

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 M2430/3036R1)
- 5- Screws (for hook flange on M3642/4860R1)
- 1- Disposable Filter
- 2- Latches
- 4½ ft- length of gasket tape (M2430R1)
- 5⅞ ft- length of gasket tape (M3036R1)
- 5¾ ft- length of gasket tape (M3642/4860R1)

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.

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

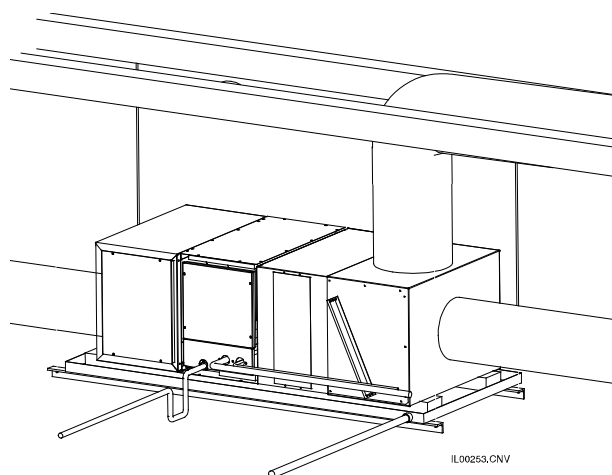
The cabinet is fully insulated with closed cell insulation. There is no exposed fiberglass inside the cabinet. The cabinet is constructed of 24 gauge (0.6-mm) galvanized steel with removable access panels on both sides for ease of service. See Dimension drawing.

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

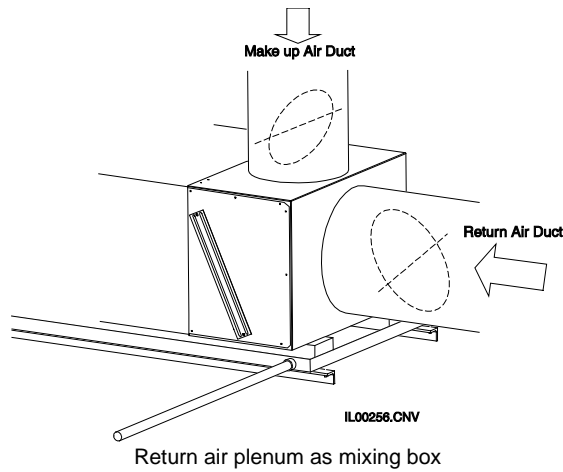
Model Size	M2430R1	M3036R1	M3642R1	M3642R1
Size, inches (mm)	14 x 25 (356x635)	14 x 30 (356x762)	14 x 38 (356x965)	14 x 38 (356x965)
Max. Airflow, cfm (L/s)	850 (400)	1020 (408)	1290 (610)	1290 (610)
Max. Velocity, fpm (m/s)	350 (1.78)			
Initial Resistance, in. wg (Pa)	.04 (10)			



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

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.



- 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).

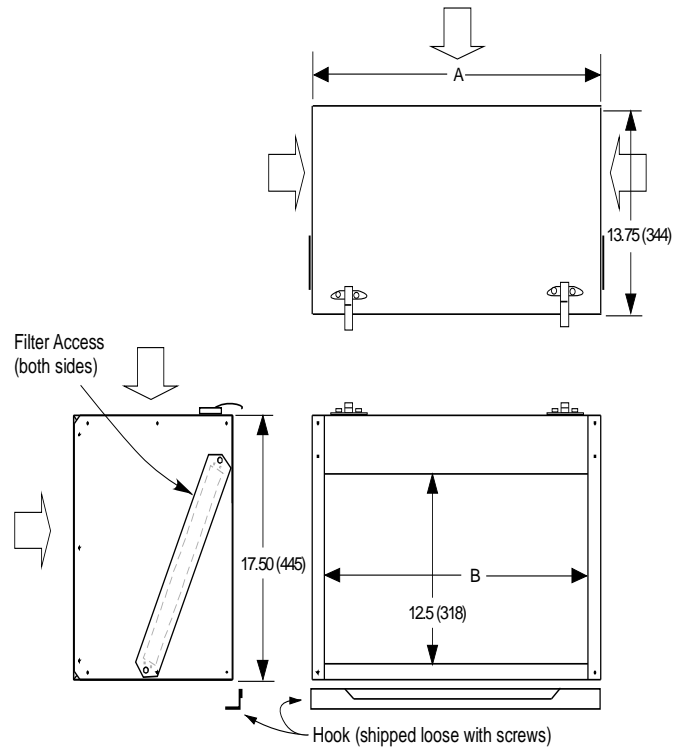
Table 2. Total Return Opening

Return Air Plenum Model	Sum of All Return Ducts, in ² (mm ²)	Equivalent Diameter, in. (mm)
M2430R1	154 in ² (0.10 m ²)	14 (356)
M3036R1	201 in ² (0.13 m ²)	16 (406)
M3642R1	254 in ² (0.16 m ²)	18 (457)
M4860R1	314 in ² (0.20 m ²)	20 (508)

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.



Model	Dimension, inch (mm)	
	A	B
M2430R1	25 (635)	23 (584)
M3036R1	30 (762)	28 (711)
M3642R1	38 (965)	36 (914)
M4860R1		

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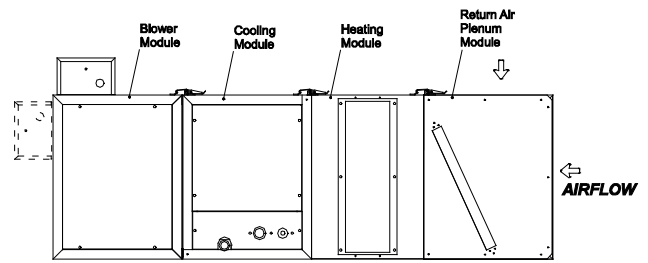
- Where round return ducts are being used, refer to Table 3 to determine the area of the various diameters of return duct. To facilitate connection of round duct to the Return Air Plenum, consider using pre-fabricated connecting stubs or take-offs that are available from supply houses. These are available 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

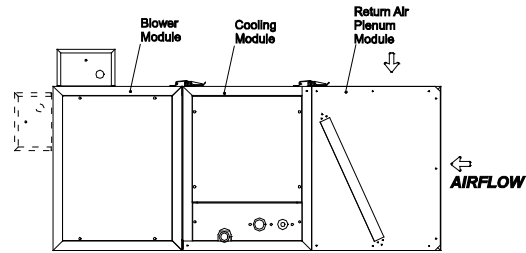
Diameter, in	Area, in ²	Diameter, mm	Area, m ²
16	201	400	0.160
14	153	350	0.120
12	113	300	0.090
10	78	250	0.063
9	63	225	0.051
8	50	200	0.040
7	38	175	0.031
6	28	150	0.023
5	19	125	0.016
4	12	100	0.010
3	7	75	0.006

Cross Reference of Old and New Model Numbers

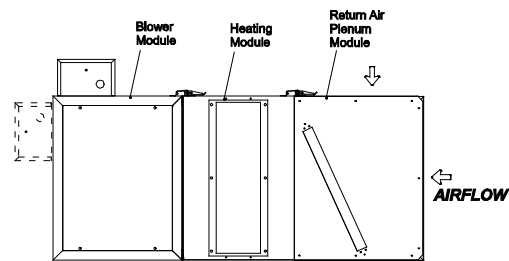
Old Model #	New Model #
MR2430	M2430R1
N/A	M3036R1
MR3660	M3642R1
MR3660	M4860R1



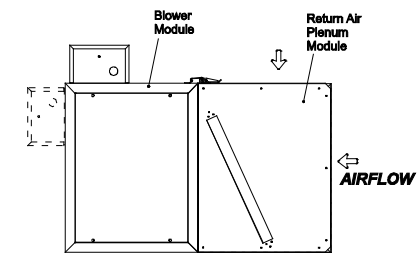
Typical Heating and Cooling System Layout



Typical Cooling Only System Layout



Typical Heating Only System Layout



Typical Blower Only System Layout

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