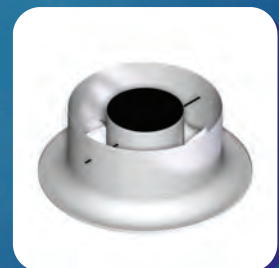
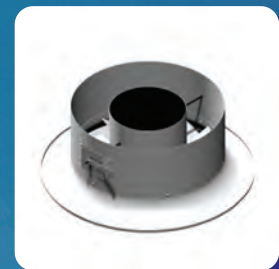


VARIABLE CORE FIXED VANE CONSTANT VOLUME RADIAL DIFFUSER

10

RVD

-  HEATING AND COOLING CHANGEOVER
-  EASY FLOW PATTERN ADJUSTMENT
-  MANUAL OR THERMAL MECHANISM
-  EXCELLENT THROW & FLOW
-  HIGH INDUCTION RATES
-  LOW NOISE
-  NO MAINTENANCE
-  10 YEAR WARRANTY



FEATURES

The RICKARD Constant Volume Radial Vane Diffuser with adjustable flow (Type RVD) is primarily intended for buildings where good air mixing is required. They are ideal for installations with ceiling voids in excess of 3.8m and where improved occupant comfort is called for in both heating & cooling modes.

Due to their ability to achieve a rapidly spreading swirl throw pattern with fast velocity decay and high induction rates, these diffusers are best suited to provide high air volume flow rates without drafts at occupant levels. The flow pattern may be adjusted manually with the manual mechanism or automatically with the thermal mechanism between a conical swirl flow pattern for cooling mode to a vertical column with a secondary conical swirl flow pattern for heating mode.

The functionality and affordability of the thermal mechanism makes this option the obvious choice for heating and cooling applications.

PERFORMANCE

High induction rates for large volume applications.

MAINTENANCE

No regular maintenance is required.

ENERGY SAVINGS

The focus of the design was to offer high comfort levels by offering the required diffuser performance with the lowest pressure drop possible.

AESTHETICS AND CONSTRUCTION

Designed with simplicity and functionality in mind, the Rickard range of RVD's compliments most of today's large modern spaces. The RVD is constructed of electro galvanized sheet steel. Each RVD is degreased, primed and finished in our standard semi-matt white chip resistant baked epoxy powder coating. A wide range of colour requirements can be met with our epoxy coating or wet spray options.

WARRANTY

Rickard warrants its Manual and Thermal RVD for a period of 10 years.

APPLICATION

AREAS WITH CEILING VOID HEIGHTS GREATER THAN 3.8m.

COOLING:

Cools the space with a conical swirl flow pattern of cold or isothermal air.

HEATING:

Heats the space with a vertical column with a secondary conical swirl flow pattern of air that has a temperature differential between -10K and +15K.

INTERNAL ZONES WITH A CONSTANT LOAD.

THE MANUAL CHANGE OVER MECHANISM CAN BE USED FOR HEATING ONLY OR COOLING ONLY APPLICATIONS.

The mechanism can be switched between modes in summer and winter if there is physical access.

THE THERMAL CHANGE OVER MECHANISM CAN BE USED FOR HEATING AND COOLING APPLICATIONS.

The mechanism will automatically switch between modes.

BUILDINGS THAT NEED EXCELLENT AIR MIXING.

WHERE HIGH AIR VOLUME FLOW RATES AND THE ABSENCE OF DRAFTS AT OCCUPANT LEVELS IS REQUIRED.

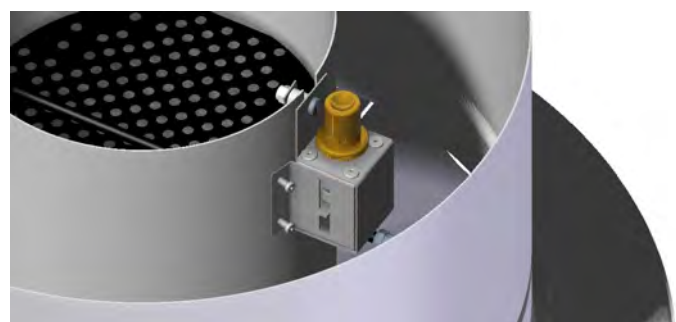
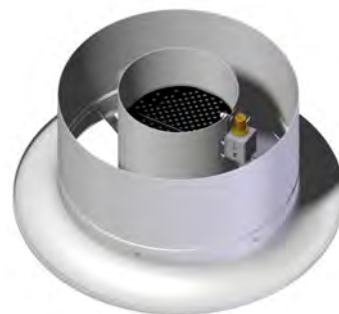


OPERATION

The RVD range is equipped with a Thermal, Electronic or Manual flow pattern mechanism for heating or cooling applications. The position of the perforated butterfly damper located in the core of the diffuser is varied.

THERMAL MECHANISM

The Thermal mechanism automatically switches the butterfly damper located in the core between the closed and open position. When the core is open, the RVD blows air in a vertical column with a secondary conical swirl flow pattern for heating. The supply air temperature should be greater than 31°C or 88°F for the heating mode to be fully activated. When the core is closed, the RVD blows air in a conical swirl flow pattern for cooling. The supply air temperature should be less than 24°C or 75°F for the cooling mode to be fully activated.



AUTOMATIC THERMAL CHANGE OVER MECHANISM

ELECTRONIC MECHANISM

The Electronic mechanism automatically switches the butterfly damper located in the core between the closed and open position. When the core is open, the RVD blows air in a vertical column with a secondary conical swirl flow pattern for heating. When the core is closed, the RVD blows air in a conical swirl flow pattern for cooling. Rickards MLM controls can be configured in two ways to control flow direction and temperature.

Configuration 1: Automatic heating and cooling mode at change-over set point. Heating mode is activated when the supply air temperature is higher than set point and cooling mode is activated when the supply air temperature is lower than set point. Supply air temperature is set externally.

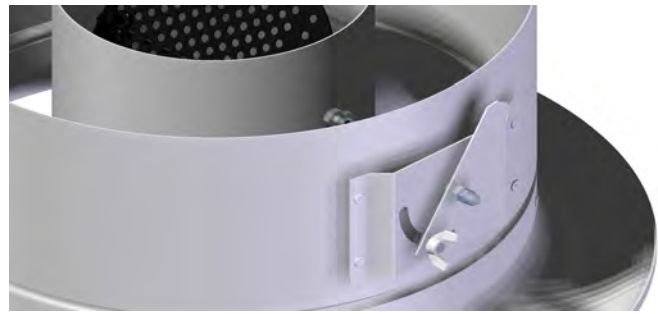
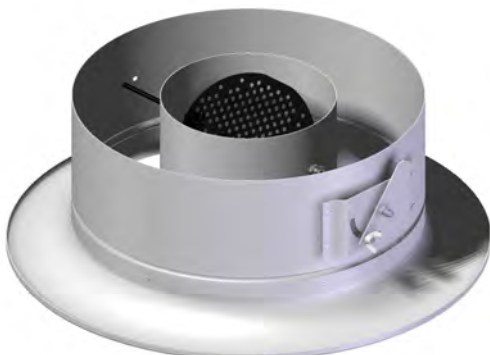
Configuration 2: Automatic heating and cooling mode using room and supply temperature (BMS decides supply temperature). In this configuration an appropriately positioned wall thermostat is required to sense room temperature and surface this value to the BMS. When the room temperature drops below set point, the BMS will use the wall thermostats temperature to call for heating. Under these circumstances the RVD's central core will open to blow hot air vertically downwards and energise the re-heaters if fitted. When the room temperature rises above set point, the BMS will use the wall thermostat temperature to call for cooling. Under these circumstances, the RVD's central core will close to blow cold air in a wide cone to cool the space.



AUTOMATIC ELECTRONIC CHANGE OVER MECHANISM

MANUAL MECHANISM

The Manual mechanism has a lever fitted to the side of the RVD and moves the damper so that the supply air discharge can be varied between a vertical column with a secondary conical swirl flow pattern for heating to a conical swirl flow pattern for cooling. Setting the manual damper between the full horizontal and vertical pattern creates a combination of the two patterns.



MANUAL CHANGE OVER MECHANISM

SELECTION

The most important practical factors to consider in internal zones are noise levels and uniform air distribution without "dumping" effects. "Dumping" is the tendency for cold, dense air to leave the diffuser as a vertical column similar to a waterfall. The effect of dumping is to overcool the person immediately below the diffuser while the person further away will not be cooled enough.

Dumping is eliminated by ensuring that the discharge air energy from the diffuser is adequate to distribute conditioned air evenly throughout the conditioned area and at the same time provide good secondary room air induction rates. Providing the total pressure in the neck of the RVD selected is not too low, dumping of conditioned cold air will not take place. The RVD is designed to avoid the tendency to dump.

A rapidly descending flow pattern similar to dumping can occur when two air streams travelling in opposite directions meet. This tendency is substantially reduced with the use of radial diffusers, but it can be avoided completely by ensuring that RVD's are placed far enough apart to eliminate drafts in the conditioned spaces. The Rickard RVD's flow pattern in cooling spreads outwards and downwards in a cone of air. The angle of the cone is approximately 65 degrees from the vertical. The swirl effect creates a rapid decay in velocity with high induction rates. Using this information, RVD's should be situated in the ceiling such that two adjacent diffusers are separated by slightly less than the sum of their cone diameter at floor level. Exactly how much less depends largely on the ceiling height and the amount of air movement desired in the conditioned space.

In heating the Rickard RVD's pattern is a vertical column to get the air down and uses a secondary conical swirl flow pattern to mix and induce the air in the room.

TYPES

Rickard's range of RVD's comes in 3 sizes, namely a **315**, **400** and a **630mm** diameter unit.

A thermal, electronic and manual mechanism is available for change-over between heating and cooling.

OPTIONS

Top entry round and side entry square plenums are available as an optional extra.

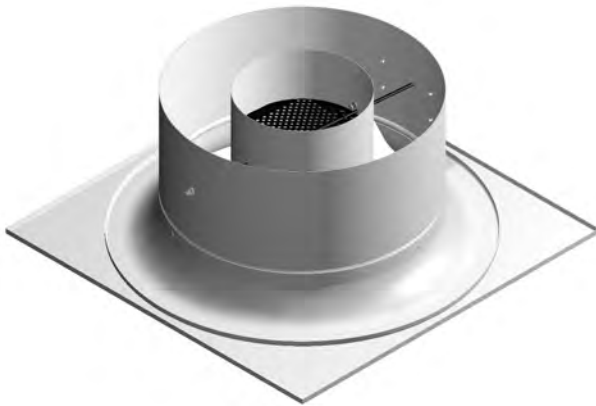
Entry plenums are constructed from mill galvanized sheet steel. Coated plenums are available as an option.

MOUNTING OPTIONS

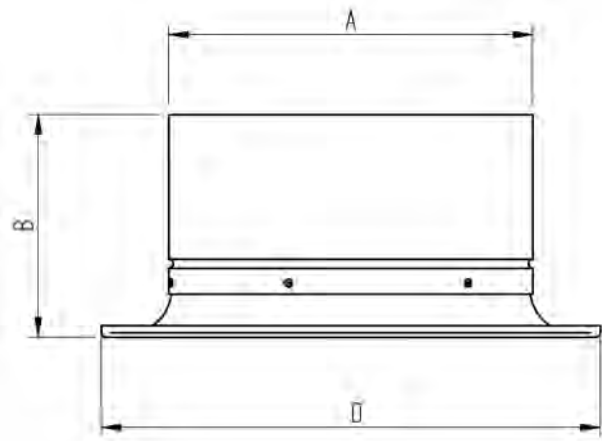
EXPOSED TEE CEILING GRID

1. Drop-in Flush Mounting
2. Drop-in Shadow Line

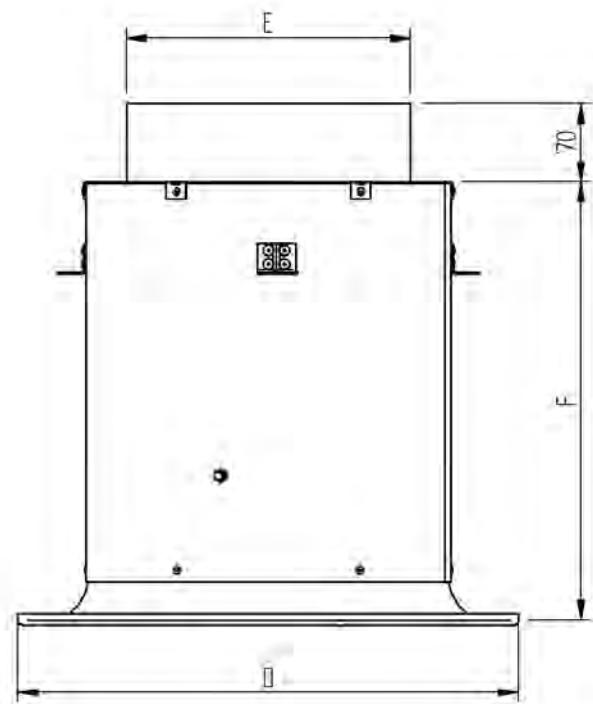
Flush Mounting and Shadow Line styles are available for 315 and 400mm Radials only. These can be supplied with the following mounting plate sizes, 595x595mm & 23¾x23¾" to suit 600x600mm & 24x24" ceiling grids respectively. Special sizes are available on request.



RVD (Shown) or RCD-NP (DROP-IN FLUSH MOUNTING)



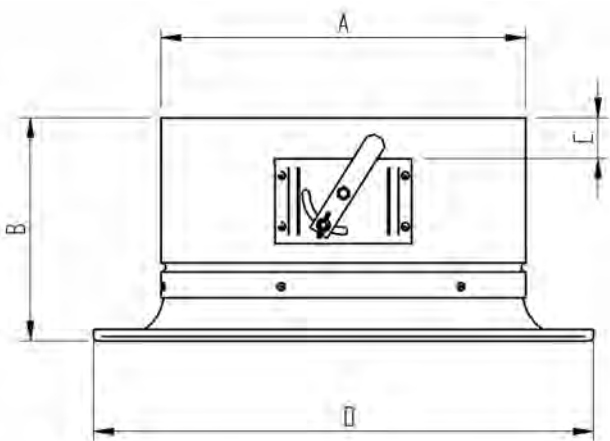
RCD-NP (NO PLENUM)



RVD or RCD-CP (CIRCULAR PLENUM)

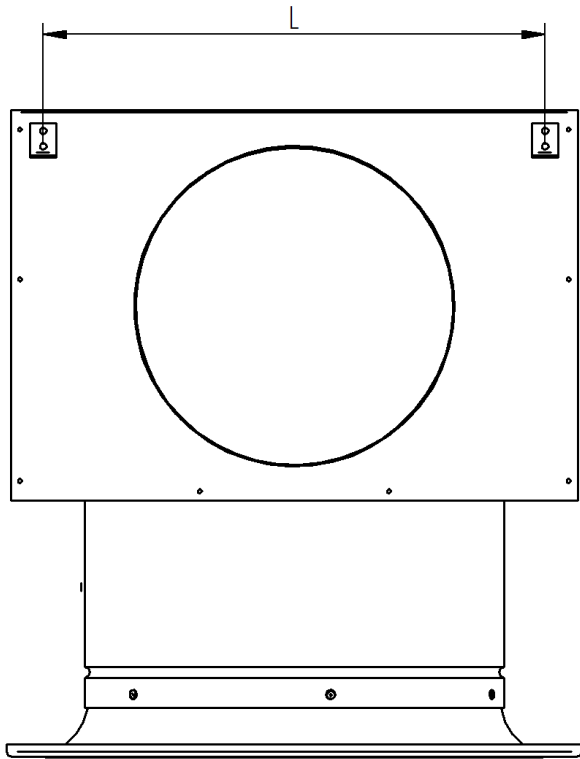
MOUNTING IN FREE SPACE

1. 4 Point Fixing (4 Brackets fitted to the round or square plenum for threaded rod connection)
2. Hard Duct Connection (no accessories required)



RVD-NP (NO PLENUM)

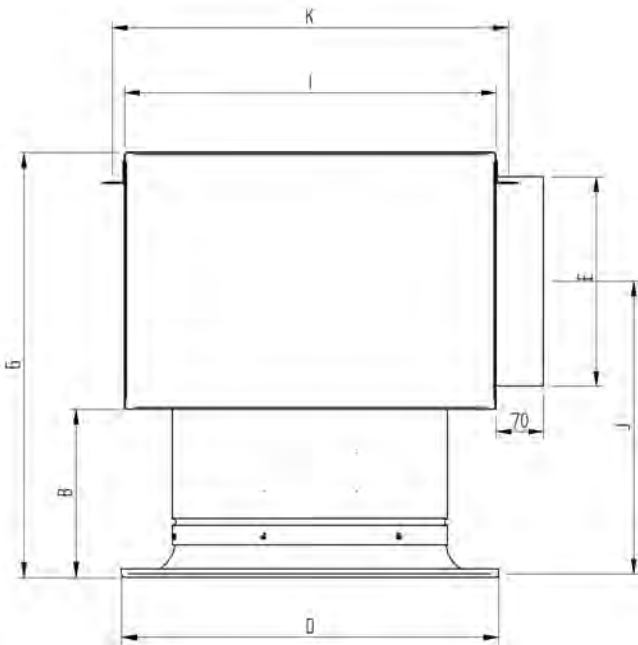
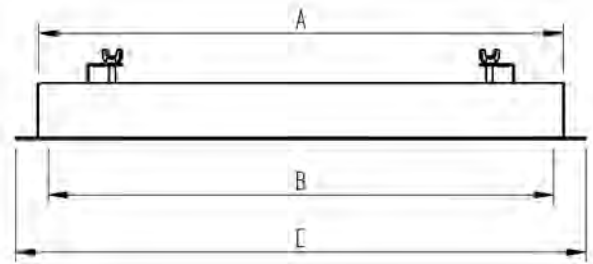
UNIT SIZE	DIMENSIONS mm										
	A	B	C	D	E	F	G	I	J	K	L
RV/CD315	319	197	36	440	250	425	480	435	340	464	385
RV/CD400	404	250	53	560	300	530	600	500	419	530	450
RVD630	634	394	102	879	400	750	850	750	615.5	780	700



RVD or RCD-SP (SQUARE PLENUM) FRONT VIEW



T-RING FOR MOUNTING RVD'S IN PLASTERED CEILINGS



RVD or RCD-SP (SQUARE PLENUM) SIDE VIEW

T-RING GENERAL DIMENSIONS					
RADIAL SIZE	A	B	C	BELL MOUTH DIAMETRE	CUT-OUT SIZE
RV/CD315	445	425	485	440	460
RV/CD400	565	545	605	560	580
RVD630	885	865	925	880	900

PLASTERED CEILING

1. T-Ring (Circular Frame to allow Drop-in Flush Mounting)
 Fixing of Radial diffusers in a plastered ceiling often presents a problem because of restricted access to the ceiling void. A T-Ring is available to allow Drop-in Flush Mounting of a standard Radial Diffuser. The T-Ring is mounted flush with the ceiling after a round hole is cut into the plaster board. Four threaded brackets draw the T-Ring flush against the ceiling to ensure a neat finish. **NOTE:** Do not overload the plastered ceiling. Attach safety wires or threaded rod to the RVD to reduce the load on the ceiling and to safeguard the occupants.

RVD-NP								
		CORE OPEN (60° CONE)			CORE CLOSED (130° CONE)			
NECK SIZE	TOTAL PRESSURE	FLOW	VERTICAL THROW (10°C Δ)	NC LEVEL	FLOW	VERTICAL THROW COMPONENT (10°C Δ)	HORIZONTAL THROW COMPONENT (10°C Δ)	NC LEVEL
[mm]	[Pa]	[l/s]	[m] (0.25 m/s)	[-]	[l/s]	[m] (0.25 m/s)	[m] (0.25 m/s)	[-]
315	25	355	4.5	38	268	4.1	4.9	36
	50	502	5.5	48	374	4.5	5.3	41
	75	616	6.0	51	456	4.9	5.7	46
	100	712	6.5	55	529	5.3	6.1	49
400	25	570	6.8	50	469	4.5	5.3	39
	50	806	7.8	59	664	5.3	6.1	49
	75	987	8.5	65	813	6.5	7.3	54
	100	1140	9.2	68	939	7.1	7.9	59
630	25	1414	7.8	55	1025	5.0	5.8	42
	50	1999	8.8	60	1450	5.9	6.7	51
	75	2448	9.4	66	1776	6.7	7.5	55
	100	2827	10.1	70	2051	7.2	8.0	61

All measurements were recorded with a differential of 10°C between supply and room temperature. Throw is measured at the point at which the air velocity reaches 0.25m/s. In heating, the RVD forms a 60°/.10 degree cone shaped pattern of air. Velocity measurements were taken directly below the diffuser. In cooling, the RVD forms a 130°/.10 degree cone shaped pattern of air. Velocity measurements were taken along this line but recorded in metres as a vertical and horizontal component.

Noise Criteria levels apply to a single diffuser mounted in a room having a Sound Absorption of 10dB in octave bands having centre frequencies from 125Hz to 8000Hz (i.e. the difference between Sound Pressure Level (dB re:2 x 10⁻⁵ Pa) and Sound Power Level (dBW re: 10⁻¹² watts) is equal to 10dB). These levels represent only the noise generated by the diffuser and do not take into account any duct-borne noise.

NOTE: Performance will differ from catalogue values if side-entry square plenums are used.

For performance data not reflected on any of the preceding tables, kindly contact your local Rickard sales representative.

RICKARD AIR DIFFUSION (PTY) LTD RESERVES THE RIGHT TO CHANGE SPECIFICATIONS AND DATA WITHOUT PRIOR NOTICE.

Performance Data applies to Standard Air having a density of 1.2 kg/m³.