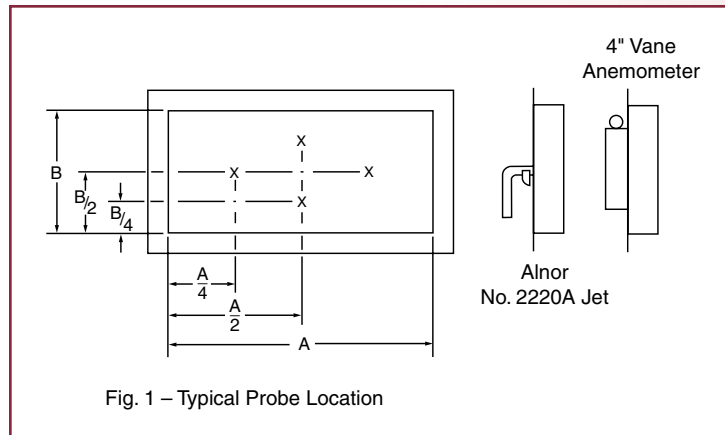


Fig. 1 – Typical Probe Location

**ALNOR VELOMETER WITH NO. 2220A JET**

**0° SPREAD**

Grille Width, In.						Grille Height, In.							
	3	4	5	6	8	10	12	14	16	18	20	22	24
8	.09	.12	.15	.18	.24								
10	.11	.15	.19	.22	.30	.38							
12	.13	.18	.22	.27	.36	.46	.55						
14	.15	.21	.26	.32	.43	.53	.64	.75					
16	.17	.24	.30	.36	.49	.61	.74	.86	.99				
18	.20	.27	.34	.41	.55	.69	.83	.97	1.11	1.25			
20	.22	.30	.38	.45	.61	.77	.92	1.08	1.24	1.40	1.55		
24	.26	.36	.45	.55	.73	.92	1.11	1.30	1.49	1.68	1.87	2.06	2.25
28	.31	.42	.53	.64	.86	1.08	1.30	1.52	1.74	1.96	2.19	2.40	2.62
32	.35	.48	.60	.73	.98	1.23	1.49	1.74	1.99	2.24	2.50	2.75	3.00
36	.39	.54	.68	.82	1.10	1.39	1.67	1.96	2.24	2.53	2.81	3.09	3.38
42	.46	.63	.79	.96	1.29	1.62	1.95	2.29	2.62	2.95	3.28	3.61	3.95
48	.53	.72	.91	1.10	1.48	1.86	2.23	2.61	2.99	3.37	3.75	4.13	4.51
54	.59	.81	1.02	1.23	1.66	2.09	2.52	2.94	3.37	3.80	4.22	4.65	5.08
60	.66	.90	1.13	1.37	1.85	2.32	2.80	3.27	3.75	4.22	4.70	5.17	5.65
66	.73	.99	1.25	1.51	2.03	2.55	3.08	3.60	4.12	4.64	5.17	5.69	6.22
72	.79	1.08	1.36	1.65	2.22	2.79	3.36	3.93	4.50	5.07	5.64	6.21	6.78

**ALNOR VELOMETER WITH NO. 2220A JET**

**22-1/2° SPREAD**

Grille Width, In.						Grille Height, In.							
	3	4	5	6	8	10	12	14	16	18	20	22	24
8	.08	.11	.14	.17	.22								
10	.10	.14	.17	.21	.28	.35							
12	.12	.16	.21	.25	.34	.43	.51						
14	.14	.19	.24	.29	.40	.50	.60	.70					
16	.16	.22	.28	.34	.45	.57	.69	.80	.92				
18	.18	.25	.31	.38	.51	.64	.77	.90	1.04	1.17			
20	.20	.28	.35	.42	.57	.71	.86	1.01	1.15	1.30	1.44		
24	.24	.33	.42	.51	.68	.86	1.03	1.21	1.39	1.56	1.74	1.91	2.09
28	.28	.39	.49	.59	.80	1.00	1.21	1.41	1.62	1.82	2.03	2.23	2.44
32	.33	.44	.56	.68	.91	1.15	1.38	1.62	1.85	2.09	2.32	2.56	2.79
36	.37	.50	.63	.76	1.03	1.29	1.56	1.82	2.08	2.35	2.61	2.88	3.14
42	.43	.58	.74	.89	1.20	1.51	1.82	2.13	2.43	2.74	3.05	3.36	3.67
48	.49	.67	.84	1.02	1.37	1.73	2.08	2.43	2.78	3.14	3.49	3.84	4.20
54	.55	.75	.95	1.15	1.54	1.94	2.34	2.74	3.13	3.53	3.93	4.33	4.72
60	.61	.83	1.05	1.28	1.72	2.16	2.60	3.04	3.48	3.93	4.37	4.81	5.25
66	.67	.92	1.16	1.40	1.89	2.38	2.86	3.34	3.83	4.32	4.81	5.29	5.78
72	.74	1.00	1.27	1.53	2.06	2.59	3.12	3.65	4.18	4.71	5.24	5.77	6.30

**ALNOR VELOMETER WITH NO. 2220A JET**

**45° SPREAD**

Grille Width, In.						Grille Height, In.							
	3	4	5	6	8	10	12	14	16	18	20	22	24
8	.07	.10	.13	.15	.21								
10	.09	.13	.16	.19	.26	.33							
12	.11	.15	.19	.23	.31	.39	.47						
14	.13	.18	.22	.27	.37	.46	.55	.65					
16	.15	.20	.26	.31	.42	.53	.63	.74	.85				
18	.17	.23	.29	.35	.47	.59	.71	.84	.96	1.08			
20	.19	.25	.32	.39	.53	.66	.80	.93	1.07	1.20	1.34		
24	.23	.31	.39	.47	.63	.79	.96	1.12	1.28	1.44	1.61	1.77	1.93
28	.26	.36	.45	.55	.74	.93	1.12	1.31	1.50	1.69	1.88	2.07	2.26
32	.30	.41	.52	.63	.84	1.06	1.28	1.50	1.71	1.93	2.15	2.36	2.58
36	.34	.46	.58	.71	.95	1.19	1.44	1.68	1.93	2.17	2.42	2.66	2.91
42	.40	.54	.68	.82	1.11	1.40	1.68	1.97	2.25	2.54	2.82	3.11	3.39
48	.45	.62	.78	.94	1.27	1.60	1.92	2.25	2.57	2.90	3.23	3.55	3.88
54	.51	.69	.88	1.06	1.43	1.80	2.16	2.53	2.90	3.27	3.63	4.00	4.37
60	.57	.77	.98	1.18	1.59	2.00	2.40	2.81	3.22	3.63	4.04	4.45	4.85
66	.62	.85	1.07	1.30	1.75	2.20	2.65	3.10	3.54	3.99	4.44	4.89	5.34
72	.68	.93	1.17	1.42	1.91	2.40	2.89	3.38	3.87	4.36	4.85	5.34	5.83

**4 INCH VANE ANEMOMETER**

**0° SPREAD**

Grille Width, In.						Grille Height, In.							
	3	4	5	6	8	10	12	14	16	18	20	22	24
8	.10	.14	.17	.21	.28								
10	.13	.17	.22	.26	.35	.44							
12	.15	.21	.26	.31	.42	.52	.63						
14	.18	.24	.30	.36	.49	.61	.73	.86					
16	.20	.28	.35	.42	.56	.70	.84	.98	1.12				
18	.23	.31	.39	.47	.63	.78	.94	1.10	1.26	1.41			
20	.26	.34	.43	.52	.70	.87	1.05	1.22	1.40	1.57	1.75		
24	.31	.41	.52	.63	.84	1.05	1.26	1.47	1.68	1.89	2.10	2.31	2.52
28	.36	.48	.61	.73	.98	1.22	1.47	1.71	1.96	2.20	2.45	2.69	2.94
32	.41	.55	.69	.84	1.11	1.40	1.68	1.96	2.24	2.52	2.79	3.07	3.35
36	.46	.62	.78	.94	1.25	1.57	1.88	2.20	2.51	2.83	3.14	3.46	3.77
42	.54	.73	.91	1.09	1.46	1.83	2.20	2.57	2.93	3.30	3.67	4.04	4.40
48	.61	.83	1.04	1.25	1.67	2.09	2.51	2.93	3.35	3.77	4.19	4.61	5.03
54	.69	.93	1.17	1.41	1.88	2.35	2.83	3.30	3.77	4.24	4.72	5.19	5.66
60	.77	1.04	1.30	1.56	2.09	2.62	3.14	3.67	4.19	4.72	5.24	5.76	6.29
66	.84	1.14	1.43	1.72	2.30	2.89	3.46	4.03	4.61	5.19	5.76	6.34	6.92
72	.92	1.24	1.56	1.88	2.51	3.14	3.77	4.40	5.03	5.66	6.29	6.92	7.55

**4 INCH VANE ANEMOMETER**

**22-1/2° SPREAD**

Grille Width, In.	3	4	5	6	8	Grille Height, In.								
						10	12	14	16	18	20	22	24	
8	.09	.12	.16	.19	.26									
10	.12	.16	.20	.24	.32	.41								
12	.14	.19	.24	.29	.39	.49	.59							
14	.16	.22	.28	.34	.46	.57	.69	.81						
16	.19	.25	.32	.39	.52	.66	.79	.92	1.06					
18	.21	.29	.36	.44	.59	.74	.89	1.04	1.19	1.34				
20	.23	.32	.40	.49	.65	.82	.99	1.16	1.33	1.49	1.66			
24	.28	.38	.48	.58	.79	.99	1.19	1.39	1.59	1.80	2.00	2.20	2.40	
28	.33	.45	.56	.68	.92	1.15	1.39	1.63	1.86	2.10	2.33	2.57	2.81	
32	.37	.51	.64	.78	1.05	1.32	1.59	1.86	2.13	2.40	2.67	2.94	3.21	
36	.42	.57	.73	.88	1.18	1.49	1.79	2.09	2.40	2.70	3.01	3.31	3.62	
42	.49	.67	.85	1.03	1.38	1.74	2.09	2.45	2.80	3.16	3.51	3.87	4.22	
48	.56	.77	.97	1.17	1.58	1.98	2.39	2.80	3.20	3.61	4.02	4.42	4.83	
54	.63	.86	1.09	1.32	1.78	2.23	2.69	3.15	3.61	4.06	4.52	4.98	5.43	
60	.71	.96	1.21	1.47	1.98	2.48	2.99	3.50	4.01	4.52	5.02	5.53	6.04	
66	.78	1.06	1.34	1.61	2.17	2.73	3.29	3.85	4.41	4.97	5.53	6.09	6.65	
72	.85	1.15	1.46	1.76	2.37	2.98	3.59	4.20	4.81	5.42	6.03	6.64	7.25	

**4 INCH VANE ANEMOMETER**

**45° SPREAD**

Grille Width, In.	3	4	5	6	8	Grille Height, In.								
						10	12	14	16	18	20	22	24	
8	.09	.12	.15	.19	.25									
10	.11	.15	.19	.23	.31	.39								
12	.13	.18	.23	.28	.38	.48	.57							
14	.16	.21	.27	.33	.44	.56	.67	.78						
16	.18	.25	.31	.38	.51	.64	.77	.90	1.03					
18	.20	.28	.35	.42	.57	.72	.86	1.01	1.16	1.31				
20	.23	.31	.39	.47	.64	.80	.96	1.13	1.29	1.45	1.62			
24	.27	.37	.47	.57	.76	.96	1.16	1.35	1.55	1.75	1.94	2.14	2.34	
28	.32	.43	.55	.66	.89	1.12	1.35	1.58	1.81	2.04	2.27	2.50	2.73	
32	.36	.50	.63	.76	1.02	1.28	1.55	1.81	2.07	2.33	2.60	2.80	3.12	
36	.41	.56	.71	.85	1.15	1.44	1.74	2.04	2.33	2.63	2.92	3.22	3.51	
42	.48	.65	.82	1.00	1.34	1.69	2.03	2.38	2.72	3.07	3.41	3.76	4.10	
48	.55	.75	.94	1.14	1.53	1.93	2.32	2.72	3.11	3.51	3.90	4.30	4.69	
54	.62	.84	1.06	1.28	1.73	2.17	2.62	3.06	3.50	3.95	4.39	4.84	5.28	
60	.69	.93	1.18	1.43	1.92	2.41	2.91	3.40	3.90	4.39	4.88	5.38	5.87	
66	.75	1.03	1.30	1.57	2.11	2.66	3.20	3.74	4.29	4.83	5.37	5.92	6.46	
72	.82	1.12	1.42	1.71	2.31	2.90	3.49	4.08	4.68	5.27	5.86	6.46	7.05	