

M SERIES BLOWER MODULE

Model Number

M 2430 B L 1 - ST2 1
 ① ② ③ ④ ⑤ ⑥ ⑦

- ① **Unit Type**
M=Modular
- ② **Nominal Capacity**
2430=24000 to 30000 Btu/hr
(7.0 to 8.8 kW)
3036=30000 to 36000 Btu/hr
(8.8 to 10.5 kW)
3642=36000 to 42000 Btu/hr
(10.5 to 12.3 kW)
4860=48000 to 60000 Btu/hr
(14.0 to 17.5 kW)
- ③ **Module Type**
B=Blower Module
- ④ **Configuration**
L=Left-hand connection
- ⑤ **Revision**
1, 2, 3, etc.
- ⑥ **Power Supply, Motor Type**
ST2=1/60/208-240, single-speed
EC1=1/60/120, variable-speed
EC2=1/50-60/240, variable-speed
- ⑦ **Paint Option**
(Blank)=None
1=White

* A cross-reference chart listing current and past model numbers is available at the end of this bulletin.

General Information

The Unico System patented[†] modular blowers are designed for use with the Unico System small-duct high-velocity (SDHV) system. The blowers exceed the U.S. Department of Energy requirements for SDHV systems requiring a minimum external static pressure of 1.2 inches of water (0.3 kPa) at the rated airflow when installed with the compatible Unico cooling module. All cooling modules are available in Heat Pump, Chilled Water and refrigerant configurations.

Blower Module	Matching Heating/Cooling Coil Module
M2430BL1	M2430CL1-*
M3036BL1	M3036CL1-*
M3642BL1	M3642CL1-*
M4860BL1	M4860CL1-*

Standard Modules Note: Model numbers listed above may not include the latest revision code.



Figure 1. Typical Blower Module with cutaway revealing motor (-ST2 Model)

Typical Application

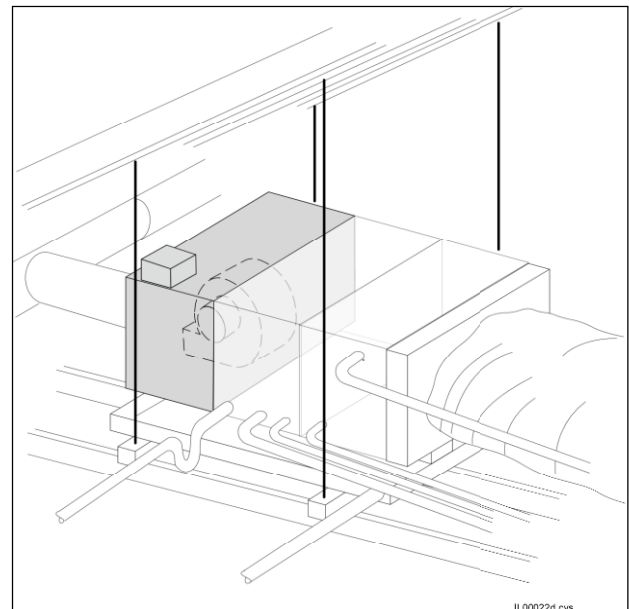


Figure 2. Attic Installation with Unico System Cooling Module, Heating

Applications

For air-conditioning, the rated airflow is 250 CFM per nominal* ton (34 L/kW-s) and for heat pumps it is 275 CFM per nominal ton (37 L/kW-s). For proper operation, we do not recommend flow rates less than 200 CFM per nominal ton (27 L/kW-s). Refer to the *Blower Capacity Data* tables and graphs later in this bulletin for blower performance data showing static pressure and amperage versus air flow.



CERTIFIED TO UL STD 1995
 CONFORMS TO CAN/CSA STD C22.2
 NO. 236

[†] U.S. Patent No. 5,277,036

* "Nominal" refers to the nameplate size of the condensing unit or heat pump.
 Note — Dimensions and specifications are subject to change without notice.

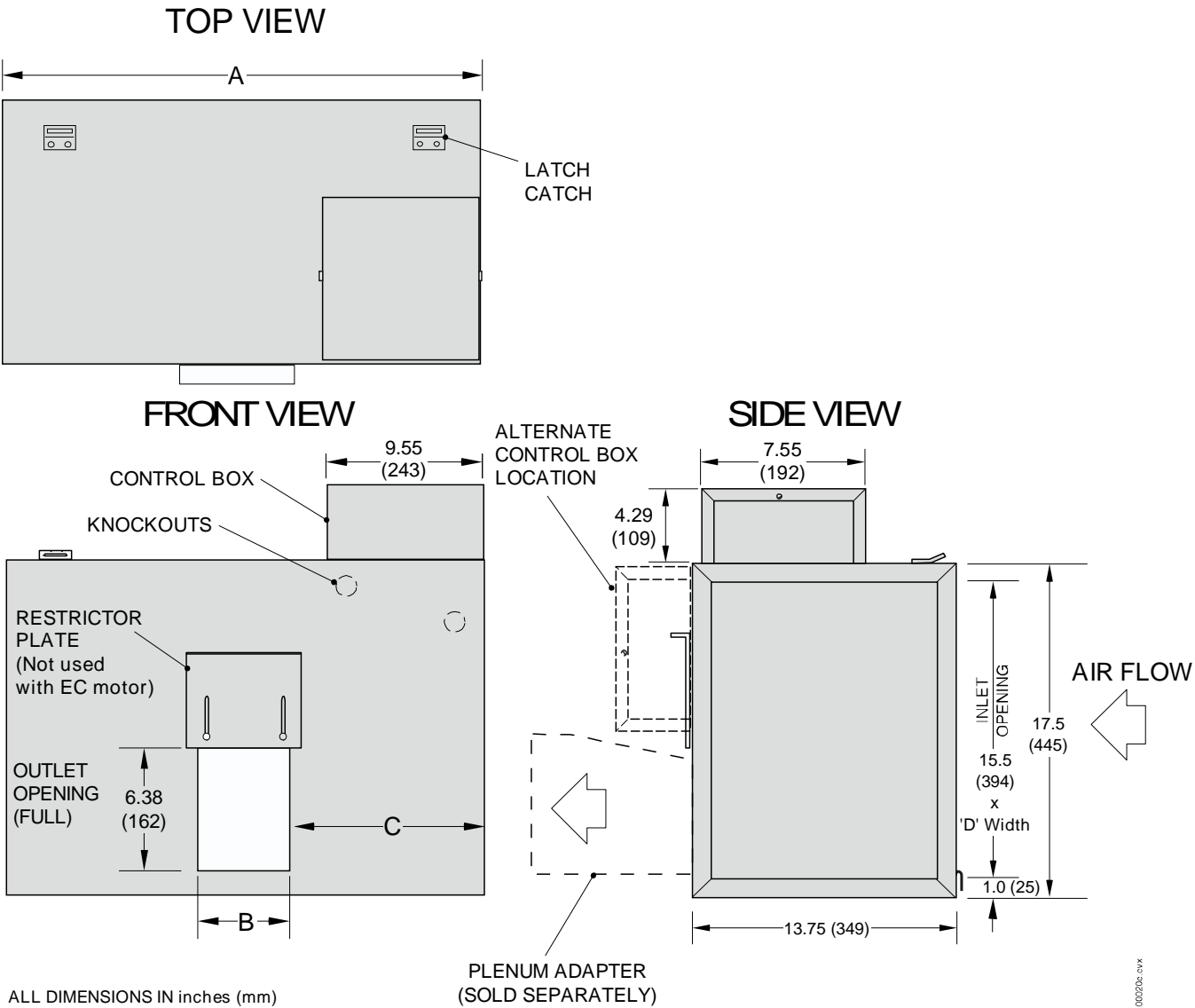
Cabinet Construction

The cabinet is constructed of 22 gauge (0.7mm) galvanized steel with removable access panels installed on both sides for ease of service. All access panels are secured with slotted hex head washer screws and hardened steel U-clip nuts to prevent stripping. The cabinet is fully insulated with closed cell insulation. There is no exposed fiberglass inside the cabinet. See dimension drawing.

All blower modules feature electrical connections and service access panels on the left-hand side of the unit when viewing the return with the airflow at your back.

Right hand blowers are available upon request. In this case, the blower discharge opening is near the top of the cabinet.

Dimensional Data



IL00020a.svx

Model No.		M2430BL1	M3036BL1	M3642BL1	M4860BL1
Dimensions [in. (mm)]	A	25.00 (635)	30.00 (762)	38.00 (965)	38.00 (965)
	B	6.00 (152)	7.24 (184)	7.16 (182)	9.92 (252)
	C	9.50 (242)	11.38 (289)	15.40 (392)	14.00 (356)
	D	23.00 (584)	28.00 (711)	36.00 (915)	36.00 (915)

Acoustic Data

Sound is always present in our lives and is important to comfort. Understanding how sound is defined is essential to understanding how to design a proper Unico System. Sound is defined as a physical disturbance in pressure that is detectable by the human ear. Sound is usually presented as Sound Pressure Level (SPL) in decibels (dB), but can also be presented as Sound Power Level (SWL). Sound pressure is what you hear so it is the only value that is important to the occupant. However, determining the value is difficult because it is dependent on the surroundings and distance from the sound source. For instance, a carpeted room is much quieter than a room with wood floors.

For the Unico System, it is also important to consider sound transmission losses through ceilings and walls. Since the blower is never placed in an occupied space, the SPL in that space is always less than the published value. This reduction in sound level depends on the construction of the ceiling or wall. For instance, a ceiling structure made of gypsum board with insulation above it will have a much greater sound transmission loss (TL) than a dropped ceiling without insulation.

The data shown in this catalog comes from measurements taken in a large room with hard surfaces for the walls and floor. It is considered to be the worst case (i.e. loudest) situation. The SPL in the occupied space will always be considerably less than this, depending on where the unit is located. To determine the actual SPL, subtract the TL for the barrier from the sound data of the unit. The table below shows typical TL values for common construction configurations. Subtract these values from the Unico air handler data.

Transmission Loss for Common Construction [dB]							
Frequency [Hz]	125	250	500	1k	2k	4k	R
Sheet Metal, 24 ga	13	17	20	27	34	39	18
Ceiling Tile, mineral fiber	13	21	27	31	35	40	20
Gypsum Frame wall	12	23	31	38	42	37	20
Gypsum Frame wall, insul.	15	30	32	43	46	38	23
Wood Floor, uninsulated	22	28	37	43	46	43	25
Wood Floor, insulated	29	40	51	57	60	58	26
Concrete Block, 190-mm	38	41	43	50	55	61	26
Concrete, 100-mm (4 in.)	41	41	45	52	56	64	26

Ref: *Handbook of Acoustical Measurements and Noise Control*, 1998

R = Overall Loss for typical Blower Module

All –STD models include a patented restrictor plate to fine tune the airflow. This plate creates a small amount of turbulence and noise. However, this is only noticeable near the unit if the unit is installed close to the occupied space. The –EC models do not need a restrictor plate and, consequently, the sound pressure level in the occupied space can be as much as 3-5 dB quieter.

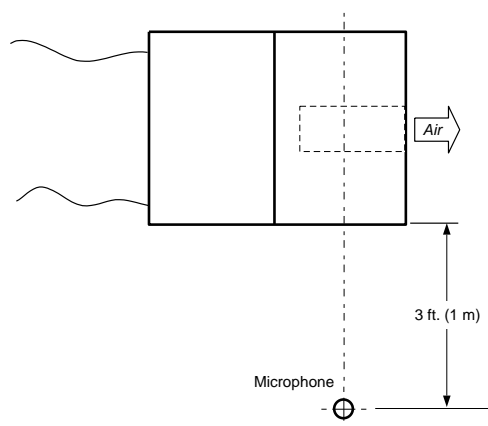
Note: Using muffler on the discharge of the unit will reduce the sound pressure by 3 dB. The muffler should be a metal duct with at least 1.5 inches (38 mm) of fiberglass

insulation, measuring at least 10in. D × 20in. L (250mm D × 500mm L).

Example. Consider an M2430BL1 located above a dropped ceiling. The SPL generated by the unit is 56dB, and the transmission loss due to the ceiling is 20dB, resulting in a overall SPL of 36dB. Similarly, if the same unit were installed in an attic with insulation(TL=26dB), the SPL would be only 30dB. This makes the Unico System one of the quietest systems on the market.

Sound Pressure Levels (L_p)

The sound pressure level for each unit was measured in a reverberant room measuring approximately 21ft × 35ft (6.4m × 10.7m) with hard tiled floors, hard walls, acoustical ceiling tiles, and no furniture. The sound level meter was located near the side of the unit as shown below.



The data shown on the next page was measured at a motor speed of 1700 RPM at maximum airflow. It is considered the worst (loudest) case scenario. Using the EC motor with additional outlets will significantly reduce the radiated sound by reducing the required static pressure and consequently the motor speed.

Blower Performance Data for –ST2 models(with cooling module installed) at 60Hz/230V.

Model	External Static Pressure [in. w.c. (kPa)]									
	1.0 (0.25)		1.25 (0.31)		1.5 (0.37)		1.75 (0.44)		2.0 (0.50)	
	CFM (L/s)	Amps	CFM (L/s)	Amps	CFM (L/s)	Amps	CFM (L/s)	Amps	CFM (L/s)	Amps
-STD Models										
M2430BL1	870 (410)	3.1	810 (383)	2.9	740 (351)	2.7	660 (310)	2.4	510 (240)	2.0
M3036BL1	1170 (552)	4.6	1150 (543)	4.4	1070 (505)	4.1	965 (455)	3.8	825 (389)	3.2
M3642BL1	1240 (585)	4.8	1170 (552)	4.5	1070 (505)	4.1	925 (437)	3.6	745 (352)	3.1
M4860BL1	1472 (695)	4.7	1400 (660)	4.5	1300 (610)	4.2	1162 (548)	3.9	953 (450)	3.4