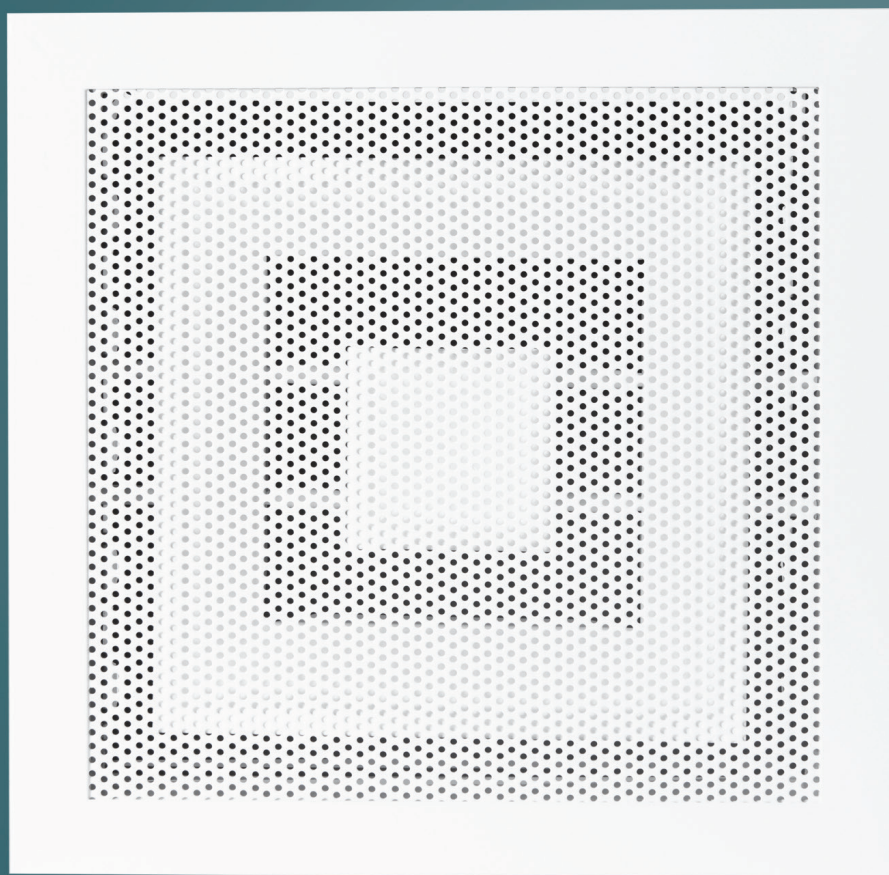




TECNALCO

CHAPTER 6



PERFORATED DIFFUSERS

CHAPTER-6 PERFORATED DIFFUSERS INDEX

- o Perforated Ceiling Diffusers _____
- o Standard Directional Core Patterns _____
- o Constructional Details and Dimensions _____
- o Engineering and Performance Data _____
 - o Air Induction
 - o Selection Tables
 - o Easy Selection Graphs
- o Perforated Ceiling Diffusers Fixing Details _____
- o Ordering Data _____

PERFORATED DIFFUSERS

PERFORATED CEILING DIFFUSERS

TECNALCO ceiling diffusers with perforated face, are recommended for heating, ventilating and cooling in centralised air conditioning systems.

Perforated face diffusers, with 4-3-2 or 1 way pattern deflectors are adjustable for horizontal diffusion of air in their respective ways without change in air volume, pressure or sound level. 100% utilisation of diffuser face area, regardless of pattern deflection, gives optimum performance in terms of air handing characteristics.

These diffusers have high diffusion induction rates, resulting in rapid temperature and velocity equalisation of the mixed air mass, well above the zone of occupancy.



Features:

- Efficient, draftless air distribution for all types of ceilings. Air pattern controllers do not damper the air in any way. Flow rate and sound level remain constant regardless of air pattern required.
- Air pattern controllers can be replaced to any desired pattern.
- Perforated surface plate completely conceals pattern controllers.
- Always available in powder coated finish in any colour to match with the false ceiling grid.
- For supply diffusers, perforated face is dropped slightly below the ceiling.
- Concealed fixing and easily removable perforated face, give easy access to air pattern deflectors and control damper
- Suitable for installation into tiled ceilings.
- Spigot air inlets are available in a variety of sizes, suitable for flexible duct connections.

Types available:

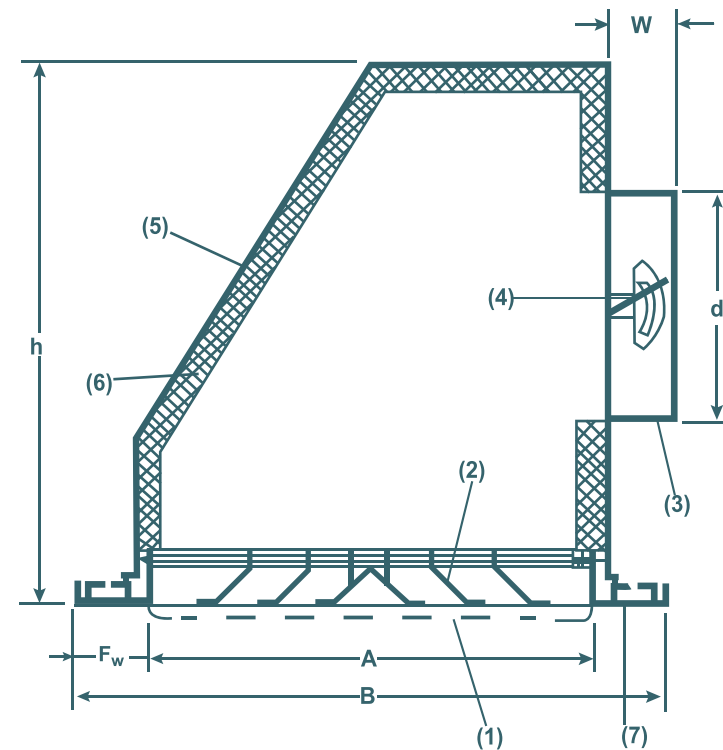
Type	Model	Remarks
PCD	'TC'	with directional core
	'TB'	with spigot damper and baffle plate
	'TT'	with spigot damper operated from face, and baffle plate
	'TR'	without damper

Standard square sizes:

L	W
300	300
400	400
500	500
600	600

N = Nominal size = L x W
 A = Neck size
 B = Overall face size
 F_w = Frame width = 30/25/20 mm widths available

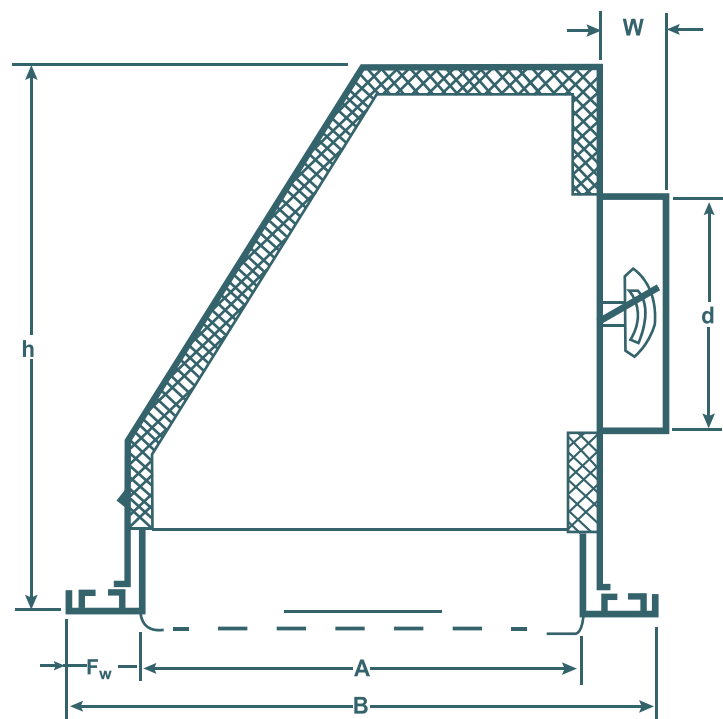
PERFORATED CEILING DIFFUSERS



PCD 'TC'

TECNALCO model PCD 'TC' is a supply perforated ceiling diffuser having directional deflectors with complete pattern adjustability of 4-3-2 or 1 way horizontal air diffusion. The spigot damper, provided at the neck of the plenum of the diffuser, is optional.

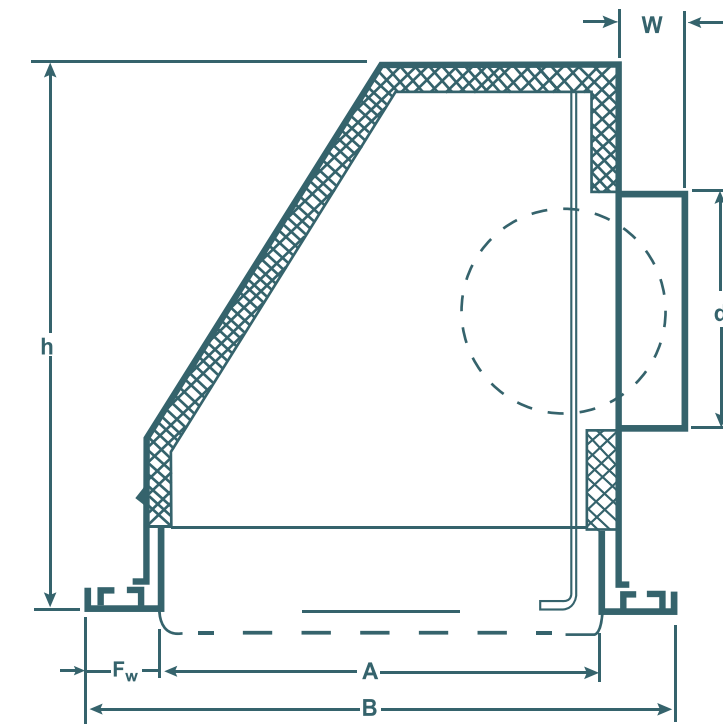
1. Perforated face plate
2. Air Pattern controller
3. Round neck
4. Spigot damper
5. Plenum box
6. Accoustic liner
7. Border frame



PCD 'TB'

TECNALCO model PCD 'TB' is a supply perforated ceiling diffuser having a baffle plate which diffuses the air vertically downwards for applications requiring localised spot cooling or heating. The spigot damper, provided at the neck of the plenum of the diffuser is optional.

PERFORATED CEILING DIFFUSERS



PCD 'TT'

TECNALCO model PCD 'TT' is a supply perforated ceiling diffuser same as that of PCD 'TB'. The spigot damper in this case can be operated from the face of the diffuser after removing the perforated face plate.

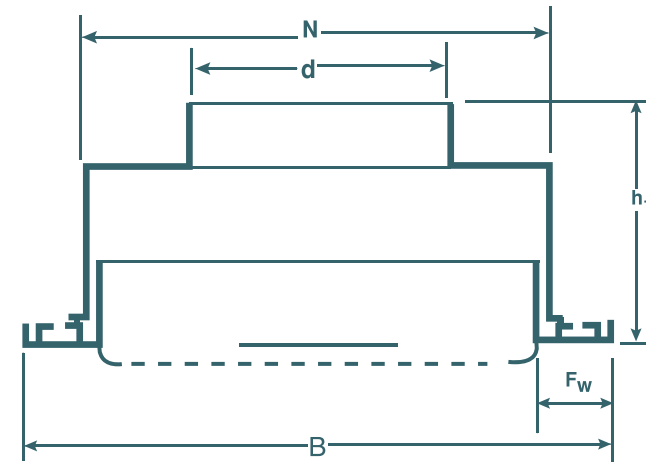
Material Construction:

1. Perforated face plate is made of mild steel (removable type) of thickness 1 mm (includes powder coating).
2. 4-3-2 or 1 Way air pattern controller and external frame are made of extruded aluminium, in powder coated finish same as that of perforated face plate.
3. Round neck is provided to the plenum for easy connection of flexible duct
4. Spigot damper is an option to the round neck
5. Plenum is made of galvanised sheet steel of 0.8 mm thickness
6. Internal acoustic liner is made of mineral fibre of 25 mm thickness.
7. Perforated diffusers are available both in angular as well as box type plenums.

Advantages of angular plenums over box type plenums:

- A better mixing of cool air
- Increase in the efficiency of throw and induction

PERFORATED CEILING DIFFUSERS



PCD - TR

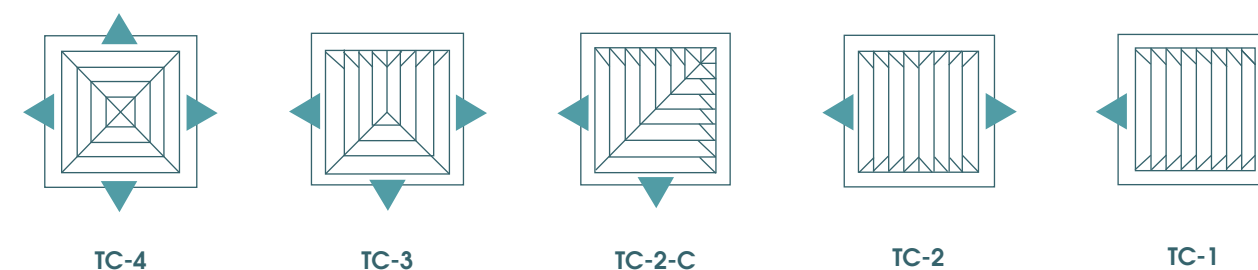
TECNALCO model PCD 'TR' is a return perforated ceiling diffuser with or without a baffle plate which matches the supply perforated ceiling diffusers in appearance. Generally these are recommended for non-ducted applications. These are also available for lay-in 'T' bar applications of standard module sizes of 600 x 600 mm or 1200 x 600 mm.

NOTE:

- Perforated face plate is made of mild steel with perforated hole dia of 3.25 mm at a pitch of 5 mm. Thickness of sheet is 0.8 mm before powder coating.
- Plenum box is made of galvanised sheet steel of thickness 0.8 mm and internal baffles are either perforated sheet or splitters to suit the designed conditions.
- All joints are welded and sealed for air tightness which adds to maintain rigidity.

Excellent performance for 'VAV' applications:

- For supply perforated ceiling diffusers the perforated face is dropped slightly below the ceiling line, thereby a uniform sheet of air is discharged horizontally along the ceiling surface. The resulting benefits thus are:
 - The strong coanda effect is maintained at the low air volumes encountered in VAV systems when air flow is thermostatically reduced to minimum air volume settings.
 - The air distribution pattern minimizes smudging effect.



Standard directional core patterns of Perforated Diffusers

CONSTRUCTIONAL DETAILS AND DIMENSIONS

Models - PCD - TC 'TB' 'TT' & TR :

Standard sized and dimensions for angular and straight box plenums

N	A	B	h	d	h ₁
300 x 300	280	340	310	155	75
400 x 400	380	440	340	175	75
500 x 500	480	540	390	205	100
600 x 600	580	640	460	245	100

NOTE:

h → height of the angular plenums /straight box plenums

h₁ → height of the return perforated diffuser plenums

Perforated Diffusers

Engineering and Performance Data

The tabulated performance data includes Area factor, Throw pattern, Discharge velocity and Sound power level.

Air volume q_v

Air volumes are given in mt³/h

Throw T

The throw values given in the tables are related to the perforated diffuser placed nearer to the ceiling.

Two throw values are given for each q_v to the corresponding terminal velocities V_t .

Minimum Throw 0.50 m/sec. V_t

Maximum Throw 0.25 m/sec. V_t

Discharge velocity V_k

The effective discharge velocities given are related to the corresponding effective free area A_k .

NC values

Noise data is given in terms of NC levels. These have been derived from sound power level data (dB re 10⁻¹² watts) by subtracting 10 dB (Room effect) from the sound power levels.

Outlet size

Outlet sizes are mentioned on the left side of each row within a tolerance of ± 10%

ENGINEERING AND PERFORMANCE DATA

Selection tables for Perforated Ceiling Diffusers

TECNALCO models - PCD 'TC' 'TB' 'TT' - 4 way throw

N. Size mm	V _k m/s	1.5	2	2.5	3	3.5	4	5	6
300 x 300 0.018	m ³ /h Throw (m) N.C.	95 0.4 - 0.6 < 20	130 0.6 - 1 < 20	160 1.1 - 1.8 22	190 1.3 - 2.1 30	225 1.6 - 2.55 45	260 1.8 - 2.9 > 50	324 2.25 - 3.6 > 50	388 2.7 - 4.3 > 50
400 x 400 0.034	m ³ /h Throw (m) N.C.	183 0.6 - 1 < 20	245 1.15 - 1.9 20	306 1.5 - 2.4 25	365 1.8 - 2.9 30	430 2.2 - 3.5 40	490 2.4 - 4 50	612 3 - 4.8 > 50	735 3.8 - 5.9 > 50
500 x 500 0.055	m ³ /h Throw (m) N.C.	300 1.2 - 2 < 20	396 1.6 - 2.5 20	495 1.9 - 3.1 25	595 2.3 - 3.8 36	695 2.7 - 4.5 45	790 3.1 - 5 50	990 3.9 - 6.4 > 50	1180 4.7 - 7.5 > 50
600 x 600 0.080	m ³ /h Throw (m) N.C.	432 1.4 - 2.3 < 20	575 1.9 - 3.2 20	720 2.4 - 3.9 25	865 2.8 - 4.8 35	1000 3.2 - 5.4 40	1150 3.8 - 6 50	1440 4.8 - 7.9 > 50	1725 6 - 9 > 50

Throw Data:
Correction Table for other directions
of discharging cores

4 way	3 way	2 way	1 way
x 1	x 1.05	x 1.10	x 1.15

Induction and Temperature co-efficient

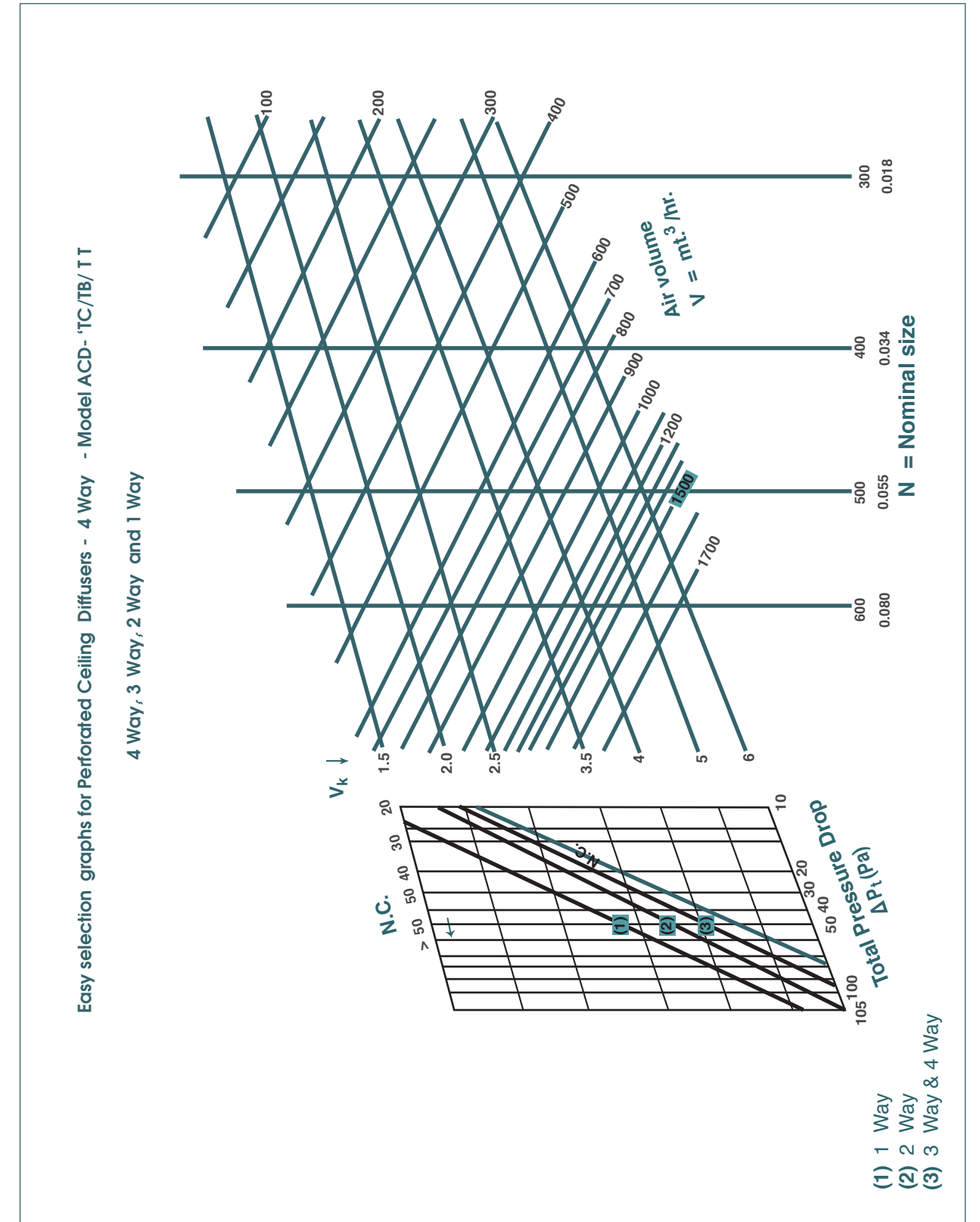
$$\Delta t_x = 0.8 \Delta t_o \left(\frac{V_x}{V_o} \right)$$

$$\text{Temp. co-efficient} = \frac{\Delta t_x}{\Delta t_o}$$

$$\text{induction } i = \frac{V_o}{V_x}$$

V _x max.	2.5	2	1.5	1	0.5	0.25
Δ t _x °C	4.4	3.52	2.64	1.76	0.88	0.44

ENGINEERING AND PERFORMANCE DATA



PERFORATED DIFFUSERS

PERFORATED CEILING DIFFUSERS FIXING DETAILS

Fixing Details:

Type C Fixing:

Concealed type fixing

Recommended for ceiling and sill applications.

Standard supply is Type 'C' fixing.

Counter sunk screw type fixing is also available on request

Available finishes:

Powder coated colour finish. (Mention RAL colour number)

Available finishes for the accessories:

Powder coated colour finish

Black matt finish

G.I. plenum box in either aluminium spray coated or epoxy primary coated

Ordering Data:

Specify

1. TECNALCO type and model
2. Nominal size - L x W
3. Quantity
4. Type of fixing
5. Surface finish
6. Remarks

Example:					
1.	2.	3.	4.	5.	6.
PCD 'TC' -4 Way	1300 x 300	25 nos.	Type 'C' fixing	Powder coated in RAL1015	Straight with spigot damper and plenum box