

CSS – Ceiling Slot Swirl Diffuser

Model: CSS

The Holyoake CSS range of Square and Round Face Ceiling Slot Swirl Diffusers have been designed to provide attractive, non-obtrusive, high quality indoor air diffusion. The CSS is comprised of slots in a radial angled pattern that produce a circular swirling airflow.

The CSS is able to achieve high room air diffusion quality, due to the swirling motion of the discharge. Strong Induction draws room air up into the supply air flow path, which results in mixing at high level, reducing draughts and uneven temperature gradients.

The airflow pattern from the CSS Ceiling Slot Swirl Diffuser can be easily adjusted from the diffuser face, without the need to access the rear of the diffuser. By rotating the pattern blades the airflow can be directed to an external (horizontal), reduced throw (horizontal), or vertical discharge swirl. It can also be used for exhaust situations by either removing the pattern blades, or adjusting them to the horizontal position.

Other directional airflow patterns can be achieved by blade adjustment, refer to your local Holyoake Branch.

CSS Square Model Installation

Installation is simple due to the square lay-in type design. The diffuser can be placed into a 'T-rail' system quickly and easily and the supply duct attached. The supply air can be fed vertically onto the back of the diffuser, or through a specifically designed side entry box. The inlet duct is available at 150, 200 or 250 mm diameter, see table on following page.

CSSR Circular Model Installation

Installation of this model is also made easy, when supplied with a Top Entry round cushion head plenum. The diffuser outer edge can be flush mounted against the ceiling surface.

CSSF Fixed Model

The CSSF is a fixed non adjustable model of the CSS diffuser. The product still achieves the same high induction and ceiling effect as the adjustable model. Performance data is identical to CSS with pattern blades.

Construction

The CSS face plate is constructed of powder coated zinc coated steel (aluminium option available, contact your local Holyoake branch) and the air pattern elements from a tough UV stabilized and fire rated engineering polymer. These are available in white or black. They have a unique slightly convex profile which has been designed to maximize the free area, generate a strong ceiling effect and provide low noise operation over a wide range of flow rates.

A part blanked Low Volume blade is also available for CSS16.

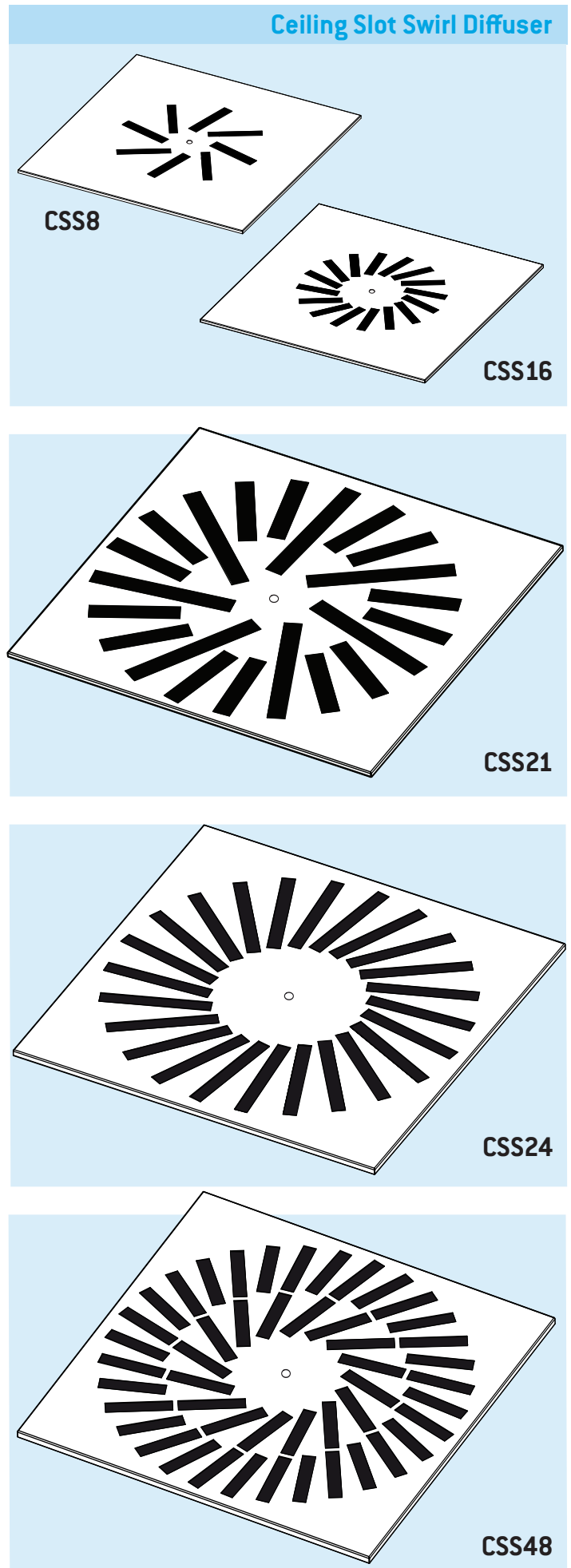
Nominal Square Face sizes of 295 x 295 mm for CSS8, 445 x 445 mm for CSS16 and CSS21; and 595 x 595 mm for all models are available, to lay in to 'T' Rail ceiling grids.

Nominal Circular Face models are available in 500 mm for CSS8, CSS16 and CSS21; and in 615 mm for all models.

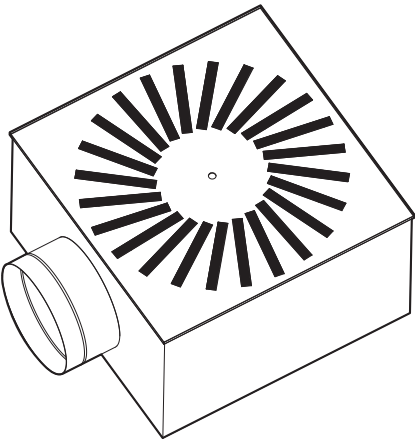
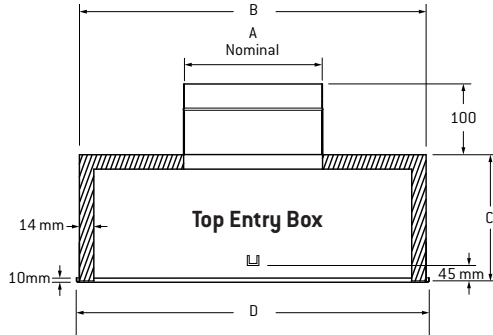
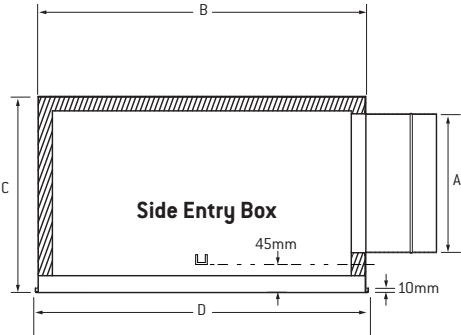
Features

- Unique Convex Profile Adjustable Pattern Blades.
- Infinite Range of Throw Patterns.
- Low Noise Operation.
- Strong Ceiling Effect.
- High Induction Swirl.
- Easy Lay-in Installation.

Ceiling Slot Swirl Diffuser



Dimensional Details



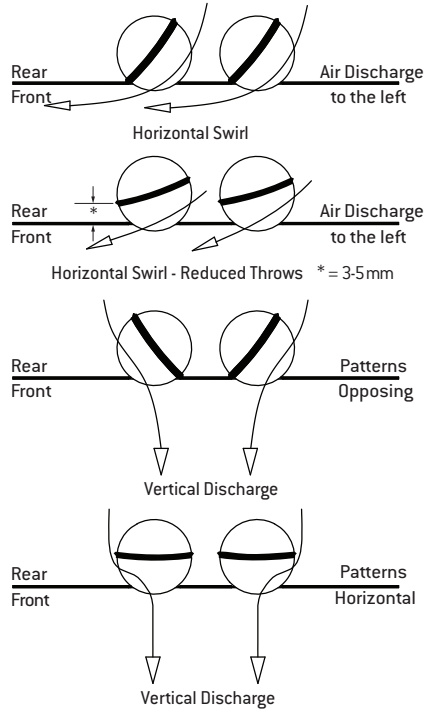
Side Entry Box Dimension (mm)					
Model	A	B	C	D	T' RAIL
CSS8	150	285	285	295	300 - 600
CSS16	200	440	300	445	450 or 600
CSS21	250	440	350	445	450 or 600
CSS24	250	585	350	595	600
CSS48	250	585	350	595	600

Top Entry Box Dimension (mm)				
Model	A	B	C	D
CSS8	150	477 or 592	150	500 or 615
CSS16	200	477 or 592	150	500 or 615
CSS21	250	477 or 592	150	500 or 615
CSS24	250	592	150	615
CSS48	250	592	150	615

Performance Data								
Model	Flowrate (l/s)	25	50	75	100	125	150	175
CSS8	Static Pressure [Pa]	8	26	56				
	Total Pressure [Pa]	11	32	61				
	Throw (m) 0.75m/s	0.3	0.6	0.9				
	Throw (m) 0.50m/s	0.5	0.8	1.3				
	Throw (m) 0.25m/s	0.8	1.4	1.9				
NC		20	29	36				
CSS16	Static Pressure [Pa]	-	4	9	17	26	37	
	Total Pressure [Pa]	-	7	15	27	41	60	
	Throw (m) 0.75m/s	-	N/A	0.4	0.7	0.8	0.9	
	Throw (m) 0.50m/s	-	0.5	0.6	1.0	1.1	1.4	
	Throw (m) 0.25m/s	-	0.8	1.2	1.4	1.7	2.0	
NC	-	-	21	28	35	39		
CSS21	Static Pressure [Pa]	-	3	7	18	23	28	33
	Total Pressure [Pa]	-	5	9	25	29	34	45
	Throw (m) 0.75m/s	-	N/A	0.4	0.5	0.7	0.8	0.9
	Throw (m) 0.50m/s	-	0.6	0.7	0.9	1.1	1.3	1.5
	Throw (m) 0.25m/s	-	1.0	1.4	1.7	1.9	2.1	2.4
NC	-	-	21	27	33	36	38	

Performance Data															
Model	Flowrate (l/s)	25	50	75	100	125	150	175	200	225	250	275	300	350	400
CSS24	Static Pressure [Pa]	-	2	3	5	8	10	14	18	23	29	35	40		
	Total Pressure [Pa]	-	3	6	10	16	20	27	36	46	55	68	80		
	Throw (m) 0.75m/s	-	N/A	N/A	N/A	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.4		
	Throw (m) 0.50m/s	-	N/A	0.3	0.8	1.1	1.5	1.8	2.1	2.4	2.7	2.8	3.0		
	Throw (m) 0.25m/s	-	0.8	1.2	1.4	2.1	2.3	2.7	3.0	3.3	3.5	3.7	3.9		
NC	-	-	-	-	-	-	20	24	29	34	36	37			
CSS48	Static Pressure [Pa]	-	-	-	4	6	8	10	13	17	20	25	29	37	50
	Total Pressure [Pa]	-	-	-	9	12	17	23	29	37	44	53	63	86	120
	Throw (m) 0.75m/s	-	-	-	0.7	0.8	1.1	1.4	1.5	1.7	2.0	2.3	2.6	2.9	3.4
	Throw (m) 0.50m/s	-	-	-	1.2	1.5	1.7	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9
	Throw (m) 0.25m/s	-	-	-	1.8	2.0	2.4	2.7	3.1	3.5	3.8	3.9	4.2	4.5	4.8
NC	-	-	-	-	-	-	-	23	27	30	33	35	39	42	

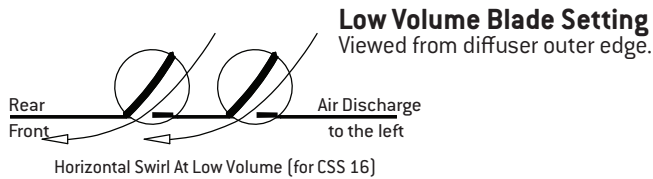
Adjustable Pattern Blade Settings
Viewed from diffuser outer edge.



Diffusers - Ceiling Swirl

Notes on Performance Data

1. Pressure, Throw and NC values above, are based on a specifically designed side entry box, with spigot dimensions as table above.
2. Listed throw values refer to a terminal velocity of 0.75, 0.50 and 0.25 m/s.
3. NC values are based on a standard room attenuation of 10dB re 10⁻¹² Watts.
4. Values less than NC20 not shown.
5. For larger panel sizes 4 way spider brackets can be provided.
6. [CSS16 Only] For ultra low volume applications a special low volume blade is available. (When tested at 10 l/s @ 10 °C, ceiling effect is maintained).
7. Product Weights are available on page 140D.



CFP, CFPP, CRS & CSS

Product Ordering Key and Suggested Specifications

CFP	-	450 600 615	-	12 20 24	-	R	-	SE TE	-	150 200 250 300 350	-	FINISH
.....
Ceiling Fixed Pattern	Diffuser Nominal Size	Number of Slots*	Circular Option	Side, or Top Entry Cushion Head Box	Duct Size	Holyoake White, Powder Coat						

* Size & Slot Options - See Page 133D.

Ceiling Radial Induction Swirl Diffusers shall be Holyoake Model CFP. These diffusers shall be designed for use in Variable Air Volume (VAV) systems with radial, high induction, air flow patterns.

CFP shall maintain a COANDA effect at reduced volume and provide uniform temperature gradients throughout the occupied space.

CFP Diffusers shall be finished in powder coat and be supplied with a suitable side, or top entry box and be fitted with accessories and dampers where indicated.

All shall be as manufactured by Holyoake.

CFPP	-	R	-	600	-	C	-	SE TE	-	150 200 250 300	-	FINISH
.....
Ceiling Fixed Pattern Pressed Steel	Circular Option	Diffuser Nominal Size	Optional Velocity Enhancer	Side, or Top Entry Cushion Head Box	Duct Size	Holyoake White, Powder Coat						

Ceiling Radial Swirl Diffusers shall be Holyoake Model CFPP 600 series. These diffusers shall be designed for use in Variable Air Volume (VAV) systems with radial, high induction, air flow patterns.

CFPP shall maintain a COANDA effect at reduced volume and provide uniform temperature gradients throughout the occupied space.

CFPP Diffusers shall be finished in powder coat and be supplied with a suitable side, or top entry box and be fitted with accessories and dampers where indicated.

All shall be as manufactured by Holyoake.

CRS	-	P	-	300 450	-	SE	-	150* 200* 250* 300 350	-	T	-	FINISH
.....
Ceiling Radial Swirl	Optional Perforated Face Plate	Nominal Neck Size	Special Side Entry Box	Duct Size	Optional 'T' Rail Frame	Holyoake White, Powder Coat						

* Note: Only these diameters are available on CRS 300

Ceiling Swirl Diffusers shall be Holyoake Model CRS. These shall be designed with a radial, high induction, air flow pattern. They shall maintain a COANDA effect at reduced volume and provide uniform temperature gradients throughout the occupied space.

CRS Diffusers shall be finished in powder coat and be supplied complete with a specifically designed swirl inducing side entry box and be fitted with accessories and dampers where indicated.

All shall be as manufactured by Holyoake.

CSS	-	R	-	8 16 21 24 48	-	450T 600T	-	SE TE	-	200 250	-	FINISH
.....
Ceiling Slot Swirl	Circular Option	Number of Slots	'T-Rail' Size	Side, or Top Entry Box	Duct Size	Holyoake White, Powder Coat						

Ceiling Slot Swirl Diffusers shall be Holyoake Model CSS. These shall be designed with a radial, high induction, air flow pattern.

CSS diffusers shall maintain a COANDA effect at reduced volume and provide uniform temperature gradients throughout the occupied space. They shall have pattern blades which can be adjusted from the diffuser face to allow the air to be directed horizontally, or vertically.

CSS Diffusers shall be finished in powder coat and be supplied with a suitable side, or top entry box and be fitted with accessories and dampers where indicated.

All shall be as manufactured by Holyoake.

Note

All ceiling diffusers, seismic restraints are required, but not supplied.

CSS - VAV, CSS - VAV - E & CSS - VAV - LP

Product Ordering Key and Suggested Specifications

CSS – VAV – **24** – **FINISH**
48

Ceiling Slot Swirl VAV Diffuser

Number of Slots

Holyoake White, Powder Coat

Ceiling Slot Swirl VAV Diffusers shall be Holyoake Model CSS – VAV. These shall be designed with a radial, high induction, air flow pattern, providing strong ceiling effect (COANDA) and be capable of handling a wide range of air flows. Designed to control the temperature in an occupied space, by an externally controlled, pressure dependant damper. Controlled by a room thermostat and building management system (supplied by others), the CSS – VAV has a specifically designed, curved edge, single blade control damper, positioned by a 24 V AC variable actuator, via a 0 – 10 V DC control signal. CSS – VAV Diffusers shall be finished in Powder Coat and are complete with a 'Premi-aire™' Pre-Insulated box, with a 250 mm diameter inlet spigot. All shall be as manufactured by Holyoake.

CSS – VAV – E – **24** – **FINISH** – **OPTIONS**
48

Ceiling Slot Swirl Electronic VAV Diffuser

Number of Slots

Holyoake White, Powder Coat

CSS VAVE Tandem Unit, 230/24 VAC Transformer, Infra Red Remote Controller, 'T Rail' Support Frame, (For Surface Mounted Applications)

Ceiling Slot Swirl Electronic VAV Diffusers shall be Holyoake Model CSS – VAV – E. These shall be designed with a radial, high induction, air flow pattern, providing strong ceiling effect (COANDA) and be capable of handling a wide range of air flows. Designed to control the temperature in an occupied space, by a stand alone control system; with an externally controlled, pressure dependant damper*. The CSS – VAV – E diffuser incorporates a supply air duct temperature sensor and a facia mounted room temperature sensor, allowing the specifically designed, curved edge, single blade control damper, positioned via a 24 V AC motor, to provide an infinite range of airflows, from minimum to maximum design flow rates. The space temperature set point is factory preset at a default of 21 degrees C, or may be adjusted from the face of the diffuser, via an Optional Infrared Remote Control. CSS – VAV – E diffusers shall be finished in powder coat and are complete with a 'Premi-Aire™' Pre-Insulated Side Entry box, with a 250 mm diameter inlet spigot and are suitable for Lay-in to a 'T Rail' ceiling grid, or may be surface mounted with an Optional 'T Rail' support frame. All shall be as manufactured by Holyoake. **A 'CSS-VAV-E Tandem' unit may be linked in parallel with the above, to provide the same airflow performance.*** ***An additional system static pressure device may be required, plus an input from the building system temperature control.**

CSS – VAV – LP – **16** – **FINISH**
24
48

Ceiling Slot Swirl VAV 'Low Profile' Diffuser

Number of Slots

Holyoake White, Powder Coat

Ceiling Slot Swirl VAV 'Low Profile' Diffusers shall be Holyoake Model "CSS – VAV – LP". These shall be designed with a radial, high induction, air flow pattern, providing strong ceiling effect (COANDA) and be capable of handling a wide range of air flows. Designed to control the temperature in an occupied space, by an externally controlled, pressure dependant damper. Controlled by a room thermostat and building management system (supplied by others), the CSS- VAV – LP has a specifically designed, curved edge, single blade control damper, positioned by a 24 V AC modulating actuator, via a 0-10 V DC control signal. CSS – VAV – LP Diffusers shall be finished in Powder Coat and are complete with a 'Low Profile' Premi-Aire™ Pre-Insulated box, with an oval spigot of 200, or 250 mm equivalent diameter. All shall be as manufactured by Holyoake

Series CSS Product Weights	
Sizes Available	Weights in Kg
CSS8	1.3
CSS16	2.4
CSS21	2.5
CSS24	2.5
CSS48	2.6
CSSR500 8	2.81
CSSR500 16	3.01
CSSR500 21	3.03
CSSR615 8	3.05
CSSR615 16	3.25

Series CSS Product Weights	
Sizes Available	Weights in Kg
CSSR615 21	3.35
CSSR615 24	3.35
CSSR615 48	3.45
450 GALV BOX	6.5
600 GALV BOX	6.5
450 PREM BOX	2.1
600 PREM BOX	2.7
500 DIA GALV PLENUM	2.94
615 DIA GALV PLENUM	3.14

Note: All ceiling diffusers, seismic restraints are required, but not supplied.