MSRRG/MSRRP/MSRRCD

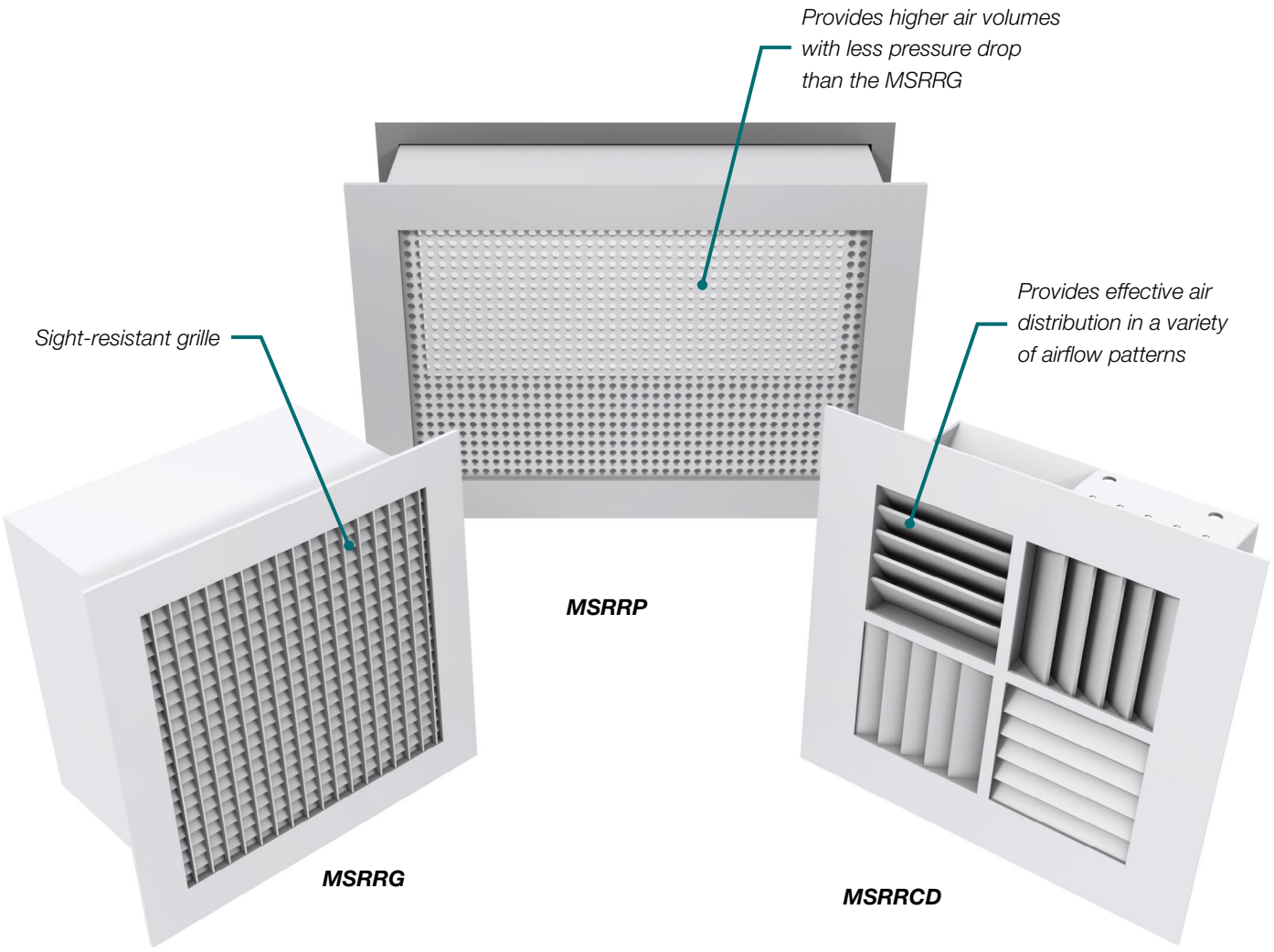
MAXIMUM SECURITY RISK RESISTANT GRILLES



price | GRILLES

MSRRG/MSRRP/MSRRCD
Maximum Security Risk Resistant Grilles

All risk resistant grilles feature heavy-duty, all-welded construction and thread resistant cores, ideal for high security applications. Multiple core and mounting options allow flexibility for various installations.



THREAD RESISTANT CORE

Thread resistant cores impede the ability to thread objects through the grille face or store contraband while still providing a functional airflow pathway.

SIGHT RESISTANT CORE (MSRRG)

MSRRG maximum security risk resistant grilles feature a sight resistant core and have the following construction details:

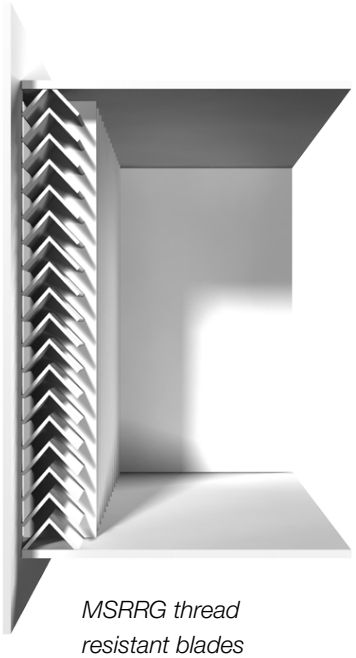
+ Faceplate: 3/16 in. hot rolled steel
+ Sleeve: 3/16 in. hot rolled steel, provided with stitch or continuously welded seems that can be ordered in a variety of thicknesses with angle for field welding or bent out flanges for pour in place construction.
+ Louvers: 1 in. angle, 45° deflection on ¼ in. centers
+ Vertical Mullions: 1 3/4 in. x 12 GA hot rolled steel bar pierces louvers on ½ in. centers
+ Optional barrier bars
+ Sizes: Min.: 6 in. x 6 in., Max.: 24 in. x 24 in.

TYPICAL APPLICATIONS

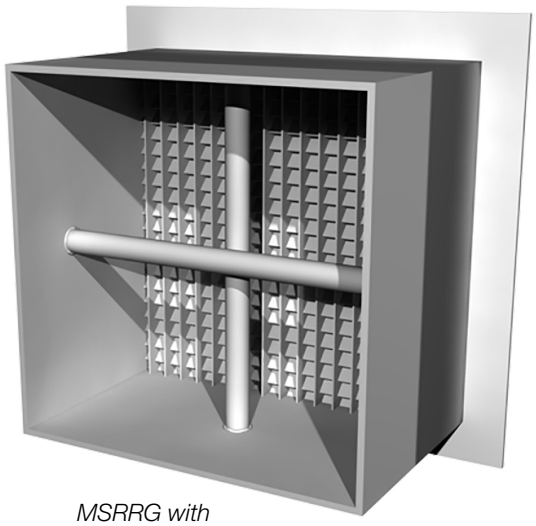
Maximum security risk resistant grilles are an excellent choice for high risk applications where self-harm is a concern. The engineered core inhibits threading of wire through the grille face and prevents the storage of contraband behind the grille while still providing a functional airflow pathway.

CONSTRUCTION

+ Application
  - Sight resistant core (MSRRG)
  - Perforated core (MSRRP)
  - Ceiling diffuser (MSRRCD)
+ Options
  - Dampers (not available on MSRRCD)
  - 4-sided mounting frame
  - Countersunk security fasteners



MSRRG thread resistant blades



MSRRG with optional barrier bars

PERFORATED CORE (MSRRP)

MSRRP maximum security risk resistant grilles are typically installed in sidewalls and feature small holes in a perforated face to provide risk resistant air distribution. The MSRRP is an economical option that provides higher air volumes with less pressure drop than the MSRRG.

+ Faceplate: 3/16 in. hot rolled steel with 3/16 in. diameter holes.
+ Sleeve: 3/16 in. hot rolled steel, provided with stitched or continuously welded seems that can be ordered in a variety of thicknesses with mounting angle for field welding or bent out flanges for pour in place construction.
+ The perforated core complies with National Institute for Corrections Guidelines for Suicide Prevention and meets California Title 24.
+ Sizes: Min.: 6 in. x 6 in., Max.: 30 in. x 30 in.



MSRRP perforated face

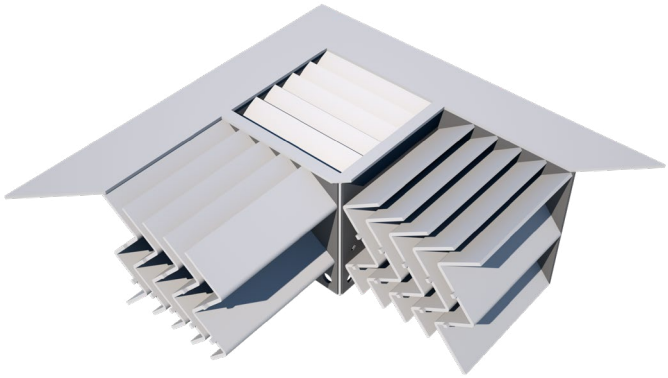
CEILING DIFFUSER (MSRRCD)

MSRRCD maximum security risk resistant ceiling diffusers feature a unique “W” shaped blade that provides effective air distribution in a variety of airflow patterns.

+ Faceplate: 12 gauge hot rolled steel
+ Sleeve: 12 gauge hot rolled steel, length as required
+ Louvers: 12 gauge hot rolled steel, with 35° deflection
+ Air Patterns: 1-way, 2-way, 2-way corner, 3-way, or 4-way
+ Sizes – 6 in. x 6 in., 9 in. x 9 in., 12 in. x 12 in., 15 in. x 15 in., 16 in. x 16 in., 18 in. x 18 in.



MSRRCD risk resistant ceiling diffuser



MSRRCD “W” blade shape

4-SIDED MOUNTING FRAME

The 4-sided 1 in. x 1 in. x 3/16 in. hot rolled steel mounting frame is shipped loose for field welding and allows for flexible installation and robust installed assembly.

PERFORMANCE DATA

MSRRG

Size	Neck Velocity (fpm)	100	150	200	250	300	350	400	450
	Velocity Pressure (in. w.g.)	0.001	0.001	0.002	0.004	0.006	0.008	0.010	0.013
	Total Pressure (in. w.g.)	0.022	0.050	0.090	0.140	0.202	0.275	0.359	0.454
6 x 6	Flow Rate (cfm)	25	38	50	63	75	88	100	113
	Sound (NC)	-	-	19	25	30	34	37	40
	Throw (ft)	1-1-4	1-3-6	2-4-8	4-5-9	4-6-10	5-7-11	6-8-11	6-8-12
8 x 8	Flow Rate (cfm)	44	67	89	111	133	156	178	200
	Sound (NC)	-	-	20	26	31	35	39	42
	Throw (ft)	1-2-6	2-4-09	3-6-11	5-7-12	6-9-13	7-10-14	8-11-15	9-11-16
10 x 10	Flow Rate (cfm)	69	104	139	174	208	243	278	313
	Sound (NC)	-	-	21	27	32	36	40	43
	Throw (ft)	1-2-7	2-5-11	4-7-13	6-9-15	7-11-16	8-12-18	10-13-19	11-14-20
12 x 12	Flow Rate (cfm)	100	150	200	250	300	350	400	450
	Sound (NC)	-	-	22	28	33	37	40	43
	Throw (ft)	1-3-9	3-6-13	5-9-16	7-11-18	9-13-20	10-15-21	11-16-23	13-17-24
14 x 14	Flow Rate (cfm)	136	204	272	340	408	476	544	613
	Sound (NC)	-	-	22	28	33	37	41	44
	Throw (ft)	1-3-10	3-7-15	6-10-19	8-13-21	10-15-23	12-17-25	13-19-26	15-20-28
16 x 16	Flow Rate (cfm)	178	267	356	444	533	622	711	800
	Sound (NC)	-	15	23	29	34	38	42	45
	Throw (ft)	2-4-11	4-8-17	7-11-21	10-14-24	11-17-26	13-20-28	15-21-30	17-23-32
18 x 18	Flow Rate (cfm)	225	338	450	563	675	788	900	1013
	Sound (NC)	-	16	23	29	34	38	42	45
	Throw (ft)	2-4-13	4-9-19	7-13-24	11-16-27	13-19-29	15-22-32	17-24-34	19-25-36
20 x 20	Flow Rate (cfm)	278	417	556	694	833	972	1111	1250
	Sound (NC)	-	16	24	30	35	39	43	46
	Throw (ft)	2-5-14	5-10-22	8-14-27	12-18-30	14-22-33	17-25-35	19-27-38	22-28-40
22 x 22	Flow Rate (cfm)	336	504	672	840	1008	1176	1344	1513
	Sound (NC)	-	17	24	30	35	39	43	46
	Throw (ft)	2-5-16	5-12-24	9-16-29	13-20-33	16-24-36	18-27-39	21-29-41	24-31-44
24 x 24	Flow Rate (cfm)	400	600	800	1000	1200	1400	1600	1800
	Sound (NC)	-	17	25	31	36	40	43	47
	Throw (ft)	2-6-17	6-13-26	10-17-32	14-22-36	17-26-39	20-30-42	23-32-45	26-34-48

Performance Notes:

1. Tested in accordance with ASHRAE Standard 70-2023 "Method of Testing for Rating the Performance of Air Outlets and Inlets."
2. Air flow is in cfm.
3. All pressures are in in. w.g.
4. Throw values are measured in feet for terminal Velocities of 150 fpm (minimum), 100 fpm (middle) and 50 fpm (maximum).
5. Throw data is based on supply air and room air being at isothermal conditions.
6. NC values are based on room absorption of 10 dB re 10^{-12} Watts and one grille.
7. Blanks "-" indicate an NC value less than 15.
8. Corrections for return application: add 5 to listed NC; multiply listed total pressure by 2.0 to obtain negative static pressure.

PERFORMANCE DATA

MSRRP - Supply

Size	Neck Velocity (fpm)	100	150	200	250	300	400	500	600	700
	Velocity Pressure (in. w.g.)	0.001	0.001	0.002	0.004	0.006	0.01	0.016	0.022	0.031
	Total Pressure (in. w.g.)	0.006	0.013	0.024	0.037	0.053	0.095	0.148	0.213	0.290
6 x 6	Flow Rate (cfm)	25	38	50	63	75	100	125	150	175
	Sound (NC)	-	-	-	-	-	-	21	29	35
	Throw (ft)	02-04-10	04-07-15	07-10-20	08-12-25	10-15-30	13-20-35	16-25-40	20-30-43	23-33-47
8 x 8	Flow Rate (cfm)	56	84	113	141	169	225	281	338	394
	Sound (NC)	-	-	-	-	-	16	25	33	40
	Throw (ft)	02-05-14	05-10-21	9-14-28	12-17-35	14-21-42	19-28-53	23-35-59	28-42-65	32-49-70
10 x 10	Flow Rate (cfm)	69	104	139	174	208	278	347	417	486
	Sound (NC)	-	-	-	-	-	17	26	34	41
	Throw (ft)	02-05-15	05-11-23	9-15-30	13-19-38	15-23-46	20-30-59	25-38-66	30-46-72	36-53-78
12 x 12	Flow Rate (cfm)	100	150	200	250	300	400	500	600	700
	Sound (NC)	-	-	-	-	-	19	28	36	43
	Throw (ft)	03-06-18	6-13-27	11-18-36	15-22-45	18-27-54	24-36-71	30-45-79	36-54-87	42-63-94
14 x 14	Flow Rate (cfm)	136	204	272	340	408	544	681	817	953
	Sound (NC)	-	-	-	-	-	20	30	38	44
	Throw (ft)	03-07-21	7-15-31	12-21-41	17-26-52	21-31-62	28-41-82	34-52-92	41-62-101	48-72-109
16 x 16	Flow Rate (cfm)	178	267	356	444	533	711	889	1067	1244
	Sound (NC)	-	-	-	-	-	22	31	39	46
	Throw (ft)	03-07-23	7-17-35	13-23-47	20-29-59	23-35-70	31-47-94	39-59-105	47-70-115	55-82-125
18 x 18	Flow Rate (cfm)	225	338	450	563	675	900	1125	1350	1575
	Sound (NC)	-	-	-	-	-	23	32	40	47
	Throw (ft)	04-08-26	8-19-39	15-26-52	22-33-65	26-39-78	35-52-105	44-65-119	52-78-130	61-92-140
20 x 20	Flow Rate (cfm)	278	417	556	694	833	1111	1389	1667	1944
	Sound (NC)	-	-	-	-	-	24	34	41	48
	Throw (ft)	04-09-29	9-20-43	16-29-58	24-36-72	29-43-87	39-58-116	48-72-132	58-87-144	67-101-156
22 x 22	Flow Rate (cfm)	336	504	672	840	1008	1344	1681	2017	2353
	Sound (NC)	-	-	-	-	-	25	35	42	49
	Throw (ft)	4-10-32	10-22-47	17-32-63	26-40-79	32-47-95	42-63-126	53-79-145	63-95-159	74-111-171
24 x 24	Flow Rate (cfm)	400	600	800	1000	1200	1600	2000	2400	2800
	Sound (NC)	-	-	-	-	-	26	35	43	50
	Throw (ft)	5-11-34	11-24-52	19-34-69	29-43-86	34-52-103	46-69-137	57-86-158	69-103-173	80-120-187
26 x 26	Flow Rate (cfm)	469	704	939	1174	1408	1878	2347	2817	3286
	Sound (NC)	-	-	-	-	-	27	36	44	51
	Throw (ft)	5-11-37	11-25-56	20-37-74	31-46-93	37-56-111	49-74-148	62-93-171	74-111-188	87-130-203
28 x 28	Flow Rate (cfm)	544	817	1089	1361	1633	2178	2722	3267	3811
	Sound (NC)	-	-	-	-	15	27	37	45	51
	Throw (ft)	5-12-40	12-27-60	21-40-80	33-50-100	40-60-120	53-80-159	66-100-184	80-120-202	93-139-218
30 x 30	Flow Rate (cfm)	625	938	1250	1563	1875	2500	3125	3750	4375
	Sound (NC)	-	-	-	-	16	28	38	46	52
	Throw (ft)	6-13-43	13-29-64	23-43-85	35-53-106	43-64-128	57-85-170	71-106-198	85-128-217	99-149-234

Performance Notes:

1. Tested in accordance with ASHRAE Standard 70-2023 "Method of Testing for Rating the Performance of Air Outlets and Inlets."
2. Air fl ow is in cfm.
3. All pressures are in in. w.g.
4. Throw values are measured in feet for terminal Velocities of 150 fpm (minimum), 100 fpm (middle) and 50 fpm (maximum).
5. Throw data is based on supply air and room air being at isothermal conditions.
6. NC values are based on room absorption of 10 dB re 10^{-12} Watts and one grille.
7. Blanks "-" indicate an NC value less than 15.

PERFORMANCE DATA

MSRRP - Return

Size	Neck Velocity (fpm)	100	150	200	250	300	400	500	600
	Velocity Pressure (in. w.g.)	0.001	0.001	0.002	0.004	0.006	0.010	0.016	0.022
	Neg. Static Pressure (in. w.g.)	0.008	0.017	0.031	0.048	0.070	0.124	0.193	0.278
6 x 6	Flow Rate (cfm)	25	38	50	63	75	100	125	150
	Sound (NC)	-	-	-	-	-	18	28	36
9 x 9	Flow Rate (cfm)	56	84	113	141	169	225	281	338
	Sound (NC)	-	-	-	-	-	23	32	40
10 x 10	Flow Rate (cfm)	69	104	139	174	208	278	347	417
	Sound (NC)	-	-	-	-	-	24	33	41
12 x 12	Flow Rate (cfm)	100	150	200	250	300	400	500	600
	Sound (NC)	-	-	-	-	-	26	35	43
14 x 14	Flow Rate (cfm)	136	204	272	340	408	544	681	817
	Sound (NC)	-	-	-	-	-	27	37	45
16 x 16	Flow Rate (cfm)	178	267	356	444	533	711	889	1067
	Sound (NC)	-	-	-	-	16	29	38	46
18 x 18	Flow Rate (cfm)	225	338	450	563	675	900	1125	1350
	Sound (NC)	-	-	-	-	17	30	39	47
20 x 20	Flow Rate (cfm)	278	417	556	694	833	1111	1389	1667
	Sound (NC)	-	-	-	-	19	31	41	48
22 x 22	Flow Rate (cfm)	336	504	672	840	1008	1344	1681	2017
	Sound (NC)	-	-	-	-	20	32	42	49
24 x 24	Flow Rate (cfm)	400	600	800	1000	1200	1600	2000	2400
	Sound (NC)	-	-	-	-	20	33	42	50
26 x 26	Flow Rate (cfm)	469	704	939	1174	1408	1878	2347	2817
	Sound (NC)	-	-	-	-	21	34	43	51
28 x 28	Flow Rate (cfm)	544	817	1089	1361	1633	2178	2722	3267
	Sound (NC)	-	-	-	-	22	34	44	52
30 x 30	Flow Rate (cfm)	625	938	1250	1563	1875	2500	3125	3750
	Sound (NC)	-	-	-	-	23	35	45	53

Performance Notes:

1. Tested in accordance with ASHRAE Standard 70-2023 "Method of Testing for Rating the Performance of Air Outlets and Inlets."
2. All pressures are in in. w.g.
3. NC values are based on a room absorption of 10 dB re 10^{-12} watts and one grille.
4. Blanks "-" indicate an NC value less than 15.
5. Air flow is in cfm.

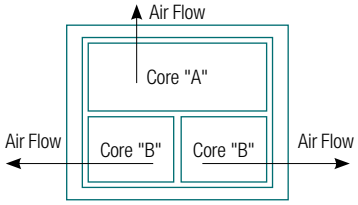
PERFORMANCE DATA

MSRRCD - Supply

Size	Neck Velocity (fpm)		50	100	150	200	250	300	350	400	500	600
	Velocity Pressure (in. w.g.)		0.000	0.001	0.001	0.002	0.004	0.006	0.008	0.010	0.016	0.022
6 x 6	Flow Rate (cfm)		13	25	38	50	63	75	88	100	125	150
	Total Pressure (in. w.g.)		0.004	0.015	0.033	0.059	0.091	0.132	0.179	0.234	0.366	0.527
	Sound (NC)		-	-	-	-	-	-	16	20	26	31
	Throw (ft)	1 way	1-2-5	3-5-8	5-7-10	7-8-12	7-9-13	8-10-14	9-11-15	9-12-16	10-13-18	12-14-20
8 x 8	Flow Rate (cfm)		22	44	67	89	111	133	156	178	222	267
	Total Pressure (in. w.g.)		0.003	0.012	0.026	0.047	0.073	0.105	0.143	0.187	0.292	0.421
	Sound (NC)		-	-	-	-	-	-	19	23	29	34
	Throw (ft)	1 way	1-2-6	3-6-11	6-9-13	8-11-15	10-12-17	11-13-19	12-14-20	13-15-22	14-17-24	15-19-27
	Total Pressure (in. w.g.)		0.005	0.020	0.044	0.078	0.123	0.176	0.240	0.314	0.490	0.706
	Sound (NC)		-	-	-	-	17	22	27	32	39	44
	Throw (ft)	2 way	0-1-3	2-3-6	3-5-10	4-6-11	5-8-13	6-10-14	8-11-15	9-11-16	10-13-18	11-14-20
		3A way	0-1-2	1-2-6	2-4-8	4-6-10	5-7-11	6-8-12	6-9-13	7-10-14	9-11-15	10-12-17
		3B way	0-1-2	1-2-3	2-3-5	2-3-7	3-4-8	3-5-8	4-6-9	4-7-10	6-8-11	7-8-12
		4 way	0-1-2	1-2-4	2-3-7	3-4-8	4-6-9	4-7-10	5-8-11	6-8-12	7-9-13	8-10-14
9 x 9	Flow Rate (cfm)		28	56	84	113	141	169	197	225	281	338
	Total Pressure (in. w.g.)		0.003	0.011	0.024	0.043	0.067	0.096	0.131	0.171	0.267	0.384
	Sound (NC)		-	-	-	-	-	15	20	24	30	36
	Throw (ft)	1 way	1-2-6	3-6-12	6-9-15	8-12-17	10-14-19	12-15-21	13-16-23	14-17-24	16-19-27	17-21-30
	Total Pressure (in. w.g.)		0.004	0.017	0.039	0.069	0.107	0.154	0.210	0.274	0.429	0.618
	Sound (NC)		-	-	-	-	17	23	28	32	39	45
	Throw (ft)	2 way	0-1-4	2-4-8	4-6-11	5-8-13	7-10-14	8-11-16	9-12-17	11-13-18	12-14-20	13-16-22
		3A way	0-1-3	1-3-7	3-5-9	5-7-11	6-9-12	7-9-13	8-10-14	9-11-15	10-12-17	11-13-19
		3B way	0-1-2	1-2-4	2-3-6	3-4-8	4-5-9	4-6-9	5-7-10	6-8-11	7-9-12	8-9-13
		4 way	0-1-3	1-3-5	3-4-8	3-5-9	4-6-10	5-8-11	6-9-12	7-9-13	8-10-14	9-11-16
12 x 12	Flow Rate (cfm)		50	100	150	200	250	300	350	400	500	600
	Total Pressure (in. w.g.)		0.002	0.009	0.019	0.034	0.053	0.077	0.104	0.136	0.213	0.307
	Sound (NC)		-	-	-	-	-	19	23	27	33	39
	Throw (ft)	1 way	1-2-7	3-7-13	7-10-20	9-13-23	11-16-26	13-20-28	15-22-30	18-23-33	21-26-36	23-28-40
	Total Pressure (in. w.g.)		0.003	0.012	0.028	0.050	0.077	0.111	0.152	0.198	0.310	0.446
	Sound (NC)		-	-	-	-	19	25	30	34	41	47
	Throw (ft)	2 way	1-2-6	3-6-12	6-9-15	8-12-17	10-14-19	12-15-21	13-16-23	14-17-24	16-19-27	17-21-30
		3A way	1-1-6	3-6-10	6-9-12	8-10-14	9-11-16	10-12-18	11-13-19	12-14-20	13-16-23	14-18-25
		3B way	1-1-3	2-3-7	3-5-9	5-7-10	6-8-11	7-9-12	8-10-13	8-10-14	9-11-16	10-12-18
		4 way	1-2-4	2-4-7	4-6-11	5-7-12	6-9-14	7-11-15	9-11-16	10-12-17	11-14-19	12-15-21
15 x 15	Flow Rate (cfm)		78	156	234	313	391	469	547	625	781	938
	Total Pressure (in. w.g.)		0.002	0.007	0.016	0.029	0.045	0.064	0.088	0.115	0.179	0.258
	Sound (NC)		-	-	-	-	16	21	25	29	36	41
	Throw (ft)	1 way	1-2-7	3-7-14	7-11-21	9-14-28	12-18-32	14-21-35	17-25-38	19-28-41	24-32-45	28-35-50
	Total Pressure (in. w.g.)		0.002	0.010	0.022	0.038	0.060	0.087	0.118	0.154	0.241	0.346
	Sound (NC)		-	-	-	-	20	26	31	35	42	48
	Throw (ft)	2 way	1-3-9	5-9-15	9-13-19	12-15-22	14-17-24	15-19-26	16-20-28	18-22-30	20-24-34	22-26-37
		3A way	1-2-9	4-9-13	9-11-16	10-13-18	12-14-20	13-16-22	14-17-24	15-18-25	16-20-28	18-22-31
		3B way	1-2-5	3-5-9	5-7-11	6-9-13	8-10-14	9-11-16	10-12-17	10-13-18	12-14-20	13-16-22
		4 way	1-2-5	3-5-9	5-7-13	6-9-15	8-12-17	9-13-19	11-14-20	12-15-22	14-17-24	15-19-26
18 x 18	Flow Rate (cfm)		113	225	338	450	563	675	788	900	1125	1350
	Total Pressure (in. w.g.)		0.002	0.006	0.014	0.025	0.039	0.056	0.076	0.099	0.155	0.224
	Sound (NC)		-	-	-	-	17	23	27	31	38	43
	Throw (ft)	1 way	1-2-7	3-7-15	7-11-22	10-15-30	12-19-37	15-22-42	17-26-46	20-30-49	25-37-55	30-42-60
	Total Pressure (in. w.g.)		0.002	0.008	0.018	0.031	0.049	0.070	0.096	0.125	0.196	0.282
	Sound (NC)		-	-	-	-	21	27	32	36	43	49
	Throw (ft)	2 way	2-4-12	7-12-18	12-16-22	15-18-26	17-20-29	18-22-32	20-24-34	21-26-36	24-29-41	26-32-45
		3A way	2-4-11	7-11-15	11-13-19	12-15-22	14-17-24	15-19-26	16-20-29	18-22-31	20-24-34	22-26-37
		3B way	1-3-7	4-7-11	7-9-13	9-11-15	10-12-17	11-13-19	12-14-20	12-15-22	14-17-24	15-19-27
		4 way	1-3-6	4-6-12	6-9-16	8-12-18	10-14-20	12-16-22	14-17-24	15-18-26	17-20-29	18-22-32

Performance Notes:

1. Tested in accordance with ASHRAE Standard 70-2023, "Method of Testing for Rating the Performance of Air Outlets and Inlets."
2. Air flow is in cfm.
3. All pressures are in in. w.g.
4. Throw values are measured in feet for terminal velocities of 150 fpm (minimum), 100 fpm (middle) and 50 fpm (maximum).
5. Throw data is based on supply air and room air being at isothermal conditions.
6. NC values are based on room absorption of 10 dB re 10^{-12} Watts and one diffuser.
7. Blanks "-" indicate an NC value less than 15.



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