

CEILING APPROACHES - LINEAR

- Linear Models: **TL-C** VAV cooling only
TL-CW VAV cooling with constant volume warm-up
TL-D Manually adjustable blades
TL-RAD Return air, ducted
TL-RAP Return air, plenum
EL DDC Interoperable

For Installation Balancing and Maintenance Instructions, see

Models: TL Form 21.2
 EL Form 54.2

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GENERAL

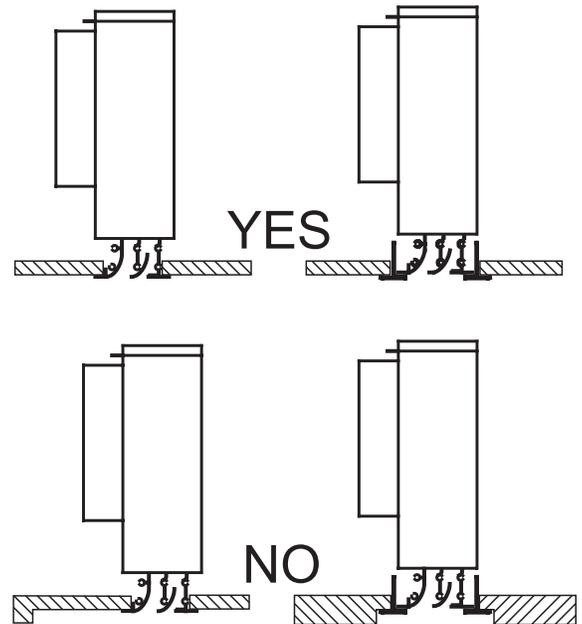
The rule of thumb when installing Therma-Fuser™ diffusers is that obstacles should not extend more than 1/16 in/1.5 mm below the plane of the bottom of the diffuser. Breaking this plane reduces the throw and destroys throw completely at low air flows. See Fig. 1.

Small inconsistencies above the plane of the diffuser bottom have little effect on Coanda or throw.

Models TL-C, TL-CW, TL-D, TL-RAD and EL are 13½ in/345 mm high and require a 13½ in/345 mm space above the ceiling. Model TL-RAP requires a 3¼ in/95 mm space above the ceiling.

Hang all diffusers as specified in local codes. For more details, see the *Installation Balancing and Maintenance* instructions for a particular model.

Fig. 1



TEE BAR CEILINGS

Linear Therma-Fuser diffusers are in standard lengths suitable for lay in use in 2 ft. and 4 ft. grid tee bar ceilings. See Figs. 2, 3 and 4. Linear Therma-Fuser diffusers can also be ordered for metric 300 mm and 600 mm grid ceilings. Widths of linear Therma-Fuser diffusers are different for each slot arrangement and require different centerline to centerline spacing between the tee bars as shown in the Table 1.

Table 1

MODEL	SLOT ARRANGEMENT	S = ℓ to ℓ SPACE BETWEEN TEE BARS
TL-XX-XX11	1 Slot, 1 Way	2 ^{13/16} in/71 mm
TL-XX-XX21	2 Slots, 1 Way	4 in/102 mm
TL-XX-XX22	2 Slots, 2 Way	4 ^{1/4} in/108 mm
TL-XX-XX41	4 Slots, 1 Way	6 ^{1/4} in/159 mm
TL-XX-XX42	4 Slots, 4 Way	6 ^{5/8} in/168 mm

Fig. 2. 2x2 ft./600x600 mm GRID EXAMPLE

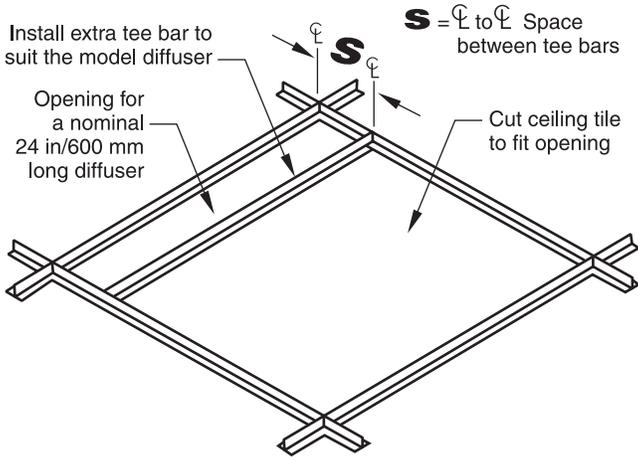


Fig. 3. 2x4 ft./600x1200 mm GRID EXAMPLE

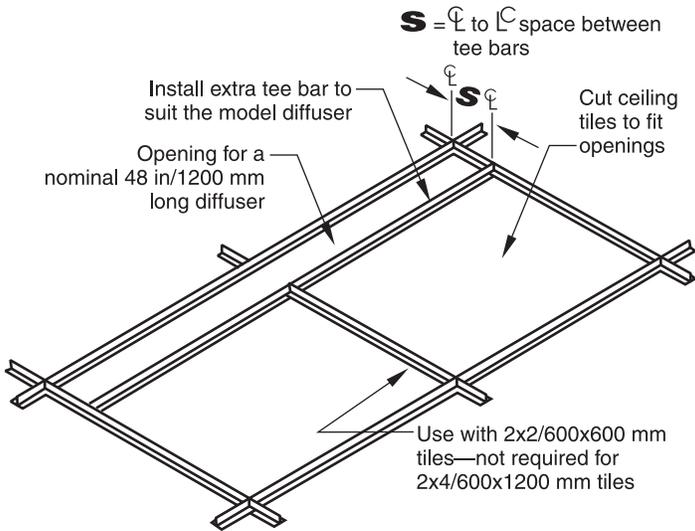
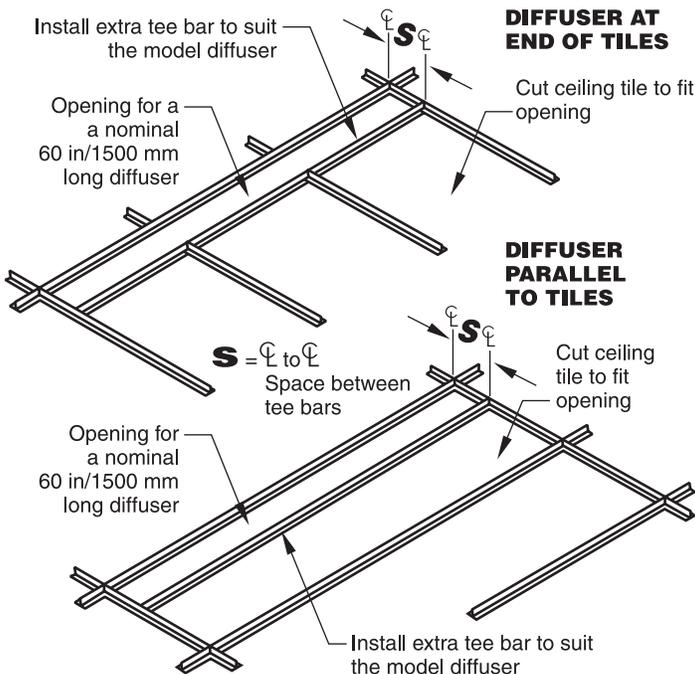


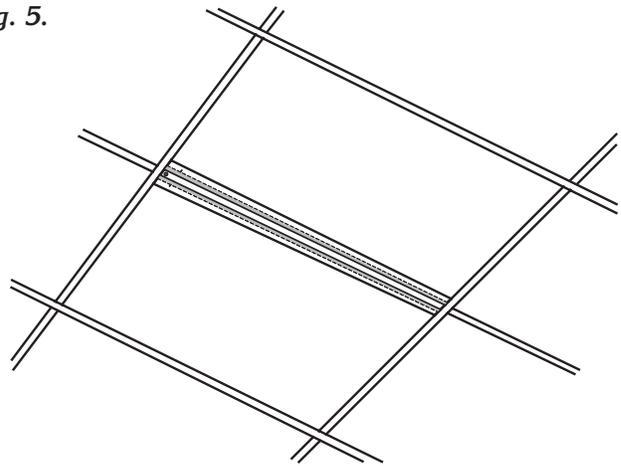
Fig. 4. 20 in.x5 ft./500x1500 mm GRID EXAMPLES



DIFFUSER INSTEAD OF A TEE

Straddling a tee bar is not possible with Therma-Fuser diffusers because the mechanism and damper control blades require the space. However, Therma-Fuser diffusers can be used instead of a tee bar.

Fig. 5.



The middle tee of 2-way Therma-Fuser diffusers (both 2-slot and 4-slot) is 1 in./25 mm wide matching a 1 in./25 mm tee width. For one-way Therma-Fuser diffusers the side opposite the blow direction is 1 in./25 mm wide. See Fig. 5.

The end angles that lie on the cross tees should be field adjusted to raise them as shown on Fig. 4 on page three of *Installation Balancing and Maintenance* instructions (Form 21.2). This results in lowering the bottom of the diffuser into the same plane as the bottom of the tees. Cut the adjacent ceiling tiles to fit and then lay them on the longitudinal edges of the diffuser. Hang the diffuser in compliance with the local codes.

REVEAL EDGE (TEGULAR) TILES

The bottom of linear Therma-Fuser diffusers must be in the plane of the ceiling tiles to avoid disruption of air flow. See Fig. 6. This is best done with the Acutherm frames described in Figs. 7 and 8.

NOTE: A standard length diffuser will not fit an Acutherm tegular frame. The diffuser must be a special order or field modified. See Fig. 10.

Fig. 6.

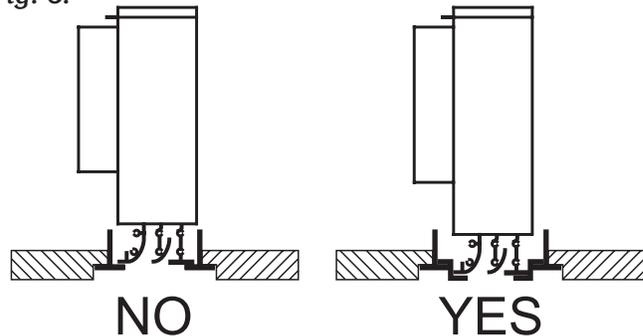


Fig. 7 Nominal 24" Acutherm Reveal Edge Frame
(For 9/16" Wide T-Bar Ceiling)

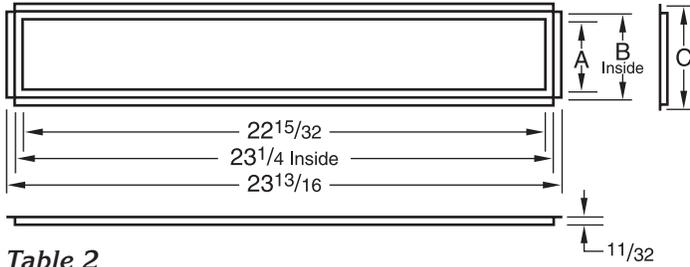


Table 2

MODEL	A	B	C	S
TL-XX-2411	2	2 3/4	3 1/4	3 3/8
TL-XX-2421	3 3/16	3 15/16	4 7/16	4 9/16
TL-XX-2422	3 7/16	4 3/16	4 11/16	4 13/16
TL-XX-2441	5 7/16	6 3/16	6 11/16	6 13/16
TL-XX-2442	5 13/16	6 9/16	7 1/16	7 3/16

NOTE: TL unit to be special ordered (see price sheet) or field modified to have a special end angle 3/8" wide on control end only. (No end angle on other end)

NOTES:

See price list for ordering.
Contact Acutherm for metric equivalent

Fig. 8. Nominal 48" Acutherm Reveal Edge Frame
(For 9/16" Wide T-Bar Ceiling)

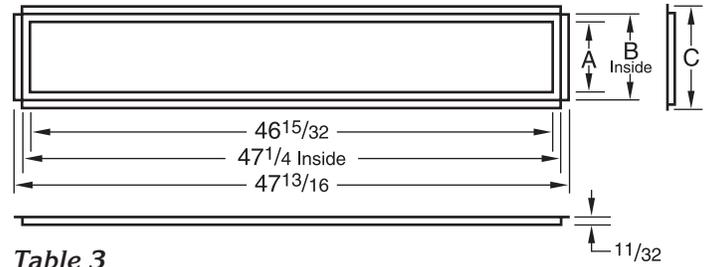


Table 3

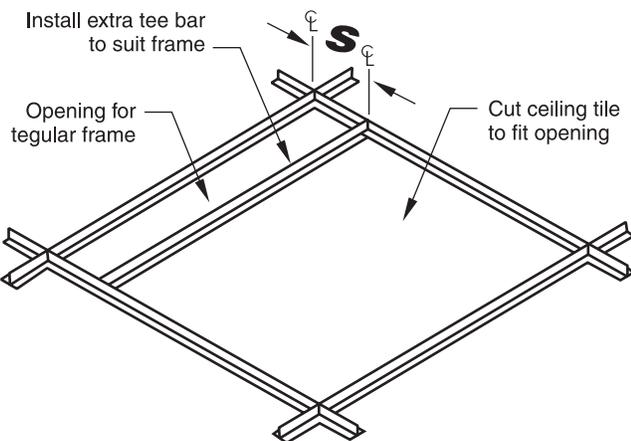
MODEL	A	B	C	S
TL-XX-4811	2	2 3/4	3 1/4	3 3/8
TL-XX-4821	3 3/16	3 15/16	4 7/16	4 9/16
TL-XX-4822	3 7/16	4 3/16	4 11/16	4 13/16
TL-XX-4841	5 7/16	6 3/16	6 11/16	6 13/16
TL-XX-4842	5 13/16	6 9/16	7 1/16	7 3/16

NOTE: TL unit to be special ordered (see price sheet) or field modified to have a special end angle 3/8" wide on control end only. (No end angle on other end)

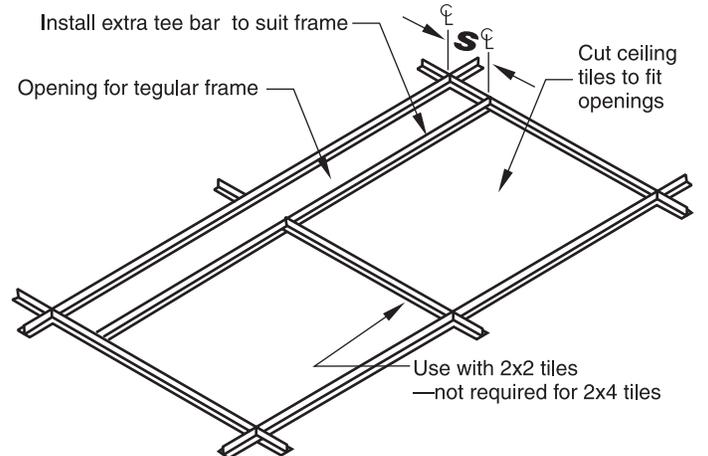
NOTES:

See price list for ordering.
Contact Acutherm for metric equivalent

T-BAR ARRANGEMENT



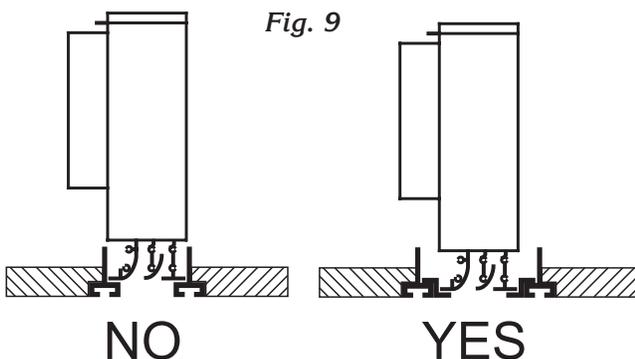
T-BAR ARRANGEMENT



BOLT SLOT/BOX TYPE (DONN) TEE BARS

The bottom of linear Therma-Fuser diffusers must be in the plane of the ceiling tiles to avoid disruption of air flow. See Fig. 9. This is best done with the Acutherm frames described in Figs. 7 and 8 REVEAL EDGE (TEGULAR) TILES above.

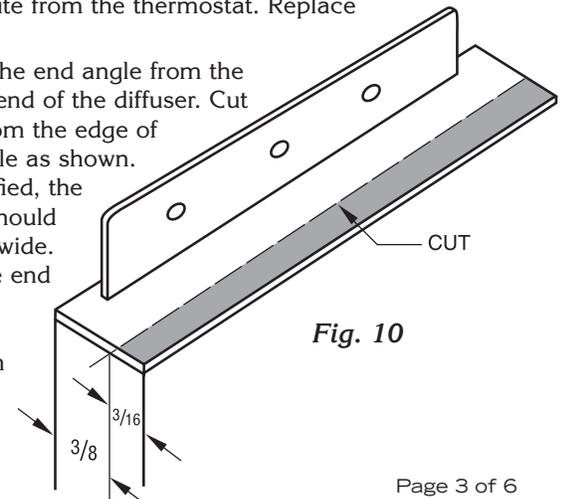
NOTE: A standard length diffuser will not fit an Acutherm tegular frame. The diffuser must be a special order or field modified. See Fig. 10.



FIELD MODIFICATION OF A STANDARD LENGTH DIFFUSER FOR A REVEAL EDGE FRAME

1. Remove and discard the end angle on the end of the diffuser opposite from the thermostat. Replace the screws.

2. Remove the end angle from the thermostat end of the diffuser. Cut 3/16 inch from the edge of the end angle as shown. When modified, the end angle should be 3/8 inch wide. Reveal edge end angles can also be purchased from Acutherm. See price list.



FIELD MODIFICATIONS — continued

3. Reinstall the modified end angle on the thermostst end of the diffuser. Do not install the modified end angle on the end opposite from the thermostat as the induction of room air over the thermostat will be reduced.

HARD (PLASTER) CEILINGS

Lay in frames are one option for installing linear Therma-Fuser diffusers in plaster or gypsum board ceilings. However, unlike square diffusers, linear diffusers are too large to fit up through the frame. **Access above the ceiling is required to lay the diffusers into the frame and to connect the duct.**

Access may be through an attic, a manhole or a lay in tile adjacent to the hard ceiling.

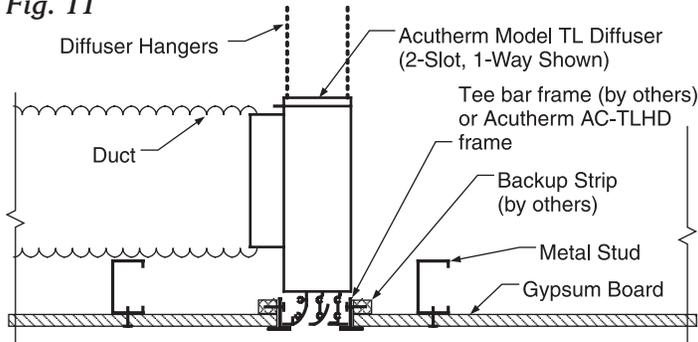
If access above the ceiling is not available, installing the diffusers first and then constructing the plaster or gypsum board around may be the better option. Access after installation is very rarely necessary because Therma-Fuser diffusers have a long history of requiring no maintenance.

FRAME OPTIONS

NOTE: Access above the ceiling is required to lay the diffusers into the frame and to connect the duct.

1. Tee Bar Frame. A field constructed frame made of tee bar converts a hard ceiling to lay in.

Fig. 11



2. Plastered Tee Bar Frame. Tee bar frame taped, covered with joint compound and sanded. This variation is an exceptionally attractive installation suitable for lobbies and other areas of high visibility.

3. Acutherm Frame. Factory made version of tee bar frame option, painted to match the Therma-Fuser diffuser. Frame dimensions are shown below. The vertical portions of the frame have a horizontal row of 0.2 inch/5mm dia. holes every 1 inch/25.4mm. Ceiling supports are not supplied due to varying ceiling thicknesses. A backup strip or metal angles can be used to secure the frame. It also can be hung in compliance with local codes. See Fig. 11.

Fig. 12. Acutherm Frame Cross Section

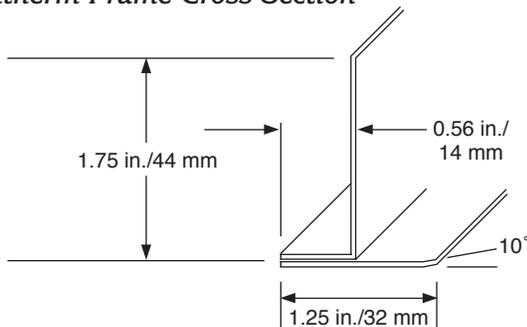


Fig. 13 Acutherm Frame

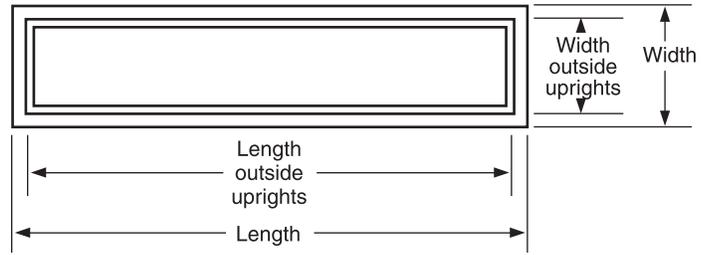


Table 4. Acutherm Frame Dimensions — Inches

FOR MODEL	LENGTH	WIDTH	OUTSIDE UPRIGHTS	
			LENGTH	WIDTH
TL-XX-2411	25 ¹ / ₄	4 ¹ / ₁₆	24	2 ¹³ / ₁₆
TL-XX-2421	25 ¹ / ₄	5 ¹ / ₄	24	4
TL-XX-2422	25 ¹ / ₄	5 ¹ / ₂	24	4 ¹ / ₄
TL-XX-2441	25 ¹ / ₄	7 ¹ / ₂	24	6 ¹ / ₄
TL-XX-2442	25 ¹ / ₄	7 ¹³ / ₁₆	24	6 ⁹ / ₁₆
TL-XX-3611	37 ¹ / ₄	4 ¹ / ₁₆	36	2 ¹³ / ₁₆
TL-XX-3621	37 ¹ / ₄	5 ¹ / ₄	36	4
TL-XX-3622	37 ¹ / ₄	5 ¹ / ₂	36	4 ¹ / ₄
TL-XX-3641	37 ¹ / ₄	7 ¹ / ₂	36	6 ¹ / ₄
TL-XX-3642	37 ¹ / ₄	7 ¹³ / ₁₆	36	6 ⁹ / ₁₆
TL-XX-4811	49 ¹ / ₄	4 ¹ / ₁₆	48	2 ¹³ / ₁₆
TL-XX-4821	49 ¹ / ₄	5 ¹ / ₄	48	4
TL-XX-4822	49 ¹ / ₄	5 ¹ / ₂	48	4 ¹ / ₄
TL-XX-4841	49 ¹ / ₄	7 ¹ / ₂	48	6 ¹ / ₄
TL-XX-4842	49 ¹ / ₄	7 ¹³ / ₁₆	48	6 ⁹ / ₁₆
TL-XX-6011	61 ¹ / ₄	4 ¹ / ₁₆	60	2 ¹³ / ₁₆
TL-XX-6021	61 ¹ / ₄	5 ¹ / ₄	60	4
TL-XX-6022	61 ¹ / ₄	5 ¹ / ₂	60	4 ¹ / ₄
TL-XX-6041	61 ¹ / ₄	7 ¹ / ₂	60	6 ¹ / ₄
TL-XX-6042	61 ¹ / ₄	7 ¹³ / ₁₆	60	6 ⁹ / ₁₆

NOTES:

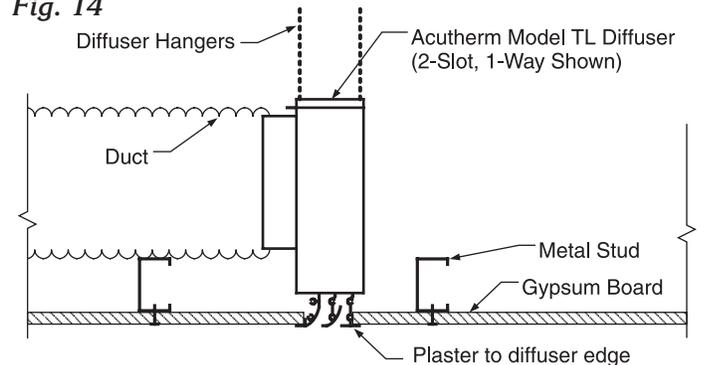
See price list for ordering.

Contact Acutherm for metric equivalent

INSTALLATION PRIOR TO CEILING

First install the Therma-Fuser diffuser by hanging it at the correct height for the ceiling and connecting the duct. After diffuser installation, cut and fit gypsum board so it lays on the lip of the diffuser. See Fig. 14.

Fig. 14



CONCEALED SPLINE CEILINGS

As with other ceilings, it is necessary to locate the bottom of the Therma-Fuser diffuser in the plane of the ceiling. This is best done by hanging the diffuser at the correct height for the ceiling and then cutting and installing the ceiling tiles on the lip of the diffuser. See Figs. 15 and 16.

Fig. 15 EXAMPLE: Diffuser with ends centered between seams of 12 inch square tiles.

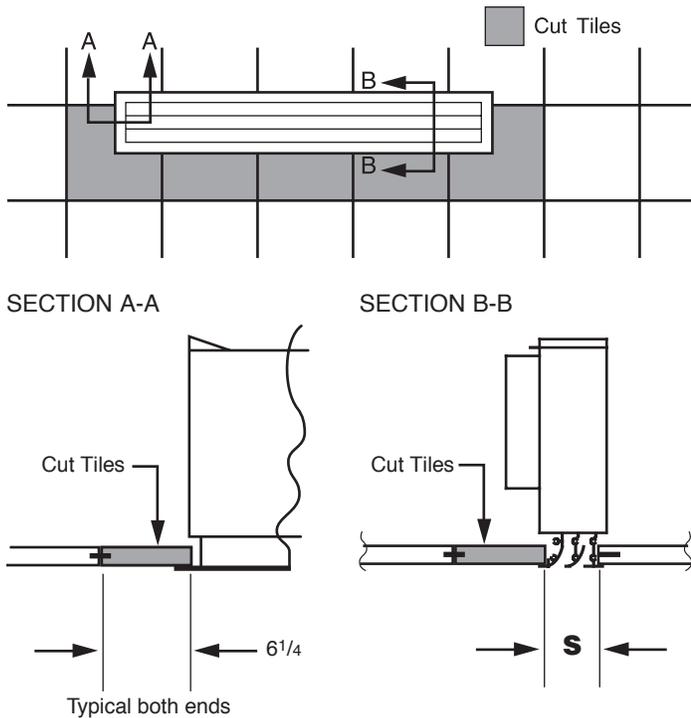


Fig. 16 EXAMPLE: Diffuser with right end butted to the seam of 12 inch square tiles.

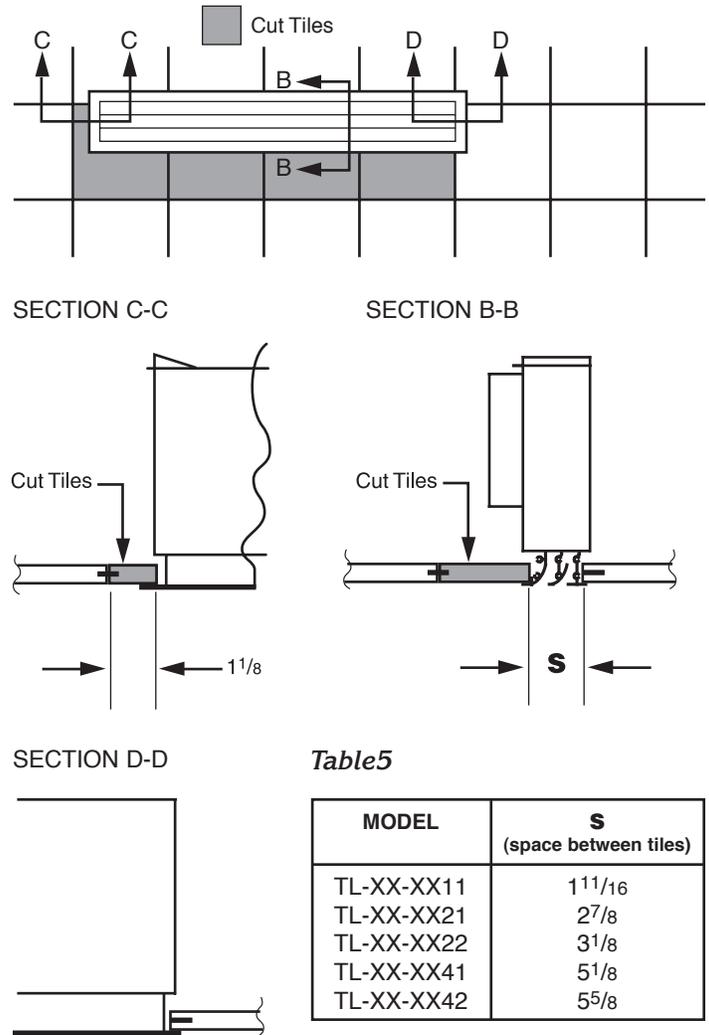


Table 5

MODEL	S (space between tiles)
TL-XX-XX11	1 ¹¹ / ₁₆
TL-XX-XX21	2 ⁷ / ₈
TL-XX-XX22	3 ¹ / ₈
TL-XX-XX41	5 ¹ / ₈
TL-XX-XX42	5 ⁵ / ₈

THIN (METAL PAN) TILES

Thin tiles need to be larger than the diffuser so that a hole can be cut in the tile just smaller than the face of the diffuser. See Table 6 for dimensions.

NOTE: Thin tile end angles are required. The diffuser must be special ordered or a standard diffuser must have thin tile end angles field installed. Thin tile end angles are required to keep the diffuser centered in the tile opening. See price list.

INSTALLATION PROCEDURE

Hang the diffuser and connect the duct.

Loosen the screws and remove the end angles from the diffuser.

Table 6. Dimensions for Holes in Thin Tiles

	MODEL	DIFFUSER LENGTH	HOLE LENGTH
STANDARD	TL-XX-24XX	23 ³ / ₄ in.	23 in.
	TL-XX-36XX	35 ³ / ₄	35 in.
	TL-XX-48XX	47 ³ / ₄	47 in.
	TL-XX-60XX	59 ³ / ₄	59 in.
METRIC	TL-XX-24XX	595 mm	576 mm
	TL-XX-36XX	895 mm	876 mm
	TL-XX-48XX	1195 mm	1176 mm
	TL-XX-60XX	1495 mm	1476 mm

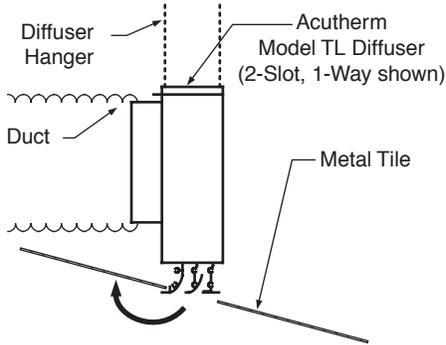
MODEL (Standard and Metric)	HOLE WIDTH
TL-XX-XX11	2 ³ / ₁₆ in. / 56 mm
TL-XX-XX21	3 ³ / ₈ in. / 86 mm
TL-XX-XX22	3 ⁵ / ₈ in. / 92 mm
TL-XX-XX41	5 ⁵ / ₈ in. / 143 mm
TL-XX-XX42	6 in. / 152 mm



THIN TILE INSTALLATION PROCEDURE — continued

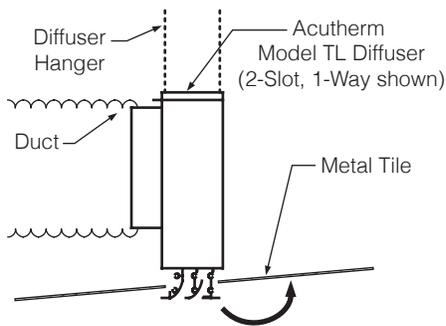
Slide the tile up and to the left over the left side of the diffuser. See Fig. 17.

Fig. 17



Slide the tile to the right and up over the right side of the diffuser. See Fig. 18.

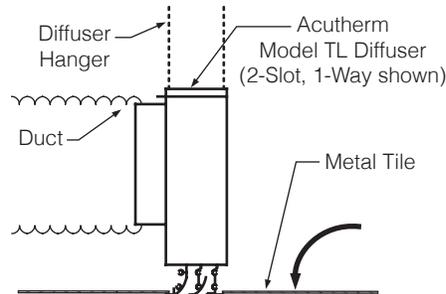
Fig. 18



Install thin tile end angles.

Drop the tile down onto the diffuser lip. See Fig. 19.

Fig. 19



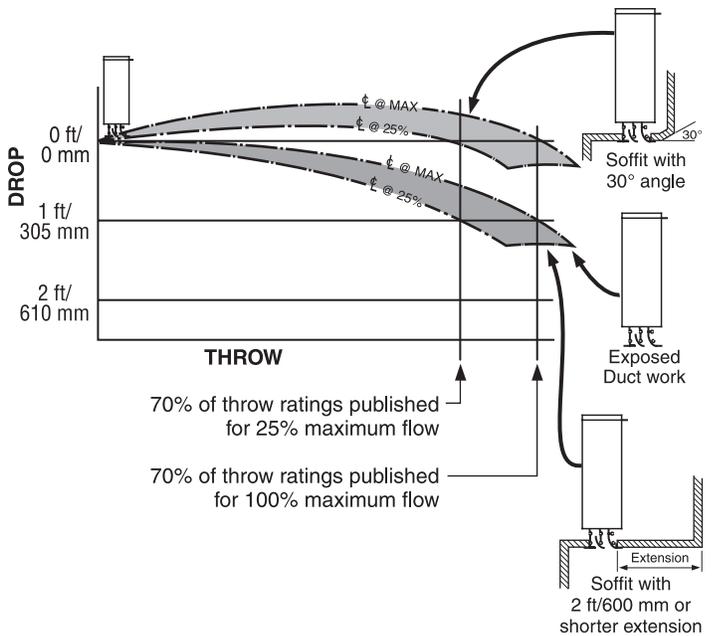
EXPOSED DUCT WORK

Therma-Fuser diffusers installed well below the level of the ceiling have some reduction of throw and increased drop. Installation below 8 ft./2.4m risks 50 fpm/0.25 L/s air velocities dropping into the occupied space (below 6ft./1.8m). See Fig. 20.

SOFFITS

Therma-Fuser diffusers installed in soffits below the level of the ceiling have some reduction of throw and increased drop. Good performance results if they are at least 8 ft/2.4m above the floor. Installation lower than this should consider a 30° upward bend on the soffit a minimum of 2 in/50mm wide. See Fig 20.

Fig 20. Lobe Center Lines for $V_T = 50 \text{ fpm} / .25 \text{ L/s}$ at Maximum Flow and 25% Maximum Flow.



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