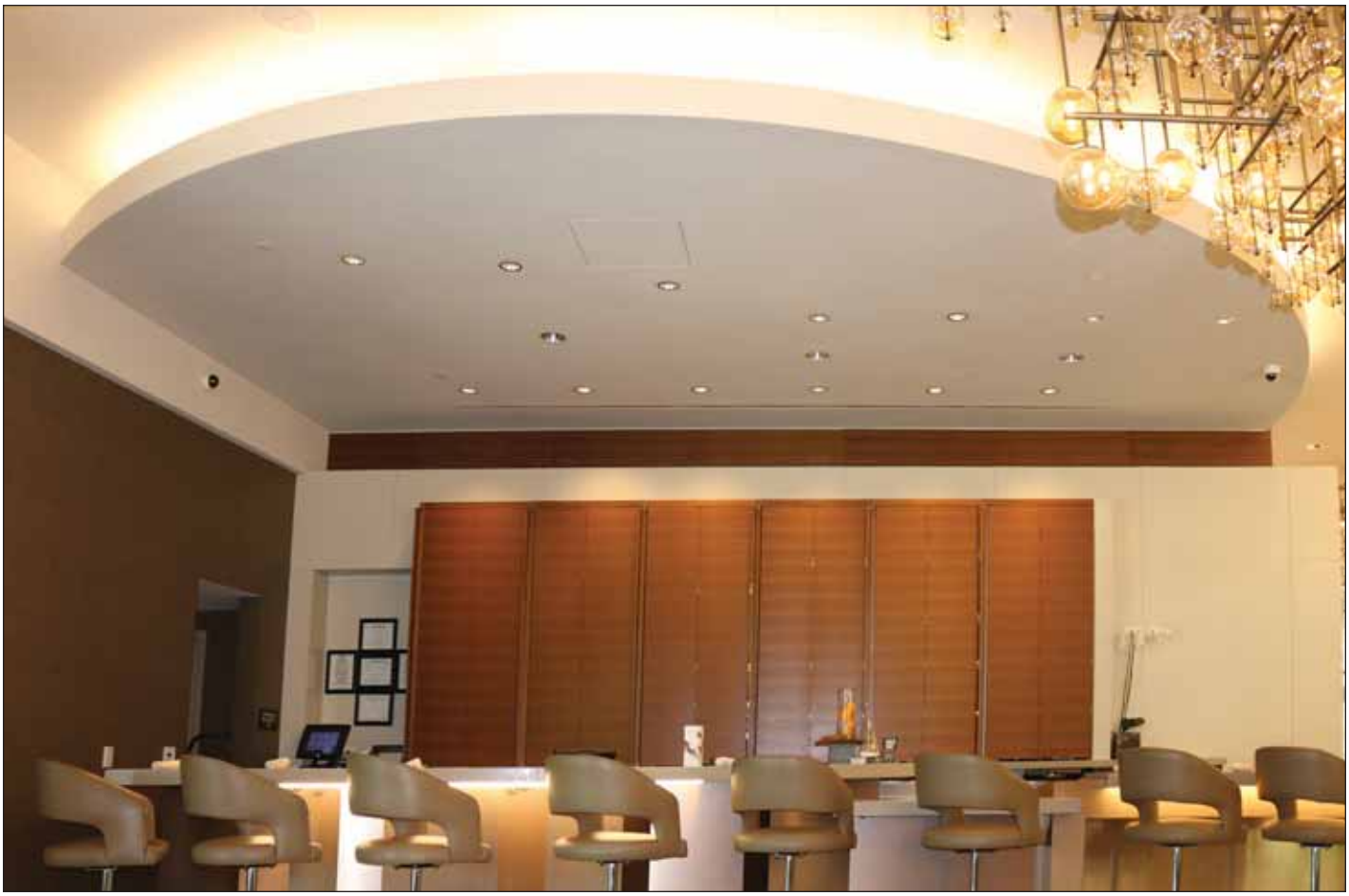




THE FLOWLINE™ SYSTEM...

AN ARCHITECTURAL SOLUTION FOR SUPERIOR AIR DISTRIBUTION.

FlowLine™ is a custom architectural linear diffuser system designed to integrate and blend supply and return air openings harmoniously into interior commercial building designs. The flexibility of FlowLine™ provides design and application possibilities that are limited only by your imagination. FlowLine™ can blend or contrast as you integrate it into either ceiling or sidewall applications. FlowLine™ linear may be used to either inconspicuously hide the air distribution system or conversely it may be used as a contrasting, architectural design element, using straight lines and/or curves to enhance the interior of a building.

Whether you require straight lines, mitered angles or smooth curves, Nailor can custom fabricate FlowLine™ to meet your most demanding architectural and engineering performance requirements. FlowLine™ can be custom curved in any plane to suit architectural requirements. Flat face radiuses for ceilings and concave or convex curving for sidewall applications are available to special order. FlowLine™ is fabricated using sturdy heavy wall aluminum extrusions. A variety of frame/border styles and associated mounting hardware allows FlowLine™ to be installed either during or after ceiling installation. In acoustical suspension ceiling systems using continuous runs, the FlowLine™ system is installed at the same time as the ceiling grid and becomes an integral part of the ceiling assembly.

FlowLine™ linear is available in five slot widths providing a much higher air volume capability than conventional multiple slot linear designs, which are more visible. A two slot option is also available for even higher capacities. Engineered for outstanding performance and tested in accordance with the latest ASHRAE Standard 70, FlowLine™ can provide higher airflows at lower noise levels than traditional linear slot designs, making it an ideal solution for high profile architectural projects.



FlowLine™ is available in two air pattern controller designs. The FLH Series features adjustable horizontal high throw pattern controllers for ceiling applications. The FLV Series features adjustable vertical jet pattern controllers for high ceiling and sidewall applications.

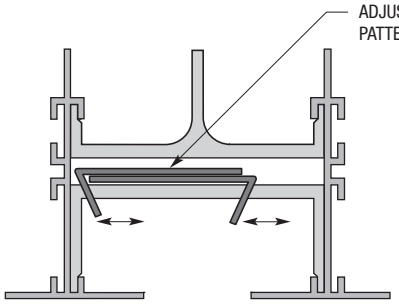
...Invisible Air

KEY FEATURES:

- High capacity single slot linear diffuser available in five slot widths, offers an attractive alternative to traditional multi-slot designs. Available slot widths are 1" (25), 1 1/2" (38), 2" (51), 2 1/2" (64) and 3" (76). A two slot option is also available.
- Comprehensive selection of frame/border styles and mounting hardware to suit any installation.
- Choice of FLH Series Horizontal or FLV Series Vertical Pattern Controllers. May be combined within a single system.
- Custom curving availability to meet specific design requirements, provides architectural appeal.
- Heavy wall extruded aluminum construction permits support and full integration with ceiling system.
- Mitered end borders are available which maximize aesthetic appeal.
- Available in single sections up to 12 ft. (3658) in length. Longer lengths are supplied in multiple sections with alignment strips for field assembly.
- High performance design is ideally suited to VAV systems, both heating and cooling.
- Custom colors and anodized finishes are available.

FLH SERIES:

Designed primarily for continuous linear slot ceiling applications requiring horizontal air patterns. Tight, high induction air pattern maximizes coanda effect under a wide range of airflow volumes for maximum occupant comfort. Typical applications would include open office perimeter zones, entrance foyers and lobbies, mall and office entrance atriums and conference meeting rooms.

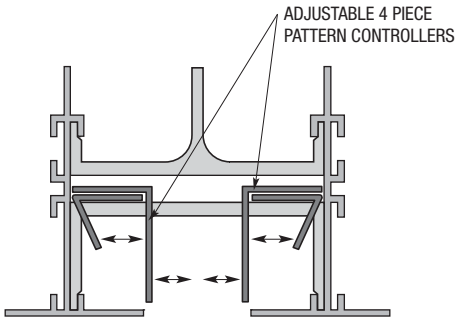


Horizontal High Throw Series:
Pattern controllers provide 180° directional control; left or right horizontal throw, angular discharge, volume control and shut-off capability.

FLV SERIES:

Designed primarily for continuous linear slot ceiling applications requiring an adjustable extended throw vertical air pattern. Typical applications would include perimeter glass curtain walls and high bays for heated and/or cooled air, which may be directed downwards, terminating at the floor at a comfortable velocity. Also suitable for interior zones with high ceilings, such as entrance foyers and lobbies, mall and office entrance atriums, convention center and theaters.

This model may also be used in high sidewall applications with long throw requirements.



Vertical Jet Throw Series:
Versatile pattern controllers provide for an adjustable perpendicular discharge.

FLP(I) SERIES:

Nailor offers factory built supply air plenum boots in various lengths to suit the application in both uninsulated and insulated versions. Nailor engineered plenums save on costly field labor and ensure a sure-fit trouble free installation.

FT SERIES:

The FlowLine™ Series is available in modular lengths for lay-in T-Bar applications, utilizing either the horizontal high throw or vertical jet throw pattern controllers. Units are supplied with factory installed engineered plenums in uninsulated or insulated versions.

FM SERIES:

The FM Series is an architecturally pleasing modular square ceiling diffuser primarily for lay-in T-Bar applications. Designed to complement the FlowLine™ Linear Diffuser System, the FM Series features a single slot at the perimeter of a 2 ft. x 2 ft. (600 x 600) ceiling module and accommodates a center acoustic ceiling tile.

FM SERIES

- MODULAR SQUARE CEILING DIFFUSER
- COMPLIMENTS FLOWLINE™ LINEAR DIFFUSER SYSTEM
- ROUND NECK (SUPPLY)



Models:

Supply 1" (25) Slot

FM(I)10 Standard 15/16" (24) or 9/16" (14) Flat T-Bar

FMB(I)10 Bolt-Slot (Fineline® Type) T-Bar

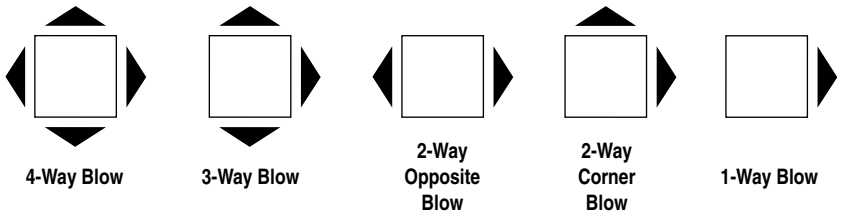
(I) Adds Internal Insulation.

Return 1" (25) Slot

FMR10 Standard 15/16" (24) or 9/16" (14) Flat T-Bar

FMBR10 Bolt-Slot (Fineline® Type T-Bar

Field Adjustable Discharge Pattern Options



The FM Series modular square ceiling diffusers are ideal for interior spaces and compliment the Nailor FlowLine™ Linear Diffuser system. Designed with the architect in mind, these single slot diffusers provide a high capacity capability with high performance. To fully integrate into the ceiling system, the FM Series diffusers incorporate a field cut center ceiling tile (by others) that matches and blends in with the surrounding ceiling system.

This product is available in a nominal ceiling module size of 24" x 24" (600 x 600) with a 1" (25) slot to suit either imperial or metric exposed grid ceiling systems. The 4-way blow linear slot design utilizes the FlowLine™ Horizontal High Throw adjustable pattern controller, providing a tight air pattern along the ceiling and making it an excellent choice for VAV systems.

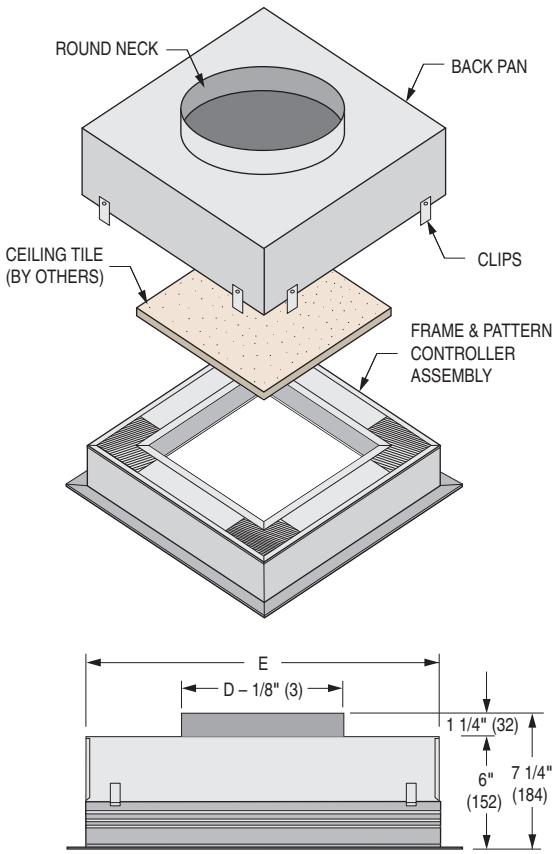
STANDARD FEATURES:

- Extruded aluminum construction with corrosion-resistant steel pattern controllers.
- Factory precision welding on all mitered corners.
- Pattern controllers are individually adjustable for horizontal or vertical discharge air patterns.
- Can be field adjusted for one, two, three or four-way blow directional air patterns.
- Adjustable dual pattern controller design permits both dampering and full shut-off without adding blank-offs.
- Supply diffusers have a round neck for flexible or hard duct connection.
- Matching return air units for ductless plenum return applications incorporate a light shield to block out light and prevent see-through.
- Plenum is secured with steel S-clips and is easily removed for installation of a field cut ceiling tile (by others) into the face of the diffuser.
- Standard finish is AW Appliance White face with black pattern controllers. Other finishes are available.

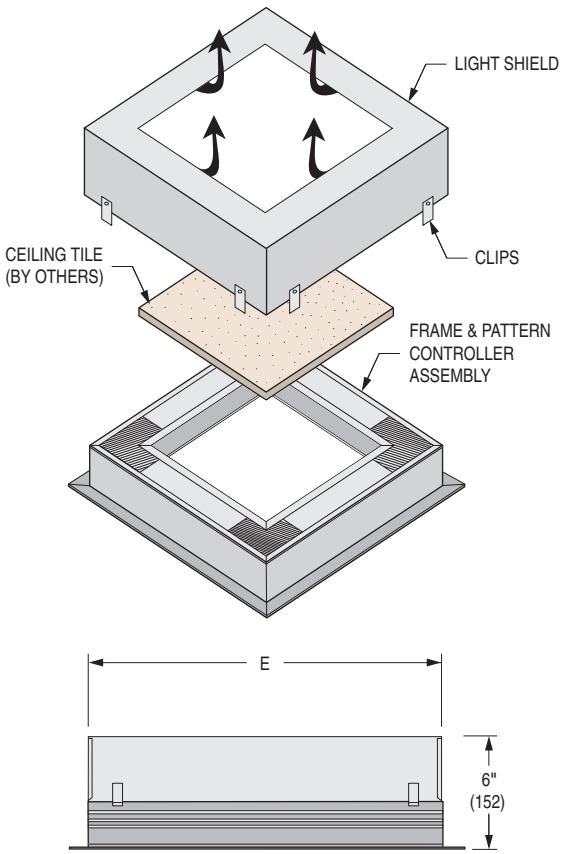
FM SERIES SQUARE CEILING DIFFUSERS

Standard Ceiling Module (CM) Sizes: Imperial 24" x 24" (610 x 610) • Metric 600 x 600mm
(Frame/Border Type AA Illustrated)

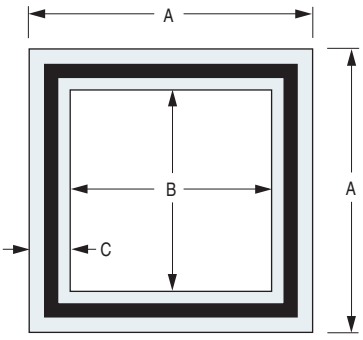
Supply Model



Return Model



Face View



Ceiling Tile Cutting Dimensions

Models	Border	Imperial Module 24" x 24" (610 x 610)	Metric Module 600 x 600 mm
FM(I)10, FMR10	AA	17 3/16 x 17 3/16 (437 x 437)	427 x 427
FMB(I)10, FMBR10	AG	17 5/8 x 17 5/8 (448 x 448)	438 x 438

Standard Round Inlet Sizes (Supply Units):

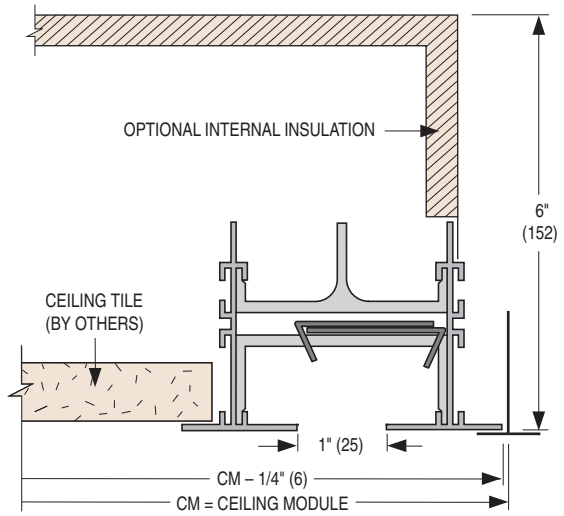
(Nominal D Diameter)
6" (152), 8" (203), 10" (254).

Dimensional Data:

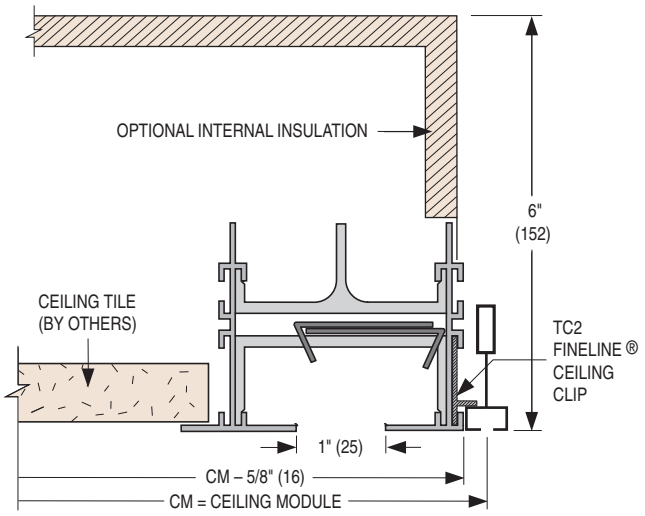
Models	Imperial Module 24 x 24 (610 x 610)				Metric Module 600 x 600 mm			
	A	B	C	E	A	B	C	E
FM(I)10, FMR10	23 3/4 (603)	16 5/8 (422)	3 9/16 (90)	22 15/16 (583)	594	413	90	573
FMB(I)10, FMBR10	23 3/8 (594)	17 1/16 (433)	3 5/32 (80)	22 9/16 (573)	584	423	80	584

FM SERIES SQUARE CEILING DIFFUSERS • FRAME/BORDER TYPES

Type AA Lay-in T-Bar Ceiling
(Models FM and FMR)
For Installation with 15/16" (24) or 9/16" (14) Flat T-Bar only.

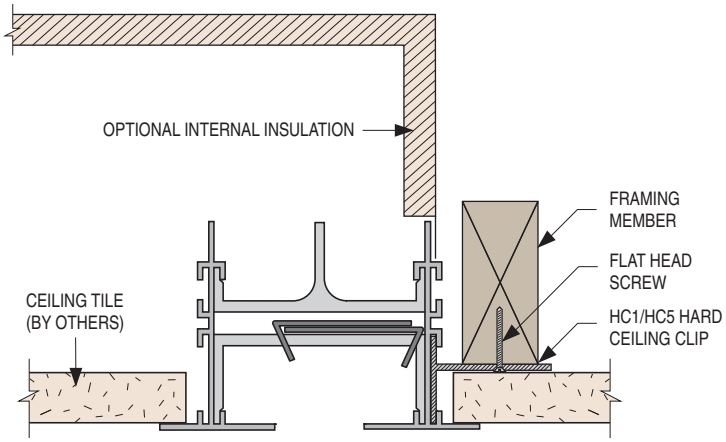


Type AG Bolt-Slot (Fineline® Type) Ceiling
(Models FMB and FMBR)

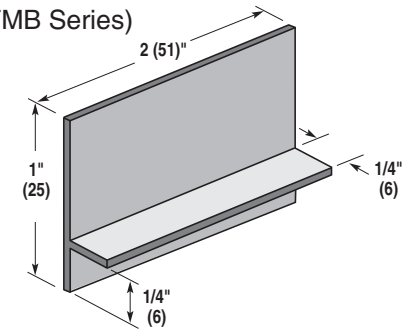


OPTIONAL HANGER & MOUNTING CLIPS

Type AA Surface Mount Application in Hard Ceiling

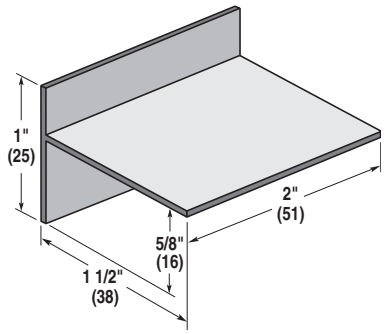


TC2 Fineline® T-Bar Clip
(Standard on
FMB Series)



The TC2 FlowLine™ T-Bar clips are used to support and level the FlowLine™ assembly in Bolt-Slot (Fineline® type) suspension systems.

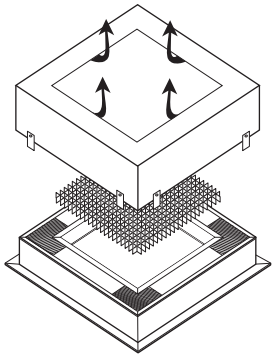
HC1 Hard Ceiling Clip 5/8" (16)
HC5 Hard Ceiling Clip 1/2" (13)
(Optional)



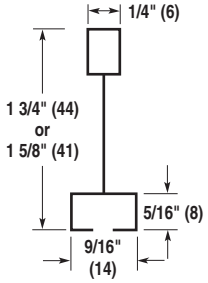
	A Dim.
HC1	5/8" (16)
HC5	1/2" (13)

The HC1 and HC5 Hard Ceiling Clip can be used to mount the FlowLine™ Square Ceiling Diffuser with frame/border type AA, where standard 5/8" (16) or 1/2" (13) gypsum wallboard (drywall) is used.

High Capacity Return
1/2" x 1/2" x 1/2" (13 x 13 x 13)
Aluminum Grid Face



Typical Bolt-Slot
(Fineline® Type)
T-Bar Detail



PERFORMANCE DATA • MODULAR SQUARE CEILING DIFFUSERS

MODELS: FM10 AND FMB10

	Inlet Size	Neck Velocity, FPM	300	400	500	600	700	800	900
		Velocity Pressure, (in. w.g.)	.006	.010	.016	.022	.031	.040	.050
1" Slot Width	6" Dia. Inlet	Airflow, CFM	59	79	98	118	137	157	177
		Static Pressure	.015	.026	.041	.059	.080	.104	.132
		Noise Criteria	<15	<15	<15	16	20	24	28
		Throw	0-1-5	1-2-07	2-4-10	2-5-11	3-6-12	4-7-13	5-8-14
	8" Dia. Inlet	Airflow, CFM	105	140	175	209	244	279	314
		Static Pressure	.029	.052	.081	.117	.160	.209	.264
		Noise Criteria	<15	18	25	30	35	39	43
		Throw	1-4-10	2-6-13	5-8-14	6-10-16	7-12-17	8-13-18	10-13-19
	10" Dia. Inlet	Airflow, CFM	164	218	273	327	382	436	491
		Static Pressure	.050	.089	.139	.201	.273	.357	.452
		Noise Criteria	22	30	37	43	47	51	55
		Throw	4-7-13	7-11-16	8-12-18	11-13-19	12-14-20	13-16-23	13-17-24

Performance Notes:

1. All pressures are in inches w.g..
2. Throw values are given at 150, 100 and 50 fpm terminal velocities under isothermal conditions.
3. Noise criteria values are based on 10 dB room absorption, re 10^{-12} watts.
4. Pressure, throw and NC values are based on 4-way air pattern.
5. Data derived from tests conducted in accordance with ANSI/ASHRAE Standard 70-2023.

HOW TO ORDER

MODEL SERIES: FM

FLOWLINE™ MODULAR SQUARE CEILING DIFFUSERS

EXAMPLE: FM10 - 24 x 24 - 08 - AA - AW - —

1. **Models**

   Supply – 1" (25)

   FM(I)10 Standard T-Bar

   FMB(I)10 Bolt-Slot T-Bar

   (I) Adds Internal Insulation

   Return – 1" (25)

   FMR10 Standard T-Bar

   FMBR10 Bolt-Slot T-Bar

2. **Ceiling Module Size**

   Imperial Sizes

   inches

   24 x 24

   Metric Sizes

   mm

   600 x 600

3. **Inlet Size**

   (Supply Models only)

   06 6" (152) Round

   08 8" (203) Round

   10 10" (254) Round

4. **Frame/Border Type**

   AA Flange Frame (Models FM & FMR only) (default)

   AG Flange/Flangeless Frame (Models FMB & FMBR only) (default)

5. **Finish**

   AW Appliance White (default)

   BW British White

   SP Special custom color

Options and Accessories

6. **Optional**

   (Return Models only)

   HCR High Capacity Return

7. **Outside Mounting Hardware**

   – None (default)

   HC1* Hard Ceiling Clip – 5/8" (16) drywall

   HC5* Hard Ceiling Clip – 1/2" (13) drywall

   TC2** Fineline® T-Bar Mounting Clip

Note:

1. Mounting clips are not removable once mounted at factory.

2. *HC1 and HC5 Hard Ceiling Clips are optional on FM models, where installation is required in a hard ceiling. Standard FM models are for lay-in flat T-Bar ceilings.

3.**TC2 Fineline T-Bar Clips are supplied as standard on FMB Bolt-Slot models and allow unit to sit flush and level in ceiling grid.

4. HCR High Capacity return option available for models FMR10 and FMBR10 includes a 1/2" x 1/2" x 1/2" (13 x 13 x 13) aluminum grid face.

SUGGESTED SPECIFICATIONS

FLH and FLV Series

Furnish and install Nailor FlowLine™ linear slot diffusers and accessories of the size and type shown on the architectural and mechanical plans and/or air distribution schedules. Mechanical contractor shall coordinate installation with General Contractor and other sub-contractors as required.

The linear slot diffuser shall utilize heavy wall extruded aluminum frames and be capable of supporting the ceiling system. Material shall be minimum wall thickness 0.06" (1.52). Diffuser frames shall be supplied with integral spacer bars and hanger brackets, spaced approximately on 24" (610) centers. The integral hanger brackets shall allow the linear slot diffusers to be supported from the ceiling structure with hanger wire in lay-in suspension ceiling installations. In hard ceiling installations, provide support clips by the manufacturer that allow the diffusers to be secured to the ceiling diffuser opening framing channels.

The linear slot diffuser shall be complete with factory end border configurations as shown or indicated. Where exposed end caps are required, they shall be factory installed architectural mitered picture frame type. Flanges/butt type end caps are not acceptable.

Provide alignment strips and spline clips by the manufacturer to secure joints and ceiling tees to the linear diffuser as required. Mitered corner sections shall be supplied by the manufacturer in one-piece construction.

The air pattern controller shall be dual type on 24" (610) centers and fully adjustable to permit various air pattern configurations, as well as allow throttling, as required for air volume reduction or complete shut-off without adding any blank-off devices. Pattern controllers shall be minimum 20 ga. (1.01) corrosion-resistant steel. One-piece pattern controllers are not acceptable.

Linear slot diffusers shall incorporate either horizontal high throw or vertical jet throw pattern controllers as shown on mechanical plans and drawings.

All diffusers shall have a single slot, unless shown otherwise, and shall be capable of being used for supply, return or exhaust air. Horizontal high throw diffusers shall maintain a tight ceiling pattern from maximum to minimum cataloged airflows and be suitable for VAV systems.

Where curved linear slot diffusers are indicated, they shall be one slot design and stretch formed by the manufacturer to the exact radii required. Segmented linear slot diffusers are not acceptable. Pattern controller shall be factory installed and fixed in the airflow direction specified on the drawings.

Supply air engineered plenum boots shall be minimum 22 ga. (0.85) coated steel and of the same manufacturer as the linear slot diffuser. Lengths and inlet sizes shall be as indicated on the plans and schedules. Where required, plenums shall be insulated with either internal matt faced fiberglass insulation or external foil back insulation, as specified on drawings or schedules. Return hood/sight baffles shall be provided as shown.

Exposed flange/border frames shall be factory painted standard white or custom painted to match specified architectural requirements. Provide paint samples if required. Pattern controllers and integral spacers shall be painted flat black.

Performance of the linear slot diffuser shall be based upon cataloged data obtained from tests conducted in accordance with ASHRAE Standard 70-2023. Pattern controllers shall be field adjusted after diffuser installation and set in their normal operating condition. Air test and balancing of linear slot diffusers shall be in accordance with the testing and balancing portion section of the specifications.

Provide manufacturers submittal drawings and published performance data.

FM Series

Furnish and install Nailor FlowLine™ modular square ceiling diffusers of the size and type shown on the architectural and mechanical plans and/or air distribution schedules. Diffusers shall be designed as a nominal 24" x 24" (600 x 600mm) module size. Mechanical contractor shall coordinate installation with General Contractor and other sub-contractors as required.

These diffusers shall utilize heavy wall extruded aluminum frames with inside and outside mitered corners. The diffusers shall feature a 1" (25) continuous slot around all four sides with dual pattern controllers that are fully adjustable to permit throttling, as required for air volume reduction or complete shut-off without adding any blank-off devices. Diffusers shall be capable of being adjustable for a 4, 3, 2 or 1-way blow pattern as required after installation. Pattern controllers shall be minimum 20 ga. (1.01) corrosion- resistant steel. One-piece pattern controllers are not acceptable. The pattern controllers shall be horizontal high throw type and shall maintain a tight ceiling air pattern from maximum to minimum cataloged airflows and be suitable for VAV systems.

Supply units shall be complete with a compatible steel back pan that is removable and secured by steel 's' clips. The back pan shall incorporate an integral drawn round neck to permit hard or flexible duct connection. Return units shall be similar in appearance but feature a light shield back pan for ductless return installations. The center acoustical ceiling tile shall be supplied, cut and field installed by the acoustical tile sub-contractor.

Exposed flange/border frames shall be factory painted standard white or custom painted to match specified architectural requirements. Provide paint samples if required. Pattern controllers and integral spacers shall be painted flat black.

Performance of the ceiling diffuser shall be based upon cataloged data obtained from tests conducted in accordance with ASHRAE Standard 70-2023. Pattern controllers shall be field adjusted after diffuser installation and set in their normal operating condition. Air test and balancing of ceiling diffusers shall be in accordance with the testing and balancing portion section of the specifications.

Provide manufacturers submittal drawings and published performance data.