



FDD Submittal



NAD Klima Ontario
2840, Argentia Road, Unit 6, Mississauga (Ont) L5N 8G4
(416) 860-1067
ontario@nadklima.com

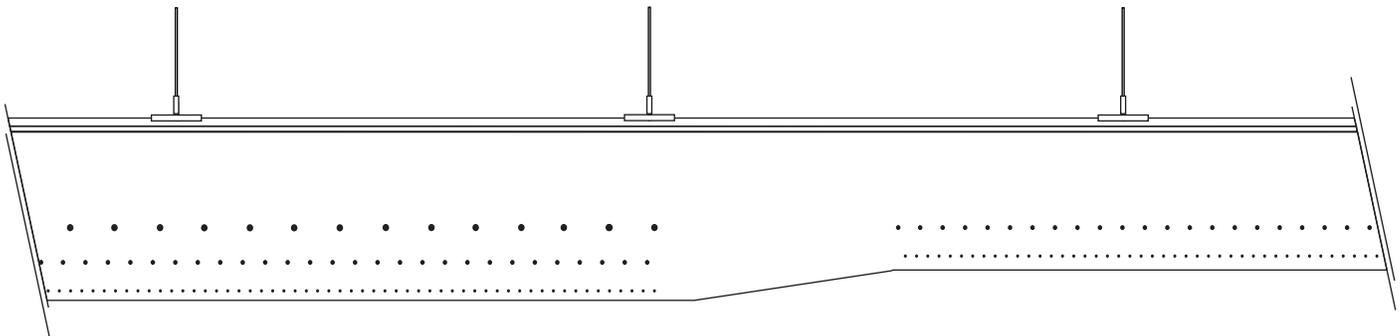
NAD Klima
144 rue Léger, Sherbrooke (Qué) J1L 1L9
(819) 780-0111 • 1 866 531-1739
info@nadklima.com

Date

Project

Engineer

Contractor



The flexible diffuser

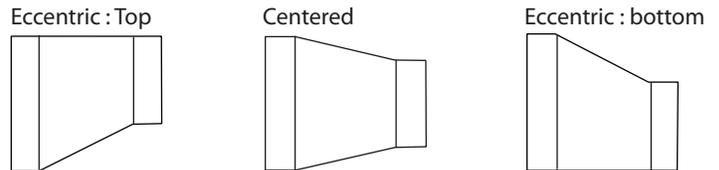
- Circular flexible diffuser with perforation
- Made with PVC permeated polyester (Polyvinyl Chloride).
- Made according to the ASTM-D 2136 standard "Standard test method for coated fabrics-low-temperature bend test".
- Qualified to NFPA 701, ASTM E-84 class 1 and CAN/ULC S102-10 standards, "Standard method of test for surface burning characteristics of building materials and assemblies".
- Resistant to mechanical traction of 400 X 375 Lbp/in.
- Treated for resistance to dust, UV rays, salty environments, condensation, fungi and mold.
- Weight of 542g/m² (16 oz/yard²).
- Section can reach up to 15 meters (50 ft)
- Diameter from 203 mm (9 in) to 1524 mm (60 in).
- Perforation designed with software.
- Easy to clean
- 17 colours available.
- Single or double suspension.
- PVC extrusion integrated into the diffuser allowing suspension to rail.
- Joining sections with zippers or by metal collar.

Accessories

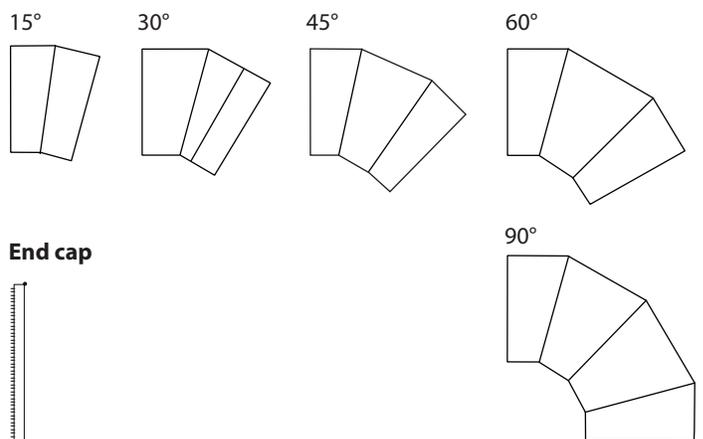
The elbows, reducers and end caps are available in polyvinyl. All of the standard accessories (elbows, sleeves, reducers, multi-branch connectors, etc.) are available in the precise dimensions of the diffusers.

For air balancing reasons, reducers are required between sections.

Reducers



Elbows



End cap



FDD - Mode of operation

General operation

The FDD flexible diffuser is made to surpass the technical limits of traditional air diffusion systems.

Its function is based on the principle of high induction diffusion. The perforations, of various diameters, and their positioning on the FDD promote a displacement of a large quantity of ambient air (see the illustration below).

The thermal exchange between the blown air and the ambient air occurs close to the FDD, and the temperatures rapidly near isothermal levels. The risk of stratification is eliminated without creating drafts in the occupied zone.

Heat recovering

In this type of situation, in a space where internal heat sources are very high, it allows for much more significant energy savings. The higher the amount of heat, the more the FDD is efficient.

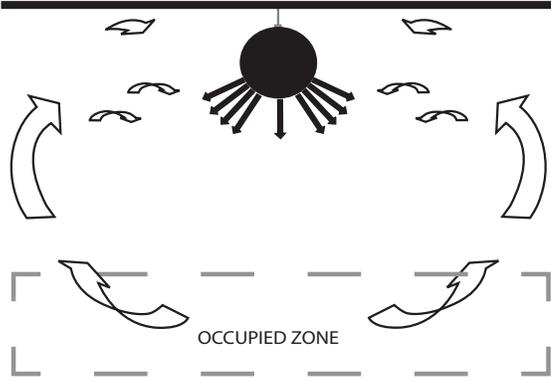
In some cases, energy saving in winter can reach up to 100% on the heating of the fresh air and the heating of the building..

Height of areal Mode of diffusion

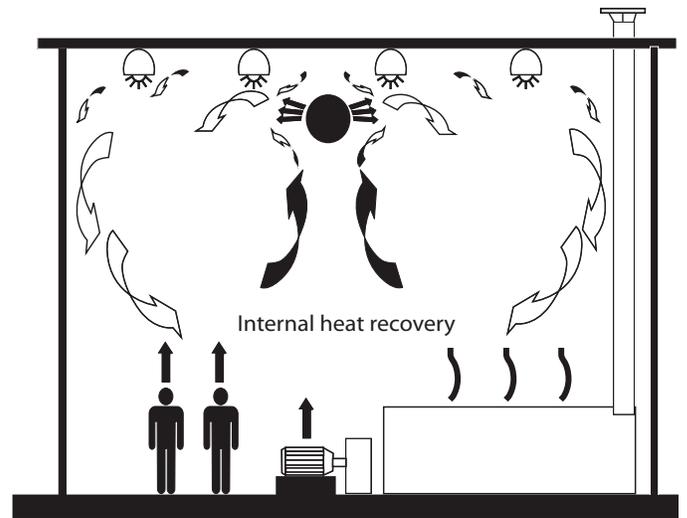
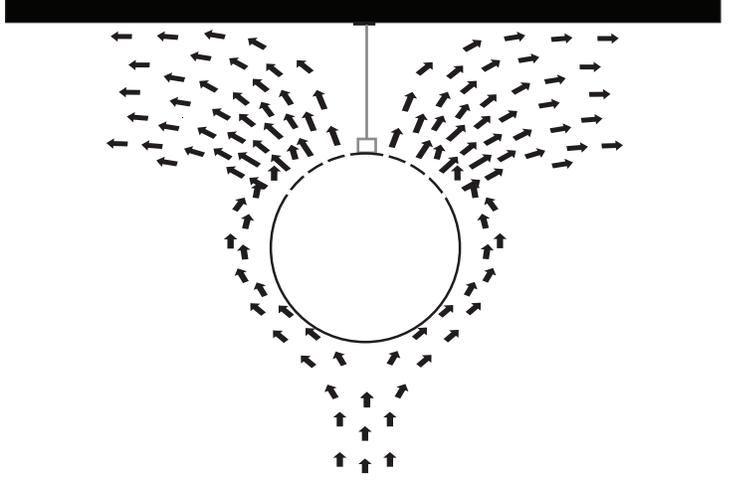
Indeed, for areas with **elevated heights** ($H > 6\text{ m}$ (20 ft)), the FDD is perforated to diffuse air downwards, for both heating and cooling modes.

In the case of heating mode, air is directed downwards to oppose the force of gravity exerted on the different densities of warm blown air and cooler ambient air (figure A). The large mass of air circulates in a controlled manner, from the top of the space downwards, resulting in an optimal temperature mixture. The variation in temperature throughout the occupied area is $< 1^\circ\text{C}$.

Figure A:
Heating mode with elevated heights - $H > 6\text{ m}$ (20 ft)

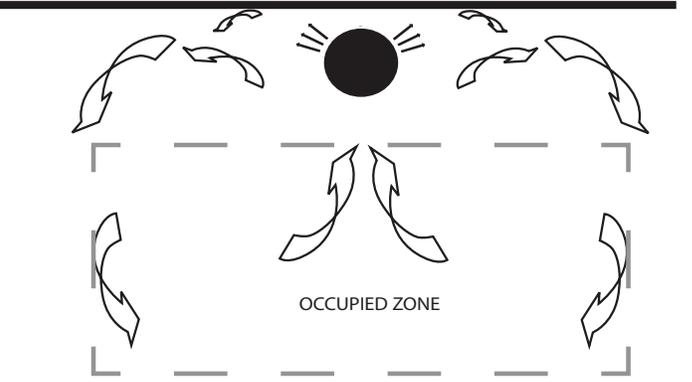


Representation of the induction effect generated by the FDD



For rooms with **lower ceilings** ($H < 6\text{ m}$ (20 ft)), air is pushed upwards through the FDD (see figure B). For cooling mode, the multitude of perforations with different diameters allow air to be pushed upwards. It then mixes with the hot air of the room which often accumulates at ceiling height.

Figure B:
Cooling mode with lower heights - $H < 6\text{ m}$ (20 ft)



FDD - Dimensions and weight

Ø diameter		Total weight	
mm	in	kg / li m.	lb / li ft.
203	8	1.17	0.79
254	10	1.26	0.85
305	12	1.35	0.91
356	14	1.43	0.96
406	16	1.52	1.02
457	18	1.61	1.08
508	20	1.69	1.14
559	22	1.78	1.20
610	24	1.87	1.26
660	26	1.95	1.31
711	28	2.04	1.37
762	30	2.13	1.43
813	32	2.21	1.49
864	34	2.30	1.55
914	36	2.39	1.60
965	38	2.47	1.66
1016	40	2.56	1.72
1067	42	2.65	1.78
1118	44	2.73	1.84
1168	46	2.82	1.90
1219	48	2.91	1.95
1270	50	2.99	2.01
1321	52	3.08	2.07
1372	54	3.17	2.13
1422	56	3.25	2.19
1473	58	3.34	2.25

FDD - Suspension system

The lightweight polyvinyl and the support mechanism allow for a rapid installation of the FDD. The installation consists in a suspension of a rail on the ceiling with 9.5 mm (3/8 in) threaded rods supplied by the installer.

Once the rail is installed, the tube is slid onto the rail. It should be noted that the distance between the two suspension rods is 3 m (10 ft) or less, as illustrated in figure 2.

The FDD can be installed in two ways; either by single centered suspension on a rail (figure 3) or by a double lateral suspension with two rails (figure 4).

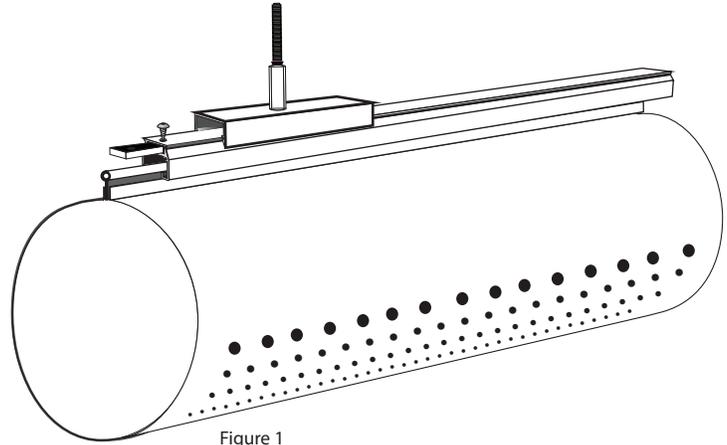
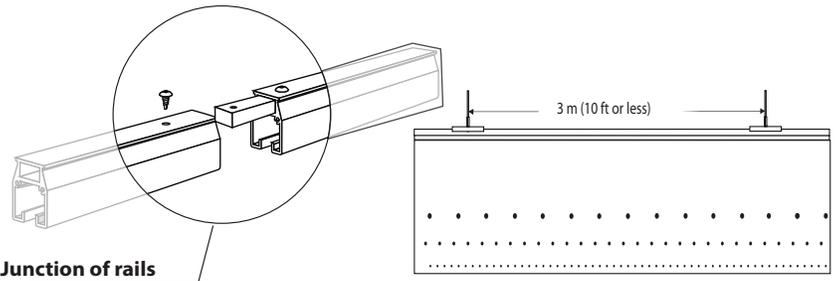


Figure 1



Junction of rails

Figure 2

Single suspension

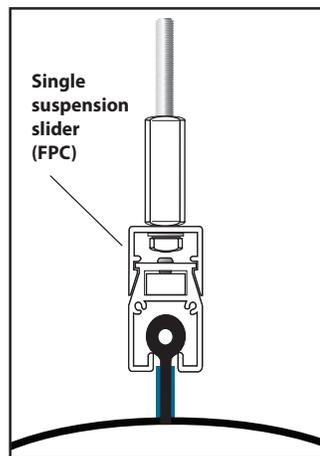


Figure 3

Double suspension

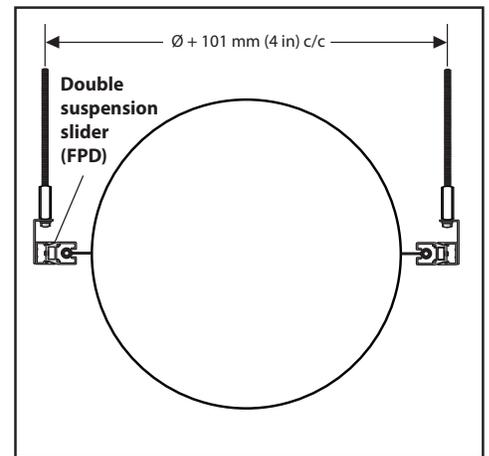


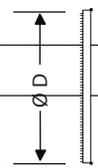
Figure 4

Note : a slider is provided per 1.5 m (5 ft) length

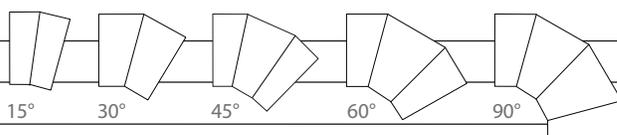
FDD - Codification

FDD							Product																		
00000 = Write the total length of the diffuser in millimeters (mm)							Length																		
203, 254, 305, 356, 406, 457, 508, 559, 610, 660, 711, 762, 813, 864, 914, 965, 1016, 1067, 1118, 1168, 1219, 1270, 1321, 1372, 1422							Ø Diameter section																		
IM = Connection with adjustable stainless steel collar IZ = Connection with black zip IV = Connection with Velcro							Inlet section																		
EZ = Connection with black zip EM = Connection with adjustable stainless steel collar EV = Connection with Velcro							Outlet section																		
<table border="0"> <tr> <td>01 = Standard white ●</td> <td>07 = Terracotta</td> <td>17 = Emerald green</td> </tr> <tr> <td>02 = Cream white</td> <td>08 = Yellow</td> <td>18 = Forest green</td> </tr> <tr> <td>03 = Sand</td> <td>10 = Red</td> <td>19 = Metallic grey ●</td> </tr> <tr> <td>04 = Beige</td> <td>11 = Burgundy</td> <td>21 = Standard grey ●</td> </tr> <tr> <td>05 = Taupe</td> <td>14 = Standard blue ●</td> <td>24 = Black</td> </tr> <tr> <td>06 = Brown</td> <td>15 = Marine blue ●</td> <td></td> </tr> </table>							01 = Standard white ●	07 = Terracotta	17 = Emerald green	02 = Cream white	08 = Yellow	18 = Forest green	03 = Sand	10 = Red	19 = Metallic grey ●	04 = Beige	11 = Burgundy	21 = Standard grey ●	05 = Taupe	14 = Standard blue ●	24 = Black	06 = Brown	15 = Marine blue ●		Diffuser color
01 = Standard white ●	07 = Terracotta	17 = Emerald green																							
02 = Cream white	08 = Yellow	18 = Forest green																							
03 = Sand	10 = Red	19 = Metallic grey ●																							
04 = Beige	11 = Burgundy	21 = Standard grey ●																							
05 = Taupe	14 = Standard blue ●	24 = Black																							
06 = Brown	15 = Marine blue ●																								
S = Single (12:00) D = Double track (3:00 and 9:00)							Hanging system																		
FDD	00000	203	IM	EM	01	S	Example																		
● = Standard, in stock																									

CAP codification

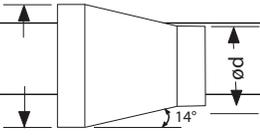
FDD							Product																		
CAP							Ø Diameter																		
203, 254, 305, 356, 406, 457, 508, 559, 610, 660, 711, 762, 813, 864, 914, 965, 1016, 1067, 1118, 1168, 1219, 1270, 1321, 1372, 1422																									
<table border="0"> <tr> <td>01 = Standard white Ⓢ</td> <td>07 = Terracotta</td> <td>17 = Emerald green</td> </tr> <tr> <td>02 = Cream white</td> <td>08 = Yellow</td> <td>18 = Forest green</td> </tr> <tr> <td>03 = Sand</td> <td>10 = Red</td> <td>19 = Metallic grey Ⓢ</td> </tr> <tr> <td>04 = Beige</td> <td>11 = Burgundy</td> <td>21 = Standard grey Ⓢ</td> </tr> <tr> <td>05 = Taupe</td> <td>14 = Standard blue Ⓢ</td> <td>24 = Black</td> </tr> <tr> <td>06 = Brown</td> <td>15 = Marine blue Ⓢ</td> <td></td> </tr> </table>							01 = Standard white Ⓢ	07 = Terracotta	17 = Emerald green	02 = Cream white	08 = Yellow	18 = Forest green	03 = Sand	10 = Red	19 = Metallic grey Ⓢ	04 = Beige	11 = Burgundy	21 = Standard grey Ⓢ	05 = Taupe	14 = Standard blue Ⓢ	24 = Black	06 = Brown	15 = Marine blue Ⓢ		Color
01 = Standard white Ⓢ	07 = Terracotta	17 = Emerald green																							
02 = Cream white	08 = Yellow	18 = Forest green																							
03 = Sand	10 = Red	19 = Metallic grey Ⓢ																							
04 = Beige	11 = Burgundy	21 = Standard grey Ⓢ																							
05 = Taupe	14 = Standard blue Ⓢ	24 = Black																							
06 = Brown	15 = Marine blue Ⓢ																								
Ⓢ = Standard, in stock							Example																		
FDD	CAP	203	01																						

Elbows codification

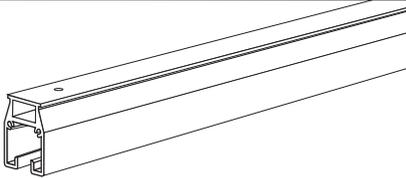
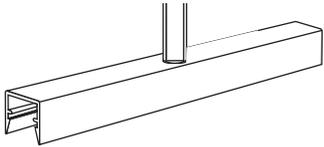
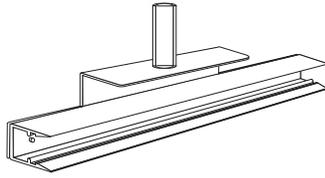
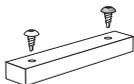
FDD							Product																		
ELB = Elbow							Angle																		
15, 30, 45, 60, 90																									
203, 254, 305, 356, 406, 457, 508, 559, 610, 660, 711, 762, 813, 864, 914, 965, 1016, 1067, 1118, 1168, 1219, 1270, 1321, 1372, 1422							Ø Diameter																		
IZ = Connection with black zip IM = Connection with adjustable stainless steel collar IV = Connection with Velcro							Inlet section																		
EZ = Connection with black zip EM = Connection with adjustable stainless steel collar EV = Connection with Velcro							Outlet section																		
S = Standard (based on: r = 1.5 Ø centre) A = Other (specified in annotation)							Radius																		
<table border="0"> <tr> <td>01 = Standard white Ⓢ</td> <td>07 = Terracotta</td> <td>17 = Emerald green</td> </tr> <tr> <td>02 = Cream white</td> <td>08 = Yellow</td> <td>18 = Forest green</td> </tr> <tr> <td>03 = Sand</td> <td>10 = Red</td> <td>19 = Metallic grey Ⓢ</td> </tr> <tr> <td>04 = Beige</td> <td>11 = Burgundy</td> <td>21 = Standard grey Ⓢ</td> </tr> <tr> <td>05 = Taupe</td> <td>14 = Standard blue Ⓢ</td> <td>24 = Black</td> </tr> <tr> <td>06 = Brown</td> <td>15 = Marine blue Ⓢ</td> <td></td> </tr> </table>							01 = Standard white Ⓢ	07 = Terracotta	17 = Emerald green	02 = Cream white	08 = Yellow	18 = Forest green	03 = Sand	10 = Red	19 = Metallic grey Ⓢ	04 = Beige	11 = Burgundy	21 = Standard grey Ⓢ	05 = Taupe	14 = Standard blue Ⓢ	24 = Black	06 = Brown	15 = Marine blue Ⓢ		Color
01 = Standard white Ⓢ	07 = Terracotta	17 = Emerald green																							
02 = Cream white	08 = Yellow	18 = Forest green																							
03 = Sand	10 = Red	19 = Metallic grey Ⓢ																							
04 = Beige	11 = Burgundy	21 = Standard grey Ⓢ																							
05 = Taupe	14 = Standard blue Ⓢ	24 = Black																							
06 = Brown	15 = Marine blue Ⓢ																								
Ⓢ = Standard, in stock							Example																		
FDD	ELB	15	203	IZ	EZ	S	01																		

FDD - Codification

Codification of reducers

FDD	RED = Reducer		Product
	203, 254, 305, 356, 406, 457, 508, 559, 610, 660, 711, 762, 813, 864, 914, 965, 1016, 1067, 1118, 1168, 1219, 1270, 1321, 1372, 1422		Ø Inlet diameter (interior)
	203, 254, 305, 356, 406, 457, 508, 559, 610, 660, 711, 762, 813, 864, 914, 965, 1016, 1067, 1118, 1168, 1219, 1270, 1321, 1372		Ø Outlet diameter (interior)
	T = Flat on top C = Centered B = Flat Bottom		Configuration
	IZ = Connection with black zip IM = Connection with adjustable stainless steel collar IV = Connection with Velcro		Inlet section
	EZ = Connection with black zip EM = Connection with adjustable stainless steel collar EV = Connection with Velcro	Outlet section	
	01 = Standard white S 07 = Terracotta 17 = Emerald green 02 = Cream 08 = Yellow 18 = Forest green 03 = Sable 10 = Red 19 = Metallic grey S 04 = Beige 11 = Burgundy 21 = Standard grey S 05 = Taupe 14 = Standard blue S 24 = Black 06 = Brown 15 = Marine blue S	Color	
	S = standard, in stock		
FDD - RED - 305 - 203 - T - IZ - EZ - 01			Example

Codification of additional accessories for FDD flexible diffuser installation

Product code		Description
FRA	Rail Aluminum (1 1/4 in x 1 3/4 in x 10 li. ft) * may be painted	
FPC	Slider for centered single suspension - coupling included Aluminum 24 mm x 20 mm x 203 mm (3/4 in x 15/16 in x 8 in)	
FPD	Lateral slider for double suspension - coupling included Aluminum 26 mm x 51 mm x 203 mm (1 in x 2 in x 8 in)	
FBL	Connector 12 mm x 6 mm x 83 mm (1/2 in x 1/4 in x 3 1/4 in)	
FRA	Example	

Accessories supplied with FDD diffuser
 - Rail
 - Slider (single or double)
 - Connectors