

CSS-VAV – Ceiling Slot Swirl VAV Diffuser

Model: CSS-VAV Diffuser

The Holyoake CSS – VAV is an externally controlled pressure dependant* VAV diffuser, complete with an adjustable blade control damper, positioned by a 24 V AC variable actuator, via a 0-10 V DC control signal.

*Performance data on the following pages is based on static pressure behind the diffuser being maintained. All testing was carried out using Spiro-set Semi-Rigid Aluminium ducting. For all VAV applications we would recommend the use of Spiro-set ducting.

Control of the diffuser is via a room thermostat and building management system (supply and installation by others).

Designed to control the temperature in a space by having the ability to change the supply air volume between a minimum and maximum, as detailed in the performance data.

(The Primary Air Temperature is not controlled by this system and would require an input from the building system temperature control).

As standard the CSS – VAV is suitable for lay-in applications into a typical 600 mm ceiling grid and comprises of the following:-

CSS 24 or CSS 48 Ceiling Slot Swirl Diffuser.

Premi-Aire™ Pre-Insulated box.

Single blade control damper.

24 V AC modulating motor with 0-10 V DC control signal.

The CSS – VAV is one of the strongest performing diffusers on the market, with proven induction technology, strong ceiling effect and capable of handling a wide range of air flows.

Using the CSS range of Square Ceiling Slot Swirl diffusers with slots set in a radial angled pattern, providing a circular swirling airflow, which achieves strong room air induction into the supply air path, creating mixing at high level, reducing draughts and uneven temperature gradients.

The whole CSS-VAV assembly, including diffuser, supply plenum box, damper and motor, is a light weight 9.6 kg.

Installation

Installation is simple due to the light weight, square, lay-in design. The assembly can easily be placed into the 'T – Rail' ceiling grid and the supply duct connected to the side entry damper spigot.

Construction

The CSS VAV face plate is constructed of powder coated zinc coated steel (aluminium option available, contact your local Holyoake branch) with tough UV stabilised air pattern elements, available in black, or white. The supply plenum box is assembled from Premi-Aire™ board and is complete with a galvanised steel connecting spigot and aluminium single blade damper, with a 24 V AC modulating motor, positioned for easy access for wiring and maintenance through an adjoining ceiling tile.

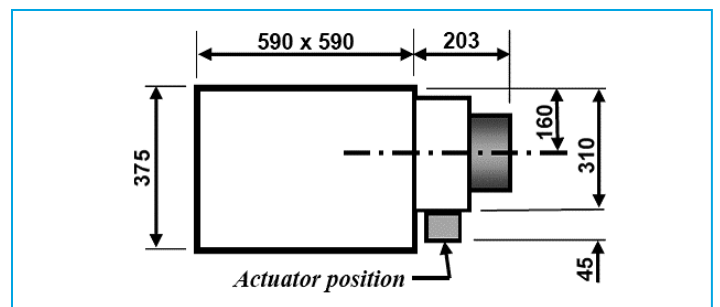
Features

- Lightweight Premi-Aire™ Box Construction.
- Infinite Range of Throw Patterns.
- High Induction Swirl.
- 24 V AC Modulating Actuator.
- 0-10 V DC Positioning Control.
- Pressure Dependant Control.



Technical Data

Swirl Type	CSS24, or CSS48
Box Type	Premi-Aire™
Thermal Rating	R1.0
Control Damper	Single Blade
Actuator	24 V AC, c/w 0-10 V DC Signal
Spigot Diameter	250mm
Gross Weight	9.6 kg



Inlet Static Pressure 13Pa - CSS24-VAV-250-SBD

Damper Position	Actuator Signal	Flow m ³ /s	Throw (m) at Vt(m/s)			NC
			0.25	0.5	0.75	
100% Open	10 VDC	0.175	2.7	1.8	1.1	32
75% Open	7.5 VDC	0.159	2.5	1.6	0.9	31
50% Open	5 VDC	0.106	1.4	0.8	n/a	27
25% Open	2.5 VDC	0.052	0.8	n/a	n/a	26
20% Open	2 VDC	0.042	0.7	n/a	n/a	25
Min Position	0 VDC	0.023	0.3	n/a	n/a	21

Inlet Static Pressure 20Pa - CSS24-VAV-250-SBD

Damper Position	Actuator Signal	Flow m ³ /s	Throw (m) at Vt(m/s)			NC
			0.25	0.5	0.75	
100% Open	10 VDC	0.213	3.2	2.3	1.6	36
75% Open	7.5 VDC	0.199	3.0	2.1	1.4	33
50% Open	5 VDC	0.134	2.2	1.3	0.7	29
25% Open	2.5 VDC	0.062	1.0	0.1	n/a	27
20% Open	2 VDC	0.055	0.8	n/a	n/a	26
Min Position	0 VDC	0.030	0.5	n/a	n/a	22

Inlet Static Pressure 25Pa - CSS24-VAV-250-SBD

Damper Position	Actuator Signal	Flow m ³ /s	Throw (m) at Vt(m/s)			NC
			0.25	0.5	0.75	
100% Open	10 VDC	0.237	3.4	2.5	1.8	42
75% Open	7.5 VDC	0.221	3.3	2.4	1.7	37
50% Open	5 VDC	0.147	2.3	1.5	0.8	30
25% Open	2.5 VDC	0.073	1.2	0.3	n/a	29
20% Open	2 VDC	0.063	1.0	0.1	n/a	27
Min Position	0 VDC	0.034	0.6	n/a	n/a	23

Inlet Static Pressure 30Pa - CSS24-VAV-250-SBD

Damper Position	Actuator Signal	Flow m ³ /s	Throw (m) at Vt(m/s)			NC
			0.25	0.5	0.75	
100% Open	10 VDC	0.258	3.5	2.7	2.0	49
75% Open	7.5 VDC	0.243	3.4	2.5	1.8	44
50% Open	5 VDC	0.162	2.5	1.6	0.9	34
25% Open	2.5 VDC	0.078	1.2	0.3	n/a	30
20% Open	2 VDC	0.068	1.1	0.2	n/a	28
Min Position	0 VDC	0.038	0.6	n/a	n/a	24

Inlet Static Pressure 40Pa - CSS24-VAV-250-SBD

Damper Position	Actuator Signal	Flow m ³ /s	Throw (m) at Vt(m/s)			NC
			0.25	0.5	0.75	
100% Open	10 VDC	0.300	3.9	3.0	2.4	57
75% Open	7.5 VDC	0.278	3.7	2.8	2.2	50
50% Open	5 VDC	0.190	2.9	2.0	1.3	36
25% Open	2.5 VDC	0.091	1.3	0.8	n/a	32
20% Open	2 VDC	0.079	1.2	0.3	n/a	29
Min Position	0 VDC	0.042	0.7	n/a	n/a	25

*Note

The air volume performance for VAV diffusers is dependant on static pressure behind the diffuser being maintained.

CSS-VAV 600 48 – Performance Data

Inlet Static Pressure 13Pa - CSS48-VAV-250-SBD

Damper Position	Actuator Signal	Flow m ³ /s	Throw (m) at Vt(m/s)			NC
			0.25	0.5	0.75	
100% Open	10 VDC	0.200	3.1	2.1	1.5	30
75% Open	7.5 VDC	0.178	2.7	1.8	1.4	29
50% Open	5 VDC	0.104	1.8	1.2	0.7	26
25% Open	2.5 VDC	0.050	1.6	0.6	n/a	24
20% Open	2 VDC	0.045	1.5	0.5	n/a	23
Min Position	0 VDC	0.020	0.4	n/a	n/a	20

Inlet Static Pressure 20Pa - CSS48-VAV-250-SBD

Damper Position	Actuator Signal	Flow m ³ /s	Throw (m) at Vt(m/s)			NC
			0.25	0.5	0.75	
100% Open	10 VDC	0.250	3.8	2.7	2.0	35
75% Open	7.5 VDC	0.222	3.5	2.4	1.7	32
50% Open	5 VDC	0.130	2.0	1.5	0.8	26
25% Open	2.5 VDC	0.062	1.6	0.7	0.3	24
20% Open	2 VDC	0.054	1.6	0.7	0.3	24
Min Position	0 VDC	0.026	0.4	n/a	n/a	20

Inlet Static Pressure 25Pa - CSS48-VAV-250-SBD

Damper Position	Actuator Signal	Flow m ³ /s	Throw (m) at Vt(m/s)			NC
			0.25	0.5	0.75	
100% Open	10 VDC	0.275	3.9	3.0	2.3	40
75% Open	7.5 VDC	0.247	3.8	2.7	2.0	35
50% Open	5 VDC	0.145	2.4	1.7	1.1	27
25% Open	2.5 VDC	0.071	1.7	1.2	0.7	26
20% Open	2 VDC	0.062	1.6	0.7	0.3	24
Min Position	0 VDC	0.030	0.8	n/a	n/a	20

Inlet Static Pressure 30Pa - CSS48-VAV-250-SBD

Damper Position	Actuator Signal	Flow m ³ /s	Throw (m) at Vt(m/s)			NC
			0.25	0.5	0.75	
100% Open	10 VDC	0.300	4.2	3.3	2.6	47
75% Open	7.5 VDC	0.280	3.9	3.0	2.3	43
50% Open	5 VDC	0.180	2.7	1.8	1.4	32
25% Open	2.5 VDC	0.082	1.7	1.2	0.7	28
20% Open	2 VDC	0.070	1.7	1.2	0.7	27
Min Position	0 VDC	0.034	0.8	n/a	n/a	22

Inlet Static Pressure 40Pa - CSS48-VAV-250-SBD

Damper Position	Actuator Signal	Flow m ³ /s	Throw (m) at Vt(m/s)			NC
			0.25	0.5	0.75	
100% Open	10 VDC	0.350	4.5	3.6	2.9	54
75% Open	7.5 VDC	0.320	4.3	3.4	2.7	49
50% Open	5 VDC	0.206	3.1	2.1	1.5	35
25% Open	2.5 VDC	0.100	1.8	1.2	0.7	31
20% Open	2 VDC	0.082	1.7	1.2	0.7	29
Min Position	0 VDC	0.040	1.5	0.5	n/a	23

*Note

The air volume performance for VAV diffusers is dependant on static pressure behind the diffuser being maintained.

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.

Product Ordering Key and Suggested Specifications

CSS – VAV Ceiling Slot Swirl VAV Diffuser	– 24 48 Number of Slots	– FINISH Holyoake White, Powder Coat	<p>Ceiling Slot Swirl VAV Diffusers shall be Holyoake Model CSS – VAV.</p> <p>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.</p> <p>Designed to control the temperature in an occupied space, by an externally controlled, pressure dependant damper.</p> <p>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 VAC variable actuator, via a 0 – 10 V DC control signal.</p> <p>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.</p> <p>All shall be as manufactured by Holyoake.</p>
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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.