

DISPLACEMENT VENTILATION ENGINEERING

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AFD

Introduction: AFD

The *Krueger by Halton* AFD provides a 180° discharge pattern making it ideal for auditoriums, classrooms, retail centers, and offices. The triangular design works well where seamless diffuser integration into a sensitive architectural space is required. The detachable face facilitates easy cleaning of the internal baffle.

MODEL

AFD - Rounded Triangle, Low-Velocity Supply Unit

FEATURES

- 20 gage front panel.
- Horizontal low velocity discharge at floor level.
- Flow pattern at an angle of 180° enables large airflow rates with low residual velocities in the occupied zone.
- Detachable front panel and removable baffle enables cleaning of the unit and duct work.
- Round duct connection with integral gasket on top or bottom.

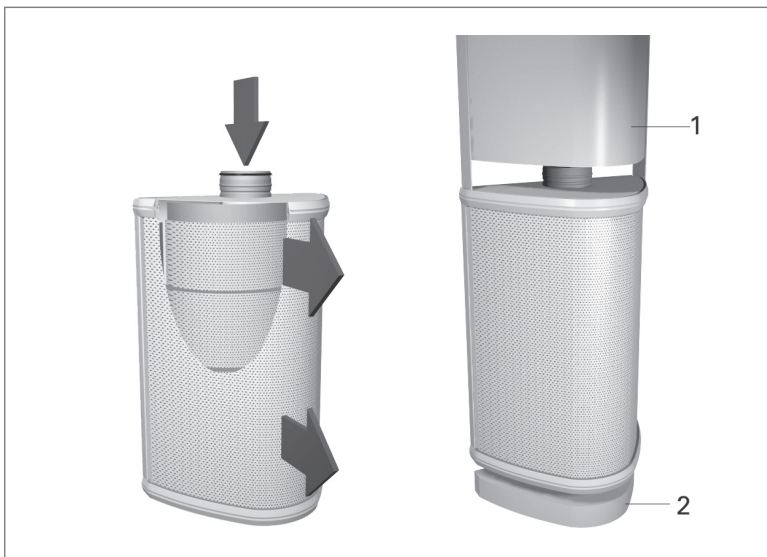
OPTIONS

- Stainless steel (AISI 316) design.
- 16 gage front panel.
- Duct cover (solid or perforated).
- Installation base (2", 4", 6").
- Vinyl trim in white or black.
- Metal trim (painted to match).

FINISHES

- Standard is Polyester Painted White (RAL 9010).
- Custom colors available.

AFD Application



FUNCTION

Air is discharged into the space through the front panel of the unit, normally at a slightly lower temperature than setpoint.

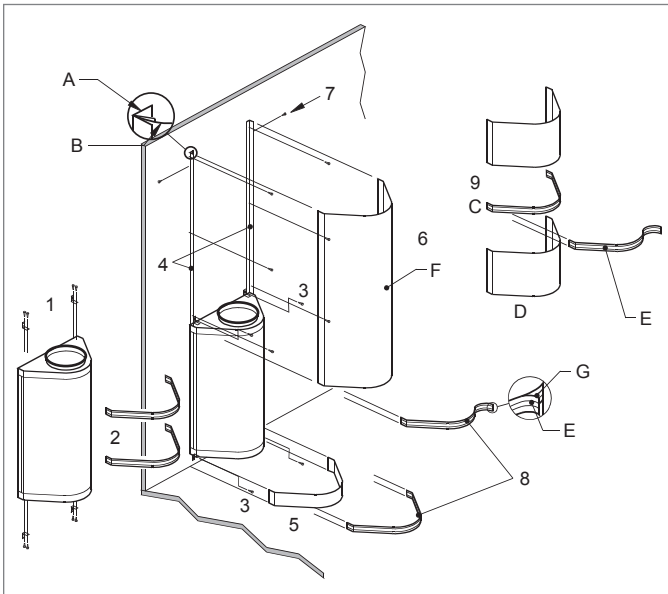
The supply air flows at floor level and gradually pervades through the occupied space before rising due to the convection of warm surfaces.

The low velocity flow pattern is semi-circular (180°).

NOTES: The flow pattern data has been defined for floor installation. (1) Duct cover is for covering the duct work and is optional. (2) Installation base is used to raise the unit off the floor and is also optional.

AFD Installation

INSTALLATION EXPLODED VIEW

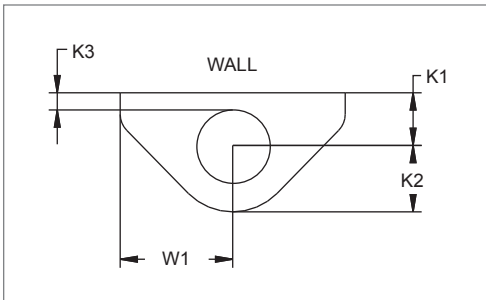


INSTALLATION

Perform the installation in order.

1. Fix mounting brackets (4 places) to low velocity unit.
2. Remove trim (E) from unit.
3. Locate unit against wall and secure through mounting brackets.
4. Fix duct cover support brackets (A) to wall between unit and ceiling.
5. Position base against lower flange of the unit.
6. After installation of duct work, locate duct cover as follows: Locate duct cover section (F) on top flange (G) of unit and firmly push into support brackets fixed to wall (B).
7. Secure duct cover with screws through cover into support brackets.
8. Re-fit trim between duct cover and unit, and between base and unit by bending trim back on itself (E) and pressing bead into groove in flange (G).
9. When multiple sections of duct cover are used (D), an aluminium coupling flange (C) is needed.

DUCT INSTALLATION



ØD	W1	K1	K2	K3
4"	7 15/16"	3 5/8"	4 1/2"	1 5/8"
5"	8 7/16"	3 7/8"	4 13/16"	1 7/16"
6"	9 11/16"	4 3/4"	5 1/2"	1 5/8"
8"	10 1/2"	5 1/4"	6"	1 1/4"
10"	12"	6 3/4"	6 13/16"	1 3/4"
12"	14 1/16"	7 7/8"	8"	1 3/4"
16"	16 5/8"	9 5/8"	9 3/4"	1 11/16"
20"	19 11/16"	11 5/8"	11 11/16"	1 3/4"

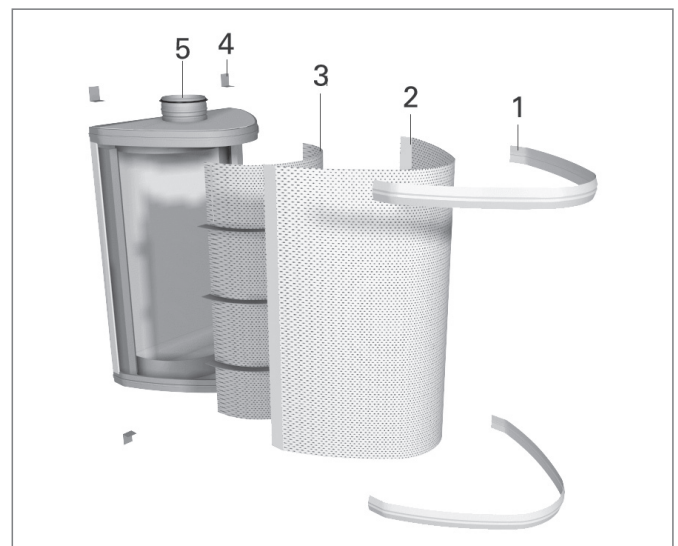
AFD Service & Maintenance

SERVICING

Open the front panel (2) by first removing the trim (1) and unscrewing the screws. Pull out the front panel. If required, the internal baffle (3) can be detached by unscrewing the screws. Pull out the inner structure.

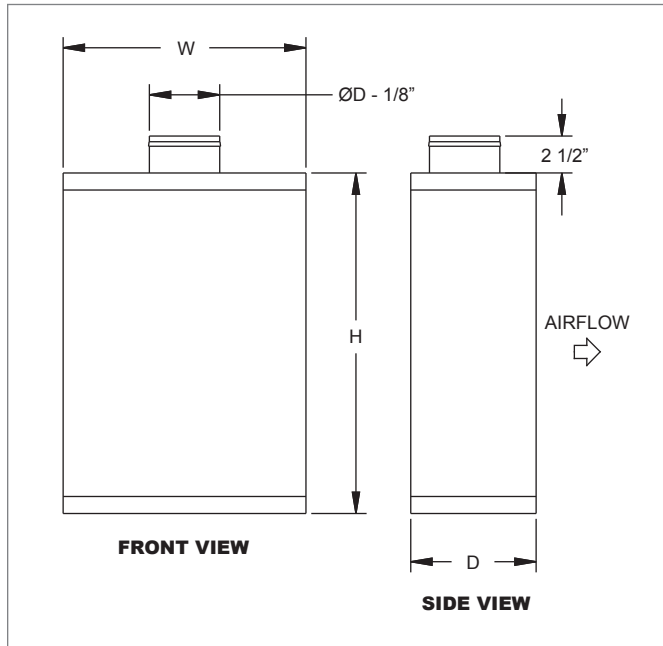
Wipe the parts with a brush or a damp cloth, instead of immersing in water. After cleaning reassemble in reverse order.

Code	Description
1	Trim
2	Front Panel
3	Internal Baffle
4	Assembly Brackets
5	Casing



AFD Dimensional Information

AFD FRONT AND SIDE VIEWS



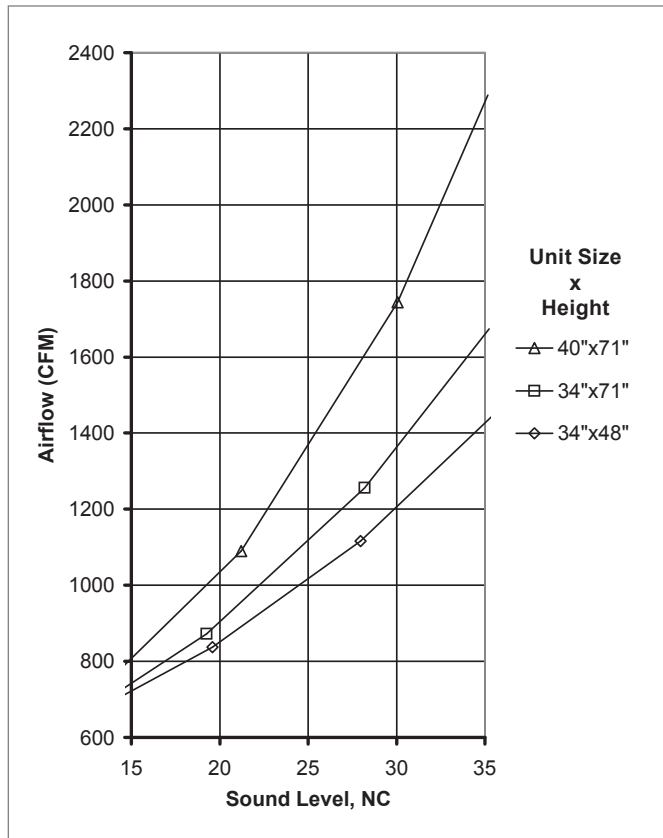
AFD DIMENSIONAL REFERENCES

AFD Size (Nominal WxH)	W	H	D	ØD
16"x24"	15 13/16"	23 5/8"	8 1/16"	4"
17"x24"	16 7/8"	23 5/8"	8 11/16"	5"
20"x32"	19 3/8"	31 1/2"	10 1/4"	6"
21"x24"	20 15/16"	23 5/8"	11 1/4"	8"
21"x48"	20 15/16"	47 1/4"	11 1/4"	8"
24"x32"	24"	31 1/2"	13 1/2"	10"
24"x48"	24"	47 1/4"	13 1/2"	10"
29"x48"	28 1/8"	47 1/4"	16"	12"
29"x71"	28 1/8"	70 7/8"	16"	12"
34"x48"	33 1/4"	47 1/4"	19 5/16"	16"
34"x71"	33 1/4"	70 7/8"	19 5/16"	16"
40"x71"	39 3/8"	70 7/8"	23 1/4"	20"

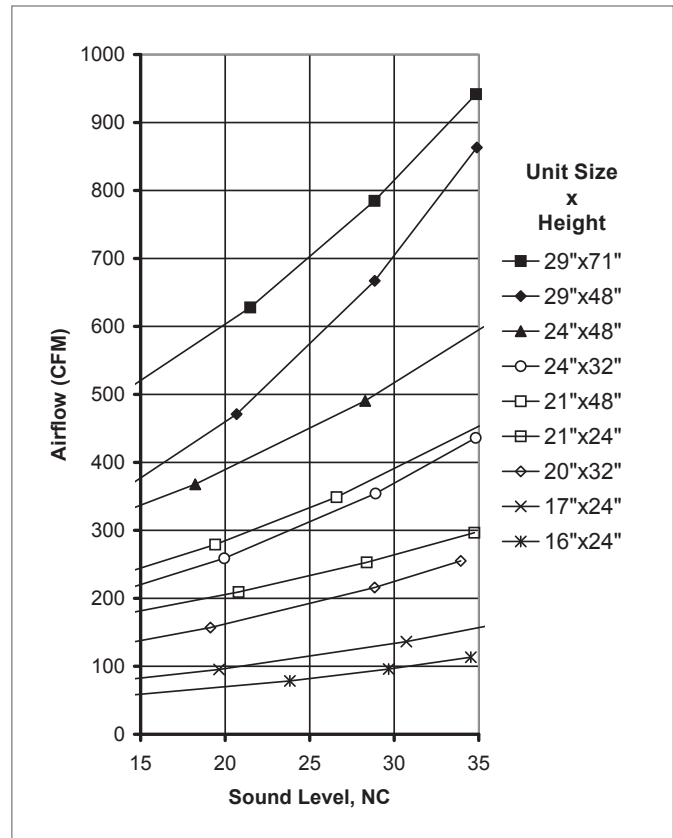
DISPLACEMENT VENTILATION

AFD Reference Chart

AIRFLOW VS. NC LEVEL: AFD SERIES, HIGH FLOW



AIRFLOW VS. NC LEVEL: AFD SERIES, LOW FLOW



AFD

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AFD Performance Data
IP/METRIC DATA: AFD SERIES

Unit Size	IP Data						NC	Metric Data						Octave Band, dB						
	Neck Vel	Air Flow	Pt	Ps	Near T ₅₀ @ 4 ft	T ₅₀ @ Floor		Neck Vel	Air Flow	Pt	Ps	Near T _{.25} @ 1.1 m	T _{.25} @ Floor	2	3	4	5	6	7	
	FPM	CFM	"WG	"WG	ft	ft		m/s	L/s	Pa	Pa	m	m							
16"x24"	600	52	.042	0.019	0	1	12	3.05	25	10.4	4.8	0.1	0.2	20	22	25	13	-	-	
	900	78	.094	0.043	1	1	24	4.57	37	23.4	10.8	0.2	0.3	26	29	34	27	16	14	
	1100	96	.140	0.065	1	2	30	5.59	45	34.9	16.2	0.2	0.5	28	33	38	34	25	17	
	1300	113	.196	0.091	1	2	35	6.60	53	48.8	22.6	0.3	0.7	30	36	42	40	33	21	
17"x24"	550	75	.038	0.019	0	2	12	2.79	35	9.5	4.8	0.1	0.7	23	23	25	13	-	-	
	700	95	.062	0.031	0	3	20	3.56	45	15.4	7.8	0.1	0.9	27	28	30	22	-	-	
	1000	136	.126	0.064	1	4	31	5.08	64	31.4	15.8	0.3	1.4	31	36	38	36	27	17	
	1200	164	.181	0.092	1	5	36	6.10	77	45.2	22.8	0.3	1.5	33	40	42	42	37	24	
20"x32"	650	128	.042	0.015	0	2	13	3.30	60	10.3	3.8	0.1	0.8	32	27	23	16	-	14	
	800	157	.063	0.023	0	3	19	4.06	74	15.7	5.7	0.1	0.9	32	30	28	23	11	16	
	1100	216	.119	0.044	1	4	29	5.59	102	29.6	10.8	0.2	1.3	32	35	36	34	25	20	
	1300	255	.166	0.061	1	5	34	6.60	120	41.4	15.1	0.3	1.5	33	38	40	40	32	22	
21"x24"	500	174	.063	0.047	0	4	13	2.54	82	15.7	11.8	0.1	1.1	24	28	25	18	-	-	
	600	209	.091	0.068	1	4	21	3.05	99	22.6	17.0	0.2	1.4	27	32	30	26	14	12	
	725	253	.132	0.100	1	5	28	3.68	119	33.0	24.8	0.2	1.6	31	36	36	34	24	19	
	850	296	.182	0.137	1	6	35	4.32	140	45.3	34.1	0.3	1.7	33	39	41	40	33	26	
21"x48"	650	227	.039	0.013	1	5	13	3.30	107	9.7	3.1	0.3	1.5	23	26	24	16	-	-	
	800	279	.059	0.019	1	6	19	4.06	132	14.7	4.7	0.3	1.8	27	30	30	23	14	-	
	1000	349	.092	0.030	1	7	27	5.08	165	22.9	7.4	0.4	2.2	31	34	36	31	24	14	
	1300	453	.156	0.050	2	8	35	6.60	214	38.8	12.5	0.5	2.5	36	39	42	41	35	25	
24"x32"	350	191	.028	0.020	0	4	11	1.78	90	7.0	5.1	0.1	1.1	11	23	21	12	-	-	
	475	259	.051	0.037	1	5	20	2.41	122	12.8	9.3	0.2	1.6	20	29	28	23	-	-	
	650	354	.096	0.070	1	7	29	3.30	167	24.0	17.4	0.3	2.1	29	36	36	34	24	21	
	800	436	.146	0.106	1	8	35	4.06	206	36.4	26.4	0.4	2.4	36	40	41	41	34	29	
24"x48"	550	300	.035	0.017	1	7	11	2.79	141	8.8	4.1	0.3	2.3	20	28	20	14	-	17	
	675	368	.053	0.025	1	9	18	3.43	174	13.3	6.2	0.3	2.7	24	31	27	22	12	19	
	900	491	.095	0.044	1	10	28	4.57	231	23.6	11.0	0.4	3.2	30	35	35	33	25	22	
	1100	600	.142	0.066	2	11	35	5.59	283	35.3	16.5	0.5	3.5	34	39	42	41	34	24	
29"x48"	400	314	.025	0.015	0	3	11	2.03	148	6.3	3.8	0.1	0.9	16	11	11	-	-	19	
	600	471	.057	0.035	1	6	21	3.05	222	14.2	8.6	0.3	1.7	23	24	24	13	-	21	
	850	667	.114	0.069	2	8	29	4.32	315	28.5	17.3	0.6	2.4	29	35	35	30	23	23	
	1100	863	.191	0.116	3	10	35	5.59	407	47.7	28.9	1.1	3.1	33	43	43	43	35	24	
29"x71"	600	471	.035	0.013	1	10	12	3.05	222	8.7	3.1	0.4	3.0	30	24	17	-	-	18	
	800	628	.062	0.022	2	13	21	4.06	296	15.5	5.5	0.6	4.0	31	31	29	21	14	20	
	1000	785	.097	0.035	3	15	29	5.08	370	24.2	8.7	1.0	4.7	31	37	37	32	25	22	
	1200	942	.140	0.050	5	17	35	6.10	444	34.8	12.5	1.5	5.1	32	42	45	42	33	23	
34"x48"	450	628	.035	0.023	2	6	11	2.29	296	8.8	5.6	0.5	1.8	20	19	17	11	-	-	
	600	837	.063	0.040	3	9	20	3.05	395	15.6	10.0	0.8	2.9	27	28	26	22	14	16	
	800	1116	.112	0.072	5	13	28	4.06	527	27.8	17.8	1.5	3.8	33	36	35	32	26	22	
	1050	1465	.192	0.123	8	16	36	5.33	691	47.9	30.7	2.6	5.0	39	44	44	43	37	27	
34"x71"	450	628	.018	0.006	4	6	11	2.29	296	4.5	1.4	1.1	1.8	29	17	12	-	-	-	
	625	872	.035	0.011	5	10	19	3.18	412	8.8	2.7	1.5	3.0	32	26	23	20	-	16	
	900	1256	.073	0.022	7	14	28	4.57	593	18.2	5.6	2.2	4.3	36	35	34	33	24	21	
	1200	1674	.130	0.040	10	18	35	6.10	790	32.3	9.9	2.9	5.4	38	42	43	43	38	26	
40"x71"	300	654	.012	0.007	3	7	12	1.52	309	3.1	1.7	0.9	2.2	31	15	-	-	-	11	
	500	1090	.034	0.019	7	12	21	2.54	514	8.5	4.7	2.2	3.7	36	27	18	16	12	18	
	800	1744	.088	0.048	11	19	30	4.06	823	21.9	11.9	3.4	5.6	41	37	35	33	27	24	
	1050	2289	.151	0.083	15	21	35	5.33	1080	37.7	20.6	4.5	6.5	43	43	45	43	35	28	

NOTES: Throw values are given for terminal velocities of 50 fpm (0.25 m/s). Throw values are given for -6°F (-3°C) ΔT conditions. N.C. values are based on Octave Band 2 - 7 sound power levels minus a room absorption of 4dB. Dash in space denotes a NC or dB value of less than 10. Data was obtained from tests conducted in accordance with ANSI / ASHRAE Standard 70-1991.

DISPLACEMENT VENTILATION

AFD

AFD Suggested Specification & Configuration**AFD**

Furnish and install Krueger by Halton AFD displacement diffuser as indicated on the drawings and diffuser schedule.

The rounded triangle low velocity diffuser shall be made of galvanized steel with a polyester powder coat finish. The unit shall include a detachable perforated front panel and include an internal equalization baffle. The front panel shall have holes on a staggered pattern providing a well-balanced appearance and enhancement to performance. Both the internal baffle and diffuser face shall be attached securely to the extruded aluminum frame or galvanized housing. The diffuser design will be robust, rigid and sturdy with a 20ga. face and cabinet. The unit shall have a round duct connection as required by the diffuser schedule. Round inlets shall include a fixed rubber gasket located near the edge of the inlet ensuring a proper seal of the attached duct work. The horizontal edges of the diffuser shall include a vinyl or metal trim for aesthetic appeal. Mounting brackets shall be included with the unit for installation.

BASE

Furnish and install the base as indicated on the drawings and diffuser schedule. The base shall be manufactured of 20ga. steel to match the footprint of the displacement diffuser. The base height will be indicated on the drawings and diffuser schedule. The base will be independently removable from the diffuser allowing access to the duct if supplied from below; or to the area beneath the diffuser. The base finish will match the diffuser.

DUCT COVER

Furnish and install the duct cover as indicated on the drawings and diffuser schedule. The duct cover will be supplied in either a solid or perforated 20ga. steel material. The perforated material will match the diffuser in pattern and stagger. The duct cover will be supplied with mounting angles and trim pieces for installation. The duct cover finish will match the diffuser.

PERFORMANCE

Unit performance shall be tested in accordance with the following standards: Air flow rate, EN-ISO 5167-1; Pressure Difference, EN-ISO 5135; Sound Power Level, EN-ISO 7235.

- 1. MODEL: (XXX)**
AFD - Rounded Triangle, Low-Velocity Supply Unit
- 2. UNIT SIZE: (XXxXX)**
16x24 - Nominal
17x24 - Nominal
20x32 - Nominal
21x24 - Nominal
21x48 - Nominal
24x32 - Nominal
24x48 - Nominal
29x48 - Nominal
29x71 - Nominal
34x48 - Nominal
34x71 - Nominal
40x71 - Nominal
- 3. INLET: (XX) ***
4, 5, 6, 8, 10, 12, 16, 20
- 4. MATERIAL: (XX)**
GS - Steel
SS - 316 Stainless Steel **
- 5. FRONT PANEL THICKNESS: (XX)**
20 - 20 Gage (Standard)
16 - 16 Gage
- 6. TRIM: (XXX)**
WHT - White
BLK - Black
MTL - Metal, Painted to Match
- 7. DUCT COVER: (XX)**
00 - None
DP - Perforated Duct Cover
DS - Solid Sheet Duct Cover
- 8. DUCT COVER LENGTH: (XXX.XXX)**
xxx.xxx - Length in Inches
- 9. INSTALLATION BASE: (XX)**
00 - None
B2 - 2" Base Cover
B4 - 4" Base Cover
B6 - 6" Base Cover
- 10. FINISH: (XX)**
44 - White (RAL-9010) 90 - Polished ***
35 - Black 07 - Custom

* See dimensional information for unit and inlet size offerings.
 ** Material Code SS (316 stainless steel) not available with Front Panel Thickness code 16 (16 gage). Material Code SS (316 stainless steel) only available with Finish code 90 (polished). If Material Code SS (Stainless Steel) is selected, the Duct Cover and Installation Base, if selected will be Stainless Steel.
 *** Finish code 90 (polished) not available with Material Code GS (steel).

SAMPLE CONFIGURATION: AFD - 34x48 - 16 - GS - 20 - WHT - DP - 120.250 - B4 - 44