



M SERIES REFRIGERANT COIL MODULE

REFRIGERANT COILS for R454B, R32, R-410A

Bulletin 20-020.2

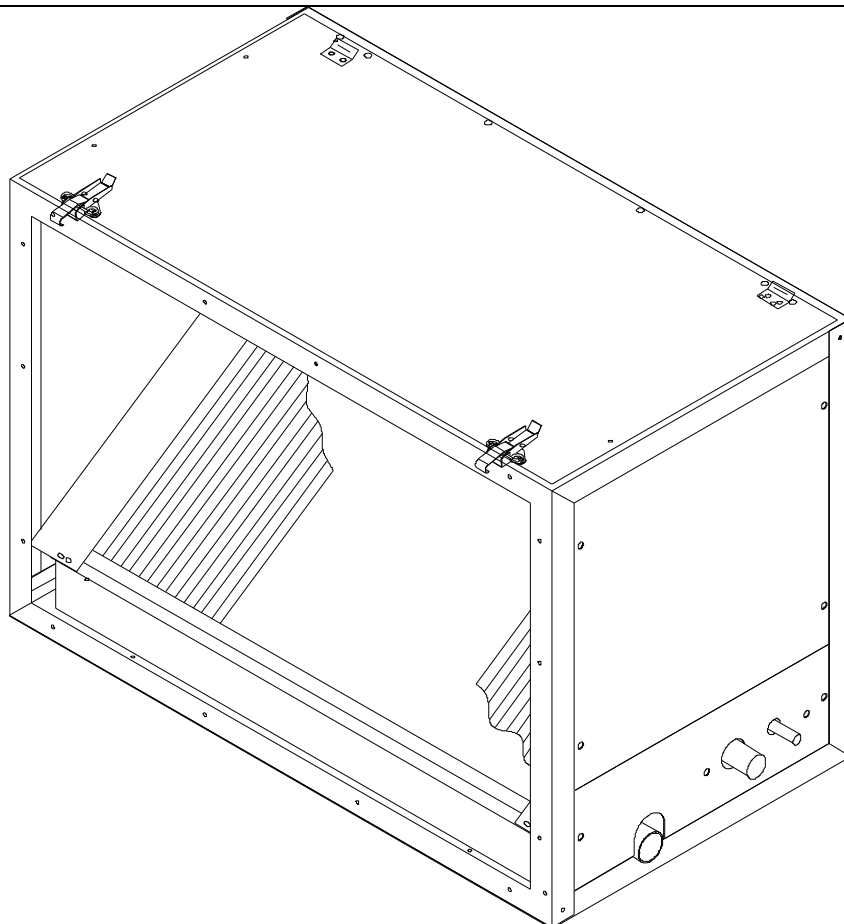


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Certified to UL 60335-2-40
 UL 60335-1
 Conforms to CSA C22.2 #60335-2-40
 CSA C22.2 #60335-1



Unico products comply with the European regulations that guarantee product safety.

MODEL NUMBER KEY

M **2430** **C** **L** **1** - **B** **1** **C** **1**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Unit Type

M = Modular

② Nominal Capacity

1218 = 12000 to 18000 Btu/hr
(3.5 to 5.3 kW)

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

C = Coil

④ Configuration

L = Left-hand connection

R = Right-hand connection

⑤ Revision

1, 2, 3, etc.

⑥ Coil Style, TXV Option

B = 4 row coil (2430/3036/3642)
3 row coil (4860)

E = 6 row coil
(1218/2430/3036/3642)
4 row coil (4860)

BA = 4 row aluminum tube coil
(2430/3036/3642 only)

⑦ Paint Color

0 = None

1 = White

For R-410A coils, (7), (8), and (9) are blank (not used).

For coils sold in the USA, R-410A coils are for replacement only.

⑧ Coil Coating

(blank) = None

C = E-Coat

⑨ Refrigerant Type

1 = A2L



Figure 1. Refrigerant Coil Module with cut-away (E-style shown).

Matching Blower/Heating Modules

Evaporator Coil Prefix	Matching Blower Module Prefix	Matching Hot Water Coil Module Prefix
M1218CL1/ M1218CL2	M1218BL*	M1218CL1
M2430CL1	M2430BL*	M2430CL1
M3036CL1	M3036BL*	M3036CL1
M3642CL1	M3642BL*	M3642CL1
M4860CL1	M4860BL*	M4860CL1

PACKING LIST

Package includes:

- (1) – Coil Module
- (1) – Liquid line extension, 3/8-inch (9.5mm) OD
- (1) – Spacer Module (M4860CL1 only)
- (1) – PVC Condensate Trap
- (1) – (For R-454B, R-32 models) Refrigerant Sensor and Mitigation Control
- (1) – For R-410A models) Expansion Valve*

* For A2L units, order expansion valve separately

GENERAL INFORMATION

Unico System designed and built evaporator coil modules can be easily installed with the matching *Unico System* blower modules. See coil/blower match-up table below. The evaporator can be matched to most types of remote condensing units and heat pumps. All coils are designed for both heat pump and cooling-only applications. Check the AHRI directory for compatibility, capacity, and efficiency ratings (www.ahrinet.org).

FEATURES

- Slant coil for M1218, M2430, M3036, M3642 for vertical or horizontal airflow applications. A-coil for M4860.
- Internally mounted TXV easily accessible*
- Compatible with R-454B, R-32 and R-410A refrigerants
- Standard *Unico System* ‘latch’ system
- High efficiency heat transfer surface
- Temperature limit switch to prevent freezing
- (optional) E-Coating for B and E coils (not for BA style) improved corrosion resistance and coil life

* Must be ordered separately for R-454B and R-32 models

TYPICAL APPLICATION

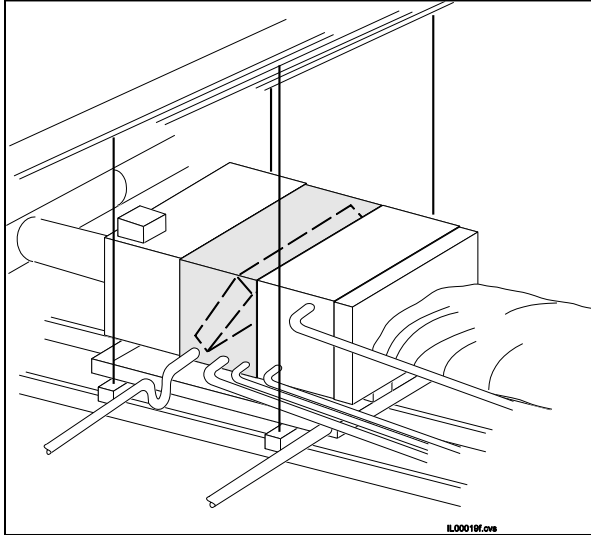


Figure 2. Horizontal installation with *Unico System* Heating Module and Blower Module

CABINET CONSTRUCTION

The cabinet is constructed of 22 gauge (0.030 in, 0.76 mm) galvanized steel with removable access panels 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 lined with closed cell insulation and does not contain fiberglass insulation. Easy snap latches are included for quick field assembly with the matching modules.

COIL CONSTRUCTION

Unico-designed coils are constructed of evenly spaced aluminum fins mechanically bonded to copper tubes (B, E style) or aluminum (BA style). The tubes are 3/8" (9.52 mm) diameter. Full fin collars provide the greatest tube-fin contact for excellent heat transfer. All coils are slanted, except the M4860 models, which feature an 'A' shaped coil to provide the maximum amount of heat transfer surface.

The coil is pressurized and then factory leak tested. The drain pan is constructed of stainless steel for maximum corrosion protection with a 3/4-inch (19 mm) FPT drain connection. All refrigerant lines are sweat connections that extend outside of the cabinet.

An E-Coated coil option is available for all evaporator coil models with copper tubes. E-Coating improves the life of the coil by reducing the possibility of leaks and coil failures due to chemical attack, particularly formicary corrosion.

CONTROLS

Each coil is supplied with an anti-frost switch mounted directly on the return bends to prevent the formation of ice during cooling operation. For heat pump applications, the anti-frost switch during the heating mode.

The expansion valve is suitable for both air-conditioning and heat pump applications. It includes an internal check valve for proper operation in the heating mode. In addition, the valves employ mechanical threaded connections with a Teflon o-ring (Chatleff style) for easy installation.

TXV INSTALLATION

Each coil comes with two access fittings – one for servicing the unit and one for TXV equalizer line installation.

NOTE

FOR R-454B AND R-32 MODELS: THE TXV IS NOT INCLUDED WITH THE COIL MODULE AND MUST BE PURCHASED SEPARATELY. SEE SPARE PARTS LIST ON PAGE 6 FOR TXV KIT NUMBERS.

REFRIGERANT COIL MODULE SPECIFICATIONS

Model No.	M2430CL1-B M2430CL1-BA	M3036CL1-B M3036CL1-BA	M3642CL1-B M3642CL1-BA	M4860CL1-B
Compatible condenser size, Ton (kW)	1.5-2.5 (5.0–8.8)	2.0-3.0 (7.0-10.5)	3.0-4.0 (10.5–14.0)	4.0-5.0 (14.0-17.6)
Net face area, ft ² (m ²)	2.13(0.20)	2.34(0.22)	3.48(0.32)	7.44(0.69)
Tube diameter, in. (mm)	3/8 (9.5)			
Fin density, fins/in. (fins/m)	B: 14 (551) BA: 15 (590)			
Number of rows	4			3
Internal Coil Volume, in ³ (cm ³)	B: 118 (1934) BA: 97 (1589)	B: 147 (2409) BA: 120 (1966)	B: 194 (3179) BA: 158 (2589)	307 (5031)
Design pressure, psig (kPa)]	500 (3447)			
Suction line O.D., in. (mm)	7/8 (22.2)			
Liquid line OD., in. (mm)	3/8 (9.5)			
P-trap condensate connection, in. (mm)	3/4 FPT(19)			
Refrigerant type	R-454B / R-32 / R-410A			
Expansion device*	TXV with internal Check Valve*			
Expansion valve* nominal size, ton (kW)	2	3	4/5	
Cabinet dimensions, in. (mm)	Width	25.0 (635)	30.0 (762)	38.0 (965)
	Height	17.5 (445)		
	Depth	13.5 (343)		
Net weight, lbs. (kg)	B: 50 (23) BA: 42 (19)	B: 58 (26) BA: 50 (23)	B: 70 (32) BA: 57 (26)	108 (49)
Shipping weight, lbs. (kg)	B: 54 (24) BA: 46 (21)	B: 62 (28) BA: 54 (25)	B: 77 (35) BA: 64 (29)	119 (54)

* TXV not included, order TXV separately

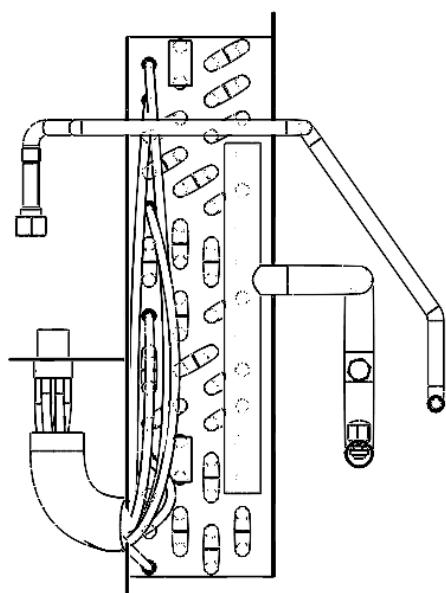
Model No.		M1218CL*-E	M2430CL1-E	M3036CL1-E	M3642CL1-E
Compatible condenser size, Ton (kW)		1.0-1.5 (3.5-5)	1.5-2.5 (5.0–8.8)	2.0-3.0 (7.0-10.5)	3.0-4.0 (10.5–14.0)
Net Face Area, ft² (m²)		1.17 (0.11)	2.13 (0.20)	2.65 (0.25)	3.48 (0.32)
Tube diameter, in. (mm)		3/8(9.5)			
Fin density, fins/in. (fins/m)		15 (590)	15.5 (610)		
Number of rows		6			
Internal Coil Volume, in³ (cm³)		98 (1606)	178 (2917)	221 (3625)	291 (4769)
Design pressure, psig (kPa)]		500 (3447)			
Suction line O.D., in. (mm)		5/8 (15.9)	7/8 (22.2)		
Liquid line OD., in. (mm)		3/8 (9.5)			
P-trap condensate connection, in. (mm)		3/4 FPT(19)			
Refrigerant Type		R-454B / R-32 / R-410A			
Expansion device*		TXV with internal Check Valve*			
Expansion valve* nominal size, ton (kW)		CL1: 1.5 CL2: 2	2	3	
Cabinet dimensions, in. (mm)	Width	20.0 (520)	25.0 (635)	30.0 (762)	38.0 (965)
	Height	12.0 (305)	17.5 (445)		
	Depth	16 (406)	13.5 (343)		
Net weight, lbs. (kg)		36 (16)	50 (23)	58 (26)	70 (32)
Shipping weight, lbs. (kg)		41 (19)	54 (24)	62 (28)	77 (35)

* TXV not included, order TXV separately

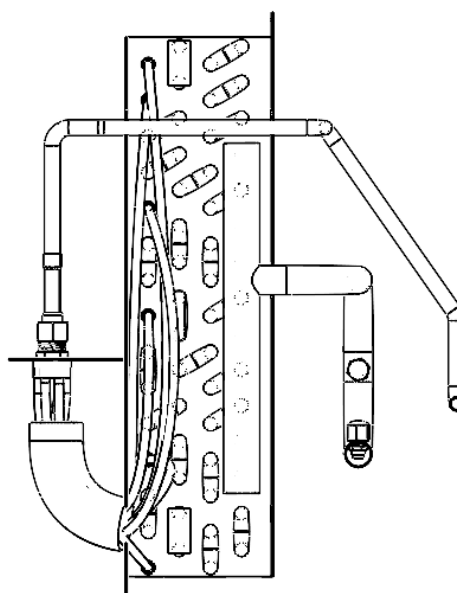
ACCESSORIES

Liquid Line Extension (when TXV is not needed)

Part No.	Description
A01023-G01	Liquid line extension, LH, M2430/3036/3642C-B
A01023-G02	Liquid line extension, RH, M2430/3036/3642C-B
A01023-G03	Liquid line extension, LH, M2430/3036/3642C-B, for applications w/o TXV
A01023-G04	Liquid line extension, RH, M2430/3036/3642C-B, for applications w/o TXV
A01044-G01	Liquid line extension, M4860CL1-B
A00392-G01	Liquid line extension, Flare, M1218CL1
A02735-G01	Liquid line extension, Chatleff, M1218CL2
A01024-G01	Liquid line extension, LH, M2430/3036/3642C-E
A01024-G02	Liquid line extension, RH, M2430/3036/3642C-E
A01024-G03	Liquid line extension, LH, M2430/3036/3642C-E, for applications w/o TXV
A01024-G01	Liquid line extension, RH, M2430/3036/3642C-E, for applications w/o TXV



Application with TXV



Application without TXV

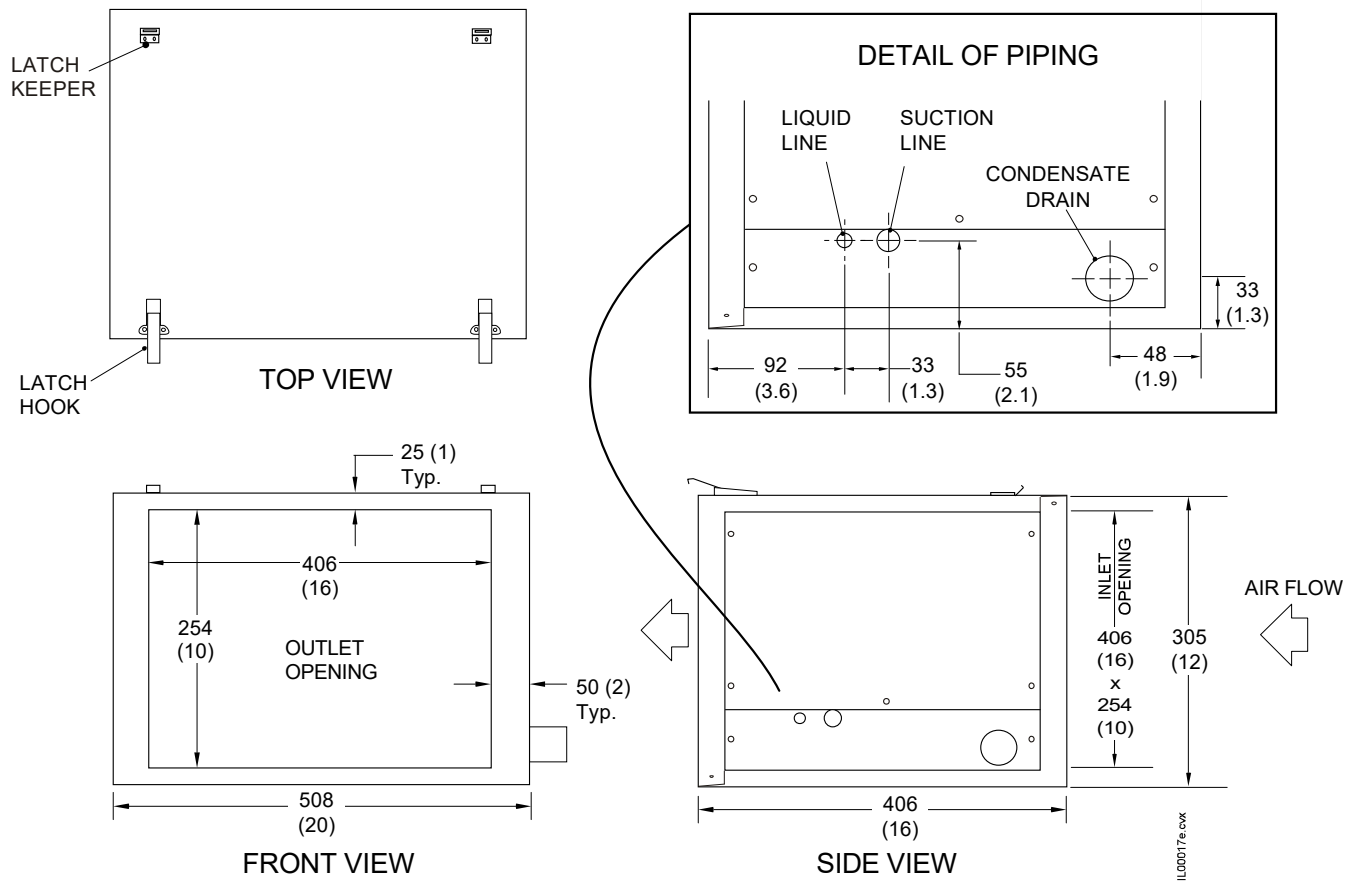
Expansion Valve (when sold separately)

Part No.	Description
TXV-1T-454	TXV Kit, R454B, 1-ton, M1218
TXV-2T-454	TXV Kit, R454B, 2-ton, M2430
TXV-3T-454	TXV Kit, R454B, 3-ton, M3036
TXV-4T-454	TXV Kit, R454B, 3-ton, M3642
TXV-5T-454	TXV Kit, R454B, 4-ton, M4860
TXV-1T-32	TXV Kit, R32, 1-ton, M1218
TXV-2T-32	TXV Kit, R32, 2-ton, M2430
TXV-3T-32	TXV Kit, R32, 3-ton, M3036
TXV-4T-32	TXV Kit, R32, 4-ton, M3642
TXV-5T-32	TXV Kit, R32, 5-ton, M4860

Condensate Drain

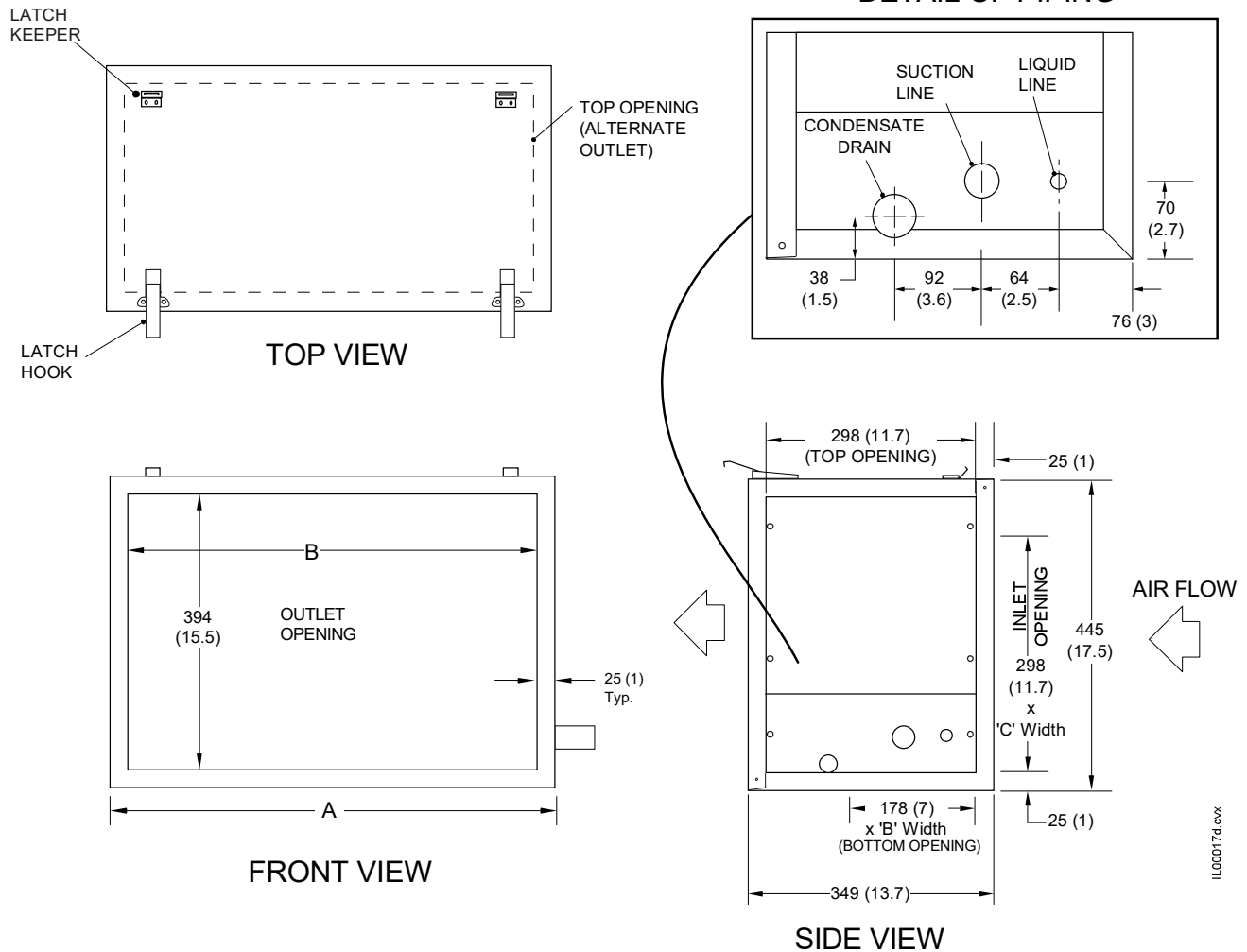
Part No.	Description
A02713-K01	P-trap Kit
A01514-G01	Waterless Condensate Trap Kit

M1218



All dimensions are in mm (inches)

M2430/3036/3642

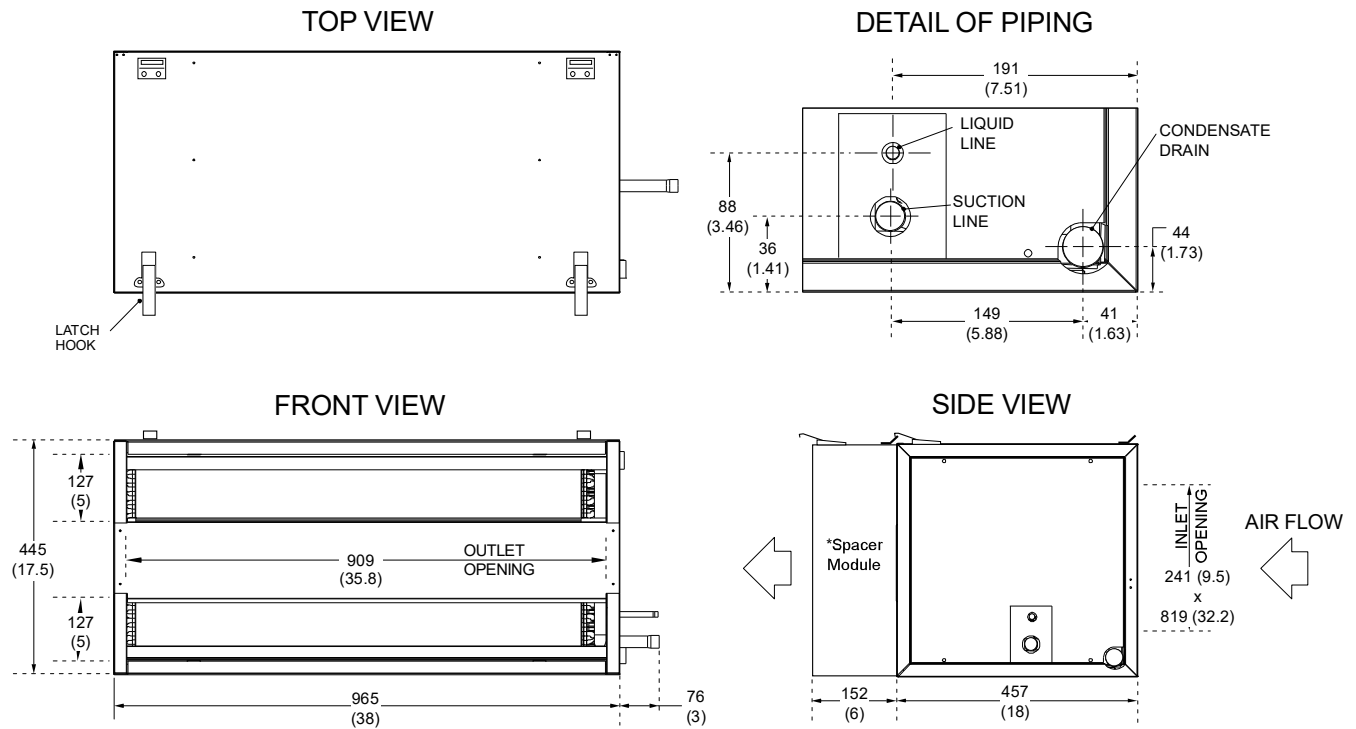


	2430	3036	3642
A	635 (25.0)	762 (30.0)	965 (38.0)
B	584 (23.0)	711 (28.0)	915 (36.0)
C	508 (20.0)	635 (25.0)	838 (33.0)

All dimensions are in mm (inches)

Unit shown for horizontal airflow arrangement. Use alternate openings for vertical arrangement.

M4860

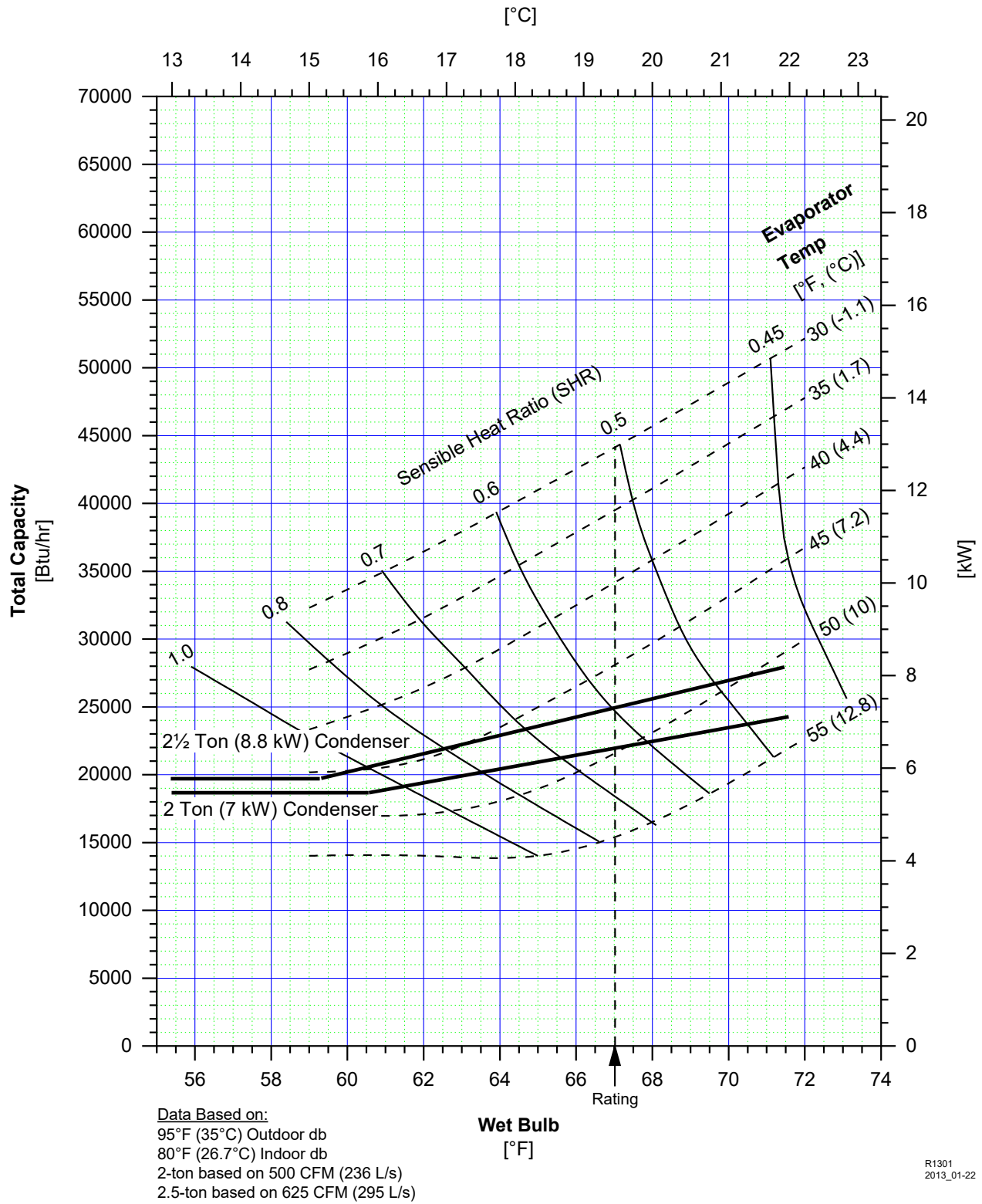


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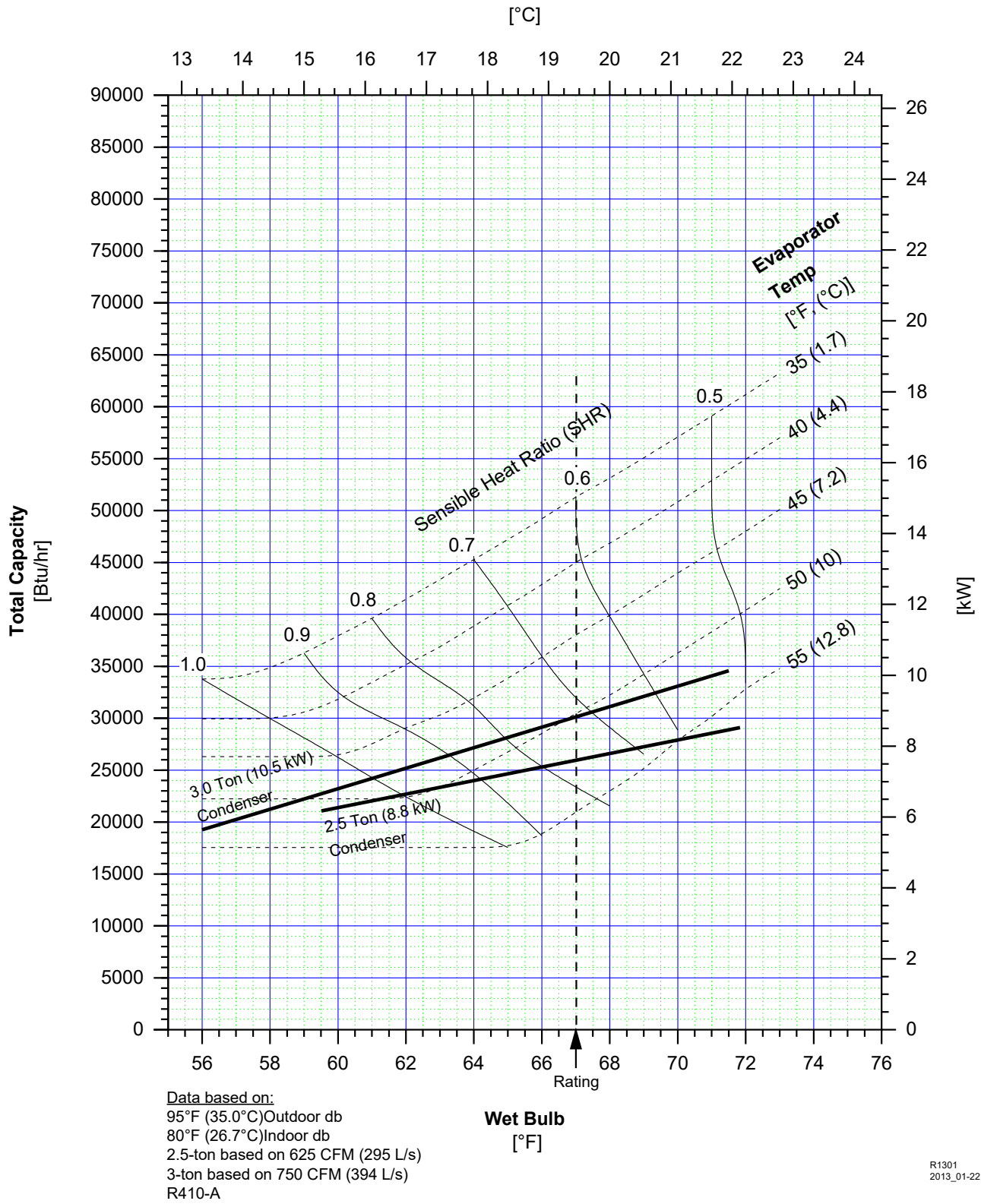
All dimensions are in mm (inches)

COOLING CAPACITY

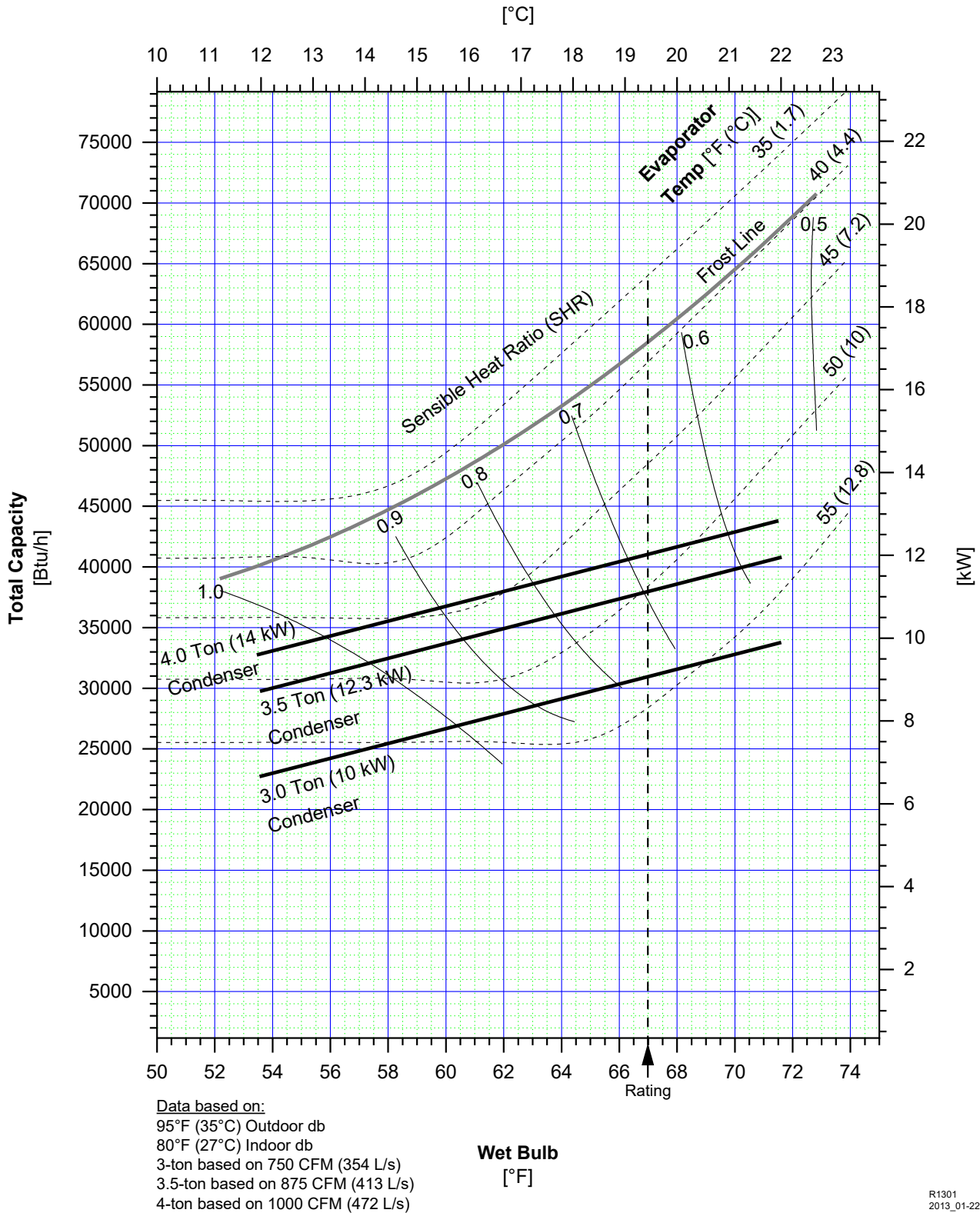
M2430C**

R1301
2013_01-22

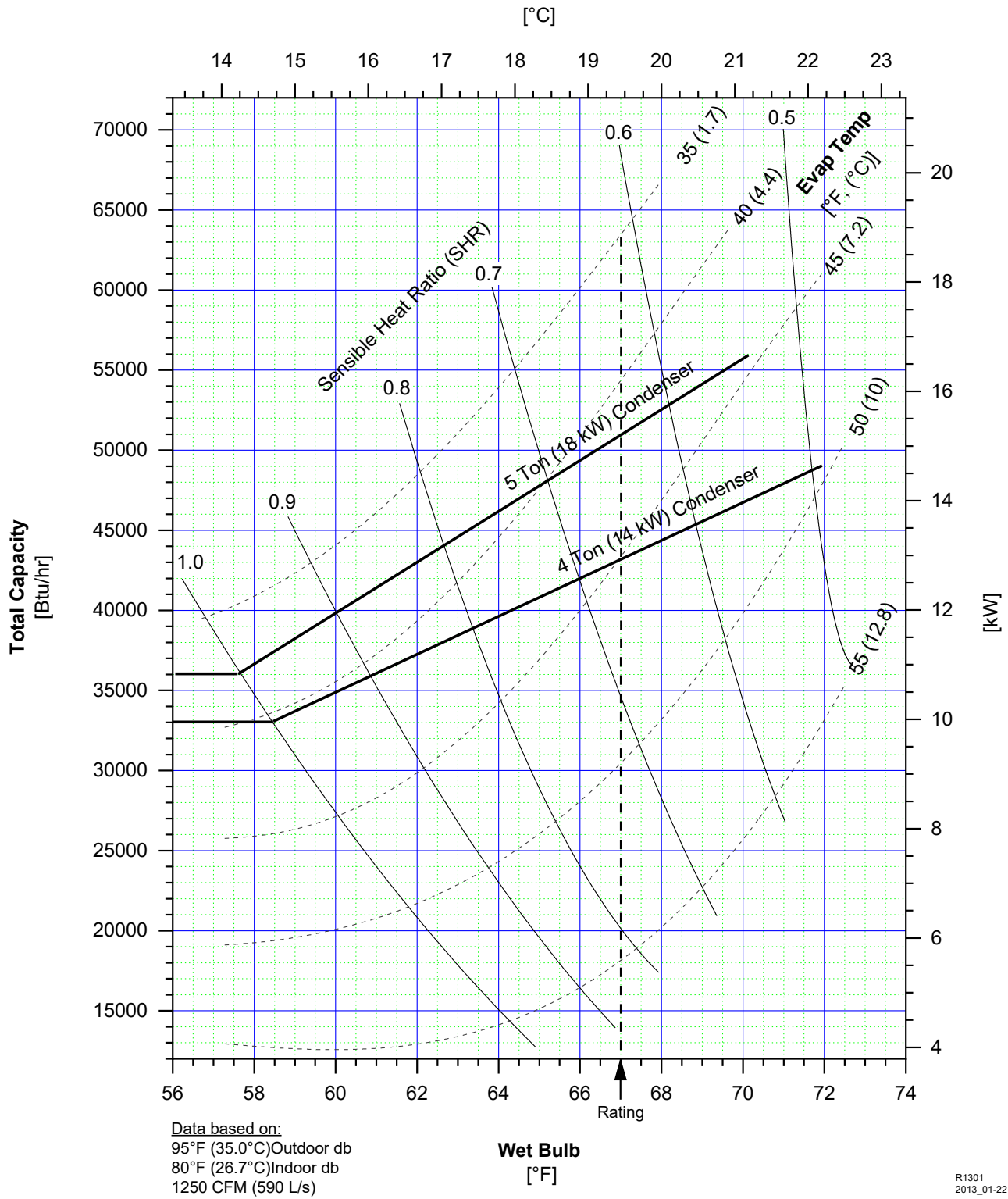
M3036C**



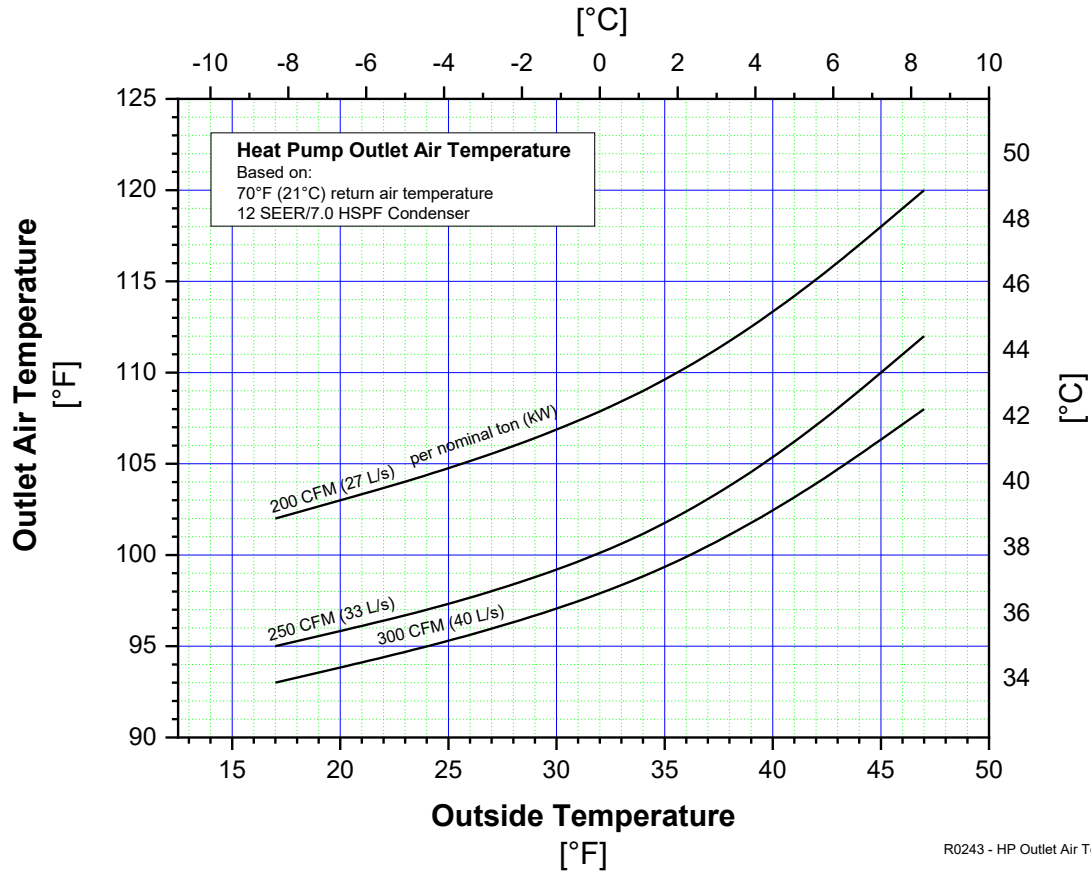
M3642C**

R1301
2013_01-22

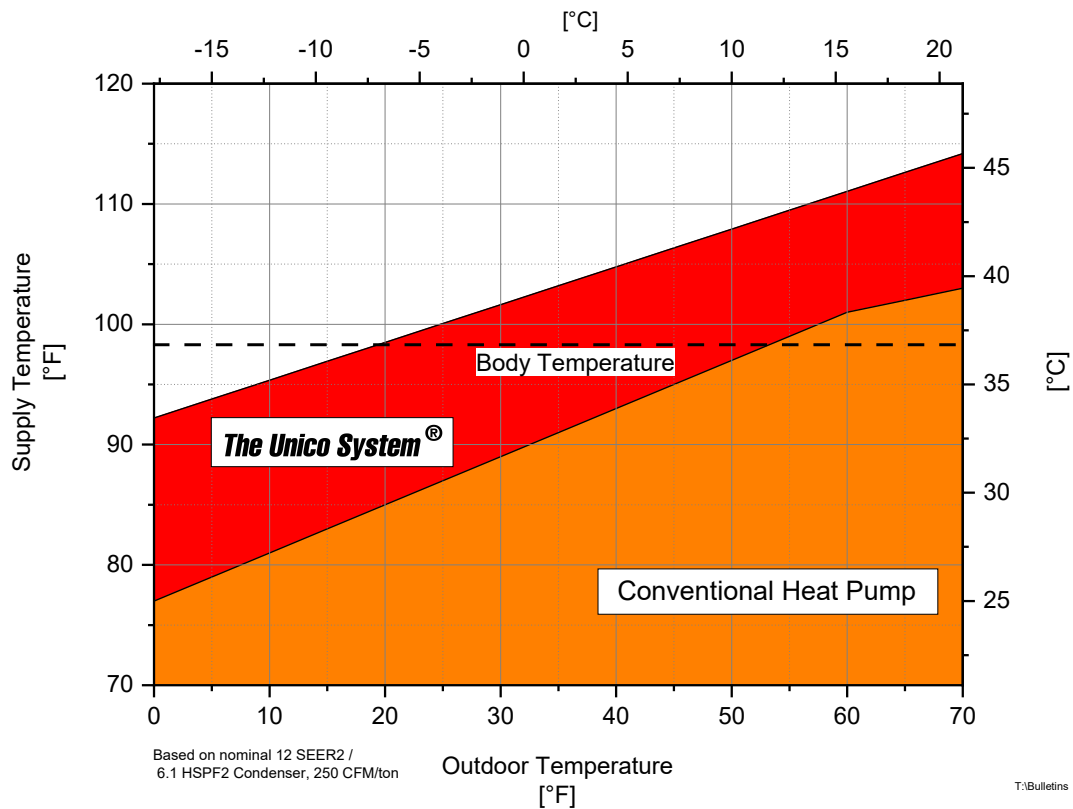
M4860C**



HEATING CAPACITY



The Heat Pump System "That FEELS Warm"



EXAMPLES

Example 1. Find the total sensible heat capacity of a 2.5 Ton (8.8 kW) condenser matched to a 2430 system with indoor temperature of 80°F (27°C) dry bulb / 66°F (19°C) wet bulb.

Solution:

First, determine the total heat capacity, which is defined as the sum of the sensible heat and latent heat. Sensible heat is the energy due to temperature change, whereas latent heat is the energy embodied in a phase change. Latent heat is associated with the amount of moisture removed from the air and sensible heat is associated with the air temperature drop.

To find the total capacity, go to the performance graph of the 2430 coil and trace a line vertically from the 66°F (19°C) mark until it crosses the 2.5 ton (8.8 kW) line. From that intersection, carry a line horizontally until it intersects the Total Capacity axis. You can then read the total capacity directly. In this case:

Total Heat Capacity = 27,000 BTU/hr (7.9 kW)

Next, determine the sensible heat capacity using the Sensible Ratio (SHR) and the total heat capacity from above.

The Sensible Heat Ratio (SHR) is defined as the ratio of the Sensible Heat Capacity to the Total Heat Capacity, where:

$$SHR = \frac{\text{Sensible Heat Capacity}}{\text{Total Heat Capacity}}$$

and

$$\text{Total Heat} = \text{Sensible Heat} + \text{Latent Heat}$$

To determine the sensible heat ratio, find where the wet bulb temperature crosses the selected condensing unit line. There are a series of solid lined curves numbered 1.0 to 0.45. The Sensible Heat Ratio is 0.61

$$\text{Sensible Heat Ratio} = 0.61$$

To determine the sensible heat capacity, take the Total Heat, 27,000 BTU/hr, and multiply it by the Sensible Heat Ratio, 0.61.

$$\text{Sensible Heat Capacity} = 16,470 \text{ BTU/hr (4.8 kW)}$$

Subtracting this from the Total Heat Capacity gives the amount of Latent Heat.

$$\text{Latent Heat Capacity} = 10,530 \text{ BTU/hr (3.1 kW)}$$

Example 2. Find the outlet temperature of a Unico System Heat Pump when the outdoor temperature is 30°F (-1°C) and the flow rate is 250 CFM (33 L/s) per nominal ton (kW).

Solution:

Refer to the Heat Pump Outlet Air Temperature graph. The outlet air temperature can be read directly from this graph by finding the intersection of the point where the 30°F (-1°C) outdoor temperature line intersects the 250 CFM (33 L/s) per nominal ton (kW) line, and a horizontal line passing through the vertical axis, "Outlet Air Temperature".

$$\text{Outlet Air Temperature} = 99^\circ\text{F (37}^\circ\text{C)}$$