SPD

SQUARE PLAQUE DIFFUSER

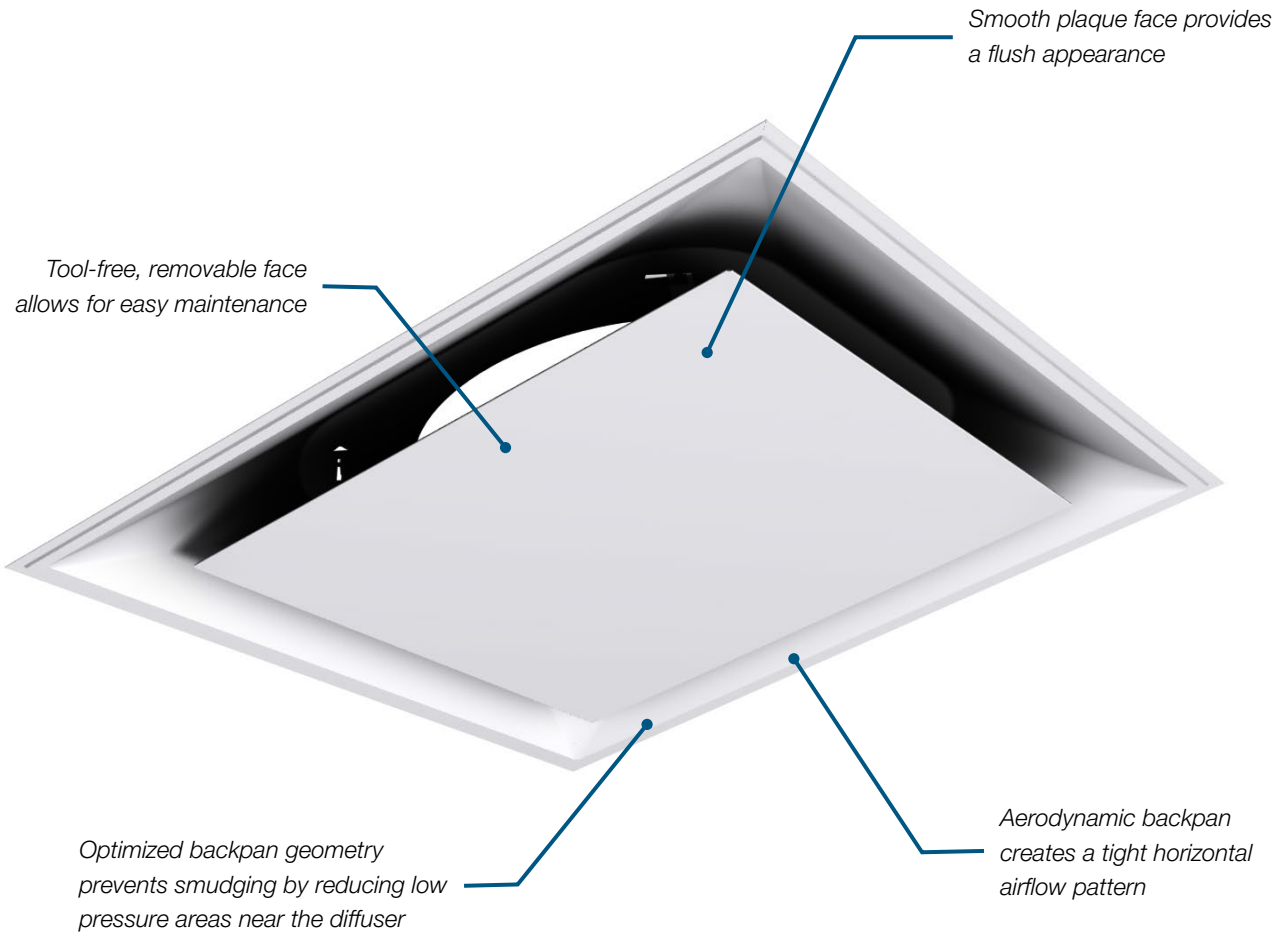




price | DIFFUSERS

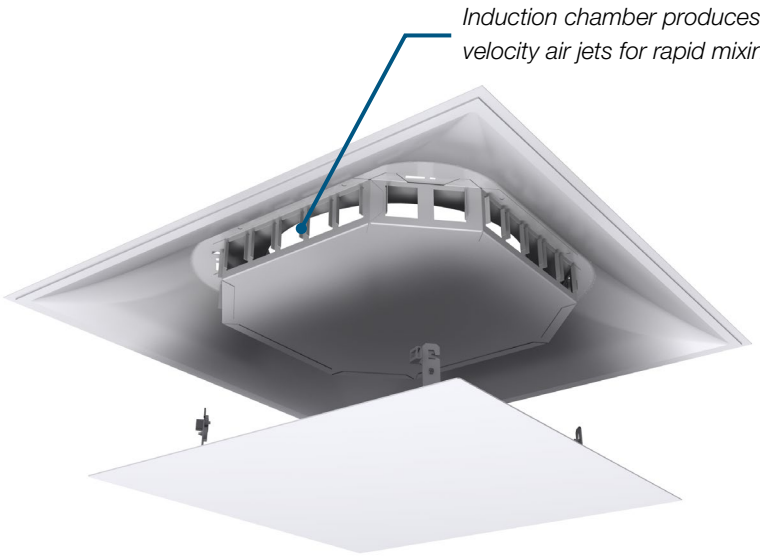
SPD
Square Plaque Diffuser

The Square Plaque Diffuser (SPD) has a flush appearance, making it ideal for architecturally-conscience commercial spaces, and provides industry-leading low pressure drop and sound generation with a 360° radial, horizontal air pattern for rapid mixing and optimal thermal comfort. The one-piece, aerodynamically optimized backpan maintains the horizontal air pattern even at low air volumes, making it a great choice for high turndown VAV applications. This versatile diffuser is easy to maintain, with little to no ceiling smudging and a tool-free removable face for quick access to dampers, accessories, and ductwork.



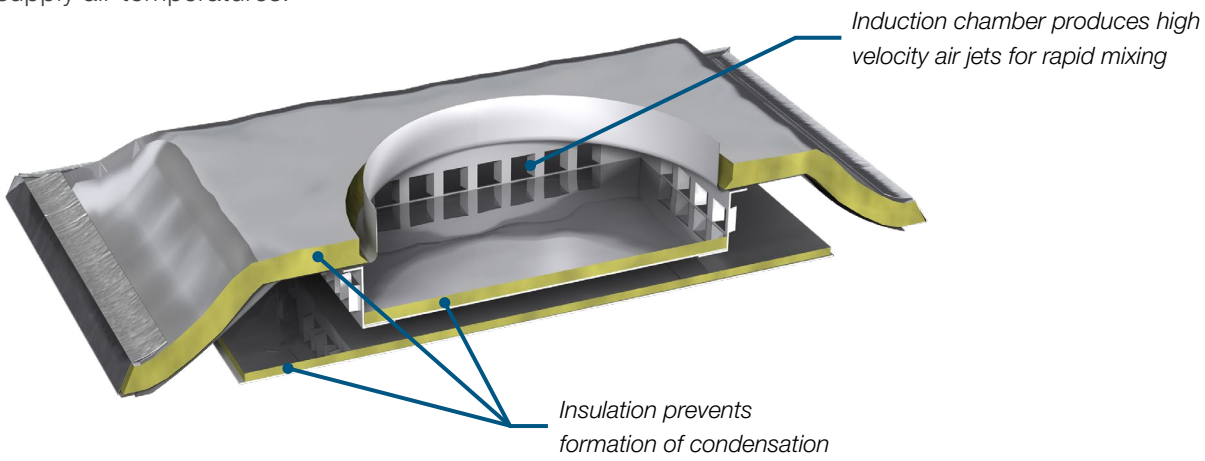
HIGH INDUCTION CONSTRUCTION

Optional high induction construction uses engineered discharge nozzles to promote a high rate of induction, rapidly mixing supply air and room air in order to eliminate drafts and provide high thermal comfort.



LOW TEMPERATURE CONSTRUCTION

Incorporating the benefits of the high induction construction, high-velocity, low-temperature air jets rapidly mix room air to maintain throw at low flow conditions. Thermally lined diffuser backpan, induction chamber and plaque prevent condensation from forming and reduce heat gain through the diffuser in order to maintaim low supply air temperatures.



TYPICAL APPLICATIONS

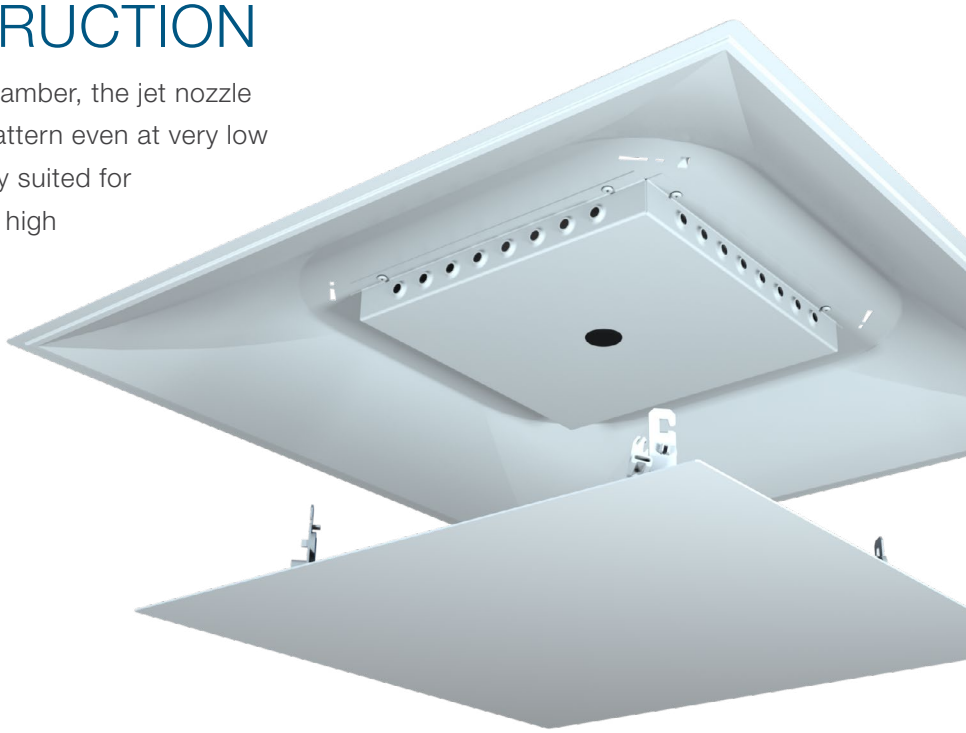
The SPD is compatible with a wide variety of ceiling systems, and is designed to deliver architectural appeal without sacrificing performance. The SPD is an excellent choice for VAV applications, providing a tight, horizontal airflow pattern, even at low air volumes.

CONSTRUCTION OPTIONS

+ Material
  - Steel (SPD)
  - Aluminum (ASPD)
+ Options
  - Fire rated construction (SPD-FR)
  - High induction construction (SPD-HI)
  - Low temperature construction (SPDLT/ ASPDLT)
  - Jet nozzle construction (SPJD)

JET NOZZLE CONSTRUCTION

Featuring integrated nozzles and a pressure chamber, the jet nozzle option is engineered to maintain a horizontal pattern even at very low airflow rates. The low airflow capability is ideally suited for dedicated outdoor air systems (DOAS) and the high induction provides optimal thermal comfort.

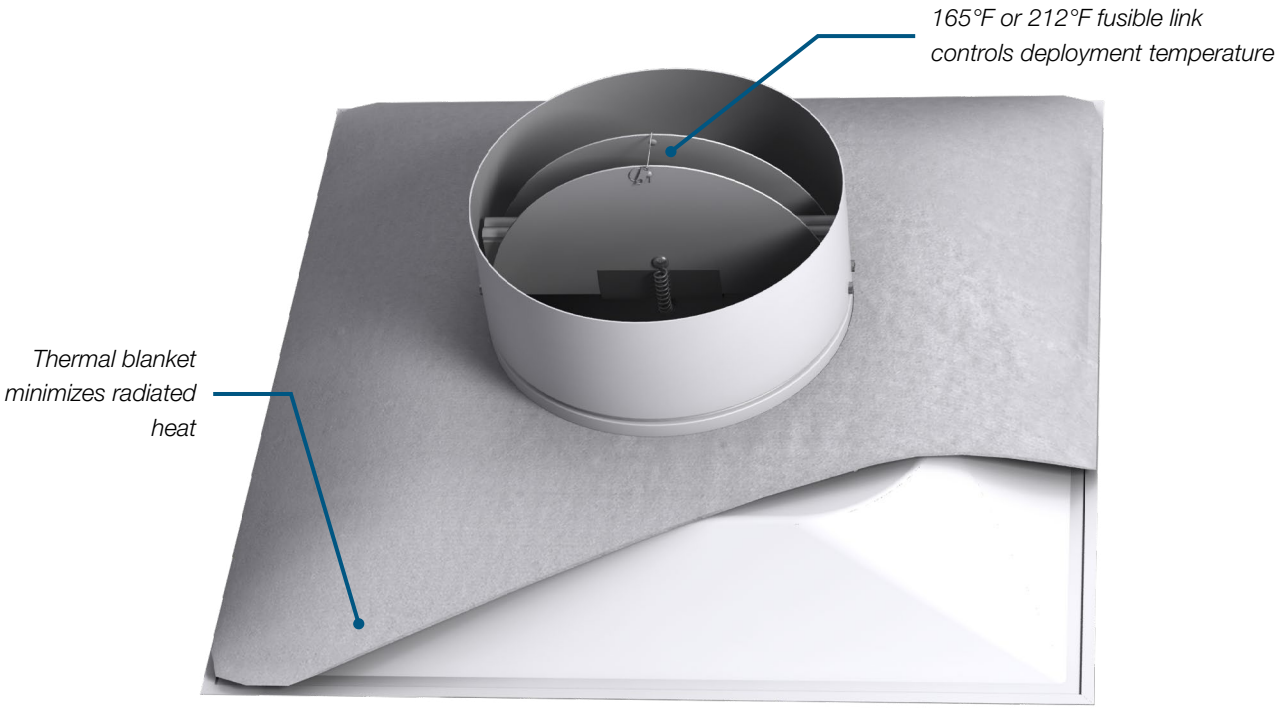


FIRE RATED CONSTRUCTION

Optional Fire Rated Assembly listing in the UL Fire Resistance Directory.

Fire rated models meet UL time vs. temperature test criteria and NFPA 90A requirements.

Fire rated construction incorporates a thermal blanket and fire damper for use in fire rated T-bar ceiling applications. The butterfly-type fire damper is available with either a 165°F or 212°F fusible link.



PERFORMANCE DATA

SPD – 12 in. x 12 in. Face Size

Listed Size	Neck Velocity (fpm)	400	500	600	700	800	900	1000	1200	1400	1600
	Velocity Pressure (in. w.g.)	0.010	0.016	0.022	0.031	0.040	0.050	0.062	0.090	0.122	0.160
4	Total Pressure (in. w.g.)	0.017	0.026	0.038	0.052	0.068	0.086	0.106	0.153	0.208	0.271
	Flow Rate (cfm)	35	44	52	61	70	78	87	104	122	139
	Sound (NC)	-	-	-	-	-	15	19	25	30	34
	Throw (ft)	1-2-4	1-2-4	2-3-5	2-3-6	2-4-6	3-4-7	3-4-7	4-5-8	4-6-9	5-6-9
5	Total Pressure (in. w.g.)	0.027	0.042	0.061	0.082	0.108	0.136	0.168	0.242	0.330	0.431
	Flow Rate (cfm)	54	68	82	95	109	122	136	163	190	218
	Sound (NC)	-	-	-	-	16	20	24	30	35	39
	Throw (ft)	2-2-5	2-3-6	2-4-7	3-4-8	3-5-8	4-5-9	4-6-9	5-7-10	5-8-11	6-8-11
6	Total Pressure (in. w.g.)	0.038	0.059	0.085	0.116	0.152	0.192	0.237	0.341	0.464	0.606
	Flow Rate (cfm)	78	98	118	137	157	176	196	235	274	314
	Sound (NC)	-	-	-	16	20	24	27	33	38	43
	Throw (ft)	2-3-6	2-4-7	3-4-8	3-5-9	4-6-10	4-7-10	5-7-11	6-8-12	7-9-13	8-10-14
7	Total Pressure (in. w.g.)	0.052	0.081	0.117	0.159	0.207	0.263	0.324	0.467	0.635	0.830
	Flow Rate (cfm)	107	134	160	187	214	240	267	320	374	427
	Sound (NC)	-	-	-	19	24	27	31	37	42	46
	Throw (ft)	2-4-7	3-4-9	4-5-10	4-6-11	5-7-11	5-8-12	6-9-13	7-10-14	8-11-15	9-11-16
8	Total Pressure (in. w.g.)	0.068	0.106	0.153	0.208	0.271	0.343	0.424	0.610	0.831	1.085
	Flow Rate (cfm)	140	175	209	244	279	314	349	419	489	558
	Sound (NC)	-	-	17	22	26	30	34	39	44	49
	Throw (ft)	3-4-8	3-5-10	4-6-11	5-7-12	6-8-13	6-9-14	7-10-15	8-11-16	10-12-17	11-13-18

SPD – 20 in. x 20 in. Face Size

Listed Size	Neck Velocity (fpm)	400	500	600	700	800	900	1000	1200	1400	1600
	Velocity Pressure (in. w.g.)	0.010	0.016	0.022	0.031	0.040	0.050	0.062	0.090	0.122	0.160
6	Total Pressure (in. w.g.)	0.014	0.022	0.031	0.043	0.056	0.071	0.087	0.126	0.171	0.223
	Flow Rate (cfm)	78	98	118	137	157	176	196	235	274	314
	Sound (NC)	-	-	-	-	-	18	21	27	32	36
	Throw (ft)	0-1-3	1-2-4	1-2-4	1-3-5	2-3-6	2-3-6	2-4-6	3-4-7	3-5-7	4-6-8
8	Total Pressure (in. w.g.)	0.022	0.035	0.050	0.069	0.090	0.114	0.140	0.202	0.275	0.359
	Flow Rate (cfm)	140	175	209	244	279	314	349	419	489	558
	Sound (NC)	-	-	-	16	20	24	27	33	38	42
	Throw (ft)	1-2-5	2-3-6	2-4-6	3-4-7	3-5-7	4-5-8	4-6-8	5-6-9	6-7-10	6-7-11
10	Total Pressure (in. w.g.)	0.032	0.051	0.073	0.099	0.130	0.164	0.203	0.292	0.397	0.519
	Flow Rate (cfm)	218	273	327	382	436	491	545	654	763	872
	Sound (NC)	-	-	-	20	24	28	31	37	42	46
	Throw (ft)	2-3-6	3-4-7	3-5-8	4-6-9	4-6-9	5-7-10	5-7-10	6-8-11	7-9-12	8-9-13

Performance Notes:

1. Tested in accordance with ASHRAE Standard 70-2023 "Method of Testing for Rating the Performance of Air
2. Outlets and Inlets."
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 atisothermal conditions.
6. If the diffuser is mounted on an exposed duct, multiply the radii of diffusion in the table by 0.70.
7. NC values are based on room absorption of 10 dB re 10-12 Watts and one diffuser.
8. Blanks "-" indicate an NC level below 15.

PERFORMANCE DATA

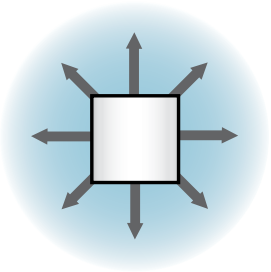
SPD – 24 in. x 24 in. Face Size

Listed Size	Neck Velocity (fpm)	400	500	600	700	800	900	1000	1200	1400	1600
	Velocity Pressure (in. w.g.)	**0.010**	**0.016**	**0.022**	**0.031**	**0.040**	**0.050**	**0.062**	**0.090**	**0.122**	**0.160**
6	**Total Pressure (in. w.g.)**	0.010	0.016	0.023	0.032	0.041	0.053	0.065	0.093	0.127	0.166
	Flow Rate (cfm)	78	98	118	137	157	176	196	235	274	314
	Sound (NC)	-	-	-	-	-	19	22	29	34	38
	Throw (ft)	1-2-4	1-2-4	2-3-5	2-3-6	2-4-6	3-4-7	3-4-7	4-5-8	4-6-9	5-7-9
8	**Total Pressure (in. w.g.)**	0.018	0.029	0.042	0.057	0.074	0.093	0.115	0.166	0.226	0.295
	Flow Rate (cfm)	140	175	209	244	279	314	349	419	489	558
	Sound (NC)	-	-	-	-	19	23	27	33	38	43
	Throw (ft)	2-2-5	2-3-6	2-4-7	3-4-8	3-5-9	4-6-9	4-6-10	5-7-11	6-8-12	7-9-12
10	**Total Pressure (in. w.g.)**	0.029	0.045	0.065	0.088	0.115	0.146	0.180	0.259	0.353	0.461
	Flow Rate (cfm)	218	273	327	382	436	491	545	654	763	872
	Sound (NC)	-	-	-	18	22	26	30	36	41	46
	Throw (ft)	2-3-6	3-4-8	3-5-9	4-6-10	4-6-11	5-7-12	5-8-12	6-9-13	8-10-14	9-11-15
12	**Total Pressure (in. w.g.)**	0.041	0.065	0.093	0.127	0.166	0.210	0.259	0.373	0.508	0.664
	Flow Rate (cfm)	314	393	471	550	628	707	785	942	1099	1256
	Sound (NC)	-	-	15	21	25	29	33	39	44	49
	Throw (ft)	3-4-8	3-5-10	4-6-11	5-7-12	5-8-13	6-9-14	7-10-15	8-11-16	9-12-17	11-13-19
14	**Total Pressure (in. w.g.)**	0.057	0.088	0.127	0.173	0.226	0.286	0.353	0.509	0.693	0.905
	Flow Rate (cfm)	428	535	641	748	855	962	1069	1283	1497	1710
	Sound (NC)	-	-	18	23	27	31	35	41	46	51
	Throw (ft)	3-5-10	4-6-12	5-7-13	6-9-14	6-10-15	7-11-16	8-12-17	10-13-19	11-14-20	12-15-22
15	**Total Pressure (in. w.g.)**	0.065	0.101	0.146	0.199	0.259	0.328	0.405	0.584	0.794	1.037
	Flow Rate (cfm)	491	614	736	859	982	1104	1227	1472	1718	1963
	Sound (NC)	-	-	19	24	28	32	36	42	47	52
	Throw (ft)	4-5-11	4-7-13	5-8-14	6-9-15	7-11-16	8-12-17	9-13-18	11-14-20	12-15-22	13-16-23

Performance Notes:

1. Tested in accordance with ASHRAE Standard 70 - 2023 "Method of Testing for Rating the Performance of Air Outlets and Inlets."
2. Airflow is in cubic feet per minute [cfm].
3. NC, sound pressure levels, are based on a room absorption of 10 dB re 10^{-12} Watts, and a single diffuser/grille.
4. Blanks "-" indicate an NC level below 15.
5. All pressures are in inches of water column [in. w.g.].
6. Pressures not listed can be calculated using the following formula: $P_{total} = P_{static} + P_{velocity}$
7. Throw data is based on supply air and room air being at isothermal conditions.
8. Throw data is given in feet [ft] to terminal velocities of:
   150 fpm (minimum)
   100 fpm (middle)
   50 fpm (maximum)
9. Diffuser tested with a ceiling. If the diffuser is mounted on an exposed duct, multiply the radii of diffusion in the table by 0.70.
10. Does not include effects of ceiling radiation damper (SPD-FR)

Throw Diagram



Plan View - Horizontal Radial Pattern

PERFORMANCE DATA

SPD – Return, 24 in. x 24 in. Face Size

Listed Size	Neck Velocity (fpm) / Velocity Pressure (in. w.g.)	200 / 0.002	300 / 0.006	400 / 0.010	500 / 0.016	600 / 0.022	700 / 0.031	800 / 0.040	900 / 0.050	1000 / 0.062
6	Neg. Static Pressure (in. w.g.)	0.005	0.012	0.021	0.032	0.047	0.063	0.082	0.105	0.128
	Flow Rate (cfm)	39	59	79	98	118	137	157	177	196
	Sound (NC)	-	-	-	-	-	-	-	16	19
8	Neg. Static Pressure (in. w.g.)	0.009	0.020	0.033	0.049	0.068	0.090	0.114	0.141	0.171
	Flow Rate (cfm)	70	105	140	175	209	244	279	314	349
	Sound (NC)	-	-	-	-	-	-	-	17	20
10	Neg. Static Pressure (in. w.g.)	0.009	0.0020	0.036	0.057	0.081	0.111	0.144	0.183	0.225
	Flow Rate (cfm)	109	164	218	273	327	382	436	491	545
	Sound (NC)	-	-	0	-	-	17	21	24	27
12	Neg. Static Pressure (in. w.g.)	0.016	0.033	0.056	0.085	0.120	0.159	0.204	0.254	0.308
	Flow Rate (cfm)	157	236	314	393	471	550	628	707	785
	Sound (NC)	-	-	-	16	21	25	28	32	35

Performance Notes:

1. Tested in accordance with ASHRAE Standard 70 - 2023 "Method of Testing for Rating the Performance of Air Outlets and Inlets."
2. Airflow is in cubic feet per minute [cfm].
3. NC, sound pressure levels, are based on a room absorption of 10 dB re 10^{-12} Watts, and a single diffuser/grille.
4. Blanks "-" indicate an NC level below 15.
5. All pressures are in inches of water column [in. w.g.].
6. Pressures not listed can be calculated using the following formula: $P_{total} = P_{static} + P_{velocity}$
7. For 14 in. and 15 in. inlet sizes, use 12 in. inlet data.

PERFORMANCE DATA

SPD-HI – High Induction, 24 in. x 24 in. Face Size

Listed Size	Neck Velocity (fpm)	200	300	400	500	600	700	800	900	1000	1200
	Velocity Pressure (in. w.g.)	**0.002**	**0.006**	**0.010**	**0.016**	**0.022**	**0.031**	**0.040**	**0.050**	**0.062**	**0.090**
6	**Total Pressure (in. w.g.)**	0.004	0.009	0.015	0.024	0.034	0.047	0.061	0.078	0.096	0.138
	Flow Rate (cfm)	39	59	79	98	118	137	157	177	196	236
	Sound (NC)	-	-	-	-	-	-	17	20	24	29
	Throw (ft)	1-1-2	1-1-2	1-2-3	1-2-4	2-2-5	2-3-5	2-3-6	2-3-7	3-4-8	3-5-9
8	**Total Pressure (in. w.g.)**	0.008	0.019	0.034	0.052	0.075	0.103	0.134	0.170	0.210	0.302
	Flow Rate (cfm)	70	105	140	174	209	244	279	314	349	419
	Sound (NC)	-	-	-	-	20	25	29	32	36	41
	Throw (ft)	1-2-4	2-3-5	2-4-7	3-5-9	4-5-11	4-6-12	5-7-13	5-8-14	6-9-15	7-11-16
10	**Total Pressure (in. w.g.)**	0.015	0.035	0.062	0.096	0.138	0.188	0.246	0.311	0.385	0.554
	Flow Rate (cfm)	109	164	218	273	327	382	436	491	545	654
	Sound (NC)	-	-	17	24	29	34	38	42	45	51
	Throw (ft)	2-3-6	3-4-8	4-6-11	5-7-13	6-8-14	7-10-15	8-11-16	8-12-17	9-13-18	11-14-20
12	**Total Pressure (in. w.g.)**	0.025	0.057	0.101	0.158	0.227	0.309	0.404	0.511	0.631	0.909
	Flow Rate (cfm)	157	236	314	393	471	550	628	707	785	942
	Sound (NC)	-	15	24	31	37	42	46	50	59	59
	Throw (ft)	3-4-8	4-6-12	5-8-14	7-10-15	8-12-17	9-13-18	11-14-19	12-15-21	13-15-22	14-17-24
14	**Total Pressure (in. w.g.)**	0.038	0.086	0.154	0.240	0.346	0.471	0.615	0.778	0.960	1.383
	Flow Rate (cfm)	214	321	427	534	641	748	855	962	1068	1282
	Sound (NC)	-	22	31	38	43	48	52	56	59	65
	Throw (ft)	4-6-11	6-8-14	7-11-16	9-13-18	11-14-20	12-15-21	13-16-23	14-17-24	15-18-25	16-20-28

For performance notes, see end of section.

PERFORMANCE DATA

SPDLT – Low Temperature Construction, 20 in. x 20 in. Module

Inlet Size	Flow Rate (cfm)	Total Pressure (in. w.g.)	Static Pressure (in. w.g.)	Sound (NC)	Isothermal Conditions				Cooling Conditions			
					Throw (ft)			Drop in.	Throw (ft)			Drop in.
					150 fpm	100 fpm	50 fpm		150 fpm	100 fpm	50 fpm	
4 in.ø	50	0.05	0.03	-	2	4	8	6	2	4	7	11
	75	0.11	0.06	25	4	6	12	8	4	5	9	14
	100	0.20	0.12	33	5	8	14	10	5	7	10	15
	125	0.31	0.18	39	7	10	16	11	6	8	11	17
	150	0.44	0.26	44	8	12	18	13	7	9	12	19
	175	0.60	0.35	48	9	13	19	13	8	9	13	20
	200	0.79	0.46	52	11	14	20	14	8	10	14	22
6 in. ø	50	0.04	0.04	-	2	4	8	6	2	4	7	11
	75	0.09	0.08	18	4	6	12	8	4	5	9	14
	100	0.15	0.13	26	5	8	14	10	5	7	10	15
	125	0.24	0.21	32	7	10	16	11	6	8	11	17
	150	0.34	0.30	38	8	12	18	13	7	9	12	19
	175	0.47	0.42	42	9	13	19	13	8	9	13	20
	200	0.61	0.55	46	11	14	20	14	8	10	14	22
8 in.ø	50	0.04	0.04	-	2	4	8	6	2	4	7	11
	75	0.09	0.09	-	4	6	12	8	4	5	9	14
	100	0.17	0.16	21	5	8	14	10	5	7	10	15
	125	0.26	0.25	27	7	10	16	11	6	8	11	17
	150	0.37	0.36	33	8	12	18	13	7	9	12	19
	175	0.51	0.49	37	9	13	19	13	8	9	13	20
	200	0.66	0.64	41	11	14	20	14	8	10	14	22

SPDLT – Low Temperature Construction, 24 in. x 24 in. Module

Inlet Size	Flow Rate (cfm)	Total Pressure (in. w.g.)	Static Pressure (in. w.g.)	Sound (NC)	Isothermal Conditions				Cooling Conditions			
					Throw (ft)			Drop in.	Throw (ft)			Drop in.
					150 fpm	100 fpm	50 fpm		150 fpm	100 fpm	50 fpm	
4 in.ø	50	0.05	0.03	-	2	4	7	4	2	4	7	10
	75	0.11	0.06	25	3	5	11	6	3	5	10	14
	100	0.19	0.11	33	5	7	14	8	5	7	11	16
	125	0.29	0.16	39	6	9	16	9	6	9	13	19
	150	0.42	0.24	43	7	11	18	10	7	10	14	20
	175	0.58	0.33	47	8	12	19	11	8	10	15	21
	200	0.75	0.42	51	9	14	20	12	9	11	16	23
6 in. ø	50	0.03	0.03	-	2	4	7	4	2	4	7	10
	75	0.06	0.05	18	3	5	11	6	3	5	10	14
	100	0.11	0.09	25	5	7	14	8	5	7	11	16
	125	0.17	0.14	31	6	9	16	9	6	9	13	19
	150	0.24	0.20	36	7	11	18	10	7	10	14	20
	175	0.33	0.28	40	8	12	19	11	8	10	15	21
	200	0.43	0.37	43	9	14	20	12	9	11	16	23
8 in.ø	50	0.02	0.02	-	2	4	7	4	2	4	7	10
	75	0.05	0.05	-	3	5	11	6	3	5	10	14
	100	0.09	0.08	21	5	7	14	8	5	7	11	16
	125	0.14	0.13	27	6	9	16	9	6	9	13	19
	150	0.21	0.20	32	7	11	18	10	7	10	14	20
	175	0.28	0.26	36	8	12	19	11	8	10	15	21
	200	0.37	0.35	39	9	14	20	12	9	11	16	23
10 in.ø	50	0.02	0.02	-	2	4	7	4	2	4	7	10
	75	0.05	0.05	-	3	5	11	6	3	5	10	14
	100	0.10	0.10	18	5	7	14	8	5	7	11	16
	125	0.15	0.15	24	6	9	16	9	6	9	13	19
	150	0.22	0.22	29	7	11	18	10	7	10	14	20
	175	0.30	0.29	33	8	12	19	11	8	10	15	21
	200	0.39	0.38	36	9	14	20	12	9	11	16	23

Performance Notes:

1. Tested in accordance with ASHRAE Standard 70 - 2023 "Method of Testing for Rating the Performance of Air Outlets and Inlets."
2. Airflow is in cubic feet per minute [cfm].
3. NC, sound pressure levels, are based on a room absorption of 10 dB re 10^{-12} Watts, and a single diffuser/grille.
4. Blanks "-" indicate an NC level below 15.
5. All pressures are in inches of water column [in. w.g.].
6. Pressures not listed can be calculated using the following formula: $P_{total} = P_{static} + P_{velocity}$
7. Isothermal conditions indicate supply air temperature is equal to room air temperature.
8. Cooling conditions are based on a supply air temperature of 40 °F and a room temperature of 75 °F.
9. Drop is in inches at a terminal velocify of 50 fpm.

PERFORMANCE DATA

SPJD – Jet Nozzle Construction, 12 in. x 12 in. Module

Size	Velocity Pressure (in. w.g.)	0.001	0.001	0.002	0.003	0.004	0.005	0.006
4	Total Pressure (in. w.g.)	0.105	0.177	0.268	0.378	0.506	0.654	0.820
	Flow Rate (cfm)	10	13	16	19	22	25	28
	NC	-	20	24	28	32	35	38
	Throw (ft)	4-6-8	5-7-9	7-8-10	7-8-11	8-9-12	8-10-13	9-10-14

SPJD – Jet Nozzle Construction, 24 in. x 24 in. Module

Size	Velocity Pressure (in. w.g.)	0.001	0.001	0.001	0.002	0.003	0.003	0.004
6	Total Pressure (in. w.g.)	0.091	0.142	0.205	0.279	0.364	0.461	0.569
	Flow Rate (cfm)	20	25	30	35	40	45	50
	NC	-	-	-	-	17	21	24
	Throw (ft)	6-8-10	7-8-11	8-9-12	8-10-13	9-11-14	9-11-15	10-12-16

Performance Notes:

1. Based on product testing in accordance with ASHRAE Standard 70-2023 "Method of Testing for Rating the Performance of Air Outlets and Inlets."
2. Airflow is in cubic feet per minute [cfm].
3. All pressures are in inches of water column [in. w.g.].
4. NC, sound pressure levels, are based on a room absorption of 10 dB re 10^{-12} Watts, and a single diffuser.
5. Blanks "-" indicate an NC level below 15.
6. Throw data is based on supply air and room air being at isothermal conditions.
7. Throw data is given in feet [ft] to a terminal velocities of 50 fpm (minimum), 35 fpm (middle), and 20 fpm (maximum).

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