DIFFUSERS

Diffusers - Sub Section Contents

Ceiling Round Adjustable	79 - 89D
Barrel/Jet/Floor/Eyelash	91 - 112D
Ceiling Swirl	113 - 140D
Ceiling Multi Pattern	141 - 172D
Ceiling Square Face Round Neck	173 - 184D
Ceiling Perforated	185 - 200D

ECO-A – Environmental Ceiling Outlet - Automatic

DIFFUSERS CEILING ROUND ADJUSTABLE

CRA	Ceiling Round Adjustable	80 - 81D
CRA-T	Ceiling Round Adjustable - Thermal	80 - 81D
CRP	Ceiling Round Adjustable - Plaque	82 - 83D
CRP-T	Ceiling Round Adjustable - Plaque - Thermal	82 - 83D
ECO-A	Environmental Ceiling Outlet - Automatic	85 - 88D
ECO-M	Environmental Ceiling Outlet - Manual	84 & 88D
Ordering Key & Specifications		89D

- Round adjustable
- Louver face and plaque type variable volume diffuser
- Multi cone circular
- Ceiling thermal diffuser
- Aluminium spun construction
- UV stabilised and fire rated polymer construction
- Full range of air distribution patterns

CRA – Ceiling Round Adjustable Diffuser

Model: **CRA**

Adjustable Supply Air Pattern, from Horizontal to Vertical Projection.
Manual, or Automatic adjustment via a Thermal Power Pill.

The CRA diffuser is an adjustable supply air pattern diffuser that offers architecturally appealing styling with superior ceiling effect, over standard round ceiling diffusers, to offer excellent diffusion efficiency and flexibility. All of the diffusers in the CRA range have three cones to maintain a uniformity of appearance. In standard form the diffuser is manually adjustable to change the supply air pattern from horizontal for cooling to a vertical discharge for heating. The adjustment is made by turning the small centre cone to provide horizontal throw in the down position and vertical throw in the up position.

The radial supply air pattern and slim flange of the CRA means the diffuser achieves a better ceiling effect than standard round ceiling diffusers. This makes the diffuser suitable for variable air volume applications. The radial supply air pattern also means that the diffuser still delivers the air horizontally even when there is no ceiling present, making it ideal for use with exposed duct systems.

Model: **CRA-T**

The CRA can also be supplied with the ability to change the supply air pattern automatically. This is coded CRA-T. In this form the diffuser will throw air horizontally with a supply air temperature below 24ºC and air with a temperature above 28ºC will be thrown vertically. This is achieved with a thermal power pill. No wiring is required[1].

Installation

The CRA comes complete with a patented installation system, of spun aluminium construction, designed to provide a perfect finish irrespective of the ceiling design. Each size of diffuser has a complimentary mounting plate that has been designed to fix the diffuser in solid ceilings, suspended ceiling tiles and in the case where no ceiling is present, exposed duct arrangements.

Construction

CRA diffusers are constructed from aluminium spinnings supported by aluminium arms holding the screw thread adjustment mechanism.

Features

- Compact flange for superior ceiling effect.
- Adjustable supply air pattern, for Horizontal, or Vertical projection.
- Installation mounting plate.
- Spun aluminium construction.
- Automatic thermal option.
- Suitable for use with exposed duct installations.

CRA Size	Weight in Kg
200	1.1
250	1.25
300	1.8
350	2.15
400	2.8
CRA - T	Add 0.8

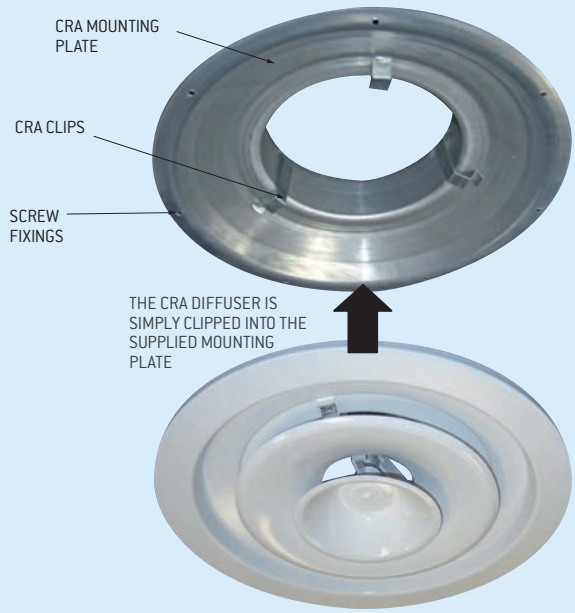
Notes

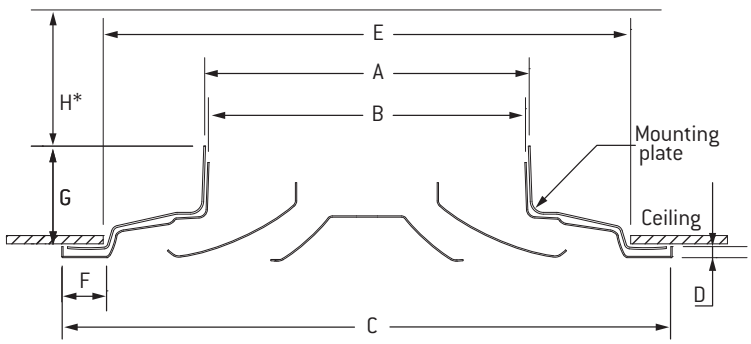
1. **Thermal power pill on CRA-T versions extends 230mm above the assembly and suitable clearance is required.**

2. **Seismic restraints required, but not supplied.**

CRA - Ceiling Round Adjustable

Mounting System





CRA								
Nominal Duct Size	A	B	C	D	E	F	G	H
200	195	187	387	8	335	27	88	230
250	245	237	463	8	410	27	88	230
300	295	287	552	10	490	41	91	230
350	345	337	600	10	545	41	91	230
400	395	387	650	10	585	41	91	230

Model: **CRA**

Nominal Duct Size 200mm Diameter	**Flow Rate (l/s)**	**50**	**75**	**100**	**125**	**150**	**175**	**200**	**225**
	Neck Velocity (m/s)	1.84	2.76	3.68	4.60	5.52	6.44	7.36	8.28
	Velocity Pressure (Pa)	2	5	7	12	20	25	32	40
	Total Pressure (Pa)	12	17	24	30	38	43	50	55
	Throw (m) @ 0.75 m/s	1	1.5	1.8	2.3	2.6	2.8	3	3.5
	Throw (m) @ 0.50 m/s	1.2	2	2.3	2.7	3	3.3	3.5	3.8
	Throw (m) @ 0.25 m/s	2	2.5	2.8	3.2	3.5	3.8	4.2	4.8
	NC	**17**	**20**	**25**	**30**	**35**	**38**	**42**	**45**
Nominal Duct Size 250mm Diameter	**Flow Rate (l/s)**	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**275**
	Neck Velocity (m/s)	2.29	2.86	3.43	4.00	4.57	5.15	5.72	6.29
	Velocity Pressure (Pa)	4	5	8	10	11	14	16	18
	Total Pressure (Pa)	10	20	28	40	50	60	68	75
	Throw (m) @ 0.75 m/s	1.5	1.8	2.4	2.8	3.0	3.2	3.4	3.5
	Throw (m) @ 0.50 m/s	2.3	2.5	2.8	3.3	3.4	3.8	4.2	4.3
	Throw (m) @ 0.25 m/s	3.0	3.3	3.4	3.8	3.9	4.5	4.8	4.9
	NC	**20**	**22**	**25**	**29**	**32**	**34**	**37**	**40**
Nominal Duct Size 300mm Diameter	**Flow Rate (l/s)**	**150**	**175**	**200**	**225**	**250**	**300**	**325**	**350**
	Neck Velocity (m/s)	2.34	2.73	3.11	3.50	3.89	4.67	5.06	5.45
	Velocity Pressure (Pa)	3	6	7	10	12	15	18	20
	Total Pressure (Pa)	12	18	22	30	35	50	60	70
	Throw (m) @ 0.75 m/s	2.2	2.8	3.1	3.5	4.0	4.2	4.3	4.5
	Throw (m) @ 0.50 m/s	3.2	3.8	3.9	4.0	4.2	5.0	5.2	5.5
	Throw (m) @ 0.25 m/s	4.2	4.5	4.7	4.8	4.9	6.0	6.1	6.2
	NC	**22**	**25**	**27**	**30**	**32**	**34**	**35**	**37**
Nominal Duct Size 350mm Diameter	**Flow Rate (l/s)**	**200**	**225**	**250**	**275**	**300**	**325**	**350**	**375**
	Neck Velocity (m/s)	2.26	2.54	2.82	3.10	3.39	3.67	3.95	4.23
	Velocity Pressure (Pa)	2	3	4	6	7	8	10	11
	Total Pressure (Pa)	10	17	22	25	28	32	39	45
	Throw (m) @ 0.75 m/s	2.0	2.2	2.5	2.6	2.8	3.0	3.2	3.3
	Throw (m) @ 0.50 m/s	2.5	2.8	3.2	3.4	3.6	3.8	3.9	4.0
	Throw (m) @ 0.25 m/s	3.4	3.7	4.0	4.2	4.3	4.5	4.7	4.9
	NC	**21**	**22**	**24**	**25**	**27**	**30**	**32**	**34**
Nominal Duct Size 400mm Diameter	**Flow Rate (l/s)**	**275**	**300**	**325**	**350**	**375**	**400**	**425**	**450**
	Neck Velocity (m/s)	2.35	2.56	2.78	2.99	3.21	3.42	3.63	3.85
	Velocity Pressure (Pa)	3	5	6	6.5	7	8	9	10
	Total Pressure (Pa)	10	16	20	24	26	28	30	32
	Throw (m) @ 0.75 m/s	2.2	2.3	2.6	2.8	2.9	3.2	3.4	3.5
	Throw (m) @ 0.50 m/s	3.0	3.4	3.5	3.7	3.9	4.0	4.2	4.3
	Throw (m) @ 0.25 m/s	4.0	4.2	4.5	4.8	5.1	5.3	5.4	5.5
	NC	**20**	**22**	**24**	**26**	**27**	**28**	**29**	**30**

Notes on Performance Data

1. All pressures are in Pascals.
2. Minimum radii of diffusion are to a terminal velocity (Vt) of 0.75 m/s and maximum to 0.25 m/s. If diffuser is mounted on an exposed round duct, multiply radii of diffusions shown by 0.70.
3. The NC values are based on a room absorption of 8dB re 10^{-12} Watts.
4. For effect of dampering see page 12A, table 9.
5. Performance data shown is for the diffuser with cones in the 'down' position for horizontal throw. Performance for the cones in the 'up' position for vertical downwards throw, can be approximated by the use of the following factors:

Total Pressure	**X 1.6**
Radii of Diffusion	X 0.9
NC	+ 5

CRP – Ceiling Round Adjustable Plaque Diffuser

Model: **CRP**

Adjustable Supply Air Pattern, from Horizontal to Vertical Projection.
Manual, or Automatic adjustment via a Thermal Power Pill.

The CRP diffuser is an adjustable supply air plaque diffuser that offers an alternative appearance to the CRA range with visually appealing styling and a strong ceiling effect. All of the diffusers in the CRP range have a circular plaque core to maintain a uniformity of appearance. In standard form the diffuser is manually adjustable to change the supply air pattern from horizontal for cooling to vertical discharge for heating. The adjustment is made by turning the circular plaque core centre to provide horizontal throw in the down position and vertical throw in the up position.

The radial supply air pattern and slim flange of the CRP means the diffuser achieves an excellent ceiling effect. This makes the diffuser suitable for variable air volume applications.

CRA - Ceiling Round Adjustable Plaque

Model: **CRP-T**

The CRP can also be supplied with the ability to change the supply air pattern automatically. This is coded CRP-T. In this form the diffuser will throw air horizontally with a supply air temperature below 24ºC and air with a temperature above 28ºC will be thrown vertically. This is achieved with a thermal power pill. No wiring is required[1].

Mounting System

Installation

The CRP comes complete with a patented installation system, of spun aluminium construction, designed to provide a perfect finish irrespective of the ceiling design. Each size of diffuser has a complimentary mounting plate that has been designed to fix the diffuser in solid ceilings, suspended ceiling tiles and in the case where no ceiling is present, exposed duct arrangements.

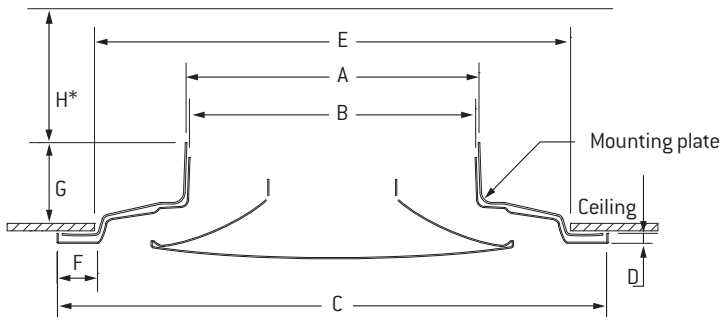
Construction

CRP diffusers are constructed from aluminium spinnings supported by aluminium arms holding the screw thread adjustment mechanism.

Features

- Compact flange for superior ceiling effect.
- Adjustable Supply Air pattern Plaque, for Horizontal, or Vertical Projection.
- Installation mounting plate.
- Spun aluminium construction.
- Automatic thermal option.
- Suitable for use with exposed duct installations.

CRP Size	Weight in Kg
200	1.1
250	1.25
300	1.8
350	2.15
400	2.8
CRP - T	Add 0.8



CRP								
Nominal Duct Size	A	B	C	D	E	F	G	H
200	195	187	387	8	335	27	88	230
250	245	237	463	8	410	27	88	230
300	295	287	552	10	490	41	91	230
350	345	337	600	10	545	41	91	230
400	395	387	650	10	585	41	91	230

Notes

1. **Thermal power pill on CRP-T versions extends 230mm above the assembly and suitable clearance is required.**

2. **Seismic restraints required, but not supplied.**

Model: **CRP**

	Flow Rate (l/s)	50	75	100	125	150	175	200
Nominal Duct Size 200mm Diameter	Neck Velocity (m/s)	1.84	2.76	3.68	4.60	5.52	6.44	7.36
	Velocity Pressure (Pa)	2	5	7	12	20	25	32
	Total Pressure (Pa)	17	24	30	38	43	50	55
	Throw (m) @ 0.75 m/s	1.5	1.8	2.3	2.6	2.8	3.0	3.5
	Throw (m) @ 0.50 m/s	2.0	2.3	2.7	3.0	3.3	3.5	3.8
	Throw (m) @ 0.25 m/s	2.5	2.8	3.2	3.5	3.8	4.2	4.8
	NC	20	26	30	35	38	42	45
	Flow Rate (l/s)	**100**	**125**	**150**	**175**	**200**	**225**	**250**
Nominal Duct Size 250mm Diameter	Neck Velocity (m/s)	2.29	2.86	3.43	4.00	4.57	5.15	5.72
	Velocity Pressure (Pa)	4	5	8	10	11	14	16
	Total Pressure (Pa)	20	28	40	50	60	68	75
	Throw (m) @ 0.75 m/s	1.8	2.4	2.8	3.0	3.2	3.4	3.5
	Throw (m) @ 0.50 m/s	2.5	2.8	3.3	3.4	3.8	4.2	4.3
	Throw (m) @ 0.25 m/s	3.3	3.4	3.8	3.9	4.5	4.8	4.9
	NC	22	25	29	32	34	37	40
	Flow Rate (l/s)	**150**	**175**	**200**	**225**	**250**	**300**	**325**
Nominal Duct Size 300mm Diameter	Neck Velocity (m/s)	2.34	2.73	3.11	3.50	3.89	4.67	5.06
	Velocity Pressure (Pa)	3	6	7	10	12	15	18
	Total Pressure (Pa)	18	22	30	35	50	60	70
	Throw (m) @ 0.75 m/s	2.8	3.1	3.1	4.0	4.2	4.3	4.5
	Throw (m) @ 0.50 m/s	3.8	3.9	4.0	4.2	5.0	5.2	5.5
	Throw (m) @ 0.25 m/s	4.5	4.7	4.7	4.9	6.0	6.1	6.2
	NC	25	27	30	32	34	35	37
	Flow Rate (l/s)	**200**	**225**	**250**	**275**	**300**	**325**	**350**
Nominal Duct Size 350mm Diameter	Neck Velocity (m/s)	2.26	2.54	2.82	3.10	3.39	3.67	3.95
	Velocity Pressure (Pa)	2	3	4	6	7	8	10
	Total Pressure (Pa)	17	22	25	28	32	39	45
	Throw (m) @ 0.75 m/s	2.2	2.5	2.6	2.8	3.0	3.2	3.3
	Throw (m) @ 0.50 m/s	2.8	3.2	3.4	3.6	3.8	3.9	4.0
	Throw (m) @ 0.25 m/s	3.7	4.0	4.2	4.3	4.5	4.7	4.9
	NC	22	24	25	27	30	32	34
	Flow Rate (l/s)	**275**	**300**	**325**	**350**	**375**	**400**	**425**
Nominal Duct Size 400mm Diameter	Neck Velocity (m/s)	2.35	2.56	2.78	2.99	3.21	3.42	3.63
	Velocity Pressure (Pa)	3	5	6	6.5	7	8	9
	Total Pressure (Pa)	16	20	24	26	28	30	32
	Throw (m) @ 0.75 m/s	2.3	2.6	2.8	2.9	3.2	3.4	3.5
	Throw (m) @ 0.50 m/s	3.4	3.5	3.7	3.9	4.0	4.2	4.3
	Throw (m) @ 0.25 m/s	4.2	4.5	4.8	5.1	5.3	5.4	5.5
	NC	22	24	26	27	28	29	30

Notes on Performance Data

1. All pressures are in Pascals.
2. Minimum radii of diffusion are to a terminal velocity (Vt) of 0.75 m/s and maximum to 0.25 m/s. If diffuser is mounted on an exposed round duct, multiply radii of diffusions shown by 0.70.
3. The NC values are based on a room absorption of 8dB re 10^{-12} Watts.
4. For effect of dampering see page 12A, table 9.
5. Performance data shown is for the diffuser with cones in the 'down' position for horizontal throw. Performance for the cones in the 'up' position for vertical downwards throw, can be approximated by the use of the following factors:

Total Pressure	X 1.6
Radii of Diffusion	X 0.9
NC	+ 5

ECO-M – Environmental Ceiling Outlet

Model: **ECO–Manual**

Description

The ECO Manual Diffuser is a supply or return air diffuser made from an Engineering Polymer. It has a simple, visually appealing style that is suitable in commercial and domestic buildings alike. The central diffusion cone of the ECO can be adjusted up or down by hand to control the air volume being supplied. For 'shut off' the cone can be adjusted fully home to stop the air supply completely.

Performance

The radial supply air pattern of the ECO Manual creates a strong ceiling effect resulting in a draft-less environment. The strong ceiling effect allows it to be used in Variable Air Volume applications.

Installation

The ECO Manual is very easy to install. A hole is created in the ceiling using the supplied template. The ECO can then be offered up to the ceiling and the ducting attached. The neck of the ECO is then inserted through the hole in the ceiling enabling the four retaining legs to snap over retaining the ECO tightly on the ceiling. The ECO can be mounted into both solid and suspended ceilings with little fuss using the automatic snap over retaining legs. NOTE: Seismic restraints required, but not supplied.

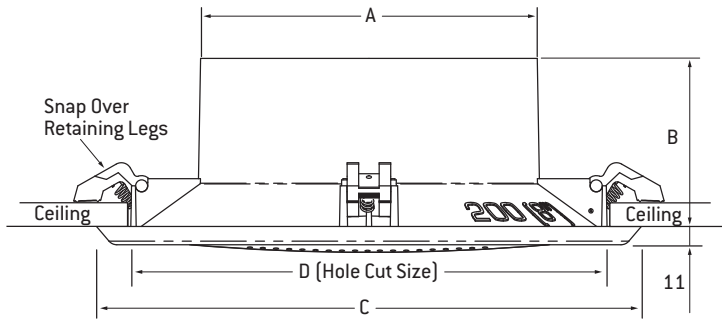
Retrofit Installation

The ECO Manual fits into the same sized hole as other similar types of diffuser. In addition the slightly larger diameter outer flange covers any imperfections in the ceiling finish that may have been left when the original diffuser was removed.

Construction and Finish

The ECO is constructed of a tough UV stabilised and fire rated engineering polymer. The colour of the ECO is White. All visible surfaces have a textured finish.

Environmental Ceiling Outlet



ECO-M	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
150	147	100	269	240 ± 5	0.8
200	197	100	319	290 ± 5	1.1
250	247	108	391	360 ± 5	1.6
300	297	123	440	410 ± 5	2.2

Model: **ECO - M**

Horizontal Radial Throw (Isothermal Air).

	Flow Rate (l/s)	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375	400
Nominal Duct Size 150mm Diameter	Supply Pstatic (Pa)	7	23	50	84	133											
	Exhaust Pstatic (Pa)	5	19	43	80	130											
	Horizontal Radial Throw (m) @0.75m/s	-	0.5	1.0	1.3	1.6											
	Horizontal Radial Throw (m) @0.50m/s	0.4	1.1	1.5	2.1	2.4											
	Horizontal Radial Throw (m) @0.25m/s	0.9	1.8	2.4	3.0	3.6											
	NC	-	-	16	27	35											
	Flow Rate (l/s)	**25**	**50**	**75**	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**275**	**300**	**325**	**350**	**375**	**400**
Nominal Duct Size 200mm Diameter	Supply Pstatic (Pa)	-	9	20	36	54	76	103									
	Exhaust Pstatic (Pa)	3	14	30	50	80	118	160									
	Horizontal Radial Throw (m) @0.75m/s	-	-	0.8	1.2	1.3	1.9	2.5									
	Horizontal Radial Throw (m) @0.50m/s	-	0.9	1.2	1.8	2.0	2.5	3.0									
	Horizontal Radial Throw (m) @0.25m/s	-	1.5	2.3	2.8	3.2	3.7	4.1									
	NC	-	-	-	-	18	24	27									
	Flow Rate (l/s)	**25**	**50**	**75**	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**275**	**300**	**325**	**350**	**375**	**400**
Nominal Duct Size 250mm Diameter	Supply Pstatic (Pa)	-	8	17	25	35	44	56	70	85	102	123					
	Exhaust Pstatic (Pa)	2	7	16	28	45	65	90	120	-	-	-					
	Horizontal Radial Throw (m) @0.75m/s	-	-	0.7	1.1	1.2	1.8	2.3	2.4	2.5	2.7	3.1					
	Horizontal Radial Throw (m) @0.50m/s	-	0.8	1.1	1.6	1.8	2.4	2.7	3.0	3.3	3.9	4.2					
	Horizontal Radial Throw (m) @0.25m/s	-	1.3	2.2	2.4	3.0	3.6	3.9	4.2	4.8	5.1	5.4					
	NC	-	-	-	-	-	15	17	18	22	27	31					
	Flow Rate (l/s)	**25**	**50**	**75**	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**275**	**300**	**325**	**350**	**375**	**400**
Nominal Duct Size 300mm Diameter	Supply Pstatic (Pa)	-	-	6	8	11	15	18	23	28	33	39	45	52	61	68	75
	Exhaust Pstatic (Pa)	-	-	6	12	16	20	23	30	37	41	44	58	63	75	80	95
	Horizontal Radial Throw (m) @0.75m/s	-	-	0.6	0.8	1.2	1.4	1.6	1.8	2.0	2.1	2.4	2.7	2.9	3.0	3.3	3.4
	Horizontal Radial Throw (m) @0.50m/s	-	-	1.0	1.5	1.8	2.0	2.3	2.6	2.7	3.0	3.3	3.5	3.6	3.7	3.9	4.1
	Horizontal Radial Throw (m) @0.25m/s	-	-	1.8	2.3	2.7	3.0	3.2	3.3	3.6	3.9	4.2	4.4	4.5	4.8	5.0	5.1
	NC	-	-	-	-	-	-	-	-	-	-	-	15	17	18	18	21

Model: **ECO–Automatic**

Description

The ECO Automatic is a circular ceiling diffuser with the capability of automatically altering a portion of the supply airflow, from a horizontal to a vertical throw, depending on the supply air temperature. Suited for both domestic and commercial situations the appearance of the ECO Automatic is enhanced by the addition of a perforated front face. If the damper is set to automatic mode the perforated face enables some air to be directed downwards when in heating mode, while a portion of the air continues to be directed horizontally. This spreading of the warm air ensures fast mixing and even temperature distribution across the height of the room.

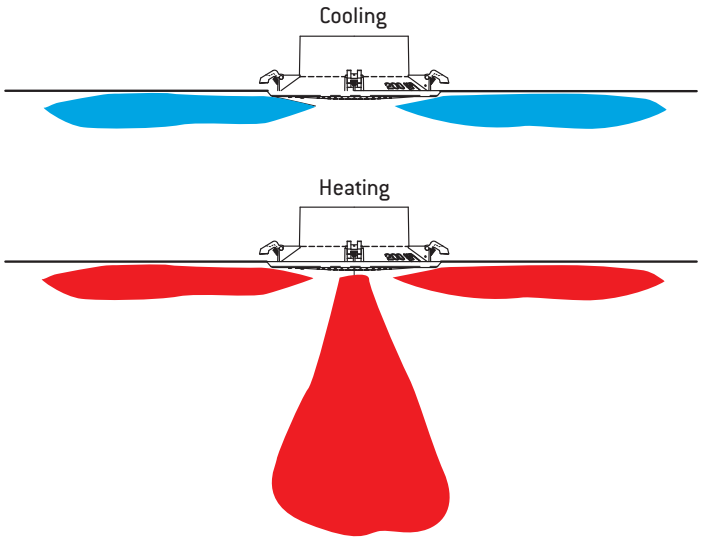
Operation

The ECO can automatically direct a portion of the supply air vertically when the supply air temperature is above 30°C. A temperature sensing device detects the supply air temperature and opens or closes a 'go – no go' damper to position the damper in Heating Mode, or Cooling Mode. In Heating Mode a portion of the supply air is let through the holes in the front face allowing it to be projected vertically downwards. In Cooling Mode all of the supply air is directed horizontally allowing mixing with the room air at high level and therefore reducing the chance of draughts being felt. The ECO is powered by the supply air temperature and does not need any external power source.

The ECO Automatic can also be locked in either the Heating, or Cooling modes by positioning the Operator in the side of the front face. The Operator locks into position effectively stopping the 'go – no go' damper from moving.

Performance

The ECO Automatic has the same performance as the ECO Manual while in Cooling Mode. A very strong radial ceiling effect is maintained at varying flow rates, making it suitable for variable air volume systems. In heating mode the benefits of throwing a portion of the heated air vertically, is a greatly reduced temperature gradient across the height of the room and a considerably faster heat up period.



Automatic Environmental Ceiling Outlet

Installation

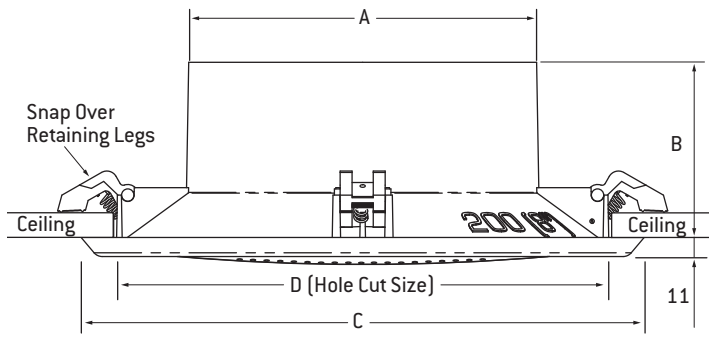
The ECO Automatic is very easy to install. A hole is created in the ceiling using the supplied template. The ECO will then be offered up to the ceiling and the ducting attached. The neck of the ECO is then inserted through the hole in the ceiling, enabling the four retaining legs to snap over, retaining the ECO tightly on the ceiling. The ECO can be mounted into both solid and suspended ceilings with little fuss, using the automatic snap over retaining legs.

Retrofit Installation

The ECO Automatic fits into the same sized hole as other similar types of diffuser. In addition, the slightly larger diameter outer flange, covers any imperfections in the ceiling finish that may have been left when the original diffuser was removed.

Construction and Finish

The ECO is constructed of a tough UV stabilised and fire rated engineering polymer. The colour of the ECO is White. All visible surfaces have a textured finish.



ECO-A	A (mm)	B (mm)	C (mm)	D (mm)
200	197	100	319	290 ± 5
250	247	108	391	360 ± 5
300	297	123	440	410 ± 5

ECO-A – Performance Data

Model: **ECO-A**

Horizontal Radial Throw - Cooling Mode.

	Flow Rate (l/s)	50	75	100	125	150	175	200	225	250	275	300	325	350
Nominal Duct Size 200mm Diameter.	Static Pressure (Pa)	10	22	40	60	84	113	144	176	211				
	Horizontal Radial Throw (m) @ 0.75 m/s		0.8	1.1	1.2	1.8	2.4	2.9	3.4	3.9				
	Horizontal Radial Throw (m) @ 0.50 m/s	0.9	1.1	1.7	1.9	2.4	2.9	3.5	3.9	4.4				
	Horizontal Radial Throw (m) @ 0.25 m/s	1.4	2.2	2.7	3.0	3.5	3.9	4.4	4.9	5.5				
	NC			16	20	25	29	32	35	39				

	Flow Rate (l/s)	50	75	100	125	150	175	200	225	250	275	300	325	350
Nominal Duct Size 250mm Diameter.	Static Pressure (Pa)		19	28	39	48	62	77	94	112	135	160		
	Horizontal Radial Throw (m) @ 0.75 m/s		0.7	1.0	1.1	1.7	2.2	2.3	2.4	2.6	2.9	3.1		
	Horizontal Radial Throw (m) @ 0.50 m/s		1.0	1.5	1.7	2.3	2.6	2.9	3.1	3.7	4.0	4.3		
	Horizontal Radial Throw (m) @ 0.25 m/s		2.1	2.3	2.9	3.4	3.7	4.0	4.6	4.8	5.1	5.4		
	NC					16	18	20	24	29	33	36		

	Flow Rate (l/s)	50	75	100	125	150	175	200	225	250	275	300	325	325
Nominal Duct Size 300mm Diameter.	Static Pressure (Pa)			9	12	17	20	25	31	36	43	50	57	67
	Horizontal Radial Throw (m) @ 0.75 m/s			0.8	1.1	1.3	1.5	1.7	1.9	2.0	2.3	2.6	2.8	2.9
	Horizontal Radial Throw (m) @ 0.50 m/s			1.4	1.7	1.9	2.2	2.5	2.6	2.9	3.1	3.3	3.4	3.5
	Horizontal Radial Throw (m) @ 0.25 m/s			2.2	2.6	2.9	3.0	3.1	3.4	3.7	4.0	4.2	4.3	4.6
	NC									18	21	23	26	29

Model: **ECO-A**

Horizontal and Vertical Throws - Heating Mode.

	Flow Rate (l/s)	50	75	100	125	150	175	200	225	250	275	300	325	350
Nominal Duct Size 200mm Diameter.	Static Pressure (Pa)	6	14	24	38	53	70	87	105	124				
	Horizontal Radial Throw (m) @ 0.75 m/s	-	0.4	0.6	0.7	0.9	1.1	1.3	1.6	1.9				
	Horizontal Radial Throw (m) @ 0.50 m/s	0.4	0.6	0.9	1	1.2	1.4	1.6	1.9	2.2				
	Horizontal Radial Throw (m) @ 0.25 m/s	0.8	1.2	1.4	1.6	1.8	2	2.3	2.6	2.8				
	Vertical Throw (m) @ 0.75 m/s	-	0.2	0.4	0.6	0.8	1	1.3	1.5	1.8				
	Vertical Throw (m) @ 0.50 m/s	0.2	0.3	0.6	0.8	1	1.2	1.4	1.6	1.9				
	Vertical Throw (m) @ 0.25 m/s	0.4	0.6	0.8	1	1.2	1.4	1.7	2	2.3				
	NC	-	-	18	20	24	26	31	33	36				

	Flow Rate (l/s)	50	75	100	125	150	175	200	225	250	275	300	325	350
Nominal Duct Size 250mm Diameter.	Static Pressure (Pa)		11	17	24	30	39	49	59	71	86	101		
	Horizontal Radial Throw (m) @ 0.75 m/s		0.3	0.5	0.6	0.9	1.1	1.2	1.2	1.3	1.5	1.7		
	Horizontal Radial Throw (m) @ 0.50 m/s		0.5	0.8	0.9	1.2	1.3	1.5	1.6	1.9	2.1	2.3		
	Horizontal Radial Throw (m) @ 0.25 m/s		1.1	1.2	1.5	1.8	1.9	2.1	2.4	2.5	2.7	2.9		
	Vertical Throw (m) @ 0.75 m/s		0.2	0.4	0.5	0.7	1	1.1	1.1	1.2	1.3	1.5		
	Vertical Throw (m) @ 0.50 m/s		0.2	0.4	0.7	1	1.1	1.2	1.3	1.4	1.5	1.8		
	Vertical Throw (m) @ 0.25 m/s		0.3	0.5	1	1.2	1.3	1.4	1.6	1.7	1.8	1.9		
	NC		-	-	-	-	18	20	23	28	32	34		

	Flow Rate (l/s)	50	75	100	125	150	175	200	225	250	275	300	325	350
Nominal Duct Size 300mm Diameter.	Static Pressure (Pa)			5	7	10	12	16	19	23	27	31	36	42
	Horizontal Radial Throw (m) @ 0.75 m/s			0.4	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.4	1.5
	Horizontal Radial Throw (m) @ 0.50 m/s			0.7	0.9	1	1.1	1.3	1.4	1.5	1.6	1.7	1.8	1.8
	Horizontal Radial Throw (m) @ 0.25 m/s			1.1	1.3	1.5	1.6	1.7	1.8	1.9	2.1	2.2	2.2	2.4
	Vertical Throw (m) @ 0.75 m/s			0.3	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.4
	Vertical Throw (m) @ 0.50 m/s			0.5	0.6	0.8	0.9	1	1.1	1.2	1.3	1.4	1.5	1.5
	Vertical Throw (m) @ 0.25 m/s			0.7	0.8	1	1.1	1.2	1.3	1.4	1.5	1.6	1.8	1.9
	NC			-	-	-	-	-	-	18	20	22	25	28

Notes

1. Cooling Performance Data based on Isothermal air.
2. Heating Performance Data based on a temperature differential of 17 Degrees C.
3. Seismic restraints required but not supplied.

Model: **ECO-R**

Return/Exhaust Performance.

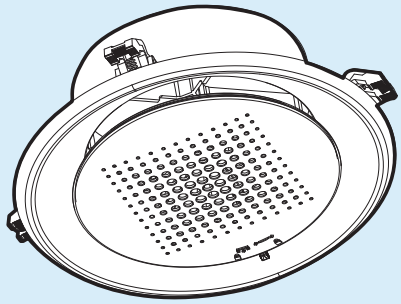
	Flow Rate (l/s)	25	50	75	100	125	150
Nominal Duct Size 150mm Diameter.	Negative Static Pressure (Pa)	5	19	43	80	130	175
	NC	18	22	24	27	35	37

ECO-A Size	Weight in Kg
200	1.1
250	1.6
300	2.2

ECO-R Size	Weight in Kg
150	0.8

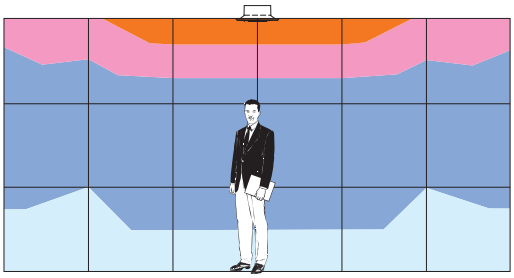
Heating Comparison

The graphical comparison below shows the temperature gradient in a room that has been heated from cold. The graphs demonstrate how the ECO – Automatic quickly achieves an even heat distribution across the height of the room. The vertical and horizontal air jets are more effective at evenly distributing and mixing the heat than with a horizontal throw only.

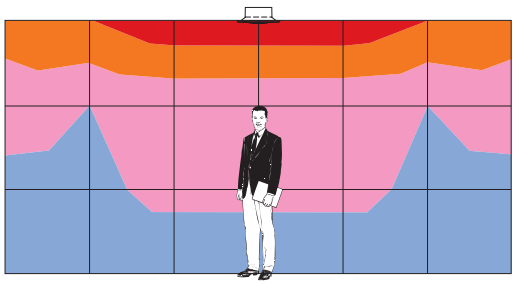


ECO - Automatic Diffuser Performance

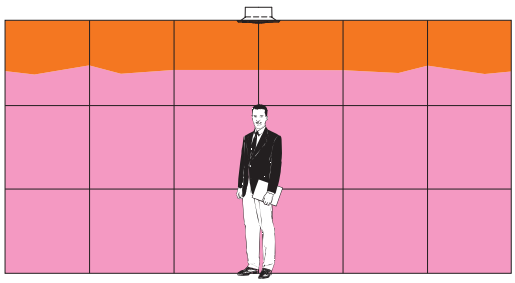
20 Min Heating



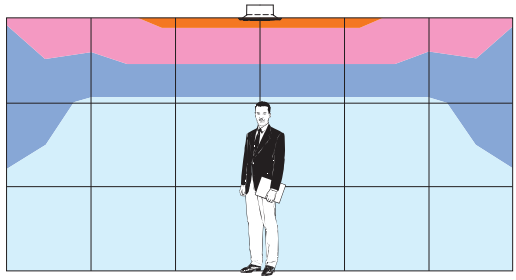
30 Min Heating

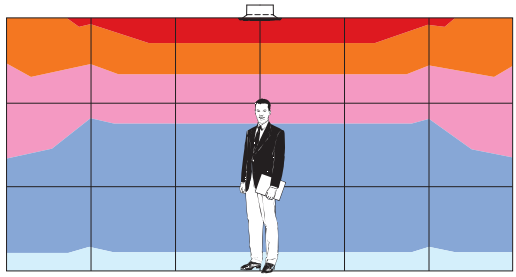


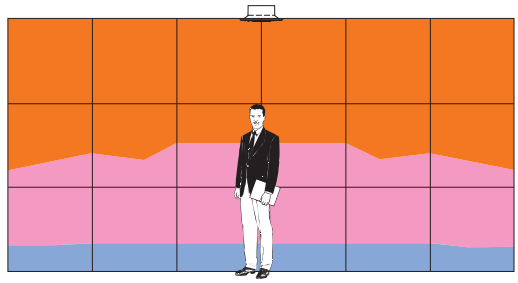
60 Min Heating



Comparable Non-Automatic Diffuser Performance







ECO – Models & Settings

ECO - M

Model: **ECO-M**

Environmental Ceiling Outlet Manual circular radial pattern ceiling diffuser with plaque fascia.

ECO - A

Model: **ECO-A**

Environmental Ceiling Outlet Automatic circular radial pattern ceiling diffuser with perforated fascia.

Model: **ECO-R***

Environmental Ceiling Outlet - Return/Exhaust

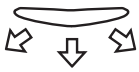
(Design, as ECO-A above).

* 150mm Duct Size Only

Adjustment Settings

The ECO Automatic Diffuser is versatile and can be adjusted to operate Automatically or set to provide the combination air pattern or alternatively set for horizontal air pattern only by simply moving the adjustment arm into the desired setting position.

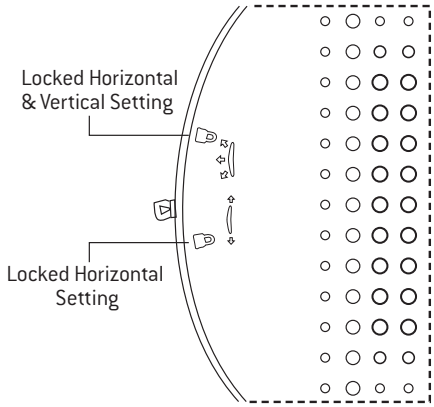
Horizontal & Vertical Air Pattern
Heating Mode

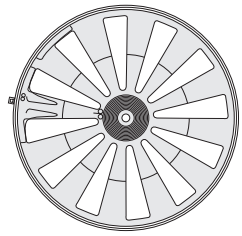


Combination Horizontal & Vertical (heating)

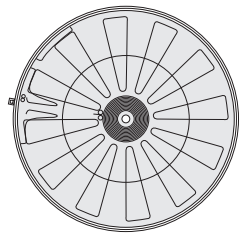
Horizontal Air Pattern
Cooling Mode

Horizontal Only (cooling)





Damper Open



Damper Closed

SAV – Steel Air Valve

Model: **SAV**

Description

The SAV diffuser, used in exhaust applications, offers an aesthetically pleasing finish in a steel construction. Complete with an adjustable cone for airflow volume adjustment, the cone can easily be adjusted by removing the diffuser from the mounting frame. A peripheral gasket seal guarantees a perfect seal between the diffuser and frame to hold the cone in position.

Installation

The SAV is suitable for all installation types (walls, ceilings, or duct installations). The diffuser can be rotated in the groove for quick removal and adjustment of the cone position. Fastenings should be through the mounting frame.

Component Parts

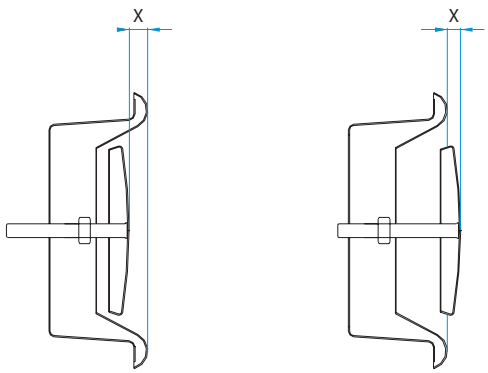
1) Diffuser
2) Cone
3) Frame

Construction and Finish

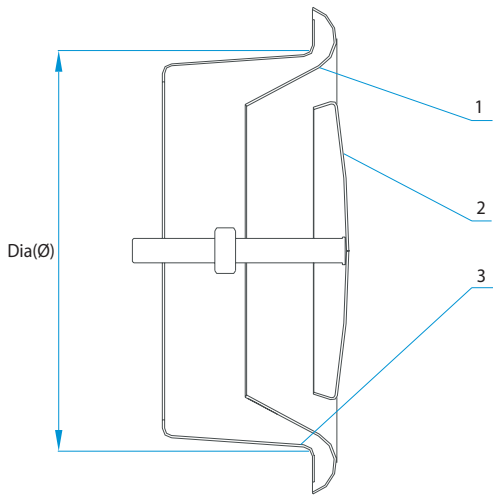
The SAV is constructed from galvanised steel with the diffuser and cone available in white powdercoat.

Performance

Adjust the airflow volume by rotating the cone within the diffuser.



Steel Air Valve



Model: **SAV**

Exhaust Performance Data

	Flow Rate (l/s)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
Nominal Duct Size 150mm Diameter	Exhaust Static Pressure (Pa) X+12	-	-	-	4.1	7.3	11.8	17.7	25.3	34.4	45.7	58.5	73.4	91.0	110.6	133.0	-
	X+6	-	-	4.7	9.4	16.2	25.1	36.6	51.0	68.1	88.1	110.8	136.9	-	-	-	-
	X+3	-	-	6.7	13.2	22.5	34.6	50.3	69.3	91.8	118.2	148.7	-	-	-	-	-
	X+0	-	3.9	10.2	20.1	34.0	51.9	74.6	102.5	135.7	-	-	-	-	-	-	-
	X-3	-	6.1	15.7	30.7	52.1	79.6	114.4	-	-	-	-	-	-	-	-	-
	X-6	-	9.0	24.0	48.4	83.3	129.0	-	-	-	-	-	-	-	-	-	-
	NC	-	-	-	<25	30	35	>40	-	-	-	-	-	-	-	-	-

	Flow Rate (l/s)	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Nominal Duct Size 200mm Diameter	Exhaust Static Pressure (Pa) X+12	-	-	-	4.9	7.1	9.9	13.3	17.3	21.9	27.2	33.3	40.0	47.6	55.9	65.1	75.1
	X+6	-	-	6.3	9.8	14.4	19.9	26.5	34.4	43.3	53.5	65.2	78.1	92.5	108.4	125.3	144.7
	X+3	-	4.9	8.5	13.4	19.6	27.3	36.4	47.2	59.8	74.1	90.4	108.3	128.4	-	-	-
	X+0	-	7.3	12.6	19.7	28.7	39.7	52.9	68.6	86.5	107.0	129.7	-	-	-	-	-
	X-3	6.0	12.4	21.5	34.0	49.9	69.3	93.3	121.2	-	-	-	-	-	-	-	-
	X-6	9.7	19.8	34.7	54.6	80.2	111.7	-	-	-	-	-	-	-	-	-	-
	NC	-	-	-	<25	30	35	>40	-	-	-	-	-	-	-	-	-

ECO-A, ECO-M, CRA & CRP

Product Ordering Key and Suggested Specifications

CRA – 200 – FINISH

- CRA: Series
- 200: Nominal Duct Size
- FINISH: Holyoake White Mill Aluminium Powder Coat

Circular Ceiling Diffusers shall be Holyoake Model CRA with compact flange and adjustable air pattern. Diffusers shall be manufactured from spun aluminium with threaded adjustable core mechanism. The air pattern shall be radial and adjustable from horizontal to vertical. Circular Ceiling Diffuser to be supplied with integral mounting system. Diffusers shall be finished in powdercoat and fitted with accessories and dampers where indicated.

All shall be as manufactured by Holyoake.

CRA-T – 200 – FINISH

- CRA-T: Series
- 200: Nominal Duct Size
- FINISH: Holyoake White Mill Aluminium Powder Coat

Circular Ceiling Diffusers shall be Holyoake Model CRA-T with compact flange and thermal core adjustment. Diffusers shall be of spun aluminium construction with Holyoake thermal power pill. With supply air temperatures below 24 degrees the supply air pattern is diffused horizontally. With supply air temperatures above 28 degrees the core is automatically lifted to produce a supply air pattern diffused vertically. Circular Ceiling Diffuser to be supplied with integral mounting system. Diffusers shall be finished in powdercoat and fitted with accessories and dampers where indicated.

All shall be as manufactured by Holyoake.

CRP – 200 – FINISH

- CRP: Series
- 200: Nominal Duct Size
- FINISH: Holyoake White Mill Aluminium Powder Coat

Circular Ceiling Diffusers shall be Holyoake Model CRP with compact flange and adjustable supply air plaque. Diffusers shall be manufactured from spun aluminium with threaded adjustable plaque core. The air pattern shall be radial and adjustable from horizontal to vertical. Circular Ceiling Diffusers to be supplied with integral mounting system. Diffusers shall be finished in powdercoat and fitted with accessories and dampers where indicated.

All shall be as manufactured by Holyoake.

CRP-T – 200 – FINISH

- CRP-T: Series
- 200: Nominal Duct Size
- FINISH: Holyoake White Mill Aluminium Powder Coat

Circular Ceiling Diffusers shall be Holyoake Model CRP-T with compact flange and thermal core adjustment. Diffusers shall be of spun aluminium construction with Holyoake thermal power pill. With supply air temperatures below 24 degrees the supply air pattern is diffused horizontally. With supply air temperatures above 28 degrees the core is automatically lifted to produce a supply air pattern diffused vertically. Circular Ceiling Diffuser to be supplied with integral mounting system. Diffusers shall be finished in powdercoat and fitted with accessories and dampers where indicated.

All shall be as manufactured by Holyoake.

ECO – M – 150 / 200 / 250

- ECO: Series
- M: Manual
- 150 / 200 / 250: Duct Size

Ceiling diffusers shall be Holyoake Series ECO-M, manufactured from injection moulded tough U.V. stabilised and fire rated engineering polymer, in self coloured white as standard. Series ECO-M shall have the ability to regulate the airflow via an adjustable central cone.

All shall be as manufactured by Holyoake.

ECO – A – 200 / 250 / 300

- ECO: Series
- A: Automatic
- 200 / 250 / 300: Duct Size

Ceiling diffusers shall be Holyoake Series ECO-A, manufactured from injection moulded tough U.V. stabilised and fire rated engineering polymer, in self coloured white as standard.

Series ECO-A shall have the ability to regulate the airflow via an adjustable central cone and automatically direct a portion of the airflow downwards, when supplying air above 30°C.

All shall be as manufactured by Holyoake.

ECO – R – 150

- ECO: Series
- R: Return/Exhaust
- 150: Duct Size

Ceiling diffusers shall be Holyoake Series ECO-R, manufactured from injection moulded tough U.V. stabilised and fire rated engineering polymer, in self coloured white as standard. The exhaust air can be regulated via an adjustable central cone.

All shall be as manufactured by Holyoake.

FSD – Floor Swirl Diffuser

DIFFUSERS BARREL/JET FLOOR/EYELASH

BHC	Barrel High Capacity	92 - 93D
DFR	Displacement Floor Mounted Round	98 - 99D
DS	Displacement Step Mounted	100 - 101D
EL	Eyelash (Curved Blade)	104 - 109D
ELP	Eyelash (Curved Blade) Panel	105 - 109D
FSD	Floor Swirl Diffuser	102 - 103D
JND	Jet Nozzle Diffuser	96 - 97D
JD	Jet Diffuser	94 - 95D
TLC-EL	Eyelash (Curved Blade) Curved Frame	105 - 109D
Ordering Key & Specification		110 - 111D

- Barrel, Jet, Swirl, Displacement and Eyelash Diffusers.
- Floor, Step, Wall, Ceiling and Panel Mounted.
- Adjustable, Perforated and Curved Blade Options.
- Curved Frame.
- Full range of air distribution patterns.

BHC – High Capacity Barrel Diffuser

Model: **BHC**

The Holyoake BHC (Barrel High Capacity) is a high capacity barrel diffuser that has been developed to provide a solution when large open areas are to be conditioned. Applications include large retail outlets, gymnasiums, conference centres and factories, or any large space requiring high capacity and long throw diffusion.

The BHC Diffuser has the ability to direct conditioned air to where it is needed. Individually adjustable blades allow the throw direction and spread of the supply jet to be altered. The rotating barrel allows the direction of the supply to be altered vertically. This function can be motorised to provide more efficient heating and cooling functions, as the jet can be directed downwards when the system is in heating mode.

Construction

The BHC diffuser is constructed from aluminium. Two standard sizes are available but longer units may be supplied, if requested. Consult with your local Holyoake branch.

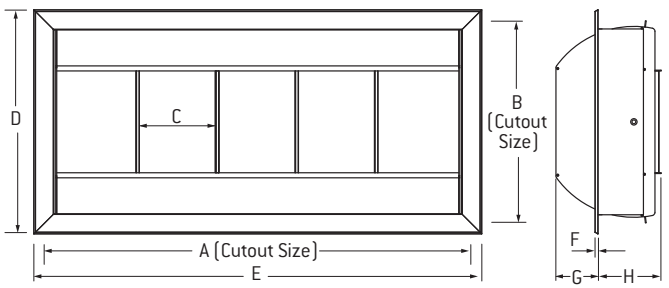
The BHC can be supplied in an anodized, mill or powdercoated finish.

Installation

The BHC is designed to be mounted into a plenum box that may contain a number of the units pointing in different directions.

The 30mm flange allows the unit to be mounted to a plenum using screw fixings through the flange.

Dimensions



Size	Dimension (mm)							
	A	B	C	D	E	F	G	H
635 x 300	672	320	125	352	710	5	67	100
1270 x 300	1308	320	125	352	1342	5	67	100

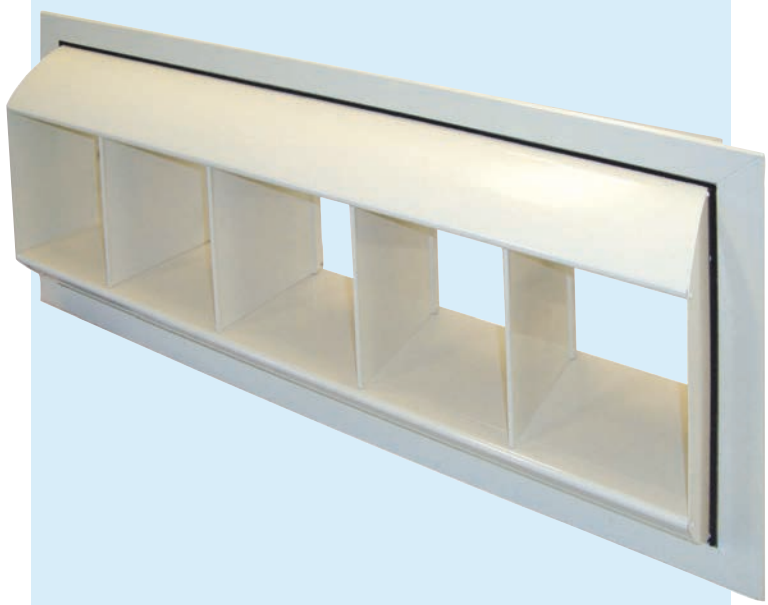
Other sizes may be available, please contact your local Holyoake branch for more information.

Options

Motorised – The facility to electrically rotate the barrel from horizontal, to downwards angled throws, (when in heating mode), can be achieved with either 24, or 230 V AC actuators, fitted internally to the mounting flange, concealing them within the supply plenum.
Thermal – A Thermal Power Pill, can be fitted to achieve the same adjustment as above, without the requirement of an electrical supply. Both options providing greater heating efficiencies.

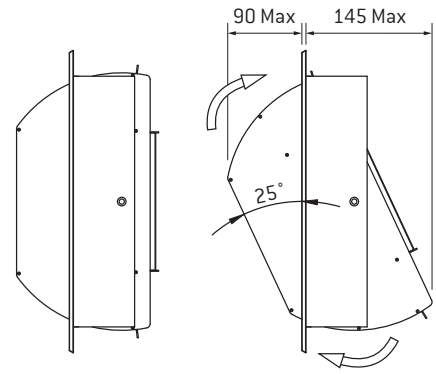
BHC SIZE	Approximate Weight in Kg.
635 x 300	3.08
1270 x 300	6.20
If Motorised add 2 Kg.	

High Capacity Barrel Diffuser



Changing the Direction of Throw

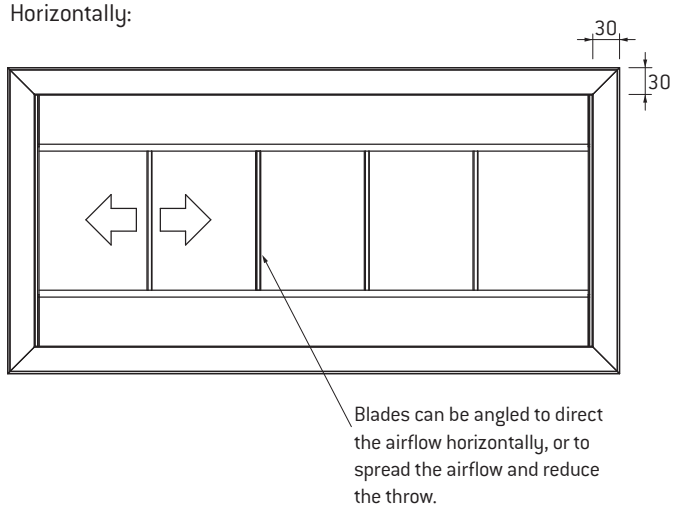
Vertically:



Airflow Horizontal

Angled Downwards or Upwards

Horizontally:



Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

	Size	635 x 300			1270 x 300		
	Deflection	0°	15°	25°	0°	15°	25°
Flow (m^3/s)	Free Area (m^2)	0.091	0.072	0.059	0.100	0.085	0.072
0.280	Velocity at outlet (m/s)	3.5	4.0	4.7			
	Throw to 0.75m/s (m)	4.9	4.3	3.4			
	Pt (Pa)	7	10	14			
	NC	-	-	-			
0.380	Velocity at outlet (m/s)	4.2	5.3	6.4			
	Throw to 0.75m/s (m)	6.7	5.8	4.6			
	Pt (Pa)	13	17	24			
	NC	-	-	-			
0.470	Velocity at outlet (m/s)	5.8	6.6	7.9	2.9	3.3	4.1
	Throw to 0.75m/s (m)	8.5	7.3	6.1	6.4	5.5	4.6
	Pt (Pa)	20	26	38	5	7	10
	NC	-	21	26	-	-	-
0.570	Velocity at outlet (m/s)	7.0	7.9	9.5	3.5	4.0	4.9
	Throw to 0.75m/s (m)	10.1	8.5	7.0	7.0	5.8	4.9
	Pt (Pa)	29	38	55	8	10	14
	NC	22	26	31	-	-	-
0.660	Velocity at outlet (m/s)	8.2	9.2	11.1	4.1	4.6	5.7
	Throw to 0.75m/s (m)	11.3	9.4	7.9	7.6	6.4	5.2
	Pt (Pa)	40	51	74	10	13	20
	NC	27	31	36	-	-	22
0.750	Velocity at outlet (m/s)	9.3	10.5	12.7	4.7	5.3	6.6
	Throw to 0.75m/s (m)	13.1	11.0	9.1	9.1	7.6	6.4
	Pt (Pa)	53	67	97	13	17	26
	NC	31	35	40	-	-	23
0.850	Velocity at outlet (m/s)				5.3	6.0	7.4
	Throw to 0.75m/s (m)				11.6	9.8	8.2
	Pt (Pa)				17	21	33
	NC				-	21	26
0.940	Velocity at outlet (m/s)				5.9	6.6	8.2
	Throw to 0.75m/s (m)				12.5	10.7	8.8
	Pt (Pa)				21	26	40
	NC				20	24	29
1.060	Velocity at outlet (m/s)				6.6	7.5	9.2
	Throw to 0.75m/s (m)				14.0	11.9	9.8
	Pt (Pa)				26	34	51
	NC				24	28	33
1.180	Velocity at outlet (m/s)				7.3	8.3	10.2
	Throw to 0.75m/s (m)				15.2	12.8	10.7
	Pt (Pa)				32	41	63
	NC				27	31	36
1.420	Velocity at outlet (m/s)				8.8	10.0	12.3
	Throw to 0.75m/s (m)				18.3	15.5	12.8
	Pt (Pa)				47	60	91
	NC				32	36	41

Performance Notes

1. All pressures are in pascals. To obtain static pressure subtract velocity pressure from the total pressure data provided.
2. Throw figures are to a terminal velocity of 0.75m/s.
3. The NC values are based on a room absorption of 10dB re 10^{-12} watts.

Corrections To Listed Data.			
Throw in m	0.75m/s	0.50m/s	0.25m/s
Multiplier	1.0	1.5	2.0
Deflection	0°	15°	25°
Multiplier	1.00	0.84	0.70

JD – Jet Diffuser

Model: **JD**

The Holyoake JD range of Jet Diffusers have been designed to provide an attractive option for air conditioning large areas. JD diffusers are perfect for situations where large supply air quantities and throw distances are required. All JD diffusers are constructed from three cones that provide a uniformity of appearance through the range.

The JD has two separate modes. Firstly there is diffuse mode where the supply air is spread and diffused into the room over a relatively short distance. The second mode is Jet Mode that throws a high velocity jet of air over a long distance. In Jet mode the direction of throw can be adjusted by up to 15˚ from the centre line of the diffuser. Switching between the two modes is achieved by rotating the cone set through 180˚.

Sizes range from 200mm to 350mm in 50mm increments. JD diffusers can be mounted directly into the end of circular duct, or can be mounted into a plenum box, which may supply air to a number of JD diffusers. Alternatively the JD diffuser may be mounted into a wall, or angled ceiling.

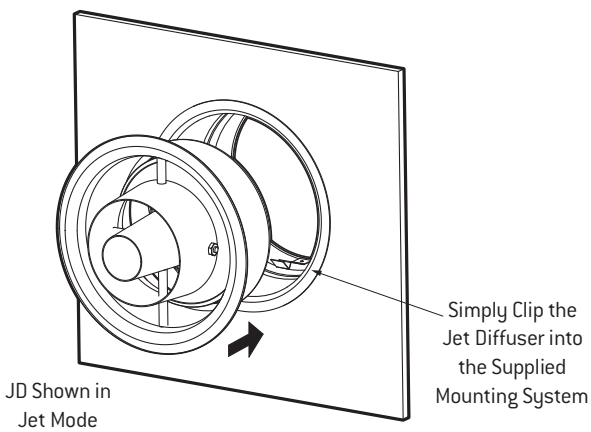
Construction

JD Jet Diffusers are constructed from aluminium spinnings and are held together using threaded rods and aluminium spacers.

The diffuser comes complete with an installation system that is also of spun aluminium construction.

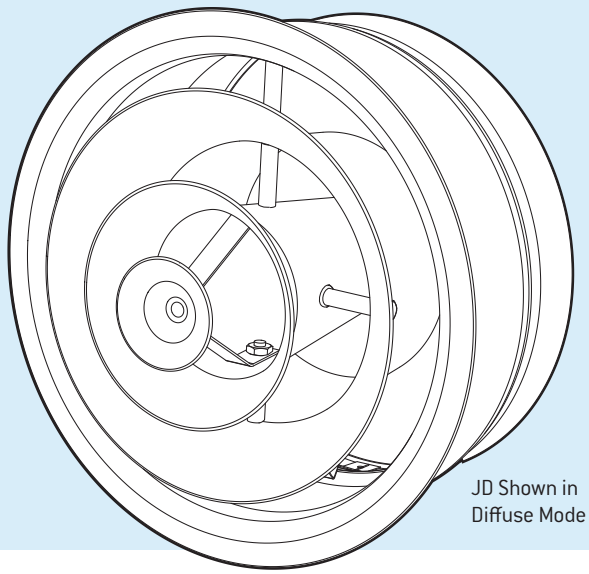
Installation - Mounting System

The JD comes complete with a patented mounting system designed to provide a perfect finish, regardless of the wall, or ceiling construction. The mounting plate can be fitted after the wall, or ceiling is in place and then the JD simply pushed into place when all finishing work is complete. The JD is held securely in place with spring steel retaining clips.

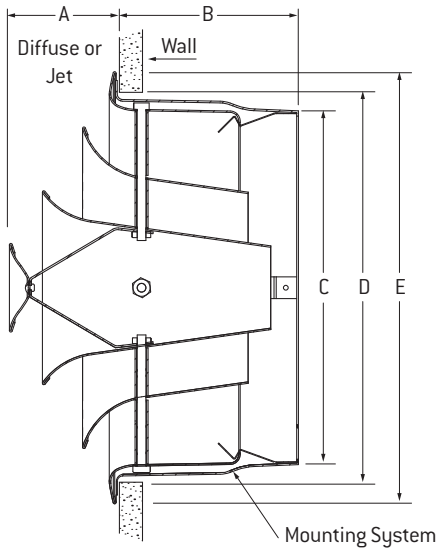


JD Shown in Jet Mode

Jet Diffuser

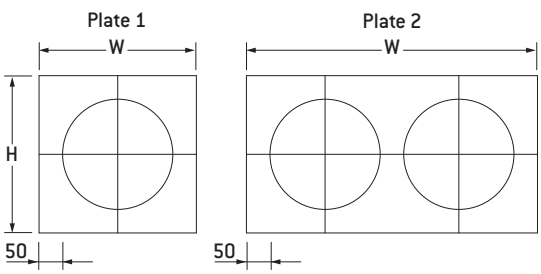


JD Shown in Diffuse Mode



Size	Dimensions (mm)				
	A	B	C	D	E
JD-200	58	126	184	205	234
JD-250	74	126	244	268	298
JD-300	92	140	294	319	348
JD-350	94	140	344	369	398

Optional Mounting Plates



JD Size	Number of JD Mounting Holes			
	1	2	3	4
	W x H	W x H	W x H	W x H
JD-200	334x334	618x334	902x334	1186x334
JD-250	398x398	746x398	1094x398	1442x398
JD-300	448x448	846x448	1244x448	1642x448
JD-350	498x498	946x498	1394x498	1842x498

Plate constructed from aluminium sheet mounted in a Style No. 1 Frame surround, see page 51B. W and H dimensions listed are neck sizes.

Nominal Size	Mode		Air Flow Rate (l/s) 100	150	200	250	300	400	500	600	800	1000
JD-200	Diffuse Mode	Throw (m)	3.4	4.9	7.0	9.0						
		Static Pressure (Pa)	9	18	29	42						
		NC	26	29	35	44						
	Jet Mode	Throw (m)	7.0	9.8	13.8	18.0						
		Static Pressure (Pa)	46	99	154	240						
		NC	30	40	50	59						
JD-250	Diffuse Mode	Throw (m)	1.5	2.5	4.0	5.3	7.0	9.7				
		Static Pressure (Pa)	4	9	14	22	32	55				
		NC	-	24	31	39	44	51				
	Jet Mode	Throw (m)	5.7	8.0	10.0	13.0	15.6	21.5				
		Static Pressure (Pa)	24	56	103	152	220	390				
		NC	16	25	28	39	45	54				
JD-300	Diffuse Mode	Throw (m)		3.0	4.1	5.2	5.9	7.8	9.6	12.0	16.0	
		Static Pressure (Pa)		2	3	4	6	10	16	22	37	
		NC		-	20	27	34	41	47	52	70	
	Jet Mode	Throw (m)		6.0	8.2	10.2	11.8	15.6	19.2	24.0	31.2	
		Static Pressure (Pa)		17	28	44	60	110	170	235	418	
		NC		-	29	37	38	45	55	63	75	
JD-350	Diffuse Mode	Throw (m)			3.2	4.1	4.8	6.4	8.4	9.8	13.2	16.8
		Static Pressure (Pa)			3	4	6	9	12	17	33	57
		NC			18	22	23	34	38	45	51	68
	Jet Mode	Throw (m)			6.5	8.2	9.6	12.6	16.8	19.7	26.4	33.6
		Static Pressure (Pa)			18	28	40	67	104	147	258	396
		NC			30	34	36	41	46	52	61	70

Heating Throw Factors			
Size	Heating Differential		
	5°C	10°C	20°C
JD-200	1.30	0.90	0.65
JD-250	1.20	0.85	0.60
JD-300	1.10	0.75	0.55
JD-350	1.00	0.65	0.45

To estimate maximum vertical projection under heating conditions multiply jet throw data by the relevant factor.

Performance Notes

1. Listed throw distances are to a terminal velocity (Vt) of 0.5 m/s for isothermal conditions.
2. The NC values are based on a room absorption of 10dB re 10^{-12} Watts.
3. To estimate vertical projection under cooling conditions multiply throw factors as follows:-
   10°C cooling x 1.15, 5°c cooling by 1.10.
4. Caution is advised if combining 'diffuse' mode and 'jet' mode off the same supply air system.
   There are considerable static pressure differences between both modes.
5. Seismic Restraints required, but not supplied.

Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

Nominal Duct Size	Approximate Weight in Kg.
JD - 200	1.10
JD - 250	1.20
JD - 300	1.50
JD - 350	1.80

JND – Jet Nozzle Diffuser

Model: **JND**

The Holyoake Jet nozzle diffuser (JND) has been specifically designed to supply large air quantities over long throws with the added benefit of directional control. Jet nozzle diffusers are perfect for supplying large spaces such as halls, airports and swimming pools. The JND consists of a single orifice, which can be adjusted in all directions.

Sizes range from 160mm to 400mm in five incremental sizes. JNDs can be mounted directly into the end of circular duct, or can be mounted into a plenum box, which may supply air to a number of diffusers. Alternatively the JND may be mounted into a wall, or angled ceiling.

Construction

Jet nozzle diffusers are constructed mainly from aluminium spinnings with the exception of the steel surround. The orifice is clamped between the front and rear faces which allows the orifice to move for directional control. Comes in white as standard.

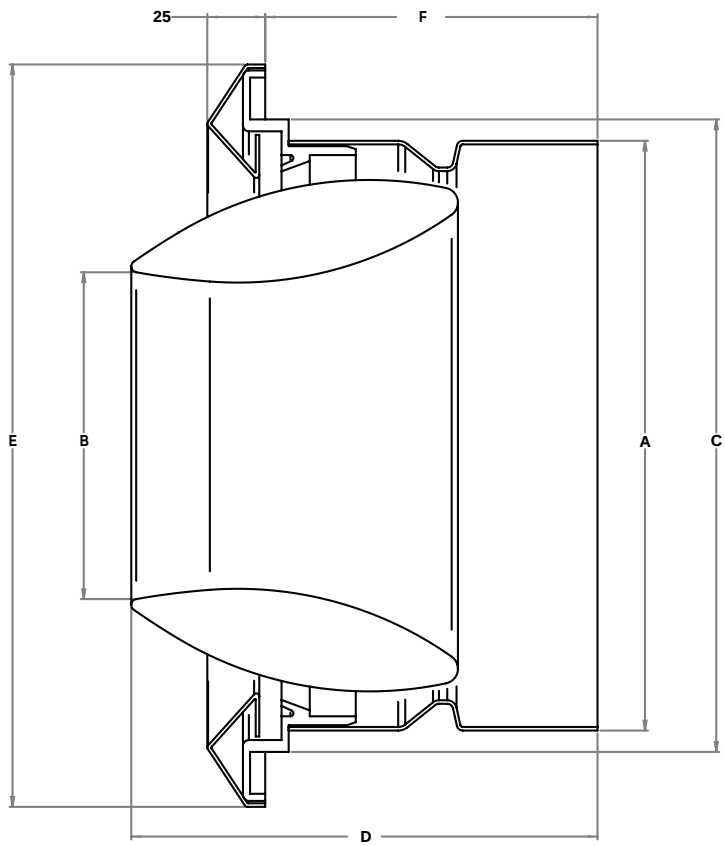
Installation

The JND comes with a concealed mounting system. The diffuser is securely fixed in place using fastners to the wall or ceiling. The front cover face-plate simply twists on to the diffusser to cover the mounting system and provide a seamless finish.

Features

- Simple installation
- Modern aesthetic look.
- Adjustable core
- Directional control
- Long throws

Size	Dimensions (mm)					
	A	B	C	D	E	F
160	159	85	168	130	210	110
200	198	114	215	150	255	118
250	251	142	263	170	300	137
360	355	200	363	215	425	160
400	399	231	407	245	471	168



Nominal Size		Air Flow Rate (l/s)									
		20	30	50	70	100	150	200	300	400	500
160	Throw (m)	0.6	4.6	10.6	14.1						
	Static Pressure (Pa)	7.8	17.4	47.5	92.1						
	NC	<20	<20	<20	28						
200	Throw (m)		1.5	5.0	9.8	15.0	18.0				
	Static Pressure (Pa)		3.8	10.9	21.9	45.8	105.7				
	NC		<20	<20	20	27	36				
250	Throw (m)			2.3	6.7	12.1	18.0	19.9			
	Static Pressure (Pa)			6.1	11.8	24.0	53.6	94.8			
	NC			<20	<20	20	26	38			
360	Throw (m)					7.7	12.5	16.8	23.8	28.8	
	Static Pressure (Pa)					5.4	12.1	21.3	47.5	83.9	
	NC					<20	<20	23	28	35	
400	Throw (m)						10.3	14.0	20.2	24.8	27.8
	Static Pressure (Pa)						7.3	13.1	29.7	53.0	83.1
	NC						<20	21	24	26	35

Heating Throw Factors			
Size	Heating Differential		
	5°C	10°C	20°C
160	1.40	0.95	0.7
200	1.30	0.90	0.65
250	1.20	0.85	0.60
360	1.10	0.75	0.55
400	1.00	0.65	0.45

To estimate maximum vertical projection under heating conditions multiply jet throw data by the relevant factor.

Nominal Duct Size	Approximate Weight in Kg.
160	0.7
200	1.1
250	1.8
360	2.9
400	3.4

Notes on Performance Data

1. Listed throw distances are to a terminal velocity (Vt) of 0.5 m/s for isothermal conditions.
2. The NC values are based on a room absorption of 10dB re 10^{-12} Watts.
3. To estimate vertical projection under cooling conditions multiply throw factors as follows:-
   10°C cooling x 1.15, 5°c cooling by 1.10.
4. Due to lab limitations the throws were determined using Computational Fluid dynamics software(CFD).
5. Seismic Restraints may be required, but not supplied.

DFR – Round Floor Mounted Displacement Diffuser

Model: **DFR**

The Holyoake DFR Series of supply diffusers operate on the principles of Displacement Ventilation.

Displacement Ventilation is essentially a buoyancy driven displacement process where supply air at a temperature slightly cooler than the design room air temperature, is delivered into the room at low level. The cool air spreads across the floor, only rising when it comes into contact with a heat source such as a human. The heated air rises and will exit the room via openings at ceiling level, taking with it any pollutants that have been picked up on the way.

Holyoake DFR Displacement Diffusers have been designed to enable floor mounting, although they can also be used in many other locations. They are ideally suited for use in Auditoria and Theatres. Typically these areas contain a large volume of space that although not occupied, is still conditioned. By introducing the treated air unobtrusively from directly behind the occupants, only the space around the patrons is conditioned, rather than the whole auditorium. This ensures that the occupied area is maintained at ideal conditions, whilst saving energy treating the whole space at design parameters.

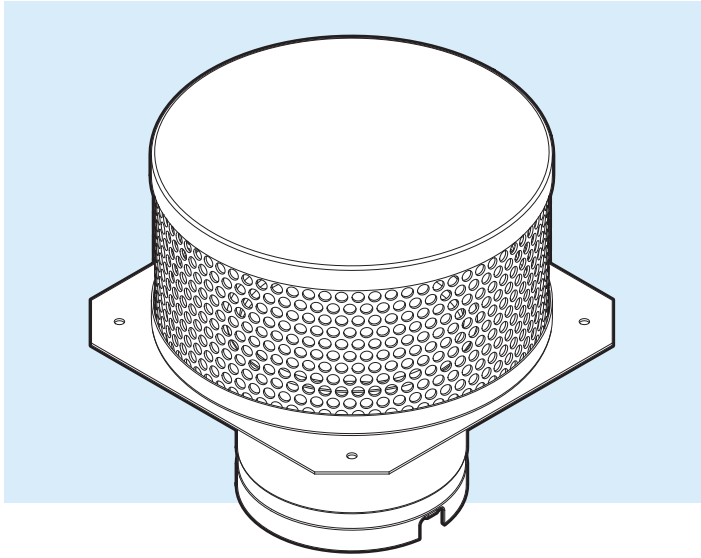
Features

- Compact Unobtrusive Design.
- Energy Saving Operation.
- No Drafts.
- Low Noise.
- Simple Installation.
- Black Powder Coat Finish.

Construction

The DFR is of robust construction and manufactured from zinc coated steel. Standard finish is powder coat Black.

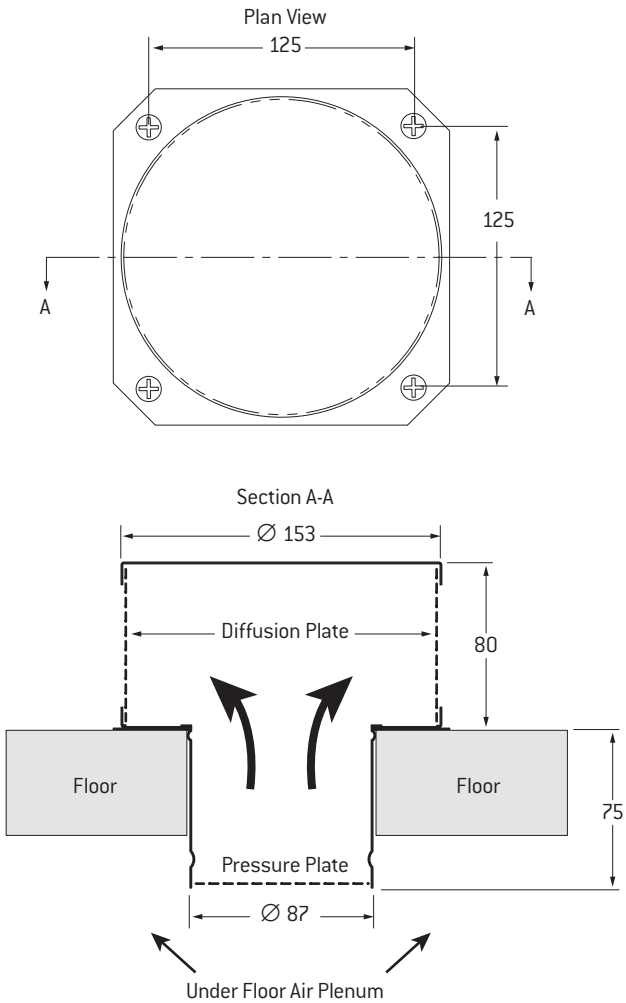
The Holyoake DFR Series of supply diffusers operate on the principles of Displacement Ventilation.



Installation

The DFR is simply inserted through a hole in the floor ensuring that the neck of the diffuser is fed from the supply plenum under the floor area. The diffuser is then fixed in place with screws inserted through the four holes in the mounting plate and suitably sealed between the flange and the plenum.

Series DFR



			Velocity at specified distance from diffuser face (m/s)			
Flowrate (l/s)	ΔPs (Pa)	NC	100mm	200mm	300mm	400mm
7.5	11	17	0.25	0.15	0.10	-
10.0	21	20	0.35	0.25	0.15	0.10
12.5	28	21	0.45	0.35	0.25	0.15

Performance Notes

1. ΔPs – Static Pressure inside the supply plenum
2. Acoustic data assumes a standard room absorption of 10dB, Re 10^{-12} watts.
3. All testing was performed with the diffuser mounted in a plenum box.

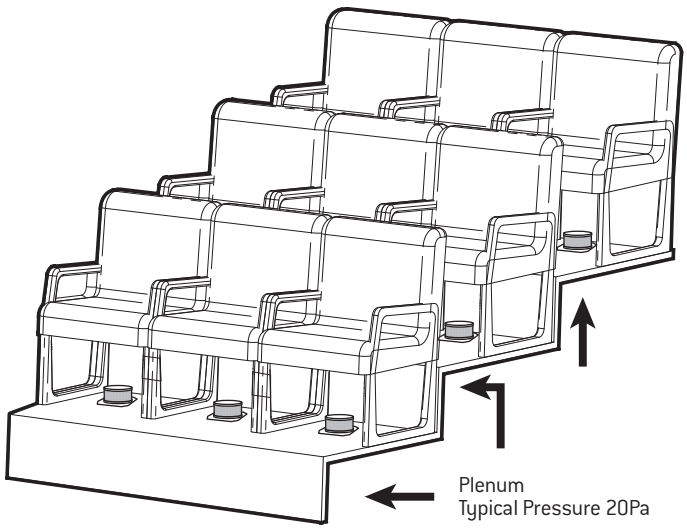
Performance

The DFR displacement diffuser supplies a low velocity, low momentum blanket of air into the occupied space. Low velocities ensure that no drafts are felt by the occupants. Plenum pressures of around 10-20 Pa will achieve excellent balancing across all diffusers while achieving low noise and throw lengths.

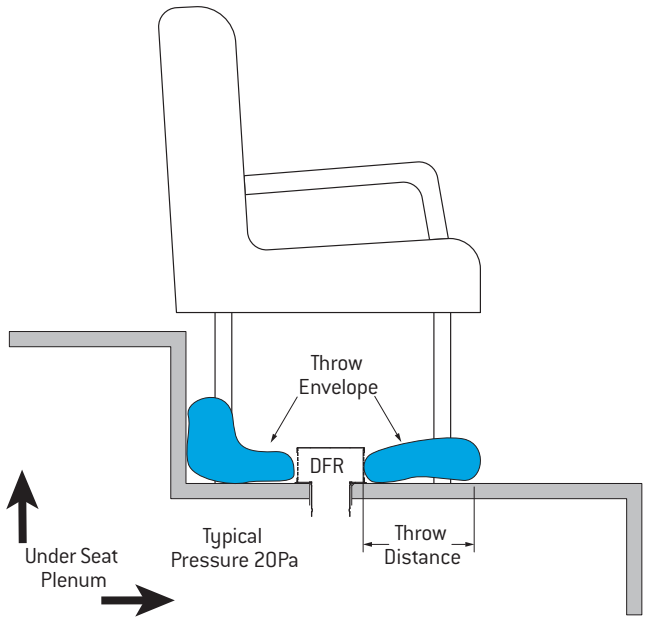
System Balancing

The DFR Displacement Diffuser achieves the unobtrusive delivery of conditioned air, whilst still maintaining a significant pressure drop across the grille. This allows the diffuser to be used in plenum fed distribution systems without balancing dampers. In theatres and auditoria, the area under the seating can be used as the supply plenum.

Typical Underseat Installation



Cross Sectional View



Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

Series	Approximate Weight in Kg.
DFR	0.76

DS – Step Mounted Displacement Diffuser

Model: **DS**

The Holyoake DS Series of supply diffusers operate on the principles of Displacement Ventilation.

Displacement Ventilation is essentially a buoyancy driven displacement process, where supply air at a temperature slightly cooler than the design room air temperature, is delivered into the room at low level. The cool air spreads across the floor only rising when it comes into contact with a heat source such as a human. The heated air rises and will exit the room via openings at ceiling level, taking with it any pollutants that have been picked up on the way.

Holyoake DS Displacement Diffusers have been designed to enable step mounting, although they can also be used in many other locations. They are ideally suited for use in Auditoria and Theatres. Typically these areas contain a large volume of space that although not occupied is still conditioned. By introducing the treated air unobtrusively from directly behind the occupants, only the space around the patrons is conditioned, rather than the whole auditorium. This ensures that the occupied area is maintained at ideal conditions, whilst saving energy treating the whole space at design parameters.

Features

- Unobtrusive Step Mounting.
- Energy Saving Operation.
- No Drafts.
- Low Noise.
- Easy Installation.
- Decorative Fascia.

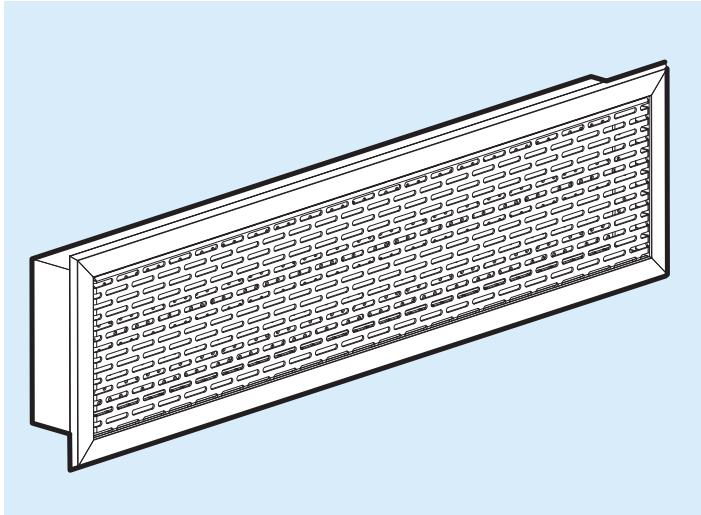
Performance

The DS displacement diffuser supplies a low velocity, low momentum, blanket of air into the occupied space. Low velocities ensure that no drafts are felt by the occupants. Plenum pressures of around 15-20 Pa will achieve excellent balancing across all diffusers, while achieving low noise and throw lengths.

Performance Notes

1. ΔPs – Static Pressure inside the supply plenum.
2. Throw lengths are based on a velocity of 0.25m/s.
3. Exit Velocity is the supply air velocity on leaving the diffuser face.
4. A_N – is the area of the exact neck of the diffuser.
5. Acoustic data assumes a standard room absorption of 10dB, Re 10^{-12} watts.
6. All testing was performed with the diffuser mounted in a plenum box.

Guide Weights 25mm Flange	
Nominal Size	**Approximate Weight in Kg.**
250 x 150	1.08
400 x 300	3.50
600 x 200	2.21
200 x 600	2.21
800 x 150	3.46
1000 x 120	4.33



Surround and Fixing Systems

The design of the grille ensures that any number of simple installation methods can be used. The Holyoake RC frame system is compatible with the 25 mm wide flange which, allows for the easy removal of the grille for cleaning, or maintenance purposes. The RC frame also allows the grille to be installed once all other trades are finished, ensuring the grille is kept in perfect condition. **Note: RC frame is not available with the 17 mm wide flange.** Alternatively, the grille can be sprung, or face fixed through the flange provided.

Two flanges are available:

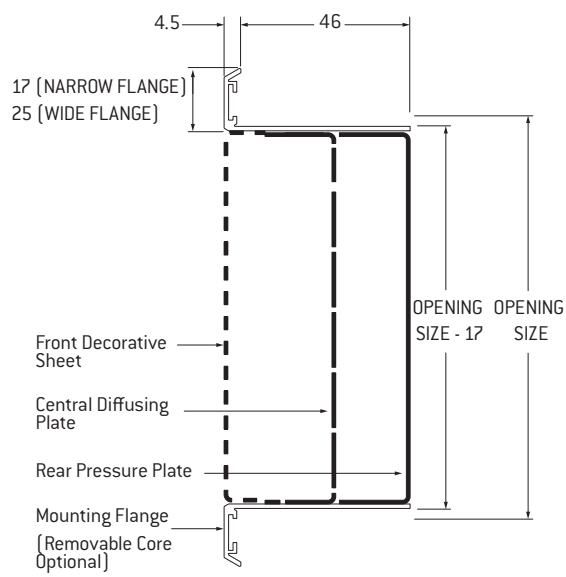
Narrow Flange – 17mm wide. Style No. 5 on page 51B

Wide Flange – 25mm wide. Uses DDL20 surround as page 204E.

System Balancing

The DS Displacement Diffuser achieves the unobtrusive delivery of conditioned air, whilst still maintaining a significant pressure drop across the grille. This allows the diffuser to be used in plenum fed distribution systems without balancing dampers. In theatres and auditoria the area under the seating can be used as the supply plenum.

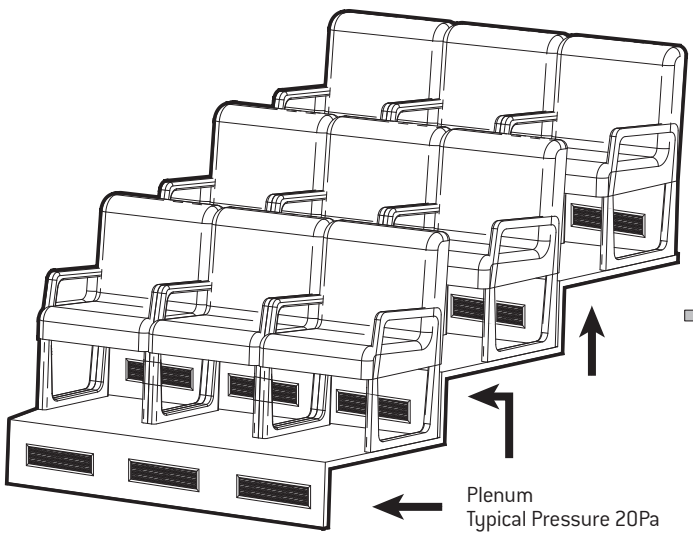
Cross Section through DS Displacement Diffuser



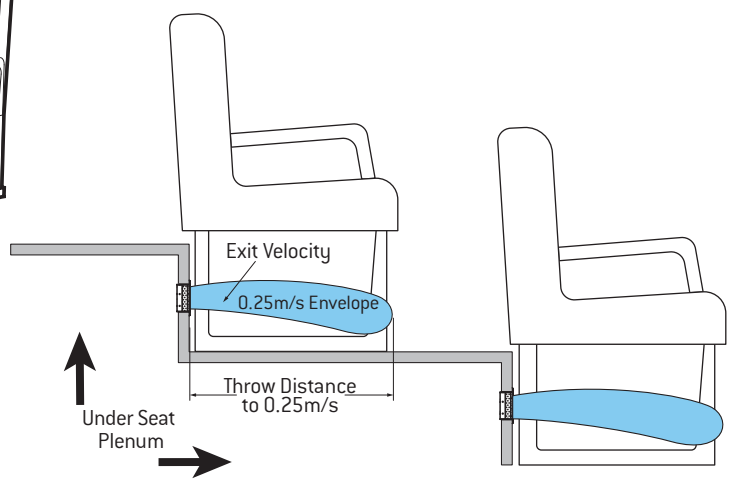
Size	Flowrate (l/s)	5.0	7.5	10.0	12.5	15.0	20.0	25.0	30.0	35.0	40.0	45.0
400x120 300x160 200x240 A_N=0.039	ΔPs (Pa)	4	6	10	14	19						
	Throw mm	150	200	350	450	800						
	Exit Vel (m/s)	0.29	0.31	0.35	0.42	0.50						
	NC	-	15	17	19	20						
500x120 400x150 300x200 200x300 A_N=0.05	ΔPs (Pa)		5	9	12	17	27					
	Throw mm		-	300	350	400	900					
	Exit Vel (m/s)		0.22	0.30	0.34	0.38	0.50					
	NC		13	14	15	17	19					
600x120 400x180 300x240 200x360 A_N=0.06	ΔPs (Pa)			5	7	9	15	22				
	Throw mm			150	300	450	750	900				
	Exit Vel (m/s)			0.29	0.35	0.40	0.45	0.50				
	NC			-	14	16	19	20				
700x120 600x140 400x210 300x280 200x420 A_N=0.07	ΔPs (Pa)				6	9	14	20	29			
	Throw mm				-	-	500	750	1000			
	Exit Vel (m/s)				0.20	0.25	0.35	0.42	0.50			
	NC				14	16	18	20	23			
800x120 600x160 400x240 300x320 200x480 A_N=0.081	ΔPs (Pa)					6.5	11	16	23	30		
	Throw mm					-	250	450	750	1000		
	Exit Vel (m/s)					0.25	0.30	0.37	0.45	0.50		
	NC					14	17	20	22	25		
900x120 600x180 400x270 300x360 200x540 A_N=0.091	ΔPs (Pa)						9	13	18.5	24	31	
	Throw mm						200	300	600	900	1300	
	Exit Vel (m/s)						0.30	0.35	0..45	0.50	0.58	
	NC						17	19	22	24	26	
1000x120 800x150 600x200 400x300 200x600 A_N=0.101	ΔPs (Pa)						7	10	15	19	25	31
	Throw mm						150	250	500	650	900	1050
	Exit Vel (m/s)						0.30	0.33	0.40	0.45	0.50	0.58
	NC						16	18	21	23	25	26

*See Performance Data Notes on Page 100D.

Typical Underseat Installation



Cross Sectional View



FSD – Floor Swirl Diffuser

Model: **FSD / FSD-DD**

The FSD Floor Swirl Diffuser is designed for use in raised floor air distribution systems, where the floor cavity is used as a pressurised supply air plenum.
The FSD core design produces a high velocity "swirl" discharge air pattern. This achieves high induction rates of room air which optimises mixing for maximum comfort conditions.

Construction

The Holyoake FSD is constructed of either die cast aluminium or high impact polycarbonate, complying with UL Standard 94-5V for flammability. It includes a low pressure drop core, dirt and dust collection basket, (which catches anything that might fall through the diffuser face and is removable for cleaning); with a combined volume control damper assembly.

A unique adjustment Pentagon allows for 5 control positions at 30, 35, 45, 65 and 85% of design flow. Default is set at 30%.

By rotating the fascia the desired airflow can be obtained between the minimum (set position) and maximum (fully open) positions.

A trim ring flange, compliments contemporary décor and lies flush with the low profile face design (of a nominal 220 mm diameter), secures the carpet and prevents the edges from fraying.

A unique adjustable mounting clamp adapts for variable floor thicknesses and permits simple and secure installation from above, without removal of the floor panel, or carpet.

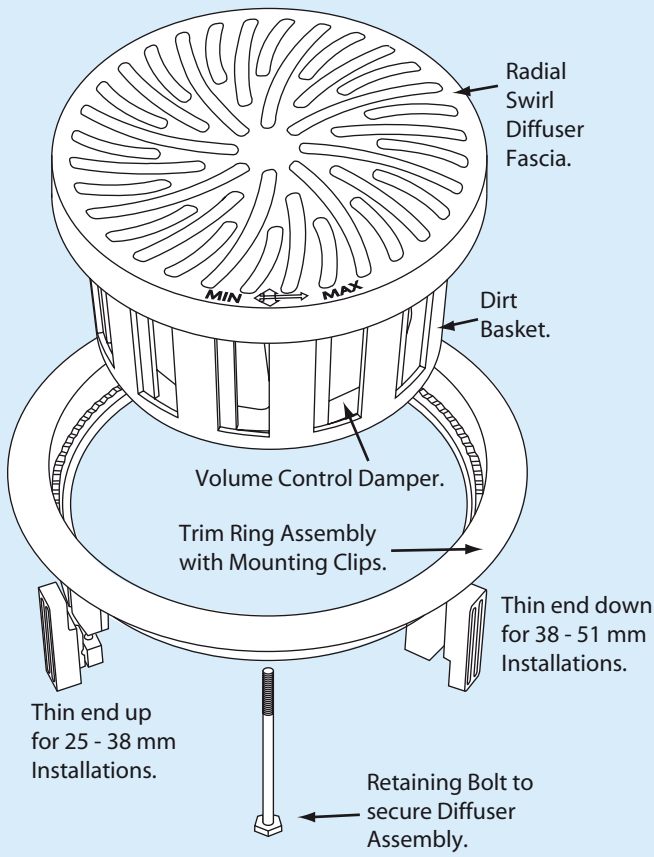
The FSD is also available in a directional model, the FSD-DD. The swirl discharge is offset by 15° and the direction can be user adjusted. The performance and swirl pattern is identical to the FSD, see the figure on the following page.

Both the aluminium and polycarbonate FSD have been load tested by the Australian Wool Testing Authority (AWTA) and supported loads of 1600kg and 700kg respectively before failure.

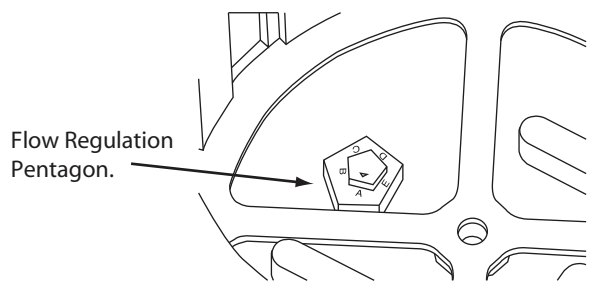
The polycarbonate version comes finished standard in grey, or black. Please specify when ordering.

Features

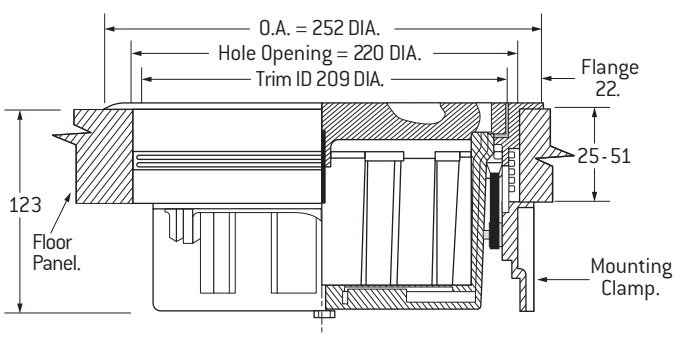
- Rotatable Swirl Fascia.
- Volume Control Damper, with Unique Adjustment Pentagon.
- Dirt and Dust Collection Basket.
- Adjustable Mounting Clamps, with Trim Ring.
- Architecturally Pleasing.
- High Impact Polycarbonate or Die Cast Aluminium.



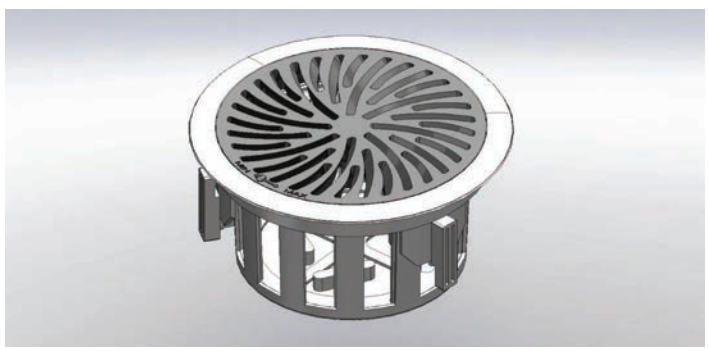
FSD Diffuser Assembly.



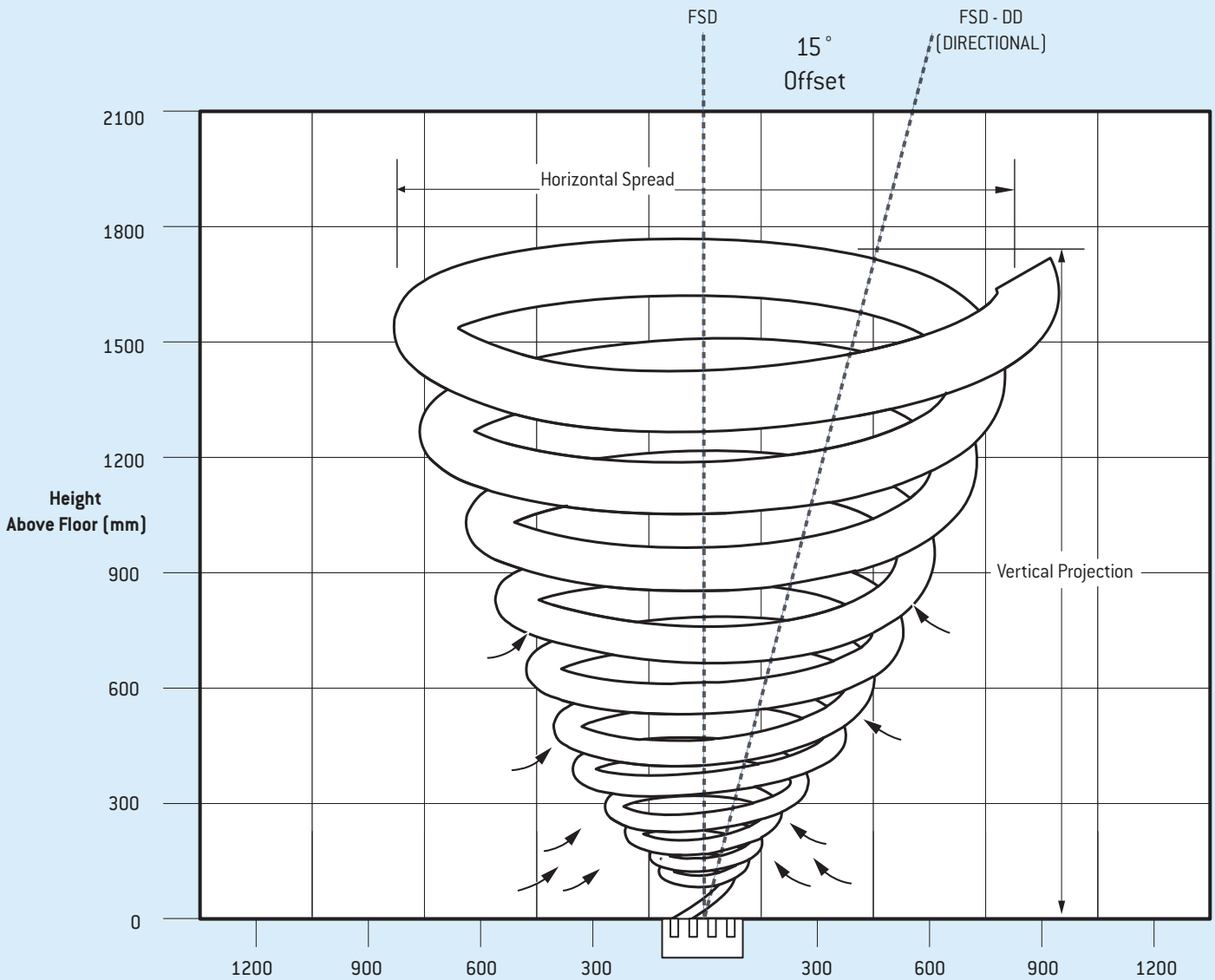
Volume Control Damper.



Cross Sectional View.



Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.



High Induction "Swirl" Pattern 50 l/s supply @12°C ΔT.
Outline Indicates Maximum Room Air Velocity of 0.25 m/s.

Performance Notes

1. Projection and spread data were determined in a room with a 3.4m ceiling height and 12°C ΔT, between supply air and averaged occupied room temperature.
2. Vertical projection (throw) is the maximum height above the floor where the terminal velocities of 0.75, 0.5 and 0.25 m/s were observed. Horizontal spread is the total width of the isovel where terminal velocities of 0.75, 0.5 and 0.25 m/s were observed.
3. Noise Criteria (values) based on 10dB room absorption, re 10^{-12} watts. Dash (-) in space denotes an NC value less than 15.
4. Pressure is in Pa.
5. Tests conducted with dirt basket/damper installed. Damper fully open.
6. Acoustic testing was performed by VIPAC and full noise spectrum data is available on request.

DT (°C)	-6	-8	-10	-12	-14	-16
Projection, m	x 1.33	x 1.11	x 1.00	x 1.06	x 0.92	x 0.91
Spread, m	x 0.87	x 0.94	x 1.00	x 1.06	x 1.11	x 1.16

Series	Approximate Weight in Kg.
FSD	1.41 Polycarbonate
FSD-A	2.75 Die Cast Aluminium

Airflow l/s	10	20	30	40	50	60	70	80
Plenum Pressure (Pa)	0	3	5	11	12	17	26	33
Vertical Projection, m	0.04 - 0.26 - 0.96	0.20 - 0.45 - 1.10	0.30 - 0.70 - 1.60	0.50 - 1.00 - 2.00	0.55 - 1.15 - 2.05	0.59 - 1.30 - 2.10	1.00 - 1.83 - 2.14	1.28 - 1.97 - 2.20
Horizontal Spread, m	0.07 - 0.19 - 0.38	0.13 - 0.19 - 0.38	0.16 - 0.25 - 0.64	0.17 - 0.30 - 0.70	0.18 - 0.36 - 0.71	0.20 - 0.40 - 0.76	0.30 - 0.51 - 0.83	0.41 - 0.64 - 0.92
NC	-	-	-	-	-	-	-	15

EL – Eyelash (Curved Blade) Diffusers

Model: **EL**

Holyoake EL diffusers present a clean, functional, strong appearance, along with economy and high performance.

They are so versatile that this one series can often be used throughout an entire installation. They are an excellent choice for high sidewall and low sidewall, as well as ceiling applications. There is a wide selection of sizes and deflection patterns and the adjustable louvers and optional dampers add flexibility in operation. Special sizes and designs can also be furnished.

Features

- Extruded aluminium louvers are individually adjustable from the face of the diffuser.
- Three different fixing arrangements are available. Surface mounting in wall or ceiling openings, plain, or panel fixing in suspended ceiling 'T-Rails'.
- Optional Volume Control Damper is adjustable from the face of the diffuser. Opposed blade design meters air precisely, from the fully open to the fully closed position, with minimum disturbance of the air pattern.
- One piece construction is used in sizes up to 900 x 900.

Construction

Extruded aluminium louvers and frame.*

* = Model EL-P Panel is 0.75 mm Steel.

Air Deflection Combinations

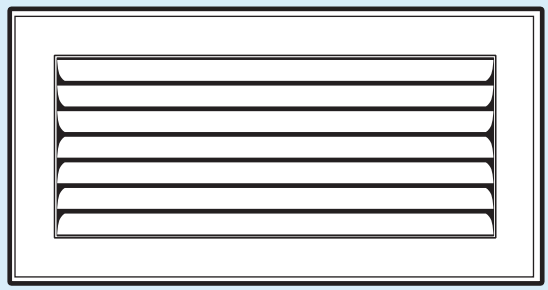
The various air deflection patterns in the plane of the diffuser face are shown in the diagrams. In addition, these patterns can be varied by the louver positions for different spreads and throws.

The capacity tables, pages 106D through to 109D, show the performances of the various air deflection patterns.

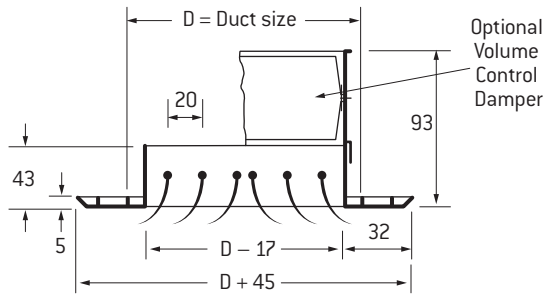
Note: Square diffusers can be rotated in their mountings.

Guide Weights For Core Styles Shown		
Model	**Size**	**Approximate Weight in Kg.**
EL1-L	1000 x 150	1.75
EL2-L	1000 x 300	2.94
EL3-L	1000 x 300	2.97
EL4-L	1000 x 450	4.15

Model: **EL2-L**

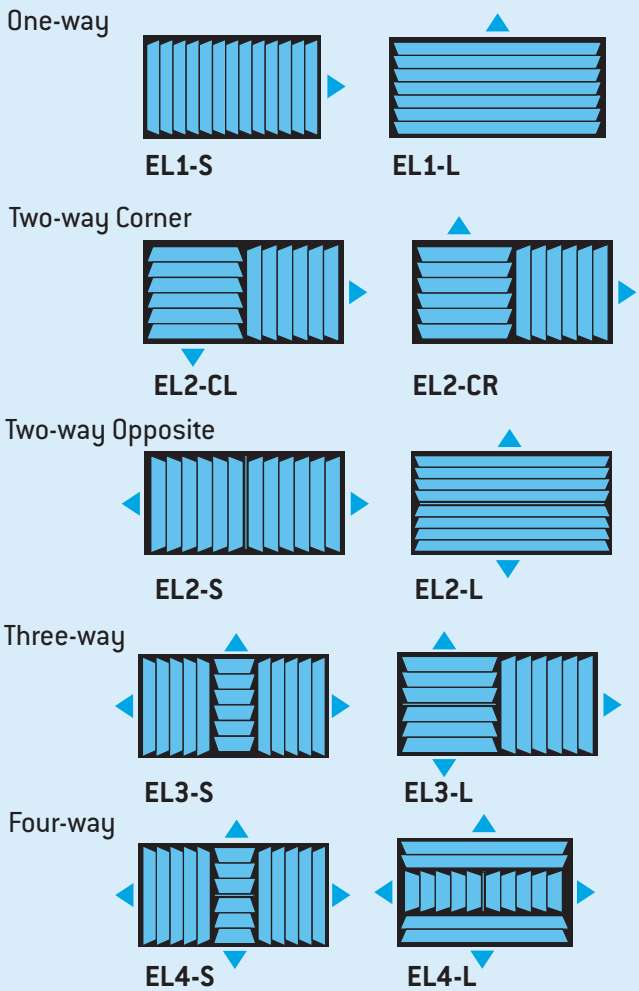


Eyelash Diffuser



Surface Mount

Core Style (Reflected Ceiling Plan)



Model: **EL-P for Suspended Ceilings**

Panel Diffusers

For installation in all suspended acoustic, or metal tile ceilings. Sized to fit standard ceiling module dimensions.

Module Sizes:

300 x 300	600 x 600	1200 x 600
300 x 600	600 x 900	

Exposed 'T'

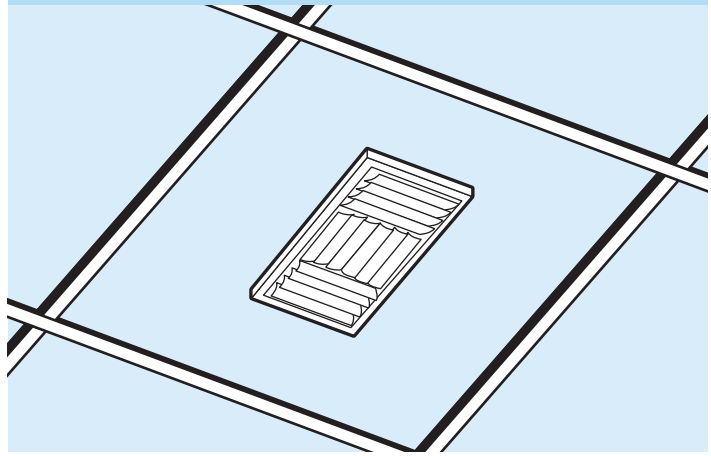
Actual panel dimension is 5 mm less than module nominated.

Concealed 'T'

Consult factory with details of ceiling system being used. Normally, panels are same size as ceiling tile, but depth and fixing systems vary.

For approximate weights, please contact your local Holyoake branch.

Panel Mounting



Model: **TLC-EL**

Model TLC-EL is designed specifically for direct mounting on to Holyoake Spiroloc rigid round duct. Only a restricted range of sizes are available as shown.

When selecting from the EL selection data, allowance must be made for the neck area reduction caused by the angle between the two sides. This can be approximated by using selection data for a grille **50mm less in height** than nominal, as shown in the table. *Where mounting duct diameter is greater than double the minimum listed, this correction can be ignored.

Allowance must also be made to the throw data that is based on a ceiling effect, which is not present for diffusers mounted on exposed round ducts.

Specify duct construction at time of ordering. Volume control damper can be added at rear of diffuser but requires and additional 30mm gap from the diffuser.

Example:

Select TLC-EL, 2 way for 0.083 m^3/s and

Vt 0.25 m/s, 6.4 m.

*Data shows 400 x 100 TLC-EL2L (See Page 107D).

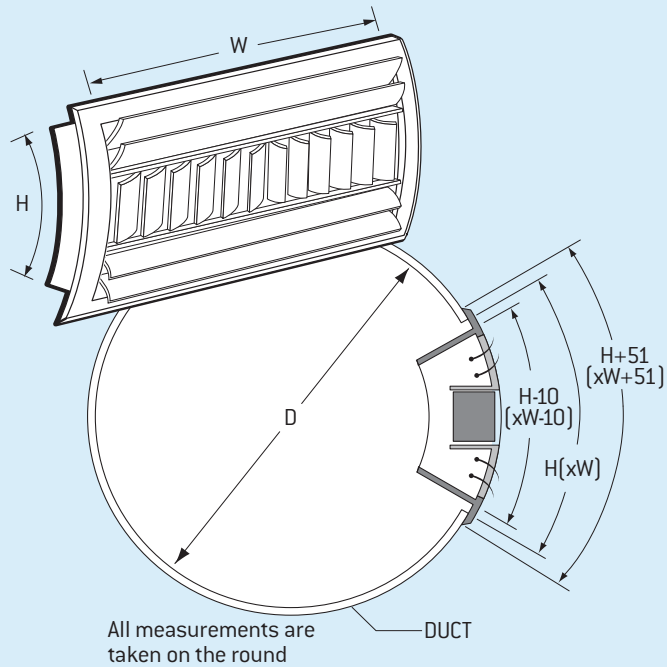
Select a nominal size 400 x 150 TLC-EL2L

Nominal Width, W	Nominal Height, H	Minimum Duct Diameter, D	*Selection Height
300	150	300	100
400	200	400	150
500	250	500	200
600	300	600	250

Maximum nominal diffuser width: 600mm.

Guide Weights For Core Styles Shown		
Model	**Size**	**Approximate Weight in Kg.**
EL2-L	300 x 150	0.45
EL2-L	400 x 200	0.90
EL2-L	500 x 250	1.13
EL2-L	600 x 300	1.58

Round Duct Mounting



All measurements are taken on the round duct surface.

EL – Performance Data

Size mm	Pattern	Core. Vel. m/s	0.51	1.02	1.53	2.04	2.55	3.06	3.57	4.08	4.59	5.10
		Vel. Press.	0	1	1	3	4	6	8	10	13	16
		Tot. Press.	1	4	8	14	23	33	44	57	73	89
	All	m^3/s	0.005	0.012	0.017	0.024	0.028	0.033	0.040	0.045	0.052	0.057
		NC				14	20	24	28	32	35	38
*150 x 100	2	Throw, m	-	-	-	1.5-4.0	2.1-4.9	2.4-5.8	2.7-6.7	3.1-7.6	3.7-8.5	4.0-9.5
Ac = 0.011 m^2	1		-	-	-	2.1-4.9	2.4-5.8	3.1-7.0	3.4-8.2	3.7-9.2	4.3-10.4	4.6-11.4
	All	m^3/s	0.007	0.014	0.024	0.031	0.038	0.045	0.052	0.061	0.068	0.076
		NC				18	21	26	30	33	36	39
*200x100	2	Throw, m	-	-	1.5-3.4	1.8-4.3	2.1-5.2	2.7-6.4	3.1-7.3	3.4-8.2	3.7-9.2	4.3-10.1
Ac = 0.0149 m^2	1		-	-	1.5-4.0	2.1-5.2	2.7-6.4	3.1-7.6	3.7-8.8	4.6-9.8	4.6-11.0	5.2-12.2
	All	m^3/s	0.009	0.019	0.028	0.038	0.047	0.056	0.066	0.076	0.085	0.094
*250 x 100		NC				16	22	27	31	34	37	40
*150 x 150	2	Throw, m	-	-	1.5-3.4	1.8-4.6	2.4-5.5	2.7-6.7	3.1-7.6	3.7-8.8	4.0-9.8	4.6-10.7
Ac = 0.018 m^2	1		-	-	1.8-4.3	2.4-5.5	2.7-6.7	3.4-7.9	3.7-9.2	4.3-10.4	4.9-11.6	8.8-12.8
	All	m^3/s	0.012	0.024	0.038	0.050	0.061	0.073	0.085	0.099	0.111	0.123
*300 x 100		NC			10	17	23	28	32	35	38	41
*200 x 150	2	Throw, m	-	0.9-2.4	1.5-3.7	2.1-4.9	2.4-6.1	3.1-7.3	3.4-8.2	4.0-9.5	4.3-10.4	4.9-11.6
Ac = 0.024 m^2	1		-	1.2-3.1	1.8-4.6	2.4-5.8	3.1-7.3	3.7-8.5	4.0-9.8	4.6-11.3	5.2-12.5	5.8-13.7
	All	m^3/s	0.014	0.028	0.043	0.057	0.071	0.085	0.099	0.113	0.127	0.142
		NC			10	18	23	28	32	36	39	42
**350 x 100	4	Throw, m	-	0.9-2.1	1.2-3.1	1.8-4.3	2.1-5.2	2.7-6.4	3.1-7.3	3.4-8.2	3.7-9.2	4.3-10.1
	3		-	0.9-2.4	1.5-3.4	1.8-4.6	2.4-5.8	2.7-6.7	3.1-7.6	3.7-8.8	4.0-9.8	4.6-10.7
Ac = 0.027 m^2	2		-	0.9-2.4	1.5-4.0	2.1-5.2	2.7-6.4	3.1-7.3	3.7-8.5	4.0-9.8	4.9-11.6	4.9-11.9
	1		-	1.2-3.1	1.8-4.6	2.4-6.1	3.1-7.6	3.7-8.8	4.3-10.4	4.9-11.6	5.5-13.1	6.1-14.3

* Not available as 3 or 4 way.

** 3 or 4 way only available in 'S' format.

Notes on Performance Data

1. All pressures are Pa-(N/m^2).
2. Minimum throw values refer to a terminal velocity of 0.75 m/s and maximum to 0.25 m/s, with a cooling temperature differential of 12°C. The throw may be increased, or decreased 20%, by changing the vane setting.
3. The NC values are based on a room absorption of 8dB, re 10^{-12} watts.
4. Data is based on an opening of about 3 mm between the frame and the first vane and progressively wider spacings between vanes away from the frame. This setting will cause the air to be discharged parallel to the face of the diffuser (horizontal discharge if installed in ceiling).
5. If the vanes are adjusted to the full open position, the listed NC values will be reduced by 7 and the total pressure will be 0.30 times that shown in the tables.

Size mm	Pattern	Core. Vel. m/s	0.51	1.02	1.53	2.04	2.55	3.06	3.57	4.08	4.59	5.10
		Vel. Press.	0	1	1	3	4	6	8	10	13	16
		Tot. Press.	1	4	8	14	23	33	44	57	73	89
**400 x 100	All	m^3/s	0.017	0.033	0.050	0.066	0.083	0.099	0.116	0.132	0.149	0.165
*250 x 150		NC			11	18	24	29	33	37	39	42
*200 x 200	4			0.9-2.1	1.5-3.4	1.8-4.6	2.4-5.5	2.7-6.4	3.1-7.6	3.7-8.5	4.0-9.5	4.3-10.4
	3	Throw, m		0.9-2.4	1.5-3.7	1.8-4.6	2.4-5.8	3.1-7.0	3.4-7.9	4.3-9.2	4.3-10.1	4.6-11.6
Ac = 0.032 m^2	2			1.2-2.7	1.5-4.0	2.1-5.2	2.7-6.4	3.1-7.6	3.7-8.8	4.3-10.1	4.6-11.3	5.2-12.5
	1			1.2-3.1	2.1-4.9	2.7-6.4	3.1-7.6	3.7-9.2	4.6-10.7	5.2-12.2	5.5-13.4	6.1-14.9
	All	m^3/s	0.019	0.038	0.057	0.076	0.094	0.113	0.132	0.151	0.170	0.189
**450 x 100		NC			12	19	25	30	34	37	40	43
**300 x 150	4			0.9-2.4	1.5-3.4	1.8-4.6	2.4-5.8	2.7-6.7	3.4-7.9	3.7-8.8	4.0-9.8	4.6-10.7
	3	Throw, m		0.9-2.4	1.5-3.7	2.1-4.9	2.4-6.1	3.1-7.3	3.4-8.2	4.0-9.5	4.6-10.7	4.9-11.6
Ac = 0.037 m^2	2			1.2-2.7	1.8-4.3	2.4-5.5	2.7-6.7	3.4-7.9	3.7-9.2	4.3-10.4	4.9-11.6	5.5-12.8
	1			1.5-3.4	2.1-4.9	2.7-6.7	3.4-7.9	4.0-9.5	4.6-11.0	5.2-12.5	5.8-14.0	6.4-15.6
**500 x 100	All	m^3/s	0.021	0.043	0.064	0.085	0.106	0.127	0.149	0.167	0.191	0.212
*350 x 150		NC			12	19	26	30	34	38	41	44
*250 x 200	4			0.9-2.4	1.5-3.7	1.8-4.6	2.4-5.8	3.1-7.0	3.4-7.9	3.7-9.2	4.3-10.1	4.6-11.3
	3	Throw, m		0.9-2.4	1.5-4.0	2.1-5.2	2.4-6.4	3.1-7.3	3.7-8.5	4.0-9.8	4.6-11.0	4.9-11.9
Ac = 0.041 m^2	2			1.2-2.7	1.8-4.3	2.4-5.8	3.1-7.0	3.4-8.2	4.0-9.5	4.6-10.7	4.9-11.9	5.5-13.4
	1			1.5-3.4	2.1-5.2	2.7-6.7	3.4-8.2	4.0-9.8	4.6-11.3	5.5-12.8	6.1-14.3	6.7-16.2
**600 x 100	All	m^3/s	0.026	0.052	0.078	0.104	0.130	0.156	0.182	0.208	0.234	0.260
**400 x 150		NC			13	20	26	31	35	39	41	44
*300 x 200	4		0.6-1.2	0.9-2.4	1.5-3.7	2.1-4.9	2.4-6.1	3.1-7.3	3.7-8.5	4.0-9.5	4.6-10.7	4.9-11.9
	3	Throw, m	0.6-1.5	1.2-2.7	1.5-4.0	2.4-5.5	2.7-6.7	3.4-7.9	3.7-9.2	4.3-10.1	4.9-11.6	5.2-12.5
Ac = 0.051 m^2	2		0.6-1.5	1.2-3.1	1.8-4.6	2.4-6.1	3.1-7.3	3.7-8.8	4.3-10.1	4.6-11.3	5.2-12.5	5.8-14.0
	1		0.6-1.8	1.5-3.7	2.4-5.5	3.1-7.0	3.7-8.8	4.3-10.4	4.9-11.9	5.5-13.4	6.4-15.3	7.0-17.1
	All	m^3/s	0.028	0.059	0.087	0.118	0.146	0.175	0.205	0.234	0.264	0.293
**450 x 150		NC			13	21	27	32	36	39	42	45
*250 x 250	4		0.6-1.2	1.2-2.7	1.5-4.0	2.1-5.2	2.7-6.4	3.1-7.6	3.7-8.5	4.0-9.8	4.6-11.0	5.2-12.2
	3	Throw, m	0.6-1.5	1.2-2.7	1.8-4.3	2.4-5.5	2.7-6.7	3.4-8.2	4.0-9.5	5.3-10.4	4.9-11.9	5.5-13.1
Ac = 0.057 m^2	2		0.6-1.5	1.2-3.1	1.8-4.6	2.4-6.1	3.1-7.6	3.7-8.8	4.3-10.4	4.9-11.6	5.5-13.1	6.1-14.3
	1		0.6-1.8	1.5-3.7	2.4-5.5	3.1-7.3	3.7-9.2	4.6-10.7	5.2-12.5	5.8-14.0	6.4-15.6	7.3-17.4
**750 x 100	All	m^3/s	0.033	0.066	0.099	0.132	0.165	0.198	0.231	0.264	0.297	0.332
**500 x 150		NC			14	21	27	32	36	40	42	45
*350 x 200	4		0.6-1.5	1.2-2.7	1.5-4.0	2.1-5.2	2.7-6.4	3.1-7.6	3.7-8.8	4.3-10.1	4.6-11.3	5.2-12.5
	3	Throw, m	0.6-1.5	1.2-2.7	1.8-4.3	2.4-5.8	3.1-7.0	3.4-8.2	4.0-9.8	4.6-11.0	5.2-12.2	5.5-13.4
Ac = 0.065 m^2	2		0.6-1.8	1.5-3.4	2.1-4.9	2.7-6.4	3.1-7.6	3.7-9.2	4.6-10.7	5.2-12.2	5.5-13.4	6.1-14.9
	1		0.9-2.1	1.5-4.0	2.4-5.8	3.1-7.6	3.7-9.2	4.6-11.0	5.5-12.8	6.1-14.3	6.7-16.2	7.6-18.0
**600 x 150	All	m^3/s	0.038	0.076	0.116	0.153	0.191	0.229	0.267	0.307	0.345	0.382
**400 x 200		NC			15	22	28	33	37	40	43	46
**350 x 250	4		0.6-1.5	1.2-2.7	1.8-4.3	2.4-5.5	2.7-6.7	3.4-7.9	3.7-9.2	4.3-10.4	4.9-11.6	5.5-13.1
	3	Throw, m	0.6-1.5	1.2-2.7	1.8-4.3	2.4-5.5	2.7-7.6	3.4-7.9	3.7-9.2	4.3-10.4	4.9-11.6	5.5-13.1
Ac = 0.075 m^2	2		0.6-1.8	1.5-3.4	2.1-4.9	2.7-6.7	3.4-7.9	4.0-9.5	4.6-11.0	5.2-12.5	5.8-14.0	6.4-15.6
	1		0.9-2.1	1.5-4.0	2.4-6.1	3.4-7.9	4.0-9.8	4.9-11.6	5.5-13.4	6.1-14.9	7.0-16.8	7.9-18.9
	All	m^3/s	0.040	0.083	0.123	0.165	0.205	0.245	0.288	0.328	0.371	0.411
**450 x 200		NC			15	22	28	33	37	40	43	46
*300 x 300	4		0.6-1.5	1.2-3.1	1.8-4.3	2.4-5.8	3.1-7.0	3.4-8.2	4.0-9.5	4.6-10.7	4.9-11.9	5.5-13.1
	3	Throw, m	0.6-1.5	1.2-3.1	1.8-4.6	2.4-6.1	3.1-7.6	3.7-8.8	4.3-10.1	4.9-11.6	5.5-12.8	6.1-14.3
Ac = 0.080 m^2	2		0.6-1.8	1.5-3.4	2.1-5.2	2.7-6.7	3.4-8.2	4.0-9.8	4.6-11.3	5.5-12.8	6.1-14.3	6.7-15.9
	1		0.9-2.1	1.8-4.3	2.4-6.1	3.4-7.9	4.0-9.8	4.9-11.9	5.8-13.7	6.4-15.3	7.0-17.1	7.9-19.2

* Not available as 3 or 4 way.

** 3 or 4 way only available in 'S' format.

EL – Performance Data

Size mm	Pattern	Core. Vel. m/s	0.51	1.02	1.53	2.04	2.55	3.06	3.57	4.08	4.59	5.10
		Vel. Press.	0	1	1	3	4	6	8	10	13	16
		Tot. Press.	1	4	8	14	23	33	44	57	73	89
**750 x 150	All	m^3/s	0.047	0.097	0.144	0.194	0.241	0.288	0.338	0.395	0.434	0.481
**500 x 200		NC			16	23	29	34	38	41	44	47
**400 x 250	4		0.6-1.5	1.2-3.1	1.8-4.6	2.4-5.8	3.1-7.3	3.7-8.5	4.0-9.8	4.6-11.0	5.2-12.5	5.8-13.7
**350 x 300	3	Throw, m	0.6-1.8	1.2-3.1	2.1-4.9	2.7-6.4	3.1-7.6	3.7-9.2	4.6-10.7	4.9-11.9	5.5-13.4	6.1-14.6
	2		0.6-1.8	1.5-3.7	2.1-5.2	3.1-7.0	3.7-8.5	4.3-10.1	4.9-11.9	5.5-13.1	6.1-14.9	7.0-16.8
Ac = 0.094 m^2	1		0.9-2.1	1.8-4.3	2.7-6.4	3.4-8.2	4.3-10.4	5.2-12.2	5.8-14.0	6.7-15.9	7.6-18.0	8.2-19.8
**600 x 200	All	m^3/s	0.054	0.109	0.163	0.217	0.271	0.326	0.380	0.434	0.491	0.543
**450 x 250		NC			16	24	30	34	38	42	45	48
**400 x 300	4		0.6-1.5	1.2-3.1	1.8-4.6	2.4-6.1	3.1-7.6	3.7-8.8	4.3-10.1	4.9-11.6	5.5-12.8	5.8-14.0
	3	Throw, m	0.6-1.8	1.5-3.4	2.1-4.9	2.7-6.4	3.4-7.9	4.0-9.5	4.6-11.0	5.2-12.5	5.8-13.7	6.4-15.3
Ac = 0.107 m^2	2		0.6-1.8	1.5-3.7	2.4-5.5	3.1-7.0	3.7-8.8	4.3-10.4	5.2-12.2	5.8-13.7	6.4-15.3	7.0-17.1
	1		0.9-2.4	1.8-4.6	2.7-6.7	3.7-8.5	4.6-10.7	5.2-12.5	6.1-14.3	6.7-16.5	7.6-18.3	8.5-20.7
**900 x 150	All	m^3/s	0.059	0.118	0.177	0.236	0.295	0.354	0.413	0.472	0.529	0.592
**500 x 250		NC			16	24	30	35	39	42	45	48
350 x 350	4		0.6-1.5	1.2-3.1	1.8-4.6	2.4-6.1	3.1-7.6	3.7-8.8	4.3-10.4	4.9-11.6	5.5-13.1	6.1-14.3
	3	Throw, m	0.6-1.8	1.5-3.4	2.1-4.9	2.7-6.7	3.4-8.2	4.0-9.8	4.6-11.3	5.2-12.5	5.8-14.0	6.4-15.6
Ac = 0.116m^2	2		0.6-1.8	1.5-3.7	2.4-5.5	3.1-7.3	3.7-9.2	4.6-10.7	5.2-12.5	5.8-14.0	6.4-15.6	7.3-17.4
	1		0.9-2.4	1.8-4.6	2.7-6.7	3.7-8.8	4.6-10.7	5.5-12.8	6.1-14.6	7.0-16.8	7.9-18.9	8.8-21.0
	All	m^3/s	0.064	0.127	0.191	0.255	0.319	0.382	0.446	0.510	0.576	0.637
400 x 300		NC			17	24	30	35	39	42	45	48
450 x 300	4		0.6-1.8	1.2-3.1	2.1-4.9	2.7-6.4	3.1-7.6	3.7-9.2	4.6-10.7	4.9-11.9	5.5-13.4	6.1-14.6
	3	Throw, m	0.6-1.8	1.5-3.4	2.1-5.2	2.7-6.7	3.4-8.2	4.0-9.8	4.6-11.3	5.5-12.8	6.1-14.3	6.7-15.9
Ac = 0.125m^2	2		0.9-2.1	1.5-4.0	2.4-5.8	3.1-7.6	3.7-9.2	4.6-11.0	5.5-12.8	6.1-14.3	6.7-16.2	7.6-18.0
	1		0.9-2.4	1.8-4.6	3.1-7.0	3.7-8.8	4.6-11.0	5.5-13.1	6.4-15.3	7.0-17.1	7.9-19.2	8.8-21.4
**750 x 200	All	m^3/s	0.073	0.144	0.217	0.288	0.361	0.434	0.505	0.576	0.651	0.722
**600 x 250		NC			17	25	31	36	40	43	46	49
500 x 300	4		0.6-1.8	1.5-3.4	2.1-4.9	2.7-6.4	3.4-7.9	4.0-9.5	4.6-11.0	5.2-12.2	5.8-13.7	6.4-15.3
450 x 350	3	Throw, m	0.6-1.8	1.5-3.7	2.1-5.2	3.1-7.0	3.7-8.5	4.3-10.1	4.9-11.9	5.5-13.4	6.1-14.9	6.7-16.5
400 x 400	2		0.9-2.1	1.5-4.0	2.4-5.8	3.1-7.6	4.0-9.8	4.6-11.3	5.5-13.0	6.1-14.6	7.0-16.8	7.6-18.3
Ac = 0.142m^2	1		0.9-2.4	2.1-4.9	3.1-7.0	3.7-9.2	4.6-11.3	5.5-13.4	6.4-15.6	7.3-17.7	8.2-19.8	9.2-22.3
**900 x 200	All	m^3/s	0.086	0.172	0.257	0.345	0.430	0.515	0.599	0.689	0.774	0.859
**750 x 250		NC			18	26	32	36	40	44	47	50
600 x 300	4		0.6-1.8	1.5-3.4	2.1-5.2	2.7-6.7	3.4-8.2	4.0-9.8	4.6-11.3	5.5-12.8	6.1-14.3	6.7-16.2
500 x 350	3	Throw, m	0.6-1.8	1.5-3.7	2.4-5.5	3.1-7.3	3.7-8.8	4.6-10.7	5.2-12.2	5.8-13.7	6.4-15.6	7.3-17.4
450 x 400	2		0.9-2.1	1.8-4.3	2.4-6.1	3.4-8.2	4.3-10.1	4.9-11.9	5.8-13.7	6.4-15.3	7.3-17.4	7.9-19.2
Ac = 0.169 m^2	1		0.9-2.4	2.1-4.9	3.1-7.3	4.0-9.8	4.9-11.9	5.8-14.0	6.7-16.5	7.6-18.3	8.5-20.7	9.8-23.2
600 x 350	All	m^3/s	0.099	0.198	0.297	0.397	0.496	0.595	0.694	0.793	0.892	0.991
500 x 400		NC			19	26	32	37	41	44	47	50
450 x 450	4		0.6-1.8	1.5-3.7	2.4-5.5	3.1-7.0	3.7-8.5	4.3-10.4	4.9-11.9	5.5-13.4	6.1-14.9	7.0-16.8
	3	Throw, m	0.9-2.1	1.5-4.0	2.4-5.8	3.1-7.6	3.7-9.2	4.6-11.0	5.5-12.8	6.1-14.3	6.7-16.2	7.6-18.0
Ac = 0.195m^2	2		0.9-2.1	1.8-4.3	2.7-6.4	3.7-8.5	4.3-10.4	5.2-12.2	5.8-14.0	6.7-15.9	7.6-18.0	8.5-20.1
	1		1.2-2.7	2.1-5.2	3.1-7.6	4.3-10.1	5.2-12.2	6.1-14.6	7.0-16.8	7.9-18.9	8.8-21.4	10.1-24.4
**900 x 250	All	m^3/s	0.111	0.222	0.333	0.444	0.557	0.666	0.774	0.887	1.000	1.112
750 x 300		NC			19	27	33	37	41	45	48	51
600 x 400	4		0.6-1.8	1.5-3.7	2.4-5.5	3.1-7.3	3.7-8.8	4.6-10.7	5.2-12.2	5.8-13.7	6.4-15.3	7.3-17.4
500 x 450	3	Throw, m	0.9-2.1	1.5-4.0	2.4-6.1	3.1-7.6	4.0-9.5	4.6-11.3	5.5-13.1	6.1-14.9	7.0-16.8	7.6-18.3
	2		0.9-2.4	1.8-4.6	2.7-6.7	3.7-8.5	4.6-10.7	5.5-12.8	6.1-14.6	6.7-16.5	7.6-18.6	8.5-20.7
Ac = 0.218m^2	1		1.2-2.7	2.1-5.2	3.4-7.9	4.3-10.4	5.5-12.8	6.1-14.9	7.3-17.4	8.2-19.5	9.2-22.0	10.4-25.0

** 3 or 4 way only available in 'S' format.

Size mm	Pattern	Core. Vel. m/s	0.51	1.02	1.53	2.04	2.55	3.06	3.57	4.08	4.59	5.10
		Vel. Press.	0	1	1	3	4	6	8	10	13	16
		Tot. Press.	1	4	8	14	23	33	44	57	73	89
900 x 300	All	m^3/s	0.127	0.253	0.381	0.505	0.633	0.762	0.887	1.016	1.143	1.270
750 x 350		NC			20	27	33	38	42	45	48	51
600 x 450	4		0.9-2.1	1.5-4.0	2.4-5.8	3.1-7.6	3.7-9.2	4.6-11.0	5.5-12.8	6.1-14.3	6.7-15.9	7.6-18.0
500 x 500	3	Throw, m	0.9-2.1	1.8-4.3	2.4-6.1	3.4-7.9	4.3-10.1	4.9-11.9	5.8-13.7	6.4-15.3	7.3-17.4	7.9-19.2
	2		0.9-2.4	1.8-4.6	2.7-6.7	3.7-8.8	4.6-11.0	6.1-14.6	6.1-14.9	7.0-17.1	7.9-18.9	8.8-21.4
Ac = 0.249 m^2	1		1.2-2.7	2.4-5.5	3.4-8.2	4.6-10.7	5.5-13.1	6.4-15.6	7.6-18.0	8.5-20.1	9.5-22.9	10.7-25.9
900 x 350	All	m^3/s	0.149	0.297	0.446	0.595	0.746	0.892	1.046	1.195	1.345	1.494
750 x 400		NC		10	20	28	34	39	43	46	49	52
600 x 500	4		0.9-2.1	1.5-4.0	2.4-5.8	3.4-7.9	4.0-9.5	4.6-11.3	5.5-13.1	6.1-14.9	7.0-16.8	7.9-18.9
	3	Throw, m	0.9-2.1	1.8-4.3	2.7-6.4	3.4-8.2	4.3-10.4	5.2-12.2	5.8-14.0	6.7-15.9	7.6-18.0	8.5-20.1
Ac = 0.293 m^2	2		0.9-2.4	2.1-4.9	3.1-7.3	3.7-9.2	4.9-11.6	5.8-13.7	6.4-15.6	7.3-17.7	8.2-19.8	9.2-22.3
	1		1.2-3.1	2.4-5.8	3.7-8.5	4.6-11.0	5.8-13.7	6.7-16.2	7.9-18.9	8.8-21.0	10.1-24.1	11.3-27.2
900 x 400	All	m^3/s	0.172	0.345	0.519	0.689	0.859	1.037	1.210	1.383	1.556	1.729
750 x 450		NC		11	21	29	35	39	43	47	50	53
600 x 600	4		0.9-2.1	1.8-4.3	2.4-6.1	3.4-8.2	4.3-10.1	4.9-11.9	5.8-13.7	6.4-15.3	7.3-17.4	8.2-19.5
	3	Throw, m	0.9-2.4	1.8-4.6	2.7-6.7	3.7-8.5	4.6-10.7	5.5-12.8	6.1-14.6	7.0-16.8	7.6-18.6	8.5-20.7
Ac = 0.339 m^2	2		0.9-2.4	2.1-4.9	3.1-7.3	4.0-9.8	4.9-11.9	5.8-14.0	6.7-16.5	7.6-18.3	8.5-20.7	9.8-23.2
	1		1.2-3.1	2.4-6.1	3.7-8.8	4.6-11.3	5.8-14.0	7.0-16.8	8.2-19.5	9.2-22.0	10.4-25.0	11.6-28.1
900 x 450	All	m^3/s	0.191	0.382	0.576	0.765	0.953	1.151	1.342	1.534	1.726	1.918
750 x 500		NC		11	22	29	35	40	44	47	50	53
	4		0.9-2.1	1.8-4.3	2.7-6.4	3.4-8.2	4.3-10.4	5.2-12.2	5.8-14.0	6.7-15.9	7.6-18.0	8.5-20.1
	3	Throw, m	0.9-2.4	1.8-4.6	2.7-6.7	3.7-8.8	4.6-11.0	5.5-13.1	6.1-14.9	7.0-17.1	7.9-19.2	8.8-21.4
Ac = 0.376 m^2	2		1.2-2.7	2.1-5.2	3.1-7.6	4.0-9.8	5.2-12.2	6.1-14.3	7.0-16.8	7.9-18.9	8.8-21.4	10.1-24.1
	1		1.2-3.1	2.4-6.1	3.7-9.2	4.9-11.9	6.1-14.3	7.3-17.4	8.5-20.1	9.5-22.6	10.7-25.6	11.9-28.7
900 x 500	All	m^3/s	0.222	0.446	0.670	0.892	1.117	1.340	1.564	1.787	2.010	2.234
750 x 600		NC		12	22	30	36	40	44	48	46	54
	4		0.9-2.4	1.8-4.6	2.7-6.7	3.7-8.5	4.6-10.7	5.5-12.8	6.1-14.6	6.7-16.5	7.6-18.6	8.5-20.7
	3	Throw, m	0.9-2.4	2.1-4.9	3.1-7.0	3.7-9.2	4.9-11.6	5.8-13.7	6.7-15.9	7.3-17.7	8.5-20.1	9.5-22.6
Ac = 0.438 m^2	2		1.6-2.7	2.4-5.2	3.4-7.9	4.3-10.4	5.5-12.8	6.1-14.9	7.3-17.4	8.2-19.5	9.2-22.3	10.4-25.0
	1		1.5-3.4	2.7-6.4	4.0-9.5	5.2-12.2	6.1-14.9	7.6-18.0	8.5-20.7	9.8-23.8	11.3-26.8	12.5-29.9
900 x 600	All	m^3/s	0.274	0.548	0.826	1.104	1.379	1.655	1.931	2.207	2.483	2.759
750 x 750		NC		13	23	31	37	41	45	49	52	55
	4		0.9-2.4	1.8-4.6	3.1-7.0	3.7-9.2	4.6-11.3	5.5-13.4	6.4-15.6	7.3-17.4	8.2-19.5	9.2-22.0
	3	Throw, m	1.2-2.7	2.1-4.9	3.1-7.6	4.0-9.8	5.2-12.2	6.1-14.3	7.0-16.8	7.6-18.6	8.8-21.4	9.8-23.8
Ac = 0.541 m^2	2		1.2-2.7	2.4-5.5	3.4-8.2	4.6-10.7	5.5-13.4	6.7-15.9	7.6-18.3	8.5-20.7	9.8-23.5	11.0-26.5
	1		1.5-3.4	2.7-6.7	4.0-9.8	5.5-12.8	6.7-15.9	7.9-18.9	9.2-22.0	10.4-25.0	11.9-28.4	13.4-32.0
900 x 750	All	m^3/s	0.338	0.675	1.020	1.360	1.698	2.038	2.378	2.717	3.057	3.396
		NC		14	24	31	37	42	46	50	53	56
	4		0.9-2.4	2.1-4.9	3.1-7.3	4.0-9.8	4.9-11.9	5.8-14.0	6.7-16.5	7.6-18.3	8.5-20.7	9.8-23.2
	3	Throw, m	1.6-2.7	2.1-5.2	3.4-7.9	4.3-10.4	5.5-12.8	6.4-15.3	7.3-17.4	8.2-19.8	9.2-22.3	10.4-25.0
Ac = 0.666 m^2	2		1.6-3.1	2.4-6.1	3.7-8.8	4.6-11.3	5.8-14.0	7.0-16.8	8.2-19.5	9.2-22.0	10.4-25.0	11.6-28.1
	1		1.5-3.7	3.1-7.0	4.3-10.4	5.5-13.4	7.0-16.8	8.5-20.1	9.8-23.5	11.0-26.5	12.5-29.9	14.0-33.6
900 x 900	All	m^3/s	0.408	0.817	1.227	1.636	2.045	2.454	2.863	3.272	3.681	4.090
		NC		14	25	32	38	43	47	51	53	56
	4		1.2-2.7	2.1-5.2	3.1-7.6	4.3-10.1	5.2-12.5	6.1-14.9	7.0-17.1	8.2-19.5	9.2-21.7	10.1-24.4
	3	Throw, m	1.2-3.1	2.4-5.5	3.4-8.2	4.6-10.7	5.5-13.4	6.7-15.9	7.6-18.3	8.5-20.7	9.8-23.5	11.0-26.5
Ac = 0.802 m^2	2		1.2-3.1	2.4-6.1	3.7-9.2	4.9-11.9	6.1-14.6	7.3-17.7	8.5-20.4	9.8-23.2	11.0-26.2	12.2-29.3
	1		1.5-4.0	3.1-7.3	4.6-11.0	5.8-14.0	7.3-17.7	8.8-21.4	10. 1-24.4	11.6-27.8	13.1-31.4	14.6-35.4

BHC, DFR, DS & JD

Product Ordering Key and Suggested Specifications

BHC – SIZE – OPTIONS – FINISH

- **BHC**: High Capacity Barrel Diffuser
- **SIZE**: 635 x 300 or 1270 x 300
- **OPTIONS**: 24 V AC or, 230 V AC Actuators / Thermal Power Pill
- **FINISH**: Mill Aluminium Anodized Aluminium Holyoake White Powder Coat

High Capacity Barrel Diffusers shall be Holyoake Series BHC. They shall be designed to be mounted into a supply plenum that may contain a number of BHC units, which will provide high capacity and long throw diffusion. Adjustment is available to change the vertical and horizontal throw and spread.

Series BHC shall be finished in Mill Aluminium and fitted with accessories where indicated.

All shall be as manufactured by Holyoake.

DFR – FINISH

- **DFR**: Displacement Floor Mounted Round Diffuser
- **FINISH**: Black Holyoake White Powder Coat

Displacement Floor Mounted Round Diffusers shall be Holyoake Series DFR. They shall be designed to mount into a supply plenum at floor level and to provide an even distribution of air flow at low velocity, thereby creating a draft-less environment. Pressure drop through the displacement diffusers will be such to provide balance within the supply plenum, while being low enough to generate very low noise levels.

Series DFR Displacement Diffusers shall be circular.

All shall be as manufactured by Holyoake.

DS – W x H – FLANGE – OPTION – FINISH

- **DS**: Displacement Step Mounted Diffuser
- **W x H**: Hole Size
- **FLANGE**: 17mm 25mm
- **OPTION**: RC Removable Core (25 mm flange only).
- **FINISH**: Powder Coat Mill Aluminium

Displacement Step Mounted Diffusers shall be Holyoake Series DS. They shall be designed to mount into a supply plenum at floor level and to provide an even distribution of air flow at low velocity, thereby creating a draft-less environment. Pressure drop through the displacement diffusers will be such to provide balance within the supply plenum, while being low enough to generate very low noise levels.

Series DS Displacement Step Mounted Diffusers are designed to be face fixed, or supplied with the Holyoake Removable Core System (25 mm flange only).

All shall be as manufactured by Holyoake.

JD – 250 – OPTIONS – FINISH

- **JD**: Jet Diffusers
- **250**: Nominal Size
- **OPTIONS**: Mounting Plate (Type 1, 2, 3 or 4)
- **FINISH**: Holyoake White Mill Aluminium Powder Coat

Circular Jet Diffusers shall be Holyoake Model JD constructed from spun aluminium cones. JD Jet Diffusers shall be capable of operating in either diffused, or jet air pattern configurations. The air patterns shall be achieved by rotating the cone assembly through 180 degrees. JD Jet Diffusers shall be complete with a mounting system suitable for wall, or ceiling applications.

Series JD shall be finished in powder coat and fitted with accessories where indicated.

All shall be as manufactured by Holyoake.

Note

For ceiling applications of JD Diffusers, Seismic Restraints would be required, but not supplied.

JND, EL, EL-P, FSD & TLC-EL

Product Ordering Key and Suggested Specifications

JND – SIZE – FINISH

- JND: Jet Nozzle Diffuser
- SIZE: 160, 200, 250, 360, 400
- FINISH: Powder coat white, special colours available on request

Holyoake Jet nozzle diffusers shall be of spun aluminium construction with a steel concealed mounting system. They shall be designed to supply large air quantities over large throws.

Series JND shall be finished in powder coat and all shall be as manufactured by Holyoake.

FSD — Floor Swirl Diffuser

OPTIONS — Die Cast Aluminium Mill Finish, or, Die Cast Aluminium Powder Coat Finish

Circular floor diffusers shall be Holyoake FSD Series manufactured in glass filled polycarbonate, in self-coloured grey, or black, as standard. Nominal FSD diffuser size shall be 220mm in diameter. The FSD diffuser shall contain a flow regulation damper and the fascia is complete with 'Min/Max' indication.

Series FSD mounting clamp and trim ring shall also be manufactured in glass filled polycarbonate.

FSD diffusers shall contain a dust/dirt collection basket.

All Series FSD materials used are fire retardant and the diffusers shall resist permanent deformation when subject to point loads up to 500 Kg.

All shall be as manufactured by Holyoake.

EL – 2 – S – 300 x 300 – ACCESSORIES – OPTIONS – FINISH

- EL: Series "Eyelash"
- 2: Core Model
- S: Style
- 300 x 300: Duct Size
- ACCESSORIES: OBD-1 Opposed Blade damper
- OPTIONS: RC 25, RC 50, CMF — Removable Core Frame Option
- FINISH: Holyoake White Mill Aluminium Powder Coat

Surface Mounted Eyelash Type

EL surface mounted diffusers shall be of the "Eyelash", or curved blade type. They shall be of extruded aluminium construction, with each blade individually adjustable from the face. Optional opposed blade damper can be adjusted through the face of the diffuser.

All shall be as manufactured by Holyoake

EL – P – 2 – S – 300 x 150 – 600 x 600 – ACCESSORIES – FINISH

- EL: Series "Eyelash"
- P: Panel Lay-in
- 2: Core Model
- S: Style
- 300 x 150: Duct Size
- 600 x 600: Module Size
- ACCESSORIES: OBD-1 Opposed Blade damper
- FINISH: Holyoake White Mill Aluminium Powder Coat

Panel Lay-in Eyelash Type

EL-P Panel Lay-in diffusers shall be of the "Eyelash", or curved blade type. They shall be of extruded aluminium construction, with each blade individually adjustable from the face. Optional opposed blade damper can be adjusted through the face of the diffuser.

All shall be as manufactured by Holyoake.

TLC-EL – 2 – L – 400 x 150 – ACCESSORIES – FINISH

- TLC-EL: Series Curved Frame "Eyelash"
- 2: Core Model
- L: Style
- 400 x 150: Nominal Duct Size
- ACCESSORIES: OBD-1 Opposed Blade damper
- FINISH: Holyoake White Mill Aluminium Powder Coat

Curved Frame Eyelash Type

TLC-EL diffusers shall be of the "Curved Frame Eyelash" type, with curved blades. They shall be of extruded aluminium construction, with each blade adjustable from the face. Optional opposed blade damper can be adjusted through the face of the diffuser.

All shall be as manufactured by Holyoake.

Note

For ceiling applications of EL Diffusers, Seismic Restraints would be required, but not supplied.

JD – Jet Diffuser

DIFFUSERS CEILING SWIRL

CFP	Ceiling Fixed Pattern - Radial Swirl	129 - 132D
CFPP	Ceiling Fixed Pattern - Pressed (Steel) Swirl	133 - 136D
CRS	Ceiling Radial Swirl	114 - 115D
CSS	Ceiling Slot Swirl	116 - 117D
CSS - VAV	Ceiling Slot Swirl VAV Diffuser	118 - 120D
SFRA	Ceiling Fixed Pattern - Radial (Aluminium) Swirl	137 - 138D
Ordering Key and Specification		139 - 140D

- High induction swirl diffusers with radial diffusion pattern
- Square and round face options
- Steel face plate or all aluminium construction
- UV stabilised and fire rated polymer construction, fixed or adjustable pattern blades
- Pressed steel or aluminium fixed pattern blades
- Full range of air distribution patterns
- VAV, Low Profile VAV and Electronic VAV
- Evenflow cushion head plenums available

CRS – Ceiling Radial Swirl Diffuser

Model: **CRS**

The Holyoake CRS range of Radial Swirl Diffusers have been designed to provide high quality indoor air diffusion. The CRS comprises of radial deflection blades that produce a circular airflow pattern with a very strong ceiling effect. This diffuser is ideal for VAV applications, because the ceiling effect is maintained for minimal through to very high flowrates.

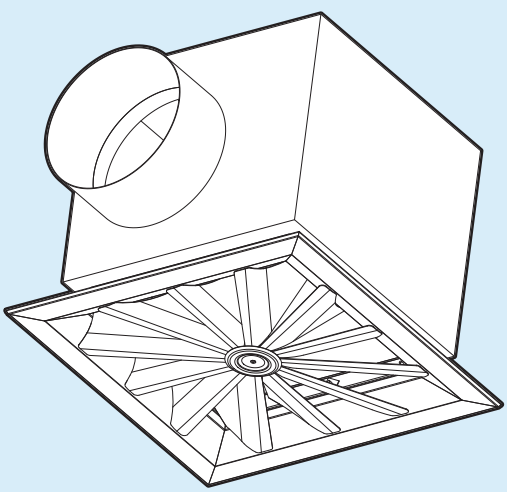
Ideal for large rooms, call centres and waiting rooms.

The CRS is able to achieve high room air diffusion quality due to the strong induction swirl pattern it produces. 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.

Installation

Installation is simple due to the square lay-in type design. The diffuser can be placed into the T-Rail system quickly and easily and the supply duct attached. Alternatively the diffuser may be conventionally mounted, or held using one of the Holyoake mounting systems, such as the T-Rail Support Frame. The supply air can be fed vertically onto the back of the diffuser, or through a specifically designed side entry box.

Specifically Designed Swirl Inducing Side Entry Box



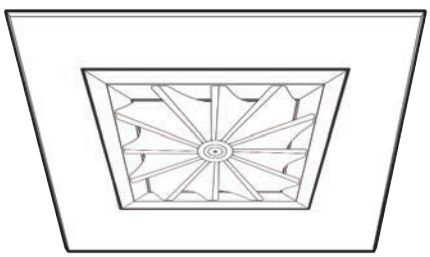
Construction

The CRS is constructed entirely from aluminium metal. It is a lightweight, but robust diffuser that can be fitted easily into the ceiling space.

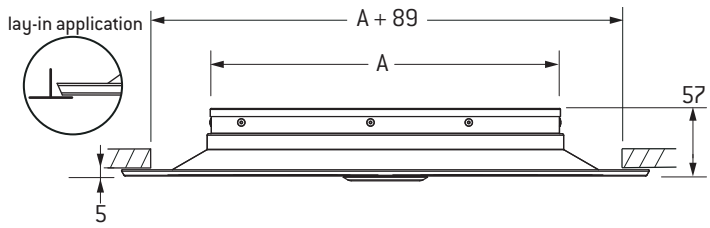
Features

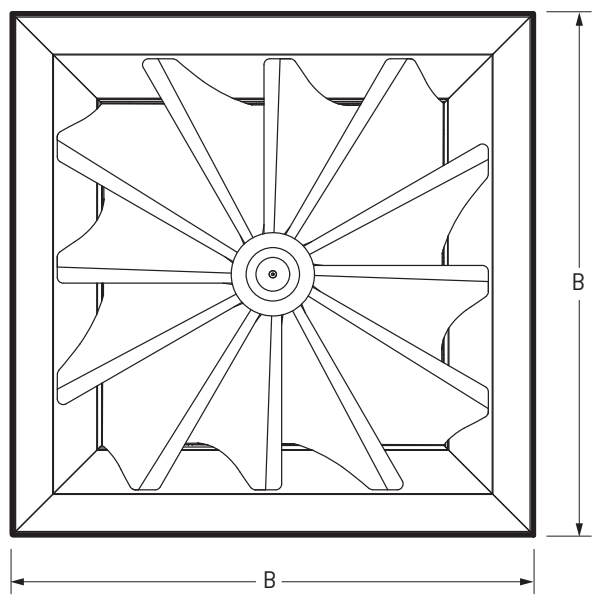
- Strong Ceiling Effect
- Radial Diffusion Pattern
- High Induction Swirl
- Easy Lay-in Installation
- Attractive Appearance

Note: The CRS300 can be mounted in a 595 x 595 panel for T-Rail mounting, see below.



Ceiling Radial Swirl Diffuser





	Sizes Available (Neck Size) (mm)	
	CRS300	CRS450
A	295	445
B	445	595
	Weights in Kg.	
Diffuser	0.9	1.45
CRS/Panel	2.00	N/A
Galv Box	4	6.5
Prem Box	1.5	2.5

Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

Model: **CRS300 Ceiling** Radial Swirl Diffuser

300 x 300 Nominal Neck

Duct Size	Flowrate (l/s)	25	50	75	100	125	150	200
150	Static Pressure (Pa)	2	6	12	23	40	55	95
	Throw (m)	na - na - 0.8	na - 0.6 - 1.8	0.6 - 1.5 - 2.2	1.3 - 2.4 - 3.3	1.6 - 2.7 - 3.4	1.9 - 3.0 - 3.9	2.2 - 3.3 - 4.2
	NC	-	-	32	37	42	47	54
200	Static Pressure (Pa)	2	4	9	15	24	34	60
	Throw (m)	na - 0.45 - 0.75	na - 0.6 - 1.3	0.65 - 0.9 - 1.8	0.85 - 1.5 - 2.2	1.4 - 1.8 - 2.5	1.7 - 2.4 - 3.3	2.1 - 2.7 - 3.9
	NC	-	-	23	26	31	36	42
250	Static Pressure (Pa)	1	4	9	15	23	33	58
	Throw (m)	na - 0.3 - 0.7	0.4 - 0.7 - 1.0	0.6 - 0.9 - 1.8	0.9 - 1.2 - 2.0	1.4 - 1.8 - 2.5	1.6 - 2.4 - 3.0	2.0 - 2.6 - 3.9
	NC	-	-	-	24	29	34	40

Model: **CRS450 Ceiling** Radial Swirl Diffuser

450 x 450 Nominal Neck

Duct Size	Flowrate (l/s)	50	100	150	200	300	400	500	600
150	Static Pressure (Pa)	5	15	32					
	Throw (m)	na – na - 0.5	na – 0.6 – 1.2	0.3 – 1.0 – 1.8					
	NC	21	28	39					
200	Static Pressure (Pa)	1	5	11	18	40	72		
	Throw (m)	na – na – 0.3	na – 0.5 – 1.0	0.3 – 0.9 – 1.8	0.6 – 1.2 – 2.1	1.5 – 2.1 – 3.0	2.1 – 2.9 – 3.6		
	NC	22	26	32	36	47	56		
250	Static Pressure (Pa)	1	2	5	8	19	33	51	
	Throw (m)	na – na – 0.3	na – 0.5 – 1.0	0.3 – 0.9 – 1.8	0.6 – 1.2 – 2.1	1.5 – 2.0 – 3.0	2.1 – 2.7 – 3.6	2.1 – 3.0 – 4.2	
	NC	15	21	24	27	39	47	54	
300	Static Pressure (Pa)	-	2	3	6	11	21	30	43
	Throw (m)	-	0.2 - 0.5 – 1.0	0.3 – 0.9 – 1.8	0.6 – 1.1 – 2.1	1.4 – 2.0 – 3.0	2.1 – 2.3 – 3.6	2.1 – 3.0 – 4.2	2.5 – 3.6 – 4.6
	NC	-	17	22	23	34	41	48	53
350	Static Pressure (Pa)	-	1	2	5	10	17	26	41
	Throw (m)	-	0.2 – 0.5 – 1.0	0.3 - 0.8 - 1.8	0.6 – 1.1 – 2.1	1.1 – 1.8 – 3.0	1.8 – 2.3 – 3.3	1.8 – 3.0 – 4.2	2.5 – 3.6 – 4.6
	NC	-	14	21	23	31	38	46	51

Options

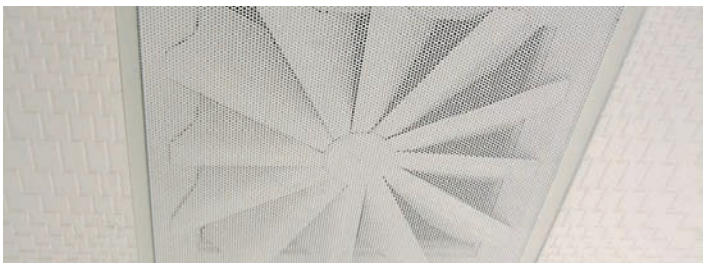
CRSP

The CRS may be supplied with a perforated face plate to provided a less open appearance. See performance notes for the effect on the performance data.

CRSP	
ΔPs	x1.2
Throw	x 1.0
NC	+3

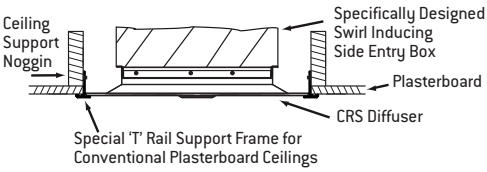
Weights in Kg.		
	CRS300	CRS450
CRSP	0.83	1.31
'T' Rail Frame	0.46	0.64

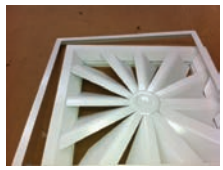
Model: **CRSP**

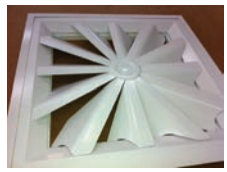


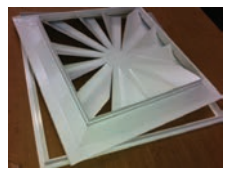
'T' Rail Support Frame

Lay in application – Special 'T' Rail Frame Option available for Surface Mounted applications.









Notes on Performance Data

1. Performance data is based on a specifically designed side entry box.
2. Listed throw distances are to a terminal velocity (Vt) of 0.75 - 0.5 - 0.25m/s.
3. The NC values are based on a room absorption of 10dB re 10^{-12} Watts.
4. "Duct Size' in tables above are plenum inlet sizes.
5. CRSP performance can be approximated by using the CRSP table.

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, un-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.

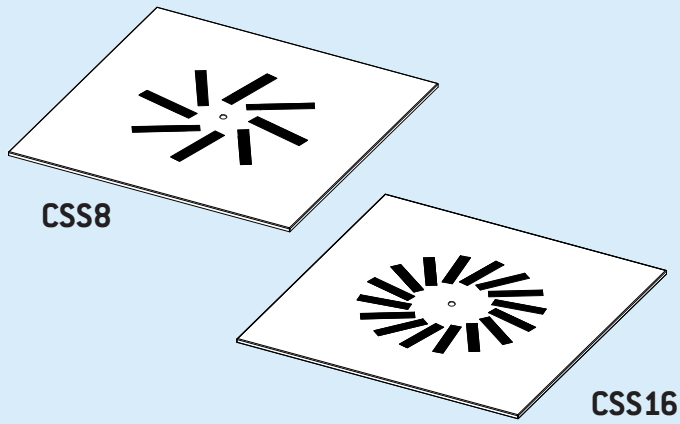
Nominal Square Face sizes of 295 x 295 mm for CSS8, 445 x 445 mm for CSS16 and CSS21; and 595 x 595 mm for all models are available, to lay in to 'T' Rail ceiling grids.

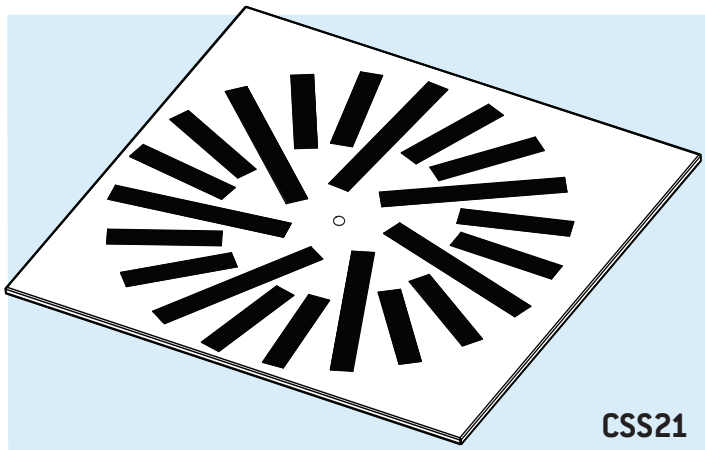
Nominal Circular Face models are available in 500 mm for CSS8, CSS16 and CSS21; and in 615 mm for all models.

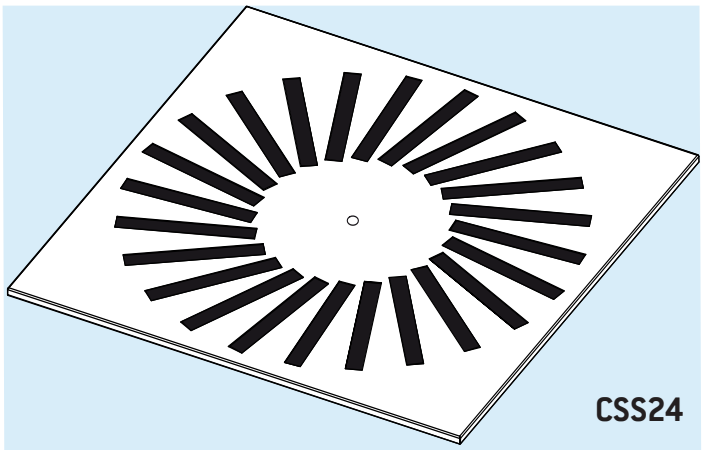
Features

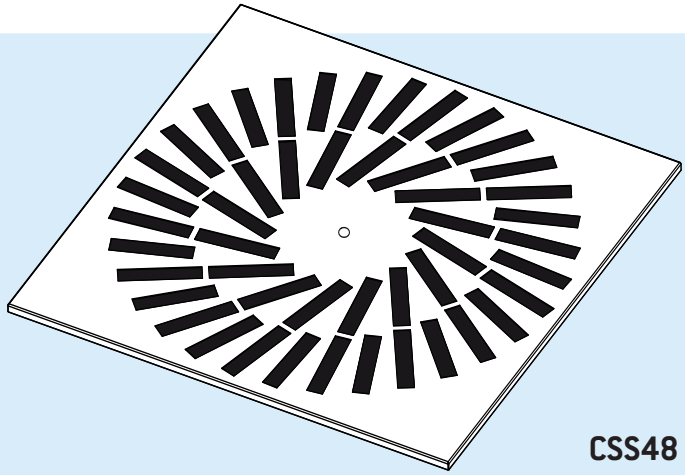
- Unique Convex Profile Adjustable Pattern Blades.
- Infinite Range of Throw Patterns.
- Low Noise Operation.
- Strong Ceiling Effect.
- High Induction Swirl.
- Easy Lay-in Installation.

Ceiling Slot Swirl Diffuser

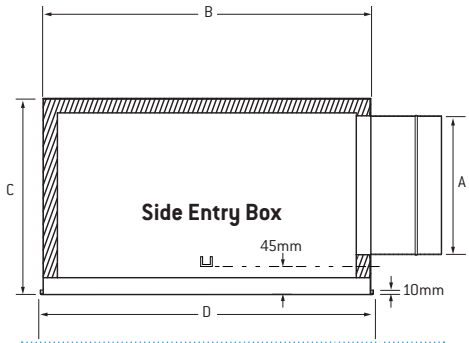


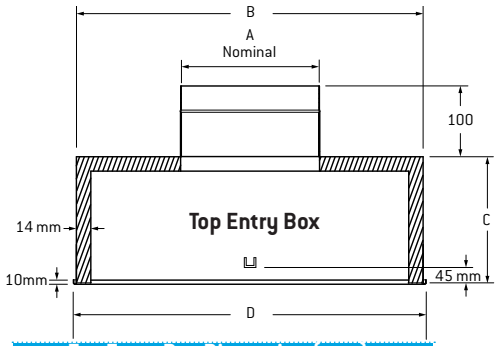


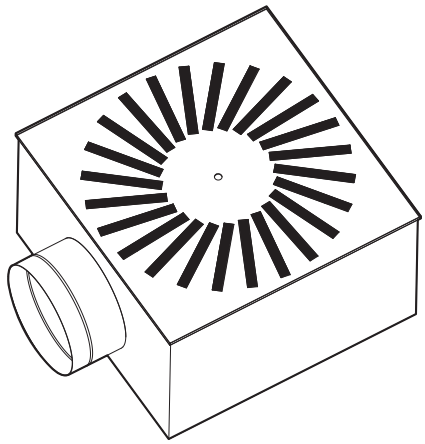




Dimensional Details





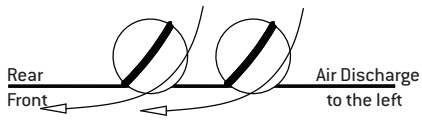


Side Entry Box Dimension (mm)					
Model	A	B	C	D	'T' RAIL
CSS8	150	285	285	295	300 - 600
CSS16	200	440	300	445	450 or 600
CSS21	250	440	350	445	450 or 600
CSS24	250	585	350	595	600
CSS48	250	585	350	595	600

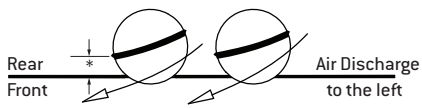
Top Entry Box Dimension (mm)				
Model	A	B	C	D
CSS8	150	477 or 592	150	500 or 615
CSS16	200	477 or 592	150	500 or 615
CSS21	250	477 or 592	150	500 or 615
CSS24	250	592	150	615
CSS48	250	592	150	615

Adjustable Pattern Blade Settings

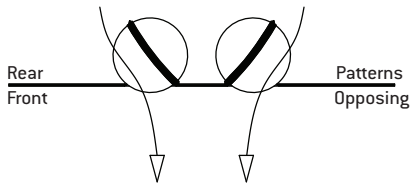
Viewed from diffuser outer edge.



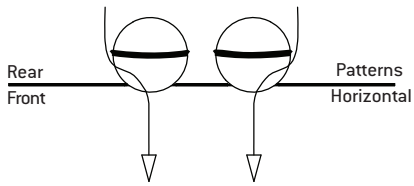
Horizontal Swirl



Horizontal Swirl - Reduced Throws * = 3-5mm



Vertical Discharge



Vertical Discharge

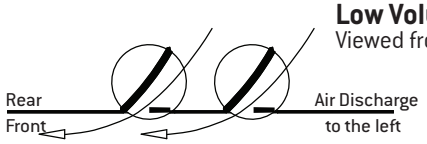
Performance Data															
Model	Flowrate (l/s)	25	50	75	100	125	150	175	200	225	250	275	300	350	400
CSS8	Static Pressure (Pa)	8	26	56											
	Total Pressure (Pa)	11	32	61											
	Throw (m) 0.75m/s	0.3	0.6	0.9											
	Throw (m) 0.50m/s	0.5	0.8	1.3											
	Throw (m) 0.25m/s	0.8	1.4	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							
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

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.

Low Volume Blade Setting

Viewed from diffuser outer edge.



Horizontal Swirl At Low Volume (for CSS 16)

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.

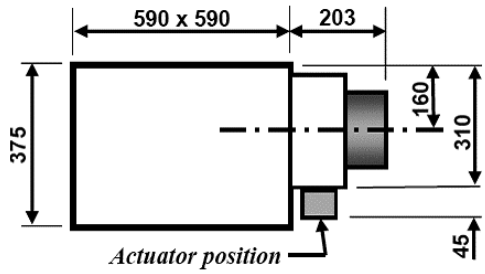
Construction

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



Performance Data – CSS-VAV 600 24

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.

Model: **CFP**

The Holyoake CFP range of square and round faced Fixed Pattern Radial Induction Swirl Diffusers, have been designed to provide high quality indoor air diffusion.
The CFP is constructed with swirl deflection blades that produce a highly turbulent radial airflow pattern. This draws room air up into the supply air path resulting in mixing at high level and rapid temperature equalization, whilst creating optimum room space conditions, with even temperature gradients.
The CFP diffuser is suitable for use with increased temperature differentials and in VAV applications, as the ceiling effect is maintained from minimal through to very high air flow rates.

CFP Square Model Installation

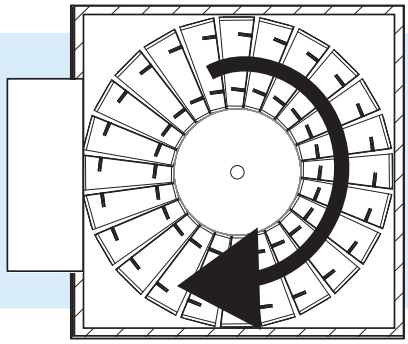
Installation is simple due to the availability of the square lay-in type design. The diffuser can be placed into the T-rail system quickly and easily and the supply duct attached. Alternatively, the diffuser may be conventionally flush mounted, or with the use of a surface mounted installation flange.

CFPR Circular Model Installation

Installation is also made simple with this model, with the availability of a top entry round cushion head plenum. The diffuser outer edge can be placed flush mounted against the ceiling surface.

Specifically Designed Swirl Inducing Side Entry Box for CFP Diffusers

A suitably sized specifically designed Holyoake Evenflow Plenum, should be incorporated to provide the best performance.



Features

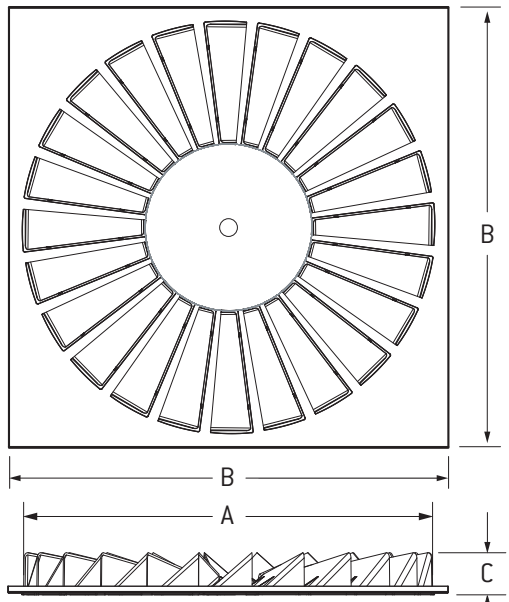
- Strong Ceiling Effect
- Radial Diffusion Pattern
- High Induction Swirl
- Easy Lay-in Installation
- Attractive Appearance
- Range of Square and Round Faced options

Construction

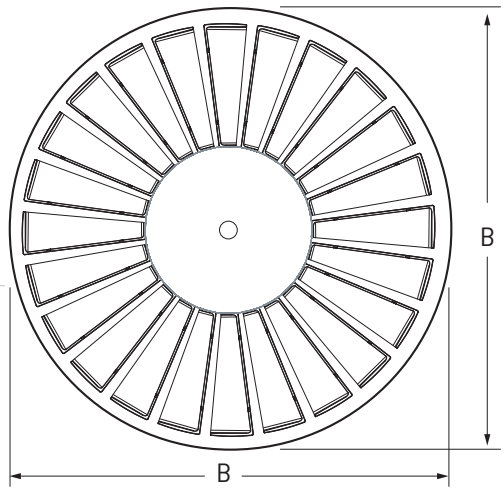
The CFP is constructed from a pressed steel body and has a high quality powder coat finish. Air pattern elements are constructed from a tough UV stabilized and fire rated engineering polymer, in either white, or black. The CFP diffuser is both robust and lightweight making on-site installation easy.

Ceiling Radial Swirl Diffuser

CFP



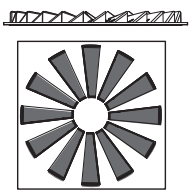
CFPR



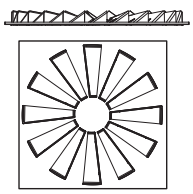
	Sizes Available (Nom: Face)				
	CFP450-12	CFP600-12	CFP600-20	CFP600-24	CFPR615-20
A	430	430	510	545	510
B	445	595	595	595	615
C	45	45	45	45	45

Note Refer to page 132D for box and diffuser weights.

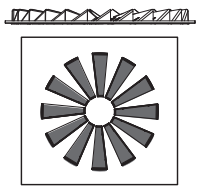
CFP – Performance Data



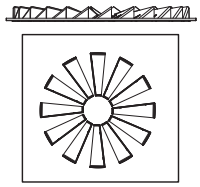
CFP-450 BLK 12



CFP-450 WHT 12



CFP-600 BLK 12



CFP-600 WHT 12

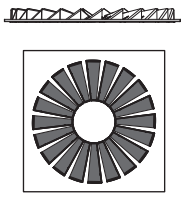
Model: **CFP Radial** Induction Swirl Diffuser (Square)

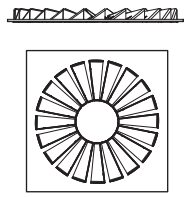
450/600/12 Nominal Face*

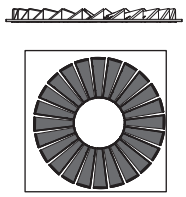
Duct Size	Flow Rate (l/s)	25	50	75	100	125	150	
150	Static Pressure (Pa)	2	5	11	19	29	43	
	Throw (m)	0.2-0.5-0.9	0.3-0.9-1.2	0.9-1.5-2.2	1.0-1.9-2.6	1.5-2.3-3.4	1.6-2.5-4.1	
	NC	*<10	11	18	24	31	37	
200	Static Pressure (Pa)	1	3	7	10	16	27	
	Throw (m)	0.2-0.3-0.8	0.3-0.6-1.2	0.5-1.0-2.0	0.8-1.5-2.3	1.2-1.9-3.0	1.2-2.0-3.8	
	NC	*<10	*<10	13	17	22	27	
250	Static Pressure (Pa)	*<1	2	5	8	10	18	
	Throw (m)	0.2-0.5-0.6	0.3-0.5-1.1	0.4-1.0-1.9	0.7-1.4-2.2	1.1-1.8-2.9	1.1-1.8-3.6	
	NC	*<10	*<10	11	13	16	20	

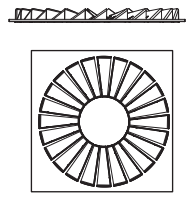
* See Notes on Performance Data on Page 131D.

Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.


CFP-600 BLK 20


CFP-600 WHT 20


CFP-600 BLK 24


CFP-600 WHT 24

Model: **CFP Radial** Induction Swirl Diffuser (Square)

600/20 Nominal Face

Duct Size:	Flow Rate (l/s)	100	125	150	175	200	250	300	350
150	Static Pressure (Pa)	8	10	13	18	25			
	Throw (m)	1.2-1.9-3.0	1.6-2.4-3.4	1.8-2.5-3.8	1.9-2.7-3.9	2.2-2.9-4.2			
	NC	14	23	33	41	51			
200	Static Pressure (Pa)	6	8	11	15	19	30	42	
	Throw (m)	1.2-1.9-3.0	1.5-2.2-3.3	1.6-2.3-3.6	1.9-2.5-3.8	2.0-2.7-3.9	2.6-3.3-4.7	2.9-3.4-5.0	
	NC	13	22	30	38	45	54	61	
250	Static Pressure (Pa)	5	6	9	12	14	21	28	38
	Throw (m)	0.9-1.2-2.4	1.2-1.3-2.7	1.3-1.6-2.8	1.5-2.0-3.0	1.6-2.2-3.5	2.1-3.0-3.9	2.4-3.3-4.5	2.8-3.4-5.1
	NC	<10	14	17	21	27	34	39	46
300	Static Pressure (Pa)	4	5	7	10	12	19	26	35
	Throw (m)	0.7-1.4-2.1	0.9-1.5-2.2	1.1-1.7-2.7	1.3-1.9-2.9	1.4-2.0-3.4	1.9-2.6-3.8	2.2-2.8-4.5	2.6-3.3-4.9
	NC	<10	<10	10	18	21	28	35	42
350	Static Pressure (Pa)	2	3	5	6	8	12	17	28
	Throw (m)	0.6-1.1-2.40	0.8-1.3-2.1	1.0-1.5-2.5	1.3-2.0-2.7	1.4-2.1-3.3	1.9-2.9-3.6	2.2-3.2-4.3	2.5-3.4-4.8
	NC	<10	<10	<10	14	19	26	33	40

Model: **CFP Radial** Induction Swirl Diffuser (Square)

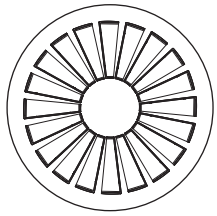
600/24 Nominal Face

Duct Size	Flow Rate (l/s)	25	50	100	150	200	250	300	400
150	Static Pressure (Pa)	*<1	2						
	Throw (m)	0.3-0.6-1.2	1.2-1.6-2.3						
	NC	*<10	*<10						
200	Static Pressure (Pa)	*<1	1	4	9	15	22	30	49
	Throw (m)	0.3-0.5-1.17	1.1-1.5-2.2	1.9-2.8-3.3	2.9-3.2-4.7	3.5-4.1-4.9	3.7-4.3-5.4	4.7-4.9-5.6	4.7-5.6-6.8
	NC	*<10	*<10	12	24	31	37	42	53
250	Static Pressure (Pa)	*<1	1	3	5	8	11	15	28
	Throw (m)	0.2-0.3-0.6	0.6-1.0-1.5	1.2-1.8-2.3	2.2-3.2-4.5	2.7-3.5-4.7	2.9-3.8-5.2	3.2-4.3-5.6	3.8-4.7-6.7
	NC	*<10	*<10	11	14	24	33	42	52
300	Static Pressure (Pa)	*<1	*<1	2	4	8	10	15	28
	Throw (m)	0.2-0.3-0.5	0.5-0.6-0.8	1.0-1.4-1.7	1.7-2.2-2.8	2.2-2.4-3.0	2.3-2.7-3.1	2.6-3.4-4.2	4.3-5.0-5.6
	NC	*<10	*<10	10	14	24	26	36	52
350	Static Pressure (Pa)	*<1	*<1	2	3	7	9	13	26
	Throw (m)			0.9-1.2-1.6	1.5-2.1-2.7	2.1-2.3-3.0	2.2-2.6-3.0	2.5-3.2-4.1	4.2-4.9-5.5
	NC	*<10	*<10	*<10	12	22	25	34	50

***Notes**

1. Performance data is based on a specifically designed side entry box.
2. Listed throw distances are to a terminal velocity (Vt) of 0.75 - 0.5 - 0.25m/s.
3. The NC values are based on a room absorption of 10dB re 10^{-12} Watts.
4. Static pressure less than 1Pa not shown.
5. NC values of less than 10 NC not shown.

CFP – Performance Data



CFP R-615 WHT 20

Model: **CFPR Radial** Induction Swirl Diffuser (Circular)

615/20 Nominal Face

Duct Size:	Flow Rate (l/s)	50	75	100	125	150	175	200	250	300	350	400
250	Static Pressure (Pa)	4	6	11	16	24	31	40	52	67		
	Throw (m)	0.4-1.0-1.5	0.8-1.4-2.0	1.2-1.6-2.5	1.4-2.4-3.4	1.7-2.6-3.6	2.0-3.1-3.9	2.2-3.1-3.9	2.4-3.4-4.9	3.0-4.3-5.6		
	NC	<10	<10	16	25	30	35	38	45	50		
300	Static Pressure (Pa)	1	3	5	7	9	13	17	26	36	48	
	Throw (m)	0.3-0.4-1.0	0.6-0.9-1.7	0.9-1.4-2.5	1.2-1.6-2.7	1.3-1.7-2.8	1.4-1.8-3.1	1.5-1.9-3.2	1.7-2.6-3.6	2.2-2.8-4.3	2.9-3.7-4.9	
	NC	<10	<10	<10	14	23	30	32	39	46	50	
350	Static Pressure (Pa)	1	2	3	4	5	7	11	15	19	23	30
	Throw (m)	0.2-0.4-1.0	0.3-0.5-1.5	0.5-1.0-1.7	1.0-1.4-2.3	1.1-1.5-2.6	1.2-1.6-2.7	1.3-1.8-2.8	1.4-2.0-3.2	2.2-2.6-4.1	2.4-3.5-4.8	2.9-3.9-5.6
	NC	<10	<10	<10	10	18	26	29	37	44	48	52

Product Weights in Kg					
	CFP450-12	CFP600-12	CFP600-20	CFP600-24	CFPR615-20
Diffuser	1.23	2.23	2.11	2.13	1.76
Galv Box	6.5	6.5	6.5	6.5	3.14
Prem Box	2.5	2.6	2.6	2.6	N/A

Notes

1. CFPR Performance Data is based on a specifically designed top entry galvanized plenum box.
2. Listed throw distances are to a terminal velocity (Vt) of 0.75 – 0.50 – 0.25 m/s.
3. The NC values are based on room absorption of 10dB re: 10^{-12} Watts.
4. NC values of less than 10 NC not shown.

Model: **CFPP**

The Holyoake CFPP range of Radial Induction Swirl Diffusers have been designed to provide high quality indoor air diffusion. The CFPP comprises of swirl deflection blades that produce a radial airflow pattern, highly turbulent for rapid temperature equalisation, producing stable room space conditions with even temperature gradients.

The CFPP diffuser is suitable for use with increased temperature differentials and in VAV applications, as the ceiling effect is maintained from minimal, through to very high air flow rates.

The CFPP is able to achieve high room air diffusion quality due to the strong induction swirl pattern it produces. This draws room air up into the supply air flow path, which results in mixing at high level, reducing the chance of draughts and optimising room space conditions.

Installation

CFPP Installation

Installation is simple due to the square lay-in type design. The diffuser can be placed into the T-rail system quickly and easily and the supply duct attached, via a circular spigot connection to the specially designed cushion head plenum. Alternatively the diffuser may be conventionally flush mounted, or with the use of a surface mounted installation flange.

CFPP-R Installation

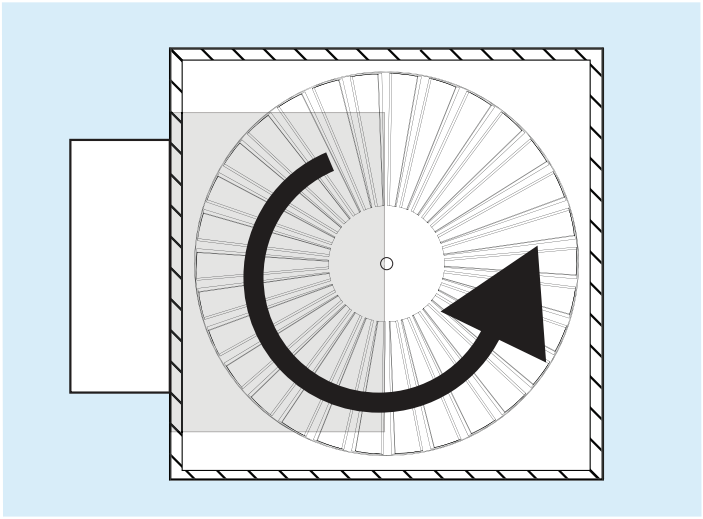
The installation is simple due to the surface mount design. The supply air duct can be attached direct to the circular spigot or fitted with specially designed Holyoake swirl plenum.

Construction

The CFPP is constructed as a single pressing with the body and air pattern elements mechanically formed steel and finished in a high quality white powder coat finish. The CFPP diffuser is both robust and lightweight, making for easy on-site installation.

Features

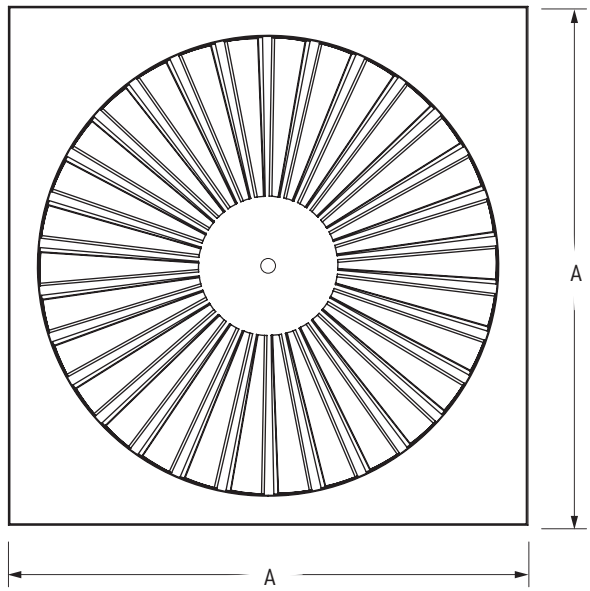
- Strong Ceiling Effect
- Radial Diffustion Pattern
- High Induction Swirl
- Easy Lay-in Installation
- Attractive Appearance



For optimum performance a specifically designed side entry Holyoake Premi-Aire Swirl plenum is recommended.

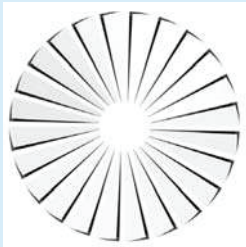
Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

Ceiling Radial Swirl Diffuser

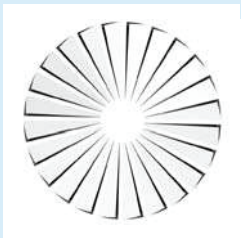


Dimension	A	B	C	D
CFPP 400/24	395	350	30	10
CFPP 450/24	445	350	30	10
CFPP 600S/24	595	350	30	10
CFPP 600/30	595	530	30	10

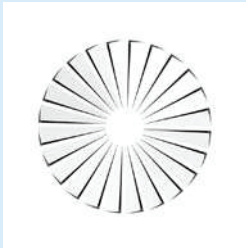
CFPP – Performance Data



CFPP 400/24



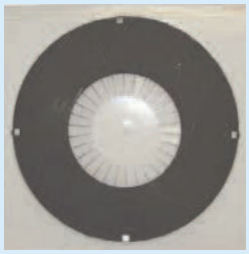
CFPP 450/24



CFPP 600S/24

CFPP 600/30

CFPP 600/30
(rear view)
CFPP600 - A_{eff} 0.0609m^2



CFPP 600C/30
(rear view)
CFPP600C - A_{eff} 0.0305m^2

Model: **CFPP Ceiling Radial Swirl Diffuser** 400

Duct Size:	Flow Rate (l/s)	25	50	75	100	125	150	175	200
150	Static Pressure (Pa)	3	6	14	25	35	58	-	-
	Throw (m)	0.2-0.3-0.5	0.4-0.6-1.0	0.6-0.9-1.4	0.8-1.1-1.6	0.9-1.2-1.9	1.1-1.5-2.1	-	-
	NC	**<10**	**11**	**25**	**32**	**37**	**43**	**-**	**-**
200	Static Pressure (Pa)	2	5	12	21	34	48	63	-
	Throw (m)	0.2-0.3-0.4	0.3-0.5-0.9	0.5-0.8-1.3	0.9-0.9-1.5	0.8-1.1-1.6	1.0-1.4-1.8	1.2-1.7-2.2	-
	NC	**<10**	**<10**	**15**	**23**	**32**	**37**	**42**	**-**
250	Static Pressure (Pa)	2	4	11	19	31	45	59	77
	Throw (m)	0.3-0.4-0.6	0.5-0.7-1.3	0.9-1.2-2.0	1.2-1.6-2.0	1.5-1.9-2.6	1.9-2.6-3.4	2.1-2.9-3.6	2.4-3.1-3.7
	NC	**<10**	**<10**	**11**	**18**	**28**	**32**	**36**	**39**

Model: **CFPP Ceiling Radial Swirl Diffuser** 600C/30

Duct Size:	Flow Rate (l/s)	25	50	75	100	125	150	175	200
150	Static Pressure (Pa)	3	6	14	25	35	58	-	-
	Throw (m)	0.2-0.3-0.5	0.4-0.6-1.0	0.6-0.9-1.4	0.8-1.1-1.6	0.9-1.2-1.9	1.1-1.5-2.1	-	-
	NC	**<10**	**11**	**25**	**32**	**37**	**43**	**-**	**-**
200	Static Pressure (Pa)	2	5	12	21	34	48	63	-
	Throw (m)	0.2-0.3-0.4	0.3-0.5-0.9	0.5-0.8-1.3	0.9-0.9-1.5	0.8-1.1-1.6	1.0-1.4-1.8	1.2-1.7-2.2	-
	NC	<10	<10	15	23	32	37	42	-
250	Static Pressure (Pa)	2	4	11	19	31	45	59	77
	Throw (m)	0.3-0.4-0.6	0.5-0.7-1.3	0.9-1.2-2.0	1.2-1.6-2.0	1.5-1.9-2.6	1.9-2.6-3.4	2.1-2.9-3.6	2.4-3.1-3.7
	NC	<10	<10	11	18	28	32	36	39

Notes on Performance Data

1. Performance data is based on a specifically designed side entry Premi-Aire cushion head box.
2. Listed throw distances are to a terminal velocity (Vt) of 0.75-0.5-0.25 m/s.
3. Performace data is based upon a Δt 9°C.
4. The NC values are based on a room absorbtion of 10dB re 10^{12} Watts.
5. NC values less than NC 10 not shown.
6. 600C fitted with velocity enhancer.

Model **CFPP Ceiling Radial Swirl Diffuser**

600/30

Duct Size:	Flow Rate (l/s)	100	125	150	175	200	250	300	350
150	Static Pressure (Pa)	8	10	13	18	25	-	-	-
	Throw (m)	1.2-1.9-3.0	1.6-2.4-3.4	1.8-2.5-3.8	1.9-2.7-3.9	2.2-2.9-4.2	-	-	-
	NC	**14**	**23**	**33**	**41**	**51**	**-**	**-**	**-**
200	Static Pressure (Pa)	6	8	11	15	19	30	42	-
	Throw (m)	1.2-1.9-3.0	1.6-2.2-3.3	1.6-2.3-3.6	1.9-2.5-3.8	2.0-2.7-3.9	2.6-3.3-4.7	2.9-3.4-5.0	-
	NC	**13**	**22**	**30**	**38**	**45**	**34**	**51**	**-**
250	Static Pressure (Pa)	5	6	9	12	14	21	28	38
	Throw (m)	0.9-1.2-2.4	1.2-1.3-2.7	1.3-1.6-2.8	1.5-2.0-3.0	1.6-2.2-3.5	2.1-3.0-3.9	2.4-3.3-4.5	2.8-3.4-5.1
	NC	**<10**	**14**	**17**	**21**	**27**	**34**	**39**	**46**
300	Static Pressure (Pa)	4	5	7	10	12	19	26	35
	Throw (m)	0.7-1.4-2.1	0.9-1.5-2.2	1.1-1.7-2.7	1.3-1.9-2.9	1.4-2.0-3.4	1.9-2.6-3.8	2.2-2.8-4.5	2.6-3.3-4.9
	NC	**<10**	**<10**	**10**	**18**	**21**	**28**	**35**	**42**
350	Static Pressure (Pa)	2	3	5	6	8	12	17	28
	Throw (m)	0.6-1.1-2.40	0.8-1.3-2.1	1.0-1.5-2.5	1.3-2.0-2.7	1.4-2.1-3.3	1.9-2.9-3.6	2.2-3.2-4.3	2.5-3.4-4.8
	NC	**<10**	**<10**	**<10**	**10**	**19**	**23**	**30**	**36**

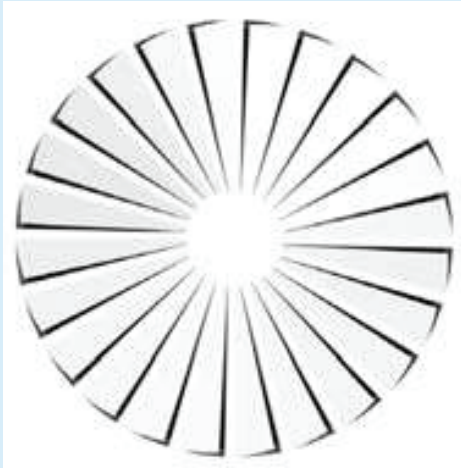
Model: **CFPP Ceiling Radial Swirl Diffuser (square)**

CFPP 300/18

Duct Size:	Flow Rate(l/s)		25	50	80	100
Nominal Duct Size 150mm Diameter	Static Pressure (Pa)		2	8	18	28
	Throw (m)	-	-	0.38	0.62	0.82
		0.3	0.3	0.63	0.95	1.10
		0.5	0.5	1.05	1.45	0.72
	NC		<10	25	38	43

Dimension	A	B	C	D
CFPP 300/18	300	200	12	18

Note: Optional plate size (A) of 250 and 350 also avaliable.



CFPP 300/18 blade profile swirl diffuser (Face View)

CFPP – Ceiling Fixed Pattern Pressed Steel Round

Model: **CFPP-R Ceiling Radial Swirl Diffuser**

Dimension	A	B	C	D
CFPP-R 500/24	500	350	30	10
CFPP-R 615/30	615	530	30	10

24 Swirl Blades

CFPP-R 500/24 - Aeff 0.0305m2

30 Swirl Blades

CFPP-R 615/30 - Aeff 0.0609m2

See pages 134D - 135D for CFPP round performance data

Notes on Performance Data

1. Performance data is based on a specifically designed side entry Premi-Aire cushion head box.
2. Listed throw distances are to a terminal velocity (Vt) of 0.75-0.5-0.25 m/s.
3. Performace data is based upon a Δt 9°C.
4. The NC values are based on a room absorbtion of 10dB re 10^{12} Watts.
5. NC values less than NC 10 not shown.

	Product Weights In Kg	
	CFPP	CFPP/-C
Diffuser	3.35	6.4
Galv Box	6.5	6.5
Prem Box	2.6	2.6

Model: **SFRA**

The Holyoake SFRA range of Circular Radial Swirl Diffusers has been designed to provide exceptional indoor air diffusion.

The Series SFRA comprises of fixed pattern radial blades producing a high induction swirl airflow pattern.

The SFRA range of fixed blade swirl diffusers, presents a stylish and effective alternative to other conventional circular, or square ceiling diffusers.

The SFRA diffusers are designed to produce rapid temperature equalisation, via a horizontal radial air pattern, achieved with a turbulent high induction swirl and are ideally suited for applications with increased temperature differentials.

The SFRA diffusers are ideally suited to VAV applications, where ceiling effect is maintained from minimal through to high airflow rates.

Installation

SFRA Installation is easy with the diffusers being supported by externally mounted fixing tabs, riveted to the circular casing periphery, to provide a suitable fixture to attach to support anchors, provided above the ceiling, (supply and fit by others).

Note: Diffusers require mechancial fixings to be supported entirely from the ductwork.
For use with circular ducting, or can be connected to a Premi-aire™ light weight plenum box spigot, **(refer to your local Holyoake branch).**

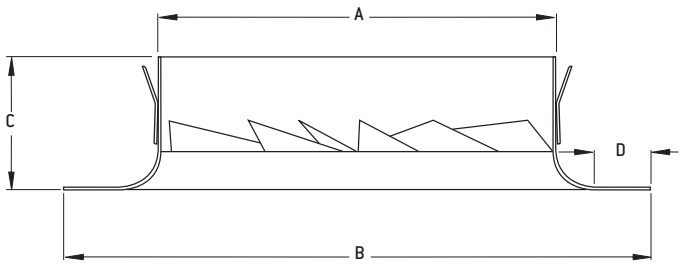
Construction

Series SFRA are manufactured from spun aluminium, with pressed and folded blades. They are available in a range of five sizes and are supplied with ceiling support tabs fitted as standard. Series SFRA are finished in white powder coat and fitted with accessories and dampers where indicated.

Features

- Strong Ceiling Effect.
- Radial Diffusion Pattern
- High Induction Swirl.
- Light Weight Spun Aluminium Construction.
- Easy Installation.
- Attractive Appearance.

Ceiling Radial Swirl Diffuser



Nominal Duct Size	SFRA			
	A	B	C	D
200	195	299	65	33
250	245	362	70	35
300	295	425	90	37
350	345	488	110	38
400	395	550	130	40

Nominal Duct Size	Approximate Weight Kg
200	0.28
250	0.43
300	0.67
350	0.95
400	1.11

SFRA – Performance Data

Model: **SFRA**

Nominal Duct Size		Flow Rate (l/s)	25	50	75					
200mm Diameter	Throw (m)	0.75m/s	-	0.1	0.2					
		0.50m/s	0.1	0.3	0.5					
		0.25m/s	0.2	0.6	1.0					
	Static Pressure (Pa)		7	18	25					
	NC		17	32	40					

Nominal Duct Size		Flow Rate (l/s)	50	75	100	125	150	175		
250mm Diameter	Throw (m)	0.75m/s	0.2	0.3	0.5	0.6	1.0	1.2		
		0.50m/s	0.4	0.5	0.9	1.1	1.6	1.8		
		0.25m/s	0.8	1.1	1.6	1.9	2.5	3.0		
	Static Pressure (Pa)		3	5	9	13	20	27		
	NC		18	22	26	32	38	48		

Nominal Duct Size		Flow Rate (l/s)	50	75	100	125	150	175	200	
300mm Diameter	Throw (m)	0.75m/s	0.2	0.4	0.6	0.8	1.1	1.3	1.4	
		0.50m/s	0.5	0.7	1.0	1.4	1.6	1.9	2.1	
		0.25m/s	1.0	1.2	1.6	2.1	2.5	2.9	3.4	
	Static Pressure (Pa)		2	4	8	11	17	23	30	
	NC		16	20	24	30	36	42	44	

Nominal Duct Size		Flow Rate (l/s)	75	100	125	150	175	200	225	250
350mm Diameter	Throw (m)	0.75m/s	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.8
		0.50m/s	0.6	1.2	1.5	1.8	2.0	2.3	2.8	3.2
		0.25m/s	1.1	1.4	1.7	2.0	2.4	2.9	3.4	4.0
	Static Pressure (Pa)		3	5	9	12	16	20	25	32
	NC		13	18	23	28	34	39	45	51

Nominal Duct Size		Flow Rate (l/s)	125	150	175	200	225	250	275	300
400mm Diameter	Throw (m)	0.75m/s	0.6	0.8	1.0	1.2	1.4	1.8	2.3	2.7
		0.50m/s	0.8	1.2	1.4	1.6	1.8	2.4	2.8	3.1
		0.25m/s	1.2	1.5	2.0	2.4	2.6	3.0	3.4	3.6
	Static Pressure (Pa)		5	7	10	13	17	20	24	29
	NC		18	21	24	27	30	33	37	42

Product Ordering Key and Suggested Specification

SFRA – **200** – **FINISH**

- SFRA: Model
- 200: Nominal Duct Size
- FINISH: Holyoake White Mill Aluminium Powder Coat

Holyoake Series SFRA Circular Fixed Round Aluminium Radial Swirl Diffusers shall be high induction horizontal swirl diffuser, with fixed pattern radial blades, to achieve a high induction swirl airflow pattern.

Series SFRA Diffusers shall be suitable for variable air volume (VAV) applications.

Circular Radial Swirl Diffusers shall be finished in white power coat.

Diffusers shall be fitted with accessories and dampers where indicated.

All shall be as manufactured by Holyoake.

Notes

1. Horizontal radial throws (m) are to a terminal velocity (Vt) of 0.75 - 0.50 - 0.25 m/s.
2. Pressure drop figures are based on duct mounted units.
3. For Premi-Aire™ side entry supply boxes, Multiply Throws by a factor of 0.95 and Pressure Drop by a factor of 1.02.
4. NC values are based on standard room attenuation of 10dB re 10^{-12} Watts.
5. NC values below NC 10 not shown.
6. Seismic restraints would be required, but not supplied.

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

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

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

- CRS – Ceiling Radial Swirl
- P – Optional Perforated Face Plate
- 300 / 450 – Nominal Neck Size
- SE – Special Side Entry Box
- 150* / 200* / 250* / 300 / 350 – Duct Size
- T – Optional 'T' Rail Frame
- FINISH – 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

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

Product Ordering Key and Suggested Specifications

CSS – VAV – [24 / 48] – FINISH

- CSS – VAV: Ceiling Slot Swirl VAV Diffuser
- 24 / 48: Number of Slots
- FINISH: 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.

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.

DIFFUSERS
CEILING MULTI PATTERN

CMP-A	Ceiling Multi Pattern - Aluminium	142 - 157D
CMP-ADJ	Ceiling Multi Pattern - Adjustable	169D
CMPH	Ceiling Multi Pattern - Horizontal Blade	158 - 165D
CMPP	Ceiling Multi Pattern - Plaque	166D
CMP-TL	Ceiling Multi Pattern - Thermal Low	168D
HOLDIT	Cost Mounting Clip	170D
Ordering Key and Specification		171 - 172D

- Square/rectangular multi pattern.
- Louver face and plaque type variable volume diffuser.
- Ceiling thermal diffuser.
- Low cost thermal diffuser.
- Aluminium, or Steel construction.
- Removeable core.
- Full range of air distribution patterns.
- Adjustable horizontal to vertical vanes.

CMP-A – Ceiling Multi Pattern Diffuser (Aluminium)

Model: **CMP-A Ceiling Multi Pattern – Aluminium**

The Series CMP-A diffusers are a Louver Face Ceiling Diffuser of extruded aluminium construction, with removable core, available in a range of sizes and air distribution patterns, to suit numerous and varied requirements.

Construction

Series CMP-A diffusers are ruggedly constructed entirely of aluminium, are lightweight and have no heavy cast, or moulded components. Precision combination corner gussets and braces keep mitres to a hairline and aluminium rivets hold the core components rigidly together, eliminating the possibility of warping, flexing, or rattling.

Panel diffusers (Type 2 on page 144D), are mechanically secured to steel panels with the Unique Holyoake mounting pins, eliminating gaps and producing a super-fine junction between panel and extrusion.

Installation

The diffusers frame assembly is installed in the ceiling opening and attached and sealed to the supply duct. The extensive range of cores, all snap in to the frame surrounds, with nickel plated spring steel thumb clips.

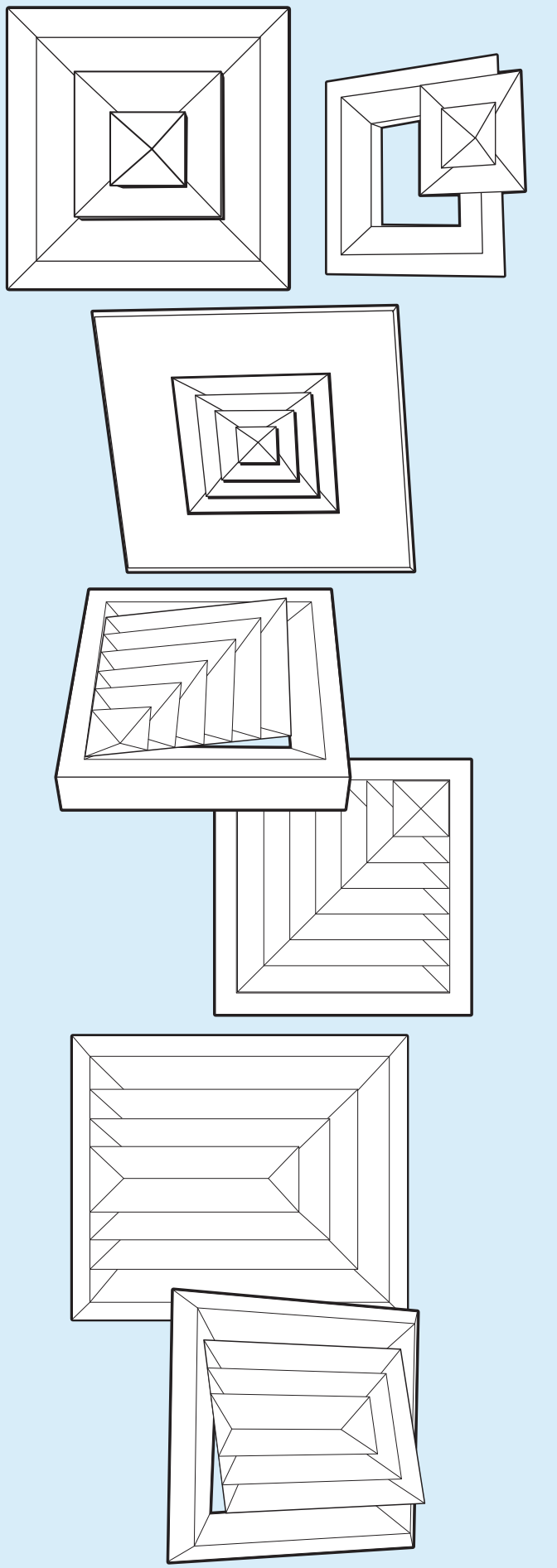
Finish

All Holyoake aluminium diffusers receive a three stage preparation, prior to final finishing; cleaning, chemical etch and drying. This preparation ensures powder coat adhesion and precludes powder peeling, or flaking after installation.
Standard colour is Holyoake White.

Features

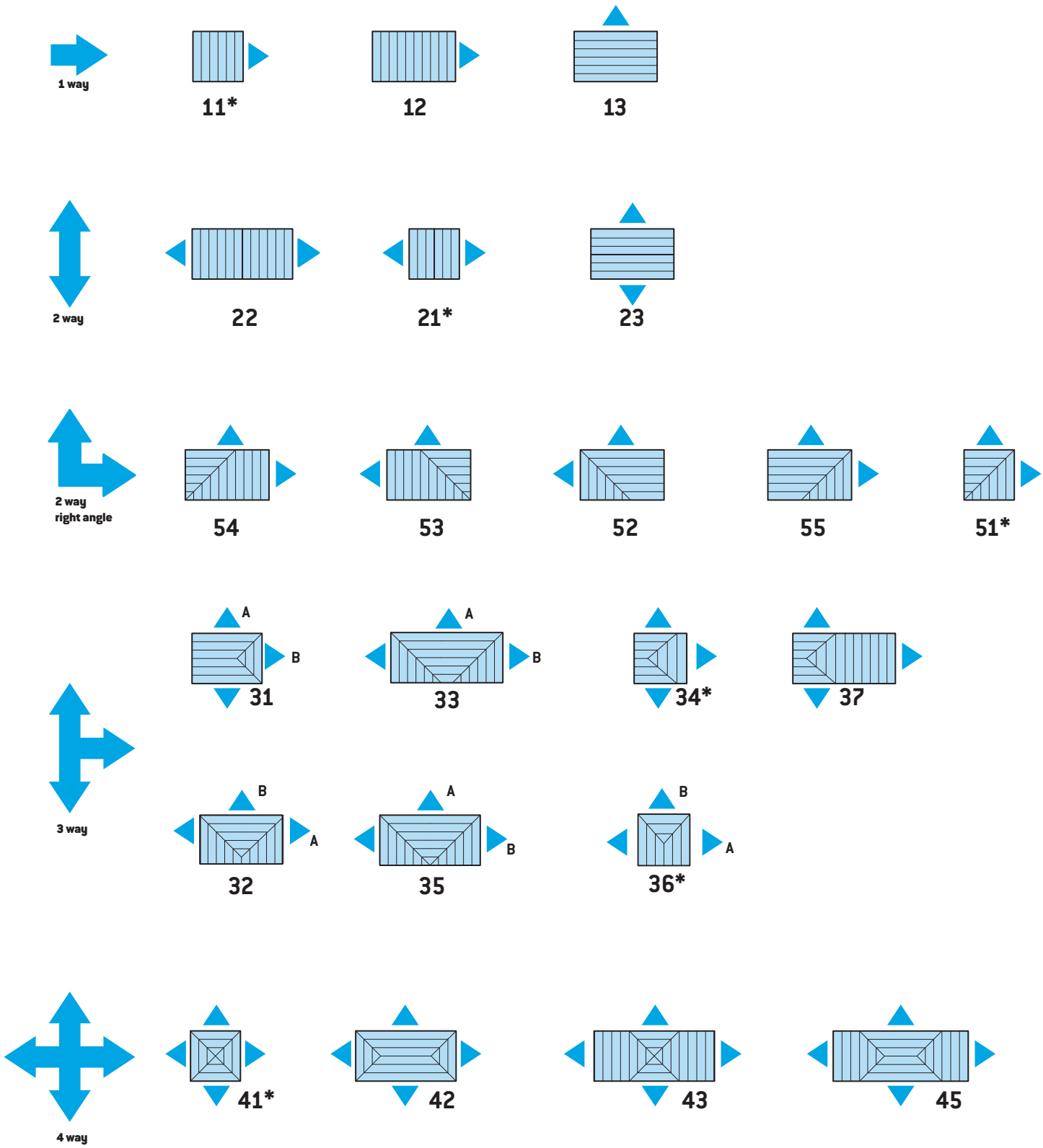
- All aluminium construction.
- Precision mitred corners.
- Selection of frame styles.
- Variety of throw patterns.
- Snap-in interchangeable cores.
- Tough powder coat finish.
- Lightweight Premi-Aire™ and galvanised cushion head boxes available.

Ceiling Diffuser



Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

Model: **CMP** and **CMPH Core Styles**



* Square core patterns.
Diffusers are only available in standard sizes as listed in performance data.

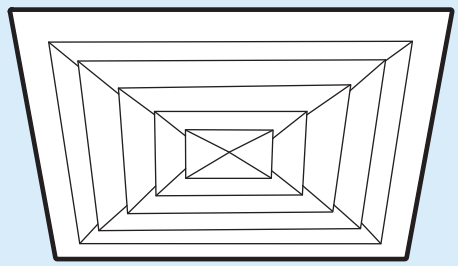
CMP-A – Ceiling Multi Pattern Diffuser (Aluminium)

Model: **CMP-A – Ceiling Multi Pattern Diffuser (Aluminium)**

Standard Flange Frame.

Designed for surface mounting on all types of ceilings, as well as lay-in ceiling tile applications.

Type 1

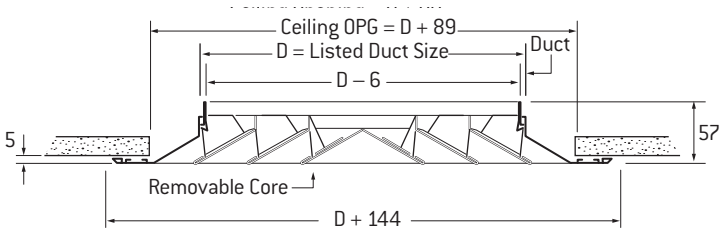


Construction

Aluminium:

0.75mm extruded 6063-T5 aluminium outer frame.

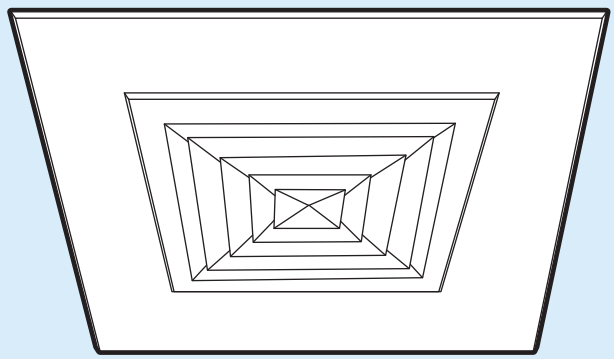
0.55mm removable aluminium core.



Panel Diffuser.

Lay-in type for installation in suspended "T-Rail" type ceilings. Standard panel overall size is 595 x 595 to suit a 600 x 600 grid. Size 450 x 450 has an overall face size of 595 x 595. It therefore does not require a panel in a 600 grid and fits "T-Rail" spacing with clearance*.

Type 2

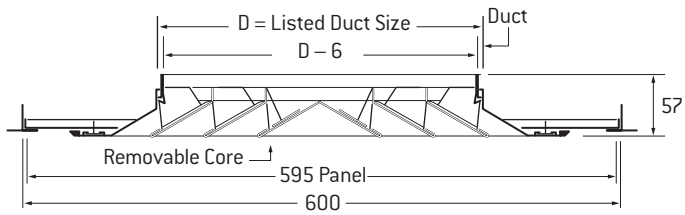


Construction

Aluminium:

0.75mm extruded 6063-T5 aluminium outer frame.

0.55mm removable aluminium core.



* Note: 0.75 mm Steel Panel on CMP-A Type 2.

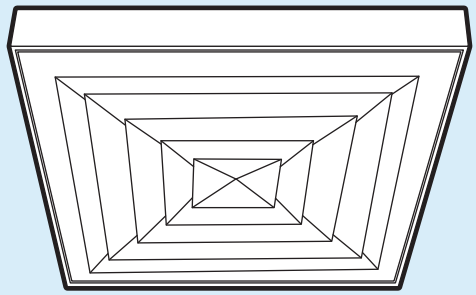
Product weights are shown on page 150D.

Model: **CMP-A – Ceiling Multi Pattern Diffuser (Aluminium)**

Drop Frame.

Lowers the face of the diffuser below the ceiling line. Can be used to reduce smudging, or against obstacles to minimise drafts. Can be supplied in any height from 50 - 81mm, but unless otherwise specified, frame height of 50 mm will be furnished. Special order only.

Type 3

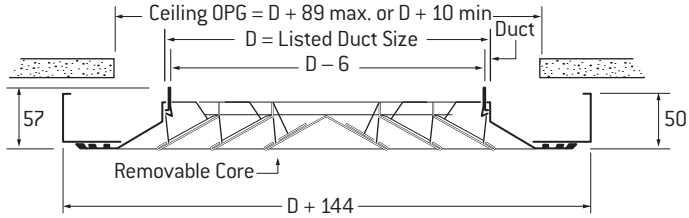


Construction

Aluminium:

0.75mm extruded 6063-T5 aluminium outer frame.

0.55mm removable aluminium core.

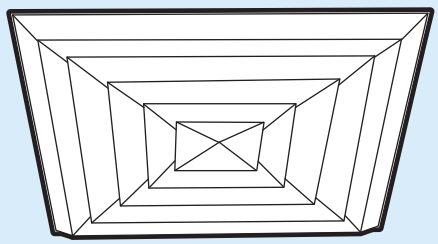


Bevelled Drop Frame.

Smartly styled bevelled type surround reduces ceiling smudging.

For all surface mounting applications. Special order only.

Type 4



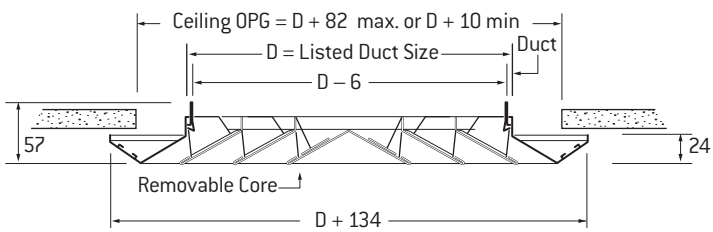
Construction

Aluminium:

0.75mm extruded 6063-T5 aluminium outer frame.

0.55mm removable aluminium core.

Product weights are shown on page 150D.



CMP – Octave Band Sound Data

Model: **CMP Supply**

Lp		OCTAVE BANDS, Lw					
NC	A-Scale	125	250	500*	1000	2000	4000
15	19	38-40-42-44	30-32-34-35	27-27-27-27	25-25-25-25	21-19-17-15	9-5 – –
20	24	40-42-44-46	33-35-37-38	31-31-31-31	30-30-30-30	27-25-23-21	17-13- 9 –
25	29	43-45-47-49	37-39-41-42	35-35-35-35	35-35-35-35	32-30-28-26	24-20-16-11
30	34	46-48-50-52	40-42-44-45	40-40-40-40	39-39-39-39	37-35-33-31	31-27-23-18
35	39	49-51-53-55	44-46-48-49	44-44-44-44	44-44-44-44	42-40-38-36	38-34-30-25
40	44	52-54-56-58	48-50-52-53	48-48-48-48	49-49-49-49	47-45-43-41	45-41-37-32
45	49	55-57-59-61	51-53-55-56	53-53-53-53	54-54-54-54	52-50-48-46	51-47-43-38
50	54	58-60-62-64	55-57-59-60	57-57-57-57	59-59-59-59	57-55-53-51	56-52-48-43

* Add 4dB for Aluminium Diffuser

1.49m² Duct
0.372m² Duct
0.092m² Duct
0.023m² Duct

Model: **CMP Return**

Lp		OCTAVE BANDS, Lw					
NC	A-Scale	125*	250	500	1000	2000	4000
15	18	24-29-34-40	26-27-28-29	25-26-27-28	25-25-25-25	22-22-22-21	18-17-16-16
20	23	28-33-38-44	30-31-32-33	29-30-31-32	30-30-30-30	27-27-27-26	24-23-22-22
25	28	33-38-43-49	35-36-37-38	34-35-36-37	35-35-35-35	32-32-31-30	29-28-27-27
30	33	37-42-47-53	39-40-41-42	38-39-40-41	39-39-39-39	37-37-36-35	35-34-33-33
35	38	41-46-51-57	43-44-45-46	42-43-44-45	44-44-44-44	42-42-41-40	41-40-39-39
40	43	46-51-56-62	48-49-50-51	47-48-49-50	49-49-49-49	47-46-45-44	46-45-44-44
45	48	50-55-60-66	52-53-54-55	51-52-53-54	54-54-54-54	52-51-50-49	51-51-50-50
50	53	54-59-64-70	56-57-58-59	55-56-57-58	59-59-59-59	57-56-55-54	56-56-55-55

* Subtract 9dB for Aluminium Diffuser

1.49m² Duct
0.372m² Duct
0.092m² Duct
0.023m² Duct

Notes on Sound Performance Data

The NC values are obtained from the performance tables on pages 148D to 157D, which are based on 8 dB room attenuation re 10^{-12} watts. The octave band dB values are sound power levels (Lw) re 10^{-12} watts. In the tables above, four values are shown for each octave band and NC value, with the first value for a duct area of 0.023m², second 0.092 m², third 0.372 m² and fourth for 1.49 m².

The A-scale dB values are based on a 8 dB room attenuation re 10^{-12} watts.

Lp - Sound pressure level, dB re 0.0002 microbars.

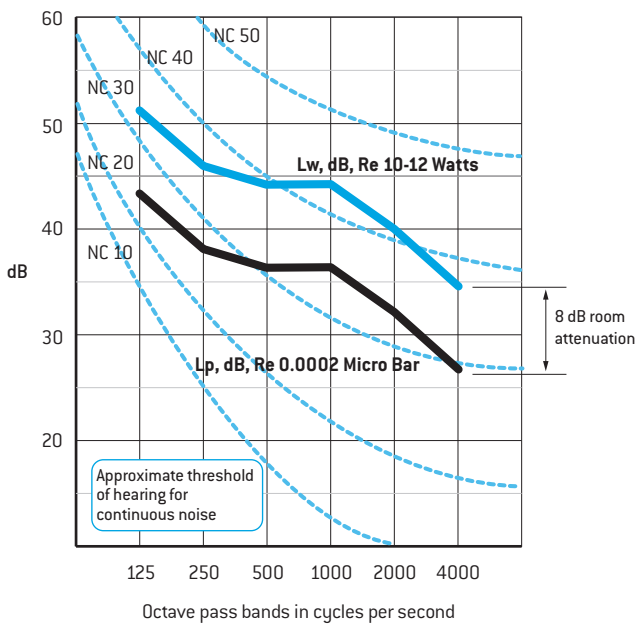
Lw - Sound power level, dB re 10^{-12} watts.

Example

A 300 x 300 CMP supplies 0.378 m³/s. List the complete sound analysis for this condition. (A 300 x 300 CMP has a duct area of 0.090 m²).

The Performance Table on Page 148D shows that a 300 x 300 CMP supplying 0.378 m³/s satisfies an NC35. The CMP Supply table above lists the following A-scale and octave band sound levels for an NC35 and 0.092 m² duct.

dB,	Lp	Octave Bands - dB, Lw					
NC	A	125	250	500	1000	2000	4000
35	39	51	46	44	44	40	34

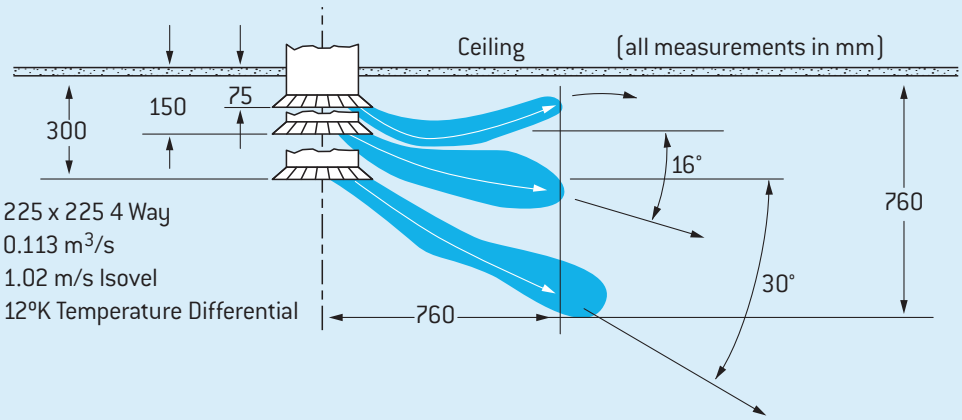


Above octave band sound power levels (Lw) plotted (top curve). The lower curve that satisfies an NC 35 was obtained by subtracting 8 dB (Room Attenuation) from each octave band sound power level.

Notes on Throw Performance Data

1. The CMP and CMPH Performance Data in the tables on the following pages (Pages 148D - 157D and 160D - 165D) applies when the outlet is mounted near the ceiling with ceiling effect.
2. Where no ceiling effect is present the horizontal throw will be about 25% less than shown in the tables.
3. The subsequent downward projection should be taken into account.

Effects of Mounting Position on Air Pattern



RECOMMENDED MAXIMUM AIR FLOW						
Ceiling Height, m.	2.40	2.70	3.00	3.60	4.20	4.80
Air Flow (m^3/s) per side	0.095	0.165	0.260	0.425	0.660	0.755

This data is based on 12°C Δt (temperature differential) during cooling.

General Performance Notes

1. Pressure: All pressures are in Pa (N/m²)

- TP = Total Pressure
- –SP = Negative Static Pressure

2. Throw: Maximum throws are to a terminal velocity of 0.25 m/s, middle to 0.5 m/s, and minimum to 0.75 m/s.

3. Sound: The NC values are based on a room absorption of 8 dB, re 10^{-12} watts and one steel diffuser. For aluminium diffusers, apply the following corrections to the listed data:

Supply:	NC = Listed + 3
	TP = Listed x 1.5
	THROW = Listed x 1.0
Return:	NC = Listed + 2
	–SP = Listed x 1.0

CMPH: Where table shows –, NC is below 20.

4. Return Factors: If the unit is used as a return inlet, the performance data is obtained by applying the return factors shown on each table in the following manner:

- **a. Sound: Add the factor shown to the NC value listed.**
- **b. Negative Static Pressure: Multiply the return factor by the total pressure listed.**

Return Example:

150 x 150 CMP with 0.071 m^3/s being returned through the unit.
Return NC = 20 + 1 = 21
Return Pressure (-SP) = TP x 1.1 = 25 (1.1) = 27.5 Pa (N/m²)

5. Size in mm: This is the Diffuser Listed Duct Size or Nominal Neck Opening

Symbols

m^3/s	Cubic metres per second	Pt	Total pressure Pa (= Ps + Pv)
m/s	Metres per second	Δt	Temperature differential, room to supply
Vk	Outlet velocity, m/s	Throw	Distance air travels from diffuser to a given Vt.
Vt	Air stream terminal velocity, m/s		Tables show throws to Vts of 0.75 (min);
Ak	Diffuser or register net jet area, m^2		0.5 and 0.25 (max) m/s.
AD or An	Inlet duct or neck area	NC	Noise criteria. Ratings are based on sound
Ps	Static pressure, Pa		power level (SWL) re. 10^{-12} watts minus 8 dB
Pv	Velocity pressure, Pa		room attenuation in all frequency bands.

Note

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

CMP – Performance Data

Size in mm	Patterns	Neck Vel m/s / TP Pa	1.57 / 6		2.10 / 11		2.62 / 18		3.15 / 25		3.67 / 35		4.19 / 45		4.72 / 57	
	Return Factors NC+1 -SP=1.1TP	Total m^3/s NC	0.036 / -		0.047 / 7		0.059 / 14		0.071 / 20		0.083 / 24		0.094 / 28		0.106 / 32	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
150 x 150	41	m^3/s side throw m	0.009		0.012		0.015		0.018		0.020		0.024		0.027	
			1.2		1.5		1.8		1.8		2.1		2.1		2.4	
			1.5		1.8		2.1		2.1		2.4		2.4		2.7	
			2.1		2.4		2.7		3.1		3.4		3.4		3.7	
	36 A/B	m^3/s side throw m	0.009	0.013	0.012	0.018	0.015	0.022	0.018	0.026	0.201	0.031	0.024	0.036	0.027	0.040
			1.2	1.5	1.5	1.8	1.8	2.1	1.8	2.1	2.1	2.4	2.1	2.4	2.4	2.7
			1.5	2.1	1.8	2.4	2.1	2.7	2.1	3.1	2.4	3.4	2.4	3.4	2.7	3.7
			2.1	3.1	2.4	3.4	2.7	4.0	3.1	4.3	3.4	4.6	3.4	4.9	3.7	5.2
	34 A/B *	m^3/s side throw m	0.018	0.009	0.024	0.012	0.029	0.015	0.036	0.018	0.041	0.021	0.047	0.024	0.053	0.027
			1.8	1.2	2.1	1.5	2.4	1.8	2.7	1.8	2.7	2.1	3.1	2.1	3.4	2.4
			2.4	1.5	2.7	1.8	3.1	2.1	3.4	2.1	3.7	2.4	4.0	2.4	4.3	2.7
			3.1	2.4	3.7	2.7	4.3	3.1	4.6	3.4	4.9	3.7	5.2	4.0	5.5	4.3
AD 0.023 m^2	21 / 51	m^3/s side throw m	0.018		0.024		0.029		0.036		0.042		0.049		0.053	
			2.1		2.4		2.7		3.1		3.4		3.4		3.7	
			2.4		2.7		3.1		3.4		3.7		4.0		4.3	
			3.4		4.0		4.6		4.9		5.2		5.5		6.1	
	11	m^3/s side throw m	0.035		0.047		0.060		0.071		0.083		0.094		0.107	
			2.4		2.7		3.1		3.4		3.7		4.0		4.3	
			3.1		3.4		4.0		4.3		4.6		4.9		5.2	
			4.3		4.9		5.5		6.1		6.4		7.0		7.3	
	Return Factors NC+3 -SP=1.3TP	Total m^3/s NC	0.080 / -		0.106 / 11		0.133 / 18		0.160 / 24		0.186 / 28		0.212 / 32		0.239 / 36	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
225 x 225	41	m^3/s side throw m	0.020		0.026		0.033		0.040		0.046		0.053		0.059	
			1.5		1.8		2.1		2.1		2.4		2.4		2.7	
			1.8		2.1		2.4		2.7		2.7		3.1		3.4	
			2.7		3.1		3.4		3.7		4.0		4.3		4.6	
	36 A/B	m^3/s side throw m	0.020	0.030	0.026	0.040	0.033	0.050	0.040	0.060	0.046	0.070	0.053	0.080	0.060	0.090
			1.5	2.1	1.8	2.4	2.1	2.7	2.1	3.1	2.4	3.4	2.4	3.4	2.7	3.7
			1.8	2.7	2.1	3.1	2.4	3.4	2.7	3.7	2.7	4.0	3.1	4.3	3.4	4.6
			2.7	3.7	3.1	4.3	3.4	4.9	3.7	5.2	4.0	5.5	4.3	6.1	4.6	6.4
	34 A/B *	m^3/s side throw m	0.034	0.023	0.044	0.031	0.056	0.039	0.067	0.046	0.078	0.054	0.089	0.062	0.100	0.070
			2.1	2.1	2.4	2.4	2.7	2.7	3.1	3.1	3.4	3.4	3.4	3.4	3.7	3.7
			2.7	2.4	3.1	2.7	3.4	3.1	3.7	3.4	4.0	3.7	4.3	4.0	4.6	4.3
			3.7	3.4	4.3	4.0	4.9	4.6	5.2	4.9	5.5	5.2	6.1	5.5	6.4	6.1
AD 0.051 m^2	21 / 51	m^3/s side throw m	0.040		0.053		0.067		0.080		0.093		0.106		0.119	
			2.7		3.1		3.4		3.7		4.0		4.3		4.6	
			3.1		3.7		4.3		4.6		4.9		5.2		5.5	
			4.6		5.2		5.8		6.4		6.7		7.3		7.9	
	11	m^3/s side throw m	0.080		0.106		0.133		0.160		0.186		0.212		0.239	
			3.4		4.0		4.6		4.9		5.2		5.5		6.1	
			4.3		4.9		5.5		6.1		6.4		7.0		7.3	
			5.8		6.7		7.6		8.2		8.8		9.5		10.1	
	Return Factors NC+5 -SP=1.4TP	Total m^3/s NC	0.142 / -		0.189 / 14		0.236 / 21		0.283 / 27		0.330 / 31		0.378 / 35		0.425 / 39	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
300 x 300	41	m^3/s side throw m	0.035		0.047		0.059		0.071		0.083		0.094		0.106	
			1.8		2.1		2.4		2.7		2.7		3.1		3.4	
			2.4		2.7		3.1		3.4		3.7		4.0		4.3	
			3.1		3.7		4.3		4.5		4.9		5.2		5.5	
	36 A/B	m^3/s side throw m	0.035	0.053	0.047	0.071	0.059	0.088	0.071	0.106	0.083	0.124	0.094	0.142	0.106	0.160
			1.8	2.4	2.1	2.7	2.4	3.1	2.7	3.4	2.7	3.7	3.1	4.0	3.4	4.3
			2.4	3.1	2.7	3.4	3.1	4.0	3.4	4.3	3.7	4.6	4.0	4.9	4.3	5.2
			3.1	4.3	3.7	4.9	4.3	5.5	4.6	6.1	4.9	5.4	5.2	7.0	5.5	7.3
	34 A/B *	m^3/s side throw m	0.053	0.044	0.071	0.059	0.088	0.074	0.106	0.088	0.124	0.103	0.142	0.118	0.160	0.133
			2.4	2.4	2.7	2.7	3.1	3.1	3.4	3.4	3.7	3.7	4.0	4.0	4.3	4.3
			3.1	3.1	3.4	3.4	4.0	4.0	4.3	4.3	4.6	4.6	4.9	4.9	5.2	5.2
			4.3	4.3	4.9	4.9	5.5	5.5	6.1	6.1	6.4	6.4	7.0	7.0	7.3	7.3
AD 0.090 m^2	21 / 51	m^3/s side throw m	0.071		0.094		0.118		0.142		0.165		0.189		0.212	
			3.1		3.7		4.3		4.6		4.9		5.2		5.5	
			3.7		4.3		4.9		5.2		5.5		6.1		6.4	
			5.2		6.1		7.0		7.6		7.9		8.5		9.2	
	11	m^3/s side throw m	0.142		0.189		0.236		0.283		0.390		0.378		0.425	
			4.0		4.6		5.2		5.5		6.1		6.4		7.0	
			4.9		5.5		6.4		6.7		7.3		7.6		8.2	
			7.0		7.9		9.2		9.8		10.4		11.3		11.9	
	Return Factors NC+5 -SP=1.9TP	Total m^3/s NC	0.220 / 7		0.295 / 16		0.368 / 23		0.441 / 29		0.515 / 33		0.590 / 37		0.661 / 41	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
375 x 375	41	m^3/s side throw m	0.055		0.074		0.092		0.110		0.129		0.147		0.165	
			2.1		2.4		2.7		3.1		3.4		3.4		3.7	
			2.7		3.1		3.4		3.7		4.0		4.3		4.6	
			3.7		4.3		4.9		5.2		5.5		6.1		6.4	
	36 A/B	m^3/s side throw m	0.055	0.083	0.074	0.111	0.092	0.138	0.110	0.166	0.129	0.193	0.147	0.221	0.165	0.249
			2.1	3.1	2.4	3.7	2.7	4.3	3.1	4.6	3.3	4.9	3.4	5.2	3.7	5.5
			2.7	3.7	3.1	4.3	3.4	4.9	3.7	5.2	4.0	5.5	4.3	6.1	4.6	6.4
			3.7	5.2	4.3	6.1	4.9	7.0	5.2	7.6	5.5	7.9	6.1	8.5	6.4	9.2
	34 A/B *	m^3/s side throw m	0.077	0.072	0.103	0.096	0.129	0.119	0.154	0.144	0.180	0.158	0.206	0.191	0.232	0.215
			2.7	2.7	3.1	3.1	3.4	3.4	3.7	3.7	4.0	4.0	4.3	4.3	4.6	4.6
			3.4	3.4	4.0	4.0	4.6	4.6	4.9	4.9	5.2	5.2	5.5	5.5	6.1	6.1
			4.9	4.9	5.5	5.5	6.4	6.4	6.7	6.7	7.3	7.3	7.6	7.6	8.2	8.2
AD 0.141 m^2	21 / 51	m^3/s side throw m	0.111		0.147		0.184		0.221		0.258		0.295		0.330	
			3.7		4.3		4.9		5.2		5.5		6.1		6.4	
			4.6		5.2		5.8		6.4		6.7		7.3		7.9	
			6.4		7.3		8.2		9.2		9.8		10.4		11.0	
	11	m^3/s side throw m	0.220		0.295		0.368		0.441		0.515		0.590		0.661	
			4.6		5.2		5.8		6.4		6.7		7.3		7.9	
			5.5		6.4		7.3		7.9		8.5		9.2		9.8	
			7.9		9.2		10.4		11.3		12.2		12.8		13.7	

All ceiling diffusers, seismic restraints are required, but not supplied. * These cores are constructed to give as near as possible equal air flow in A & B directions.

Size in mm	Patterns	Neck Vel m/s / TP Pa	1.57 / 6		2.10 / 11		2.62 / 18		3.15 / 25		3.67 / 35		4.19 / 45		4.72 / 57	
	Return Factors	Total m³/s / NC	0.319 / 9		0.425 / 18		0.531 / 25		0.637 / 31		0.734 / 35		0.850 / 39		0.956 / 43	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
450 x 450	41	m³/s side throw m	0.079		0.106		0.132		0.159		0.188		0.212		0.238	
			2.4		2.7		3.1		3.4		3.7		4.0		4.3	
			3.1		3.4		4.0		4.3		4.6		4.9		5.2	
			4.3		4.9		5.5		6.1		6.4		7.0		7.3	
	36	m³/s side throw m	0.079	0.119	0.106	0.159	0.132	0.199	0.159	0.239	0.186	0.279	0.212	0.319	0.239	0.359
			2.4	3.4	2.7	4.0	3.1	4.6	3.4	4.9	3.7	5.2	4.0	5.5	4.3	6.1
			3.1	4.3	3.4	4.9	4.0	5.5	4.3	6.1	4.6	6.4	4.9	7.0	5.2	7.3
			4.3	5.8	4.9	6.7	5.5	7.6	6.1	8.2	6.4	8.8	7.0	9.5	7.3	10.1
	34 *	m³/s side throw m	0.106	0.106	0.142	0.142	0.177	0.177	0.212	0.212	0.248	0.248	0.283	0.283	0.319	0.319
			3.4	3.4	4.0	4.0	4.6	4.6	4.9	4.9	5.2	5.2	5.5	5.5	6.1	6.1
			4.3	4.3	4.9	4.9	5.5	5.5	6.1	6.1	6.4	6.4	7.0	7.0	7.3	7.3
			5.8	5.8	6.7	6.7	7.6	7.6	8.3	8.3	8.8	8.8	9.5	9.5	10.1	10.1
AD 0.202 m²	21 / 51	m³/s side throw m	0.159		0.212		0.265		0.318		0.371		0.425		0.477	
			4.0		4.6		5.2		5.5		6.1		6.4		7.0	
			4.9		5.5		6.4		6.7		7.3		7.6		8.2	
			7.0		7.9		9.2		9.8		10.4		11.3		11.9	
	11	m³/s side throw m	0.319		0.425		0.531		0.638		0.743		0.850		0.956	
			4.9		5.8		6.7		7.0		7.6		8.2		8.8	
			6.1		7.0		7.9		8.5		9.2		10.1		10.7	
			8.5		9.8		11.3		11.9		12.8		13.7		14.6	
	Return Factors	Total m³/s / NC	0.433 / 11		0.578 / 20		0.722 / 27		0.866 / 33		1.010 / 37		1.157 / 41		1.298 / 45	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
525 x 525	41	m³/s side throw m	0.109		0.144		0.180		0.217		0.253		0.289		0.325	
			2.7		3.1		3.4		3.7		4.0		4.3		4.6	
			3.4		4.0		4.6		4.9		5.2		5.5		6.1	
			4.9		5.5		6.4		6.7		7.3		7.6		8.2	
	36	m³/s side throw m	0.109	0.163	0.144	0.217	0.180	0.271	0.217	0.325	0.235	0.379	0.289	0.423	0.325	0.486
			2.7	3.7	3.1	4.3	3.4	4.9	3.7	5.2	4.0	5.5	4.3	6.1	4.6	6.4
			3.4	4.6	4.0	5.2	4.6	5.8	4.9	6.4	5.2	6.7	5.5	7.3	6.1	7.9
			4.9	6.4	5.5	7.3	6.4	8.2	6.7	9.2	7.3	9.8	7.6	10.4	8.2	11.0
	34 *	m³/s side throw m	0.139	0.146	0.186	0.194	0.232	0.243	0.279	0.292	0.325	0.340	0.369	0.389	0.418	0.438
			3.4	3.4	4.0	4.0	4.6	4.6	4.9	4.9	5.2	5.2	5.5	5.5	6.1	6.1
			4.3	4.3	4.9	4.9	5.5	5.5	6.1	6.1	6.4	6.4	7.0	7.0	7.3	7.3
			5.8	5.8	6.7	6.7	7.6	7.6	8.2	8.2	8.8	8.8	9.5	9.5	10.1	10.1
AD 0.276 m²	21 / 51	m³/s side throw m	0.216		0.289		0.361		0.433		0.505		0.578		0.649	
			4.6		5.2		5.8		6.4		6.7		7.3		7.9	
			5.5		6.4		7.3		7.9		8.5		9.2		9.8	
			7.9		9.2		10.4		11.3		12.2		12.8		13.7	
	11	m³/s side throw m	0.432		0.578		0.723		0.866		1.010		1.160		1.300	
			5.5		6.4		7.3		7.9		8.5		9.2		9.8	
			7.0		7.9		9.2		9.8		10.4		11.3		11.9	
			9.5		11.0		12.5		13.4		14.6		15.6		16.5	
	Return Factors	Total m³/s / NC	0.566 / 12		0.755 / 21		0.944 / 28		1.130 / 34		1.320 / 38		1.510 / 42		1.700 / 46	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
600 x 600	41	m³/s side throw m	0.142		0.189		0.236		0.283		0.330		0.378		0.425	
			3.1		3.7		4.3		4.6		4.9		5.2		5.5	
			3.7		4.3		4.9		5.2		5.5		6.1		6.4	
			5.2		6.1		7.0		7.6		7.9		8.5		9.2	
	36	m³/s side throw m	0.142	0.212	0.189	0.280	0.236	0.354	0.283	0.425	0.330	0.496	0.378	0.567	0.425	0.638
			3.1	4.0	3.7	4.6	4.3	5.2	4.6	5.5	4.9	6.1	5.2	6.4	5.5	7.0
			3.7	4.9	4.3	5.5	4.9	6.4	5.2	6.7	5.5	7.3	6.1	7.6	6.4	8.2
			5.2	7.0	6.1	7.9	7.0	9.2	7.6	9.8	7.9	10.4	8.5	11.3	9.2	11.9
	34 *	m³/s side throw m	0.213	0.177	0.283	0.236	0.354	0.295	0.425	0.354	0.496	0.413	0.567	0.472	0.638	0.531
			4.0	3.7	4.6	4.3	5.2	4.9	5.5	5.2	6.1	5.5	6.4	6.1	7.0	6.4
			4.9	4.6	5.5	5.2	6.4	5.8	6.7	6.4	7.3	6.7	7.6	7.3	8.2	7.9
			7.0	6.4	7.9	7.3	9.2	8.2	9.8	9.2	10.4	9.8	11.3	10.4	11.9	11.0
AD 0.360 m²	21 / 51	m³/s side throw m	0.283		0.378		0.472		0.566		0.661		0.755		0.850	
			4.9		5.8		6.7		7.0		7.6		8.2		8.8	
			6.1		7.0		7.9		8.5		9.2		10.1		10.7	
			8.5		9.8		11.3		11.9		12.8		13.7		14.6	
	11	m³/s side throw m	0.566		0.755		0.944		1.130		1.320		1.510		1.700	
			6.1		7.0		7.9		8.5		9.2		9.8		10.7	
			7.3		8.5		9.8		10.4		11.3		12.2		12.8	
			10.7		12.2		14.0		14.9		16.2		17.1		18.3	
	Return Factors	Total m³/s / NC	0.885 / 15		1.180 / 24		1.480 / 31		1.770 / 37		2.070 / 41		2.360 / 45		2.660 / 49	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
750 x 750	41	m³/s side throw m	0.221		0.295		0.369		0.442		0.516		0.590		0.664	
			3.4		4.0		4.6		4.9		5.2		5.5		6.1	
			4.3		4.9		5.5		6.1		6.4		7.0		7.3	
			5.8		6.7		7.6		8.2		8.8		9.5		10.1	
	36	m³/s side throw m	0.221	0.332	0.295	0.443	0.369	0.553	0.442	0.663	0.516	0.774	0.590	0.885	0.664	0.996
			3.4	4.6	4.0	5.2	4.6	5.8	4.9	6.4	5.2	6.7	5.5	7.3	6.1	7.9
			4.3	5.5	4.9	6.4	5.5	7.3	6.1	7.9	6.4	7.9	7.0	9.2	7.3	9.8
			5.8	7.9	6.7	9.2	7.6	10.4	8.2	11.3	8.8	12.2	9.5	12.8	10.1	13.7
	34 *	m³/s side throw m	0.308	0.289	0.412	0.384	0.515	0.481	0.619	0.576	0.720	0.670	0.820	0.767	0.926	0.862
			4.3	4.3	4.9	4.9	5.5	5.5	6.1	6.1	6.4	6.4	7.0	7.0	7.3	7.3
			5.2	5.2	6.1	6.1	7.0	7.0	7.6	7.6	7.9	7.9	8.5	8.5	9.2	9.2
			7.3	7.3	8.5	8.5	9.8	9.8	10.4	10.4	11.3	11.3	12.2	12.2	12.8	12.8
AD 0.562 m²	21 / 51	m³/s side throw m	0.442		0.590		0.737		0.885		1.030		1.180		1.330	
			5.5		6.4		7.3		7.9		8.5		9.2		9.8	
			7.0		7.9		9.2		9.8		10.4		11.3		11.9	
			9.5		11.0		12.5		13.4		14.6		15.6		16.5	
	11	m³/s side throw m	0.885		1.180		1.480		1.770		2.070		2.360		2.660	
			7.0		7.9		9.2		9.8		10.4		11.3		11.9	
			8.5		9.8		11.3		11.9		12.8		13.7		14.6	
			11.9		13.7		15.6		16.8		18.0		21.0		20.7	

* These cores are constructed to give as near as possible equal air flow in A & B directions.

CMP – Performance Data

Size in mm	Patterns	Neck Vel m/s TP Pa	1.57 6		2.10 11		2.62 18		3.15 25		3.67 35		4.19 45		4.72 57	
	Return Factors NC+11 -SP=3.8TP	Total m^3/s NC	1.270 16		1.700 25		2.120 32		2.550 38		2.970 42		3.400 46		3.820 50	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
900 x 900	41	m^3/s side throw m	0.319 3.7 4.6 6.4		0.425 4.3 5.2 7.3		0.531 4.9 5.8 8.2		0.637 5.2 6.4 9.2		0.743 5.5 6.7 9.8		0.850 6.1 7.3 10.4		0.956 6.4 7.9 11.0	
	36 (A/B)	m^3/s side throw m	0.319 3.7 4.6 6.4	0.477 4.9 6.1 8.5	0.425 4.3 5.2 7.3	0.637 5.0 8.7 9.8	0.531 4.9 5.8 8.2	0.796 6.7 7.9 11.3	0.637 5.2 6.4 9.2	0.956 7.0 8.5 11.9	0.743 5.5 6.7 9.8	1.120 7.6 9.2 12.8	0.850 6.1 7.3 10.4	1.270 8.2 10.1 13.7	0.956 6.4 7.9 11.0	1.430 8.8 10.7 14.6
	34 * (A/B)	m^3/s side throw m	0.425 0.2 6.1 8.5	0.425 4.9 6.1 8.5	0.566 5.8 7.0 9.8	0.566 5.8 7.0 9.8	0.708 6.7 7.9 11.3	0.708 6.7 7.9 11.3	0.850 7.0 8.5 11.9	0.850 7.0 8.5 11.9	0.991 7.6 9.2 12.8	0.991 7.6 9.2 12.8	1.130 8.2 10.1 13.7	1.130 8.2 10.1 13.7	1.270 8.8 10.7 14.6	1.270 8.8 10.7 14.6
AD 0.81 m^2	21 / 51	m^3/s side throw m	0.637 6.1 7.3 10.7		0.850 7.0 8.5 12.2		1.060 7.9 9.8 14.0		1.270 8.5 10.4 14.9		1.490 9.2 11.3 16.2		1.700 9.8 12.2 17.1		1.910 10.7 12.8 18.3	
	11	m^3/s side throw m	1.270 7.6 9.2 13.1		1.700 8.8 10.7 15.3		2.120 10.1 12.2 17.4		2.550 11.0 13.1 18.6		2.970 11.6 14.0 20.1		3.400 12.5 14.9 21.7		3.820 13.4 16.2 22.9	
	Return Factors NC+14 -SP=4.5TP	Total m^3/s NC	2.270 19		3.020 28		3.780 35		4.530 41		5.290 45		6.040 49		6.800 53	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
1200 x 1200	41	m^3/s side throw m	0.566 4.6 5.5 7.9		0.755 5.2 6.4 9.2		0.944 5.8 7.3 10.4		1.130 6.4 7.9 11.3		1.320 6.7 8.5 12.2		1.510 7.3 9.2 12.8		1.700 7.9 9.8 13.7	
	36 (A/B)	m^3/s side throw m	0.566 4.6 5.5 7.9	0.850 6.1 7.3 10.7	0.755 5.2 6.4 92.0	1.130 7.0 8.5 12.2	0.944 5.8 7.3 10.4	1.420 7.9 9.8 14.0	1.130 6.4 7.9 11.3	1.700 8.5 10.4 14.9	1.320 6.7 8.5 12.2	1.980 9.2 11.3 16.2	1.510 7.3 9.2 12.8	2.270 9.8 12.2 17.1	1.700 7.9 9.8 13.7	2.550 10.7 12.8 18.3
	34 * (A/B)	m^3/s side throw m	0.779 5.8 7.3 10.1	0.743 5.8 7.3 10.1	1.040 6.7 8.2 11.6	0.991 6.7 8.2 11.6	1.300 7.6 9.5 13.1	1.240 7.6 9.5 13.1	1.560 8.2 10.1 14.3	1.440 8.2 10.1 14.3	1.820 8.8 11.0 15.3	1.740 8.8 11.0 15.3	2.080 9.5 11.6 16.5	1.980 9.5 11.6 16.5	2.340 10.1 12.5 17.4	2.230 10.1 12.5 17.4
AD 1.44 m^2	21 / 51	m^3/s side throw m	1.130 7.6 9.2 13.1		1.510 8.8 10.7 15.3		1.890 10.1 12.2 17.4		2.270 11.0 13.1 18.6		2.640 11.6 14.0 20.1		3.020 12.5 14.9 21.7		3.400 13.4 16.2 22.9	
	11	m^3/s side throw m	2.270 9.2 11.3 15.9		3.020 10.7 13.1 18.3		3.780 12.2 14.9 20.7		4.530 13.1 16.2 22.6		5.290 14.0 17.4 24.1		6.040 14.9 18.6 25.9		6.800 16.2 19.8 27.5	

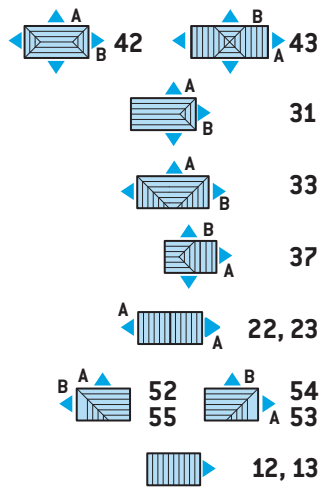
* These cores are constructed to give as near as possible equal air flow in A & B directions.

Guide Product Weights Approximate Weight in Kg.				
Size	CMPA141	CMPA136	CMPA151	CMPA121
150 x 150	0.60	0.65	0.54	0.53
225 x 225	0.80	0.80	0.83	0.81
300 x 300	1.20	1.32	1.18	1.14
375 x 375	1.60	1.56	1.66	1.60
450 x 450	2.00	1.91	2.14	2.10

Guide Product Weights Approximate Weight in Kg.				
Size	CMPA111	CMPA241	CMP-S	CMPS141
150 x 150	0.51	2.60	PANEL 595 SQ	1.00
225 x 225	0.79	2.70		1.50
300 x 300	1.13	2.70		1.90
375 x 375	1.56	2.70	2.00	2.98
450 x 450	2.03	2.70		3.40

150 x 225 — AD 0.033 m²

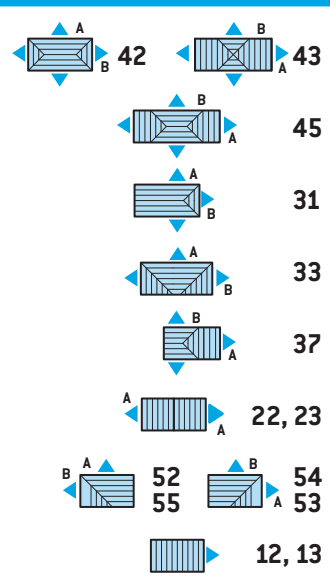
Return NC+0 — Factors -SP=1.3 TP



Neck Vel m/s		1.57		2.10		2.62		3.15		3.67		4.19		4.72	
TP Pa		6		11		18		25		35		45		57	
Total m³/s		0.053		0.071		0.088		0.106		0.124		0.142		0.159	
NC		-		10		17		23		27		31		35	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B
m³/s side		0.017	0.008	0.023	0.011	0.029	0.015	0.035	0.017	0.041	0.021	0.047	0.024	0.053	0.026
throw m		1.8	1.2	2.1	1.5	2.4	1.8	2.7	1.8	2.7	2.1	3.1	2.1	3.4	2.4
		2.4	1.5	2.7	1.8	3.1	2.1	3.4	2.1	3.7	2.4	4.0	2.4	4.3	2.7
		3.1	2.1	3.7	2.4	4.3	2.7	4.6	3.1	4.9	3.4	5.2	3.4	5.5	3.7
m³/s side		0.022	0.008	0.029	0.012	0.037	0.015	0.044	0.017	0.052	0.021	0.059	0.024	0.066	0.026
throw m		2.1	1.2	2.4	1.5	2.7	1.8	3.1	1.8	3.4	2.1	3.4	2.1	3.7	2.4
		2.4	1.5	2.7	1.8	3.1	2.1	3.4	2.1	3.7	2.4	4.0	2.4	4.3	2.7
		3.4	2.1	4.0	2.4	4.6	2.7	4.9	3.1	5.2	3.4	5.5	3.4	6.1	3.7
m³/s side		0.020	0.017	0.026	0.022	0.033	0.027	0.040	0.033	0.046	0.039	0.053	0.044	0.060	0.050
throw m		1.8	1.5	2.1	1.8	2.4	2.1	2.7	2.1	2.7	2.4	3.1	2.4	3.4	2.7
		2.4	1.8	2.7	2.1	3.1	2.4	3.4	2.7	3.7	2.7	4.0	3.1	4.3	3.4
		3.1	2.7	3.7	3.1	4.3	3.4	4.6	3.7	4.9	4.0	5.2	4.3	5.5	4.6
m³/s side		0.017	0.017	0.024	0.024	0.029	0.029	0.035	0.035	0.041	0.041	0.047	0.047	0.053	0.053
throw m		1.8	1.8	2.1	2.1	2.4	2.4	2.7	2.7	2.7	2.7	3.1	3.1	3.4	3.4
		2.4	2.4	2.7	2.7	3.1	3.1	3.4	3.4	3.7	3.7	4.0	4.0	4.3	4.3
		3.1	3.1	3.7	3.7	4.3	4.3	4.6	4.6	4.9	4.9	5.2	5.2	5.5	5.5
m³/s side		0.026		0.035		0.044		0.053		0.062		0.071		0.079	
throw m		2.4		2.7		3.1		3.4		3.7		4.0		4.3	
		3.1		3.4		4.0		4.3		4.6		4.9		5.2	
		4.0		4.6		5.2		5.5		6.1		6.4		7.0	
m³/s side		0.035	0.017	0.047	0.024	0.059	0.029	0.071	0.035	0.083	0.044	0.094	0.047	0.106	0.053
throw m		2.4	1.8	2.7	2.1	3.1	2.4	3.4	2.7	3.7	2.7	4.0	3.1	4.3	3.4
		3.1	2.4	3.4	2.7	4.0	3.1	4.3	3.4	4.6	3.7	4.9	4.0	5.2	4.3
		4.3	3.0	4.9	3.6	5.5	4.3	6.1	4.6	6.4	4.9	7.0	5.2	7.3	5.5
m³/s side		0.053		0.071		0.088		0.106		0.124		0.142		0.159	
throw m		3.1		3.7		4.3		4.6		4.9		5.2		5.5	
		3.7		4.3		4.8		5.2		5.5		6.1		6.4	
		5.2		6.1		7.0		7.6		7.9		8.5		9.2	

150 x 300 — AD 0.045 m²

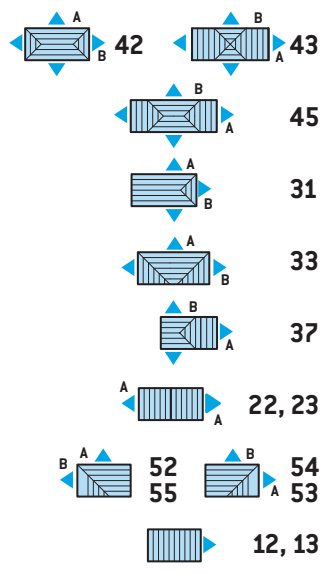
Return NC+2 — Factors -SP=1.7TP



Total m³/s		0.071		0.094		0.118		0.142		0.165		0.189		0.212	
NC		-		11		18		24		28		32		36	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B
m³/s side		0.026	0.009	0.035	0.012	0.044	0.015	0.055	0.018	0.062	0.021	0.071	0.024	0.080	0.026
throw m		2.4	1.2	2.7	1.5	3.1	1.8	3.4	1.8	3.7	2.1	4.0	2.1	4.3	2.4
		3.1	1.5	3.4	1.8	4.0	2.1	4.3	2.1	4.6	2.4	4.9	2.4	5.2	2.7
		4.0	2.1	4.6	2.4	5.2	2.7	5.5	3.1	6.1	3.4	6.4	3.4	7.3	3.7
m³/s side		0.018	0.018	0.024	0.024	0.029	0.029	0.035	0.035	0.041	0.041	0.047	0.047	0.053	0.053
throw m		2.1	2.1	2.4	2.4	2.7	2.7	3.1	3.1	3.4	3.4	3.4	3.4	3.7	3.7
		2.4	2.4	2.7	2.7	3.1	3.1	3.4	3.4	3.7	3.7	4.0	4.0	4.3	4.3
		3.4	3.4	4.0	4.0	4.6	4.6	4.9	4.9	5.2	5.2	5.5	5.5	6.1	6.1
m³/s side		0.031	0.009	0.041	0.012	0.052	0.015	0.062	0.018	0.072	0.020	0.083	0.024	0.093	0.026
throw m		2.4	1.2	2.7	1.5	3.1	1.8	3.4	1.8	3.7	2.1	4.0	2.1	4.6	2.4
		3.1	1.5	3.4	1.8	4.0	2.1	4.3	2.1	4.6	2.4	4.9	2.4	5.5	2.7
		4.3	2.1	4.9	2.4	5.5	2.7	6.1	3.1	6.4	3.4	7.0	3.4	7.9	3.7
m³/s side		0.035	0.018	0.047	0.024	0.060	0.029	0.071	0.035	0.083	0.041	0.094	0.047	0.107	0.053
throw m		1.8	1.8	2.1	2.1	2.4	2.4	2.7	2.7	2.7	2.7	3.1	3.1	3.4	3.4
		2.4	2.4	2.7	2.7	3.1	3.1	3.4	3.4	3.7	3.7	4.0	4.0	4.3	4.3
		3.1	3.1	3.7	3.7	4.3	4.3	4.6	4.6	4.9	4.9	5.2	5.2	5.5	5.5
m³/s side		0.026	0.022	0.035	0.029	0.044	0.037	0.053	0.044	0.062	0.052	0.071	A59	0.080	0.066
throw m		2.4	2.1	2.7	2.4	3.1	2.7	3.4	3.1	3.7	3.4	4.0	3.4	4.3	3.7
		3.1	2.7	3.4	3.1	4.0	3.4	4.3	3.7	4.6	4.0	4.9	4.3	5.2	4.6
		4.0	3.7	4.6	4.3	5.2	4.9	5.5	5.2	6.1	5.5	6.4	6.1	7.0	6.4
m³/s side		0.035		0.047		0.059		0.071		0.083		0.094		0.106	
throw m		2.4		2.7		3.1		3.4		3.7		4.0		4.3	
		3.1		3.4		4.0		4.3		4.6		4.9		5.2	
		4.3		4.9		5.5		6.1		6.4		7.0		7.3	
m³/s side		0.053	0.018	0.071	0.024	0.089	0.029	0.106	0.035	0.124	0.041	0.142	0.047	0.160	0.053
throw m		3.1	1.8	3.7	2.1	4.3	2.4	4.6	2.7	4.9	2.7	5.2	3.1	5.5	3.4
		3.7	2.4	4.3	2.7	4.9	3.1	5.2	3.4	5.5	3.7	6.1	4.0	6.4	4.3
		5.2	3.1	6.1	3.7	7.0	4.3	7.6	4.6	7.9	4.9	8.5	5.2	9.2	5.5
m³/s side		0.071		0.094		0.118		0.142		0.165		0.189		0.212	
throw m		3.1		3.7		4.3		4.6		4.9		5.2		5.5	
		3.7		4.3		4.9		5.2		5.5		6.1		6.4	
		5.2		6.1		7.0		7.6		7.9		8.5		9.2	

150 x 375 — AD 0.056 m²

Return NC+2 — Factors -SP=2.0TP



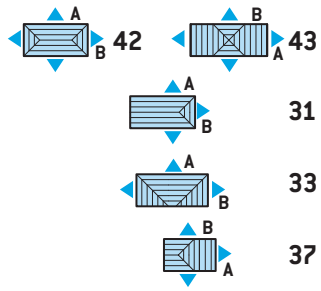
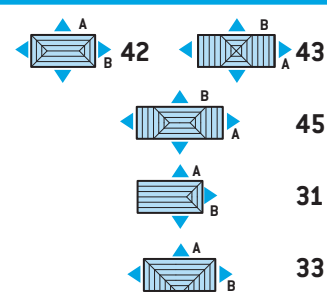
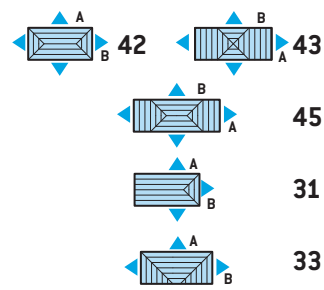
Total m³/s		0.089		0.118		0.147		0.177		0.207		0.236		0.266	
NC		-		12		19		25		29		33		37	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B
m³/s side		0.035	0.009	0.047	0.012	0.059	0.015	0.071	0.018	0.083	0.021	0.094	0.024	0.106	0.026
throw m		2.4	1.2	2.7	1.5	3.1	1.8	3.4	1.8	3.7	2.1	4.0	2.1	4.3	2.4
		3.1	1.5	3.4	1.8	4.0	2.1	4.3	2.1	4.6	2.4	4.9	2.4	5.2	2.7
		4.3	2.1	4.9	2.4	5.5	2.7	6.1	3.1	6.4	3.4	7.0	3.4	7.3	3.7
m³/s side		0.018	0.026	0.024	0.035	0.029	0.044	0.035	0.053	0.041	0.062	0.047	0.071	0.053	0.080
throw m		2.1	2.4	2.4	2.7	2.7	3.1	3.1	3.4	3.4	3.7	3.4	4.0	3.7	4.3
		2.4	3.1	2.7	3.4	3.1	4.0	3.4	4.3	3.7	4.6	4.0	4.9	4.3	5.2
		3.4	4.0	4.0	4.6	4.6	5.2	4.9	5.5	5.2	6.1	5.5	6.4	6.1	7.0
m³/s side		0.040	0.009	0.053	0.012	0.066	0.015	0.080	0.018	0.093	0.021	0.106	0.024	0.119	0.026
throw m		2.7	1.2	3.1	1.5	3.4	1.8	3.7	1.8	4.0	2.1	4.3	2.1	4.6	2.4
		3.1	1.5	3.7	1.8	4.3	2.1	4.6	2.1	4.9	2.4	5.2	2.4	5.5	2.7
		4.6	2.1	5.2	2.4	5.8	2.7	6.4	3.1	6.7	3.4	7.3	3.4	7.9	3.7
m³/s side		0.053	0.018	0.071	0.024	0.089	0.029	0.106	0.035	0.125	0.041	0.142	0.047	0.160	0.053
throw m		2.7	1.8	3.1	2.1	3.4	2.4	3.7	2.7	4.0	2.7	4.3	3.1	4.6	3.4
		3.1	2.4	3.7	2.7	4.3	3.1	4.6	3.4	4.9	3.7	5.2	4.0	5.5	4.3
		4.6	3.1	5.2	3.7	5.8	4.3	6.4	4.6	6.7	4.9	7.3	5.2	7.9	5.5
m³/s side		0.026	0.031	0.035	0.042	0.044	0.052	0.055	0.062	0.062	0.072	0.071	0.083	0.080	0.093
throw m		2.4	2.4	2.7	2.7	3.1	3.1	3.4	3.4	3.7	3.7	4.0	4.0	4.3	4.3
		3.1	3.1	3.4	3.4	4.0	4.0	4.3	4.3	4.6	4.6	4.9	4.9	5.2	5.2
		4.0	4.3	4.6	4.9	5.2	5.5	5.5	6.1	6.1	6.4	6.4	7.0	7.0	7.3
m³/s side		0.044		0.059		0.074		0.088		0.103		0.118		0.133	
throw m		2.7		3.1		3.4		3.7		4.0		4.3		4.6	
		3.4		4.0		4.6		4.9		5.2		5.5		6.1	
		4.9		5.5		6.4		6.7		7.3		7.6		8.2	
m³/s side		0.071	0.018	0.094	0.024	0.118	0.029	0.142	0.035	0.165	0.041	0.189	0.047	0.212	0.053
throw m		3.1	1.8	3.7	2.1	4.3	2.4	4.6	2.7	4.9	2.7	5.2	3.1	5.5	3.4
		3.7	2.4	4.3	2.7	4.9	3.1	5.2	3.4	5.5	3.7	6.1	4.0	6.4	4.3
		5.2	3.1	6.1	3.7	7.0	4.3	7.6	4.6	7.9	4.9	8.5	5.2	9.2	5.5
m³/s side		0.089		0.118		0.147		0.177		0.207		0.236		0.266	
throw m		3.4		4.0		4.6		4.9		5.2		5.5		6.1	
		4.3		4.9		5.5		6.1		6.4		7.0		7.3	
		5.8		6.7		7.6		8.2		8.8		9.5		10.1	

* These cores are constructed to give as near as possible equal air flow in A & B directions.

CMP – Performance Data

Size in mm	Patterns	Neck Vel m/s	1.57		2.10		2.62		3.15		3.67		4.19		4.72	
		TP Pa	6		11		18		25		35		45		57	
	Return NC+3	Total m^3/s	0.106		0.142		0.177		0.212		0.248		0.283		0.319	
	Factors -SP=2.8 TP	NC	-		13		20		26		30		34		38	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
150 x 450	42 43	m^3/s side throw m	0.044 2.7 3.4 4.9	0.009 1.2 1.5 2.1	0.059 3.1 4 5.5	0.012 1.5 1.8 2.4	0.074 3.4 4.6 6.4	0.015 1.8 2.1 2.7	0.089 3.7 4.9 6.7	0.018 1.8 2.1 3.1	0.103 4 5.2 7.3	0.021 2.1 2.4 3.4	0.118 4.3 5.5 7.6	0.024 2.1 2.4 3.4	0.133 4.6 6.1 8.2	0.026 2.4 2.7 3.7
	45 *	m^3/s side throw m	0.026 2.4 3.1 4.0	0.026 2.4 3.1 4.0	0.035 2.7 3.4 4.6	0.035 2.7 3.4 4.6	0.044 3.1 4.0 5.2	0.044 3.1 4.0 5.2	0.053 3.4 4.3 5.5	0.053 3.4 4.3 5.5	0.062 3.7 4.6 6.1	0.062 3.7 4.6 6.1	0.071 4.0 4.9 6.4	0.071 4.0 4.9 6.4	0.080 4.3 5.2 7.0	0.080 4.3 5.2 7.0
	31	m^3/s side throw m	0.049 2.7 3.4 4.9	0.009 1.2 1.5 2.1	0.065 3.1 4.0 5.5	0.012 1.5 1.8 2.4	0.081 3.4 4.6 6.4	0.015 1.8 2.1 2.7	0.097 3.7 4.9 6.7	0.018 1.8 2.1 3.1	0.113 4.0 5.2 7.3	0.021 2.1 2.4 3.4	0.130 4.3 5.5 7.6	0.024 2.1 2.4 3.4	0.146 4.6 6.1 8.2	0.026 2.4 2.7 3.7
	33	m^3/s side throw m	0.071 3.1 3.7 5.2	0.018 1.8 2.4 3.1	0.094 3.7 4.3 6.1	0.024 2.1 2.7 3.7	0.119 4.3 4.9 7.0	0.029 2.4 3.1 4.3	0.142 4.6 5.2 7.6	0.035 2.7 3.4 4.6	0.166 4.9 5.5 7.9	0.041 2.7 3.7 4.9	0.189 5.2 6.1 8.5	0.047 3.1 4.0 5.2	0.213 5.5 6.4 9.2	0.053 3.4 4.3 5.5
	37	m^3/s side throw m	0.035 2.4 3.1 4.3	0.035 2.4 3.1 4.3	0.047 2.7 3.4 4.9	0.047 2.7 3.4 4.9	0.059 3.1 4.0 5.5	0.059 3.1 4.0 5.5	0.071 3.4 4.3 6.1	0.071 3.4 4.3 6.1	0.083 3.7 4.6 6.4	0.083 3.7 4.6 6.4	0.094 4.0 4.9 7.0	0.094 4.0 4.9 7.0	0.106 4.3 5.2 7.3	0.106 4.3 5.2 7.3
	22, 23	m^3/s side throw m	0.053 3.1 3.7 5.2		0.071 3.7 4.3 6.1		0.088 4.3 4.9 7.0		0.106 4.6 5.2 7.6		0.124 4.9 5.5 7.9		0.142 5.2 6.1 8.5		0.159 5.5 6.4 9.2	
AD 0.068 m^2	52 55 54 53	m^3/s side throw m	0.088 3.4 4.3 5.8	0.018 1.8 2.4 3.1	0.118 4.0 4.9 6.7	0.024 2.1 2.7 3.7	0.148 4.6 5.5 7.6	0.029 2.4 3.1 4.3	0.177 4.9 6.1 8.2	0.035 2.7 3.4 4.6	0.207 5.2 6.4 8.8	0.041 2.7 3.7 4.9	0.236 5.5 7.0 9.5	0.047 3.1 4.0 5.2	0.266 6.1 7.3 10.1	0.053 3.4 4.3 5.5
	12, 13	m^3/s side throw m	0.106 3.7 4.6 6.4		0.142 4.3 5.2 7.3		0.177 4.9 5.8 8.2		0.212 5.2 6.4 9.2		0.248 5.5 6.7 9.8		0.283 6.1 7.3 10.4		0.319 6.4 7.9 11.0	
	Return NC+4	Total m^3/s	0.124		0.165		0.206		0.248		0.289		0.330		0.372	
	Factors -SP=3.4TP	NC	-		13		20		26		30		34		38	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
150 x 525	42 43	m^3/s side throw m	0.053 3.1 3.7 5.2	0.009 1.2 1.5 2.1	0.071 3.7 4.3 6.1	0.012 1.5 1.8 2.4	0.088 4.3 4.9 7.0	0.015 1.8 2.1 2.7	0.106 4.6 5.2 7.6	0.018 1.8 2.1 3.1	0.124 4.9 5.5 7.9	0.021 2.1 2.4 3.4	0.142 5.2 6.1 8.5	0.024 2.1 2.4 3.4	0.159 5.5 6.4 9.2	0.026 2.4 2.7 3.7
	45 *	m^3/s side throw m	0.026 2.4 3.1 4.0	0.035 2.4 3.1 4.3	0.035 2.7 3.4 4.6	0.047 2.7 3.4 4.9	0.044 3.1 4.0 5.2	0.059 3.1 4.0 5.5	0.053 3.4 4.3 5.5	0.071 3.4 4.3 6.1	0.062 3.7 4.6 6.1	0.083 3.7 4.6 6.4	0.071 4.0 4.9 6.4	0.094 4.0 4.9 7.0	0.080 4.3 5.2 7.0	0.106 4.3 5.2 7.3
	31	m^3/s side throw m	0.058 3.1 3.7 5.2	0.009 1.2 1.5 2.1	0.077 3.7 4.3 6.1	0.012 1.5 1.8 2.4	0.096 4.3 4.9 7.0	0.015 1.8 2.1 2.7	0.115 4.6 5.2 7.6	0.018 1.8 2.1 3.1	0.134 4.9 5.5 7.9	0.021 2.1 2.4 3.4	0.153 5.2 6.1 8.5	0.024 2.1 2.4 3.4	0.172 5.5 6.4 9.2	0.026 2.4 2.7 3.7
	33	m^3/s side throw m	0.088 3.4 4.3 5.8	0.018 1.8 2.4 3.1	0.118 4.0 4.9 6.7	0.024 2.1 2.7 3.7	0.148 4.6 5.5 7.6	0.029 2.4 3.1 4.3	0.177 4.9 6.1 8.2	0.035 2.7 3.4 4.6	0.207 5.2 6.4 8.8	0.041 2.7 3.7 4.9	0.236 5.5 7.0 9.5	0.047 3.1 4.0 5.2	0.266 6.1 7.3 10.1	0.053 3.4 4.3 5.5
	37	m^3/s side throw m	0.044 2.7 3.4 4.9	0.040 2.7 3.1 4.6	0.059 3.1 4.0 5.5	0.053 3.1 3.7 5.2	0.074 3.4 4.6 6.4	0.066 3.4 4.3 5.8	0.088 3.7 4.9 6.7	0.079 3.7 4.6 6.4	0.103 4.0 5.2 7.3	0.093 4.0 4.9 6.7	0.118 4.3 5.5 7.6	0.106 4.3 5.2 7.3	0.133 4.6 6.1 8.2	0.119 4.6 5.5 7.9
	22, 23	m^3/s side throw m	0.062 3.1 3.7 5.2		0.083 3.7 4.3 6.1		0.103 4.3 4.9 7.0		0.124 4.6 5.2 7.6		0.144 4.9 5.5 7.9		0.165 5.2 6.1 8.5		0.186 5.5 6.4 9.2	
AD 0.079 m^2	52 55 54 53	m^3/s side throw m	0.106 3.7 4.6 6.4	0.018 1.8 2.4 3.1	0.142 4.3 5.2 7.3	0.024 2.1 2.7 3.7	0.177 4.9 5.8 8.2	0.029 2.4 3.1 4.3	0.212 5.2 6.4 9.2	0.035 2.7 3.4 4.6	0.248 5.5 6.7 9.8	0.041 2.7 3.7 4.9	0.283 6.1 7.3 10.1	0.047 3.1 4.0 5.2	0.319 6.4 7.9 11.0	0.053 3.4 4.3 5.5
	12, 13	m^3/s side throw m	0.124 3.7 4.6 6.4		0.165 4.3 5.2 7.3		0.206 4.9 5.8 8.2		0.248 5.2 6.4 9.2		0.289 5.5 6.7 9.8		0.330 6.1 7.3 10.4		0.372 6.4 7.9 11.0	
	Return NC+5	Total m^3/s	0.142		0.189		0.236		0.283		0.330		0.378		0.425	
	Factors -SP=4.1TP	NC	-		14		21		27		31		35		39	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
150 x 600	42 43	m^3/s side throw m	0.062 3.1 3.7 5.2	0.009 1.2 1.5 2.1	0.083 3.7 4.3 6.1	0.012 1.5 1.8 2.4	0.103 4.3 4.9 7.0	0.015 1.8 2.1 2.7	0.124 4.6 5.2 7.6	0.018 1.8 2.1 3.1	0.144 4.9 5.5 7.9	0.021 2.1 2.4 3.4	0.165 5.2 6.1 8.5	0.024 2.1 2.4 3.4	0.186 5.5 6.4 9.2	0.026 2.4 2.7 3.7
	45 *	m^3/s side throw m	0.035 2.4 3.1 4.3	0.035 2.4 3.1 4.3	0.047 2.7 3.4 4.9	0.047 2.7 3.4 4.9	0.059 3.1 4.0 5.5	0.059 3.1 4.0 5.5	0.071 3.4 4.3 6.1	0.071 3.4 4.3 6.1	0.083 3.7 4.6 6.4	0.083 3.7 4.6 6.4	0.094 4.0 4.9 7.0	0.094 4.0 4.9 7.0	0.106 4.3 5.2 7.3	0.106 4.3 5.2 7.3
	31	m^3/s side throw m	0.067 3.1 3.7 5.2	0.009 1.2 1.5 2.1	0.088 3.7 4.3 6.1	0.012 1.5 1.8 2.4	0.111 4.3 4.9 7.0	0.015 1.8 2.1 2.7	0.133 4.6 5.2 7.6	0.018 1.8 2.1 3.1	0.155 4.9 5.5 7.9	0.021 2.1 2.4 3.4	0.177 5.2 6.1 8.5	0.024 2.1 2.4 3.4	0.199 5.5 6.4 9.2	0.026 2.4 2.7 3.7
	33	m^3/s side throw m	0.106 3.7 4.6 6.4	0.018 1.8 2.4 3.1	0.142 4.3 5.2 7.3	0.024 2.1 2.7 3.7	0.178 4.9 5.8 8.2	0.029 2.4 3.1 4.3	0.213 5.2 6.4 9.2	0.035 2.7 3.4 4.6	0.248 5.5 6.7 9.8	0.041 2.7 3.7 4.9	0.283 6.1 7.3 10.4	0.047 3.1 4.0 5.2	0.319 6.4 7.9 11.0	0.053 3.4 4.3 5.5
	37	m^3/s side throw m	0.044 2.7 3.4 4.9	0.049 2.7 3.4 4.9	0.059 3.1 4.0 5.5	0.064 3.1 4.0 5.5	0.074 3.4 4.6 6.4	0.081 3.4 4.6 6.4	0.089 3.7 4.9 6.7	0.097 3.7 4.9 6.7	0.103 4.0 5.2 7.3	0.114 4.0 5.2 7.3	0.118 4.3 5.5 7.6	0.130 4.3 5.5 7.6	0.133 4.6 6.1 8.2	0.146 4.6 6.1 8.2
	22, 23	m^3/s side throw m	0.071 3.1 3.7 5.2		0.094 3.7 4.3 6.1		0.118 4.3 4.9 7.0		0.142 4.6 5.2 7.6		0.165 4.9 5.5 7.9		0.189 5.2 6.1 8.5		0.212 5.5 6.4 9.2	
AD 0.090 m^2	52 55 54 53	m^3/s side throw m	0.123 3.7 4.6 6.4	0.018 1.8 2.4 3.1	0.165 4.3 5.2 7.3	0.024 2.1 2.7 3.7	0.207 4.9 5.8 8.2	0.029 2.4 3.1 4.3	0.248 5.2 6.4 9.2	0.035 2.7 3.4 4.6	0.289 5.5 6.7 9.8	0.041 2.7 3.7 4.9	0.330 6.1 7.3 10.4	0.047 3.1 4.0 5.2	0.372 6.4 7.9 11.0	0.053 3.4 4.3 5.5
	12, 13	m^3/s side throw m	0.142 4.0 4.9 7.0		0.189 4.6 5.5 7.9		0.236 5.2 6.4 9.2		0.283 5.5 6.7 9.8		0.330 6.1 7.3 10.4		0.378 6.4 7.6 11.3		0.425 7.0 8.2 11.9	

* These cores are constructed to give as near as possible equal air flow in A & B directions.

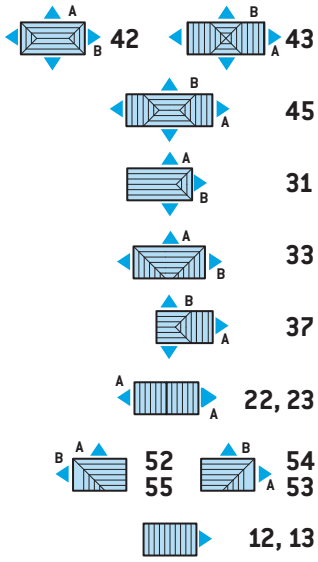
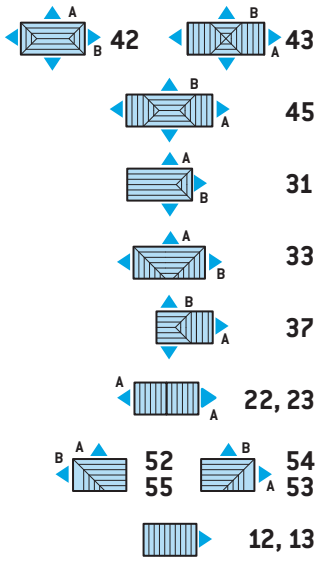
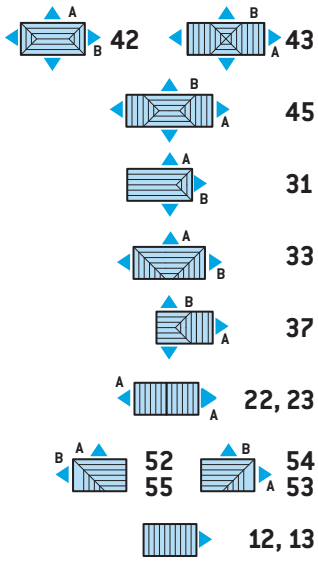
Size in mm	Patterns	Neck Vel m/s / TP Pa	1.57 / 6		2.10 / 11		2.62 / 18		3.15 / 25		3.67 / 35		4.19 / 45		4.72 / 57	
	Return NC+5	Total m^3/s / NC	0.106 / -		0.142 / 13		0.177 / 20		0.212 / 26		0.248 / 30		0.283 / 34		0.319 / 38	
	Factors -SP=4.1 TP		A	B	A	B	A	B	A	B	A	B	A	B	A	B
225 x 300	 42 43 31 33 37 22, 23 52 55 54 53 12, 13	m^3/s side throw m	0.033 2.1 2.7 3.7	0.020 1.5 1.8 2.7	0.044 2.4 3.1 4.3	0.026 1.8 2.1 3.1	0.055 2.7 3.4 4.9	0.033 2.1 2.4 3.4	0.067 3.1 3.7 5.2	0.040 2.1 2.7 3.7	0.077 3.4 4 5.5	0.046 2.4 2.7 4	0.089 3.4 4.3 6.1	0.053 2.4 3.1 4.3	0.100 3.7 4.6 6.4	0.060 2.7 3.4 4.6
		m^3/s side throw m	0.043 2.7 3.4 4.9	0.020 1.5 1.8 2.7	0.057 3.1 4.0 5.5	26.000 1.8 2.1 3.1	0.072 3.4 4.6 6.4	0.033 2.1 2.4 3.4	0.086 3.7 4.9 6.7	0.040 2.1 2.7 3.7	0.101 4.0 5.2 7.3	0.046 2.4 2.7 4.0	0.115 4.3 5.5 7.6	0.053 2.4 3.1 4.3	0.129 4.6 6.1 8.2	0.060 2.7 3.4 4.6
		m^3/s side throw m	0.035 2.4 3.1 4.0	0.035 2.4 3.1 4.0	0.047 2.7 3.4 4.6	0.047 2.7 3.4 4.6	0.059 3.1 4.0 5.2	0.059 3.1 4.0 5.2	0.071 3.4 4.3 5.5	0.071 3.4 4.3 5.5	0.083 3.7 4.6 6.1	0.083 3.7 4.6 6.1	0.094 4.0 4.9 6.4	0.094 4.0 4.9 6.4	0.106 4.3 5.2 7.0	0.106 4.3 5.2 7.0
		m^3/s side throw m	0.033 2.4 3.1 4.3	0.036 2.7 3.1 4.6	0.044 2.7 3.4 4.9	0.049 3.1 3.7 5.2	0.055 3.1 4.0 5.5	0.060 3.4 4.3 5.8	0.067 3.4 4.3 6.1	0.073 3.7 4.6 6.4	0.077 3.7 4.6 6.4	0.085 4.0 4.9 6.7	0.089 4.0 4.9 7.0	0.097 4.3 5.2 7.3	0.100 4.3 5.2 7.3	0.109 4.6 5.5 7.9
		m^3/s side throw m	0.053 3.1 3.7 5.2		0.071 3.7 4.3 6.1		0.089 4.3 4.9 7.0		0.106 4.6 5.2 7.6		0.124 4.9 5.5 7.9		0.142 5.2 6.1 8.5		0.159 5.5 6.4 9.2	
AD 0.068 m^2		m^3/s side throw m	0.067 3.1 3.7 5.2	0.040 2.4 3.1 4.0	0.089 3.7 4.3 6.1	0.055 2.7 3.4 4.6	0.111 4.3 4.9 7.0	0.067 3.1 4.0 5.2	0.133 4.6 5.2 7.6	0.080 3.4 4.3 5.5	0.155 4.9 5.5 7.9	0.093 3.7 4.6 6.1	0.177 5.2 6.1 8.5	0.106 4.0 4.9 6.4	0.199 5.5 6.4 9.2	0.119 4.3 5.2 7.0
		m^3/s side throw m	0.106 3.7 4.6 6.4		0.142 4.3 5.2 7.3		0.177 4.9 5.8 8.2		0.212 5.2 6.4 9.2		0.243 5.5 6.7 9.8		0.283 6.1 7.3 10.4		0.319 6.4 7.9 11.0	
	Return NC+4	Total m^3/s / NC	0.133 / -		0.177 / 14		0.222 / 21		0.266 / 27		0.310 / 31		0.354 / 35		0.400 / 39	
	Factors -SP=1.8 TP		A	B	A	B	A	B	A	B	A	B	A	B	A	B
225 x 375	 42 43 45 * 31 33 37 22, 23 52 55 54 53 12, 13	m^3/s side throw m	0.046 2.7 3.4 4.9	0.020 1.5 1.8 2.7	0.062 3.1 4.0 5.5	0.026 1.8 2.1 3.1	0.079 3.4 4.6 6.4	0.033 2.1 2.4 3.4	0.094 3.7 4.9 6.7	0.040 2.1 2.7 3.7	0.109 4.0 5.2 7.3	0.046 2.4 2.7 4.0	0.124 4.3 5.5 7.6	0.053 2.4 3.1 4.3	0.140 4.6 6.1 8.2	0.060 2.7 3.4 4.6
		m^3/s side throw m	0.033 2.4 3.1 4.3	0.033 2.4 3.1 4.3	0.044 2.7 3.4 4.9	0.044 2.7 3.4 4.9	0.055 3.1 4.0 5.5	0.055 3.1 4.0 5.5	0.067 3.4 4.3 6.1	0.067 3.4 4.3 6.1	0.077 3.7 4.6 6.4	0.077 3.7 4.6 6.4	0.089 4.0 4.9 7.0	0.089 4.0 4.9 7.0	0.100 4.3 5.2 7.3	0.100 4.3 5.2 7.3
		m^3/s side throw m	0.057 3.1 3.7 5.2	0.020 1.5 1.8 2.7	0.075 3.7 4.3 6.1	0.026 1.8 2.1 3.1	0.094 4.3 4.9 7.0	0.033 2.1 2.4 3.4	0.113 4.6 5.2 7.6	0.040 2.1 2.7 3.7	0.132 4.9 5.5 7.9	0.046 2.4 2.7 4.0	0.151 5.2 6.1 8.5	0.053 2.4 3.1 4.3	0.169 5.5 6.4 9.2	0.060 2.7 3.4 4.6
		m^3/s side throw m	0.039 2.7 3.1 4.6	0.055 2.1 2.7 3.7	0.052 3.1 3.7 5.2	0.073 2.4 3.1 4.3	0.065 3.4 4.3 5.8	0.093 2.7 3.4 4.9	0.078 3.7 4.6 6.4	0.110 3.1 3.7 5.2	0.091 4.0 4.9 6.7	0.128 3.4 4.0 5.5	0.103 4.3 5.2 7.3	0.147 3.4 4.3 6.1	0.117 4.6 5.5 7.9	0.166 3.7 4.6 6.4
		m^3/s side throw m	0.046 2.7 3.4 4.9	0.043 2.7 3.4 4.9	0.061 3.1 4.0 5.5	0.058 3.1 4.0 5.5	0.076 3.4 4.6 6.4	0.072 3.4 4.6 6.4	0.092 3.7 4.9 6.7	0.086 3.7 4.9 6.7	0.107 4.0 5.2 7.3	0.100 4.0 5.2 7.3	0.123 4.3 5.5 7.6	0.115 4.3 5.5 7.6	0.138 4.6 6.1 8.2	0.129 4.6 6.1 8.2
		m^3/s side throw m	0.066 3.1 3.7 5.2		0.088 3.7 4.3 6.1		0.111 4.3 4.9 7.0		0.133 4.6 5.2 7.6		0.155 4.9 5.5 7.9		0.177 5.2 6.1 8.5		0.199 5.5 6.4 9.2	
AD 0.084 m^2		m^3/s side throw m	0.093 3.4 4.3 5.8	0.040 2.4 3.1 4.0	0.124 4.0 4.9 6.7	0.053 2.7 3.4 4.6	0.155 4.6 5.5 7.6	0.067 3.1 4.0 5.2	0.186 4.9 6.1 8.2	0.080 3.4 4.3 5.5	0.217 5.2 6.4 8.8	0.093 3.7 4.6 6.1	0.248 5.5 7.0 9.5	0.106 4.0 4.9 6.4	0.279 6.1 7.3 10.1	0.119 4.3 5.2 7.0
		m^3/s side throw m	0.133 4.0 4.9 7.0		0.177 4.6 5.5 7.9		0.222 5.2 6.4 9.2		0.266 5.5 6.7 9.8		0.310 6.1 7.3 10.4		0.354 6.4 7.6 11.3		0.400 7.0 8.2 11.9	
	Return NC+4	Total m^3/s / NC	0.159 / -		0.212 / 15		0.265 / 22		0.319 / 28		0.372 / 32		0.425 / 36		0.478 / 40	
	Factors -SP=2.2 TP		A	B	A	B	A	B	A	B	A	B	A	B	A	B
225 x 450	 42 43 45 * 31 33 37 22, 23 52 55 54 53 12, 13	m^3/s side throw m	0.060 3.1 3.7 5.2	0.020 1.5 1.8 2.7	0.080 3.7 4.3 6.1	0.026 1.8 2.1 3.1	0.100 4.3 4.9 7.0	0.033 2.1 2.4 3.4	0.120 4.6 5.2 7.6	0.040 2.1 2.7 3.7	0.140 4.9 5.5 7.9	0.046 2.4 2.7 4.0	0.160 5.2 6.1 8.5	0.053 2.4 3.1 4.3	0.179 5.5 6.4 9.2	0.060 2.7 3.4 4.6
		m^3/s side throw m	0.033 2.4 3.1 4.3	0.049 2.7 3.4 4.9	0.044 2.7 3.4 4.9	0.062 3.1 4.0 5.5	0.055 3.1 4.0 5.5	0.077 3.4 4.6 6.4	0.067 3.4 4.3 6.1	0.093 3.7 4.9 6.7	0.077 3.7 4.6 6.4	0.109 4.0 5.2 7.3	0.089 4.0 4.9 7.0	0.124 4.3 5.5 7.6	0.100 4.3 5.2 7.3	0.140 4.6 6.1 8.2
		m^3/s side throw m	0.069 3.1 3.7 5.2	0.020 1.5 1.8 2.7	0.093 3.7 4.3 6.1	0.026 1.8 2.1 3.1	0.116 4.3 4.9 7.0	0.033 2.1 2.4 3.4	0.139 4.6 5.2 7.6	0.040 2.1 2.7 3.7	0.163 4.9 5.5 7.9	0.046 2.4 2.7 4.0	0.186 5.2 6.1 8.5	0.053 2.4 3.1 4.3	0.209 5.5 6.4 9.2	0.060 2.7 3.4 4.6
		m^3/s side throw m	0.079 2.4 3.1 4.3	0.040 2.4 3.1 4.0	0.106 2.7 3.4 4.9	0.053 2.7 3.4 4.6	0.133 3.1 4.0 5.5	0.067 3.1 4.0 5.2	0.159 3.4 4.3 6.1	0.080 3.4 4.3 5.5	0.186 3.7 4.6 6.4	0.093 3.7 4.6 6.1	0.212 4.0 4.9 7.0	0.106 4.0 4.9 6.4	0.239 4.3 5.2 7.3	0.119 4.3 5.2 7.0
		m^3/s side throw m	0.046 2.7 3.4 4.9	0.056 3.1 3.7 5.2	0.061 3.1 4.0 5.5	0.075 3.7 4.3 6.1	0.077 3.4 4.6 6.4	0.094 4.3 4.9 7.0	0.092 3.7 4.9 6.7	0.113 4.6 5.2 7.6	0.107 4.0 5.2 7.3	0.131 4.9 5.5 7.9	0.123 4.3 5.5 7.6	0.150 5.2 6.1 8.5	0.138 4.6 6.1 8.2	0.169 5.5 6.4 9.2
		m^3/s side throw m	0.077 3.4 4.3 5.8		0.106 4.0 4.9 6.7		0.133 4.6 5.5 7.6		0.159 4.9 6.1 8.2		0.186 5.2 6.4 8.8		0.212 5.5 7.0 9.5		0.239 6.1 7.3 10.1	
AD 0.101 m^2		m^3/s side throw m	0.119 3.7 4.6 6.4	0.040 2.4 3.1 4.0	0.160 4.3 5.2 7.3	0.053 2.7 3.4 4.6	0.199 4.9 5.8 8.2	0.067 3.1 4.0 5.2	0.239 5.2 6.4 9.2	0.080 3.4 4.3 5.5	0.279 5.5 6.7 9.8	0.093 3.7 4.6 6.1	0.319 6.1 7.3 10.4	0.106 4.0 4.9 6.4	0.358 6.4 7.9 11.0	0.119 4.3 5.2 7.0
		m^3/s side throw m	0.159 4.0 4.9 7.0		0.212 4.6 5.5 7.9		0.265 5.2 6.4 9.2		0.319 5.5 6.7 9.8		0.372 6.1 7.3 10.4		0.425 6.4 7.6 11.3		0.478 7.0 8.2 11.9	

* These cores are constructed to give as near as possible equal air flow in A & B directions.

CMP – Performance Data

Size in mm	Patterns	Neck Vel m/s	1.57		2.10		2.62		3.15		3.67		4.19		4.72	
		TP Pa	6		11		18		25		35		45		57	
	Return NC+5	Total m^3/s	0.186		0.247		0.309		0.371		0.433		0.496		0.557	
	Factors -SP=2.6 TP	NC	-		15		22		28		32		36		40	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
225 x 525	42	m^3/s side throw m	0.073	0.020	0.097	0.026	0.122	0.033	0.146	0.040	0.170	0.046	0.195	0.053	0.219	0.060
			3.4	1.5	4	1.8	4.6	2.1	4.9	2.1	5.2	2.4	5.5	2.4	6.1	2.7
			4.3	1.8	4.9	2.1	5.5	2.4	6.1	2.7	6.4	2.7	7.0	3.1	7.3	3.4
			5.8	2.7	6.7	3.1	7.6	3.4	8.2	3.7	8.8	4	9.5	4.3	10.1	4.6
	43	m^3/s side throw m	0.046	0.046	0.062	0.062	0.077	0.077	0.093	0.093	0.108	0.108	0.123	0.123	0.139	0.139
			2.7	2.7	3.1	3.1	3.4	3.4	3.7	3.7	4.0	4.0	4.3	4.3	4.6	4.6
			3.4	3.4	4.0	4.0	4.6	4.6	4.9	4.9	5.2	5.2	5.5	5.5	6.1	6.1
			4.9	4.9	5.5	5.5	6.4	6.4	6.7	6.7	7.3	7.3	7.6	7.6	8.2	8.2
	45 *	m^3/s side throw m	0.083	0.020	0.111	0.026	0.138	0.033	0.166	0.040	0.194	0.046	0.221	0.053	0.249	0.060
			3.4	1.5	4.0	1.8	4.6	2.1	4.9	2.1	5.2	2.4	5.5	2.4	6.1	2.7
			4.3	1.8	4.9	2.1	5.5	2.4	6.1	2.7	6.4	2.7	7.0	3.1	7.3	3.4
			5.8	2.7	6.7	3.1	7.6	3.4	8.2	3.7	8.8	4.0	8.5	4.3	10.1	4.6
	31	m^3/s side throw m	0.106	0.040	0.142	0.053	0.177	0.067	0.212	0.080	0.247	0.093	0.282	0.106	0.318	0.119
			3.7	2.4	4.3	2.7	4.9	3.1	5.2	3.4	5.5	3.7	6.1	4.0	6.4	4.3
			4.6	3.1	5.2	3.4	5.8	4.0	6.4	4.3	6.7	4.6	7.3	4.9	7.9	5.2
			6.4	4.0	7.3	4.6	8.2	5.2	9.2	5.5	9.8	6.1	10.4	6.4	11.0	7.0
	33	m^3/s side throw m	0.060	0.063	0.080	0.083	0.100	0.105	0.119	0.126	0.139	0.147	0.159	0.168	0.179	0.188
			3.1	3.1	3.7	3.7	4.3	4.3	4.6	4.6	4.9	4.9	5.2	5.2	5.5	5.5
			3.7	3.7	4.3	4.3	4.9	4.9	5.2	5.2	5.5	5.5	6.1	6.1	6.4	6.4
			5.2	5.2	6.1	6.1	7.0	7.0	7.6	7.6	7.9	7.9	8.5	8.5	9.2	9.2
	37	m^3/s side throw m	0.093		0.124		0.154		0.186		0.216		0.248		0.279	
			3.4		4.0		4.6		4.9		5.2		5.5		6.1	
			4.3		4.9		5.5		6.1		6.4		7.0		7.3	
			5.8		6.7		7.6		8.2		8.8		9.5		10.1	
	22, 23	m^3/s side throw m	0.145	0.040	0.195	0.053	0.243	0.067	0.291	0.080	0.340	0.093	0.389	0.106	0.438	0.119
			4.0	2.4	4.6	2.7	5.2	3.1	5.5	3.4	6.1	3.7	6.4	4.0	7.0	4.3
			4.9	3.1	5.5	3.4	6.4	4.0	6.7	4.3	7.3	4.6	7.6	4.9	8.2	5.2
			7.0	4.0	7.9	4.6	9.2	5.2	9.8	5.5	10.4	6.1	11.3	6.4	11.9	7.0
AD 0.118 m^2	52 55 / 54 53	m^3/s side throw m	0.186		0.247		0.309		0.371		0.433		0.496		0.557	
			4.3		4.9		5.5		6.1		6.4		7.0		7.3	
			5.2		6.1		7.0		7.6		7.9		8.5		9.2	
			7.3		8.5		9.8		10.4		11.3		12.2		12.8	
	12, 13															
	Return NC+5	Total m^3/s	0.212		0.283		0.354		0.425		0.496		0.566		0.637	
	Factors -SP=3.0 TP	NC	-		16		23		29		33		37		41	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
225 x 600	42	m^3/s side throw m	0.086	0.020	0.115	0.026	0.144	0.033	0.173	0.040	0.202	0.046	0.230	0.053	0.259	0.060
			3.4	1.5	4.0	1.8	4.6	2.1	4.9	2.1	5.2	2.4	5.5	2.4	6.1	2.7
			4.3	1.8	4.9	2.1	5.5	2.4	6.1	2.7	6.4	2.7	7.0	3.1	7.3	3.4
			5.8	2.7	6.7	3.1	7.6	3.4	8.2	3.7	8.8	4.0	9.5	4.3	10.1	4.6
	43	m^3/s side throw m	0.047	0.060	0.062	0.080	0.077	0.100	0.093	0.119	0.109	0.139	0.124	0.159	0.140	0.179
			2.7	3.1	3.1	3.7	3.4	4.3	3.7	4.6	4.0	4.9	4.3	5.2	4.6	5.5
			3.4	3.7	4.0	4.3	4.6	4.9	4.9	5.2	5.2	5.5	5.5	6.1	6.1	6.4
			4.9	5.2	5.5	6.1	6.4	7.0	6.7	7.6	7.3	7.9	7.6	8.5	8.2	9.2
	45 *	m^3/s side throw m	0.096	0.020	0.128	0.026	0.161	0.033	0.193	0.040	0.225	0.046	0.257	0.053	0.286	0.060
			3.4	1.5	4.0	1.8	4.6	2.1	4.9	2.1	5.2	2.4	5.5	2.4	6.1	2.7
			4.3	1.8	4.9	2.1	5.5	2.4	6.1	2.7	6.4	2.7	7.0	3.1	7.3	3.4
			5.8	2.7	6.7	3.1	7.6	3.4	8.2	3.7	8.8	4.0	9.5	4.3	10.1	4.6
	31	m^3/s side throw m	0.133	0.040	0.178	0.053	0.221	0.067	0.265	0.080	0.310	0.093	0.354	0.106	0.398	0.119
			4.0	2.4	4.6	2.7	5.2	3.1	5.5	3.4	6.1	3.7	6.4	4.0	7.0	4.3
			4.9	3.1	5.5	3.4	6.4	4.0	6.7	4.3	7.3	4.6	7.6	4.9	8.2	5.2
			7.0	4.0	7.9	4.6	9.2	5.2	9.8	5.5	10.4	6.1	11.3	6.4	11.9	7.0
	33	m^3/s side throw m	0.073	0.069	0.097	0.093	0.122	0.116	0.146	0.139	0.170	0.162	0.195	0.186	0.220	0.209
			3.1	3.1	3.7	3.7	4.3	4.3	4.6	4.6	4.9	4.9	5.2	5.2	5.5	5.5
			3.7	3.7	4.3	4.3	4.9	4.9	5.2	5.2	5.5	5.5	6.1	6.1	6.4	6.4
			5.2	5.2	6.1	6.1	7.0	7.0	7.6	7.6	7.9	7.9	8.5	8.5	9.2	9.2
	37	m^3/s side throw m	0.106		0.142		0.177		0.212		0.248		0.283		0.319	
			3.7		4.3		4.9		5.2		5.5		6.1		6.4	
			4.6		5.2		5.8		6.4		6.7		7.3		7.9	
			6.4		7.3		8.2		9.2		9.8		10.4		11.0	
	22, 23	m^3/s side throw m	0.172	0.040	0.230	0.053	0.288	0.067	0.345	0.080	0.403	0.093	0.460	0.106	0.518	0.119
			4.3	2.4	4.9	2.7	5.5	3.1	6.1	3.4	6.4	3.7	7.0	4.0	7.3	4.3
			5.2	3.1	6.1	3.4	7.0	4.0	7.6	4.3	7.9	4.6	8.5	4.9	9.2	5.2
			7.3	4.0	8.5	4.6	9.8	5.2	10.4	5.5	11.3	6.1	12.2	6.4	12.8	7.0
AD 0.135 m^2	52 55 / 54 53	m^3/s side throw m	0.212		0.283		0.354		0.425		0.406		0.566		0.637	
			4.3		4.9		5.5		6.1		6.4		7.0		7.3	
			5.2		6.1		7.0		7.6		7.9		8.5		9.2	
			7.3		8.5		9.8		10.4		11.3		12.2		12.8	
	12, 13															
	Return NC+3	Total m^3/s	0.177		0.236		0.295		0.354		0.413		0.472		0.531	
	Factors -SP=1.7 TP	NC	-		16		23		29		33		37		41	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
300 x 375	42	m^3/s side throw m	0.053	0.035	0.071	0.047	0.088	0.059	0.106	0.071	0.124	0.083	0.142	0.094	0.159	0.106
			2.4	1.8	2.7	2.1	3.1	2.4	3.4	2.7	3.7	2.7	4.0	3.1	4.3	3.4
			3.4	2.4	3.4	2.7	4.0	3.1	4.3	3.4	4.6	3.7	4.9	4.0	5.2	4.3
			4.3	3.1	4.9	3.7	5.5	4.3	6.1	4.6	6.4	4.9	7.0	5.2	7.3	5.5
	43	m^3/s side throw m	0.071	0.035	0.094	0.047	0.118	0.059	0.142	0.071	0.165	0.083	0.189	0.094	0.212	0.106
			3.1	1.8	3.7	2.1	4.3	2.4	4.6	2.7	4.9	2.7	5.2	3.1	5.5	3.4
			3.7	2.4	4.3	2.7	4.9	3.1	5.2	3.4	5.5	3.7	6.1	4.0	6.4	4.3
			5.2	3.1	6.1	3.7	7.0	4.3	7.6	4.6	7.9	4.9	8.5	5.2	9.2	5.5
	31	m^3/s side throw m	0.061	0.055	0.081	0.074	0.102	0.092	0.122	0.111	0.142	0.129	0.162	0.147	0.183	0.166
			2.7	2.1	3.1	2.4	3.4	2.7	3.7	3.1	4.0	3.4	4.3	3.4	4.6	3.7
			3.1	2.7	3.7	3.1	4.3	3.4	4.6	3.7	4.9	4.0	5.2	4.3	5.5	4.6
			4.6	3.7	5.2	4.3	5.8	4.9	6.4	5.2	6.7	5.5	7.3	6.1	7.9	6.4
	33	m^3/s side throw m	0.053	0.062	0.071	0.083	0.088	0.103	0.106	0.124	0.124	0.144	0.142	0.165	0.159	0.186
			3.1	3.1	3.7	3.7	4.3	4.3	4.6	4.6	4.9	4.9	5.2	5.2	5.5	5.5
			3.7	3.7	4.3	4.3	4.9	4.9	5.2	5.2	5.5	5.5	6.1	6.1	6.4	6.4
			5.2	5.2	6.1	6.1	7.0	7.0	7.6	7.6	7.9	7.9	8.5	8.5	9.2	9.2
	37	m^3/s side throw m	0.088		0.118		0.147		0.177		0.207		0.236		0.266	
			3.4		4.0		4.6		4.9		5.2		5.5		6.1	
			4.3		4.9		5.5		6.1		6.4		7.0		7.3	
			5.8		6.7		7.6		8.2		8.8		9.5		10.1	
	22, 23	m^3/s side throw m	0.106	0.071	0.142	0.094	0.177	0.118	0.212	0.142	0.248	0.165	0.283	0.189	0.319	0.212
			3.7	2.7	4.3	3.1	4.9	3.4	5.2	3.7	5.5	4.0	6.1	4.3	6.4	4.6
			4.6	3.4	5.2	4.0	5.8	4.6	6.4	4.9	6.7	5.2	7.3	5.5	7.9	6.1
			6.4	4.9	7.3	5.5	8.2	6.4	9.2	6.7	9.8	7.3	10.4	7.6	11.0	8.2
AD 0.112 m^2	52 55 / 54 53	m^3/s side throw m	0.177		0.236		0.295		0.354		0.413		0.472		0.531	
			4.3		4.9		5.5		6.1		6.4		7.0		7.3	
			5.2		6.1		7.0		7.6		7.9		8.5		9.2	
			7.3		8.5		9.8		10.4		11.3		12.2		12.8	
	12, 13															

* These cores are constructed to give as near as possible equal air flow in A & B directions.

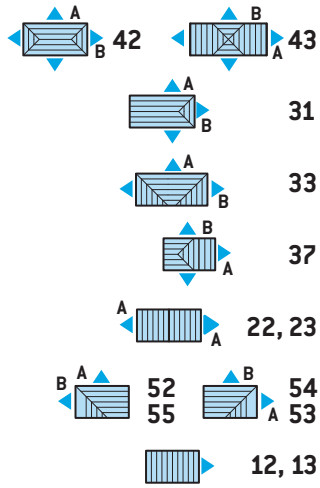
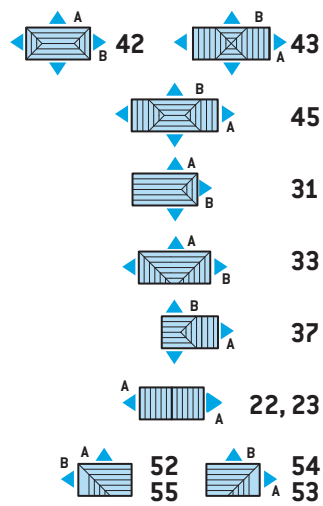
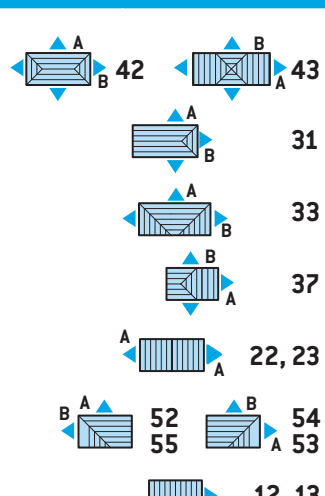
Size in mm	Patterns	Neck Vel m/s TP Pa	1.57 6		2.10 11		2.62 18		3.15 25		3.67 35		4.19 45		4.72 57	
	Return NC+4 Factors -SP=2.0 TP	Total m³/s NC	0.212 -		0.283 17		0.354 24		0.425 30		0.496 34		0.566 38		0.637 42	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
300 x 450		m³/s side throw m	0.071 3.1 3.7 5.2	0.035 1.8 2.4 3.1	0.094 3.7 4.3 6.1	0.047 2.1 2.7 3.7	0.118 4.3 4.9 7	0.059 2.4 3.1 4.3	0.142 4.6 5.2 7.6	0.071 2.7 3.4 4.6	0.165 4.9 5.5 7.9	0.083 2.7 3.7 4.9	0.189 5.2 6.1 8.5	0.094 3.1 4 5.2	0.212 5.5 6.4 9.2	0.106 3.4 4.3 5.5
		m³/s side throw m	0.053 3.1 3.7 5.2	0.053 3.1 3.7 5.2	0.071 3.7 4.3 6.1	0.071 3.7 4.3 6.1	0.088 4.3 4.9 7.2	0.088 4.3 4.9 7.2	0.106 4.6 5.2 7.6	0.106 4.6 5.2 7.6	0.124 4.9 5.5 7.9	0.124 4.9 5.5 7.9	0.142 5.2 6.1 8.5	0.142 5.2 6.1 8.5	0.159 5.5 6.4 9.2	0.159 5.5 6.4 9.2
		m³/s side throw m	0.088 3.4 4.3 5.8	0.035 1.8 2.4 3.1	0.118 4.0 4.9 6.7	0.047 2.1 2.7 3.7	0.147 4.6 5.5 7.6	0.059 2.4 3.1 4.3	0.177 4.9 6.1 8.2	0.071 2.7 3.4 4.6	0.206 5.2 6.4 8.8	0.083 2.7 3.7 4.9	0.236 5.5 7.0 9.5	0.094 3.1 4.0 5.2	0.265 6.1 7.3 10.1	0.106 3.4 4.3 5.5
		m³/s side throw m	0.067 2.7 3.4 4.9	0.079 2.4 3.1 4.3	0.088 3.1 4.0 5.5	0.106 2.7 3.4 4.9	0.111 3.4 4.6 6.4	0.133 3.1 4.0 5.5	0.133 3.7 4.9 6.7	0.159 3.4 4.3 6.1	0.155 4.0 5.2 7.3	0.186 3.7 4.6 6.4	0.177 4.3 5.5 7.6	0.212 4.4 4.9 7.0	0.199 4.6 6.1 8.2	0.239 4.3 5.2 7.3
		m³/s side throw m	0.071 3.1 3.7 5.2	0.071 3.1 3.7 5.2	0.094 3.7 4.3 6.1	0.094 3.7 4.3 6.1	0.118 4.3 4.9 7.0	0.118 4.3 4.9 7.0	0.142 4.6 5.2 7.6	0.142 4.6 5.2 7.6	0.165 4.9 5.5 7.9	0.165 4.9 5.5 7.9	0.189 5.2 6.1 8.5	0.189 5.2 6.1 8.5	0.212 5.5 6.4 9.2	0.212 5.5 6.4 9.2
		m³/s side throw m	0.106 3.7 4.6 6.4		0.142 4.3 5.2 7.3		0.177 4.9 5.8 8.2		0.212 5.2 6.4 9.2		0.248 5.5 6.7 9.8		0.283 6.1 7.3 10.4		0.319 6.4 7.9 11.0	
		m³/s side throw m	0.142 3.1 4.9 7.0	0.071 2.7 3.4 4.9	0.189 4.6 5.5 7.9	0.094 3.1 4.0 5.5	0.236 5.2 6.4 9.2	0.118 3.4 4.6 6.4	0.283 5.5 6.7 9.8	0.142 3.7 4.9 6.7	0.330 6.1 7.3 10.4	0.165 4.0 5.2 7.3	0.378 6.4 7.6 11.3	0.189 4.3 5.5 7.6	0.425 7.0 8.2 11.9	0.212 4.6 6.1 8.2
		m³/s side throw m	0.212 4.3 5.2 7.3		0.283 4.9 6.1 8.5		0.354 5.5 7.0 9.8		0.425 6.1 7.6 10.4		0.496 6.4 7.9 11.3		0.566 7.0 8.5 12.2		0.637 7.3 9.2 12.8	
AD 0.135 m²																
	Return NC+6 Factors -SP=2.3 TP	Total m³/s NC	0.248 -		0.330 17		0.413 24		0.496 30		0.578 34		0.661 38		0.743 42	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
300 x 525		m³/s side throw m	0.088 3.4 4.3 5.8	0.035 1.8 2.4 3.1	0.118 4.0 4.9 6.7	0.047 2.1 2.7 3.7	0.147 4.6 5.5 7.6	0.059 2.4 3.1 4.3	0.177 4.9 6.1 8.2	0.071 2.7 3.4 4.6	0.206 5.2 6.4 8.8	0.083 2.7 3.7 4.9	0.236 5.5 7.0 9.5	0.094 3.1 4.0 5.2	0.265 6.1 7.3 10.1	0.106 3.4 4.3 5.5
		m³/s side throw m	0.053 3.1 3.7 5.2	0.071 3.1 3.7 5.2	0.071 3.7 4.3 6.1	0.094 3.7 4.3 6.1	0.088 4.3 4.9 7.0	0.118 4.3 4.9 7.0	0.106 4.6 5.2 7.6	0.142 4.6 5.2 7.6	0.124 4.9 5.5 7.9	0.165 4.9 5.5 7.9	0.142 5.2 6.1 8.5	0.189 5.2 6.1 8.5	0.159 5.5 6.4 9.2	0.212 5.5 6.4 9.2
		m³/s side throw m	0.106 3.7 4.6 6.4	0.035 1.8 2.4 3.1	0.142 4.3 5.2 7.3	0.047 2.1 2.7 3.7	0.177 4.9 5.8 8.2	0.059 2.4 3.1 4.3	0.212 5.2 6.4 9.2	0.071 2.7 3.4 4.6	0.248 5.5 6.7 9.8	0.083 2.7 3.7 4.9	0.283 6.1 7.3 10.4	0.094 3.1 4.0 5.3	0.319 6.4 7.9 11.0	0.106 3.4 4.3 5.5
		m³/s side throw m	0.070 2.7 3.4 4.9	0.109 2.7 3.4 4.9	0.093 3.1 4.0 5.5	0.144 3.1 4.0 5.5	0.116 3.4 4.6 6.4	0.180 3.4 4.6 6.4	0.139 3.7 4.9 6.7	0.217 3.7 4.9 6.7	0.163 4.0 5.2 7.3	0.253 4.0 5.2 7.3	0.186 4.3 5.5 7.6	0.289 4.3 5.5 7.6	0.209 4.6 6.1 82.0	0.325 4.6 6.1 8.2
		m³/s side throw m	0.088 3.4 4.3 5.8	0.079 3.4 4.3 5.8	0.118 4.0 4.9 6.Y	0.106 4.0 4.9 6.7	0.148 4.6 5.5 7.6	0.133 4.6 5.5 7.6	0.177 4.9 6.1 8.2	0.159 4.9 6.1 8.2	0.206 5.2 6.4 8.8	0.186 5.2 6.4 8.8	0.236 5.5 7.0 9.5	0.212 5.5 7.0 9.5	0.265 6.1 7.3 10.1	0.239 6.1 7.3 10.1
		m³/s side throw m	0.124 3.7 4.6 6.4		0.165 4.3 5.2 7.3		0.206 4.9 5.8 8.2		0.248 5.2 6.4 9.2		0.289 5.5 6.7 9.8		0.330 6.1 7.3 10.4		0.372 6.4 7.9 11.0	
		m³/s side throw m	0.177 4.3 5.2 7.3	0.071 2.7 3.4 4.9	0.236 4.9 6.1 8.5	0.094 3.1 4.0 5.5	0.295 5.5 7.0 9.8	0.118 3.4 4.6 6.4	0.354 6.1 7.6 10.4	0.142 3.7 4.9 6.7	0.413 6.4 7.9 11.3	0.165 4.0 5.2 7.3	0.472 7.0 8.5 12.2	0.189 4.3 5.5 7.6	0.531 7.3 9.2 12.8	0.212 4.6 6.1 8.2
		m³/s side throw m	0.248 4.6 5.5 7.9		0.330 5.2 6.4 9.2		0.413 5.8 7.3 10.4		0.496 6.4 7.9 11.3		0.578 6.7 8.5 12.2		0.661 7.3 9.2 12.8		0.743 7.9 9.8 13.7	
AD 0.157 m²																
	Return NC+6 Factors -SP=2.7 TP	Total m³/s NC	0.283 9		0.378 18		0.472 25		0.566 31		0.661 35		0.755 39		0.850 43	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
300 x 600		m³/s side throw m	0.106 3.7 4.6 6.4	0.035 1.8 2.4 3.1	0.142 4.3 5.2 7.3	0.047 2.1 2.7 3.7	0.177 4.9 5.8 8.2	0.059 2.4 3.1 4.3	0.212 5.2 6.4 9.2	0.071 2.7 3.4 4.6	0.248 5.5 6.7 9.8	0.083 2.7 3.7 4.9	0.283 6.1 7.3 10.4	0.094 3.1 4.0 5.2	0.319 6.4 7.9 11.0	0.106 3.4 4.3 5.5
		m³/s side throw m	0.071 3.1 3.7 5.2	0.071 3.1 3.7 5.2	0.094 3.7 4.3 6.1	0.094 3.7 4.3 6.1	0.118 4.3 4.9 7.0	0.118 4.3 4.9 7.0	0.142 4.6 5.2 7.6	0.142 4.6 5.2 7.6	0.165 4.9 5.5 7.9	0.165 4.9 5.5 7.9	0.189 5.2 6.1 8.5	0.189 5.2 6.1 8.5	0.212 5.5 6.4 9.2	0.212 5.5 6.4 9.2
		m³/s side throw m	0.124 3.7 4.6 6.4	0.035 1.8 2.4 3.1	0.165 4.3 5.2 7.3	0.047 2.1 2.7 3.7	0.206 4.9 5.8 8.2	0.083 2.4 3.1 4.3	0.248 5.2 6.4 9.2	0.071 2.7 3.4 4.6	0.289 5.5 6.7 9.8	0.083 2.7 3.7 4.9	0.330 6.1 7.3 10.4	0.094 3.1 4.0 5.2	0.372 6.4 7.9 11.0	0.106 3.4 4.3 5.5
		m³/s side throw m	0.142 3.1 3.7 5.2	0.071 2.7 3.4 4.9	0.189 3.7 4.3 6.1	0.094 3.1 4.0 5.5	0.236 4.3 4.9 7.0	0.118 3.4 4.6 6.4	0.283 4.6 5.2 7.6	0.142 3.7 4.9 6.7	0.330 4.9 5.5 7.9	0.165 4.0 5.2 7.3	0.378 5.2 6.1 8.5	0.189 4.3 5.5 7.6	0.425 5.5 6.4 9.2	0.212 4.6 6.1 8.2
		m³/s side throw m	0.088 3.4 4.3 5.8	0.097 3.4 4.3 5.8	0.118 4.0 4.9 6.7	0.130 4.0 4.9 6.7	0.148 4.6 5.5 7.6	0.162 4.6 5.5 7.6	0.177 4.9 6.1 8.2	0.195 4.9 6.1 8.2	0.206 5.2 6.4 8.8	0.227 5.2 6.4 8.8	0.236 5.5 7.0 9.5	0.259 5.5 7.0 9.5	0.275 6.1 7.3 10.1	0.292 6.1 7.3 10.1
		m³/s side throw m	0.142 4.0 4.9 7.0		0.189 4.6 5.5 7.9		0.236 5.2 6.4 9.2		0.283 5.5 6.7 9.8		0.330 6.1 7.3 10.4		0.378 6.4 7.6 11.3		0.425 7.0 8.2 11.9	
		m³/s side throw m	0.212 4.3 5.2 7.3	0.071 2.7 3.4 4.9	0.283 4.9 6.1 8.5	0.094 3.1 4.0 5.5	0.354 5.5 7.0 9.8	0.118 3.4 4.6 6.4	0.425 6.1 7.6 10.4	0.142 3.7 4.9 6.7	0.496 6.4 7.9 11.3	0.165 4.0 5.2 7.3	0.566 7.0 8.5 12.2	0.189 4.3 5.5 7.6	0.637 7.3 9.2 12.8	0.212 4.6 6.1 8.2
		m³/s side throw m	0.283 4.9 6.1 8.5		0.378 5.8 7.0 9.8		0.472 6.7 7.9 11.3		0.566 7.0 8.5 11.9		0.661 7.6 9.2 12.8		0.775 8.2 10.1 13.7		0.850 8.8 10.7 14.6	
AD 0.180 m²																

* These cores are constructed to give as near as possible equal air flow in A & B directions.

CMP – Performance Data

Size in mm	Patterns	Neck Vel m/s	1.57		2.10		2.62		3.15		3.67		4.19		4.72	
		TP Pa	6		11		17		24		33		43		54	
	Return NC+5	Total m^3/s	0.265		0.354		0.442		0.531		0.619		0.708		0.796	
	Factors -SP=2.1 TP	NC	9		18		25		31		35		39		43	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
375 x 450	42 / 43	m^3/s side throw m	0.077 2.7 3.4 4.9	0.055 2.1 2.7 3.7	0.103 3.1 4 5.5	0.074 2.4 3.1 4.3	0.129 3.4 4.6 6.4	0.092 2.7 3.4 4.9	0.155 3.7 4.9 6.7	0.111 3.1 3.7 5.2	0.181 4 5.2 7.3	0.129 3.4 4 5.5	0.207 4.3 5.5 7.6	0.147 3.4 4.3 6.1	0.232 4.6 6.1 8.2	0.166 3.7 4.6 6.4
	31	m^3/s side throw m	0.105 3.7 4.6 6.4	0.055 2.1 2.7 3.7	0.140 4.3 5.2 7.3	0.074 2.4 3.1 4.3	0.175 4.9 5.8 8.2	0.092 2.7 3.4 4.9	0.210 5.2 6.4 9.2	0.111 3.1 3.7 5.2	0.245 5.5 6.7 9.8	0.129 3.4 4.0 5.5	0.280 6.1 7.3 10.4	0.147 3.4 4.3 6.1	0.315 6.4 7.9 11.0	0.166 3.7 4.6 6.4
	33	m^3/s side throw m	0.093 3.4 4.3 5.8	0.080 2.4 3.1 4.3	0.124 4.0 4.9 6.7	0.106 2.7 3.4 4.9	0.155 4.6 5.5 7.6	0.133 3.1 4.0 5.5	0.186 4.9 6.1 8.2	0.159 3.4 4.3 6.1	0.217 5.2 6.4 8.8	0.186 3.7 4.6 6.4	0.248 5.5 7.0 9.5	0.212 4.0 4.9 7.0	0.279 6.1 7.3 10.1	0.239 4.3 5.2 7.3
	37	m^3/s side throw m	0.077 3.4 4.3 5.8	0.094 3.4 4.3 5.8	0.103 4.0 4.9 6.7	0.126 4.0 4.9 6.7	0.129 4.6 5.5 7.6	0.157 4.6 5.5 7.6	0.154 4.9 6.1 8.2	0.188 4.9 6.1 8.2	0.180 5.2 6.4 8.8	0.220 5.2 6.4 8.8	0.206 5.5 7.0 9.5	0.251 5.5 7.0 9.5	0.232 6.1 7.3 10.1	0.282 6.1 7.3 10.1
	22, 23	m^3/s side throw m	0.133 4.0 4.9 7.0		0.177 4.6 5.5 7.9		0.221 5.2 6.4 9.2		0.265 5.5 6.7 9.8		0.310 6.1 7.3 10.4		0.354 6.4 7.6 11.3		0.398 7.0 8.2 11.9	
AD 0.169 m^2	52 / 55 / 54 / 53	m^3/s side throw m	0.155 4.9 6.1 8.5	0.111 3.4 4.3 5.8	0.207 5.8 7.0 9.8	0.147 4.0 4.9 6.7	0.258 6.7 7.9 11.3	0.184 4.6 5.5 7.6	0.310 7.0 8.5 11.9	0.221 4.9 6.1 8.2	0.362 7.6 9.2 12.8	0.258 5.2 6.4 8.8	0.414 8.2 10.1 13.7	0.295 5.5 7.0 9.5	0.465 8.8 10.7 14.6	0.331 6.1 7.3 10.1
	12, 13	m^3/s side throw m	0.265 4.6 5.5 7.9		0.354 5.2 6.4 9.2		0.442 5.8 7.3 10.4		0.531 6.4 7.9 11.3		0.619 6.7 8.5 12.2		0.708 7.3 9.2 12.8		0.796 7.9 9.8 13.7	
	Return NC+6	Total m^3/s	0.309		0.413		0.515		0.619		0.723		0.826		0.930	
	Factors -SP=2.2 TP	NC	9		18		25		31		35		39		43	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
375 x 525	42 / 43	m^3/s side throw m	0.099 3.7 4.6 6.4	0.055 2.1 2.7 3.7	0.133 4.3 5.2 7.3	0.074 2.4 3.1 4.3	0.166 4.9 5.8 8.2	0.092 2.7 3.4 4.9	0.199 5.2 6.4 9.2	0.111 3.1 3.7 5.2	0.233 5.5 6.7 9.8	0.129 3.4 4.0 5.5	0.266 6.1 7.3 10.4	0.147 3.4 4.3 6.1	0.299 6.4 7.9 11.0	0.166 3.7 4.6 6.4
	45 *	m^3/s side throw m	0.077 3.4 4.3 5.8	0.077 3.4 4.3 5.8	0.103 4.0 4.9 6.7	0.103 4.0 4.9 6.7	0.129 4.6 5.5 7.6	0.129 4.6 5.5 7.6	0.154 4.9 6.1 8.2	0.154 4.9 6.1 8.2	0.180 5.2 6.4 8.8	0.180 5.2 6.4 8.8	0.206 5.5 7.0 9.5	0.206 5.5 7.0 9.5	0.232 6.1 7.3 10.1	0.232 6.1 7.3 10.1
	31	m^3/s side throw m	0.127 3.7 4.6 6.4	0.055 2.1 2.7 3.7	0.170 4.3 5.2 7.3	0.074 2.4 3.1 4.3	0.212 4.9 5.8 8.2	0.092 2.7 3.4 4.9	0.254 5.2 6.4 9.2	0.111 3.1 3.7 5.2	0.297 5.5 6.7 9.8	0.129 3.4 4.0 5.5	0.339 6.1 7.3 10.4	0.147 3.4 4.3 6.1	0.382 6.4 7.9 11.0	0.166 3.7 4.6 6.4
	33	m^3/s side throw m	0.101 3.1 3.7 5.2	0.109 2.7 3.4 4.9	0.134 3.7 4.3 6.1	0.144 3.1 4.0 5.5	0.168 4.3 4.9 7.0	0.180 3.4 4.6 6.4	0.201 4.6 5.2 7.6	0.217 3.7 4.9 6.7	0.235 4.9 5.5 7.9	0.253 4.0 5.2 7.3	0.269 5.2 6.1 8.5	0.289 4.3 5.5 7.6	0.303 5.5 6.4 9.2	0.325 4.6 6.1 8.2
	37	m^3/s side throw m	0.100 3.7 4.6 6.4	0.105 3.7 4.6 6.4	0.133 4.3 5.2 7.3	0.140 4.3 5.2 7.3	0.166 4.9 5.8 8.2	0.175 4.9 5.8 8.2	0.199 5.2 6.4 9.2	0.210 5.2 6.4 9.2	0.232 5.5 6.7 9.8	0.245 5.5 6.7 9.8	0.266 6.1 7.3 10.4	0.280 6.1 7.3 10.4	0.299 6.4 7.9 11.0	0.315 6.4 7.9 11.0
	22, 23	m^3/s side throw m	0.154 4.0 4.9 7.0		0.206 4.6 5.5 7.9		0.258 5.2 6.4 9.2		0.310 5.5 6.7 9.8		0.362 6.1 7.3 10.4		0.413 6.4 7.6 11.3		0.465 7.0 8.2 11.9	
AD 0.197 m^2	52 / 55 / 54 / 53	m^3/s side throw m	0.199 4.3 5.2 7.3	0.111 3.4 4.3 5.8	0.266 4.9 6.1 8.5	0.147 4.0 4.9 6.7	0.331 5.5 7.0 9.8	0.184 4.6 5.5 7.6	0.398 6.1 7.6 10.4	0.221 4.9 6.1 8.2	0.465 6.4 7.9 11.3	0.258 5.2 6.4 8.8	0.532 7.0 8.5 12.2	0.295 5.5 7.0 9.5	0.599 7.3 9.2 12.8	0.331 6.1 7.3 10.1
	12, 13	m^3/s side throw m	0.309 4.9 6.1 8.5		0.413 5.8 7.0 9.8		0.515 6.7 7.9 11.3		0.619 7.0 8.5 11.9		0.723 7.6 9.2 12.8		0.826 8.2 10.1 13.7		0.930 8.8 10.7 14.6	
	Return NC+7	Total m^3/s	0.354		0.472		0.590		0.708		0.826		0.944		1.060	
	Factors -SP=2.7 TP	NC	10		19		26		32		36		40		44	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B
375 x 600	42 / 43	m^3/s side throw m	0.122 3.7 4.6 6.4	0.055 2.1 2.7 3.7	0.162 4.3 5.2 7.3	0.074 2.4 3.1 4.3	0.203 4.9 5.8 8.2	0.092 2.7 3.4 4.9	0.244 5.2 6.4 9.2	0.111 3.1 3.7 5.2	0.284 5.5 6.9 9.8	0.129 3.4 4.0 5.5	0.325 6.1 7.3 10.4	0.147 3.4 4.3 6.1	0.365 6.4 7.9 11.0	0.166 3.7 4.6 6.4
	45 *	m^3/s side throw m	0.077 3.4 4.3 5.8	0.100 3.7 4.6 6.4	0.103 4.0 4.9 6.7	0.133 4.3 5.2 7.3	0.129 4.6 5.5 7.6	0.166 4.9 5.8 8.2	0.154 4.9 6.1 8.2	0.199 5.2 6.4 9.2	0.180 52.0 6.4 8.8	0.232 5.5 6.7 9.8	0.206 5.5 7.0 9.5	0.266 6.1 7.3 10.4	0.232 6.1 7.3 10.1	0.299 6.4 7.9 11.0
	31	m^3/s side throw m	0.149 4.0 4.9 7.0	0.055 2.1 2.7 3.7	0.199 4.6 5.5 7.9	0.074 2.4 3.1 4.3	0.249 5.2 6.4 9.2	0.092 2.7 3.4 4.9	0.299 5.5 6.7 9.8	0.111 3.1 3.7 5.2	0.348 6.1 7.3 10.4	0.129 3.4 4.0 5.5	0.398 6.4 7.6 11.3	0.147 3.4 4.3 6.1	0.448 7.0 8.2 11.9	0.166 3.7 4.6 6.4
	33	m^3/s side throw m	0.100 3.7 4.6 6.4	0.142 3.0 3.7 5.2	0.142 4.3 5.2 7.3	0.189 3.7 4.3 6.1	0.177 4.9 5.8 8.2	0.236 4.3 4.9 7.0	0.212 5.2 6.4 9.2	0.283 4.6 5.2 7.6	0.248 5.5 6.7 9.8	0.330 4.9 5.5 7.9	0.283 6.1 7.3 10.4	0.378 5.2 6.1 8.5	0.319 6.4 7.9 11.0	0.425 5.5 6.4 9.2
	37	m^3/s side throw m	0.122 3.7 4.6 6.4	0.116 3.7 4.6 6.4	0.162 4.3 5.2 7.3	0.155 4.3 5.2 7.3	0.203 4.9 5.8 8.2	0.194 4.9 5.8 8.2	0.244 5.2 6.4 9.2	0.232 5.2 6.4 9.2	0.284 5.5 6.7 9.8	0.271 5.5 6.7 9.8	0.325 6.1 7.3 10.4	0.310 6.1 7.3 10.4	0.366 6.4 7.9 11.0	0.348 6.4 7.9 11.0
	22, 23	m^3/s side throw m	0.177 4.3 5.2 7.3		0.236 4.9 6.1 8.5		0.295 5.5 7.0 9.8		0.354 6.1 7.6 10.4		0.413 6.4 7.9 11.3		0.472 7.0 8.5 12.2		0.531 7.3 9.2 12.8	
AD 0.225 m^2	52 / 55 / 54 / 53	m^3/s side throw m	0.244 4.6 5.5 7.9	0.111 3.4 4.3 5.8	0.325 5.2 6.4 9.2	0.147 4.0 4.9 6.7	0.406 5.8 7.3 10.4	0.184 4.6 5.5 7.6	0.405 6.4 7.9 11.3	0.221 4.9 6.1 8.2	0.568 6.7 8.5 12.2	0.258 5.2 6.4 8.8	0.650 7.3 9.2 12.8	0.295 5.5 7.0 9.5	0.731 7.9 9.8 13.7	0.331 6.1 7.3 10.1
	12, 13	m^3/s side throw m	0.354 5.2 6.4 9.2		0.472 6.1 7.3 10.4		0.590 7.0 8.2 11.9		0.708 7.6 9.2 12.8		0.826 7.9 9.8 13.7		0.944 8.5 10.4 14.6		1.060 9.2 11.0 15.6	

* These cores are constructed to give as near as possible equal air flow in A & B directions.

Size in mm	Patterns	Neck Vel m/s / TP Pa	1.57 / 6		2.10 / 11		2.62 / 17		3.15 / 24		3.67 / 33		4.19 / 43		4.72 / 54	
	Return NC+6	Total m^3/s / NC	0.372 / 9		0.496 / 19		0.618 / 26		0.743 / 32		0.869 / 36		0.991 / 40		1.110 / 44	
	Factors -SP=2.3 TP		A	B	A	B	A	B	A	B	A	B	A	B	A	B
450 x 525	 42 43 31 33 37 22, 23 52 55 54 53 12, 13	m^3/s side throw m	0.106	0.080	0.142	0.106	0.177	0.132	0.212	0.159	0.248	0.186	0.283	0.212	0.318	0.239
			3.1	2.4	3.7	2.7	4.3	3.1	4.6	3.4	4.9	3.7	5.2	4	5.5	4.3
			3.7	3.1	4.3	3.4	4.9	4	5.2	4.3	5.5	4.6	6.1	4.9	6.4	5.2
			5.2	4.3	6.1	4.9	7	5.5	7.6	6.1	7.9	6.4	8.5	7	9.2	7.3
		m^3/s side throw m	0.146	0.080	0.195	0.106	0.243	0.133	0.292	0.159	0.341	0.186	0.389	0.212	0.438	0.239
			4.0	2.4	4.6	2.7	5.2	3.1	5.5	3.4	6.1	3.7	6.4	4.0	7.0	4.9
			4.9	3.1	5.5	3.4	6.4	4.0	6.7	4.3	7.3	4.6	7.6	4.9	8.2	5.2
			7.0	4.3	7.9	4.9	9.2	5.5	9.8	6.1	10.4	6.4	11.3	7.0	11.9	7.3
		m^3/s side throw m	0.132	0.109	0.176	0.144	0.219	0.180	0.263	0.217	0.308	0.253	0.351	0.289	0.395	0.325
			4.0	2.7	4.6	3.1	5.2	3.4	5.5	3.7	6.1	4.0	6.4	4.3	7.0	4.6
			4.9	3.4	5.5	4.0	6.4	4.6	6.7	4.9	7.3	5.2	7.6	5.5	8.2	6.1
			7.0	4.9	7.9	5.5	9.2	6.4	9.8	6.7	10.4	7.3	11.3	7.6	11.9	8.2
		m^3/s side throw m	0.133	0.119	0.177	0.159	0.221	0.198	0.266	0.238	0.310	0.278	0.354	0.317	0.399	0.357
			4.0	3.7	4.6	4.3	5.2	4.9	5.5	5.2	6.1	5.5	6.4	6.1	7.0	6.4
			4.9	4.6	5.5	5.2	6.4	5.8	6.7	6.4	7.3	6.7	7.6	7.3	8.2	7.9
			7.0	6.4	7.9	7.3	9.2	8.2	9.8	9.2	10.4	9.8	11.3	10.4	11.9	11.0
		m^3/s side throw m	0.186		0.248		0.309		0.372		0.434		0.496		0.557	
			4.3		4.9		5.5		6.1		6.4		7.0		7.3	
			5.2		6.1		7.0		7.6		7.9		8.5		9.1	
			7.3		8.5		9.8		10.4		11.3		12.2		12.8	
AD 0.236 m^2		m^3/s side throw m	0.212	0.160	0.283	0.212	0.359	0.264	0.425	0.319	0.496	0.373	0.566	0.425	0.637	0.477
			4.3	3.7	4.9	4.3	5.5	4.9	6.1	5.2	6.4	5.5	7.0	6.1	7.3	6.4
			5.2	4.6	6.1	5.2	7.0	5.8	7.6	6.4	7.9	6.7	8.5	7.3	9.1	7.9
			7.3	6.4	8.5	7.3	9.8	8.2	10.4	9.2	11.3	9.8	12.2	10.4	12.8	11.0
		m^3/s side throw m	0.372		0.496		0.618		0.743		0.869		0.991		1.110	
			5.2		6.1		7.0		7.6		7.9		8.5		9.2	
			6.4		7.3		8.2		9.2		9.8		10.4		11.0	
			9.2		10.4		11.9		12.8		13.7		14.6		15.6	
	Return NC+7	Total m^3/s / NC	0.425 / 11		0.566 / 20		0.708 / 27		0.851 / 33		0.991 / 37		1.130 / 41		1.270 / 45	
	Factors -SP=2.6 TP		A	B	A	B	A	B	A	B	A	B	A	B	A	B
450 x 600	 42 43 45 * 31 33 37 22, 23 52 55 54 53 12, 13	m^3/s side throw m	0.133	0.080	0.177	0.106	0.221	0.133	0.266	0.159	0.310	0.186	0.354	0.212	0.398	0.239
			4.0	2.4	4.6	2.7	5.2	3.1	5.5	3.4	6.1	3.7	6.4	4.0	7.0	4.3
			4.9	3.1	5.5	3.4	6.4	4.0	6.7	4.3	7.3	4.6	7.6	4.9	8.2	5.2
			7.0	4.3	7.9	4.9	9.2	5.5	9.8	6.1	10.4	6.4	11.3	7.0	11.9	7.3
		m^3/s side throw m	0.106	0.106	0.142	0.142	0.177	0.177	0.212	0.212	0.248	0.248	0.283	0.283	0.319	0.319
			3.7	3.7	4.3	4.3	4.9	4.9	5.2	5.2	5.5	5.5	6.1	6.1	6.4	6.4
			4.6	4.6	5.2	5.2	5.8	5.8	6.4	6.4	6.7	6.7	7.3	7.3	7.9	7.9
			6.4	6.4	7.3	7.3	8.2	8.2	9.2	9.2	9.8	9.8	10.4	10.4	11.0	11.0
		m^3/s side throw m	0.173	0.080	0.230	0.106	0.288	0.133	0.345	0.159	0.403	0.186	0.460	0.212	0.518	0.239
			4.3	2.4	4.9	2.7	5.5	3.1	6.1	3.4	6.4	3.7	7.0	4.0	7.3	4.3
			5.2	3.1	6.1	3.4	7.0	4.0	7.6	4.3	7.9	5.2	8.5	4.9	9.2	5.2
			7.3	4.3	8.5	4.9	9.8	5.5	10.4	6.1	11.3	6.4	12.2	7.0	12.8	7.3
		m^3/s side throw m	0.142	0.142	0.189	0.189	0.236	0.236	0.283	0.283	0.330	0.330	0.378	0.378	0.425	0.425
			4.0	3.1	4.6	3.7	5.2	4.3	5.5	4.6	6.1	4.9	6.4	5.2	7.0	5.5
			4.9	3.7	5.5	4.3	6.4	4.9	6.7	5.2	7.3	5.5	7.6	6.1	8.2	6.4
			7.0	5.2	7.9	6.1	9.2	7.0	9.8	7.6	10.4	7.9	11.3	8.5	11.9	9.2
		m^3/s side throw m	0.133	0.146	0.177	0.195	0.221	0.243	0.266	0.292	0.310	0.340	0.354	0.389	0.399	0.438
			4.0	4.0	4.6	4.6	5.2	5.2	5.5	5.5	6.1	6.1	6.4	6.4	7.0	7.0
			4.9	4.9	5.5	5.5	6.4	6.4	6.7	6.7	7.3	7.3	7.6	7.6	8.2	8.2
			7.0	7.0	7.9	7.9	9.2	9.2	9.8	9.8	10.4	10.4	11.3	11.3	11.9	11.9
		m^3/s side throw m	0.212		0.283		0.354		0.425		0.496		0.566		0.637	
			4.3		4.9		5.5		6.1		6.4		7.0		7.3	
			5.2		6.1		7.0		7.6		7.9		8.5		9.2	
			7.3		8.5		9.8		10.4		11.3		12.2		12.8	
AD 0.27 m^2		m^3/s side throw m	0.265	0.160	0.354	0.212	0.443	0.265	0.531	0.319	0.620	0.372	0.708	0.425	0.797	0.478
			4.6	3.7	5.2	4.3	5.8	4.9	6.4	5.2	6.7	5.5	7.3	6.1	7.9	6.4
			5.5	5.2	6.4	5.5	7.3	5.8	7.9	6.4	8.5	6.7	9.2	7.2	9.8	7.9
			7.9	6.4	9.2	7.3	10.4	8.2	11.3	9.2	12.2	9.8	12.8	10.4	13.7	11.1
		m^3/s side throw m	0.425		0.566		0.708		0.850		0.991		1.133		1.270	
			5.5		6.4		7.3		7.6		8.5		9.2		9.8	
			7.0		7.9		9.2		9.8		10.4		11.3		11.9	
			9.5		11.0		12.5		13.4		14.6		15.6		16.5	
	Return NC+8	Total m^3/s / NC	0.496 / 12		0.661 / 21		0.826 / 28		0.991 / 34		1.156 / 38		1.322 / 42		1.490 / 46	
	Factors -SP=3.2 TP		A	B	A	B	A	B	A	B	A	B	A	B	A	B
525 x 600	 42 43 31 33 37 22, 23 52 55 54 53 12, 13	m^3/s side throw m	0.139	0.109	0.186	0.144	0.233	0.180	0.279	0.217	0.326	0.253	0.372	0.289	0.419	0.325
			3.4	2.7	4.0	3.1	4.6	3.4	4.9	3.7	5.2	4.0	5.5	4.3	6.1	4.6
			4.3	3.4	4.9	4.0	5.5	4.6	6.1	4.9	6.4	5.2	7.0	5.5	7.3	6.1
			5.8	4.9	6.7	5.5	7.6	6.4	8.2	6.7	8.8	7.3	9.5	7.6	10.1	8.2
		m^3/s side throw m	0.194	0.109	0.258	0.144	0.323	0.180	0.387	0.217	0.452	0.253	0.517	0.289	0.581	0.325
			4.3	2.7	4.9	3.1	5.5	3.4	6.1	3.7	6.4	4.0	7.0	4.3	7.3	4.6
			5.2	3.4	6.1	4.0	7.0	4.6	7.6	4.9	7.9	5.2	8.5	5.5	9.2	6.1
			7.3	4.9	8.5	5.5	9.8	6.4	10.4	6.7	11.3	7.3	12.2	7.6	12.8	8.2
		m^3/s side throw m	0.177	0.142	0.236	0.189	0.295	0.236	0.354	0.283	0.414	0.331	0.471	0.377	0.532	0.426
			4.3	3.1	4.9	3.7	5.5	4.3	6.1	4.6	6.4	4.9	7.0	5.2	7.3	5.5
			5.2	3.7	6.1	4.3	7.0	4.9	7.6	5.2	7.9	5.5	8.5	6.1	9.2	6.4
			7.3	5.2	8.5	6.1	9.8	7.0	10.4	7.6	11.3	7.9	12.2	8.5	12.8	9.2
		m^3/s side throw m	0.170	0.163	0.227	0.217	0.283	0.271	0.340	0.326	0.397	0.380	0.453	0.434	0.510	0.486
			3.7	3.7	4.3	4.3	4.9	4.9	5.2	5.2	5.5	5.5	6.1	6.1	6.4	6.4
			4.6	4.6	5.2	5.2	5.8	5.8	6.4	6.4	6.7	6.7	7.3	7.3	7.9	7.9
			6.4	6.4	7.3	7.3	8.2	8.2	9.2	9.2	9.8	9.8	10.4	10.4	11.0	11.0
		m^3/s side throw m	0.248		0.330		0.413		0.496		0.578		0.661		0.744	
			4.6		5.2		5.8		6.4		6.7		7.3		7.9	
			5.5		6.4		7.3		7.9		8.5		9.2		9.8	
			7.9		9.2		10.4		11.3		12.2		12.8		13.7	
AD 0.315 m^2		m^3/s side throw m	0.279	0.217	0.372	0.289	0.465	0.361	0.577	0.434	0.652	0.505	0.744	0.578	0.838	0.650
			4.9	4.0	5.8	4.6	6.7	5.2	7.0	5.5	7.6	6.1	8.2	6.4	8.8	7.0
			6.1	4.9	7.0	5.5	7.9	6.4	8.5	6.7	9.2	7.3	10.1	7.6	10.7	8.2
			8.5	7.0	9.8	7.9	11.3	9.2	11.9	9.8	12.8	10.4	13.7	11.3	14.6	11.9
		m^3/s side throw m	0.496		0.661		0.826		0.991		1.160		1.320		1.490	
			5.8		6.7		7.6		8.2		8.8		9.5		10.1	
			7.3		8.2		9.5		10.1		11.0		11.6		12.5	
			10.1		11.6		13.1		14.3		15.3		16.5		17.4	

* These cores are constructed to give as near as possible equal air flow in A & B directions.

CMPH – Ceiling Multi Pattern - Horizontal

Model: **CMPH – Ceiling Multi Pattern - Horizontal**

The CMPH series of diffusers was developed to increase the acceptable application range of multi-pattern type ceiling outlets, for the reduced volumetric flow levels typically associated with VAV systems.

It is a variation on the basic CMP series with a horizontal blade added to each blade, which increases the induction rate, resulting in rapid mixing of supply and room air, which produces a strong ceiling effect at lower flows, minimising dumping.

These diffusers are also ideal for lower than normal ceiling heights, or low fixed volume air flows such as those usually found in centre zones.

In general, they operate at higher pressure, noise level, and throw distance than the equivalent Model CMP at the same flow.

Construction

CMPH series diffusers are ruggedly constructed entirely of aluminium, are lightweight and have no heavy cast, or moulded components. Precision combination corner gussets and braces, keep mitres to a hairline and aluminium rivets hold the core components rigidly together, eliminating the possibility of warping, flexing, or rattling.

Panel diffusers (Type 2 on page 159D) are mechanically secured to steel panels with the unique Holyoake mounting pins, eliminating gaps and producing a super-fine junction between panel and extrusion.

Installation

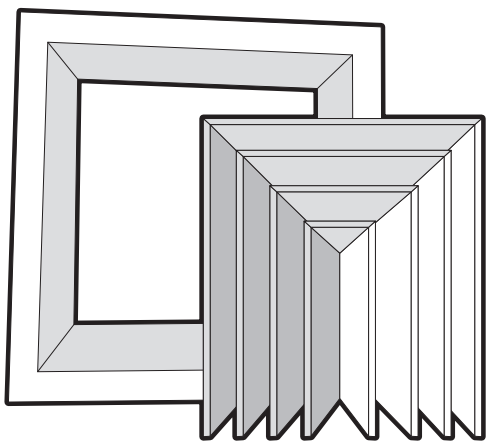
The diffusers frame assembly is installed in the ceiling opening and attached and sealed to the supply duct. The extensive range of cores, all snap in to the frame surrounds, with nickel plated spring steel thumb clips.

Finish

All Holyoake aluminium diffusers receive a three stage preparation, prior to final finishing; cleaning, chemical etch and drying. This preparation ensures powder coat adhesion and precludes powder peeling, or flaking after installation.
Standard colour is Holyoake White.

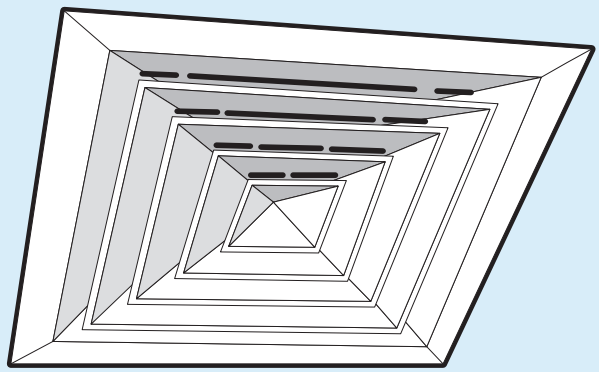
Features

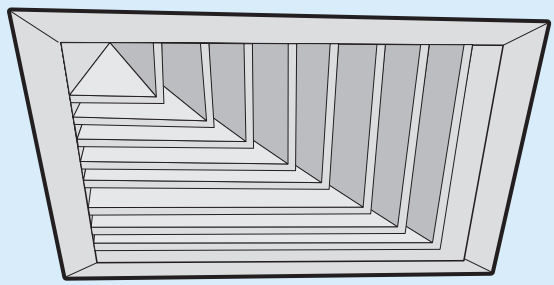
- All aluminium lightweight construction.
- Precision mitred corners.
- Selection of frame styles.
- Variety of throw patterns.
- Snap-in interchangeable cores.
- Tough powder coat finish.
- Lightweight Premi-Aire and galvanised cushion head boxes available.

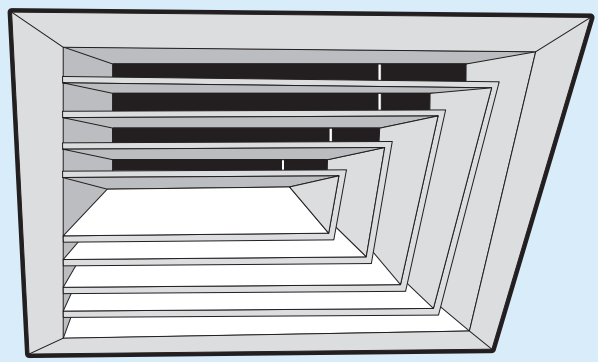


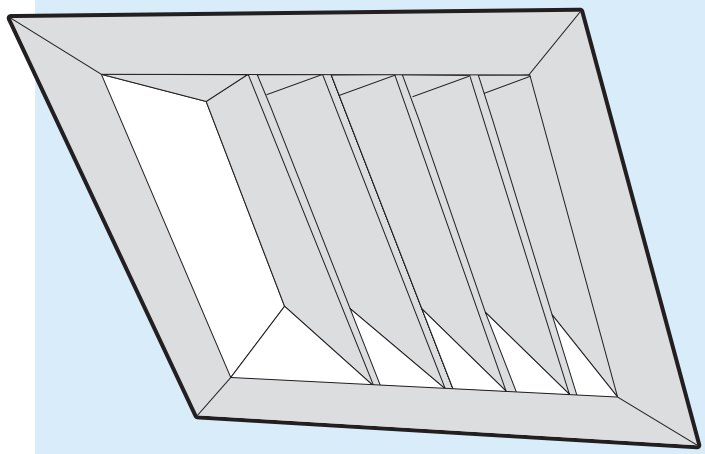
Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

Ceiling Diffuser





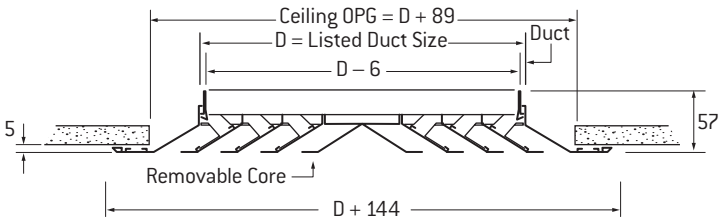




Model: **CMPH – Ceiling Multi Pattern Diffuser - Horizontal**

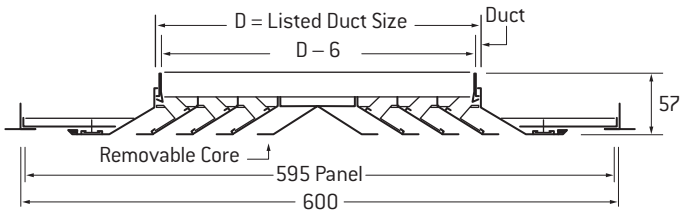
Standard Flange Frame.

Designed for surface mounting on all types of ceilings, as well as lay-in ceiling tile applications.



Panel Diffuser.

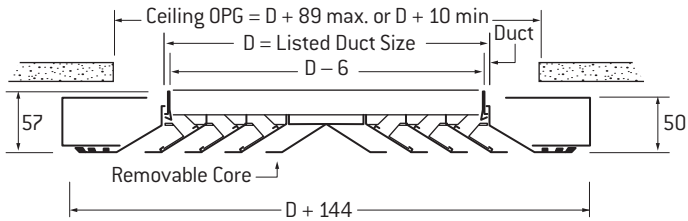
Lay-in type for installation in suspended "T-Rail" type ceilings. Standard panel overall size is 595 x 595 to suit a 600 x 600 grid. Size 450 x 450 has an overall face size of 595 x 595. It therefore does not require a panel in a 600 grid and fits "T-Rail" spacing with clearance*.



Drop Frame.

Lowers the face of the diffuser below the ceiling line. Can be used to reduce smudging, or against obstacles to minimise drafts. Can be supplied in any height from 50-81mm, but unless otherwise specified, frame height of 50 mm will be furnished.

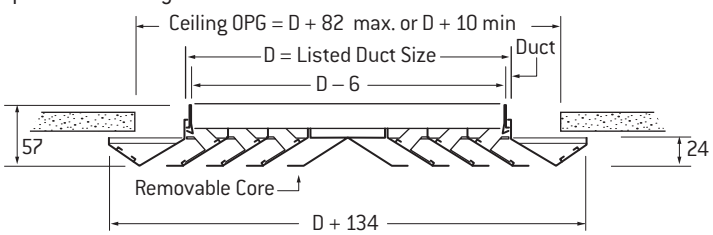
Special order only.



Bevelled Drop Frame.

Smartly styled bevelled type surround reduces ceiling smudging. For all surface mounting applications.

Special order only.



Construction

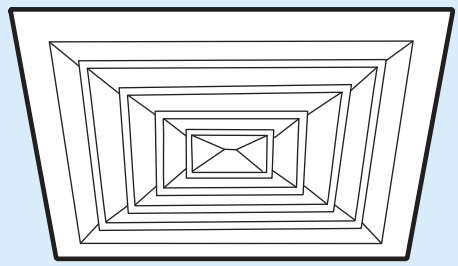
Aluminium:

0.75mm extruded 6063-T5 aluminium outer frame.

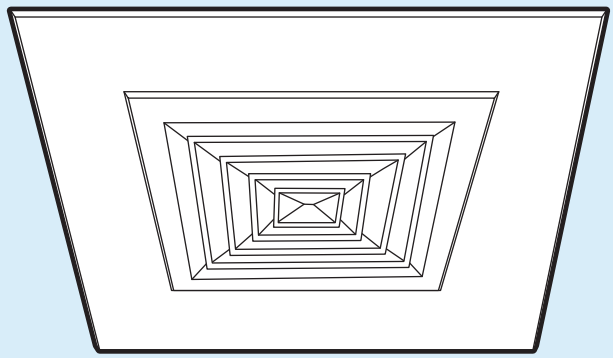
0.55mm removable aluminium core.

* Note: 0.75 mm Steel Panel on CMPH Type 2.
Product weights are shown on page 161D.

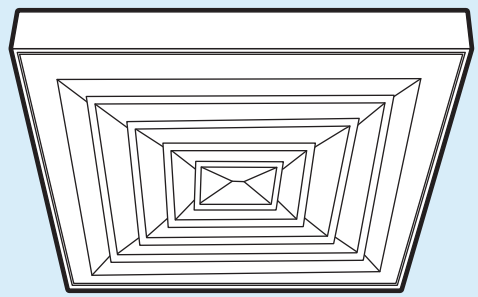
Type 1



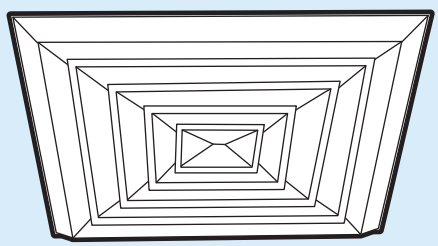
Type 2



Type 3



Type 4



CMPH – Performance Data

Size in mm	Patterns	Neck Vel m/s / TP Pa / Static Pa	1.04 / 4 / 3		1.57 / 10 / 8		2.10 / 16 / 13		2.62 / 24 / 20		3.15 / 35 / 30		3.67 / 48 / 40	
	Return Factors NC+1 -SP=1.1 TP	Total m^3/s / NC	0.024 / -		0.036 / -		0.047 / -		0.059 / -		0.071 / 23		0.083 / 28	
			A	B	A	B	A	B	A	B	A	B	A	B
150 x 150	41	m^3/s side	0.006		0.008		0.012		0.015		0.017		0.021	
		throw m 0.75	0.5		0.9		1.8		2.7		3.2		3.4	
		throw m 0.50	0.6		1.2		2.4		3.7		4.3		4.6	
		throw m 0.25	0.9		2.7		5.8		6.4		7		7.3	
	36 *	m^3/s side	0.005	0.009	0.007	0.014	0.009	0.019	0.012	0.024	0.014	0.028	0.017	0.033
		throw m 0.75	0.5	0.7	0.7	1.4	1.4	2.3	2.5	3.0	3.0	3.9	3.4	4.6
		throw m 0.50	0.6	0.9	0.9	1.8	1.8	3.0	3.4	4.0	4.0	5.2	4.6	6.1
		throw m 0.25	0.9	1.5	2.4	3.7	3.4	6.1	6.1	7.0	6.7	7.9	7.3	8.8
AD 0.023 m^2	21	m^3/s side	0.012		0.018		0.024		0.030		0.035		0.041	
		throw m 0.75	0.9		1.6		2.7		3.2		4.3		4.8	
		throw m 0.50	1.2		2.1		3.7		4.3		5.8		6.4	
		throw m 0.25	1.8		5.2		6.4		7.0		8.5		9.4	
	51	m^3/s side	0.024		0.035		0.047		0.059		0.071		0.083	
		throw m 0.75	0.9		2.3		3.2		4.3		5.0		5.9	
		throw m 0.50	1.2		3.0		4.3		5.8		6.7		7.9	
		throw m 0.25	2.7		6.1		7.0		8.5		9.7		10.4	
	11													
	Return Factors NC+3 -SP=1.3 TP	Total m^3/s / NC	0.052 / -		0.080 / -		0.106 / -		0.132 / 23		0.158 / 28		0.184 / 33	
			A	B	A	B	A	B	A	B	A	B	A	B
225 x 225	41	m^3/s side	0.013		0.020		0.026		0.033		0.040		0.046	
		throw m 0.75	0.7		1.6		2.7		4.1		4.3		5.0	
		throw m 0.50	0.9		2.1		3.7		5.5		5.8		6.7	
		throw m 0.25	2.1		5.5		6.4		7.9		8.5		9.7	
	36 *	m^3/s side	0.010	0.021	0.016	0.032	0.021	0.042	0.026	0.053	0.032	0.063	0.037	0.074
		throw m 0.75	0.7	0.9	1.6	2.3	2.5	3.2	3.2	4.1	3.7	5.0	4.8	5.9
		throw m 0.50	0.9	1.2	2.1	3.0	3.4	4.3	4.3	5.5	4.9	6.7	6.4	7.9
		throw m 0.25	1.8	2.7	3.7	6.1	6.1	7.0	7.0	8.2	7.6	9.7	9.1	11.3
AD 0.051 m^2	21	m^3/s side	0.026		0.040		0.053		0.066		0.079		0.092	
		throw m 0.75	1.1		2.5		3.2		4.3		5.5		6.2	
		throw m 0.50	1.5		3.4		4.3		5.8		7.3		8.2	
		throw m 0.25	3.0		6.1		7.0		8.5		10.1		10.7	
	51	m^3/s side	0.052		0.080		0.106		0.132		0.158		0.184	
		throw m 0.75	1.6		3.0		4.3		5.5		6.4		7.3	
		throw m 0.50	2.1		4.0		5.8		7.3		8.5		9.7	
		throw m 0.25	5.2		6.7		8.5		10.1		11.0		12.8	
	11													
	Return Factors NC+5 -SP=1.4 TP	Total m^3/s / NC	0.094 / -		0.142 / -		0.189 / -		0.236 / 28		0.283 / 33		0.330 / 38	
			A	B	A	B	A	B	A	B	A	B	A	B
300 x 300	41	m^3/s side	0.024		0.035		0.047		0.059		0.071		0.083	
		throw m 0.75	0.9		2.3		3.0		4.3		5.3		5.9	
		throw m 0.50	1.2		3.0		4.0		5.8		7.0		7.9	
		throw m 0.25	2.4		6.1		7.0		8.5		10.1		10.4	
	36 *	m^3/s side	0.019	0.038	0.028	0.057	0.038	0.076	0.047	0.094	0.057	0.113	0.066	0.132
		throw m 0.75	0.9	1.4	1.8	2.7	3.0	3.9	3.9	5.0	5.0	5.9	5.7	6.9
		throw m 0.50	1.2	1.8	2.4	3.7	4.0	5.2	5.2	6.7	6.7	7.9	7.6	9.1
		throw m 0.25	2.7	3.4	5.8	6.4	5.2	7.9	7.9	9.7	9.7	10.4	10.1	12.2
AD 0.090 m^2	21	m^3/s side	0.047		0.071		0.094		0.118		0.142		0.165	
		throw m 0.75	1.6		3.0		4.1		5.3		6.4		7.1	
		throw m 0.50	2.1		4.0		5.5		7.0		8.5		9.4	
		throw m 0.25	5.2		7.0		8.5		10.1		11.0		12.5	
	51	m^3/s side	0.094		0.142		0.189		0.236		0.283		0.330	
		throw m 0.75	2.3		3.9		5.5		6.4		7.3		8.0	
		throw m 0.50	3.0		5.2		7.3		8.5		9.7		10.7	
		throw m 0.25	6.1		7.9		10.1		11.6		12.8		14.9	
	11													
	Return Factors NC+5 -SP=1.9 TP	Total m^3/s / NC	0.146 / -		0.222 / -		0.295 / -		0.368 / 28		0.441 / 33		0.514 / 38	
			A	B	A	B	A	B	A	B	A	B	A	B
375 x 375	41	m^3/s side	0.036		0.055		0.074		0.092		0.110		0.128	
		throw m 0.75	1.4		2.7		3.9		5.0		5.9		6.6	
		throw m 0.50	1.8		3.7		5.2		6.7		7.9		8.8	
		throw m 0.25	3.4		6.4		7.9		9.7		10.4		11.9	
	36 *	m^3/s side	0.029	0.059	0.044	0.089	0.059	0.118	0.074	0.147	0.088	0.177	0.103	0.206
		throw m 0.75	1.1	1.8	2.5	3.2	3.4	4.6	4.8	5.7	5.5	6.9	6.4	7.8
		throw m 0.50	1.5	2.4	3.4	4.3	4.6	6.1	6.4	7.6	7.3	9.1	8.5	10.4
		throw m 0.25	3.0	5.8	6.1	7.0	7.3	9.1	9.4	10.1	10.1	12.2	11.0	14.3
AD 0.141 m^2	21	m^3/s side	0.073		0.111		0.147		0.184		0.220		0.257	
		throw m 0.75	1.8		3.4		5.0		5.9		7.1		7.5	
		throw m 0.50	2.4		4.6		6.7		7.9		9.4		10.1	
		throw m 0.25	5.8		7.3		9.7		10.4		12.5		14.3	
	51	m^3/s side	0.146		0.222		0.295		0.368		0.441		0.514	
		throw m 0.75	2.7		4.6		5.9		7.1		8.0		18.5	
		throw m 0.50	3.7		6.1		7.9		9.4		10.7		11.3	
		throw m 0.25	6.4		8.8		10.4		12.5		14.9		15.5	
	11													
	Return Factors NC+7 -SP=2.2 TP	Total m^3/s / NC	0.212 / -		0.319 / -		0.425 / -		0.531 / 28		0.637 / 33		0.743 / 38	
			A	B	A	B	A	B	A	B	A	B	A	B
450 x 450	41	m^3/s side	0.053		0.080		0.106		0.133		0.159		0.186	
		throw m 0.75	1.6		3.2		4.3		5.5		6.4		7.5	
		throw m 0.50	2.1		4.3		5.8		7.3		8.5		10.1	
		throw m 0.25	4.9		7.0		8.5		10.1		11.6		13.7	
	36 *	m^3/s side	0.042	0.085	0.064	0.127	0.085	0.170	0.106	0.212	0.127	0.255	0.149	0.297
		throw m 0.75	1.6	2.3	3.0	3.4	4.3	5.0	5.0	6.2	6.2	7.3	7.1	8.0
		throw m 0.25	2.1	3.0	4.0	4.6	5.8	6.7	6.7	8.2	8.2	9.7	9.4	10.7
		throw m 0.25	4.3	6.1	6.7	7.3	8.5	9.7	9.7	11.3	10.7	12.8	12.5	14.9
AD 0.202 m^2	21	m^3/s side	0.106		0.159		0.212		0.265		0.319		0.371	
		throw m 0.75	2.5		3.9		5.5		6.6		7.5		8.2	
		throw m 0.50	3.4		5.2		7.3		8.8		10.1		11.0	
		throw m 0.25	6.1		7.9		10.1		11.9		13.7		15.2	
	51	m^3/s side	0.212		0.319		0.425		0.531		0.637		0.743	
		throw m 0.75	3.2		5.0		6.4		7.5		8.2		8.7	
		throw m 0.50	4.3		6.7		8.5		10.1		11.0		11.6	
		throw m 0.25	7.0		9.7		11.3		13.7		15.2		16.8	
	11													

* These cores are constructed to give as near as possible equal air flow in A & B directions.

Size in mm	Patterns	Neck Vel m/s TP Pa Static Pa	1.04 4 3		1.57 10 8		2.10 16 13		2.62 24 20		3.15 35 30		3.67 48 40	
	Return Factors NC+9 -SP=2.7 TP	Total m^3/s NC	0.288 - A	B	0.434 - A	B	0.578 28 A	B	0.722 33 A	B	0.866 38 A	B	1.010 43 A	B
525 x 525	41	m^3/s side	0.072		0.109		0.144		0.180		0.217		0.252	
		throw m 0.75	1.8		3.4		5		5.9		7.1		8	
		throw m 0.50	2.4		4.6		6.7		7.9		9.4		10.7	
		throw m 0.25	5.8		7.3		9.7		10.4		12.5		14.9	
	36 *	m^3/s side	0.058	0.115	0.087	0.174	0.116	0.231	0.144	0.289	0.173	0.346	0.202	0.404
		throw m 0.75	1.8	2.7	3.2	4.1	4.6	5.7	5.5	6.9	6.4	7.5	7.5	8.2
		throw m 0.50	2.4	3.7	4.3	5.5	6.1	7.6	7.3	9.1	8.5	10.1	10.1	11.0
		throw m 0.25	5.8	6.4	7.0	8.2	8.8	10.1	10.1	12.2	11.3	13.7	13.4	15.5
AD 0.276 m^2	21 51	m^3/s side	0.144		0.217		0.289		0.361		0.433		0.505	
		throw m 0.75	2.7		4.3		5.9		7.1		7.8		8.5	
		throw m 0.50	3.7		5.8		7.9		9.4		10.4		11.3	
		throw m 0.25	6.4		8.5		10.4		12.5		14.6		15.8	
	11	m^3/s side	0.288		0.434		0.578		0.722		0.866		1.010	
		throw m 0.75	3.4		5.5		7.1		8.0		8.7		9.1	
		throw m 0.50	4.6		7.3		9.4		10.7		11.6		12.2	
		throw m 0.25	7.3		10.1		12.5		14.9		16.2		17.4	
	Return Factors NC+9 -SP=2.83 TP	Total m^3/s NC	0.378 - A	B	0.566 - A	B	0.755 28 A	B	0.944 33 A	B	1.133 38 A	B	1.321 43 A	B
600 x 600	41	m^3/s side	0.094		0.142		0.189		0.236		0.283		0.330	
		throw m 0.75	2.5		3.9		5.5		6.4		7.5		8.2	
		throw m 0.50	3.4		5.2		7.3		8.5		10.1		11.0	
		throw m 0.25	6.1		7.9		10.1		11.3		13.7		15.5	
	36 *	m^3/s side	0.076	0.151	0.113	0.227	0.151	0.302	0.189	0.378	0.227	0.453	0.264	0.529
		throw m 0.75	1.8	3.0	3.4	4.6	5.0	5.9	5.9	7.3	7.1	8.0	7.8	8.5
		throw m 0.50	2.4	4.0	4.6	6.1	6.7	7.9	7.9	9.7	9.4	10.7	10.4	11.3
		throw m 0.25	6.1	6.7	7.3	9.1	9.7	10.4	10.4	12.8	12.5	14.9	14.3	15.8
AD 0.36 m^2	21 51	m^3/s side	0.188		0.283		0.378		0.472		0.566		0.661	
		throw m 0.75	3.0		5.0		6.6		7.5		8.2		8.7	
		throw m 0.50	4.0		6.7		8.8		10.1		11.0		11.6	
		throw m 0.25	6.7		9.7		11.3		13.7		17.4		16.8	
	11	m^3/s side	0.378		0.566		0.755		0.944		1.133		1.321	
		throw m 0.75	3.9		5.9		7.3		8.7		8.9		9.6	
		throw m 0.50	5.2		7.9		9.7		11.6		11.9		12.8	
		throw m 0.25	7.9		10.4		13.1		15.8		17.1		18.0	
	Return Factors NC+9 -SP=3.3 TP	Total m^3/s NC	0.477 - A	B	0.717 - A	B	0.956 28 A	B	1.194 33 A	B	1.432 38 A	B	1.671 43 A	B
675 x 675	41	m^3/s side	0.119		0.179		0.239		0.298		0.358		0.418	
		throw m 0.75	2.7		4.6		5.7		6.9		7.8		8.5	
		throw m 0.50	3.7		6.1		7.6		9.1		10.4		11.3	
		throw m 0.25	6.4		9.1		10.4		12.2		14.6		15.8	
	36 *	m^3/s side	0.095	0.191	0.143	0.287	0.191	0.382	0.239	0.478	0.286	0.573	0.334	0.668
		throw m 0.75	2.3	3.0	3.9	5.0	5.5	6.4	6.4	7.5	7.5	8.5	8.0	8.7
		throw m 0.50	3.0	4.0	5.2	6.7	7.3	8.5	8.5	10.1	10.1	11.3	10.7	11.6
		throw m 0.25	6.4	7.0	7.9	9.7	10.1	11.6	11.3	13.7	13.7	15.5	14.9	16.2
AD 0.456 m^2	21 51	m^3/s side	0.238		0.359		0.478		0.597		0.716		0.835	
		throw m 0.75	3.2		5.5		7.3		7.8		8.7		8.9	
		throw m 0.50	4.3		7.3		9.7		10.4		11.6		11.9	
		throw m 0.25	7.0		10.1		12.2		14.6		16.2		17.4	
	11	m^3/s side	0.477		0.717		0.956		1.194		1.432		1.671	
		throw m 0.75	4.3		6.4		7.5		8.9		9.1		10.1	
		throw m 0.50	5.8		8.5		10.1		11.9		12.2		13.4	
		throw m 0.25	8.5		11.3		14.3		16.5		17.4		18.6	
825 x 825	Return Factors NC+9 -SP=3.5 TP	Total m^3/s NC	0.713 - A	B	1.071 23 A	B	1.428 28 A	B	1.784 33 A	B	2.140 38 A	B	2.497 43 A	B
AD 0.681 m^2	41	m^3/s side	0.178		0.268		0.357		0.446		0.535		0.624	
		throw m 0.75	3.0		4.8		6.6		7.5		8.0		8.7	
		throw m 0.50	4.0		6.4		8.8		10.1		10.7		11.6	
		throw m 0.25	7.0		9.7		11.3		13.1		14.9		16.2	

* These cores are constructed to give as near as possible equal air flow in A & B directions.

Guide Product Weights		
Approximate Weight in Kg.		
Size	CMPH141	CMPH241
150 x 150	0.53	2.77
225 x 225	0.91	2.84
300 x 300	1.33	2.89
375 x 375	1.79	2.94
450 x 450	2.35	3.05

CMPH – Performance Data

Size in mm	Patterns	Neck Vel m/s / TP Pa / Static Pa	1.04 / 4 / 3		1.57 / 10 / 8		2.10 / 16 / 13		2.62 / 24 / 20		3.15 / 35 / 30		3.67 / 48 / 40	
	Return Factors NC+0 -SP=1.3 TP	Total m^3/s NC	0.035 -		0.052 -		0.071 -		0.087 23		0.104 28		0.123 33	
			A	B	A	B	A	B	A	B	A	B	A	B
150 x 225	42 / 43	m^3/s side	0.012	0.006	0.017	0.008	0.024	0.012	0.029	0.015	0.035	0.017	0.041	0.020
		throw m 0.75	0.7	0.5	1.4	0.9	2.6	1.8	3.2	2.8	4.1	3.2	4.8	3.5
		throw m 0.50	0.9	0.6	1.8	1.2	3.4	2.4	4.3	3.7	5.5	4.3	6.4	4.6
		throw m 0.25	2.1	0.9	4.3	2.7	6.1	5.8	7	6.4	8.2	7	9.4	7.3
	31	m^3/s side	0.014	0.007	0.021	0.010	0.030	0.012	0.037	0.015	0.044	0.018	0.052	0.021
		throw m 0.75	0.7	0.5	1.6	1.1	2.8	1.8	3.5	2.8	4.4	3.5	5.0	3.9
		throw m 0.50	0.9	0.6	2.1	1.5	3.7	2.4	4.6	3.7	5.8	4.6	6.7	5.2
		throw m 0.25	1.8	1.2	5.5	3.0	6.4	5.8	7.3	6.4	8.5	7.3	9.7	7.9
	32	m^3/s side	0.013	0.011	0.020	0.017	0.027	0.022	0.033	0.028	0.040	0.033	0.046	0.039
		throw m 0.75	0.7	0.7	1.6	1.1	3.0	2.3	3.9	3.0	4.6	3.7	5.5	4.4
		throw m 0.50	0.9	0.9	2.1	1.5	4.0	3.0	5.2	4.0	6.1	4.9	7.3	5.8
		throw m 0.25	2.1	1.5	4.6	3.0	6.7	6.1	7.9	7.0	9.1	7.6	10.1	8.5
	22, 23	m^3/s side	0.018		0.026		0.035		0.043		0.052		0.061	
		throw m 0.75	0.8		2.0		3.6		4.7		5.5		6.6	
		throw m 0.50	1.1		2.6		4.8		6.2		7.3		8.8	
		throw m 0.25	2.6		5.5		8.0		9.5		11.0		12.1	
AD 0.033 m^2	52 / 55 / 54 / 53	m^3/s side	0.023	0.120	0.035	0.017	0.047	0.024	0.058	0.029	0.069	0.035	0.082	0.041
		throw m 0.75	1.1	0.5	2.6	1.1	3.5	1.8	4.6	2.8	5.5	3.5	6.2	3.9
		throw m 0.50	1.5	0.6	3.4	1.5	4.6	2.4	6.1	3.7	7.3	4.6	8.2	5.2
		throw m 0.25	3.0	1.2	6.1	3.0	7.3	5.8	8.8	6.4	10.1	7.3	10.7	7.9
	12, 13	m^3/s side	0.035		0.052		0.071		0.087		0.104		0.123	
		throw m 0.75	1.7		3.3		4.4		6.1		6.8		8.1	
		throw m 0.50	2.2		4.4		5.9		8.1		9.1		10.8	
		throw m 0.25	4.0		7.7		9.5		11.7		12.4		13.5	
	Return Factors NC+2 -SP=1.7 TP	Total m^3/s NC	0.047 -		0.071 -		0.094 -		0.118 23		0.142 28		0.165 33	
			A	B	A	B	A	B	A	B	A	B	A	B
150 x 300	42 / 43	m^3/s side	0.018	0.006	0.027	0.009	0.035	0.012	0.044	0.015	0.053	0.018	0.062	0.021
		throw m 0.75	0.7	0.7	1.6	0.9	3.0	2.0	3.5	3.0	4.4	3.5	5.0	4.4
		throw m 0.50	0.9	0.9	2.1	1.2	4.0	2.7	4.6	4.0	5.8	4.6	6.7	5.8
		throw m 0.25	2.4	1.5	4.6	2.7	6.7	8.1	7.3	6.7	8.5	7.3	10.1	8.5
	31	m^3/s side	0.020	0.006	0.031	0.009	0.041	0.012	0.052	0.015	0.062	0.018	0.072	0.021
		throw m 0.75	0.7	0.7	1.8	1.4	3.0	2.6	3.9	3.0	5.0	3.9	5.7	4.6
		throw m 0.50	0.9	0.9	2.4	1.8	4.0	3.4	5.2	4.0	6.7	5.2	7.6	6.1
		throw m 0.25	2.1	1.5	5.8	3.7	7.0	6.1	7.9	7.0	9.7	7.9	10.1	9.1
	32	m^3/s side	0.023	0.012	0.035	0.018	0.047	0.024	0.060	0.029	0.071	0.035	0.083	0.041
		throw m 0.75	0.9	0.9	2.3	1.6	3.2	2.6	4.4	3.2	5.0	4.1	5.9	5.0
		throw m 0.50	1.2	1.2	3.0	2.1	4.3	3.4	5.8	4.3	6.7	5.5	7.9	6.7
		throw m 0.25	2.7	2.1	6.1	5.5	7.0	6.1	8.5	8.5	9.7	8.2	10.4	9.7
	22, 23	m^3/s side	0.024		0.035		0.047		0.059		0.071		0.083	
		throw m 0.75	1.1		2.2		3.8		5.2		6.0		7.1	
		throw m 0.50	1.5		2.9		5.1		6.9		8.0		9.5	
		throw m 0.25	3.3		5.9		8.4		10.2		11.7		12.4	
AD 0.045 m^2	52 / 55 / 54 / 53	m^3/s side	0.036	0.011	0.054	0.017	0.071	0.023	0.090	0.028	0.108	0.034	0.125	0.040
		throw m 0.75	1.4	0.7	2.8	1.4	3.9	2.6	5.0	3.0	5.9	3.9	6.6	4.6
		throw m 0.50	1.8	0.9	3.7	1.8	5.2	3.4	6.7	4.0	7.9	5.2	8.8	6.1
		throw m 0.25	3.4	1.5	6.4	3.7	7.9	6.1	9.7	7.0	10.4	7.9	12.2	9.1
	12, 13	m^3/s side	0.047		0.071		0.094		0.118		0.142		0.165	
		throw m 0.75	2.0		3.6		5.3		6.3		7.7		8.5	
		throw m 0.50	2.6		4.8		7.0		8.4		10.2		11.3	
		throw m 0.25	6.2		8.4		10.2		12.1		13.2		15.0	
	Return Factors NC+2 -SP=2.0 TP	Total m^3/s NC	0.059 -		0.087 -		0.118 -		0.146 23		0.175 28		0.205 33	
			A	B	A	B	A	B	A	B	A	B	A	B
150 x 375	22, 23	m^3/s side	0.029		0.044		0.059		0.073		0.087		0.103	
		throw m 0.75	1.4		3.0		4.1		5.5		6.6		7.7	
		throw m 0.50	1.8		4.0		5.5		7.3		8.8		10.2	
		throw m 0.25	3.7		7.3		8.8		11.0		12.1		13.2	
	52 / 55 / 54 / 53	m^3/s side	0.047	0.012	0.070	0.017	0.094	0.024	0.117	0.029	0.140	0.035	0.165	0.040
		throw m 0.75	1.6	0.9	3.2	1.6	4.4	2.8	5.5	3.2	6.2	4.1	7.1	5.0
		throw m 0.50	2.1	1.2	4.3	2.1	5.8	3.7	7.3	4.3	8.2	5.5	9.4	6.7
		throw m 0.25	5.5	2.1	7.0	3.7	8.5	6.4	10.1	7.0	10.7	8.2	12.5	9.7
AD 0.056 m^2	12, 13	m^3/s side	0.059		0.087		0.118		0.146		0.175		0.205	
		throw m 0.75	2.2		3.8		5.5		6.8		8.3		9.1	
		throw m 0.50	2.9		5.1		7.3		9.1		11.0		12.1	
		throw m 0.25	7.0		8.4		11.0		12.1		14.6		15.7	
	Return Factors NC+3 -SP=2.8 TP	Total m^3/s NC	0.071 -		0.106 -		0.142 -		0.177 23		0.212 28		0.248 33	
			A	B	A	B	A	B	A	B	A	B	A	B
150 x 450	22, 23	m^3/s side	0.035		0.053		0.071		0.088		0.106		0.124	
		throw m 0.75	1.7		3.3		4.4		6.0		6.8		8.0	
		throw m 0.50	2.2		4.4		5.9		8.0		9.1		10.6	
		throw m 0.25	4.0		7.7		9.5		11.7		12.4		13.6	
AD 0.068 m^2	12, 13	m^3/s side	0.071		0.106		0.142		0.177		0.212		0.248	
		throw m 0.75	2.5		4.1		6.1		7.1		8.5		9.6	
		throw m 0.50	3.3		5.5		8.1		9.5		11.3		12.8	
		throw m 0.25	7.3		8.8		11.7		12.4		15.0		17.6	
150 x 525	Return Factors NC+4 -SP=3.4 TP	Total m^3/s NC	0.083 -		0.123 -		0.165 -		0.205 23		0.245 28		0.288 33	
			A	B	A	B	A	B	A	B	A	B	A	B
AD 0.079 m^2	12, 13	m^3/s side	0.083		0.123		0.165		0.205		0.245		0.288	
		throw m 0.75	2.5		4.4		6.3		7.4		9.1		9.6	
		throw m 0.50	3.3		5.9		8.4		9.9		12.1		12.8	
		throw m 0.25	7.3		9.1		12.1		12.8		15.7		17.9	
	Return Factors NC+5 -SP=4.1 TP	Total m^3/s NC	0.071 -		0.106 -		0.142 -		0.177 28		0.212 33		0.248 38	
			A	B	A	B	A	B	A	B	A	B	A	B
225 x 300	42 / 43	m^3/s side	0.023	0.013	0.033	0.020	0.044	0.027	0.056	0.033	0.066	0.040	0.078	0.046
		throw m 0.75	0.9	0.7	2.3	1.6	3.0	2.8	4.4	3.2	5.3	4.1	5.9	5.3
		throw m 0.50	1.2	0.9	3.0	2.1	4.0	3.7	5.8	4.3	7.0	5.5	7.9	7.0
		throw m 0.25	2.7	2.1	6.1	5.5	7.0	6.4	8.5	7.0	9.7	8.2	10.4	10.1
	31	m^3/s side	0.029	0.013	0.043	0.020	0.058	0.027	0.072	0.033	0.086	0.040	0.101	0.046
		throw m 0.75	1.1	0.7	2.6	1.6	3.5	2.8	4.6	3.5	5.5	4.4	6.2	5.3
		throw m 0.50	1.5	0.9	3.4	2.1	4.6	3.7	6.1	4.6	7.3	5.8	8.2	7.0
		throw m 0.25	3.0	2.4	6.1	5.5	7.3	6.4	9.1	7.3	10.1	8.5	10.7	9.7
AD 0.068 m^2	32	m^3/s side	0.023	0.023	0.035	0.035	0.047	0.047	0.059	0.059	0.071	0.071	0.083	0.083
		throw m 0.75	1.4	0.9	2.8	1.8	3.7	3.0	5.0	3.9	5.7	4.6	6.6	5.3
		throw m 0.50	1.8	1.2	3.7	2.4	4.9	4.0	6.7	5.2	7.6	6.1	8.8	7.0
		throw m 0.25	3.4	2.4	6.4	5.8	7.9	6.7	9.7	7.9	10.4	9.1	11.3	9.1
	52 / 55 / 54 / 53	m^3/s side	0.045	0.026	0.066	0.040	0.089	0.053	0.111	0.066	0.133	0.079	0.155	0.093
		throw m 0.75	1.8	0.7	3.5	1.6	4.6	2.8	5.7	3.5	6.4	4.4	7.3	5.3
		throw m 0.50	2.4	0.9	4.6	2.1	6.1	3.7	7.6	4.6	8.5	5.8	9.7	7.0
		throw m 0.25	5.8	2.4	7.3	5.5	8.8	6.4	10.1	7.3	11.3	8.5	13.1	9.7

Size in mm	Patterns	Neck Vel m/s TP Pa Static Pa		1.04 5 3		1.57 10 8		2.10 16 13		2.62 24 20		3.15 35 30		3.67 48 40	
	Return NC+4 Factors -SP=1.8 TP	Total m^3/s NC		0.088 - A	B	0.132 - A	B	0.177 - A	B	0.221 28 A	B	0.266 33 A	B	0.310 38 A	B
225 x 375 AD 0.084 m^2	42 43 31 32 22, 23 52 54 55 53 12, 13	m^3/s side		0.031	0.013	0.046	0.020	0.062	0.027	0.078	0.033	0.093	0.040	0.109	0.046
		throw m	0.75	1.1	0.7	2.6	1.8	3.5	2.8	4.6	3.5	5.5	4.4	6.2	5.5
			0.50	1.5	0.9	3.4	2.4	4.6	3.7	6.1	4.6	7.3	5.8	8.2	7.3
			0.25	3.0	2.4	6.1	5.8	7.3	6.4	9.1	7.3	10.1	8.5	11	10.1
		m^3/s side		0.037	0.013	0.056	0.020	0.075	0.027	0.094	0.033	0.113	0.040	0.132	0.046
		throw m	0.75	1.4	0.7	2.8	1.8	3.7	3.0	5.0	3.9	5.7	4.6	6.6	5.5
			0.50	1.8	0.9	3.7	2.4	4.9	4.0	6.7	5.2	7.6	6.1	8.8	7.3
			0.25	3.4	2.4	6.4	5.8	7.9	6.7	9.7	7.9	10.4	9.1	11.3	10.1
		m^3/s side		0.037	0.026	0.055	0.039	0.074	0.052	0.092	0.064	0.111	0.078	0.129	0.090
		throw m	0.75	1.6	0.9	3.0	2.3	3.9	3.0	5.3	4.4	6.2	5.0	7.1	5.9
			0.50	2.1	1.2	4.0	3.0	5.2	4.0	7.0	5.8	8.2	6.7	9.4	7.9
			0.25	4.6	2.7	6.7	6.1	8.2	7.0	10.1	8.5	10.7	9.8	12.5	10.4
		m^3/s side		0.044		0.066		0.089		0.111		0.133		0.155	
		throw m	0.75	2.0		3.6		4.7		6.3		7.4		8.5	
			0.50	2.6		4.8		6.2		8.4		9.9		11.3	
			0.25	5.5		8.0		9.9		12.1		12.8		15.0	
		m^3/s side		0.062	0.026	0.093	0.039	0.124	0.053	0.155	0.066	0.159	0.067	0.218	0.092
		throw m	0.75	1.8	0.7	3.5	1.8	5.0	3.0	5.9	3.9	6.8	5.0	7.6	5.5
			0.50	2.4	0.9	4.6	2.4	6.7	4.0	7.9	5.2	9.1	6.7	10.1	7.3
			0.25	5.8	2.4	7.3	5.8	9.8	6.7	10.4	7.9	12.2	9.8	13.7	10.1
		m^3/s side		0.088		0.132		0.177		0.221		0.266		0.310	
		throw m	0.75	2.8		4.4		6.3		7.7		9.1		9.6	
			0.50	3.7		5.9		8.4		10.2		12.1		12.8	
			0.25	7.3		9.1		12.1		13.2		15.7		17.9	
	Return NC+4 Factors -SP=2.2 TP	Total m^3/s NC		0.105 -		0.159 -		0.213 -		0.265 28		0.319 33		0.372 38	
				A	B	A	B	A	B	A	B	A	B	A	B
225 x 450 AD 0.101 m^2	42 43 31 22, 23 52 54 55 53 12, 13	m^3/s side		0.040	0.013	0.060	0.020	0.080	0.027	0.100	0.033	0.120	0.040	0.140	0.046
		throw m	0.75	1.4	0.9	2.8	2.0	3.9	3.0	5.0	3.9	5.7	4.8	6.6	5.7
			0.50	1.8	1.2	3.7	2.7	5.2	4.0	6.7	5.2	7.6	6.4	8.8	7.6
			0.25	3.7	2.7	6.4	6.1	7.9	6.7	9.8	7.9	10.1	9.4	11.9	10.1
		m^3/s side		0.046	0.013	0.070	0.020	0.093	0.027	0.116	0.033	0.140	0.040	0.163	0.046
		throw m	0.75	1.6	0.9	3.0	2.3	3.9	3.2	5.3	4.4	6.2	5.0	7.1	5.9
			0.50	2.1	1.2	4.0	3.0	5.2	4.3	7.0	5.8	8.2	6.7	9.4	7.9
			0.25	4.6	2.7	6.7	6.1	8.2	7.0	10.1	8.5	10.7	9.8	12.5	10.4
		m^3/s side		0.053		0.080		0.107		0.133		0.160		0.186	
		throw m	0.75	2.0		3.8		5.2		6.6		7.7		9.1	
			0.50	2.6		5.1		6.9		8.8		10.2		12.1	
			0.25	6.6		8.4		10.2		12.1		13.5		15.7	
		m^3/s side		0.079	0.026	0.120	0.039	0.160	0.053	0.200	0.065	0.240	0.079	0.280	0.092
		throw m	0.75	2.3	0.9	3.7	2.3	5.3	3.2	6.6	4.4	7.4	5.0	8.0	5.9
			0.50	3.0	1.2	4.9	3.0	7.0	4.3	8.8	5.8	9.8	6.7	10.7	7.9
			0.25	6.1	2.7	7.6	6.1	10.1	7.0	11.3	8.5	12.8	9.8	14.9	10.4
		m^3/s side		0.105		0.159		0.213		0.265		0.319		0.372	
		throw m	0.75	3.3		5.2		6.6		8.3		9.6		9.9	
			0.50	4.4		6.9		8.8		11.0		12.8		13.2	
			0.25	7.7		10.2		12.4		14.6		17.2		18.3	
	Return NC+5 Factors -SP=2.6 TP	Total m^3/s NC		0.123 -		0.185 -		0.248 23		0.309 28		0.372 33		0.434 38	
				A	B	A	B	A	B	A	B	A	B	A	B
225 x 525 AD 0.118 m^2	42 43 31 22, 23 52 54 55 53	m^3/s side		0.049	0.013	0.073	0.020	0.097	0.027	0.122	0.033	0.146	0.040	0.171	0.046
		throw m	0.75	1.4	0.9	3.0	2.0	3.9	3.2	5.0	4.1	5.9	5.0	6.8	5.9
			0.50	1.8	1.2	4.0	2.7	5.2	4.3	6.7	5.5	7.9	6.7	9.1	7.9
			0.25	4.3	2.7	6.7	6.1	7.9	7.0	10.1	8.2	10.4	9.8	12.2	10.4
		m^3/s side		0.055	0.013	0.083	0.020	0.111	0.027	0.138	0.033	0.166	0.040	0.194	0.046
		throw m	0.75	1.6	0.9	3.2	2.3	4.4	3.5	5.5	4.4	6.4	5.3	7.4	6.2
			0.50	2.1	1.2	4.3	3.0	5.8	4.6	7.3	5.8	8.5	7.0	9.8	8.2
			0.25	5.2	2.7	7.0	6.1	8.5	7.3	10.1	8.5	11.0	10.1	12.8	10.7
		m^3/s side		0.062		0.093		0.124		0.155		0.186		0.217	
		throw m	0.75	2.2		3.8		5.5		6.8		8.3		9.3	
			0.50	2.9		5.1		7.3		9.1		11.0		12.4	
			0.25	6.9		8.4		11.0		12.1		14.6		17.2	
		m^3/s side		0.097	0.026	0.146	0.039	0.196	0.052	0.244	0.065	0.294	0.078	0.342	0.092
		throw m	0.75	2.6	0.9	3.9	2.3	5.3	3.5	6.6	4.4	7.6	5.3	8.3	6.2
			0.50	3.4	1.2	5.2	3.0	7.0	4.6	8.8	5.8	10.1	7.0	11.0	8.2
			0.25	6.4	2.7	7.9	6.1	10.1	7.3	11.3	8.5	13.1	10.1	15.5	10.7
	Return NC+3 Factors -SP=1.7 TP	Total m^3/s NC		0.117 -		0.177 -		0.236 23		0.295 28		0.354 33		0.413 38	
				A	B	A	B	A	B	A	B	A	B	A	B
300 x 375 AD 0.113 m^2	42 43 31 32 22, 23 52 54 55 53 12, 13	m^3/s side		0.036	0.023	0.053	0.035	0.071	0.047	0.089	0.059	0.106	0.071	0.123	0.083
		throw m	0.75	1.4	0.9	3.0	2.0	3.9	3.2	5.0	4.1	5.9	5.0	6.8	5.7
			0.50	1.8	1.2	4.0	2.7	5.2	4.3	6.7	5.5	7.9	6.7	9.1	7.6
			0.25	4.3	2.7	6.7	6.1	7.9	7.0	9.7	8.2	10.4	9.8	12.2	10.1
		m^3/s side		0.047	0.023	0.071	0.035	0.095	0.047	0.118	0.059	0.142	0.071	0.165	0.083
		throw m	0.75	1.6	0.9	3.0	2.3	4.4	3.2	5.3	4.4	6.4	5.3	7.1	6.2
			0.50	2.1	1.2	4.0	3.0	5.8	4.3	7.0	5.8	8.5	7.0	9.4	8.2
			0.25	5.2	2.7	6.7	6.1	8.5	7.0	10.1	8.5	11.0	10.1	12.5	10.7
		m^3/s side		0.037	0.040	0.055	0.061	0.074	0.081	0.092	0.101	0.111	0.122	0.129	0.142
		throw m	0.75	1.1	1.8	2.8	3.2	3.5	4.6	4.8	5.7	5.5	6.8	6.4	7.8
			0.50	1.5	2.4	3.7	4.3	4.6	6.1	6.4	7.6	7.3	9.1	8.5	10.4
			0.25	3.0	5.8	6.4	7.0	7.3	9.1	9.4	10.1	10.1	12.2	11.0	14.3
		m^3/s side		0.059		0.088		0.118		0.148		0.177		0.207	
		throw m	0.75	2.2		3.8		5.5		6.8		8.3		9.3	
			0.50	2.9		5.1		7.3		9.1		11.0		12.4	
			0.25	6.9		8.4		11.0		12.1		14.6		17.2	
		m^3/s side		0.070	0.047	0.106	0.071	0.142	0.094	0.177	0.118	0.212	0.142	0.248	0.165
		throw m	0.75	2.6	0.9	3.9	2.3	5.3	3.5	6.6	4.4	7.6	5.3	8.3	6.2
			0.50	3.4	1.2	5.2	3.0	7.0	4.6	8.8	5.8	10.1	7.0	11.0	8.2
			0.25	6.4	2.7	7.9	6.1	10.1	7.3	11.3	8.5	13.1	10.1	15.5	10.7
		m^3/s side		0.117		0.177		0.236		0.295		0.354		0.413	
		throw m	0.75	3.3		5.2		6.6		8.3		9.9		10.1	
			0.50	4.4		6.9		8.8		11.0		13.2		13.5	
			0.25	7.7		10.2		12.4		14.6		17.6		18.7	

CMPH – Performance Data

Size in mm	Patterns	Neck Vel m/s TP Pa Static Pa		1.04 5 3		1.57 10 8		2.10 16 13		2.62 24 20		3.15 35 30		3.67 48 40	
	Return NC+4 Factors -SP=2.0 TP	Total m^3/s NC		0.140 -		0.212 -		0.283 23		0.354 28		0.425 33		0.496 38	
				A	B	A	B	A	B	A	B	A	B	A	B
300 x 450	42 43	m^3/s side	0.75	0.047	0.023	0.071	0.035	0.095	0.047	0.118	0.059	0.142	0.071	0.165	0.083
		throw m	0.50	1.6	1.1	3.2	2.3	4.4	3.5	5.5	4.4	6.4	5.3	7.4	5.9
			0.25	2.1	1.5	4.3	3.0	5.8	4.6	7.3	5.8	8.5	7.0	9.8	7.9
				5.2	2.7	6.7	6.1	8.5	7.3	10.1	8.5	11.0	10.1	12.8	10.4
	31	m^3/s side	0.75	0.059	0.023	0.088	0.035	0.118	0.047	0.147	0.059	0.177	0.071	0.206	0.083
		throw m	0.50	1.6	1.1	3.2	2.6	4.4	3.5	5.7	4.6	6.6	5.9	7.6	6.4
			0.25	2.1	1.5	4.3	3.4	5.8	4.6	7.6	6.1	8.8	7.9	10.1	8.5
				5.5	3.0	7.0	6.1	8.5	7.3	10.1	8.8	11.3	10.4	13.1	11.0
	32	m^3/s side	0.75	0.053	0.044	0.079	0.066	0.106	0.089	0.133	0.111	0.159	0.133	1.860	0.155
		throw m	0.50	2.0	1.4	3.5	2.8	5.0	3.7	5.9	5.0	7.1	5.7	8.0	6.6
			0.25	2.7	1.8	4.6	3.7	6.7	4.9	7.9	6.7	9.4	7.6	10.7	8.8
				6.1	3.4	7.3	6.4	9.8	7.9	10.4	9.8	12.5	10.4	14.6	11.3
	22, 23	m^3/s side	0.75	0.070		0.106		0.142		0.177		0.213		0.248	
		throw m	0.50	2.5		4.1		6.0		7.1		8.5		9.6	
			0.25	3.3		5.5		8.0		9.5		11.3		12.8	
				7.3		8.8		11.7		12.4		15.0		17.6	
AD 0.135 m^2	52 55 54 53	m^3/s side	0.75	0.093	0.047	0.141	0.071	0.189	0.094	0.236	0.118	0.283	0.142	0.331	0.165
		throw m	0.50	2.8	1.1	4.1	2.6	5.7	3.5	7.1	4.6	7.8	5.7	8.5	6.4
			0.25	3.7	1.5	5.5	7.1	7.6	4.6	9.4	6.1	10.4	7.6	11.3	8.5
				6.4	3.0	8.2	3.4	10.4	7.3	12.5	8.8	14.3	10.4	15.8	11.0
	12, 13	m^3/s side	0.75	0.140		0.212		0.283		0.354		0.425		0.496	
		throw m	0.50	3.6		5.5		7.1		8.5		9.9		10.4	
			0.25	4.8		7.3		9.5		11.3		13.2		13.9	
				8.0		10.6		12.8		15.0		17.9		19.4	
	Return NC+6 Factors -SP=2.3 TP	Total m^3/s NC		0.165 -		0.248 -		0.330 23		0.413 28		0.496 33		0.578 38	
				A	B	A	B	A	B	A	B	A	B	A	B
300 x 525	42 43	m^3/s side	0.75	0.060	0.023	0.089	0.035	0.118	0.047	0.148	0.059	0.177	0.071	0.206	0.083
		throw m	0.50	1.8	1.1	3.2	2.6	4.4	3.5	5.7	4.6	6.6	5.5	7.6	6.2
			0.25	2.4	1.5	4.3	3.4	5.8	4.6	7.6	6.1	8.8	7.3	10.1	8.2
				5.8	3.0	7.0	6.1	8.5	7.3	10.1	8.8	11.3	10.1	13.4	10.7
	22, 23	m^3/s side	0.75	0.083		0.124		0.165		0.207		0.248		0.289	
		throw m	0.50	2.5		4.1		6.0		7.1		8.5		9.6	
			0.25	3.3		5.5		8.0		9.5		11.3		12.8	
				7.3		8.8		11.7		12.4		15.0		17.6	
AD 0.158 m^2	52 55 54 53	m^3/s side	0.75	0.118	0.047	0.177	0.071	0.236	0.094	0.295	0.118	0.355	0.141	0.413	0.165
		throw m	0.50	2.8	1.4	4.4	2.8	5.9	3.7	7.4	4.8	8.0	5.9	8.7	6.6
			0.25	3.7	1.8	5.8	3.7	7.9	4.9	9.8	6.4	10.7	7.9	11.6	8.8
				6.4	3.4	8.5	6.4	10.4	7.6	12.8	9.4	14.9	10.4	16.2	11.3
300 x 600	Return NC+6 Factors -SP=2.7 TP	Total m^3/s NC		0.187 -		0.283 -		0.378 23		0.472 28		0.566 33		0.661 38	
				A	B	A	B	A	B	A	B	A	B	A	B
AD 0.180 m^2	42 43	m^3/s side	0.75	0.071	0.023	0.106	0.035	0.142	0.047	0.177	0.059	0.212	0.071	0.248	0.083
		throw m	0.50	1.8	1.4	3.2	2.8	4.6	3.5	5.9	4.8	6.8	5.5	7.8	6.4
			0.25	2.4	1.8	4.3	3.7	6.1	4.6	7.9	6.4	9.1	7.3	10.4	8.5
				5.8	3.4	7.0	6.4	9.1	7.3	10.4	9.1	12.2	10.1	14.0	11.0
	Return NC+5 Factors -SP=2.1 TP	Total m^3/s NC		0.177 -		0.264 -		0.354 23		0.441 28		0.532 33		0.618 38	
				A	B	A	B	A	B	A	B	A	B	A	B
375 x 450	42 43	m^3/s side	0.75	0.052	0.037	0.077	0.055	0.103	0.074	0.129	0.092	0.155	0.111	0.180	0.129
		throw m	0.50	1.8	1.1	3.0	2.8	4.6	3.5	5.7	4.6	6.8	5.5	7.6	6.2
			0.25	2.4	1.5	4.0	3.7	6.1	4.6	7.6	6.1	9.1	7.3	10.1	8.2
				5.8	3.0	6.7	6.4	9.1	7.3	10.1	8.8	12.2	10.1	13.4	10.7
	31	m^3/s side	0.75	0.069	0.037	0.105	0.055	0.140	0.074	0.175	0.092	0.210	0.111	0.245	0.129
		throw m	0.50	2.0	1.4	3.5	2.8	5.0	3.7	5.9	5.0	7.1	5.9	8.0	6.6
			0.25	2.7	1.8	4.6	3.7	6.7	4.9	7.9	6.7	9.4	7.9	10.7	8.8
				6.1	3.4	7.3	6.4	9.8	7.6	10.4	9.8	12.5	10.4	14.6	11.3
AD 0.169 m^2	32	m^3/s side	0.75	0.053	0.061	0.079	0.093	0.106	0.124	0.133	0.155	0.159	0.186	0.186	0.217
		throw m	0.50	1.6	2.3	3.0	3.7	3.9	5.0	5.3	6.2	6.2	7.4	7.1	8.0
			0.25	2.1	3.0	4.0	4.9	5.2	6.7	7.0	8.2	8.2	9.8	9.4	10.7
				4.6	6.1	6.7	7.6	8.2	10.1	10.1	10.7	10.7	12.8	12.5	14.9
	Return NC+6 Factors -SP=2.2 TP	Total m^3/s NC		0.205 -		0.309 -		0.413 23		0.516 28		0.620 33		0.723 38	
				A	B	A	B	A	B	A	B	A	B	A	B
375 x 525	31	m^3/s side	0.75	0.084	0.037	0.127	0.055	0.170	0.074	0.212	0.092	0.255	0.111	0.297	0.129
		throw m	0.50	2.0	1.4	3.7	3.0	5.3	3.9	6.2	5.3	7.6	5.9	8.0	6.8
			0.25	2.7	1.8	4.9	4.0	7.0	5.2	8.2	7.0	10.1	7.9	10.7	9.1
				6.4	4.3	7.6	6.7	9.8	7.9	10.7	10.1	13.1	10.4	14.9	11.6
	32	m^3/s side	0.75	0.072	0.067	0.108	0.100	0.145	0.134	0.181	0.168	0.217	0.202	0.253	0.235
		throw m	0.50	2.0	1.8	3.9	3.2	5.5	4.4	6.4	5.5	7.6	6.4	8.3	7.4
			0.25	2.7	2.4	5.2	4.3	7.3	5.8	8.5	7.3	10.1	8.5	11.0	9.8
				6.4	5.5	8.2	8.2	10.1	8.5	11.0	10.1	13.7	11.6	15.2	12.8
	22, 23	m^3/s side	0.75	0.103		0.155		0.207		0.258		0.310		0.362	
		throw m	0.50	2.8		4.7		6.6		7.7		9.1		9.9	
			0.25	3.7		6.2		8.8		10.2		12.1		13.2	
				7.7		9.9		12.1		13.2		16.5		18.3	
AD 0.197 m^2	52 55 54 53	m^3/s side	0.75	0.132	0.073	0.199	0.110	0.266	0.147	0.332	0.184	0.399	0.221	0.465	0.258
		throw m	0.50	3.0	1.4	4.8	3.0	6.2	3.9	7.6	5.3	8.3	5.9	8.7	6.8
			0.25	4.0	1.8	6.4	4.0	8.2	5.2	10.1	7.0	11.0	7.9	11.6	9.1
				7.0	4.3	9.4	6.7	10.7	7.9	13.7	9.1	15.2	10.4	16.5	11.6
	12, 13	m^3/s side	0.75	0.205		0.309		0.413		0.516		0.620		0.723	
		throw m	0.50	3.8		6.1		8.0		9.1		10.1		10.7	
			0.25	5.1		8.1		10.6		12.1		13.5		14.3	
				8.4		11.7		13.5		17.2		18.7		19.8	
	Return NC+7 Factors -SP=2.7 TP	Total m^3/s NC		0.234 -		0.353 -		0.473 23		0.590 28		0.709 33		0.826 38	
				A	B	A	B	A	B	A	B	A	B	A	B
375 x 600	42 43	m^3/s side	0.75	0.080	0.037	0.122	0.055	0.163	0.074	0.203	0.092	0.244	0.111	0.284	0.129
		throw m	0.50	2.3	1.4	3.5	3.0	5.0	3.9	6.2	5.0	7.1	5.9	7.8	6.6
			0.25	3.0	1.8	4.6	4.0	6.7	5.2	8.2	6.7	9.4	7.9	10.4	8.8
				6.1	4.3	7.3	6.7	9.8	8.2	10.7	9.8	12.5	10.4	14.6	11.6
	22, 23	m^3/s side	0.75	0.117		0.177		0.237		0.295		0.355		0.413	
		throw m	0.50	3.3		5.2		6.8		8.0		9.3		10.1	
			0.25	4.4		6.9		9.1		10.6		12.4		13.5	
				7.7		10.2		12.1		13.9		17.6		19.0	
AD 0.225 m^2	52 55 54 53	m^3/s side	0.75	0.161	0.073	0.243	0.110	0.325	0.148	0.405	0.185	0.487	0.222	0.567	0.259
		throw m	0.50	3.2	1.6	5.0	3.2	6.4	4.4	7.6	5.5	8.5	6.2	8.9	7.1
			0.25	4.3	2.1	6.7	4.3	8.5	5.8	10.1	7.3	11.3	8.2	11.9	9.4
				7.0	5.2	9.8	6.7	11.3	8.2	13.7	10.1	15.5	10.7	16.8	12.5
	12, 13	m^3/s side	0.75	0.234		0.353		0.473		0.590		0.709		0.826	
		throw m	0.50	3.8		6.1		8.3		9.3		10.1		10.7	
			0.25	5.1		8.1		11.0		12.4		13.5		14.3	
				8.8		11.7		14.6		17.6		19.4		20.1	

Size in mm	Patterns	Neck Vel m/s TP Pa Static Pa		1.04 5 3		1.57 10 8		2.10 16 13		2.62 24 20		3.15 35 30		3.67 48 40	
	Return Factors NC+6 -SP=2.3 TP	Total m^3/s NC		0.246 -		0.371 -		0.496 23		0.619 28		0.744 33		0.867 38	
				A	B	A	B	A	B	A	B	A	B	A	B
450 x 525	31	m^3/s side		0.097	0.053	0.146	0.079	0.195	0.106	0.243	0.133	0.292	0.159	0.341	0.186
		throw m	0.75	2.6	1.6	3.9	3.2	5.3	4.4	6.6	5.5	7.6	6.2	8.3	7.4
			0.50	3.4	2.1	5.2	4.3	7.0	5.8	8.8	7.3	10.1	8.2	11.0	9.8
			0.25	6.4	5.2	7.9	6.7	10.1	8.5	11.3	10.1	13.7	10.7	15.2	12.8
	22, 23	m^3/s side		0.123		0.186		0.248		0.310		0.372		0.434	
		throw m	0.75	3.3		5.2		6.8		8.0		9.3		10.1	
			0.50	4.4		6.9		9.1		10.6		12.4		13.5	
			0.25	7.7		10.2		12.1		14.6		17.9		19.4	
AD 0.236 m^2	52 55 / 54 53	m^3/s side		0.193	0.053	0.292	0.079	0.390	0.106	0.487	0.132	0.585	0.159	0.681	0.186
		throw m	0.75	3.2	1.6	5.0	3.2	6.6	4.4	7.6	5.5	8.5	6.2	8.9	7.4
			0.50	4.3	2.1	6.7	4.3	8.8	5.8	10.1	7.3	11.3	8.2	11.9	9.8
			0.25	7.0	5.2	9.8	6.7	11.6	8.5	14.0	10.1	15.5	10.7	16.8	12.8
	12, 13	m^3/s side		0.246		0.371		0.496		0.619		0.744		0.867	
		throw m	0.75	4.1		6.3		8.5		9.9		10.4		10.7	
			0.50	5.5		8.4		11.3		13.2		13.9		14.3	
			0.25	8.8		12.1		15.0		17.6		19.8		20.5	
	Return Factors NC+7 -SP=2.6 TP	Total m^3/s NC		0.281 -		0.424 -		0.567 23		0.707 28		0.851 33		0.991 38	
				A	B	A	B	A	B	A	B	A	B	A	B
450 x 600	42 / 43	m^3/s side		0.088	0.053	0.133	0.079	0.178	0.106	0.221	0.133	0.267	0.159	0.310	0.186
		throw m	0.75	2.6	1.6	3.9	3.0	5.5	4.1	6.4	5.3	7.6	6.4	8.3	7.1
			0.50	3.4	2.1	5.2	4.0	7.3	5.5	8.5	7.0	10.1	8.5	11.0	9.4
			0.25	6.4	5.2	7.9	7.0	10.1	8.5	11.3	10.1	13.7	11.0	15.5	12.5
	31	m^3/s side		0.114	0.053	0.172	0.079	0.230	0.106	0.287	0.133	0.346	0.159	0.403	0.186
		throw m	0.75	2.8	1.8	4.4	3.2	5.7	4.6	6.8	5.7	8.0	6.6	8.5	7.6
			0.50	3.7	2.4	5.8	4.3	7.6	6.1	9.1	7.6	10.7	8.8	11.3	10.1
			0.25	6.4	5.8	8.5	7.0	10.1	8.8	12.2	10.1	14.6	11.3	15.5	13.1
	32	m^3/s side		0.094	0.094	0.141	0.141	0.189	0.189	0.236	0.236	0.284	0.284	0.330	0.330
		throw m	0.75	3.0	2.0	4.6	3.5	5.9	5.0	7.1	5.9	8.0	7.1	8.7	8.0
			0.50	4.0	2.7	6.1	4.6	7.9	6.7	9.4	7.9	10.7	9.4	11.6	10.7
			0.25	6.7	6.1	8.8	7.3	10.4	9.8	12.5	10.4	14.9	12.5	16.2	14.6
	22, 23	m^3/s side		0.141		0.212		0.284		0.354		0.426		0.496	
		throw m	0.75	3.6		5.5		7.1		8.5		9.6		10.4	
			0.50	4.8		7.3		9.5		11.3		12.8		13.9	
			0.25	8.0		10.6		12.4		15.0		18.3		19.8	
AD 0.270 m^2	52 55 / 54 53	m^3/s side		0.228	0.053	0.345	0.080	0.461	0.106	0.574	0.133	0.691	0.160	0.805	0.186
		throw m	0.75	3.5	1.8	5.3	3.2	6.8	4.6	7.8	5.7	8.7	6.6	9.2	7.6
			0.50	4.6	2.4	7.0	4.3	9.1	6.1	10.4	7.6	11.6	8.8	12.2	10.1
			0.25	7.3	5.8	10.1	7.0	12.2	8.8	14.3	10.1	15.8	11.3	17.1	13.1
	12, 13	m^3/s side		0.281		0.424		0.567		0.707		0.851		0.991	
		throw m	0.75	4.1		6.8		8.5		10.1		10.4		11.0	
			0.50	5.5		9.1		11.3		13.5		13.9		14.6	
			0.25	8.8		12.4		15.4		17.9		20.1		20.9	
	Return Factors NC+9 -SP=3.2 TP	Total m^3/s NC		0.369 -		0.556 -		0.744 23		0.928 28		1.116 33		1.301 38	
				A	B	A	B	A	B	A	B	A	B	A	B
525 x 675	31	m^3/s side		0.148	0.072	0.224	0.108	0.300	0.145	0.374	0.181	0.450	0.217	0.524	0.253
		throw m	0.75	3.0	2.0	4.6	3.5	5.9	5.0	7.1	5.9	8.5	7.1	8.7	7.8
			0.50	4.0	2.7	6.1	4.6	7.9	6.7	9.4	7.9	11.3	9.4	11.6	10.4
			0.25	6.7	6.1	9.1	7.3	10.4	9.8	12.5	10.4	15.5	12.5	16.2	13.7
	32	m^3/s side		0.125	0.118	0.189	0.179	0.252	0.239	0.315	0.298	0.379	0.359	0.441	0.418
		throw m	0.75	3.2	2.3	5.0	3.9	6.4	5.0	7.6	6.4	8.3	7.6	18.9	8.0
			0.50	4.3	3.0	6.7	5.2	8.5	6.7	10.1	8.5	11.0	10.1	11.9	10.7
			0.25	7.0	6.1	9.8	7.9	11.0	10.1	13.4	11.6	15.2	13.1	16.5	14.9
	22, 23	m^3/s side		0.185		0.278		0.372		0.464		0.558		0.651	
		throw m	0.75	3.8		6.0		7.7		9.1		9.9		10.7	
			0.50	5.1		8.0		10.2		12.1		13.2		14.3	
			0.25	8.4		11.7		13.2		16.1		18.7		20.1	
AD 0.354 m^2	52 55 / 54 53	m^3/s side		0.297	0.072	0.448	0.108	0.599	0.145	0.748	0.180	0.899	0.217	1.048	0.253
		throw m	0.75	3.7	2.0	5.5	3.5	7.1	5.0	8.0	5.9	8.7	7.1	9.4	7.8
			0.50	4.9	2.7	7.3	4.6	9.4	6.7	10.7	7.9	11.6	9.4	12.5	10.4
			0.25	7.6	6.1	10.4	7.3	12.5	9.8	14.9	10.4	16.2	12.5	17.4	13.7
	12, 13	m^3/s side		0.369		0.556		0.744		0.928		1.116		1.301	
		throw m	0.75	4.7		7.1		8.8		10.4		10.7		11.6	
			0.50	6.2		9.5		11.7		13.9		14.3		15.4	
			0.25	9.5		12.8		15.7		19.0		20.5		21.6	
525 x 825	Return Factors NC+9 -SP=3.3 TP	Total m^3/s NC		0.450 -		0.680 -		0.910 23		1.135 28		1.364 33		1.590 38	
				A	B	A	B	A	B	A	B	A	B	A	B
AD 0.433 m^2	42 / 43	m^3/s side		0.153	0.072	0.232	0.108	0.310	0.145	0.387	0.181	0.465	0.217	0.542	0.253
		throw m	0.75	3.0	2.3	4.6	3.5	5.9	5.0	7.1	5.9	8.0	7.1	8.7	7.6
			0.50	4.0	3.0	6.1	4.6	7.9	6.7	9.4	7.9	10.7	9.4	11.6	10.1
			0.25	6.7	6.1	8.8	7.3	10.4	9.7	12.5	10.4	15.2	12.5	16.2	13.7
600 x 750	Return Factors NC+9 -SP=3.5 TP	Total m^3/s NC		0.468 -		0.707 -		0.945 23		1.179 28		1.418 33		1.652 38	
				A	B	A	B	A	B	A	B	A	B	A	B
AD 0.450 m^2	42 / 43	m^3/s side		0.140	0.094	0.212	0.141	0.284	0.189	0.354	0.236	0.425	0.284	0.496	0.330
		throw m	0.75	3.0	2.3	4.8	3.5	6.2	5.0	7.4	6.2	8.0	7.1	8.9	8.3
			0.50	4.0	3.0	6.4	4.6	8.2	6.7	9.8	8.2	10.7	9.4	11.9	11.0
			0.25	6.7	6.1	9.1	7.3	10.7	9.8	12.8	10.7	15.2	12.5	16.5	14.6
	32	m^3/s side		0.161	0.146	0.243	0.221	0.325	0.295	0.405	0.368	0.487	0.443	0.568	0.516
		throw m	0.75	3.2	2.6	5.5	4.4	6.8	5.7	7.8	6.6	8.5	7.8	9.2	8.5
			0.50	4.3	3.4	7.3	5.8	9.1	7.6	10.4	8.8	11.3	10.4	12.2	11.3
			0.25	7.3	6.4	10.1	8.5	12.2	10.4	14.6	11.9	16.2	14.6	17.1	15.8

CMPP – Plaque Ceiling Diffuser

Model: **CMPP Plaque Diffuser**

The CMPP Plaque Diffuser offers an alternative appearance to the CMP series of diffuser, where the performance characteristics of a traditional louvered face diffuser are required. The CMPP is a variation on the CMP diffuser where the inner louvers are replaced with a plaque, leaving only the outer slot available for air supply.

Features

- Clean Modern Architectural design.
- 4- way air distribution pattern.
- Removable core.
- Extended throw projection.
- Low noise generation.
- Durable powder coat finish.
- Lightweight Premi-Aire and galvanised cushion head boxes available.

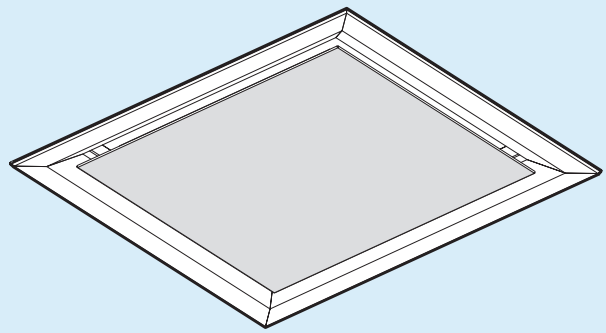
Performance

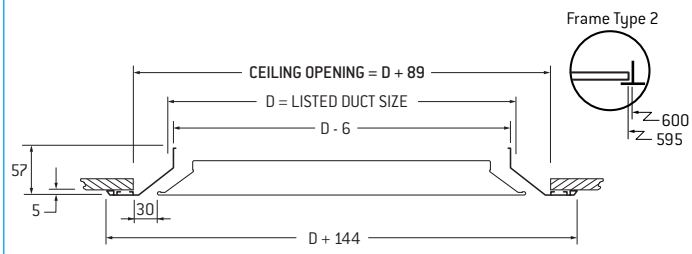
The CMPP has a throw pattern similar to a CMPH diffuser and as such is suitable for variable volume applications. Due to the inner louvers having been replaced with a blanking plaque, the amount of air that the CMPP can handle is small compared to other similar sized diffusers. The CMPP would most often be specified due to its visual appearance.

Construction

CMPP Plaque diffusers are constructed of aluminium. Precision combination corner gussets and braces keep mitres to a hairline. Aluminium rivets hold the fascia rigidly to an aluminium frame, to form a sturdy plaque core. The core snaps into the surround with nickel plated spring steel thumb clips. The CMPP is supplied with a robust powdercoat finish.

Plaque Ceiling Diffuser





CMPP, Frame Type 1, Surface Mount.

Series CMPP – Performance Data

LISTED DUCT SIZE	Total Pressure (Pa)	6	11	18	25	35	45	57
150 x 150 (295 overall)	m^3/s	0.025	0.037	0.046	0.055	0.065	0.072	0.081
	Throw	0.1-1.9	0.4-2.5	0.9-3.3	1.3-4.1	1.6-4.5	1.9-5.0	2.3-5.1
	NC	<15	<15	<15	<15	15	18	21
225 x 225 (370 overall)	m^3/s	0.041	0.059	0.072	0.086	0.104	0.119	0.142
	Throw	0.3-2.3	0.9-3.2	1.5-4.1	2.1-4.9	2.6-5.5	3.3-6.1	4.4-7.0
	NC	<15	<15	<15	<15	15	18	21
300 x 300 (445 overall)	m^3/s	0.056	0.080	0.102	0.121	0.142	0.160	0.185
	Throw	1.0-3.4	1.7-4.9	2.3-5.5	2.9-5.6	3.4-6.4	3.8-7.1	4.4-8.0
	NC	<15	<15	<15	<15	16	19	22
375 x 375 (520 overall)	m^3/s	0.074	0.102	0.134	0.165	0.193	0.204	0.234
	Throw	1.7-3.9	2.0-4.9	2.7-5.8	3.2-6.0	3.7-6.6	3.9-6.8	4.4-7.5
	NC	<15	<15	<15	18	22	23	27
450 x 450 (595 overall)	m^3/s	0.092	0.122	0.155	0.186	0.218	0.244	0.274
	Throw	1.5-4.5	2.3-5.0	3.1-6.1	3.6-6.5	4.0-6.8	4.3-7.0	4.7-7.3
	NC	<15	<15	<15	16	21	24	26

Performance Note

Throw values are given for terminal velocities of 0.75 and 0.25 m/s respectively.

Guide Product Weights	
Description	Approximate Weight in Kg.
CMPP 450 x 450	2.95

CMP-TL – Ceiling Multi Pattern Thermal

Model: **CMP-TL Ceiling Thermal Diffuser**

The CMP-TL Diffuser delivers a large volume of air, as well as offering the same exceptional pattern change characteristics as the CRA-T. The diffuser is based on the time proven CMP range, but with the added benefit of being able to supply a vertical stream of air, when an air conditioning system is in heating mode. This vertical stream is supplied through a central core which is controlled by a thermally actuated damper. The damper will start closure with supply air temperatures below 24ºC and start to open when above 30ºC.

The diffuser is designed to "lay-in" to a standard "T-Rail" ceiling system, as well as being able to be mounted in a solid ceiling. Duct entry must be vertical onto the back of the diffuser, to ensure a vertical projection through the thermally actuated damper.

Features

- Automatic air pattern change.
- High air flow capabilities.
- 4 way horizontal air flow pattern.
- Vertical airstream on heating mode
- Modern architectural design with Removable Core.
- Lay in diffuser size.
- Durable powder coat finish.

Construction

CMP-TL Diffusers are constructed out of aluminium. Precision combination corner gussets and braces keep mitres to a hairline. Cores snap into surrounds with nickel plated spring steel thumb clips. The central thermally actuated damper is constructed of a tough UV stabilised and fire rated engineering polymer.

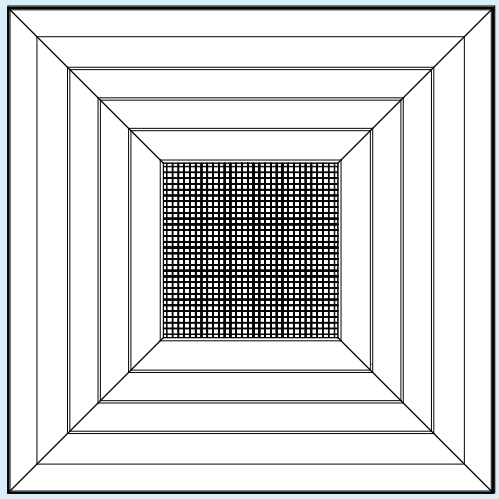
Notes on Performance Data

1. All Performance data is based on isothermal conditions.
2. Performance data is based on a vertical square entry duct attached to the back of the diffuser.
3. NC values are based on a room absorption of 10dB, re 10^{-12} watts.

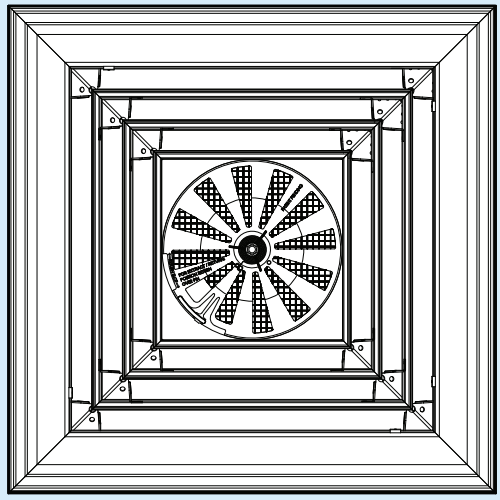
Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

Guide Product Weights	
Description	**Approximate Weight in Kg.**
CMP-TL 450 x 450	1.94

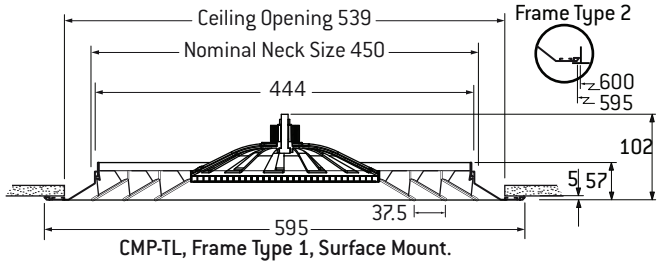
Ceiling Multi Thermal Diffuser



Face View



Rear View



CMP-TL, Frame Type 1, Surface Mount.

Performance Data for 450 X 450 Neck Size						
Flow, m^3/s		**0.050**	**0.100**	**0.200**	**0.300**	**0.400**
Neck Velocity, m/s		0.28	0.56	1.12	1.67	2.22
Velocity Pressure, Pa		-	0.5	1	2	3
HORIZONTAL PROJECTION Pt (Pa)		-	2.5	6	12	20
Throw (m) to Vt of:	**0.75 m/s**	0.7	1.3	2.0	2.7	3.5
	0.50 m/s	1.0	1.8	2.8	3.5	4.2
	0.25 m/s	3.0	3.5	3.8	4.3	5.0
	NC	**<10**	**<10**	**20**	**33**	**40**
VERTICAL PROJECTION Pt (Pa)		-	2	5	10	17
Downward Flow, m^3/s		**0.010**	**0.025**	**0.040**	**0.050**	**0.062**
Throw (m) to Vt of:	**0.50 m/s**	0.5	1	2	4	4.5
	NC	**<10**	**11**	**32**	**33**	**37**

Model: **CMP-ADJ – Ceiling Multi Pattern Adjustable Vanes**

The CMP-ADJ adjustable vane diffuser was developed to provide a continuous adjustment from horizontal to vertical throw, on each face of a four way, or multi pattern CMP-A (Aluminium) diffuser.

Features

- Fully adjustable throw pattern.
- Independent discharge pattern each side.
- Horizontal, or vertical throws.
- No adjustment tools required.
- Adjust through diffuser face.
- 4 way, or multi pattern core styles available up to 600 x 600 mm neck size.

Construction

CMP-ADJ diffusers are standard CMP-A aluminium construction, with clip-on extruded aluminium 6063 T5 adjustable throw vanes, all supplied in a durable powder coat finish to match the diffuser.

Adjustable Ceiling Diffuser

Notes on Performance Data

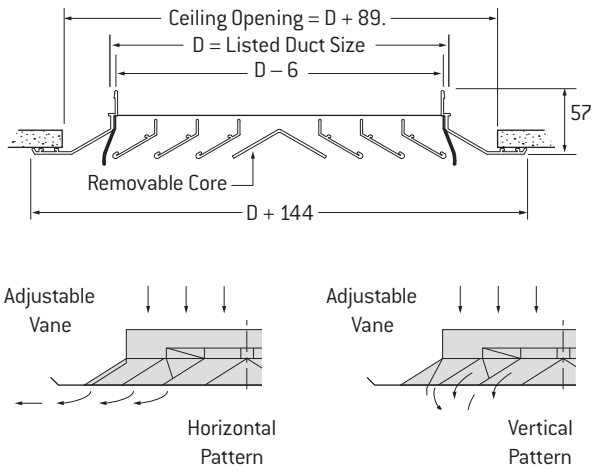
To obtain the performance data for the CMP-ADJ adjustable diffuser, apply the corrections from the table below to the listed data for square, 4 way core style CMP diffusers, as follows:

1. Sound: NC = listed + correction
2. Pressure drop: TP = listed x factor
3. Throw: Horizontal = listed, Vertical = listed x factor

Apply the throw factor to the 0.25 m/s terminal velocity throw only.

Example: 300 x 300 CMP-ADJ, 0.280 m^3/s, 20°C temperature difference heating, vertical projection:
NC=27+7=34 TP=25x2.3=57.5
Throw = 4.5 x 0.6 = 2.7m at 0.25m/s terminal velocity.

Note: Refer to page 170D for Product weights.



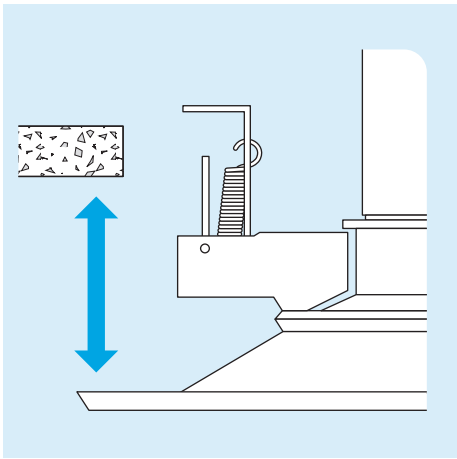
Series CMP-ADJ Performance Data

Neck Size	Sound, NC Add		Pressure, TP Multiply		Throw, Vertical			
					Cooling, ΔT Multiply	Heating, ΔT Multiply		
	H	V	H	V	10°	0°	10°	20°
150 x 150	3	7	1.3	1.6	1.3	1.1	0.8	0.6
225 x 225	3	7	1.5	2.3	1.5	1.2	0.9	0.6
300 x 300	3	7	1.5	2.3	1.6	1.3	1.0	0.6
375 x 375	3	7	1.5	2.3	1.7	1.3	1.0	0.6
450 x 450	3	7	1.5	2.3	1.7	1.3	0.9	0.6
525 x 525	3	7	1.5	2.3	1.7	1.3	0.8	0.5
600 x 600	3	7	1.5	2.3	1.5	1.1	0.7	0.3

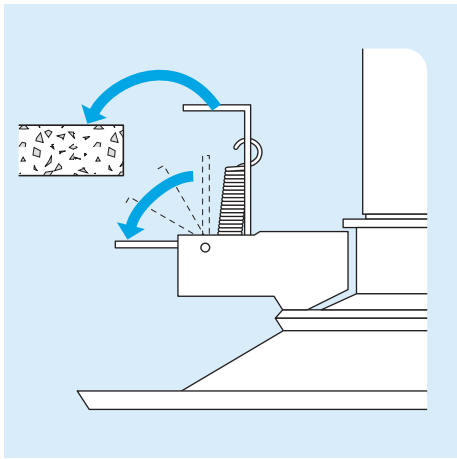
"HOLDIT" MOUNTING CLIP

The **"Holdit" Mounting** Clip

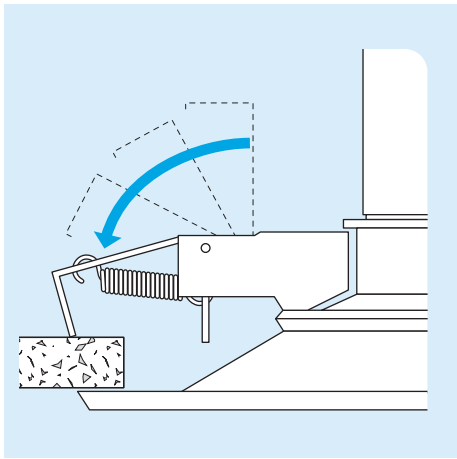
Suitable for All Frame Type 1, CMP and CMPH Diffusers



With the Holdit clip in the unloaded position try the ceiling diffuser in the ceiling opening.



Set the trigger into the loaded position and lift the ceiling diffuser up into the ceiling opening.



As the ceiling diffuser is lifted the trigger will activate the spring loaded holding arm to pull the diffuser up to the ceiling.

This innovative ceiling diffuser fixing device has been developed to make the fixing of CMP diffusers a breeze. Unlike other fixing devices*, the installer can try a ceiling diffuser in a ceiling opening with the HOLDIT clip in the UNLOADED position before final installation. Once satisfied that the diffuser will fit neatly into the opening, ensuring a tight fit up to the ceiling and covering all edges of the hole, the HOLDIT clip may be loaded. When the ceiling diffuser is repositioned into the ceiling opening, the trigger will activate the spring loaded arm and pull the ceiling diffuser up to the ceiling and HOLDIT securely in place with no unsightly screws, or fixing.

*** Other fixing accessories are available from your local Holyoake branch. Refer to Section K "Accessories" for a range of supplementary equipment.**

Guide Product Weights		
Approximate Weight in Kg.		
Size	CMP-ADJ	CMPH-ADJ
150 x 150	0.73	0.75
225 x 225	1.11	1.25
300 x 300	1.60	1.60
375 x 375	1.76	1.95
450 x 450	2.55	2.91

CMP-A, CMP-ADJ & CMPH

Product Ordering Key and Suggested Specifications

CMP	–	A	–	1	–	41	–	450x450	–	600x600	–	OBD	–	TRV	–	SRA 300 DIA CH 300 DIA	–	FINISH
Ceiling Multi Pattern		Aluminium		Frame Style		Core Pattern		Duct Size		Module Size		Opposed Blade Damper Attached		Throw Reducing Vanes		Square to Round Adaptor, or Cushion Head		Holyoake White Mill Aluminium Powder Coat

Ceiling Multi Pattern Louver Face diffusers shall be type CMP-A and be all Aluminium construction with removable core, to give the air distribution pattern shown on the drawings. They shall be available with a range of frame styles and purpose made accessories for both throw adjustment and volume control.

All shall be as manufactured by Holyoake.

CMP-ADJ	–	2	–	41	–	225x225	–	600x600	–	OBD	–	TRV	–	SRA 150 DIA CH 150 DIA	–	FINISH
Ceiling Multi Pattern - Adjustable		Frame Style		Core Pattern		Duct Size		Module Size		Opposed Blade Damper Attached		Throw Reducing Vanes		Square to Round Adaptor, or Cushion Head		Holyoake White Mill Aluminium Powder Coat

Ceiling Multi Pattern - Adjustable Louver Face diffusers shall be type CMP-ADJ. They shall be of all Aluminium construction, with removeable cores. CMP-ADJ are fitted with vanes which can easily be adjusted to enable vertical, or horizontal throw.

All shall be as manufactured by Holyoake.

CMPH	–	2	–	41	–	300x300	–	600 x 600	–	OBD	–	TRV	–	SRA 150 DIA CH 150 DIA	–	FINISH
Ceiling Multi Pattern Horizontal		Frame Style		Core Pattern		Duct Size		Module Size		Opposed Blade Damper Attached		Throw Reducing Vanes		Square to Round Adaptor, or Cushion Head		Holyoake White Mill Aluminium Powder Coat

Ceiling Multi Pattern Horizontal Louver Face diffusers shall be type CMPH and be all Aluminium construction with additional horizontal blades. Complete with removeable core to give multiple air distribution patterns. They shall be available with a range of frame styles and accessories for both throw adjustment and volume control.

All shall be as manufactured by Holyoake.

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

CMPP & CMP - TL

Product Ordering Key and Suggested Specifications

CMPP	–	1	–	300x300	–	450 x 450	–	OBD	–	SRA 300 DIA CH 300 DIA	–	FINISH
Ceiling Multi Pattern Plaque		Frame Style		Duct Size		Module Size		Opposed Blade Damper Attached		Square to Round Adaptor, or Cushion Head		Holyoake White Mill Aluminium Powder Coat

Ceiling Multi Pattern - Plaque Louver Face diffusers shall be type CMPP. They shall be of all Aluminium construction, with removeable plaque core. CMPP have a range of frame styles and accessories for installation and volume control.

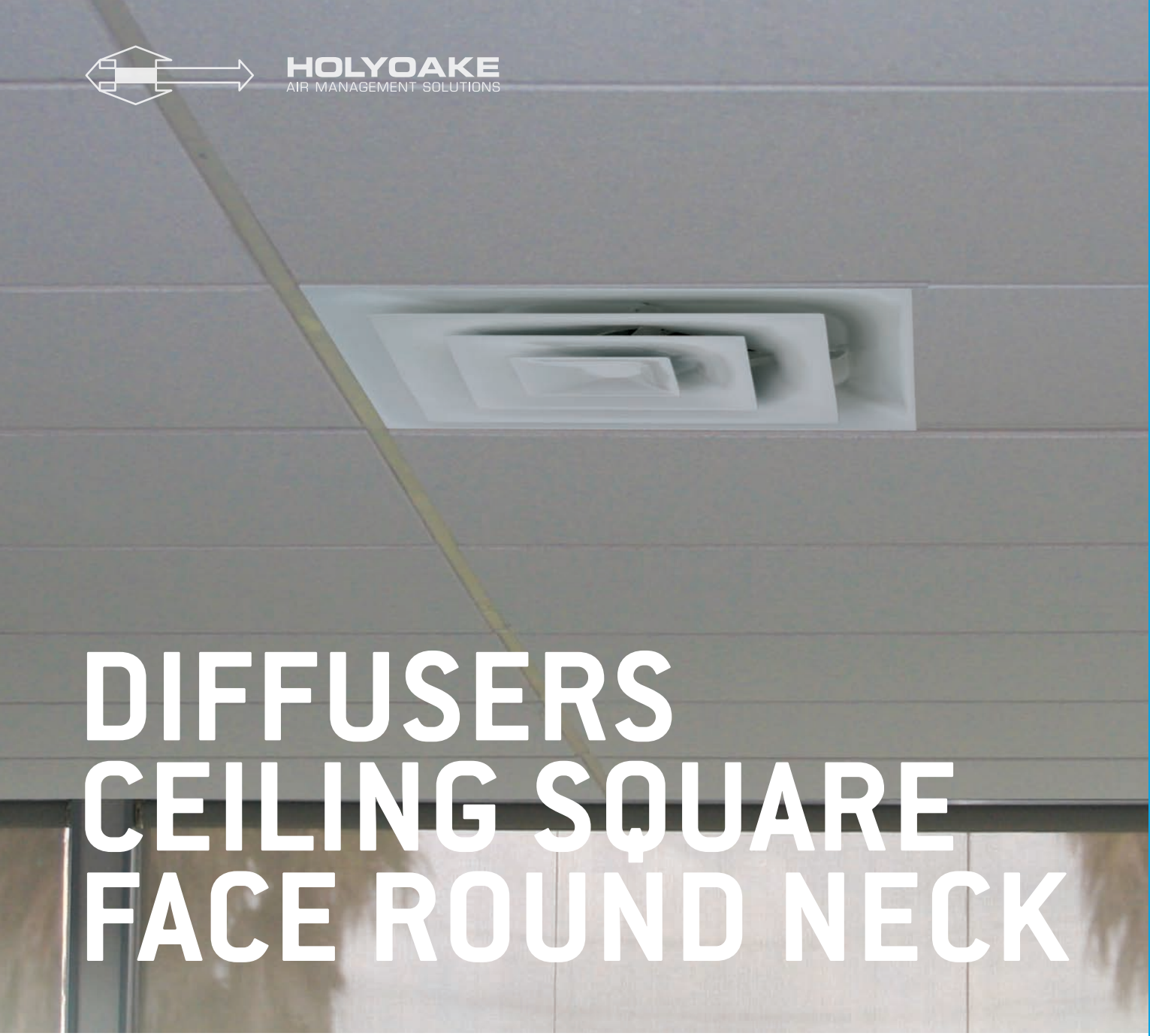
All shall be as manufactured by Holyoake.

CMP-TL	–	1	–	450x450	–	SRA 300 DIA CH 300 DIA	–	FINISH
Ceiling Multi Pattern - Thermal Low Cost		Frame Style		Neck Size		Square to Round Adaptor, or Cushion Head		Holyoake White Mill Aluminium Powder Coat

Ceiling Multi Pattern - Thermal Low Cost Louver Face diffusers shall be type CMP-TL. They shall be of Aluminium construction, with removeable cores. CMP-TL central cores, are complete with a vertical supply section controlled by a thermally actuated damper. Supply air is diffused horizontally below temperatures of 24°C and vertically with temperatures above 30°C.

All shall be as manufactured by Holyoake.

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



DIFFUSERS CEILING SQUARE FACE ROUND NECK

CSRD	Ceiling Square Face Round Neck Disc	180 - 181D
CSRV	Ceiling Square Face Round Neck - Plaque VAV	180 - 181D
Ordering Key & Specification		182D
Typical VAV System Zone Map		182D

- Square face, Round neck, Louver type and Plaque type
- Thermal, Electric and Pneumatic versions
- Variable volume diffusers
- Pressure dependant versions with modulating damper
- Steel, or Aluminium construction
- Removeable core
- Full range of air distribution patterns
- Adjustable horizontal to vertical blade option
- Infra red remote control version

CSRD & CSRV – VAV

Diffusers

All models are designed to control the temperature in a space by having the ability to change the supply air volume.
All diffusers have a standard outer body that is sized to lay-in to a standard 600mm wide ceiling grid (Frame Type 2).
The outer body is shaped to give a radial diffusion pattern and strong ceiling effect across a wide range of flow rates.

Model: **CSRD**

The CSRD is a manually adjustable diffuser. It is fitted with an adjustable volume balancing disc damper.

Model: **CSRV**

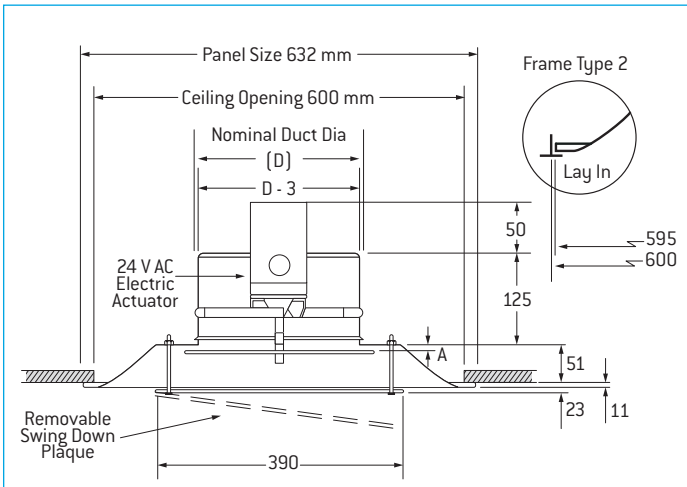
The CSRV is an externally controlled VAV diffuser. It contains an adjustable disc damper which is driven open and closed by a 24 V AC electric actuator. Control of the damper can be from a wall mounted controller, or from a building management system.

CSRV Features:

- Stand Alone Control.
- Fully Modulating Damper.
- Excellent Air Distribution.

The outer body of the CSRV diffuser is constructed from a single piece of pressed steel. This pressing has been specifically designed to maintain a strong ceiling effect irrespective of the flow rate. This design feature gives the diffuser the excellent air distribution performance that is required for a variable volume diffuser. The airflow performance for the CSRV diffuser is detailed on the following page.

CSRV shown. CSRD & CSRV have a choice of either a flat face plate, or a profiled face plate.



CSRV Frame Type 1, Surface Mount.

Damper Position 'A'		
DUCT DIA (D)	Minimum Opening	Maximum Opening
150	10	42
175	10	42
200	10	42
250	15	42
300	15	42
350	15	42

Standard Set-Up/Performance Data Notes

1. The performance data for the CSRD and CSRV diffusers relates to two different damper positions, Minimum and Maximum (Dimension 'A'), for each size of diffuser.
2. CSRD and CSRV diffusers are available with neck sizes ranging from 150 mm up to 350 mm diameter.
3. All sizes of diffuser, by default, have a face size designed to 'lay-in' to a standard 600 mm wide "T-Rail" ceiling System (Frame Type 2).
4. The diffuser can be supplied suitable for surface mounting (Frame Type 1).
5. The Standard version has by default a 230 V AC Supply Pack (Transformer). Specify 230 V AC, or 24 V AC when ordering.

Models: **CSRD & CSRV**

Inlet Static Pressure 13 Pa											
	Minimum Opening					Maximum Opening					NC
Nominal Duct Dia (D)	Flow m³/s	Vp	Throw (m) at Vt (m/s)			Flow m³/s	Vp	Throw (m) at Vt (m/s)			at Maximum Opening
		Pa	0.25	0.5	0.75		Pa	0.25	0.5	0.75	
150	0.016	0.6	0.6	0.4	0.3	0.033	2.8	0.9	0.6	0.4	17
175	0.019	0.5	0.7	0.4	0.3	0.051	2.7	1.2	0.7	0.5	17
200	0.021	0.3	0.8	0.5	0.3	0.068	2.6	1.5	0.8	0.6	17
250	0.037	0.4	1.4	0.7	0.5	0.089	2.2	2.0	1.2	0.8	17
300	0.044	0.3	1.4	0.8	0.6	0.117	1.9	2.3	1.3	0.9	17
350	0.058	0.2	1.5	0.9	0.7	0.157	1.7	2.7	1.5	1.1	17

Inlet Static Pressure 25 Pa											
	Minimum Opening					Maximum Opening					NC
Nominal Duct Dia (D)	Flow m³/s	Vp	Throw (m) at Vt (m/s)			Flow m³/s	Vp	Throw (m) at Vt (m/s)			at Maximum Opening
		Pa	0.25	0.5	0.75		Pa	0.25	0.5	0.75	
150	0.024	1.4	0.9	0.5	0.4	0.047	5.5	1.2	0.8	0.6	20
175	0.028	1.0	1.0	0.6	0.4	0.065	5.2	1.5	1.0	0.7	20
200	0.030	0.6	1.3	0.6	0.5	0.083	4.8	1.7	1.1	0.8	20
250	0.052	0.8	1.8	1.0	0.6	0.121	4.0	2.6	1.5	1.0	20
300	0.061	0.5	1.9	1.1	0.7	0.160	3.6	2.7	1.8	1.2	20
350	0.084	0.4	2.0	1.2	0.8	0.220	3.6	3.3	2.1	1.5	20

Inlet Static Pressure 38 Pa											
	Minimum Opening					Maximum Opening					NC
Nominal Duct Dia (D)	Flow m³/s	Vp	Throw (m) at Vt (m/s)			Flow m³/s	Vp	Throw (m) at Vt (m/s)			at Maximum Opening
		Pa	0.25	0.5	0.75		Pa	0.25	0.5	0.75	
150	0.029	2.1	0.9	0.6	0.5	0.058	8.3	1.5	0.9	0.6	27
175	0.035	1.6	1.1	0.7	0.5	0.081	7.9	1.9	1.2	0.7	27
200	0.038	1.0	1.4	0.9	0.6	0.103	7.5	2.3	1.4	0.8	27
250	0.065	1.5	2.0	1.2	0.8	0.148	6.1	2.9	1.8	1.3	27
300	0.075	0.8	2.2	1.3	0.8	0.197	5.5	3.0	2.2	1.5	27
350	0.103	0.6	2.3	1.4	1.0	0.270	5.1	3.7	2.9	2.3	27

Inlet Static Pressure 50 Pa											
	Minimum Opening					Maximum Opening					NC
Nominal Duct Dia (D)	Flow m³/s	Vp	Throw (m) at Vt (m/s)			Flow m³/s	Vp	Throw (m) at Vt (m/s)			at Maximum Opening
		Pa	0.25	0.5	0.75		Pa	0.25	0.5	0.75	
150	0.033	2.7	1.2	0.7	0.5	0.066	10.8	1.6	0.9	0.7	33
175	0.040	2.1	1.3	0.8	0.6	0.092	10.3	2.1	1.2	0.9	33
200	0.045	1.4	1.5	1.0	0.7	0.118	9.8	2.5	1.5	1.0	33
250	0.074	1.5	2.2	1.4	0.8	0.169	7.9	3.2	2.0	1.4	33
300	0.087	1.1	2.3	1.5	0.9	0.226	7.2	3.3	2.4	1.6	33
350	0.119	0.7	2.4	1.6	1.1	0.310	7.2	3.5	2.5	1.9	33

Performance Note

The air volume performance for pressure dependent diffusers is only valid if the pressure behind the diffuser is finely maintained.

600 x 600 Nominal Size	Approximate Weight Kg
CSRD	5.0
CSRV	5.4

CSRD & CSRV

Product Ordering Key and Suggested Specifications

CSRD	–	PROFILED	–	200 DIA	–	600 x 600*	–	TYPE 2	–	FINISH
Ceiling Square Round Neck Plaque Diffuser		Face Plate, Flat, or Profiled		Neck Size		Module Size		Frame Type 1 = Surface 2 = Lay-in		Holyoake White Powder Coat

Series CSRD Plaque type diffusers shall be of steel construction with a manual disc damper for volume control adjustment. The Plaque shall have horizontal retaining clips to prevent accidental removal and shall swing down for easy access to the damper.

All shall be as manufactured by Holyoake.

CSRV	–	FLAT	–	300 DIA	–	600 x 600*	–	TYPE 2	ACTUATOR	–	FINISH
Ceiling Square Round Neck Variable Volume Plaque Diffuser		Face Plate, Flat, or Profiled		Neck Size		Module Size		Frame Type 1 = Surface 2 = Lay-in	24 V AC/230 V AC Electric		Holyoake White Powder Coat

Series CSRV Plaque type diffusers shall be of steel construction with electric disc damper for automatic, or adjustable volume control. The CSRV Plaque shall have horizontal retaining clips to prevent accidental removal and shall swing down for easy access to actuator.

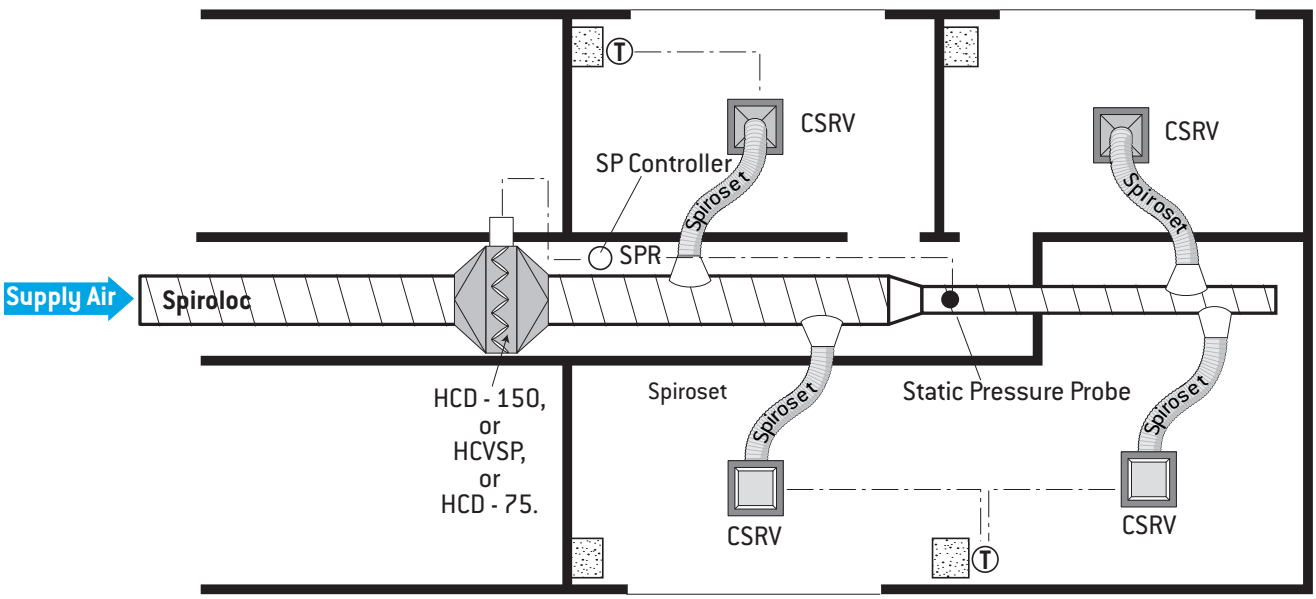
All shall be as manufactured by Holyoake.

* Only Nominal Face Size Available.

Note

Seismic restraints will be required, but not supplied.

Typical Application of VAV System Components



Application Notes

1. Zone sizes normally range from one to ten diffusers.
2. Thermostat (T) may be mounted on diffuser face.
3. Static pressure sensing should be from a point acceptable as average zone duct pressure.

DIFFUSERS CEILING PERFORATED

CPMS	Ceiling Perforated Maximum Security	196 - 197D
CPR	Ceiling Perforated Return	186 - 191D
CPS	Ceiling Perforated Supply	186 - 191D
CPSHS	Ceiling Perforated Supply - High Secure	194 - 195D
CPSS	Ceiling Perforated Supply - Secure	192 - 193D
Ordering Key & Specification		200D

- Square face, Perforated Plate Louver type.
- Round Neck, Square Neck options.
- Heavy Gauge Secure and High Secure Versions.
- Return options.
- Galvanised, Stainless Steel and Aluminium Construction and Face options.
- Removable Core and 'T' Rail Style.
- Full range of air distribution patterns.
- Adjustable multi pattern controllers.

CPS & CPR – Perforated Diffusers

Models: **CPS & CPR**

The Holyoake Series CPS and CPR perforated supply and return diffusers are designed for heating, cooling and ventilating, ceiling applications.

The Series CPS comprises of a perforated face plate mounted in a removable core frame, which blends suitably into many ceiling types. Concealed, adjustable pattern controllers on the rear, provide efficient airflow distribution and can be easily adjusted, by simply removing the fascia, unlocking and repositioning. Then any desired distribution pattern can be obtained, without any change in airflow, or noise levels. This simplifies ordering procedures and eliminates the need to re-balance the system. Series CPR are identical, without patterns. Minimal ceiling plenum height is required, (dependant on connecting spigot style); which is available with a varied choice of round, or square inlet sizes, see table below.

Construction

Extruded aluminium frames. Aluminium perforated face and galvanised adaptor pan.

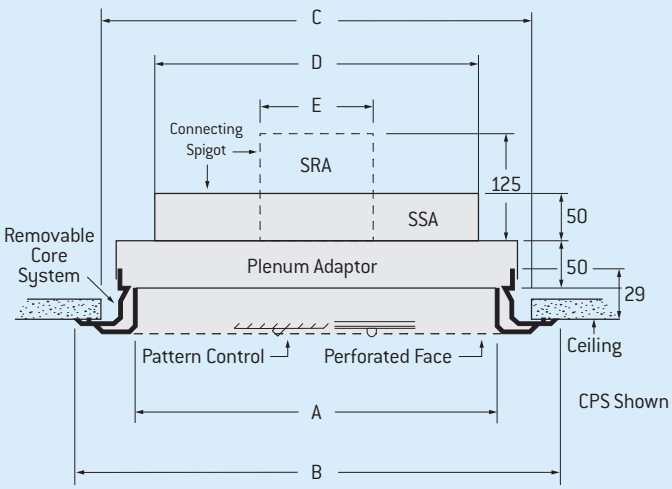
Installation

The CPS plenum adaptor is independently supported, built in to the ceiling and then connected and sealed to the ductwork.
The Removable core system allows the preset pattern controllers to be suitably positioned and then the perforated face is simply pushed into the installed frame and clipped into place.

Features

- Aesthetically pleasing design.
- Fully adjustable concealed pattern controllers.
- Infinite range of distribution patterns.
- Compact assembly height and Removable Core frame.
- Plaster ceiling and 'T' Rail installation options.
- Circular, or square inlets in a range of sizes.

CPS Supply and CPR Return



SSA (Square to Square Adaptor) *
SRA (Square to Round Adaptor) *
* Refer to Accessories Section K.

A = Nominal Diffuser Size.
B = Overall Frame Size (A + 80mm).
C = Overall Plenum Adaptor Size (Ceiling Opening).
D = Square Adaptor Neck Size.
E = Round Adaptor Neck Size.

A Nominal Diffuser Size		250 x 250	350 x 350	450 x 450	550 x 550	250 x 550	550 x 850	250 x 850	250 x 1150	550 x 1150
C* Overall Plenum Adaptor Size		300 x 300	400 x 400	500 x 500	600 x 600	300 x 600	600 x 900	300 x 900	300 x 1200	600 x 1200
Nominal Neck Size D*	150 x 150	●●	●●	●●	●●	●●	●●	●●	●●	●●
	200 x 200		●●	●●	●●		●●			●●
	250 x 250			●●	●●		●●			●●
	300 x 300				●●		●●			●●
Nominal Neck Diameter E*	150 x 450					●●		●●	●●	
	125 DIA	●●	●●	●●	●●	●●	●●	●●	●●	●●
	150 DIA	●●	●●	●●	●●	●●	●●	●●	●●	●●
	175 DIA	●●	●●	●●	●●	●●	●●	●●	●●	●●
	200 DIA		●●	●●	●●		●●			●●
	250 DIA		●●	●●	●●		●●			●●
CPS & CPR with Adaptor	300 DIA			●●	●●		●●			●●
	350 DIA			●●	●●		●●			●●
	400 DIA				●●		●●			●●

Ceiling Module and Duct Sizes* ● Indicates available combination

Note

1. For other frame styles and module sizes and for the performance of sizes not shown in the capacity tables, contact your local Holyoake branch.
2. Seismic restraints are required, but not supplied.

Options

Heavy gauge galvanised perforated face, available against special order.
OBD-2 – Opposed blade damper.

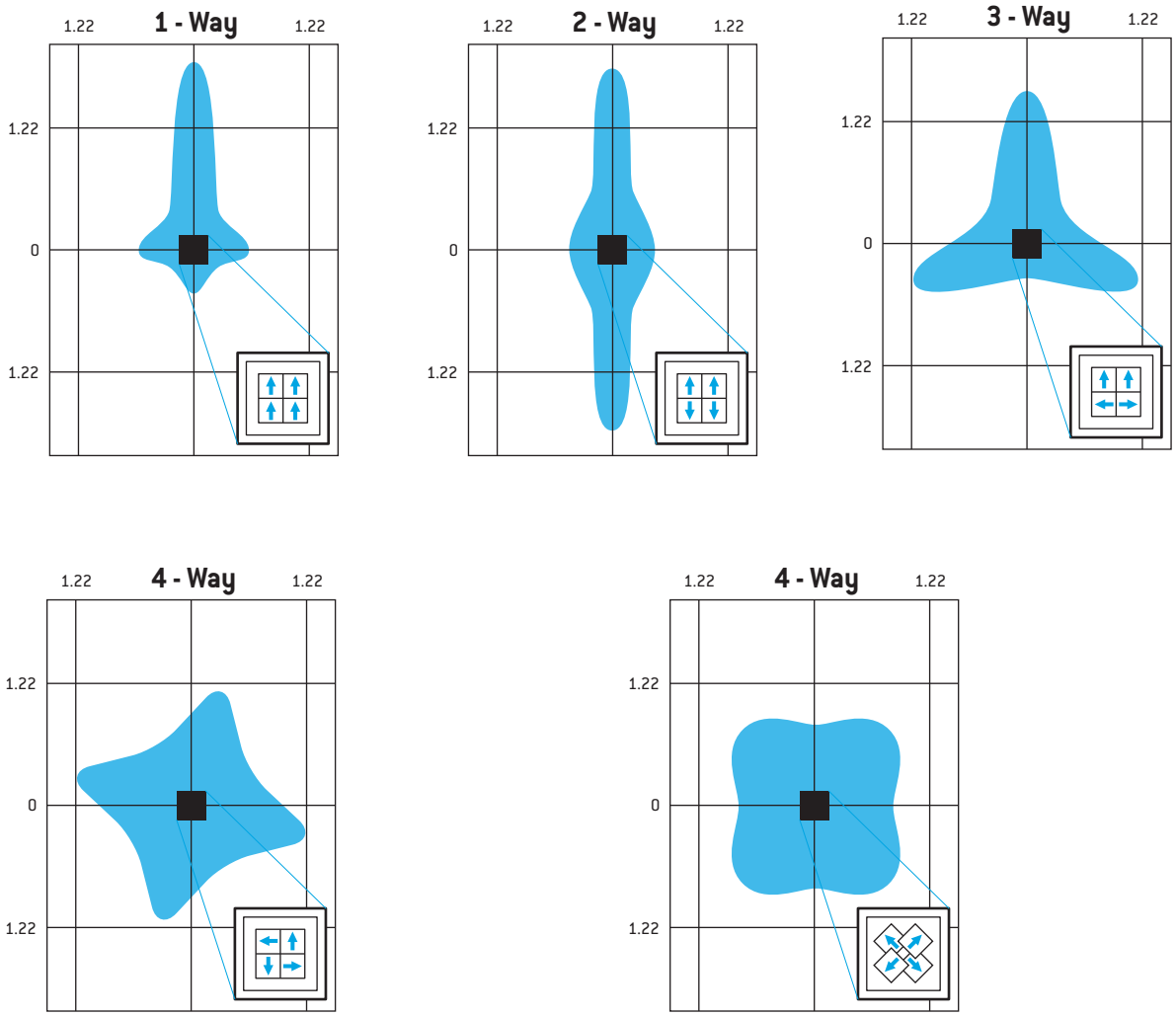
Finish

Standard Finish is Holyoake White, or can be powder coated to specific requirements.

Air Pattern Controller Adjustment Notes

1. Extract the Removeable Core from the CPS diffuser.
2. The pattern controls are mounted on the rear of the Removable Core and are now visible. Loosen stud tubing and rotate the air pattern controller to the desired flow direction. Tighten the stud tubing on the controller.
3. Replace the Removable Core assembly.

Versatile Air Distribution for most Applications



Throw values for above pattern will be 0.6 times the values shown in the peformance tables.

Performance Notes

1. Refer to Performance Data Tables on the following pages.
2. CPR – Return Data is shown in Dark Blue shaded area at the bottom of each table.
3. Throw values are given for terminal velocities of 0.75 and 0.25 m/s.

CPS & CPR – Performance Data

300 x 300 Module Size

Duct Size	Neck Velocity, m/s Vel. Press., Pa	1.53 2	2.04 3	2.55 4	3.06 6	3.57 8	4.08 10	5.1 16	6.12 23	7.14 31
125 mm RD	**Tot. Press., Pa**	**3**	**5**	**8**	**11**	**15**	**19**	**30**	**43**	**59**
	Flow Rate, m³/s	**0.019**	**0.026**	**0.033**	**0.038**	**0.045**	**0.052**	**0.064**	**0.078**	**0.090**
	NC	**-**	**-**	**15**	**20**	**24**	**28**	**34**	**39**	**43**
	Throw, m 4-WAY	0.3-1.2	0.6-1.5	0.6-1.8	0.6-2.1	0.9-2.1	0.9-2.4	1.5-2.7	1.8-3.1	1.8-3.1
	Throw, m 3-WAY	0.3-1.2	0.6-1.8	0.6-2.1	0.6-2.4	0.9-2.7	1.2-3.1	1.5-3.1	1.8-3.7	1.8-4.0
	Throw, m 2-WAY	0.3-1.5	0.6-1.8	0.6-2.4	0.9-3.1	1.2-3.1	1.2-3.7	1.8-4.0	2.1-4.3	2.1-4.6
	Throw, m 1-WAY	0.6-1.8	0.6-2.4	0.9-2.7	1.2-3.1	1.5-3.4	1.8-4.0	1.8-4.0	2.4-4.3	2.7-4.6
150 mm RD	**Tot. Press., Pa**	**4**	**7**	**10**	**15**	**20**	**25**	**40**	**57**	**77**
	Flow Rate, m³/s	**0.028**	**0.038**	**0.047**	**0.057**	**0.066**	**0.076**	**0.092**	**0.111**	**0.130**
	NC	**-**	**-**	**17**	**22**	**26**	**30**	**36**	**41**	**45**
	Throw, m 4-WAY	0.3-1.2	0.6-1.5	0.9-2.1	0.9-2.4	0.9-2.4	0.9-2.7	1.5-3.1	1.8-3.1	2.1-3.4
	Throw, m 3-WAY	0.3-1.2	0.6-1.8	0.9-2.4	0.9-2.7	0.9-3.1	1.2-3.1	1.5-3.4	1.8-4.0	2.1-4.3
	Throw, m 2-WAY	0.3-1.5	0.6-2.1	0.9-2.7	0.9-3.1	1.2-3.4	1.2-3.7	1.8-4.3	2.1-4.6	2.4-5.2
	Throw, m 1-WAY	0.6-1.8	0.9-2.7	0.9-3.4	1.2-3.4	1.5-3.7	1.8-4.0	2.1-4.6	2.7-4.9	3.1-5.2
175 mm RD	**Tot. Press., Pa**	**6**	**10**	**15**	**21**	**29**	**37**	**58**	**83**	**113**
	Flow Rate, m³/s	**0.038**	**0.050**	**0.064**	**0.076**	**0.090**	**0.102**	**0.127**	**0.151**	**0.177**
	NC	**-**	**15**	**21**	**26**	**30**	**34**	**40**	**45**	**49**
	Throw, m 4-WAY	0.3-1.5	0.6-1.8	0.9-2.7	0.9-3.1	1.2-3.1	1.2-3.4	1.8-3.7	2.4-4.0	2.7-4.3
	Throw, m 3-WAY	0.3-1.5	0.6-2.1	0.9-3.1	0.9-3.4	1.2-3.7	1.5-4.0	1.8-4.3	2.1-4.9	2.7-5.2
	Throw, m 2-WAY	0.3-1.8	0.6-2.7	0.9-3.4	1.2-3.7	1.5-4.3	1.5-4.6	2.1-5.2	2.7-5.5	3.1-6.1
	Throw, m 1-WAY	0.6-2.4	0.9-3.4	1.2-3.7	1.5-3.4	1.8-4.3	2.4-4.6	2.7-5.2	3.4-5.5	3.7-6.1
150 x 150	**Tot. Press., Pa**	**5**	**8**	**13**	**19**	**25**	**33**	**50**	**73**	**99**
	Flow Rate, m³/s	**0.035**	**0.047**	**0.059**	**0.071**	**0.083**	**0.094**	**0.118**	**0.142**	**0.165**
	NC	**-**	**13**	**19**	**24**	**28**	**32**	**38**	**43**	**47**
	Throw, m 4-WAY	0.3-1.5	0.6-1.8	0.9-2.4	0.9-2.7	1.2-2.7	1.2-3.1	1.8-3.7	2.1-3.7	2.4-4.0
	Throw, m 3-WAY	0.3-1.5	0.6-2.1	0.9-2.7	0.9-3.1	1.2-3.4	1.5-3.7	1.8-4.3	2.1-4.6	2.4-2.9
	Throw, m 2-WAY	0.3-1.8	0.6-2.4	0.9-3.1	1.2-3.7	1.5-4.0	1.5-4.3	2.1-5.2	2.4-5.2	2.7-5.8
	Throw, m 1-WAY	0.6-2.1	0.9-3.1	1.2-3.4	1.5-3.7	1.8-4.0	2.1-4.3	2.7-5.2	3.1-5.2	3.4-5.8
* **250 x 250**	**Neg Stat. Press., Pa**	**8**	**13**	**19**	**28**	**39**	**50**	**78**	**113**	**154**
	Flow Rate, m³/s	**0.099**	**0.132**	**0.163**	**0.198**	**0.229**	**0.262**	**0.328**	**0.392**	**0.458**
	NC	**-**	**17**	**24**	**30**	**35**	**39**	**46**	**53**	**58**

* performance data for CPR.

300 x 600 Module Size

Duct Size	Neck Velocity, m/s Vel. Press., Pa	1.53 2	2.04 3	2.55 4	3.06 6	3.57 8	4.08 10	5.1 16	6.12 23	7.14 31
125 mm RD	**Tot. Press., Pa**	**3**	**5**	**7**	**10**	**14**	**18**	**27**	**39**	**54**
	Flow Rate, m³/s	**0.019**	**0.226**	**0.033**	**0.038**	**0.045**	**0.052**	**0.064**	**0.078**	**0.090**
	NC	**-**	**-**	**14**	**19**	**23**	**27**	**33**	**38**	**42**
	Throw, m 4-WAY	0.3-1.2	0.6-1.5	0.6-1.8	0.6-2.1	0.9-2.1	0.9-2.4	1.5-2.7	1.8-3.1	1.8-3.1
	Throw, m 3-WAY	0.3-1.2	0.6-1.8	0.6-2.1	0.6-2.4	0.9-2.7	1.2-3.1	1.5-3.1	1.8-3.7	1.8-4.0
	Throw, m 2-WAY	0.3-1.5	0.6-1.8	0.6-2.4	0.9-3.1	1.2-3.1	1.2-3.7	1.8-4.0	2.1-4.3	2.1-4.6
	Throw, m 1-WAY	0.6-1.8	0.6-2.4	0.9-2.7	1.2-3.1	1.5-3.4	1.8-4.0	1.8-4.0	2.4-4.3	2.7-4.6
150 mm RD	**Tot. Press., Pa**	**4**	**6**	**9**	**12**	**17**	**21**	**33**	**48**	**65**
	Flow Rate, m³/s	**0.028**	**0.038**	**0.047**	**0.057**	**0.066**	**0.076**	**0.092**	**0.111**	**0.130**
	NC	**-**	**-**	**17**	**22**	**26**	**30**	**36**	**41**	**45**
	Throw, m 4-WAY	0.3-1.2	0.6-1.5	0.9-2.1	0.9-2.4	0.9-2.4	0.9-2.7	1.5-3.1	1.8-3.1	2.1-3.4
	Throw, m 3-WAY	0.3-1.2	0.6-1.8	0.9-2.4	0.9-2.7	0.9-3.1	1.2-3.1	1.5-3.4	1.8-4.0	2.1-4.3
	Throw, m 2-WAY	0.3-1.5	0.6-2.1	0.9-2.7	0.9-3.1	1.2-3.4	1.2-3.7	1.8-4.3	2.1-4.6	2.4-5.2
	Throw, m 1-WAY	0.6-1.8	0.9-2.7	0.9-3.4	1.2-3.4	1.5-3.7	1.8-4.0	2.1-4.6	2.7-4.9	3.1-5.2
175 mm RD	**Tot. Press., Pa**	**4**	**7**	**10**	**15**	**19**	**25**	**39**	**56**	**76**
	Flow Rate, m³/s	**0.038**	**0.050**	**0.064**	**0.076**	**0.090**	**0.102**	**0.127**	**0.151**	**0.177**
	NC	**-**	**14**	**20**	**25**	**29**	**33**	**39**	**44**	**48**
	Throw, m 4-WAY	0.3-1.5	0.6-1.8	0.9-2.7	0.9-3.1	1.2-3.1	1.2-3.4	1.8-3.7	2.4-4.0	2.7-4.3
	Throw, m 3-WAY	0.3-1.5	0.6-2.1	0.9-3.1	0.9-3.4	1.2-3.7	1.5-4.0	1.8-4.3	2.1-4.9	2.7-5.2
	Throw, m 2-WAY	0.3-1.8	0.6-2.7	0.9-3.4	1.2-3.7	1.5-4.3	1.5-4.6	2.1-5.2	2.7-5.5	3.1-6.1
	Throw, m 1-WAY	0.6-2.4	0.9-3.4	1.2-3.7	1.5-3.4	1.8-4.3	2.4-4.6	2.7-5.2	3.4-5.5	3.7-6.1
150 x 150	**Tot. Press., Pa**	**5**	**8**	**12**	**18**	**24**	**31**	**48**	**69**	**94**
	Flow Rate, m³/s	**0.035**	**0.047**	**0.059**	**0.071**	**0.083**	**0.094**	**0.118**	**0.142**	**0.165**
	NC	**-**	**13**	**19**	**24**	**28**	**32**	**38**	**43**	**47**
	Throw, m 4-WAY	0.3-1.5	0.6-1.8	0.9-2.4	0.9-2.7	1.2-2.7	1.2-3.1	1.8-3.4	2.1-3.7	2.4-4.0
	Throw, m 3-WAY	0.3-1.5	0.6-2.1	0.9-2.7	0.9-3.1	1.2-3.4	1.5-3.7	1.8-4.0	2.1-4.6	2.4-4.9
	Throw, m 2-WAY	0.3-1.8	0.6-2.4	0.9-3.1	1.2-3.7	1.5-4.0	1.5-4.3	2.1-4.9	2.4-5.2	2.7-5.8
	Throw, m 1-WAY	0.6-2.1	0.9-3.1	1.2-3.4	1.5-3.7	1.8-4.0	2.1-4.3	2.4-4.9	3.1-5.2	3.4-5.8
150 x 450	**Tot. Press., Pa**	**11**	**17**	**28**	**40**	**53**	**69**	**108**	**153**	**210**
	Flow Rate, m³/s	**0.106**	**0.142**	**0.177**	**0.212**	**0.248**	**0.282**	**0.354**	**0.425**	**0.496**
	NC	**17**	**25**	**31**	**36**	**40**	**44**	**50**	**55**	**59**
	Throw, m 4-WAY	1.5-4.6	1.8-5.2	2.4-5.8	3.1-6.4	3.4-6.7	4.0-7.3	4.9-8.2	5.2-9.2	5.8-9.8
	Throw, m 3-WAY	1.5-4.6	2.1-5.2	2.4-5.8	3.1-6.4	3.7-6.7	4.0-7.3	4.9-8.2	5.2-9.2	5.8-9.8
	Throw, m 2-WAY	1.5-4.6	2.1-5.2	2.7-5.8	3.4-6.4	4.0-6.7	4.3-7.3	4.9-8.2	5.2-9.2	5.8-9.8
	Throw, m 1-WAY	2.4-6.4	3.1-7.3	4.0-8.2	4.6-9.2	5.5-9.8	6.1-10.4	6.7-11.9	7.3-12.8	8.2-14.0
* **250 x 500**	**Neg Stat. Press., Pa**	**8**	**13**	**19**	**28**	**39**	**50**	**78**	**113**	**154**
	Flow Rate, m³/s	**0.217**	**0.288**	**0.363**	**0.434**	**0.510**	**0.578**	**0.722**	**0.864**	**1.010**
	NC	**-**	**19**	**25**	**31**	**36**	**41**	**48**	**55**	**60**

* performance data for CPR.

Performance Data – CPS & CPR

400 x 400 Module Size

Duct Size	Neck Velocity, m/s / Vel. Press., Pa		1.53 / 2	2.04 / 3	2.55 / 4	3.06 / 6	3.57 / 8	4.08 / 10	5.1 / 16	6.12 / 23	7.14 / 31
125 mm RD	Tot. Press., Pa		3	5	7	10	14	18	28	40	54
	Flow Rate, m^3/s		0.019	0.026	0.033	0.038	0.045	0.052	0.064	0.078	0.090
	NC		-	-	14	19	23	27	33	38	42
	Throw, m	4-WAY	0.3-1.2	0.6-1.5	0.6-1.8	0.6-2.1	0.9-2.1	0.9-2.4	1.5-2.7	1.8-3.1	1.8-3.1
		3-WAY	0.3-1.2	0.6-1.8	0.6-2.1	0.6-2.4	0.9-2.7	1.2-3.1	1.5-3.1	1.8-3.7	1.8-4.0
		2-WAY	0.3-1.5	0.6-1.8	0.6-2.4	0.9-3.1	1.2-3.1	1.2-3.7	1.8-4.0	2.1-4.3	2.1-4.6
		1-WAY	0.6-1.8	0.6-2.4	0.9-2.7	1.2-3.1	1.5-3.4	1.8-4.0	1.8-4.0	2.4-4.3	2.7-4.6
150 mm RD	Tot. Press., Pa		4	6	9	12	17	21	33	48	65
	Flow Rate, m^3/s		0.028	0.038	0.047	0.057	0.066	0.076	0.094	0.110	0.130
	NC		-	-	17	22	26	30	36	41	45
	Throw, m	4-WAY	0.3-1.2	0.6-1.5	0.9-2.1	0.9-2.4	0.9-2.4	0.9-2.7	1.5-3.1	1.8-3.1	2.1-3.4
		3-WAY	0.3-1.2	0.6-1.8	0.9-2.4	0.9-2.7	0.9-3.1	1.2-3.1	1.5-3.4	1.8-4.0	2.1-4.3
		2-WAY	0.3-1.5	0.6-2.1	0.9-2.7	0.9-3.1	1.2-3.4	1.2-3.7	1.8-4.3	2.1-4.6	2.4-5.2
		1-WAY	0.6-1.8	0.9-2.7	0.9-3.4	1.2-3.4	1.5-3.7	1.8-4.0	2.1-4.6	2.7-4.9	3.1-5.2
175 mm RD or 150 x 150	Tot. Press., Pa		4	7	10	15	19	25	39	56	76
	Flow Rate, m^3/s		0.038	0.050	0.064	0.076	0.090	0.102	0.127	0.151	0.177
	NC		-	14	20	25	29	33	39	44	48
	Throw, m	4-WAY	0.3-1.5	0.6-1.8	0.9-2.7	0.9-3.1	1.2-3.1	1.2-3.4	1.8-3.7	2.4-4.0	2.7-4.3
		3-WAY	0.3-1.5	0.6-2.1	0.9-3.1	0.9-3.4	1.2-3.7	1.5-4.0	1.8-4.3	2.1-4.9	2.7-5.2
		2-WAY	0.3-1.8	0.6-2.7	0.9-3.4	1.2-3.1	1.5-4.3	1.5-4.6	2.1-5.2	2.7-5.5	3.1-6.1
		1-WAY	0.6-2.4	0.9-3.4	1.2-3.7	1.5-4.0	1.8-4.3	2.4-4.6	2.7-5.2	3.4-5.5	3.7-6.1
200 mm RD	Tot. Press., Pa		5	7	12	17	22	29	45	64	88
	Flow Rate, m^3/s		0.050	0.066	0.083	0.099	0.116	0.132	0.165	0.198	0.231
	NC		-	16	22	27	31	35	41	46	50
	Throw, m	4-WAY	0.3-1.8	0.6-2.4	1.2-3.1	1.2-3.4	1.2-3.7	1.5-3.7	1.8-4.0	2.4-4.3	2.7-4.9
		3-WAY	0.3-1.8	0.6-2.4	1.2-3.4	1.2-4.0	1.5-4.0	1.5-4.3	2.1-4.9	2.7-5.5	3.1-5.8
		2-WAY	0.3-2.1	0.6-3.1	1.2-3.7	1.2-4.3	1.5-4.6	1.8-5.2	2.4-5.8	3.1-6.4	3.7-6.7
		1-WAY	0.9-2.7	1.2-3.7	1.5-4.0	1.8-4.3	2.1-4.6	2.4-5.2	3.1-5.8	4.0-6.4	4.0-6.7
250 mm RD	Tot. Press., Pa		6	10	16	23	30	39	61	87	119
	Flow Rate, m^3/s		0.078	0.104	0.127	0.153	0.179	0.205	0.257	0.309	0.359
	NC		11	19	25	30	34	38	44	49	53
	Throw, m	4-WAY	0.3-2.4	0.6-3.1	1.2-3.7	1.2-4.0	1.8-4.3	2.1-4.3	2.4-5.2	3.1-5.5	3.4-6.1
		3-WAY	0.3-2.4	0.6-3.1	1.2-4.0	1.8-4.6	2.1-5.2	2.1-5.5	2.7-6.1	3.4-6.7	3.7-7.0
		2-WAY	0.3-2.7	0.6-3.7	1.2-4.3	1.8-5.5	2.1-5.8	2.4-6.4	3.1-7.0	3.7-7.6	4.3-8.5
		1-WAY	0.3-3.4	1.2-4.3	2.1-5.2	2.4-5.5	2.7-5.8	3.1-6.4	3.7-7.0	4.6-7.6	4.6-8.5
200 x 200	Tot. Press., Pa		5	9	14	20	27	34	54	76	104
	Flow Rate, m^3/s		0.064	0.085	0.104	0.125	0.146	0.168	0.210	0.253	0.295
	NC		9	17	23	28	32	36	42	47	51
	Throw, m	4-WAY	0.3-2.1	0.6-2.7	1.2-3.4	1.2-3.7	1.5-4.0	1.8-4.0	2.1-4.6	2.7-4.9	3.1-5.5
		3-WAY	0.3-2.1	0.6-2.7	1.2-3.7	1.5-4.3	1.8-4.6	1.8-4.9	2.4-5.5	3.1-6.1	3.4-6.4
		2-WAY	0.3-2.4	0.6-3.4	1.2-4.0	1.5-4.9	1.8-5.2	2.1-5.8	2.7-6.4	3.4-7.0	4.0-7.6
		1-WAY	0.9-3.1	1.2-4.0	1.8-4.6	2.1-4.9	2.4-5.2	2.7-5.8	3.4-6.4	4.3-7.0	4.3-7.6
* 350 x 350	Neg Stat. Press., Pa		8	13	19	28	39	50	78	113	154
	Flow Rate, m^3/s		0.194	0.257	0.321	0.385	0.449	0.515	0.642	0.770	0.897
	NC		-	18	25	31	36	40	47	54	59

* performance data for CPR.

Guide Product Weights		
Approximate Weight in Kg.		
Size	CPR	CPS
300 x 300	1.35	1.75
600 x 600	1.98	2.38

CPS & CPR – Performance Data

500 x 500 Module Size

Duct Size	Neck Velocity, m/s Vel. Press., Pa		1.53 2	2.04 3	2.55 4	3.06 6	3.57 8	4.08 10	5.1 16	6.12 23	7.14 31
125 mm RD	**Tot. Press., Pa**		**3**	**5**	**7**	**10**	**14**	**18**	**28**	**40**	**54**
	Flow Rate, m^3/s		**0.019**	**0.026**	**0.033**	**0.038**	**0.045**	**0.052**	**0.064**	**0.078**	**0.090**
	NC		**-**	**-**	**14**	**19**	**23**	**27**	**33**	**38**	**42**
	Throw, m	4-WAY	0.3-1.2	0.6-1.5	0.6-1.8	0.6-2.1	0.9-2.1	0.9-2.4	1.5-2.7	1.8-3.1	1.8-3.1
		3-WAY	0.3-1.2	0.6-1.8	0.6-2.1	0.6-2.4	0.9-2.7	1.2-3.1	1.5-3.1	1.8-3.7	1.8-4.0
		2-WAY	0.3-1.5	0.6-1.8	0.6-2.4	0.9-3.1	1.2-3.1	1.2-3.7	1.8-4.0	2.1-4.3	2.1-4.6
		1-WAY	0.6-1.8	0.6-2.4	0.9-2.7	1.2-3.1	1.5-3.4	1.8-4.0	1.8-4.0	2.4-4.3	2.7-4.6
150 mm RD	**Tot. Press., Pa**		**4**	**6**	**9**	**12**	**17**	**21**	**33**	**48**	**65**
	Flow Rate, m^3/s		**0.028**	**0.038**	**0.047**	**0.057**	**0.066**	**0.076**	**0.094**	**0.110**	**0.130**
	NC		**-**	**-**	**17**	**22**	**26**	**30**	**36**	**41**	**45**
	Throw, m	4-WAY	0.3-1.2	0.6-1.5	0.9-2.1	0.9-2.4	0.9-2.4	0.9-2.7	1.5-3.1	1.8-3.1	2.1-3.4
		3-WAY	0.3-1.2	0.6-1.8	0.9-2.4	0.9-2.7	0.9-3.1	1.2-3.1	1.5-3.4	1.8-4.0	2.1-4.3
		2-WAY	0.3-1.5	0.6-2.1	0.9-2.7	0.9-3.1	1.2-3.4	1.2-3.7	1.8-4.3	2.1-4.6	2.4-5.2
		1-WAY	0.6-1.8	0.9-2.7	0.9-3.4	1.4-3.4	1.5-3.7	1.8-4.0	2.1-4.6	2.7-4.9	3.1-5.2
175 mm RD or 150 x 150	**Tot. Press., Pa**		**4**	**7**	**10**	**14**	**18**	**23**	**37**	**52**	**71**
	Flow Rate, m^3/s		**0.038**	**0.050**	**0.064**	**0.076**	**0.090**	**0.102**	**0.127**	**0.151**	**0.177**
	NC		**-**	**13**	**19**	**24**	**28**	**32**	**38**	**43**	**47**
	Throw, m	4-WAY	0.3-1.5	0.6-1.8	0.9-2.7	0.9-3.1	1.2-3.1	1.2-3.4	1.8-3.7	2.4-4.0	2.7-4.3
		3-WAY	0.3-1.5	0.6-2.1	0.9-3.1	0.9-3.4	1.2-3.7	1.5-4.0	1.8-4.3	2.1-4.9	2.7-5.2
		2-WAY	0.3-1.8	0.6-2.7	0.9-3.4	1.2-3.7	1.5-4.3	1.5-4.6	2.1-5.2	2.7-5.5	3.1-6.1
		1-WAY	0.6-2.4	0.9-3.4	1.2-3.7	1.5-4.0	1.8-4.3	2.4-4.6	2.7-5.2	3.4-5.5	3.7-6.1
200 mm RD	**Tot. Press., Pa**		**4**	**6**	**10**	**14**	**19**	**24**	**38**	**54**	**74**
	Flow Rate, m^3/s		**0.050**	**0.066**	**0.083**	**0.099**	**0.116**	**0.132**	**0.165**	**0.198**	**0.231**
	NC		**-**	**16**	**22**	**27**	**31**	**35**	**41**	**46**	**50**
	Throw, m	4-WAY	0.3-1.8	0.6-2.4	1.2-3.1	1.2-3.4	1.2-3.7	1.5-3.7	1.8-4.0	2.4-4.3	2.7-4.9
		3-WAY	0.3-1.8	0.6-2.4	1.2-3.4	1.2-4.0	1.5-4.0	1.5-4.3	2.1-4.9	2.7-5.5	3.1-5.8
		2-WAY	0.3-2.1	0.6-3.1	1.2-3.7	1.2-4.3	1.5-4.6	1.8-5.2	2.4-5.8	3.1-6.4	3.7-6.7
		1-WAY	0.9-2.7	1.2-3.7	1.5-4.0	1.8-4.3	2.1-4.6	2.4-5.2	3.1-5.8	4.0-6.4	4.0-6.7
250 mm RD or 200 x 200	**Tot. Press., Pa**		**5**	**8**	**13**	**18**	**24**	**31**	**49**	**70**	**95**
	Flow Rate, m^3/s		**0.078**	**0.104**	**0.127**	**0.153**	**0.179**	**0.205**	**0.257**	**0.309**	**0.359**
	NC		**11**	**19**	**25**	**30**	**34**	**38**	**44**	**49**	**53**
	Throw, m	4-WAY	0.3-2.4	0.6-3.1	1.2-3.7	1.2-4.0	1.8-4.3	2.1-4.3	2.4-5.2	3.1-5.5	3.4-6.1
		3-WAY	0.3-2.4	0.6-3.1	1.2-4.0	1.8-4.6	2.1-5.2	2.1-5.5	2.7-6.1	3.4-6.7	3.7-7.0
		2-WAY	0.3-2.7	0.6-3.7	1.2-4.3	1.8-5.5	2.1-5.8	2.4-6.4	3.1-7.0	3.7-7.6	4.3-8.5
		1-WAY	0.9-3.4	1.2-4.3	1.2-5.2	2.4-5.5	2.7-5.8	3.1-6.4	3.7-7.0	4.6-7.6	4.6-8.5
300 mm RD	**Tot. Press., Pa**		**6**	**10**	**15**	**22**	**30**	**38**	**60**	**85**	**116**
	Flow Rate, m^3/s		**0.111**	**0.149**	**0.184**	**0.222**	**0.260**	**0.297**	**0.371**	**0.446**	**0.516**
	NC		**14**	**22**	**28**	**33**	**37**	**41**	**47**	**52**	**56**
	Throw, m	4-WAY	0.6-2.1	0.9-3.7	1.5-4.3	1.5-4.9	1.8-5.2	2.1-5.5	2.7-6.1	3.7-6.4	4.3-7.0
		3-WAY	0.6-3.1	0.9-4.0	1.5-4.9	1.8-5.5	2.1-6.1	2.4-6.4	3.4-7.0	4.0-8.2	4.6-8.5
		2-WAY	0.6-3.4	0.9-4.6	1.5-5.5	2.1-6.1	2.4-7.0	2.7-7.6	3.7-8.5	4.6-9.5	5.2-10.1
		1-WAY	0.9-4.3	1.5-5.5	2.1-6.1	2.4-6.4	3.4-7.0	3.4-7.6	4.6-8.5	5.5-9.5	9.5-10.1
350 mm RD	**Tot. Press., Pa**		**8**	**13**	**20**	**29**	**38**	**49**	**77**	**110**	**151**
	Flow Rate, m^3/s		**0.151**	**0.201**	**0.250**	**0.300**	**0.349**	**0.401**	**0.500**	**0.600**	**0.699**
	NC		**19**	**27**	**38**	**38**	**42**	**46**	**52**	**57**	**61**
	Throw, m	4-WAY	0.6-3.1	1.2-4.0	1.8-4.9	1.8-5.5	2.1-5.8	2.4-6.1	3.4-7.0	4.0-7.3	4.9-7.9
		3-WAY	0.6-3.4	1.2-4.3	1.8-5.5	2.1-6.1	2.4-7.0	3.1-7.3	3.7-7.9	4.3-9.2	5.2-9.5
		2-WAY	0.9-3.7	1.2-5.2	1.8-6.1	2.4-7.0	3.1-7.9	3.4-8.8	4.0-9.5	5.2-10.7	5.8-11.3
		1-WAY	1.2-4.9	1.8-6.1	2.4-7.0	3.1-7.3	3.7-7.9	4.0-8.8	5.2-9.5	6.1-10.7	6.7-11.3
250 x 250	**Tot. Press., Pa**		**6**	**9**	**15**	**21**	**28**	**36**	**56**	**80**	**109**
	Flow Rate, m^3/s		**0.099**	**0.132**	**0.165**	**0.196**	**0.229**	**0.262**	**0.328**	**0.394**	**0.460**
	NC		**13**	**21**	**27**	**32**	**36**	**40**	**46**	**51**	**55**
	Throw, m	4-WAY	0.6-2.4	0.9-3.4	1.5-4.0	1.5-4.6	1.8-4.9	2.1-5.2	2.7-5.8	3.4-6.1	4.0-6.7
		3-WAY	0.6-2.7	0.9-3.7	1.5-4.6	1.8-5.2	2.1-5.8	2.4-6.1	3.1-6.7	3.7-7.6	4.3-7.9
		2-WAY	0.6-3.1	0.9-4.3	1.5-5.2	2.1-5.8	2.4-6.7	2.7-7.3	3.4-7.9	4.3-8.8	4.9-9.5
		1-WAY	0.9-4.0	1.5-5.2	2.1-6.8	2.4-6.1	3.1-6.7	3.4-7.3	4.3-7.9	5.2-8.8	5.5-9.5
* **450 x 450**	**Neg Stat. Press., Pa**		**8**	**13**	**19**	**28**	**39**	**50**	**78**	**113**	**154**
	Flow Rate, m^3/s		**0.319**	**0.425**	**0.529**	**0.637**	**0.746**	**0.850**	**1.060**	**1.270**	**1.490**
	NC		**10**	**19**	**26**	**32**	**37**	**41**	**48**	**55**	**60**

* performance data for CPR.

Performance Data – CPS & CPR

600 x 600 Module Size

Duct Size	Neck Velocity, m/s / Vel. Press., Pa		1.53 / 2	2.04 / 3	2.55 / 4	3.06 / 6	3.57 / 8	4.08 / 10	5.1 / 16	6.12 / 23	7.14 / 31
125 mm RD	Tot. Press., Pa		3	5	7	10	14	18	28	40	54
	Flow Rate, m^3/s		0.019	0.026	0.033	0.038	0.045	0.052	0.064	0.078	0.090
	NC		-	-	14	19	23	27	33	38	42
	Throw, m	4-WAY	0.3-1.2	0.6-1.5	0.6-1.8	0.6-2.1	0.9-2.1	0.9-2.4	1.5-2.7	1.8-3.1	1.8-3.1
		3-WAY	0.3-1.2	0.6-1.8	0.6-2.1	0.6-2.4	0.9-2.7	1.2-3.1	1.5-3.1	1.8-3.7	1.8-4.0
		2-WAY	0.3-1.5	0.6-1.8	0.6-2.4	0.9-3.1	1.2-3.1	1.2-3.7	1.8-4.0	2.1-4.3	2.1-4.6
		1-WAY	0.6-1.8	0.6-2.4	0.9-2.7	1.2-3.1	1.5-3.4	1.8-4.0	1.8-4.0	2.4-4.3	2.7-4.6
150 mm RD	Tot. Press., Pa		4	6	9	12	17	21	33	48	65
	Flow Rate, m^3/s		0.028	0.038	0.047	0.057	0.066	0.076	0.094	0.110	0.130
	NC		-	-	17	22	26	30	36	41	45
	Throw, m	4-WAY	0.3-1.2	0.6-1.5	0.9-2.1	0.9-2.4	0.9-2.4	0.9-2.7	1.5-3.1	1.8-3.1	2.1-3.4
		3-WAY	0.3-1.2	0.6-1.8	0.9-2.4	0.9-2.7	0.9-3.1	1.2-3.1	1.5-3.4	1.8-4.0	2.1-4.3
		2-WAY	0.3-1.5	0.6-2.1	0.9-2.7	0.9-3.1	1.2-3.4	1.2-3.7	1.8-4.3	2.1-4.6	2.4-5.2
		1-WAY	0.6-1.8	0.9-2.7	0.9-3.4	1.2-3.4	1.5-3.7	1.8-4.0	2.1-4.6	2.7-4.9	3.1-5.2
175 mm RD or 150 x 150	Tot. Press., Pa		4	6	10	14	18	23	37	52	71
	Flow Rate, m^3/s		0.038	0.050	0.064	0.076	0.090	0.102	0.127	0.151	0.177
	NC		-	13	19	24	28	32	38	43	47
	Throw, m	4-WAY	0.3-1.5	0.6-1.8	0.9-2.7	0.9-3.1	1.2-3.1	1.2-3.4	1.8-3.7	2.4-4.0	2.7-4.3
		3-WAY	0.3-1.5	0.6-2.1	0.9-3.1	0.9-3.4	1.2-3.7	1.5-4.0	1.8-4.3	2.1-4.9	2.7-5.2
		2-WAY	0.3-1.8	0.6-2.7	0.9-3.4	1.2-3.7	1.5-4.3	1.5-4.6	2.1-5.2	2.7-5.5	3.1-6.1
		1-WAY	0.6-2.4	0.9-3.4	1.2-3.7	1.5-4.0	1.8-4.3	2.4-4.6	2.7-5.2	3.4-5.5	3.7-6.1
200 mm RD	Tot. Press., Pa		4	6	10	14	19	24	38	54	74
	Flow Rate, m^3/s		0.050	0.066	0.083	0.099	0.116	0.132	0.165	0.198	0.231
	NC		-	17	23	28	32	36	42	47	51
	Throw, m	4-WAY	0.3-1.8	0.6-2.4	1.2-3.1	1.2-3.4	1.2-3.7	1.5-3.7	1.8-4.0	2.4-4.3	2.7-4.9
		3-WAY	0.3-1.8	0.6-2.4	1.2-3.4	1.2-4.0	1.5-4.0	1.5-4.3	2.1-4.9	2.7-5.5	3.1-5.8
		2-WAY	0.3-2.1	0.6-3.1	1.2-3.7	1.2-4.3	1.5-4.6	1.8-5.2	2.4-5.8	3.1-6.4	3.7-6.7
		1-WAY	0.9-2.7	1.2-3.7	1.5-4.0	1.8-4.3	2.1-4.6	2.4-5.2	3.1-5.8	4.0-6.4	4.0-6.7
250 mm RD or 200 x 200	Tot. Press., Pa		4	7	11	16	21	28	43	61	83
	Flow Rate, m^3/s		0.078	0.104	0.127	0.153	0.179	0.205	0.257	0.309	0.359
	NC		11	19	25	30	34	38	44	49	53
	Throw, m	4-WAY	0.3-2.4	0.6-3.1	1.2-3.7	1.2-4.0	1.8-4.3	2.1-4.3	2.4-5.2	3.1-5.5	3.4-6.1
		3-WAY	0.3-2.4	0.6-3.1	1.2-4.0	1.8-4.6	2.1-5.2	2.1-5.5	2.7-6.1	3.4-6.7	3.7-7.0
		2-WAY	0.3-2.7	0.6-3.7	1.2-4.3	1.8-5.5	2.1-5.8	2.4-6.4	3.1-7.0	3.7-7.6	4.3-8.5
		1-WAY	0.3-3.4	1.2-4.3	2.1-5.2	2.4-5.5	2.7-5.8	3.1-6.4	3.7-7.0	4.6-7.6	4.6-8.5
300 mm RD or 250 x 250	Tot. Press., Pa		5	9	14	19	26	33	52	75	102
	Flow Rate, m^3/s		0.111	0.149	0.184	0.222	0.260	0.297	0.371	0.446	0.519
	NC		14	22	28	33	37	41	47	52	56
	Throw, m	4-WAY	0.6-2.4	0.9-3.7	1.5-4.3	1.5-4.9	1.8-5.2	2.1-5.5	2.7-6.1	3.7-6.4	4.3-7.0
		3-WAY	0.6-3.1	0.9-4.0	1.5-4.9	1.8-5.5	2.1-6.1	2.4-6.4	3.4-7.0	4.0-8.2	4.6-8.5
		2-WAY	0.6-3.4	0.9-4.6	1.5-5.5	2.1-6.1	2.4-7.0	2.7-7.6	3.7-8.5	4.6-9.5	5.2-10.1
		1-WAY	0.9-4.3	1.5-5.5	2.1-6.1	2.4-6.4	3.4-7.0	3.4-7.6	4.6-8.5	5.5-9.5	9.5-10.1
350 mm RD	Tot. Press., Pa		6	10	16	22	28	39	61	86	118
	Flow Rate, m^3/s		0.151	0.201	0.250	0.300	0.349	0.401	0.500	0.600	0.699
	NC		16	24	30	35	39	43	49	54	58
	Throw, m	4-WAY	0.6-3.1	1.2-4.0	1.8-4.9	1.8-5.5	2.1-5.8	2.4-6.1	3.4-7.0	4.0-7.3	4.9-7.9
		3-WAY	0.6-3.4	1.2-4.3	1.8-5.5	2.1-6.1	2.4-7.0	3.1-7.3	3.7-7.9	4.3-9.2	5.2-9.5
		2-WAY	0.9-3.7	1.2-5.2	1.8-6.1	2.4-7.0	3.1-7.9	3.4-8.8	4.0-9.5	5.2-10.7	5.8-11.3
		1-WAY	1.2-4.9	1.8-6.1	2.4-7.0	3.1-7.3	3.7-7.9	4.0-8.8	5.2-9.5	6.1-10.7	6.7-11.3
400 mm RD	Tot. Press., Pa		8	12	19	28	37	48	75	108	147
	Flow Rate, m^3/s		0.198	0.264	0.331	0.397	0.463	0.529	0.661	0.793	0.924
	NC		19	27	33	38	42	46	52	57	58
	Throw, m	4-WAY	0.6-3.7	1.5-4.6	1.8-5.8	2.4-6.1	2.7-6.4	3.4-7.3	4.0-7.9	4.6-8.5	5.5-9.5
		3-WAY	0.9-3.7	1.5-5.2	1.8-6.1	2.4-7.6	2.7-7.9	3.4-8.5	4.3-9.8	5.2-10.4	5.8-11.6
		2-WAY	1.2-4.3	1.5-5.8	1.8-7.3	2.7-8.5	3.4-9.5	4.0-10.1	4.6-11.3	5.8-12.2	6.4-13.4
		1-WAY	1.5-5.5	2.4-7.3	2.7-7.9	3.4-8.5	4.0-9.5	4.6-10.1	5.8-11.3	7.3-12.2	7.6-13.4
300 x 300	Tot. Press., Pa		6	10	15	21	29	37	58	83	113
	Flow Rate, m^3/s		0.142	0.189	0.236	0.283	0.331	0.378	0.472	0.567	0.661
	NC		16	24	30	35	39	43	49	54	58
	Throw, m	4-WAY	0.6-3.1	1.2-4.0	1.5-4.9	2.1-5.2	2.4-5.5	2.7-6.1	3.4-6.7	4.0-7.3	4.6-7.9
		3-WAY	0.6-3.1	1.2-4.3	1.5-5.2	2.1-6.4	2.4-6.7	2.7-7.3	3.7-8.2	4.3-8.8	4.9-9.8
		2-WAY	0.6-3.7	1.2-4.9	1.5-6.1	2.4-7.3	2.7-7.9	3.4-8.5	4.0-9.5	4.9-10.4	5.5-11.3
		1-WAY	1.2-4.6	2.1-6.1	2.4-6.7	3.1-7.3	3.4-7.9	4.0-8.5	4.9-9.5	6.1-10.4	6.4-11.3
* 550 x 550	Neg Stat. Press., Pa		8	13	19	28	39	50	78	113	154
	Flow Rate, m^3/s		0.472	0.637	0.793	0.954	1.100	1.270	1.590	1.900	2.220
	NC		11	20	27	33	38	42	49	56	61

* performance data for CPR.

CPSS – Perforated Secure Diffuser

Model: **CPSS**

The Holyoake Series CPSS range of Perforated Supply Secure Diffusers has been designed to provide a medium to high level of security. The CPSS is constructed of heavy gauge perforated plate, framed by a heavy section aluminium surround. The perforated diffusion plate is locked in place by solid heavy aluminium spacers.

The CPSS can be used as a ceiling, or wall mounted diffuser, or as a return if required.

The small perforation size and heavy gauge material, make it ideal for use In locations where security and safety is a requirement.

Construction

The Series CPSS comprises of a 2, or 3 mm thick perforated steel face plate mounted in a 4 mm thick aluminium surround, with mitred and welded corners.
A 40 x 6 mm centre support bar is added to diffusers with a 300 mm nominal neck size and above.

Installation

The CPSS should be fixed from the rear for maximum security. This can be achieved using angle section mounting brackets fixed to the surround of the diffuser and sandwiching the ceiling, or wall.
Alternatively, the diffuser can be face fixed using security screws.

Features

- Highly Secure Heavy Duty construction.
- Secure diffuser fixing by 3 mm thick aluminium spacers.
- 2 or 3 mm thick perforated steel diffusion plate.
- Mitred and welded corners.
- 2 or 3 mm diameter holes for 30, or 40 % free area.
- 4 mm thick aluminium surround.

Options

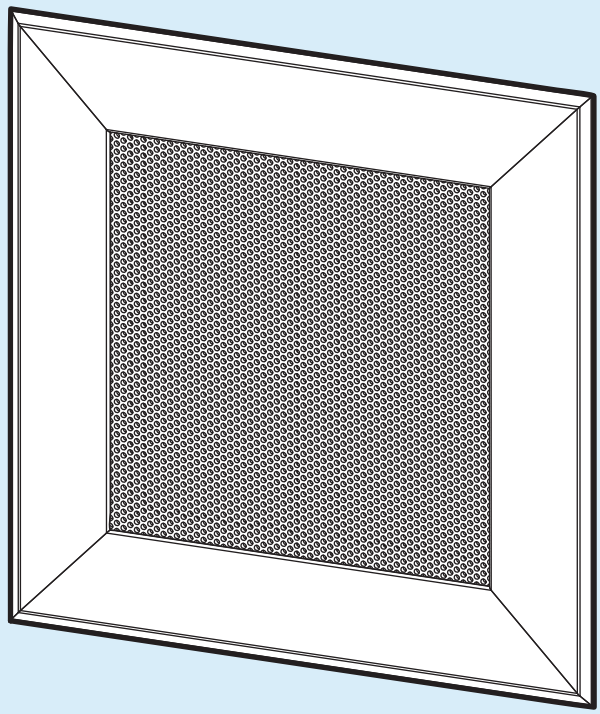
SSA, SRA and RRA Neck Adaptors are available to suit a wide range of duct sizes.

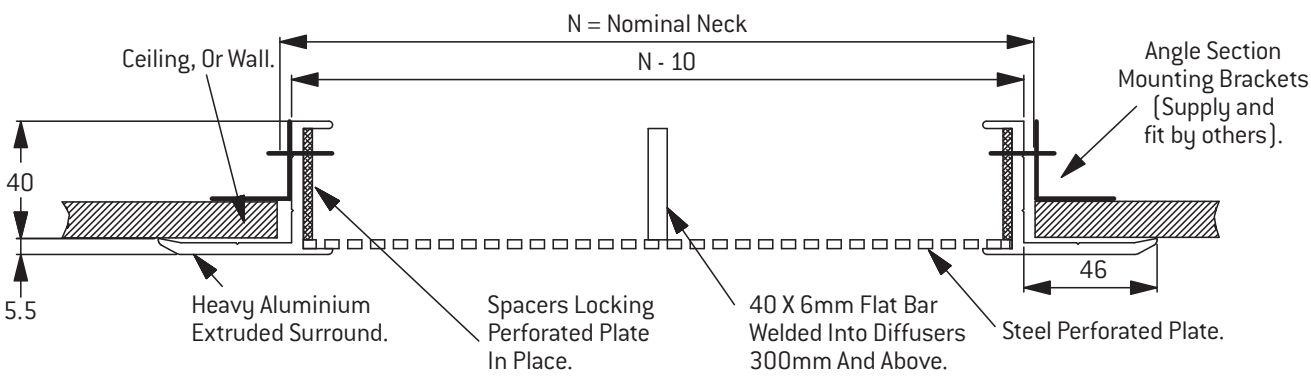
Premi-Aire™, or Galvanised Cushion Head boxes are available to suit standard spiral ducting.
(Refer to Sections J Spiro Ducting and K Accessories).

Finish

Standard Finish is Holyoake White, or can be powder coated to specific requirements.

CPSS- Ceiling Perforated Supply Secure





Contact your local Holyoake branch for specific requirements and local material variations.

Performance Data – CPSS

Nominal Neck (mm)	Flowrate (l/s)	25	50	75	100	150	200	250	300	400	500	600	700	800	900	1000
200x200	Vel (m/s)	0.7	1.4	2.1	2.8	4.2	5.5	6.9								
	ΔP_{S1} (Pa)	4	15	35	62	139										
A_N = 0.036	ΔP_{S2} (Pa)	1	6	13	23	53	94	146								
225x225	Vel (m/s)	0.5	1.1	1.6	2.2	3.2	4.3	5.4	6.5							
	ΔP_{S1} (Pa)	2	9	20	36	81	143									
A_N = 0.046	ΔP_{S2} (Pa)	1	3	8	14	31	54	85	122							
250x250	Vel (m/s)	0.4	0.9	1.3	1.7	2.6	3.5	4.3	5.2	6.9						
	ΔP_{S1} (Pa)	1	6	13	22	50	89	139								
A_N = 0.058	ΔP_{S2} (Pa)	1	2	5	8	19	34	53	76	135						
300x300	Vel (m/s)	0.3	0.6	0.9	1.2	1.8	2.4	3.0	3.6	4.8	5.9	7.1				
	ΔP_{S1} (Pa)	1	2	6	10	22	39	62	89	158						
A_N = 0.084	ΔP_{S2} (Pa)	0	1	2	4	8	15	23	34	60	94	135				
350x350	Vel (m/s)	0.2	0.4	0.6	0.9	1.3	1.7	2.2	2.6	3.5	4.3	5.2	6.1	6.9		
	ΔP_{S1} (Pa)	0	1	3	5	11	20	31	45	80	126					
A_N = 0.116	ΔP_{S2} (Pa)	0	0	1	2	4	8	12	17	31	48	69	93	122		
400x400	Vel (m/s)	0.2	0.3	0.5	0.7	1.0	1.3	1.6	2.0	2.6	3.3	3.9	4.6	5.3	5.9	6.6
	ΔP_{S1} (Pa)	0	1	2	3	6	11	18	25	45	70	102				
A_N = 0.152	ΔP_{S2} (Pa)	0	0	1	1	2	4	7	10	17	27	39	52	69	87	107
450x450	Vel (m/s)	0.1	0.3	0.4	0.5	0.8	1.0	1.3	1.5	2.1	2.6	3.1	3.6	4.1	4.6	5.2
	ΔP_{S1} (Pa)	0	0	1	2	4	7	11	15	27	43	61	83	109		
A_N = 0.194	ΔP_{S2} (Pa)	0	0	0	1	1	3	4	6	10	16	23	32	41	52	65
500x500	Vel (m/s)	0.1	0.2	0.3	0.4	0.6	0.8	1.0	1.2	1.7	2.1	2.5	2.9	3.3	3.7	4.2
	ΔP_{S1} (Pa)	0	0	1	1	2	4	7	10	17	27	39	53	70	88	109
A_N = 0.240	ΔP_{S2} (Pa)	0	0	0	0	1	2	3	4	7	10	15	20	26	33	41
550x550	Vel (m/s)	0.1	0.2	0.3	0.3	0.5	0.7	0.9	1.0	1.4	1.7	2.1	2.4	2.7	3.1	3.4
	ΔP_{S1} (Pa)	0	0	0	1	2	3	5	7	12	18	26	36	47	59	73
A_N = 0.292	ΔP_{S2} (Pa)	0	0	0	0	1	1	2	2	4	7	10	14	18	22	28
600x600	Vel (m/s)	0.1	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.4	1.7	2.0	2.3	2.6	2.9
	ΔP_{S1} (Pa)	0	0	0	1	1	2	3	5	8	13	18	25	32	41	50
A_N = 0.348	ΔP_{S2} (Pa)	0	0	0	0	0	1	1	2	3	5	7	9	12	16	19

Guide Product Weights		
Description	Size	Approximate Weight in Kg.
CPSS	200 x 200	0.99
CPSS INC SECURE BOX	250 x 250	8.56

Performance Notes

1. Vel (m/s) is the duct velocity.
2. A_N is the neck area in m^2.
3. ΔP_{S1} (Pa) is based on a 2mm thick diffusion plate with 2mm diameter holes. Free Area 30%.
4. ΔP_{S2} (Pa) is based on a 3mm thick diffusion plate with 3mm diameter holes. Free Area 40%.
5. Minimum size 190 x 190 exact neck.
6. For ceiling applications, seismic restraints would be required, but not supplied.

CPSHS – Perforated Secure Diffuser

Model: **CPSHS**

The Holyoake Series CPSHS range of Perforated Supply High Secure Diffusers has been designed to provide a medium to high level of security, for “At Risk” and “High Secure” areas within Prisons, Detention Centres and Holding Cells.
The CPSHS is manufactured from Stainless Steel Type 304, for easy wash down and is fitted with a single piece construction face plate. This ensures no ledges and with a long welded sleeve with neck clamping flanges, eliminates the need for face fixings. Coupled with the small 2 mm diameter holes, the Holyoake CPSHS has all the attributes “High Secure” areas demand.

Construction

The Series CPSHS comprises of a 1.2 mm thick perforated stainless steel one piece diffusion face plate, with integral seamless 25 mm flange, mounted in a long, welded, stainless steel sleeve, with neck clamping flanges and a 1.6 mm rear cross bar, spot welded to the rear of the diffuser, for added strength and security.

Installation

The CPSHS must be fixed from the rear for maximum security, using the neck clamping plates to sandwich the concrete floor, creating a “High Secure” fixing.
We recommend the concrete ceiling is recessed to conceal the flange edge, see below.

Features

- Highly secure Heavy Duty construction.
- Neck clamping flanges for secure diffuser fixing.
- 1.2 mm thick perforated stainless steel diffusion plate.
- One piece construction face plate for maximum security.
- 2 mm diameter holes for 40% free area.

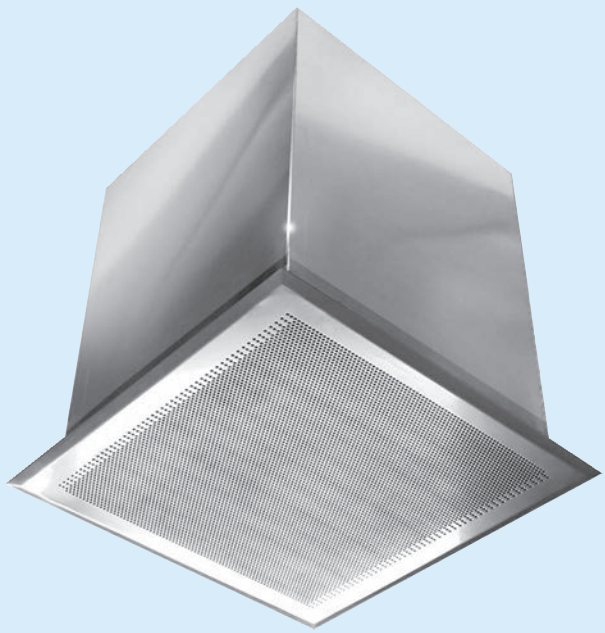
Options

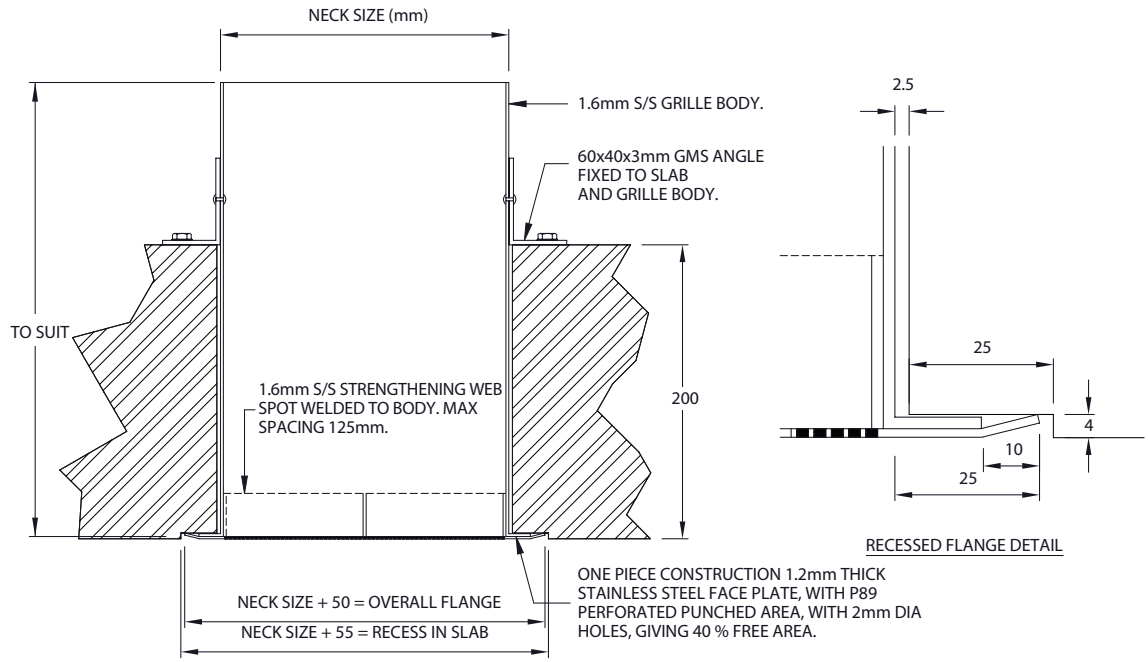
The CPSHS diffusers are available in a range of sizes, however, all are individually punched. Therefore, we recommend that sizes and quantities are discussed with your local Holyoake branch, to ensure the most cost effective solution is agreed, prior to manufacture.

Finish

Standard, is 304 grade stainless steel Mill finish.

CPSHS- Ceiling Perforated Supply High Secure





Performance Data – CPSHS

Neck (mm)	Flowrate (l/s)	25	50	75	100	150	200	250	300	400	500	600	700	800	900	1000
200 x 200	Vel (m/s)	0.7	1.4	2.1	2.8	4.2										
	ΔP (Pa)	4	15	35	62	139										
225 x 225	Vel (m/s)	0.5	1.1	1.6	2.2	3.2	4.3									
	ΔP (Pa)	2	9	20	36	81	143									
250 x 250	Vel (m/s)	0.4	0.9	1.3	1.7	2.6	3.5	4.3								
	ΔP (Pa)	1	6	13	22	50	89	139								
300 x 300	Vel (m/s)	0.3	0.6	0.9	1.2	1.8	2.4	3	3.6	4.8						
	ΔP (Pa)	1	2	6	10	22	39	62	89	158						
350 x 350	Vel (m/s)	0.2	0.4	0.6	0.9	1.3	1.7	2.2	2.6	3.5	4.3					
	ΔP (Pa)	0	1	3	5	11	20	31	45	80	126					
400 x 400	Vel (m/s)	0.2	0.3	0.5	0.7	1	1.3	1.6	2	2.6	3.3	3.9				
	ΔP (Pa)	0	1.	2	3	6	11	18	25	45	70	102				
450 x 450	Vel (m/s)	0.1	0.3	0.4	0.5	0.8	1	1.3	1.5	2.1	2.6	3.1	3.6	4.1		
	ΔP (Pa)	0	0	1	2	4	7	11	15	27	43	61	83	109		
500 x 500	Vel (m/s)	0.1	0.2	0.3	0.4	0.6	0.8	1	1.2	1.7	2.1	2.5	2.9	3.3	3.7	4.2
	ΔP (Pa)	0	0	1	1	2	4	7	10	17	27	39	53	70	88	109

Guide Product Weights		
Description	Size	Approximate Weight in Kg.
CPSHS INC SECURE BOX	250 x 250	4.84

Performance Notes

1. Vel (m/s) is the duct velocity.
2. Minimum size 200 x 200 neck.
3. Seismic restraints may be required, but not supplied.

CPMS – Maximum Security Diffuser

Model: **CPMS**

The Holyoake Series CPMS Perforated Maximum Security Diffuser has been designed specifically for maximum security prisons. The diffuser has been tested to meet grade 2 requirements of American corrections standard ASTM F2542 (Standard test methods for physical assault on ventilation grilles for detention and correctional facilities).

- BRANZ Type Test ST1068-TT
  Summary availiable on request or at:
  https://www.branz.co.nz/appraisal-codemark-certificates/
  (Certified for grade 2 requirements)

*Test certification is only available for the 200mm size.

The CPMS is manufactured from Stainless Steel Type 304, for easy wash down. The single piece faceplate ensures no pryable edges and a seamless finish when installed. Coupled with the small 2 mm diameter holes, the Holyoake CPMS has all the attributes that maximum security prisons require.

Construction

The Series CPMS comprises of a 1.8 mm thick perforated stainless steel face plate welded to the duct portion of the diffuser. Two high strength 20mm K700 Bohler bars are securely welded to the duct as required by corrections. M8 threaded rods attached to the faceplate are fastened to the 3mm stainless steel mounting.

Installation

1. The rear mounting frame is fastened on the back of the ceiling/wall with appropriate fixings, 10mm holes are provided in the base of the mounting frame for this purpose.
2. The CPMS diffuser is securely fitted by clamping the diffuser into the ceiling/wall between the front face and the rear mounting frame via the M8 threaded rods, supplied with the product.
3. After the diffuser is securely clamped in place, M8 x 20 bolts are to be fitted through the mounting frame and into the duct portion of the diffuser. 8mm holes in the neck of the mounting frame provide a guide for drilling. All on site fixings are to be provided by the installer.

Features

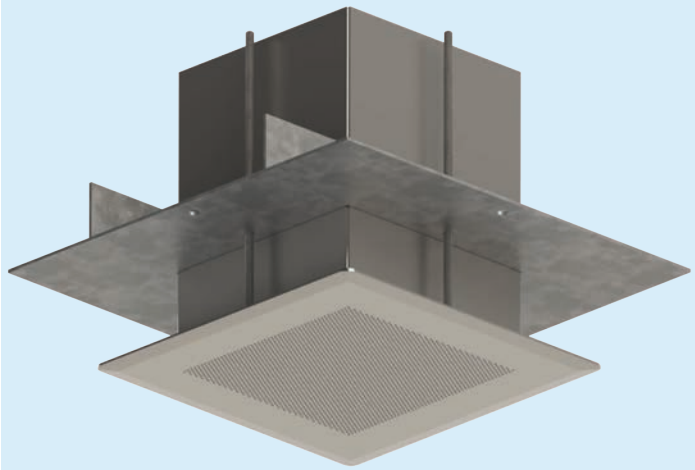
- Heavy duty construction for maximum security prisons.
- 3mm Stainless Steel Mounting frame supplied with all required holes for installation.
- 1.8 mm thick perforated stainless steel diffusion plate.
- One piece construction face plate provides a seamless finish.
- 2 mm diameter holes with 22% free area.

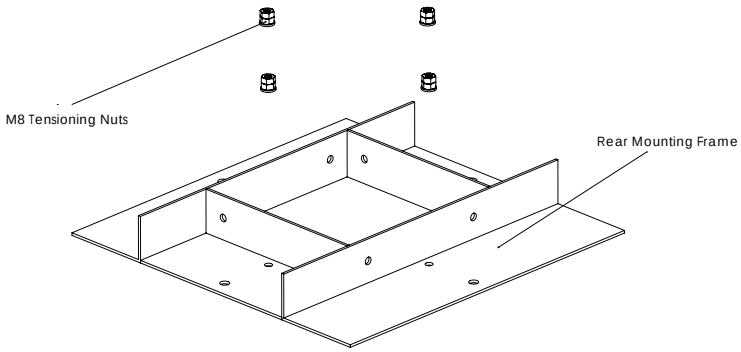
Finish

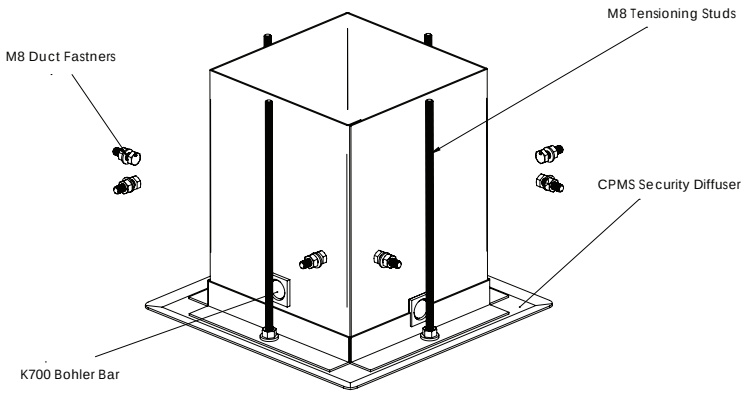
304 grade stainless steel Mill finish.

Note: This product range is expanding at the time of print, please contact your local Holyoake branch for current sizes.

CPMS- Ceiling Perforated Maximum Security





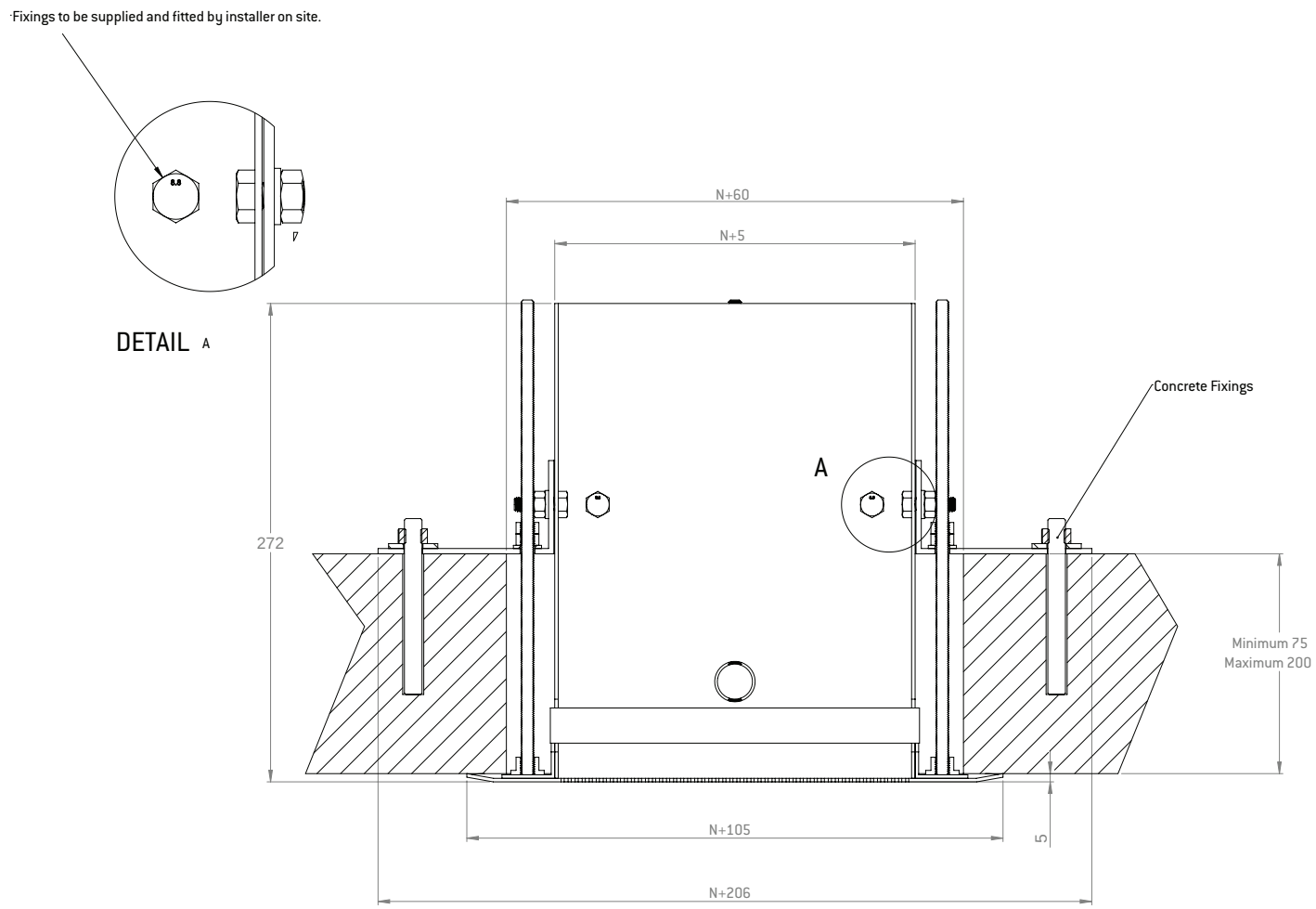


Guide Product Weights		
Description	**Neck Size**	**Approximate Weight in Kg.**
CPMS 200	200 x 200	12
CPMS 250	250 x 250	14

Neck (mm)	Flowrate (l/s)	25	50	75	100	150	200	250	300	400	500	600	700	800
200 x 200	Vel (m/s)	0.6	1.3	1.9	2.5	3.8	5							
Supply	**ΔP (Pa)**	**6**	**27**	**60**	**108**	**158**	**260**							
Return	Neg ΔP (Pa)	10	16	48	86	139	238							
	NC	**22**	**22**	**23**	**23**	**24**	**24**							
250 x 250	Vel (m/s)	0.4	0.8	1.2	1.6	2.4	3.2	4	4.8					
Supply	**ΔP (Pa)**	**4**	**12**	**31**	**50**	**88**	**129**	**179**	**240**					
Return	Neg ΔP (Pa)	6	11	23	37	69	109	159	219					
	NC	**21**	**21**	**22**	**22**	**23**	**23**	**24**	**23**					

Performance Notes

1. Vel (m/s) is the duct velocity.
2. Seismic restraints may be required, but not supplied.



CPR, CPS, CPMS, CPSHS, CPSS, CPT & CPTR

Product Ordering Key and Suggested Specifications

CPS / CPR	–	600 x 600	–	300 x 300/300 DIA	–	OPTIONS	–	ACCESSORIES	–	FINISH
Ceiling Perforated Supply. Ceiling Perforated Return.		Plenum Adaptor Size (Ceiling Opening).		Nominal Neck Size/ Nominal Neck Diameter.		OBD-2 Opposed Blade Damper / Heavy Gauge Galvanised Perforated Plate.		SRA 300 x 300/ 250 DIA. Square to Round Adaptor.		Holyoake White. Powder Coat.

Ceiling Perforated diffusers shall be Holyoake Series CPS, or CPR and shall consist of an extruded aluminium frame with close mitred corners and 0.75 mm aluminium perforated face in an extruded aluminium sub-frame. The face shall be removable, by means of a separate mounting frame, which if used for supply air shall be furnished with field adjustable pattern control louvers and a galvanised steel plenum with duct connection. All shall be as manufactured by Holyoake.

CPMS	–	200 x 200	–	FINISH
Ceiling Perforated Maximum Security.		Neck Size.		304 Stainless Steel Mill

Ceiling Perforated Maximum Security Grilles (CPMS) shall be constructed of Stainless Steel type 304 for easy wash down. The faceplate shall be constructed from a single piece with 2mm holes, with no ledges or face fixings. They shall be tested to ASTM F254 and meet a minimum grade 2 rating. All shall be as manufactured by Holyoake.

CPSHS	–	200 x 200	–	FINISH
Ceiling Perforated Supply High Secure.		Neck Size.		304 Grade Stainless Steel Mill Finish.

Ceiling Perforated Supply High Secure diffusers shall be Holyoake Series CPSHS. These shall be constructed from a single piece of Stainless Steel 304 Grade face plate, with small 2mm diameter holes, with no ledges, or face fixings. Complete with a long welded neck sleeve for full floor penetration and neck clamping flanges, ensuring no face fixings are required. All shall be as manufactured by Holyoake.

CPSS	–	600 x 600	–	2 / 3	–	ACCESSORIES	–	FINISH
Ceiling Perforated Supply Secure.		Nominal Neck Size.		Perforated Hole Size and Plate Thickness.		SSA, SRA & RRA Neck Adaptors, Premi-Aire™, or Galvanised Cushion Head Boxes.		Holyoake White. Powder Coat.

Ceiling Perforated Supply Secure diffusers shall be Holyoake Series CPSS and shall be constructed from heavy section aluminium surround to provide maximum security. 2 or 3 mm thick steel plate shall provide 30, or 40 % free area. Finished in a durable Powder Coat. All shall be as manufactured by Holyoake.

Note Seismic restraints are required, but not supplied.