

Return Air Plenum (RAP) Module

Packing List

Package includes:

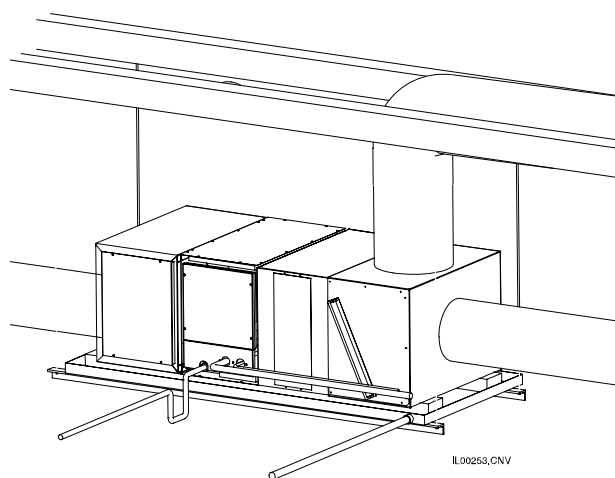
- 1- Return Air Plenum Cabinet
- 1- Hook Flange (to connect to Cooling Module)
- 4- Screws (for hook flange on MR2430)
- 5- Screws (for hook flange on MR3660)
- 1- Disposable Filter
- 2- Latches
- 4½ ft- length of gasket tape (MR2430)
- 5¾ ft- length of gasket tape (MR3660)

Features

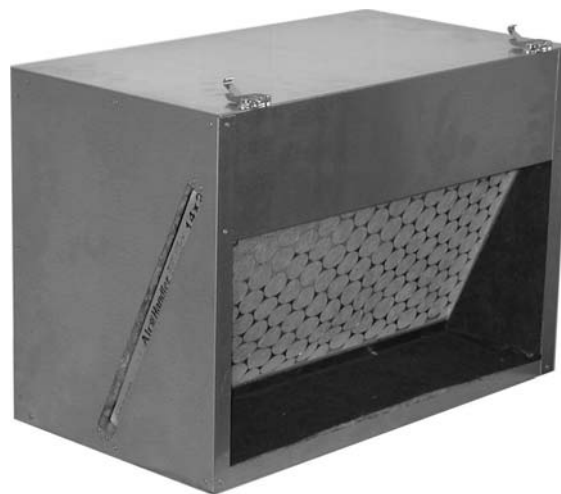
- Blank sides and top allow for custom, multiple-return openings
- Centrally located disposable filter
- Heavy-duty closed cell insulation (no exposed fiberglass insulation)
- Filter access from both sides
- Standard *Unico System* 'latch' system

Applications

The *Unico System* designed and built Return Air Plenum (RAP) is easily installed with the matching *Unico System* modular air-handling units. The RAP is designed specifically for multiple return duct systems. The plenum comes without any return openings so the installer can cut whatever openings are necessary for any number of return ducts. The top and all three sides of the RAP can be used for return air connections. Plus, it includes a centrally located filter accessible from either side of the cabinet.



Horizontal installation with Unico System Blower, Cooling, Heating, and Return Air Plenum Modules.



MR2430 Module shown with filter access cover removed

The RAP is also ideal for bringing in outside air and combining it with return air, effectively changing the RAP into a mixing box. (Refer to Tech Note 105, *Providing Outside Air*, and Tech Note 106, *Return Duct System Design Requirements* for more information.)

Return ducts can be any material so long as the duct is insulated, has acoustical properties, and is the correct size.

Cabinet Construction

The cabinet is fully insulated with closed cell insulation. There is no exposed fiberglass inside the cabinet. The cabinet is constructed of 24 gauge (0.6-mm) galvanized steel with removable access panels on both sides for ease of service. See Dimension drawing.

Filter

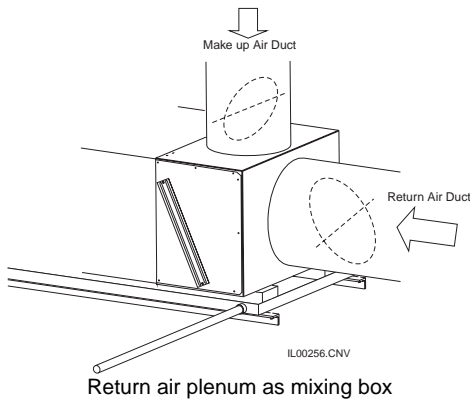
The RAP includes a disposable 1-inch (25 mm) filter. Table 1 lists the sizes. Replace with similar filter type. *Do not use filters with over 0.10-inch static pressure drop, such as electrostatic or pleated type.*

Table 1. Filter Data

Model Size	MR2430	MR3660
Size, inches mm	14 x 25 (356 x 635)	14 x 38 (356 x 965)
Max. Airflow, cfm L/s	850 400	1290 610
Max. Velocity, fpm m/s	350 1.78	
Initial Resistance, in. wg Pa	.04 10	

Providing Outside Air

The *Unico System* is designed to handle up to 100 percent outside air provided the air is filtered and all water coils are freeze protected if necessary. To accommodate outside air, the amount of required airflow must first be established in accordance with all local codes or *ASHRAE Standard 62*. Outside air is normally based on occupancy, square footage, and use. Refer to *Tech Note 105, Providing Outside Air*, for more details. The Return Air Plenum provides a convenient plenum box for connecting and filtering the combined air streams from an outside air duct and the inside air ducts.



Return Duct System

Before proceeding with the installation of the Return Air Plenum, the design and layout of the return duct system should be completed considering the following factors:

- If using return filter grilles, only use one filter. Use the filter that is most convenient for servicing.
- For optimum acoustical performance metal ducts

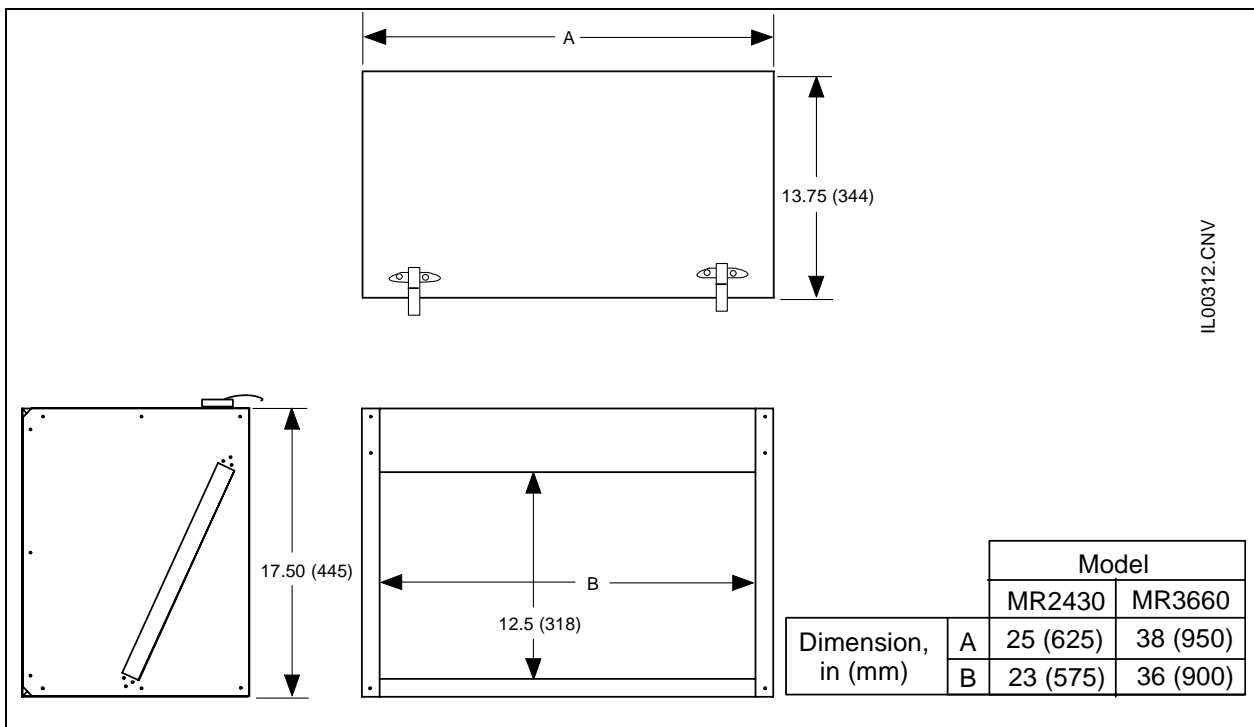
should be lined with fiberglass insulation and flexible duct should be the sound attenuating type that does not have a solid plastic inner liner.

- Multiple returns should be used when conditioning two or more spaces that do not communicate with each other. This is particularly important when heating and cooling separate floors with doors separating them or office spaces with closed doors.
- For multiple return systems, the duct system must be designed for static pressure drop no greater than 0.05 inches of water.
- Be sure the number and size of the ducts, as designed for the job, provide sufficient area for the capacity of the system. Table 2 provides the minimum return air opening for the system design airflow. This assumes ducts are no longer than 25-feet in length with generous or large radius turns. Where longer lengths and sharp radius turns are necessary, larger ducts must be used (adapters may be required).

Table 2. Total Return Opening

Unit Model	Return Air Plenum Model	Minimum Total Return Opening
2430	MR2430	200 in ² (0.13 m ²)
3642	MR3660	254 in ² (0.16 m ²)
4860		314 in ² (0.20 m ²)

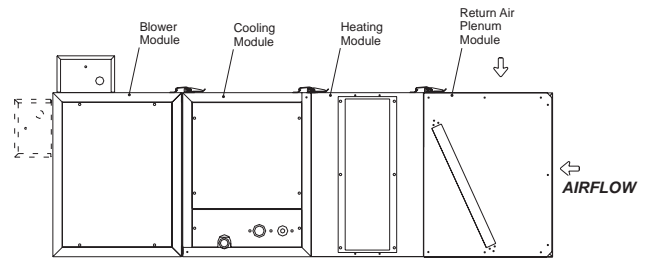
- Where round return ducts are being used, refer to Table 3 to determine the area of the various diameters of return duct. To facilitate connection



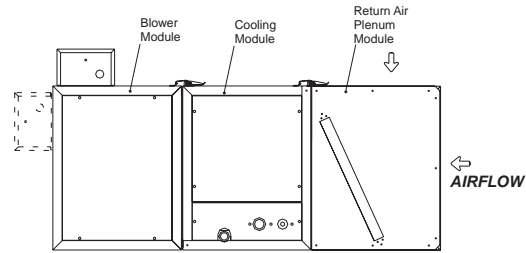
of round duct to the Return Air Plenum, consider using pre-fabricated connecting stubs or take-offs that are available from supply houses. These are available for connecting either rigid metal pipe or insulated flexible duct. Flexible duct may be retained at the connection stub using duct retaining straps such as the wire tie type. Be sure all return ducts are properly insulated with the required R-factor for the application.

Table 3. Diameter to Area conversion

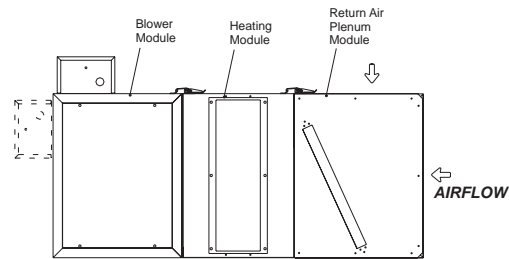
Diameter, in	Area, in ²	Diameter, mm	Area, m ²
16	201	400	0.160
14	153	350	0.120
12	113	300	0.090
10	78	250	0.063
9	63	225	0.051
8	50	200	0.040
7	38	175	0.031
6	28	150	0.023
5	19	125	0.016
4	12	100	0.010
3	7	75	0.006



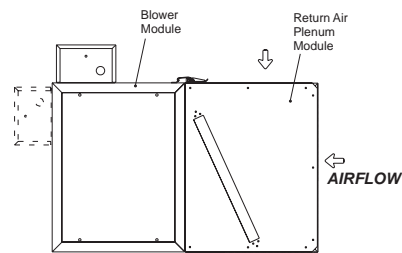
Typical Heating and Cooling System Layout



Typical Cooling Only System Layout



Typical Heating Only System Layout



Typical Blower Only System Layout

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