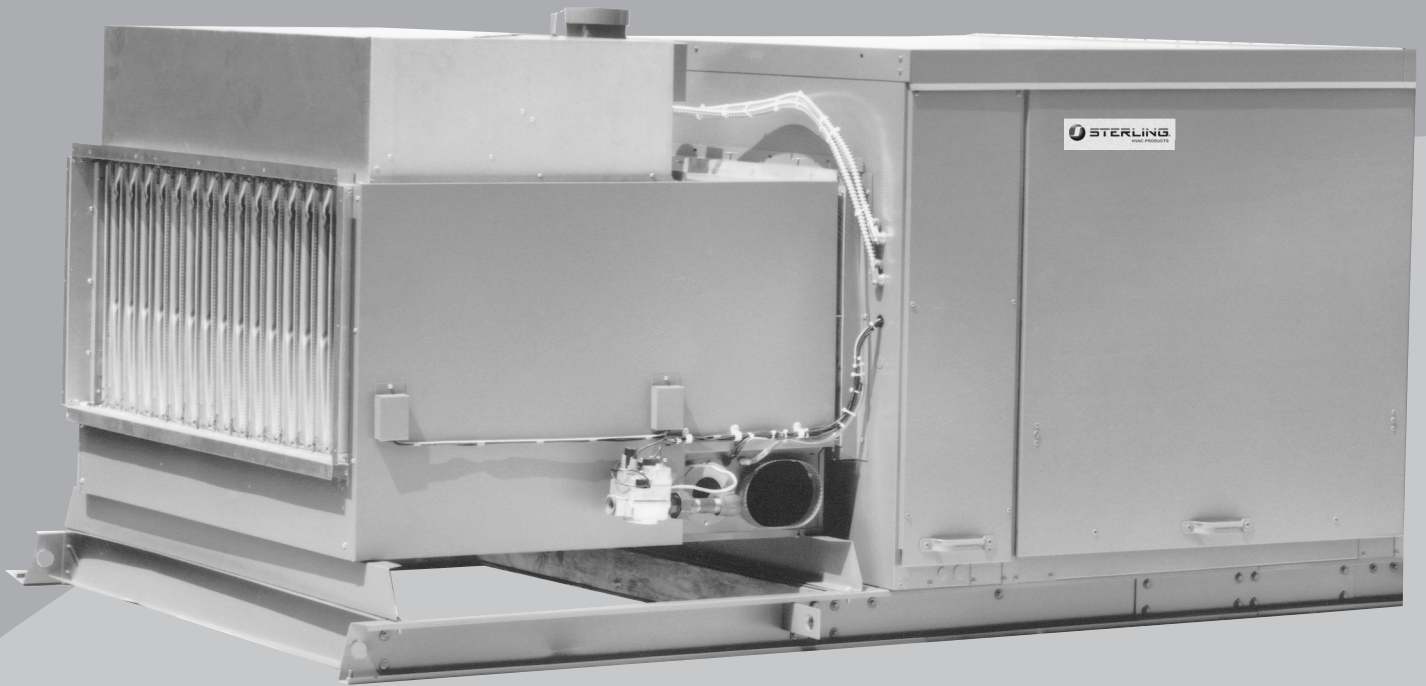


HVAC INDOOR MAKE-UP AIR HANDLERS

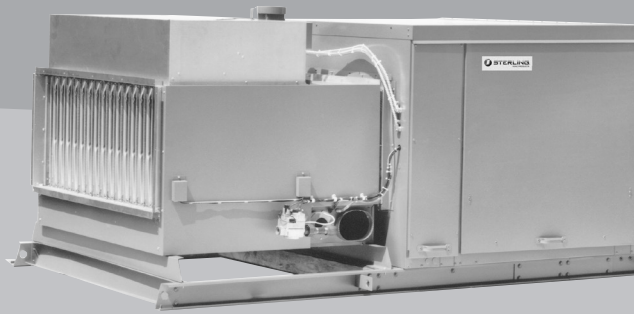
Application Manual



PACKAGED INDOOR ARRANGEMENTS
FOR MAKE-UP AIR, HEATING AND COOLING

 **STERLING**[®]
HVAC PRODUCTS





Contents

	PAGE
GENERAL INFORMATION	2, 3
UNIT NUMBER DESCRIPTION	4
INDOOR DUCT FURNACE ARRANGEMENTS	5-7
PACKAGED INDOOR ARRANGEMENTS – ME	8, 9
Performance Data – ME	10-18
Dimensional Data – ME & MS	33-45
PACKAGED INDOOR SEPARATED COMBUSTION ARRANGEMENTS – MS	19, 20
Performance Data	21-32
COOLING COIL OPTIONS [CO]	46
Performance Data	47-50
GAS TYPE [GT] AND GAS CONTROL [GC]	51, 52
SUPPLY VOLTAGE [SV], MOTOR TYPE [MT] AND MOTOR SIZE [MS]	53
AIR INLET CONFIGURATION [AI]	54
AIR CONTROL AND DAMPER ARRANGEMENT [AC]	54, 55
ACCESSORIES [AS]	56-59
EVAPORATIVE COOLING MODULE	60-62
SPECIFICATIONS GUIDE	63-67
UNIT SELECTION PROCEDURE	68
COOLING COIL SELECTION PROCEDURE	69
UNIT NET AND SHIP WEIGHTS	70, 71
MOTOR ELECTRICAL DATA	72
UNIT CONFIGURATIONS/SUBMITTAL INDEX	73
WARRANTY	76

General Information

STERLING QUALITY

Sterling HVAC Products, a division of Mestek, has been a leading producer of quality engineered and manufactured HVAC equipment for over 40 years. This experience has allowed us to design and manufacture a complete line of Indoor Gas-Fired Make-Up Air equipment suitable for commercial, institutional and industrial applications. Our wide range of modular mechanical and electrical components allow custom unit selection in a standard package, providing outstanding versatility, performance and reliability you've come to expect from Sterling. Our expert engineering staff is always available to provide professional assistance in any phase of your project from preliminary planning to installation and operation.

Sterling Indoor Make-Up Air Units, similar to the Outdoor Engineered Product Line, have incorporated a multi-digit "Model Number" in order to more comprehensively describe the product. With this "Model Number" system, we can now offer the vast array of features found in this application manual to meet your ever demanding applications as "Standard Equipment for Sterling".

Sterling Specifier

The STERLING SPECIFIER is a computer program developed to assist the HVAC industry in design and application of Sterling rooftop and indoor make-up air equipment.

This automated selection program is capable of selecting a unit by direct model number input or design data (i.e.: Required Output, Air Flow or Temperature Rise). When utilizing design data, the Sterling Specifier is programmed to adapt the remaining selection fields to only allow functional combinations of unit features.

The Sterling Specifier is designed to produce and print model number specific certification and specification sheets that include customer information, submittal sheet attachment listing and model number description. These files are in common, user-friendly formats for inclusion with complete project submittals.

To obtain access to the Sterling Specifier, contact your Sterling Representative at 1-800-490-2290.

Product Description

STERLING INDOOR MAKE-UP AIR UNITS

The Sterling Indoor Make-Up Air Unit is a packaged air, heating and cooling system, suitable for heating, cooling, ventilating and makeup air applications. Unit sizes range from 800 to 14,000 CFM (0.4-6.6 cu. m/s) with 1/2-15 HP. motors and 100,000 BTU/H to 1,200,000 BTU/H (29.3 to 351.4 kW) input. Duct furnaces are ETL certified for safety and performance, with a range of 100,000 to 400,000 BTU/H (29.3 to 117.1 kW) input per duct furnace. Packaged units are also designed to be in compliance with “UL-1995” Standard for HVAC Equipment. Sterling Indoor units may be ordered with DX or Chilled Water Cooling, Evaporative Cooling or Packaged Heating and Cooling Systems.

The mechanical configuration is determined by customer selection and may consist of one of 5 standard arrangements (see “Indoor Arrangements” [IA], model number digit 7). Indoor Arrangements are divided into two classifications “Standard” and “High CFM” Blower types. The “Standard” Blower units consist of a blower cabinet that houses dampers, filters and blower(s) in one cabinet, an optional Evaporative cooling unit and up to 2 Indoor Duct Furnaces (800 MBH Max.) (234.3 kW Max.) may also be included. The “High CFM” blower units utilize a separate Damper/Filter cabinet with a “V” bank filter arrangement, a Blower cabinet and up to 3 Duct Furnaces (1200 MBH Max.) (351.4 kW Max.). An optional cooling coil cabinet is offered with up to 2 furnaces (800 MBH Max.). All arrangements are rail mounted.

Furnace types are also divided into two classifications- Power Vented and Separated Combustion models, with Left or Right Hand access (see “Unit Type” [UT], “Furnace Type” [FT] model number digits 1,2 and 5). All furnace types offer an 80% efficiency rating with Power Vented models offering a ΔT of 30-80 °F (17-44 °C) and Separated Combustion models offering a ΔT of 20-90 °F (11-50 °C) per furnace.

In addition to a versatile array of mechanical features, Sterling Indoor Make-Up Air Units also offer a wide variety of factory installed control options. Control components are located in the main electrical cabinet. The main electrical cabinet is located out of the air stream as part of the blower transition, between the blower cabinet and the first furnace for both Standard and High CFM units. The standard electrical control scheme consists of a solid state fan time delay; two pre-wired relay sockets for fan on and damper open functions mounted on the unit’s main connection board; a solid state gas ignition system; and room or duct thermostats. The units are also equipped with a blower door safety interlock, a 24 VAC circuit breaker, a high temperature limit switch in each furnace section, and a reverse air flow switch located in the blower cabinet as standard equipment.

Gas control options range from single stage to six stages of fire, Electronic Modulation and DDC (Direct Digital Control) ready packages (see “Gas Control” [GC] model number digit 10). Air control options offer a similar range of control features from manual dampers to modulating motorized dampers that may include mixed air, dry bulb, pressure sensing, enthalpy control, DDC interface or ASHRAE Cycle control arrangements (see “Air Control” [AC] model number digit 15).

Features and Benefits

- ETL Certified Indoor Duct Furnaces.
- Packaged Units, designed to UL-1995 Standards.
- Heating Capacities from 100 MBH - 1,200 MBH. (29.3 kW - 351.4 kW)
- Power Vented and Separated Combustion Furnaces.
- 80% Efficient Furnace.
- Power Vented Furnace Temperature Rise 30-80 °F (17-44 °C) per Furnace.
- Separated Combustion Furnace Temperature Rise 20-90 °F (11-50 °C) per Furnace.
- CFM Ranges from 800 - 14,000 CFM (0.4 — 6.6 Cu. m/s).
- Motor Sizes up to 15 Horse Power (EPACT compliant).
- Standard ODP Motors; with Premium Efficiency and Totally Enclosed optional.
- Standard Right Side Service Access, Left Optional.
- Draw-thru Heating or Cooling Coil Cabinet with Stainless Steel Drip Pan.
- Evaporative Cooling with standard 8 inch or optional 12 inch media (203 or 305 mm).
- Standard 20-gauge Cabinets, Painted Sterling Gray.
- Standard 20-gauge Aluminized Steel Heat Exchanger.
- Standard 1 inch Washable Filters.
- Standard Single Stage Combination Gas Valve.
- Standard High Temperature Limit (each Furnace).
- Standard Blower Door Safety Interlock Switch.
- Standard Reverse Air Flow Safety Switch.
- Standard 24 Volt Circuit Breaker.
- Standard Printed Circuit Main Connection Board.
- Wiring Harnesses with Stamped Wire Numbers.
- Solid State Automatic Pilot Ignition Control.
- Solid State Fan Time Delay.
- Over Forty Standard Control Packages.

Indoor Make-Up Air Unit Number Description

Digit	M	X	X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	+
Item	Prefix			UT	CA	FT	FM	IA	CO	GT	GC	SV	MT	MS	AI	AC	AS				

(Internal use Only)

1, 2 - Unit Type [UT]

ME - Power Vented Indoor Make-up Air Unit
MS - Separated Combustion Indoor Make-up Air Unit

3, 4 - Capacity [CA]

Single Furnace
10 - 100,000 BTU/HR
15 - 150,000 BTU/HR
20 - 200,000 BTU/HR
25 - 250,000 BTU/HR
30 - 300,000 BTU/HR
35 - 350,000 BTU/HR
40 - 400,000 BTU/HR

Double Furnace
50 - 500,000 BTU/HR
60 - 600,000 BTU/HR
70 - 700,000 BTU/HR
80 - 800,000 BTU/HR

Triple Furnace
12 - 1,200,000 BTU/HR

5 - Furnace Type [FT]

A - Standard Temperature Rise (ME 30-80 °F, MS 20-60 °F), Right Side Access
B - Standard Temperature Rise (ME 30-80 °F, MS 20-60 °F), Left Side Access
C - High Temperature Rise (MS 60-90 °F), Right Side Access
D - High Temperature Rise (MS 60-90 °F), Left Side Access
0 - None
Z - Other

6 - Furnace Construction Material [FM]

1 - Aluminized Steel
2 - 409 Stainless Steel (First Furnace Only)
3 - 409 Stainless Steel (All Furnace Sections)
4 - 321 Stainless Steel (First Furnace Only)
5 - 321 Stainless Steel (All Furnace Sections)
6 - 409 Stainless Steel Package (First Furnace Only)
7 - 409 Stainless Steel Package (All Furnace Sections)
8 - 321 Stainless Steel Package (First Furnace Only)
9 - 321 Stainless Steel Package (All Furnace Sections)
0 - None
Z - Other

7 - Indoor Arrangement (includes furnace section(s) [IA])

A - Duct Furnace (50/12 [CA] Only)
B - Blower (Standard)
D - Blower (Standard) / Evap.
G - Blower (High CFM)
K - Blower (High CFM) / Cooling
0 - None
Z - Other

8 - Coil Options [CO]

A - DX Coil, 4 Row Single Circuit
B - DX Coil, 4 Row Dual Circuit
C - DX Coil, 6 Row Single Circuit
D - DX Coil, 6 Row Dual Circuit
E - Chilled Water Coil, 4 Row
G - Chilled Water Coil, 6 Row
0 - None
Z - Other (Special)

9 - Gas Type [GT]

1 - Natural Gas
2 - LP Gas (Propane)
3 - Natural Gas w/100% Shutoff
0 - None

10 - Gas Control [GC]

A - Single Stage Gas (Standard)
B - Two Stage Gas
H - Electronic Modulation w/Room Sensing
J - Electronic Modulation w/Duct Sensing
K - Electronic Modulation w/Duct Sensing & Ovrd. Stat
L - Electronic Modulation w/External 4-20 mA Input (Furnace One)
M - Electronic Modulation w/External 4-20 mA Input (All Furnaces)
N - Electronic Modulation w/External 0-10 VDC Input (Furnace One)
P - Electronic Modulation w/External 0-10 VDC Input (All Furnaces)
R - Two Stage Remote Temperature Control w/Duct Sensor
S - Three Stage Remote Temperature Control w/Duct Sensor
T - Four Stage Remote Temperature Control w/Duct Sensor
U - S-350 2 Stage Modular Electronic Control System
W - S-350 3 Stage Modular Electronic Control System
X - S-350 4 Stage Modular Electronic Control System
Y - S-350 6 Stage Modular Electronic Control System
0 - None
Z - Other

11 - Supply Voltage [SV]

1 - 115/1/60
2 - 208/1/60
3 - 230/1/60
4 - 208/3/60
5 - 230/3/60
6 - 460/3/60
7 - 575/3/60
0 - None
Z - Other

12 - Motor Type [MT]

1 - Open Drip Proof (Standard)
2 - Totally Enclosed
3 - Premium Efficiency, Open Drip Proof
4 - Premium Efficiency, Totally Enclosed
0 - None
Z - Other

13 - Motor Sizes [MS]

A - 1/2 HP w/Contactor
B - 3/4 HP w/Contactor
C - 1 HP w/Contactor
D - 1-1/2 HP w/Contactor
E - 2 HP w/Contactor
G - 3 HP w/Contactor
H - 5 HP w/Contactor
J - 1/2 HP w/Mag. Starter
K - 3/4 HP w/Mag. Starter
L - 1 HP w/Mag. Starter
M - 1-1/2 HP w/Mag. Starter
N - 2 HP w/Mag. Starter
P - 3 HP w/Mag. Starter
R - 5 HP w/Mag. Starter
S - 7-1/2 HP w/Mag. Starter
T - 10 HP w/Mag. Starter
U - 15 HP w/Mag. Starter
0 - None
Z - Other

1 - 1 HP VFD
2 - 1-1/2 HP VFD
3 - 2 HP VFD
4 - 3 HP VFD
5 - 5 HP VFD
6 - 7-1/2 HP VFD
7 - 10 HP VFD
8 - 15 HP VFD

14 - Air Inlet Configuration [AI]

1 - Outside Air (OA)
2 - Outside Air w/Air Hood*
3 - Return Air (RA)
4 - Outside Air and Return Air (OA/RA)
5 - Outside and Return Air w/Air Hood*
0 - None
Z - Other

*Hood shipped separately

15 - Air Control & Damper Arrangement [AC]

A - Outside Air 2 Position Motor / Spring Return
B - Return Air 2 Position Motor / Spring Return
C - OA/RA 2 Position / Spring Return
D - OA/RA Mod. Motor w/Mixed Air Control / Min. Pot.
E - OA/RA Mod. Motor w/Mixed Air Control / Min. Pot. / SR
G - OA/RA Mod. Motor w/Mixed Air Control
H - OA/RA Mod. Motor w/Mixed Air Control / SR
J - OA/RA Mod. Motor w/Min. Pot.
K - OA/RA Mod. Motor w/Min. Pot. / SR
L - OA/RA Mod. Motor w/Dry Bulb / Mixed Air Control / Min. Pot.
M - OA/RA Mod. Motor w/Dry Bulb / Mixed Air Control / Min. Pot. / SR
N - OA/RA Mod. Motor w/Enthalpy Controlled Economizer / SR
P - OA/RA Mod. Motor w/Pressure Control (Space Pressure)
Q - OA/RA Mod. Motor w/ Carbon Dioxide (CO₂) R/A Monitor
R - OA/RA Mod. Motor w/S-350-P Proportional Mixed Air Control / SR
S - OA/RA Mod. Motor w/0-10 VDC & 4-20 mA Analog Input (External Input)
T - OA/RA Mod. Motor w/0-10 VDC & 4-20 mA Analog Input / SR (External Input)
U - ASHRAE Cycle I (OA/RA 2 Pos. Motor w/Warm-up Stat / SR)
W - ASHRAE Cycle II (OA/RA Mod. Motor w/Warm-up Stat / Mixed Air / Min. Pot. / SR)
X - ASHRAE Cycle III (OA/RA Mod. Motor w/Warm-up Stat / Mixed Air / SR)
Y - Manual Dampers

0 - None
Z - Other

MOD = Modulating Damper Motor
 OA = Outside Air RA = Return Air SR = Spring Return

16 - Accessories [AS]

A1 - Moisture Eliminators
A2 - Horizontal Return
A3 - Low Leak Damper
A5 - Furnace Drip Pan, 409 Stainless (ME only)
A6 - High Altitude Unit
A7 - High Pressure Regulator
A7-1/2-1 - Regulator for 0.5-10 PSI
A7-3/8-1 - Regulator for 10-20 PSI
A7-5/16-1 - Regulator for 20-35 PSI
A8 - Unit Derate
H1 - Return Firestat
H2 - Supply Firestat
H3 - Freezestat w/ Time Delay
H4 - Ambient Lockout - Single Furnace
H6 - Ambient Lockout - Dual Furnace
H7 - Ambient Lockout - Triple Furnace
J1 - Interlock Relay - 24V Coil DPDT 10A, Plug-in
J2 - Interlock Relay - 24/115V Coil SPDT 10A
J3 - Interlock Relay - 24/115/230V Coil DPDT 10A
J4 - Interlock Relay - 24V Coil 4PDT 10A

B1 - Filters - 1 inch WA (Standard)
B2 - Filters - 2 inch WA
B3 - Filters - 2 inch TA
B4 - Filters - 1 inch 30%
B5 - Filters - 2 inch 30%

C1 - Evap. Cooler - Fill & Drain Kit
C2 - Evap. Cooler - 12 inch CELdek® Media
C3 - Evap. Cooler - Freezestat w/0 Time Delay
C4 - Evap. Cooler - 8 inch GLASdek® Media
C5 - Evap. Cooler - 12 inch GLASdek® Media

D1 - Time Clock - 7 Day†
D2 - Time Clock - 24 Hour†

E1 - Clogged Filter Switch
E2 - G.F.I. Convenience Outlet 115VAC†
E3 - Remote Control Panel†
E4 - Manual Blower Switch†

F1 - Ductstat - One Stage†
F2 - Ductstat - Two Stage†

G1 - Thermostat - T87K w/Subbase†
G2 - Thermostat - T87K w/Subbase & Guard†
G3 - Thermostat - T834N w/Subbase (Sterling Stat)†
G4 - Thermostat - TH8320R - 7 Day Programmable†
G5 - Thermostat - TH5220D (Two Stage)†
G6 - Locking Thermostat Cover†

Note: All thermostats are Mercury free

K1 - Manual Reset High Limit Switch†
K2 - High / Low Gas Pressure Limit Switches
K3 - Status Lamp (Elec. Cabinet)
K4 - Fan Time Delay (Arrangement "A" Only)
K5 - Air Flow Prove Switch (Dwyer 1910-0)†

L1 - 30 Amp, Fused Disconnect Switch†
L2 - 30 Amp, Non Fused Disconnect Switch†
L3 - 60 Amp, Fused Disconnect Switch†
L4 - 60 Amp, Non Fused Disconnect Switch†

M2 - Vent Caps†
M3 - Adapter(s) (4-5 inches)†
M4 - Vertical Concentric Vent Kit (MS only)†
M5 - Horizontal Concentric Vent Kit (MS only)†

N5 - Service Convenience Package
N6 - Double Wall Construction
R1 - Field Installed VFD
R2 - Factory Installed VFD
R3 - VFD Remote Keypad for use w/R1†
R4 - CO₂ Sensor - 100 OA†
R5 - CO₂ Sensor - Mixed Air†
R6 - Pressure Sensor†
R7 - 2-Speed VFD Relays
R8 - 3-Speed VFD Relays

0 - None
Z1 - Other (Specify)

† = Field Installed



Indoor Duct Furnaces

Power Vent [QVES] and Separated Combustion [QVSD]

Unit Type [UT] Model Digits 1,2
Capacity [CA] Model Digits 3,4
Furnace Type [FT] Model Digit 5
Furnace Material [FM] Model Digit 6
Indoor Arrangement [IA] Model Digit 7

Sterling Indoor Duct Furnaces are ETL certified. Duct Furnaces are available as Power Vented and Separated Combustion Units. Sizes range from 100 MBH to 400 MBH (29.3 kW to 117.1 kW) per furnace with double and triple in series configurations available, for a capacity range of 500 MBH to 1,200 MBH (146.4 to 351.4 kW). All Sterling Indoor Duct Furnaces are designed with ease of service in mind and feature right or left side access, slide-out burner drawer, terminal block connection, solid state automatic pilot ignition, combination gas valve and automatic reset safety limits. Duct furnaces may be ordered to operate with Natural or Propane (LP) gas (Gas Type [GT] Model digit 9) and are standard for altitudes at 0 to 2,000 feet (610m). Units are also available for higher elevations; specify when ordering if unit is above 2,000 ft. (610m).

Sterling Indoor Duct Furnaces have an 80% efficiency rating with ΔT of 30-80 °F (17-44 °C) per furnace for Unit Type ME [QVES] and a ΔT of 20-90 °F (11-50 °C) per furnace for Unit Type MS [QVSD]. The maximum discharge air temperature for all duct furnaces is 150 °F (66 °C).

All Sterling Indoor Duct Furnaces are constructed with aluminized steel heat exchangers, flue collectors, and burners, with optional 409 or 321 stainless steel heat exchanger and 409 stainless steel burner and flue collector options (Furnace Material [FM] Model Digit 6). **An optional 409 or 321 Stainless Steel heat exchanger is recommended for the following applications:**

1. When the combined temperature of outside and return air is below 40 °F (4.4 °C).
2. Whenever there is an evaporative cooler or cooling coil upstream of the furnace section(s).

Unit Type [UT] Digit 1,2

ME - Power Vented Indoor Make-Up Air Unit
 MS - Separated Combustion Indoor Make-Up Air Unit

Capacity [CA] Digit 3,4

Single Furnace*	Double Furnace	Triple Furnace
10 - 100 MBH	50 - 500 MBH	12 - 1,200 MBH
15 - 150 MBH	60 - 600 MBH	
20 - 200 MBH	70 - 700 MBH	
25 - 250 MBH	80 - 800 MBH	
30 - 300 MBH		
35 - 350 MBH		
40 - 400 MBH		

* Single Furnace Capacities [CA 10/40] available only on Indoor Arrangements [IA] B, D and K; Single Furnace Capacities [CA 20/40] available on Indoor Arrangement [IA] G.

Furnace Type [FT] Digit 5

A - Standard Temperature Rise, Right Side Access
 B - Standard Temperature Rise, Left Side Access
 C - High Temperature Rise, Right Side Access (MS only)
 D - High Temperature Rise, Left Side Access (MS only)

Furnace Material [FM] Digit 6

- 1 - Aluminized Steel (STANDARD)
- 2 - 409 Stainless Steel Heat Exchanger (First Furnace Only)
- 3 - 409 Stainless Steel Heat Exchanger (All Furnace Sections)
- 4 - 321 Stainless Steel Heat Exchanger (First Furnace Only)
- 5 - 321 Stainless Steel Heat Exchanger (All Furnace Sections)
- 6 - 409 Stainless Steel Package, Heat Exchanger, Burners Flue Collector (First Furnace Only)
- 7 - 409 Stainless Steel Package, Heat Exchanger, Burners Flue Collector (All Furnace Sections)
- 8 - 321 Stainless Steel Package, Heat Exchanger, 409 Burners, Flue Collector (First Furnace Only)
- 9 - 321 Stainless Steel Package, Heat Exchanger, 409 Burners, Flue Collector (All Furnace Sections)

Indoor Arrangement [IA] Digit 7

A - Duct Furnace (Available in Capacities [CA] 50 through 80 and 12 Only)

Indoor Duct Furnace Performance Data — Table 1

Unit Type [UT] ME; Capacity [CA] 10-12; Furnace Type [FT] A or B

Capacity [CA]	Input		Output	Minimum CFM (cu. m/s)	Temp. Rise °F (°C)	PD inch WC (kPa)	Maximum CFM (cu. m/s)	Temp. Rise °F (°C)	PD inch WC (kPa)
	(Maximum) MBH (kW)	(Minimum) MBH (kW)	MBH (kW)						
10	100	50	80	929	80	0.12	2,469	30	0.90
	(29.3)	(14.6)	(23.4)	(0.438)	(44)	(0.03)	(1.165)	(17)	(0.22)
15	150	75	120	1,389	80	0.15	3,704	30	0.75
	(43.9)	(22.0)	(35.1)	(0.656)	(44)	(0.04)	(1.748)	(17)	(0.19)
20	200	100	160	1,852	80	0.14	4,938	30	0.75
	(58.6)	(29.3)	(46.9)	(0.874)	(44)	(0.03)	(2.331)	(17)	(0.19)
25	250	125	200	2,315	80	0.14	6,173	30	0.80
	(73.2)	(36.6)	(58.6)	(1.093)	(44)	(0.03)	(2.914)	(17)	(0.20)
30	300	150	240	2,778	80	0.13	7,407	30	0.90
	(87.8)	(43.9)	(70.3)	(1.311)	(44)	(0.03)	(3.496)	(17)	(0.22)
35	350	175	280	3,241	80	0.13	8,642	30	0.90
	(102.5)	(51.2)	(82.0)	(1.530)	(44)	(0.03)	(4.079)	(17)	(0.22)
40	400	200	320	3,704	80	0.14	9,877	30	0.90
	(117.1)	(58.6)	(93.7)	(1.748)	(44)	(0.03)	(4.662)	(17)	(0.22)
50	500	250	400	2,315	160	0.28	6,173	60	1.28
	(146.4)	(73.2)	(117.1)	(1.093)	(89)	(0.07)	(2.914)	(33)	(0.32)
60	600	300	480	2,778	160	0.26	7,407	60	1.38
	(175.7)	(87.8)	(140.6)	(1.311)	(89)	(0.06)	(3.496)	(33)	(0.34)
70	700	350	560	3,241	160	0.26	8,642	60	1.37
	(205.0)	(102.5)	(164.0)	(1.530)	(89)	(0.06)	(4.079)	(33)	(0.34)
80	800	400	640	3,704	160	0.28	9,877	60	1.39
	(234.3)	(117.1)	(187.4)	(1.748)	(89)	(0.07)	(4.662)	(33)	(0.35)
12	1200	600	960	3,704	180	0.42	9,877	90	1.88
	(351.4)	(175.7)	(281.1)	(1.748)	(100)	(0.10)	(4.662)	(50)	(0.47)

NOTES: Rating shown are for unit installations at elevations between 0 and 2,000 feet (610m). For unit installations in U.S.A. above 2,000 feet (610m), the unit input must be derated 4% for each 1,000 feet (305m) above sea level; refer to local codes, or in absence of local codes, refer to the latest edition of the National Fuel Gas Code, ANSI Standard Z223.1 (NFPA No. 54).

For installations in Canada, any references to deration at altitudes in excess of 2,000 feet (610m) are to be ignored. At altitudes of 2,000 to 4,500 feet (610 to 1372m), the unit must be derated to 90% of the normal altitude rating, and be so marked in accordance with the ETL certification.



“ME”
Power Vent
Duct Furnace [QVES]

Separated Combustion Indoor Duct Furnace Performance Data – Table 2

Unit Type [UT] MS; Capacity [CA] 10-40; Furnace Type [FT] A, B, C or D
Unit Type [UT] MS; Capacity [CA] 50-12; Furnace Type [FT] A or B

Capacity (CA)	Input		Output	Minimum CFM (cu. m/s)	Temp. Rise °F (°C)	PD inch WC (kPa)	Maximum CFM (cu. m/s)	Temp. Rise °F (°C)	PD inch WC (kPa)
	(Maximum) MBH (kW)	(Minimum) MBH (kW)	MBH (kW)						
10	100	50	80	822	90	0.10	3,700	20	2.03
	(29.3)	(14.6)	(23.4)	(0.388)	(50)	(0.02)	(1.746)	(11)	(0.51)
15	150	75	120	1,233	90	0.10	5,550	20	1.81
	(43.9)	(22.0)	(35.1)	(0.582)	(50)	(0.02)	(2.620)	(11)	(0.45)
20	200	100	160	1,645	90	0.10	7,401	20	1.90
	(58.6)	(29.3)	(46.9)	(0.776)	(50)	(0.02)	(3.493)	(11)	(0.47)
25	250	125	200	2,056	90	0.10	9,251	20	1.96
	(73.2)	(36.6)	(58.6)	(0.966)	(50)	(0.02)	(4.366)	(11)	(0.49)
30	300	150	240	2,467	90	0.10	11,101	20	2.00
	(87.8)	(43.9)	(70.3)	(1.164)	(50)	(0.02)	(5.240)	(11)	(0.50)
35	350	175	280	2,878	90	0.10	12,951	20	2.02
	(102.5)	(51.2)	(82.0)	(1.358)	(50)	(0.02)	(6.113)	(11)	(0.50)
40	400	200	320	3,289	90	0.10	14,801	20	2.05
	(117.1)	(58.6)	(93.7)	(1.552)	(50)	(0.02)	(6.986)	(11)	(0.51)
50	500	250	400	2,056	180	0.28	9,269	40	2.16
	(146.5)	(73.2)	(117.1)	(0.966)	(100)	(0.07)	(4.356)	(22)	(0.54)
60	600	300	480	2,467	180	0.26	11,111	40	2.20
	(175.4)	(87.8)	(140.7)	(1.164)	(100)	(0.06)	(5.222)	(22)	(0.55)
70	700	350	560	2,878	180	0.26	12,963	40	2.22
	(205.1)	(102.5)	(164.1)	(1.358)	(100)	(0.06)	(6.093)	(22)	(0.55)
80	800	400	640	3,289	180	0.28	14,815	40	2.24
	(234.5)	(117.1)	(187.6)	(1.552)	(100)	(0.07)	(6.963)	(22)	(0.56)
12	1,200	600	960	4,938	180	0.45	14,815	60	3.38
	(351.7)	(175.4)	(281.3)	(2.321)	(100)	(0.11)	(6.963)	(33)	(0.84)

NOTES: Rating shown are for unit installations at elevations between 0 and 2,000 feet (610m). For unit installations in U.S.A. above 2,000 feet (610m), the unit input must be derated 4% for each 1,000 feet (305m) above sea level; refer to local codes, or in absence of local codes, refer to the latest edition of the National Fuel Gas Code, ANSI Standard Z223.1 (NFPA No. 54).

For installations in Canada, any references to deration at altitudes in excess of 2,000 feet (610m) are to be ignored. At altitudes of 2,000 to 4,500 feet (610 to 1372m), the unit must be derated to 90% of the normal altitude rating, and be so marked in accordance with the ETL certification.



“MS”
Separated Combustion
Duct Furnace [QVSD]

Packaged Indoor Arrangements Heating & Cooling Units

Unit Type [UT] - “ME”; Indoor Arrangement [IA] Model Digit 7

Sterling Packaged Indoor Arrangements are designed to UL-1995 standard for heating, cooling and ventilating equipment. Units are available in one of 5 standard arrangements (Indoor Arrangements [IA], Model digit 7). Packaged heating and cooling units are suitable for commercial, institutional and industrial applications where external system pressure losses are as high as 2 inch WC (0.50 kPa).

Indoor Arrangements are divided into two classifications “Standard” and “High-CFM” Blower types. The “Standard” blower units (Indoor Arrangement [IA] “B, D”) have a CFM range of 922-9,831 (0.4 - 4.6 m³/s). The Standard blower arrangement consists of a blower cabinet that houses dampers, filters and blower(s) in one cabinet; an optional Evaporative Cooling Unit with standard 8 inch or optional 12 inch (203 or 305 mm) media; and up to 2 Duct Furnaces (800 MBH Max.) (234.3 kW Max.) may also be included.

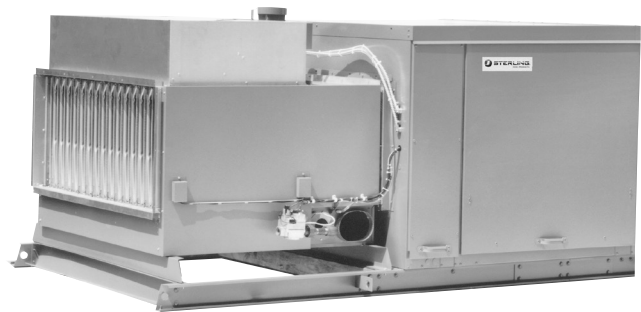
The “High-CFM” Blower Units (Indoor Arrangement [IA] “G”) have a range of 1,843 - 9,800 CFM (0.4 - 4.6 m³/s). This High-CFM Blower unit utilizes a separate Damper/Filter cabinet with a “V” bank filter arrangement, a Blower Cabinet and up to three Duct Furnaces (1,200 MBH maximum) (351.4 kW maximum). Indoor Arrangement “K” utilizes the same cabinetry as Indoor Arrangement “G”, plus an additional Coil Cabinet with up to two duct furnaces 800 MBH (234.3 kW) maximum. We offer DX or Chilled Water type cooling coils (capable of up to 20 tons nominal, under standard operating conditions), with a CFM range of 1,000 to 6,500 (0.5 - 3.1 m³/s). For cooling applications utilizing Arrangement “K” above 6,500 CFM (3.1 m³/s), a variable frequency drive will be required. The cabinetry included with Indoor Arrangement “K” is also suitable for field installations of heating coils.

For your safety and convenience, all Sterling Packaged Heating and Cooling Units include: a 24 Volt control circuit; Solid State Fan Time Delay; 24 Volt in line Circuit Breaker; Blower Door Interlock Switch; a Reverse Air Flow Switch (Return Firestat); Pre-wired Fan On and Exhaust Fan Interlock Relay Sockets; and a Printed Circuit Main Connection Board with Terminal Block Wiring. All wiring is processed at our factory as harness assemblies and each wire is permanently stamped with its wire number.

All cabinets are constructed of rugged 20-gauge material and painted Sterling gray. The modular design of the cabinetry insures reliability as well as serviceability with quick-release door latches and insulated blower filter cabinets.

Indoor Arrangements [IA] Digit 7

- A - Dual or Triple Duct Furnaces Only
- B - Blower (STANDARD)
- D - Blower (STANDARD) / Evaporative Cooler
- G - Blower (HIGH-CFM)
- K - Blower (HIGH-CFM) / Coil Cabinet



Standard Blower Unit

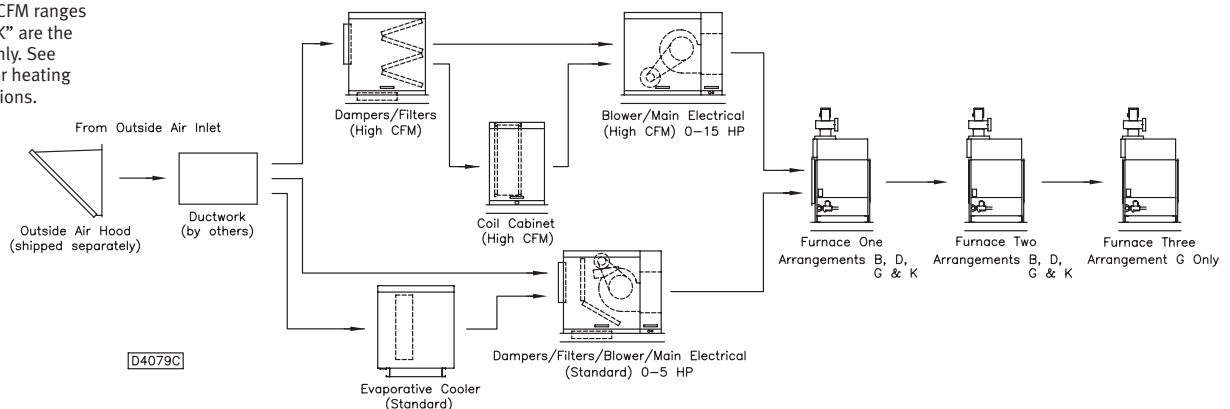
Packaged Indoor Arrangement Reference

Unit Type [UT] ME

* The maximum CFM for Indoor Arrangement K is 6,300 (3.0 m³/s). A variable frequency drive may be utilized for non-cooling air flow up to 9,831 CFM (4.6 m³/s).

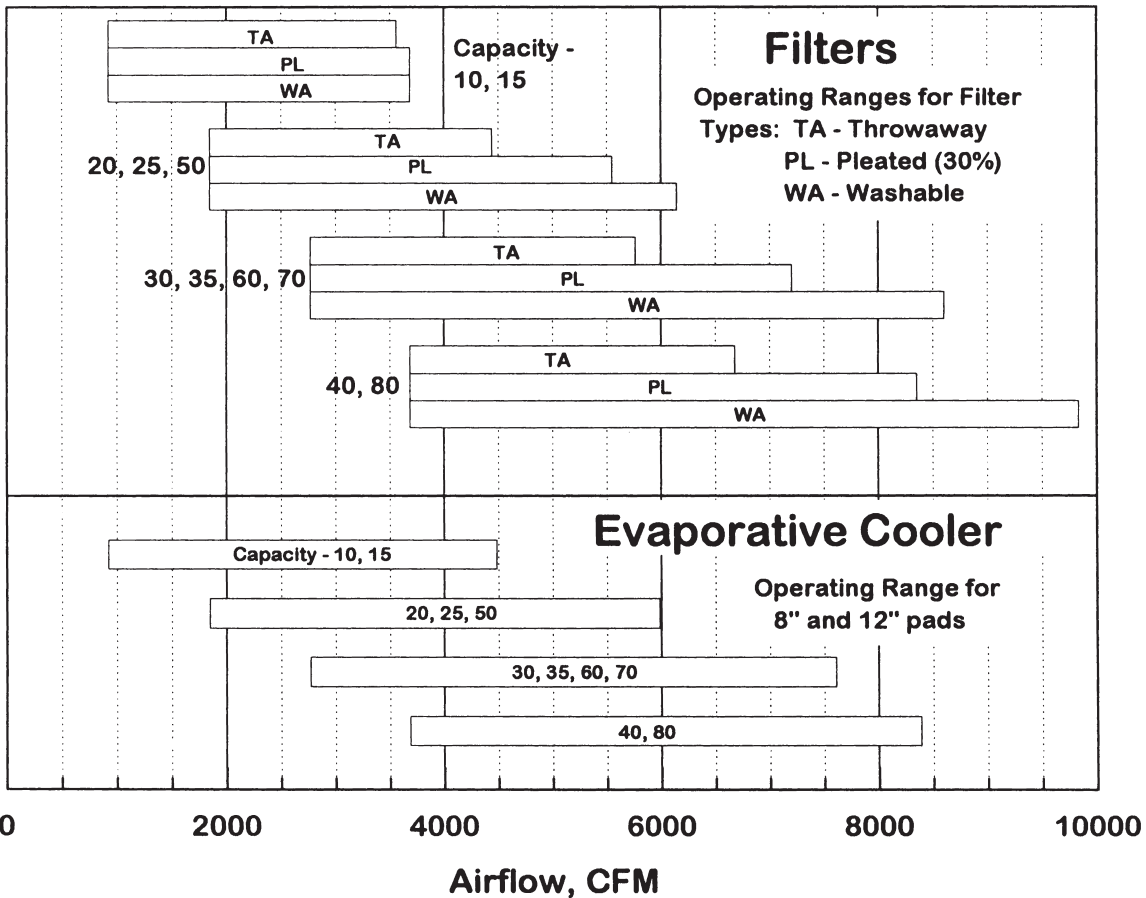
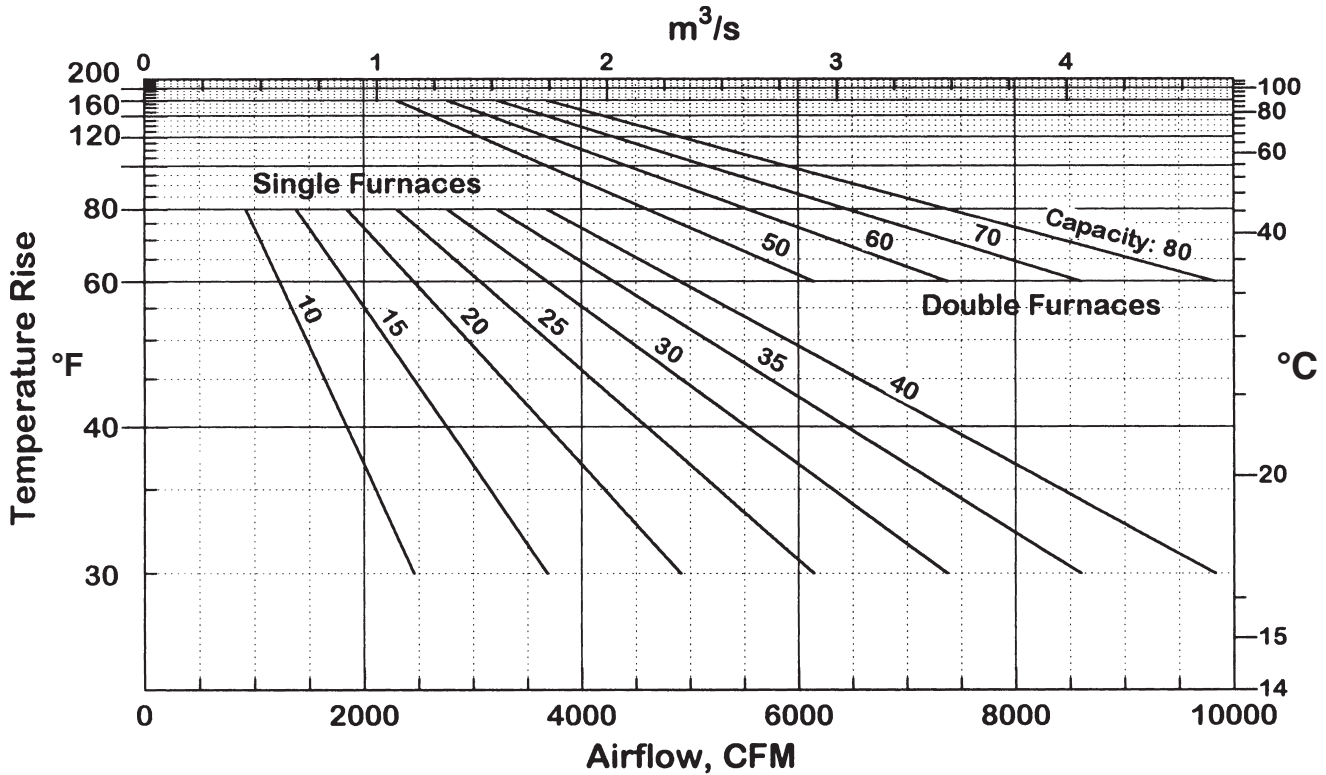
	Furnace Type A, B $\Delta T 30^{\circ}-80^{\circ}$	Furnace Type A, B $\Delta T 60^{\circ}-160^{\circ}$	Furnace Type A, B $\Delta T 90^{\circ}-180^{\circ}$
Standard Blower Indoor Arrangement B 	Capacity 10 - 40 10 - 922 - 2,458 CFM, 1/2 - 3 HP 15 - 1,382 - 3,687 CFM, 1/2 - 5 HP 20 - 1,843 - 4,916 CFM, 1/2 - 5 HP 25 - 2,304 - 6,144 CFM, 1/2 - 5 HP 30 - 2,765 - 7,373 CFM, 3/4 - 5 HP 35 - 3,226 - 8,602 CFM, 3/4 - 5 HP 40 - 3,687 - 9,831 CFM, 3/4 - 5 HP TSP 0.1 - 2 inch WC Chart #1 Tables #3, 4	Capacity 50 - 80 50 - 2,304 - 6,144 CFM, 1/2 - 5 HP 60 - 2,765 - 7,373 CFM, 3/4 - 5 HP 70 - 3,226 - 8,602 CFM, 1/2 - 5 HP 80 - 3,687 - 9,831 CFM, 3/4 - 5 HP TSP 0.1 - 2 inch WC Chart #1 Tables #3, 4	NA
Standard Blower w/Evap. Indoor Arrangement D 	Capacity 10-40 10 - 922 - 2,458 CFM, 1/2 - 3 HP 15 - 1,382 - 3,687 CFM, 1/2 - 5 HP 20 - 1,843 - 4,916 CFM, 1/2 - 5 HP 25 - 2,304 - 6,144 CFM, 1/2 - 5 HP 30 - 2,765 - 7,373 CFM, 1/2 - 5 HP 35 - 3,226 - 8,602 CFM, 3/4 - 5 HP 40 - 3,687 - 9,831 CFM, 3/4 - 5 HP TSP 0.1 - 2 inch WC Chart #1 Tables #3, 4	Capacity 50-80 50 - 2,304 - 6,144 CFM, 1/2 - 5 HP 60 - 2,765 - 7,373 CFM, 3/4 - 5 HP 70 - 3,226 - 8,602 CFM, 1/2 - 5 HP 80 - 3,687 - 9,831 CFM, 3/4 - 5 HP TSP 0.1 - 2 inch WC Chart #1 Tables #3, 4	NA
High CFM Blower Indoor Arrangement G 	Capacity 20 - 40 20 - 1,843 - 4,916 CFM, 1/2 - 5 HP 25 - 2,304 - 6,144 CFM, 1/2 - 7 1/2 HP 30 - 2,765 - 7,373 CFM, 1/2 - 7 1/2 HP 35 - 3,226 - 8,602 CFM, 3/4 - 10 HP 40 - 3,687 - 9,831 CFM, 3/4 - 10 HP TSP 0.1 - 2 inch WC Chart #2 Tables #5, 6	Capacity 50 - 80 50 - 2,304 - 6,144 CFM, 1/2 - 10 HP 60 - 2,765 - 7,373 CFM, 1/2 - 10 HP 70 - 3,226 - 8,602 CFM, 1/2 - 10 HP 80 - 3,687 - 9,831 CFM, 3/4 - 15 HP TSP 0.1 - 2 inch WC Chart #2 Tables #5, 6	Capacity 12 12 - 4,916 - 9,831 CFM, 1 - 15 HP TSP 0.1 - 2 inch WC Chart #2 Tables #5, 6
High CFM Blower w/Cooling Indoor Arrangement K † 	Capacity 10 - 40 10 - 1,000 - 2,400 CFM, 1/2 - 5 HP 15 - 1,400 - 2,900 CFM, 1/2 - 5 HP 20 - 1,800 - 4,300 CFM, 1/2 - 5 HP 25 - 2,300 - 4,300 CFM, 1/2 - 5 HP 30 - 2,700 - 5,700 CFM, 1/2 - 7 1/2 HP 35 - 3,200 - 5,700 CFM, 3/4 - 7 1/2 HP 40 - 3,700 - 6,300 CFM, 3/4 - 7 1/2 HP TSP 0.1 - 2 inch WC Chart #2 Tables #5, 6, 17 (A & B), 18 (A & B)	Capacity 50 - 80 50 - 2,300 - 4,300 CFM, 1/2 - 5 HP 60 - 2,700 - 5,700 CFM, 3/4 - 7 1/2 HP 70 - 3,200 - 5,700 CFM, 3/4 - 7 1/2 HP 80 - 3,700 - 6,300 CFM, 3/4 - 7 1/2 HP TSP 0.1 - 2 inch WC Chart #2 Tables #5, 6, 17 (A & B), 18 (A & B)	NA

† The min/max CFM ranges shown for [IA] "K" are the cooling mode only. See Tables #5 & 6 for heating mode specifications.



Quick Sizer Chart No. 1

Unit Type [UT] - "ME"; Furnace Type [FT] - (A,B) Standard Temperature Rise
 Indoor Arrangements [IA] - (B,D)



Accessory Pressure Loss — Table 4

Unit Type [UT] - “ME”

Indoor Arrangements [IA] - (B,D)

		PRESSURE LOSS (INCHES OF WATER)									
Capacity	CFM	(Opt'l) Airhood		Filters					Evaporative		Return or Outside Air Damper
		With	Mstr. Elim.	Throwaway	Washable		Pleated		8"	12"	
		Screen		2"	1"	2"	1"	2"			
10	900	.01	.02	.03	<.01	<.01	.03	.02	<.01	.01	.02
	1,000	.01	.02	.04	<.01	<.01	.04	.02	.01	.02	.02
	1,200	.02	.03	.05	<.01	<.01	.05	.03	.02	.02	.03
	1,400	.03	.04	.06	<.01	.01	.06	.03	.02	.03	.04
	1,600	.04	.05	.07	.01	.02	.08	.04	.03	.04	.06
	1,800	.05	.06	.08	.02	.02	.10	.05	.04	.06	.07
	2,000	.06	.07	.09	.02	.03	.12	.07	.05	.07	.09
	2,200	.07	.09	.10	.02	.03	.14	.08	.06	.08	.10
	2,400	.08	.11	.12	.03	.04	.16	.09	.07	.10	.12
15	1,400	.03	.04	.06	<.01	.01	.06	.03	.02	.03	.04
	1,500	.03	.04	.06	.01	.02	.07	.04	.03	.04	.05
	2,000	.06	.07	.09	.02	.03	.12	.07	.05	.07	.09
	2,500	.09	.12	.12	.03	.04	.17	.10	.07	.11	.13
	3,000	.13	.17	.16	.04	.06	.23	.14	.10	.15	.19
	3,500	.18	.23	.19	.06	.08	.30	.18	.14	.21	.25
20	3,600	.19	.24	—	.06	.09	.31	.19	.15	.22	.27
	1,800	.02	.03	.06	<.01	.01	.07	.04	.02	.03	.03
	2,000	.03	.04	.07	.01	.02	.08	.04	.03	.04	.04
	2,500	.04	.06	.09	.02	.03	.12	.07	.04	.06	.06
	3,000	.06	.08	.12	.03	.04	.16	.09	.06	.09	.08
	3,500	.09	.11	.14	.04	.05	.21	.12	.08	.12	.11
	4,000	.11	.15	.17	.05	.07	.26	.16	.10	.15	.15
	4,500	.14	.19	—	.06	.09	.31	.19	.13	.20	.19
4,900	.17	.22	—	.07	.10	.36	.22	.16	.23	.22	
25	2,300	.04	.05	.08	.02	.02	.10	.06	.03	.05	.05
	2,500	.04	.06	.09	.02	.03	.12	.07	.04	.06	.06
	3,000	.06	.08	.12	.03	.04	.16	.09	.06	.09	.08
	3,500	.09	.11	.14	.04	.05	.21	.12	.08	.12	.11
	4,000	.11	.15	.17	.05	.07	.26	.16	.10	.15	.15
	4,500	.14	.19	—	.06	.09	.31	.19	.13	.20	.19
	5,000	.17	.23	—	.07	.11	.38	.23	.16	.24	.23
5,500	.21	.28	—	.09	.13	.44	.28	.20	.29	.28	
30	2,700	.03	.04	.07	.01	.02	.09	.05	.03	.04	.04
	3,000	.04	.05	.08	.02	.02	.10	.06	.04	.05	.05
	4,000	.06	.09	.12	.03	.04	.17	.10	.06	.10	.08
	5,000	.10	.13	.16	.04	.06	.24	.14	.10	.15	.13
	6,000	.14	.19	—	.06	.09	.33	.20	.14	.21	.19
	6,500	.17	.23	—	.07	.11	.38	.23	.17	.25	.22
35	3,200	.04	.05	.09	.02	.03	.11	.06	.04	.06	.05
	4,000	.06	.09	.12	.03	.04	.17	.10	.06	.10	.08
	5,000	.10	.13	.16	.04	.06	.24	.14	.10	.15	.13
	6,000	.14	.19	—	.06	.09	.33	.20	.14	.21	.19
	7,000	.20	.26	—	.09	.13	.43	.27	.20	.29	.25
	8,000	.26	.34	—	.11	.16	—	—	—	—	.33
	8,500	.29	.39	—	.13	.18	—	—	—	—	.37

Accessory Pressure Loss — Table 4 *continued*

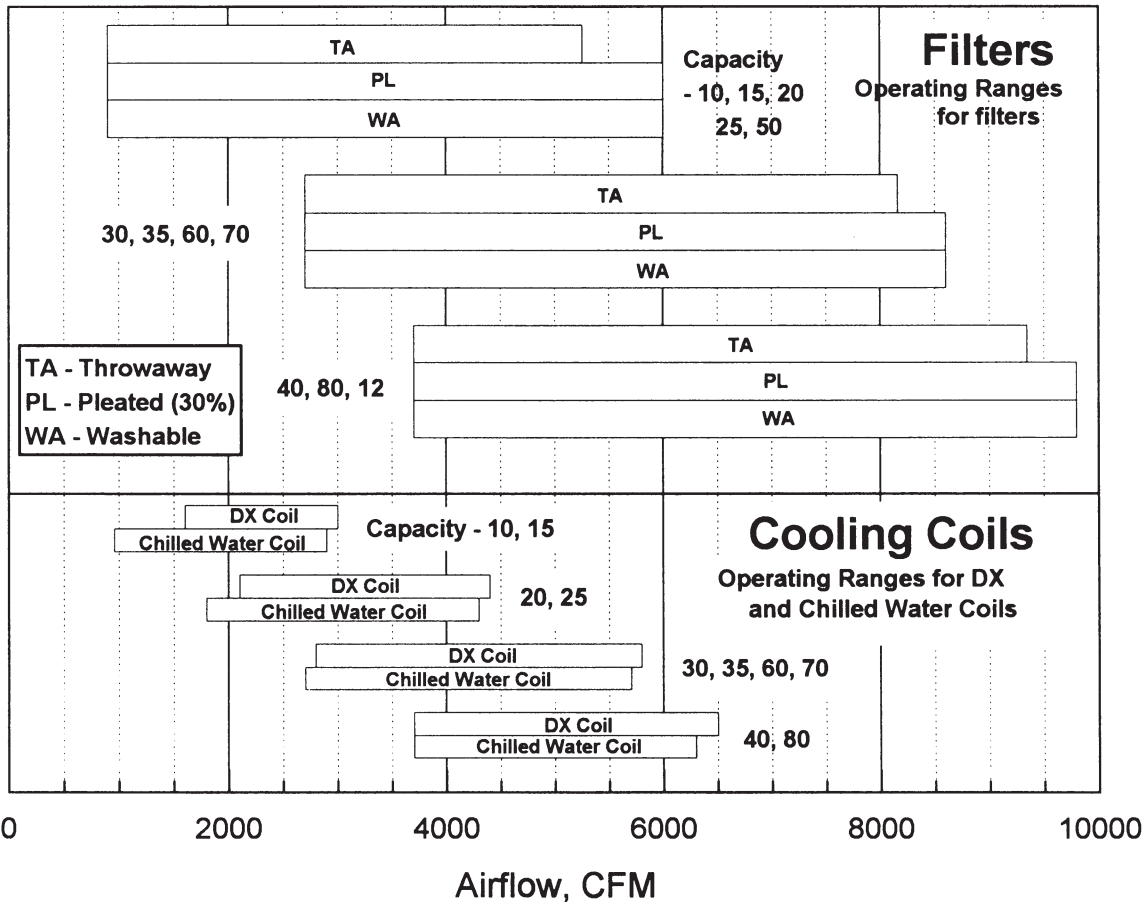
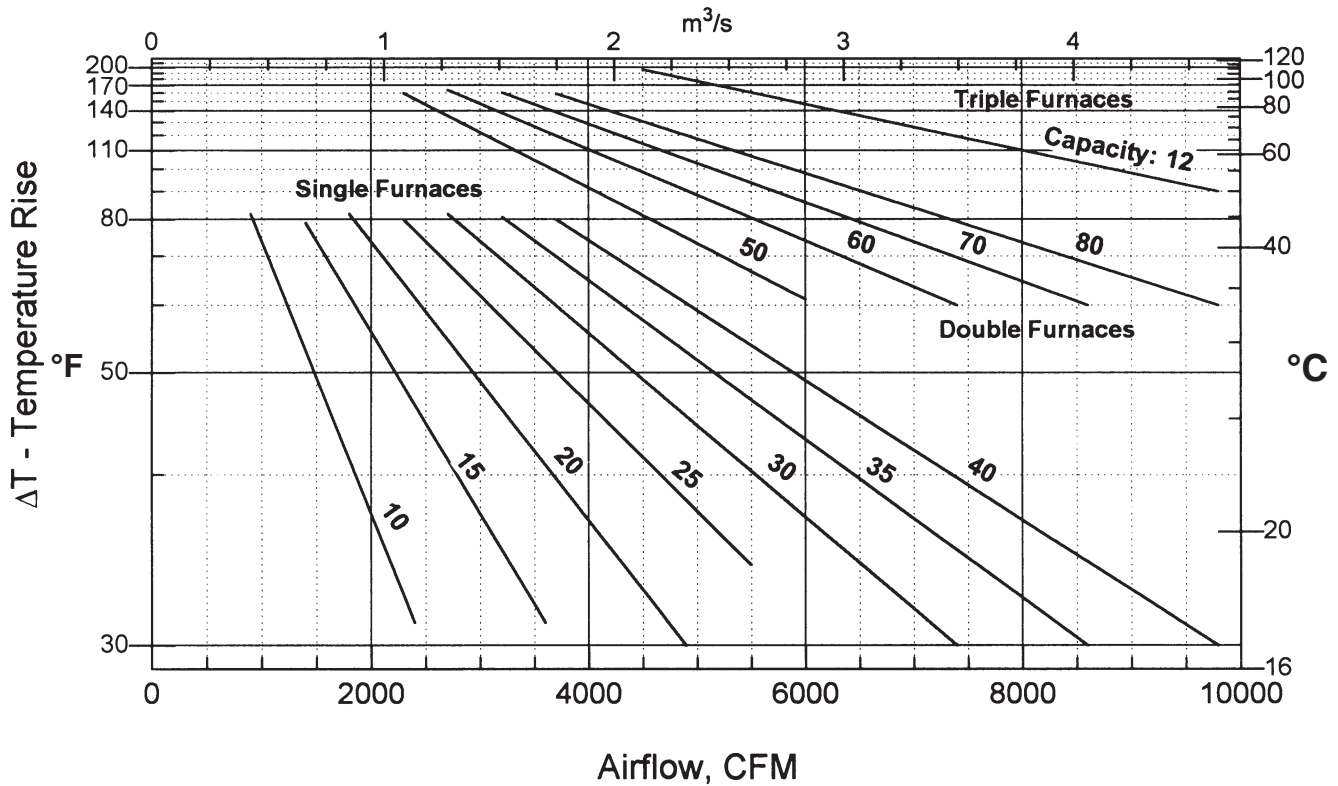
Unit Type [UT] - “ME”

Indoor Arrangements [IA] - (B,D)

		PRESSURE LOSS (INCHES OF WATER)										
		(Opt'l) Airhood		Filters						Evaporative		Return or
		With		Throwaway	Washable		Pleated		Cooling Pad		Outside Air	
Capacity	CFM	Screen	Mstr. Elim.	2"	1"	2"	1"	2"	8"	12"	Damper	
40	3,700	.04	.06	.09	.02	.03	.11	.06	.04	.07	.06	
	4,000	.05	.07	.10	.02	.03	.13	.07	.05	.08	.07	
	5,000	.08	.11	.13	.03	.05	.19	.11	.08	.12	.10	
	6,000	.11	.15	.17	.05	.07	.26	.16	.12	.18	.15	
	7,000	.16	.21	—	.07	.09	.33	.21	.16	.24	.20	
	8,000	.20	.27	—	.09	.12	.42	.26	.21	.31	.26	
	8,500	.23	.31	—	.10	.14	—	—	—	—	.30	
	<hr/>											
50	2,300	.04	.05	.08	.02	.02	.10	.06	.03	.05	.05	
	2,500	.04	.06	.09	.02	.03	.12	.07	.04	.06	.06	
	3,000	.06	.08	.12	.03	.04	.16	.09	.06	.09	.08	
	3,500	.09	.11	.14	.04	.05	.21	.12	.08	.12	.11	
	4,000	.11	.15	.17	.05	.07	.26	.16	.10	.15	.15	
	4,500	.14	.19	—	.06	.09	.31	.19	.13	.20	.19	
	5,000	.17	.23	—	.07	.11	.38	.23	.16	.24	.23	
	5,200	.19	.25	—	.08	.12	.40	.25	.17	.26	.25	
<hr/>												
60	2,700	.03	.04	.07	.01	.02	.09	.05	.03	.04	.04	
	3,000	.04	.05	.08	.02	.02	.10	.06	.04	.05	.05	
	4,000	.06	.09	.12	.03	.04	.17	.10	.06	.10	.08	
	5,000	.10	.13	.16	.04	.06	.24	.14	.10	.15	.13	
	6,000	.14	.19	—	.06	.09	.33	.20	.14	.21	.19	
	<hr/>											
70	3,200	.04	.05	.09	.02	.03	.11	.06	.04	.06	.05	
	4,000	.06	.09	.12	.03	.04	.17	.10	.06	.10	.08	
	5,000	.10	.13	.16	.04	.06	.24	.14	.10	.15	.13	
	6,000	.14	.19	—	.06	.09	.33	.20	.14	.21	.19	
	7,000	.20	.26	—	.09	.13	.43	.27	.20	.29	.25	
	7,500	.22	.30	—	.10	.14	—	—	.22	.34	.29	
	<hr/>											
80	3,700	.04	.06	.09	.02	.03	.11	.06	.04	.07	.06	
	4,000	.05	.07	.10	.02	.03	.13	.07	.05	.08	.07	
	5,000	.08	.11	.13	.03	.05	.19	.11	.08	.12	.10	
	6,000	.11	.15	.17	.05	.07	.26	.16	.12	.18	.15	
	7,000	.16	.21	—	.07	.09	.33	.21	.16	.24	.20	
	7,500	.18	.24	—	.07	.11	.38	.23	.18	.28	.23	

Quick Sizer Chart No. 2

Unit Type [UT] - "ME"; Furnace Type [FT] - (A,B) Standard Temperature Rise
 Indoor Arrangement [IA] - (G,K)



Performance — Table 5

Unit Type [UT] - “ME”; Furnace Type [FT] - (A,B) Standard Temperature Rise Indoor Arrangements [IA] - (G,K)

The maximum CFM for Indoor Arrangement “K” with cooling coil is 6,500 (3.1 m³/s). A variable frequency drive may be utilized for non-cooling air flow up to 9,831 CFM (4.6 m³/s).

TOTAL STATIC PRESSURE (INCHES OF WATER)

Capacity	TR (°F)	Input CFM	Output BTU/H	0.2		0.4		0.6		0.8		1		1.2		1.4		1.6		1.8		2	
				RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
*10																							
80	922			575	.11	730	.18	855	.25	965	.33	1065	.41	1150	.50	1230	.58	1305	.67	1375	.76	1440	.86
74	1,000			605	.14	745	.21	870	.29	980	.37	1080	.46	1165	.55	1245	.64	1320	.74	1390	.83	1455	.93
61	1,200			670	.21	795	.29	910	.38	1015	.47	1110	.57	1195	.67	1280	.77	1355	.88	1425	.99	1490	1.10
53	1,400			740	.30	850	.39	955	.48	1050	.59	1145	.69	1230	.81	1310	.92	1385	1.04	1455	1.16	1520	1.28
46	1,600	100,000	80,000	815	.42	910	.52	1005	.62	1095	.73	1180	.85	1265	.97	1340	1.09	1415	1.22	1485	1.36	1550	1.49
41	1,800			895	.57	980	.68	1065	.79	1145	.90	1225	1.03	1305	1.16	1375	1.29	1450	1.43	1515	1.57	1585	1.72
37	2,000			970	.76	1050	.87	1125	.99	1200	1.11	1275	1.24	1350	1.38	1420	1.52	1485	1.67	1550	1.82	1615	1.98
34	2,200			1050	.98	1125	1.11	1195	1.23	1265	1.36	1330	1.50	1400	1.64	1465	1.79	1530	1.95	1590	2.11	1655	2.27
30	2,458			1130	1.24	1200	1.38	1265	1.52	1330	1.66	1390	1.80	1455	1.95	1515	2.11	1575	2.27	1635	2.44	1695	2.61
*15																							
80	1,382			630	.23	745	.31	855	.39	960	.49	1055	.59	1150	.70	1235	.81	1315	.93	1385	1.05	1460	1.17
74	1,500			655	.27	770	.35	870	.44	970	.54	1065	.65	1155	.76	1240	.87	1320	.99	1395	1.12	1465	1.24
55	2,000			800	.56	895	.65	980	.77	1060	.89	1135	1.00	1210	1.13	1285	1.26	1355	1.40	1425	1.54	1495	1.69
44	2,500	150,000	120,000	955	1.02	1035	1.13	1110	1.26	1180	1.40	1245	1.55	1310	1.69	1370	1.84	1430	1.99	1490	2.14	1550	2.30
37	3,000			1115	1.69	1180	1.84	1245	1.96	1310	2.12	1370	2.28	1425	2.46	1480	2.64	1535	2.81	1585	2.98	1640	3.16
32	3,500			1280	2.62	1335	2.79	1395	2.95	1450	3.10	1505	3.27	1555	3.46	1605	3.66	1655	3.86	1705	4.07	1750	4.27
30	3,687			1315	2.84	1370	3.02	1425	3.18	1475	3.34	1530	3.50	1580	3.69	1630	3.89	1680	4.10	1730	4.32	1775	4.53
20																							
80	1,843			400	.20	495	.29	580	.39	650	.49	720	.59	780	.70	835	.82	890	.94	940	1.07	985	1.20
74	2,000			425	.26	510	.35	590	.45	665	.56	730	.67	790	.79	845	.91	900	1.04	950	1.17	995	1.31
59	2,500			490	.45	560	.55	630	.66	695	.79	755	.92	815	1.06	870	1.20	920	1.34	970	1.48	1015	1.63
49	3,000	200,000	160,000	560	.72	620	.84	680	.95	735	1.09	795	1.24	845	1.40	900	1.56	945	1.72	995	1.88	1040	2.05
42	3,500			635	1.09	685	1.23	735	1.36	790	1.50	840	1.65	885	1.82	935	2.00	980	2.18	1025	2.37	1065	2.56
37	4,000			710	1.58	755	1.73	800	1.89	845	2.04	890	2.20	935	2.37	975	2.55	1020	2.74	1060	2.95	1100	3.16
33	4,500			790	2.20	825	2.37	865	2.54	905	2.72	950	2.90	990	3.07	1025	3.25	1065	3.44	1105	3.65	1140	3.87
30	4,916			850	2.81	885	2.98	920	3.17	960	3.36	995	3.56	1035	3.75	1070	3.94	1105	4.13	1140	4.34	1175	4.55
25																							
80	2,304			440	.34	520	.43	595	.54	665	.66	730	.78	790	.91	845	1.04	900	1.17	945	1.31	995	1.45
74	2,500			465	.42	540	.52	610	.62	675	.75	740	.88	795	1.02	855	1.15	905	1.29	955	1.44	1000	1.58
61	3,000			535	.67	595	.79	655	.90	710	1.03	770	1.17	825	1.33	875	1.49	925	1.65	975	1.81	1020	1.98
53	3,500	250,000	200,000	605	1.02	655	1.15	705	1.28	760	1.42	810	1.56	860	1.72	905	1.89	955	2.07	1000	2.26	1040	2.45
46	4,000			680	1.48	720	1.61	765	1.77	810	1.93	855	2.08	900	2.24	945	2.41	985	2.59	1030	2.79	1070	3.00
41	4,500			755	2.06	790	2.21	825	2.37	870	2.55	910	2.73	950	2.90	990	3.08	1030	3.26	1065	3.45	1105	3.66
37	5,000			835	2.79	860	2.95	895	3.12	930	3.31	965	3.51	1005	3.71	1040	3.90	1075	4.10	1110	4.29	1145	4.49
30	6,144			910	3.67	935	3.84	965	4.03	995	4.22	1025	4.43	1060	4.65	1095	4.87	1130	5.09	1160	5.30	1195	5.51
30																							
80	2,765			410	.31	520	.47	615	.67	705	.89	785	1.12	855	1.36	915	1.60	970	1.85	1025	2.10	1070	2.36
74	3,000			435	.38	530	.56	625	.76	710	.99	790	1.24	860	1.49	925	1.76	980	2.02	1035	2.29	1085	2.57
55	4,000			515	.74	595	.95	670	1.18	740	1.43	810	1.70	875	1.99	940	2.30	1000	2.63	1060	2.96	1110	3.30
44	5,000	300,000	240,000	600	1.30	670	1.55	730	1.82	795	2.10	850	2.39	910	2.70	965	3.03	1020	3.38	1075	3.74	1125	4.12
37	6,000			695	2.10	750	2.40	810	2.71	860	3.02	910	3.35	960	3.69	1010	4.05	1060	4.42	1105	4.80	1155	5.19
32	7,000			790	3.19	840	3.54	890	3.89	935	4.25	985	4.62	1025	5.00	1070	5.38	1115	5.78	1155	6.19	1200	6.61
30	7,373			830	3.72	875	4.09	925	4.46	970	4.84	1015	5.22	1055	5.61	1100	6.02	1140	6.43	1180	6.85	1220	7.28
35																							
80	3,226			395	.34	495	.50	580	.68	655	.87	720	1.07	780	1.29	840	1.51	890	1.75	940	2.00	985	2.25
65	4,000			445	.55	530	.74	610	.96	680	1.17	745	1.40	805	1.63	860	1.88	910	2.14	960	2.41	1005	2.68
52	5,000			515	.97	585	1.17	655	1.41	720	1.67	780	1.94	835	2.22	890	2.50	940	2.78	985	3.07	1030	3.37
43	6,000	350,000	280,000	590	1.56	650	1.79	710	2.04	765	2.33	820	2.64	875	2.96	925	3.29	970	3.61	1015	3.94	1060	4.28
37	7,000			670	2.37	720	2.65	775	2.92	825	3.21	870	3.53	920	3.88	965	4.25	1010	4.63	1055	5.01	1095	5.38
32	8,000			750	3.43	795	3.75	840	4.06	885	4.37	930	4.70	975	5.06	1015	5.44	1055	5.85	1095	6.27	1135	6.70
30	8,602			800	4.20	840	4.54	885	4.88	925	5.21	965	5.55	1005	5.91	1045	6.30	1085	6.71	1125	7.15	1165	7.60

*Capacities 10 and 15 are available for Indoor Arrangement “K” only (with Cooling Coil Cabinet).
Notes: 1. Refer to Table 6 for “Accessory Pressure Losses”.

2. Values in Table 5 are based on “Basic Packaged Unit” which includes pressure drop of the Duct Furnace(s) and “System Effect” of the blower module.
3. Unit leaving air temperature is limited to 150 °F (66 °C), and is equal to: [Entering Air Temperature + Duct Furnace(s) Temperature Rise]

4. Brake Horsepower (BHP) includes drive losses.
5. “Total Static Pressure” is the sum of the units’ “Internal” accessory pressure loss(es) from Table 6, plus the external static pressure.
6. Ratings shown are for elevations in U.S.A. up to 2,000 feet (610m) above sea level. Above 2,000 feet (610m), input must be derated four percent for each 1,000 feet (305m) above sea level. Also refer to note on page 6.

Accessory Pressure Loss — Table 6

Unit Type [UT] - “ME”

Indoor Arrangement [IA] - (G,K)

		PRESSURE LOSS (INCHES OF WATER)							
Capacity	CFM	(Opt'l) Airhood		Filters					Return or Outside Air Damper
		With Screen	Mstr. Elim.	Throwaway 2"	Washable 1"	Washable 2"	Pleated 1"	Pleated 2"	
*10	1,000	.01	.02	.01	<.01	<.01	.01	<.01	.02
	1,200	.02	.03	.02	<.01	<.01	.02	<.01	.03
	1,400	.03	.04	.02	<.01	<.01	.02	<.01	.04
	1,600	.04	.05	.03	<.01	<.01	.03	.01	.06
	1,800	.05	.06	.03	<.01	<.01	.03	.02	.07
	2,000	.06	.07	.04	<.01	<.01	.04	.02	.09
	2,200	.07	.09	.04	<.01	<.01	.04	.02	.10
2,400	.08	.11	.05	<.01	<.01	.05	.03	.12	
*15	1,400	.03	.04	.02	<.01	<.01	.02	<.01	.04
	1,500	.03	.04	.02	<.01	<.01	.02	.01	.05
	2,000	.06	.07	.04	<.01	<.01	.04	.02	.09
	2,500	.09	.12	.05	<.01	.01	.05	.03	.13
	3,000	.13	.17	.06	.01	.02	.07	.04	.19
	3,500	.18	.23	.08	.01	.02	.09	.05	.25
3,600	.19	.24	.08	.02	.02	.10	.05	.27	
20	1,800	.02	.03	.03	<.01	<.01	.03	.02	.03
	2,000	.03	.04	.04	<.01	<.01	.04	.02	.04
	2,500	.04	.06	.05	<.01	.01	.05	.03	.06
	3,000	.06	.08	.06	.01	.02	.07	.04	.08
	3,500	.09	.11	.08	.01	.02	.09	.05	.11
	4,000	.11	.15	.09	.02	.03	.12	.07	.15
	4,500	.14	.19	.11	.02	.03	.14	.08	.19
4,900	.17	.22	.12	.03	.04	.16	.10	.22	
25	2,300	.04	.05	.04	<.01	<.01	.05	.02	.05
	2,500	.04	.06	.05	<.01	.01	.05	.03	.06
	3,000	.06	.08	.06	.01	.02	.07	.04	.08
	3,500	.09	.11	.08	.01	.02	.09	.05	.11
	4,000	.11	.15	.09	.02	.03	.12	.07	.15
	4,500	.14	.19	.11	.02	.03	.14	.08	.19
	5,000	.17	.23	.12	.03	.04	.17	.10	.23
5,500	.21	.28	.14	.04	.05	.20	.12	.28	
30	2,700	.03	.04	.03	<.01	<.01	.03	.01	.04
	3,000	.04	.05	.03	<.01	<.01	.03	.02	.05
	4,000	.06	.09	.05	<.01	.01	.05	.03	.08
	5,000	.10	.13	.06	.01	.02	.08	.04	.13
	6,000	.14	.19	.08	.02	.02	.10	.06	.19
	7,000	.20	.26	.10	.02	.03	.13	.08	.25
	7,400	.22	.29	.11	.02	.03	.15	.08	.28
35	3,200	.04	.05	.03	<.01	<.01	.04	.02	.05
	4,000	.06	.09	.05	<.01	.01	.05	.03	.08
	5,000	.10	.13	.06	.01	.02	.08	.04	.13
	6,000	.14	.19	.08	.02	.02	.10	.06	.19
	7,000	.20	.26	.10	.02	.03	.13	.08	.25
	8,000	.26	.34	.12	.03	.04	.17	.10	.33
	8,600	.30	.40	.13	.03	.05	.19	.11	.38

*Capacities 10 and 15 are available only on Indoor Arrangement “K”.

Accessory Pressure Loss — Table 6 *continued*

Unit Type [UT] - “ME”

Indoor Arrangement [IA] - (G,K)

		PRESSURE LOSS (INCHES OF WATER)							
Capacity	CFM	(Opt'l) Airhood		Filters					Return or Outside Air Damper
		With Screen	Mstr. Elim.	Throwaway 2"	Washable 1"	2"	Pleated 1"	2"	
40	3,700	.04	.06	.03	<.01	<.01	.04	.02	.06
	4,000	.05	.07	.04	<.01	<.01	.04	.02	.07
	5,000	.08	.11	.05	<.01	.01	.06	.03	.10
	6,000	.11	.15	.07	.01	.02	.08	.04	.15
	7,000	.16	.21	.08	.02	.02	.10	.06	.20
	8,000	.20	.27	.10	.02	.03	.13	.07	.26
	9,000	.26	.35	.12	.03	.04	.16	.09	.33
	9,800	.31	.41	.13	.03	.05	.18	.11	.39
50	2,300	.04	.05	.04	<.01	<.01	.05	.02	.05
	2,500	.04	.06	.05	<.01	.01	.05	.03	.06
	3,000	.06	.08	.06	.01	.02	.07	.04	.08
	3,500	.09	.11	.08	.01	.02	.09	.05	.11
	4,000	.11	.15	.09	.02	.03	.12	.07	.15
	4,500	.14	.19	.11	.02	.03	.14	.08	.19
	5,000	.17	.23	.12	.03	.04	.17	.10	.23
	5,500	.21	.28	.14	.04	.05	.20	.12	.28
6,000	.25	.33	.16	.04	.06	.23	.14	.33	
60	2,700	.03	.04	.03	<.01	<.01	.03	.01	.04
	3,000	.04	.05	.03	<.01	<.01	.03	.02	.05
	4,000	.06	.09	.05	<.01	.01	.05	.03	.08
	5,000	.10	.13	.06	.01	.02	.08	.04	.13
	6,000	.14	.19	.08	.02	.02	.10	.06	.19
	7,000	.20	.26	.10	.02	.03	.13	.08	.25
	7,400	.22	.29	.11	.02	.03	.15	.08	.28
70	3,200	.04	.05	.03	<.01	<.01	.04	.02	.05
	4,000	.06	.09	.05	<.01	.01	.05	.03	.08
	5,000	.10	.13	.06	.01	.02	.08	.04	.13
	6,000	.14	.19	.08	.02	.02	.10	.06	.19
	7,000	.20	.26	.10	.02	.03	.13	.08	.25
	8,000	.26	.34	.12	.03	.04	.17	.10	.33
	8,600	.30	.40	.13	.03	.05	.19	.11	.38
80	3,700	.04	.06	.03	<.01	<.01	.04	.02	.06
	4,000	.05	.07	.04	<.01	<.01	.04	.02	.07
	5,000	.08	.11	.05	<.01	.01	.06	.03	.10
	6,000	.11	.15	.07	.01	.02	.08	.04	.15
	7,000	.16	.21	.08	.02	.02	.10	.06	.20
	8,000	.20	.27	.10	.02	.03	.13	.07	.26
	9,000	.26	.35	.12	.03	.04	.16	.09	.33
	9,800	.31	.41	.13	.03	.05	.18	.11	.39
12	4,500	.06	.09	.05	<.01	<.01	.05	.03	.08
	5,000	.08	.11	.05	<.01	.01	.06	.03	.10
	6,000	.11	.15	.07	.01	.02	.08	.04	.15
	7,000	.16	.21	.08	.02	.02	.10	.06	.20
	8,000	.20	.27	.10	.02	.03	.13	.07	.26
	9,000	.26	.35	.12	.03	.04	.16	.09	.33
	9,800	.31	.41	.13	.03	.05	.18	.11	.39

Notes: Refer to Tables 17A & 17B for DX Cooling Coil and Tables 18A & 18B for Chilled Water Coil Pressure Losses (Indoor Arrangement “K”).

Packaged Indoor Separated Combustion Arrangements Heating & Cooling Units

Unit Type [UT] - “MS”; Indoor Arrangement [IA] Model Digit 7

Sterling Packaged Indoor Separated Combustion Units are available in one of 4 standard arrangements (Indoor Arrangements [IA], Model digit 7). Packaged heating and cooling units are suitable for commercial, institutional and industrial applications where external system pressure losses are as high as 2 inches WC (0.50 kPa).

Indoor Arrangements are divided into two classifications “Standard” and “High-CFM” Blower types. The “Standard” blower units (Indoor Arrangement [IA] “B & D”) have a CFM range of 800-8,500 (0.4 - 4.0 m³/s). The Standard blower arrangement consists of a blower cabinet that houses dampers, filters and blower(s) in one cabinet; an optional Evaporative Cooling Unit with standard 8 or optional 12 inch (203 or 305 mm) media; and up to two Separated Combustion Duct Furnaces (800 MBH Max.) (234.3 kW max).

The “High-CFM” Blower Units (Indoor Arrangement [IA] “G & K”) have a range of 2,000 - 14,000 CFM (0.9 - 6.6 m³/s). These High-CFM Blower units utilize a separate Damper/Filter cabinet with a “V” bank filter arrangement, a Blower Cabinet and up to three Duct Furnaces (1,200 MBH Max.) (351.4 kW).

Indoor Arrangement “K” utilize the same cabinetry as Indoor Arrangement “G” plus an additional Coil Cabinet capable of up to 20 tons of cooling and a CFM range of 960 - 6,300 (0.4 - 3.0 m³/s). This coil cabinet is also suitable for heating coils. Consult factory for details.

Sterling Packaged Indoor Separated Combustion Units utilize an 80% efficient duct furnace available in Standard Temperature Rise, 20-60 °F (11-33 °C) per furnace or High Temperature Rise, 60-90 °F (33-50 °C) single furnace.

For your safety and convenience, all Sterling Packaged Heating and Cooling Units include: a 24 Volt control circuit; Solid State Fan Time Delay; 24 Volt in line Circuit Breaker; Blower Door Interlock Switch; a Reverse Air Flow Switch (Return Firestat); Pre-wired Fan On and Exhaust Fan Interlock Relay Sockets; and a Printed Circuit Main Connection Board with Terminal Block Wiring. All wiring is processed at our factory as harness assemblies and each wire is permanently stamped with its wire number.

All cabinets are constructed of rugged 20-gauge material and painted Sterling gray. The modular design of the cabinetry insures reliability as well as serviceability with quick-release door latches and insulated blower filter cabinets.

Indoor Arrangements [IA] Digit 7

- A - Duct Furnace Only (CA 50-12)
- B - Blower (STANDARD)
- D - Blower (STANDARD) / Evap. Cooling
- G - Blower (HIGH-CFM)
- K - Blower (HIGH-CFM) / Coil Cabinet

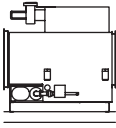
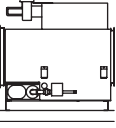
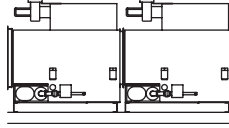
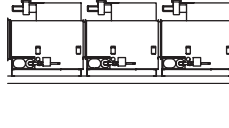


“MS”
High CFM Unit

Packaged Indoor Arrangement Reference

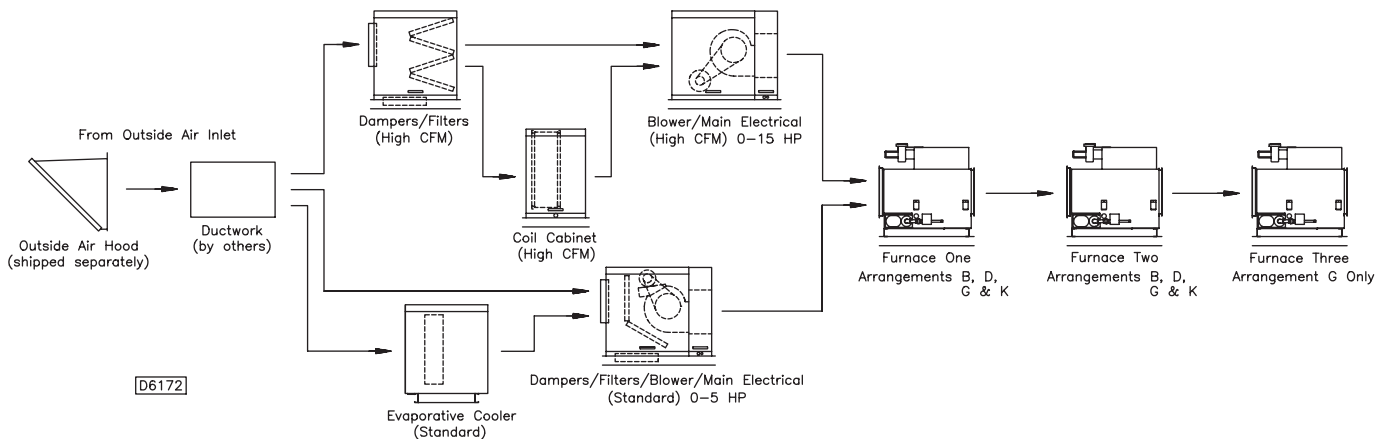
Unit Type [UT] MS

* The maximum CFM for Indoor Arrangement K is 6,300 (3.0 m³/s). A variable frequency drive may be utilized for non-cooling air flow up to 14,000 CFM (6.6 m³/2).

	Standard Blower Arrangement B	Standard Blower w/Evap. Arrangement D	High CFM Blower Arrangement G	High CFM Blower w/Cooling Arrangement K†
Furnace Type A, B $\Delta T_{20} \text{ } ^\circ\text{-}60^\circ\text{F}$ 	Capacity 10 - 40 10 - 1,200 - 3,500 CFM, 1/2 - 5 HP 15 - 2,000 - 4,500 CFM, 1/2 - 5 HP 20 - 2,500 - 5,500 CFM, 1/2 - 5 HP 25 - 3,000 - 5,500 CFM, 3/4 - 5 HP 30 - 3,700 - 7,000 CFM, 3/4 - 5 HP 35 - 4,500 - 8,500 CFM, 3/4 - 5 HP 40 - 5,000 - 8,500 CFM, 1 - 5 HP TSP 0.1 - 2 inch WC Chart #3 Tables #7, 9	Capacity 10 - 40 10 - 1,200 - 3,500 CFM, 1/2 - 5 HP 15 - 2,000 - 4,500 CFM, 1/2 - 5 HP 20 - 2,500 - 5,500 CFM, 1/2 - 5 HP 25 - 3,000 - 5,500 CFM, 3/4 - 5 HP 30 - 3,700 - 7,000 CFM, 3/4 - 5 HP 35 - 4,500 - 8,500 CFM, 3/4 - 5 HP 40 - 5,000 - 8,500 CFM, 1 - 5 HP TSP 0.1 - 2 inch WC Chart #3 Tables #7, 9	Capacity 20 - 40 20 - 2,500 - 7,400 CFM, 3/4 - 10 HP 25 - 3,100 - 7,500 CFM, 3/4 - 10 HP 30 - 3,700 - 11,000 CFM, 1/2 - 15 HP 35 - 4,500 - 13,000 CFM, 3/4 - 15 HP 40 - 5,000 - 14,000 CFM, 1 - 15 HP TSP 0.1 - 2 inch WC Chart #5 Tables #10, 12	Capacity 10 - 40 10 - 960 - 3,000 CFM, 1/2 - 5 HP 15 - 960 - 3,000 CFM, 1/2 - 5 HP 20 - 1,600 - 4,400 CFM, 3/4 - 10 HP 25 - 1,600 - 4,400 CFM, 3/4 - 10 HP 30 - 1,900 - 5,700 CFM, 1/2 - 15 HP 35 - 1,900 - 5,700 CFM, 3/4 - 15 HP 40 - 2,100 - 6,300 CFM, 1 - 15 HP TSP 0.1 - 2 inch WC Chart #5 Tables #10, 12, 17A, 17B, 18A, 18B
Furnace Type C, D $\Delta T_{60} \text{ } ^\circ\text{-}90^\circ\text{F}$ 	Capacity 10-40 10 - 800 - 1,200 CFM, 1/2 - 1-1/2 HP 15 - 1,200 - 1,800 CFM, 1/2 - 2 HP 20 - 1,600 - 2,400 CFM, 1/2 - 2 HP 25 - 2,000 - 3,000 CFM, 1/2 - 3 HP 30 - 2,400 - 3,600 CFM, 1/2 - 5 HP 35 - 2,800 - 4,200 CFM, 1/2 - 5 HP 40 - 3,200 - 4,800 CFM, 1/2 - 5 HP TSP 0.1 - 2 inch WC Chart #4 Tables #8, 9	Capacity 10-40 10 - 800 - 1,200 CFM, 1/2 - 1-1/2 HP 15 - 1,200 - 1,800 CFM, 1/2 - 2 HP 20 - 1,600 - 2,400 CFM, 1/2 - 2 HP 25 - 2,000 - 3,000 CFM, 1/2 - 3 HP 30 - 2,400 - 3,600 CFM, 1/2 - 5 HP 35 - 2,800 - 4,200 CFM, 1/2 - 5 HP 40 - 3,200 - 4,800 CFM, 1/2 - 5 HP TSP 0.1 - 2 inch WC Chart #4 Tables #8, 9	NA	Capacity 20-40 20 - 1,600 - 2,400 CFM, 1/2 - 2 HP 25 - 1,600 - 3,000 CFM, 1/2 - 2 HP 30 - 1,900 - 3,600 CFM, 1/2 - 5 HP 35 - 1,900 - 4,200 CFM, 1/2 - 5 HP 40 - 2,100 - 5,000 CFM, 1/2 - 5 HP TSP 0.1 - 2 inch WC Chart #6 Tables #11, 12, 17A, 17B, 18A, 18B
Furnace Type A, B $\Delta T_{40} \text{ } ^\circ\text{-}120^\circ\text{F}$ 	Capacity 50 - 80** 50 - 3,000 - 5,500 CFM, 1 - 5 HP 60 - 3,700 - 6,500 CFM, 1 - 5 HP 70 - 4,500 - 8,000 CFM, 1 - 5 HP 80 - 5,000 - 8,000 CFM, 1 - 5 HP TSP 0.1 - 2 inch WC Chart #3 Tables #7, 9	Capacity 50 - 80** 50 - 3,000 - 5,500 CFM, 1 - 5 HP 60 - 3,700 - 6,500 CFM, 1 - 5 HP 70 - 4,500 - 8,000 CFM, 1 - 5 HP 80 - 5,000 - 8,000 CFM, 1 - 5 HP TSP 0.1 - 2 inch WC Chart #3 Tables #7, 9	Capacity 50 - 80** 50 - 3,100 - 7,500 CFM, 1 - 10 HP 60 - 3,700 - 11,000 CFM, 3/4 - 15 HP 70 - 4,500 - 13,000 CFM, 1 - 15 HP 80 - 5,000 - 13,500 CFM, 1 - 15 HP TSP 0.1 - 2 inch WC Chart #5 Tables #10, 12	Capacity 50 - 80** 50 - 1,600 - 4,400 CFM, 1 - 10 HP 60 - 1,900 - 5,700 CFM, 3/4 - 15 HP 70 - 1,900 - 5,700 CFM, 1 - 15 HP 80 - 2,100 - 6,300 CFM, 1 - 15 HP TSP 0.1 - 2 inch WC Chart #5 Tables #10, 12, 17A, 17B, 18A, 18B
Furnace Type A, B $\Delta T_{60} \text{ } ^\circ\text{-}180^\circ\text{F}$ 	NA	NA	Capacity 12** 12 - 5,500 - 13,000 CFM, 1-1/2 - 15 HP TSP 0.1 - 2 inch WC Chart #5 Tables #10, 12,	NA

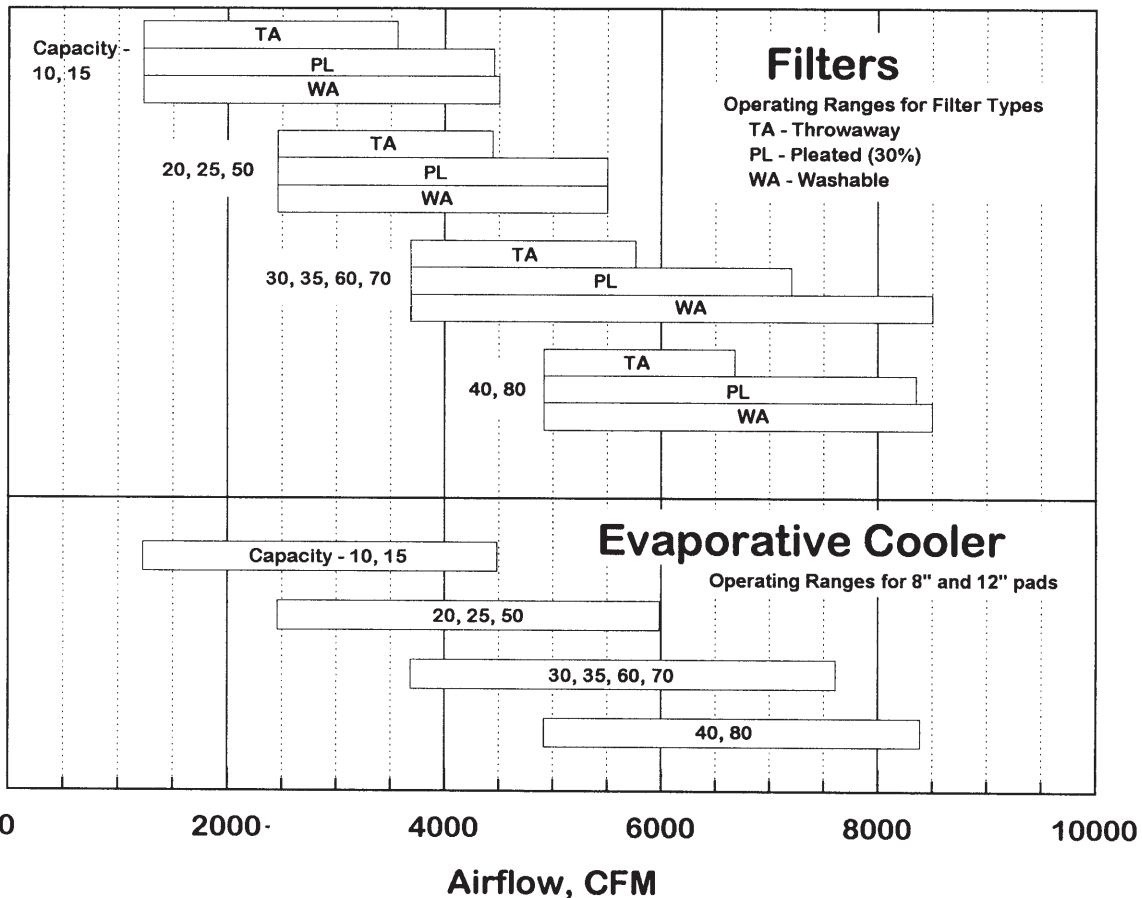
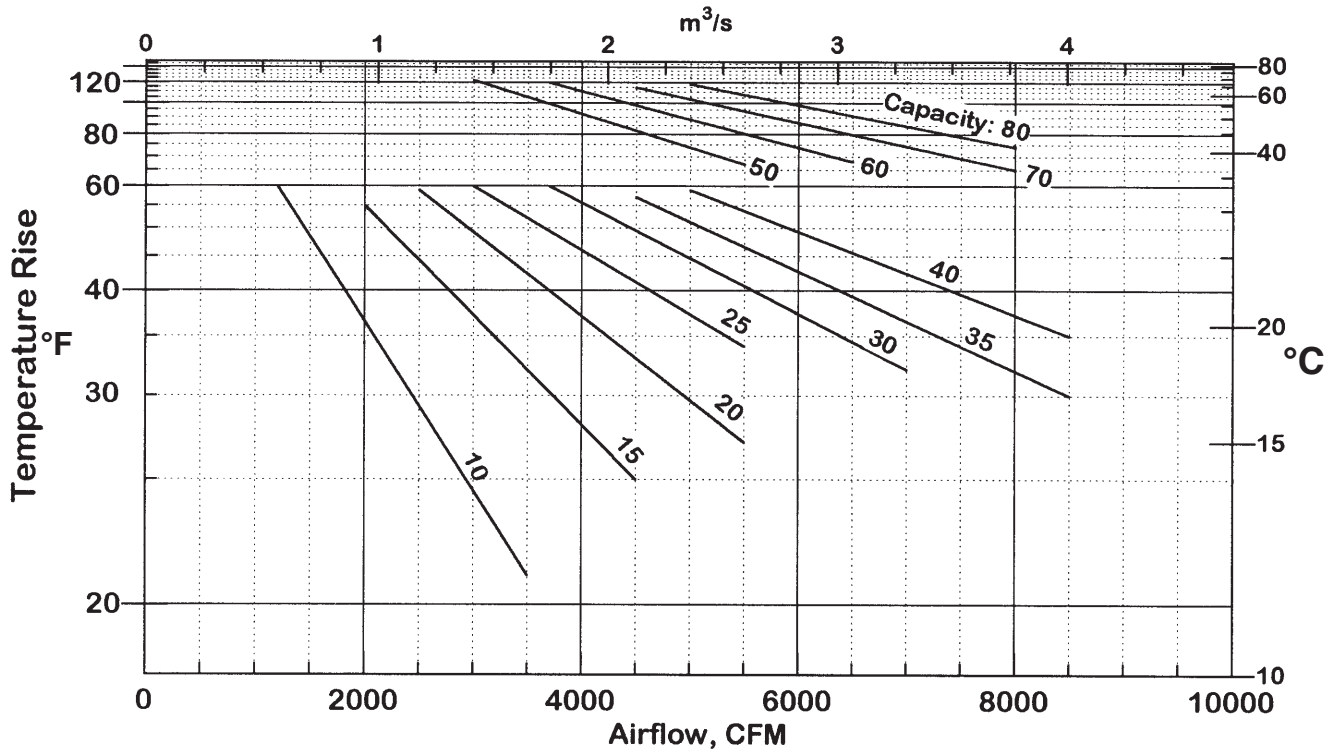
† These minimum and maximum CFM's shown are for Arrangement K in the cooling mode. See Tables #10, 11 & 12 for heating mode specifications.

**Unit Type [UT] MS Packaged Indoor Arrangements, Capacity [CA] 50-80 and 12 are shipped in two pieces and a factory supplied, field installed flex connector is provided.



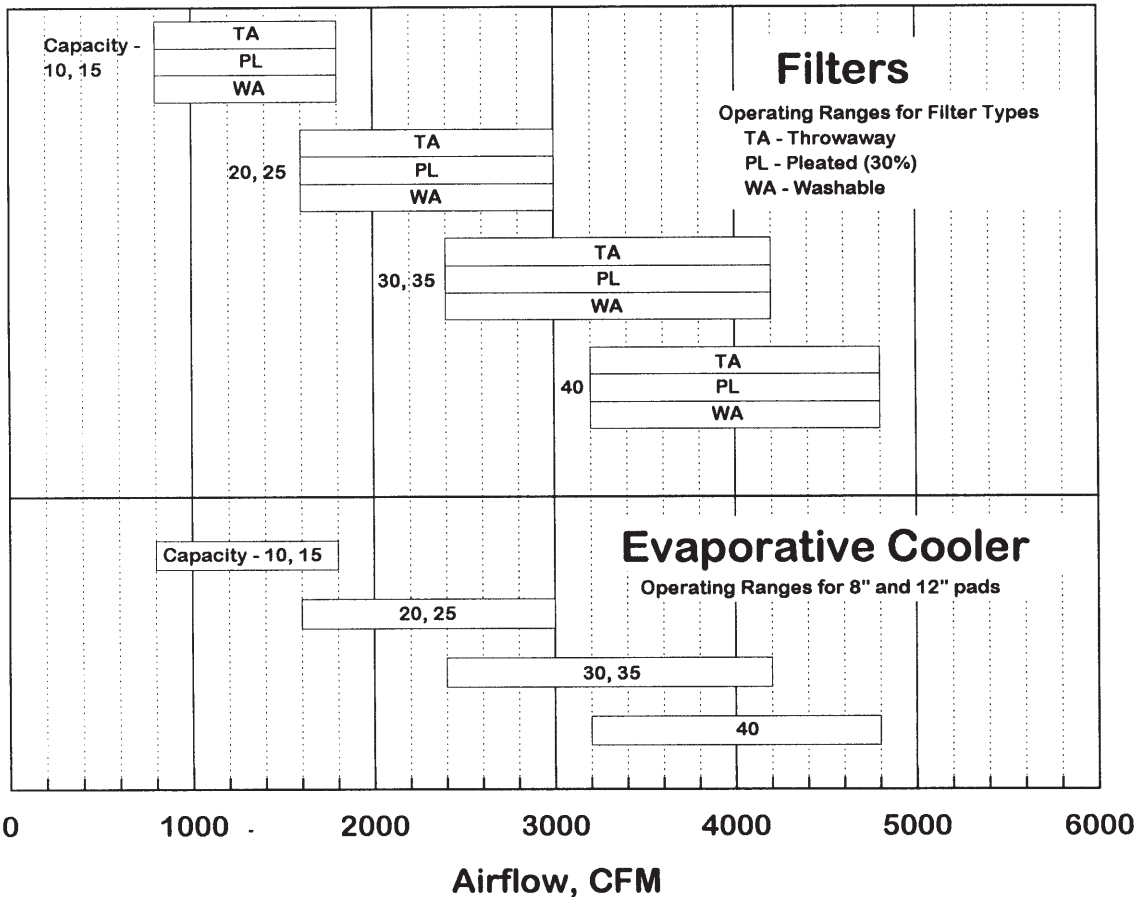
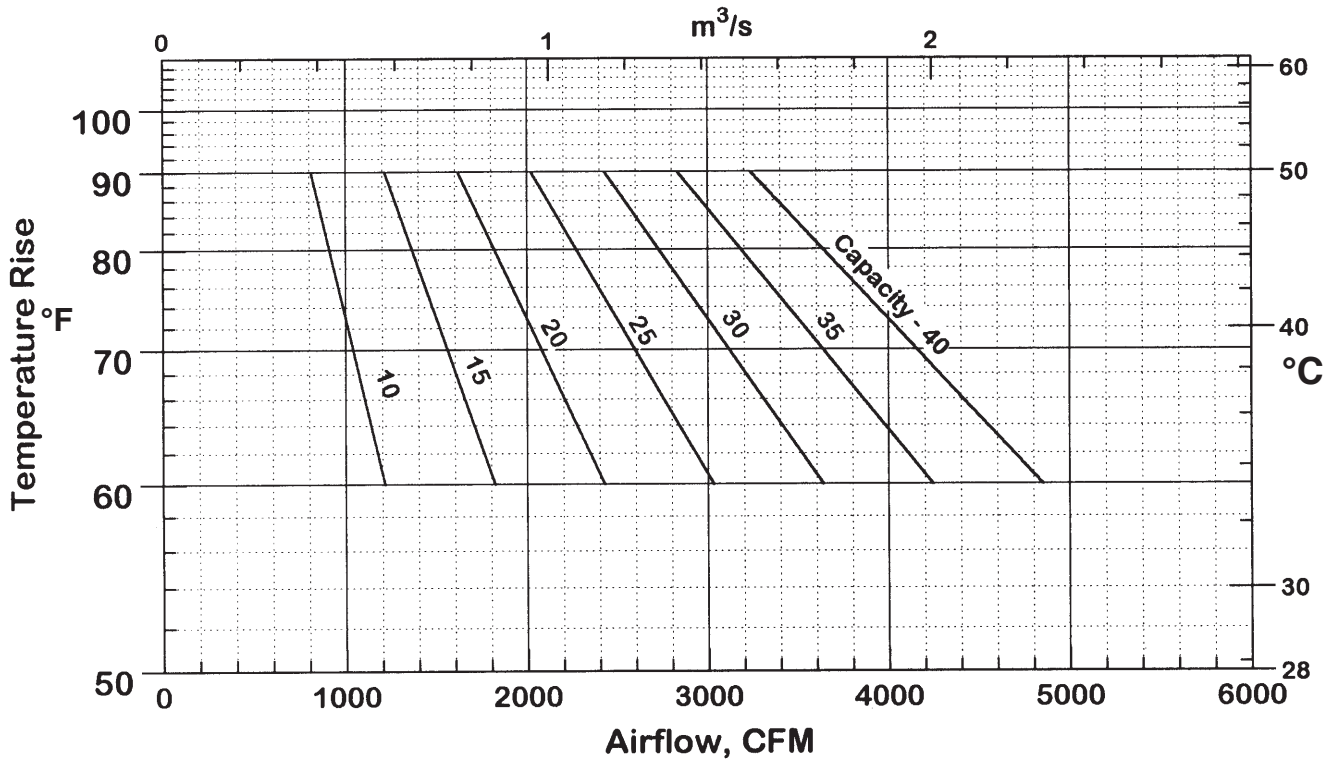
Quick Sizer Chart No. 3

Unit Type [UT] - "MS"; Furnace Type [FT] - (A,B) Standard Temperature Rise
 Indoor Arrangement [IA] - (B,D)



Quick Sizer Chart No. 4

Unit Type [UT] - "MS"; Furnace Type [FT] - (C,D) High Temperature Rise
 Indoor Arrangement [IA] - (B,D)



Performance – Table 7

Unit Type [UT] - “MS”; Furnace Type [FT] - (A,B) Standard Temperature Rise Indoor Arrangements [IA] - (B,D)

Table with columns for Capacity, Furnace Type, TR, Input, Output, and TOTAL STATIC PRESSURE (INCHES OF WATER) ranging from 0.2 to 2.0. The table lists performance metrics for various furnace models and capacities.

- Notes: 1. Refer to Table 7 for “Accessory Pressure Losses”. 2. Values in Tables 7 and 8 are based on “Basic Packaged Unit” which includes pressure drop of the Duct Furnace(s) and “System Effect” of the blower module. 3. Unit leaving air temperature is limited to 150 °F (66 °C), and is equal to: [Entering Air Temperature + Duct Furnace(s) Temperature Rise]

- 4. Brake Horsepower (BHP) includes drive losses. 5. “Total Static Pressure” is the sum of the units’ “Internal” accessory pressure loss(es) from Table 9, plus the external static pressure. 6. Ratings shown are for elevations in U.S.A. up to 2,000 feet (610m) above sea level. Above 2,000 feet (610m), input must be derated four percent for each 1,000 feet (305m) above sea level. Also refer to note on page 7.

Performance — Table 8

Unit Type [UT] - “MS”; Furnace Type [FT] - (C,D) High Temperature Rise
Indoor Arrangements [IA] - (B,D)

Capacity Furnace Type	TR (°F)	Input CFM	Input BTU/H	Output BTU/H	TOTAL STATIC PRESSURE (INCHES OF WATER)																			
					0.2		0.4		0.6		0.8		1		1.2		1.4		1.6		1.8		2	
					RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
10-C,D	91	800			550	.09	710	.15	840	.22	950	.29	1045	.37	1135	.45	1210	.53	1285	.61	1355	.69	1420	.78
	81	900			575	.11	730	.18	855	.25	965	.33	1065	.41	1150	.50	1230	.58	1305	.67	1375	.76	1440	.86
	73	1,000	100,000	79,000	605	.14	745	.21	870	.29	980	.37	1080	.46	1165	.55	1245	.64	1320	.74	1390	.83	1455	.93
	66	1,100			635	.17	770	.25	890	.33	995	.42	1095	.51	1180	.61	1260	.71	1335	.81	1410	.91	1475	1.01
	61	1,200			670	.21	795	.29	910	.38	1015	.47	1110	.57	1195	.67	1280	.77	1355	.88	1425	.99	1490	1.10
15-C,D	91	1,200			580	.16	705	.23	830	.31	940	.40	1045	.50	1135	.60	1220	.70	1300	.80	1375	.91	1445	1.02
	78	1,400			630	.23	745	.31	855	.39	960	.49	1055	.59	1150	.70	1235	.81	1315	.93	1385	1.05	1460	1.17
	68	1,600	150,000	118,500	685	.31	795	.40	890	.50	985	.60	1075	.70	1160	.82	1245	.94	1325	1.07	1400	1.19	1470	1.33
	61	1,800			740	.42	845	.52	935	.62	1020	.73	1100	.84	1180	.96	1260	1.09	1340	1.22	1410	1.36	1480	1.50
20-C,D	91	1,600			500	.19	615	.26	720	.35	815	.44	900	.54	980	.64	1055	.76	1130	.88	1200	1.00	1270	1.13
	81	1,800			530	.24	640	.33	735	.42	830	.51	915	.62	990	.73	1060	.84	1130	.96	1200	1.09	1265	1.23
	73	2,000	200,000	158,000	560	.31	665	.41	755	.50	845	.60	925	.71	1000	.83	1075	.95	1140	1.07	1205	1.20	1265	1.34
	66	2,200			595	.40	695	.50	780	.60	860	.71	940	.82	1015	.94	1085	1.07	1150	1.19	1215	1.33	1270	1.47
	61	2,400			635	.49	725	.60	805	.71	885	.83	955	.95	1030	1.07	1095	1.20	1160	1.34	1225	1.48	1285	1.62
25-C,D	91	2,000			540	.30	645	.39	740	.48	825	.58	910	.69	985	.80	1060	.92	1125	1.05	1190	1.18	1250	1.31
	81	2,250			580	.39	680	.50	765	.60	850	.71	925	.82	1000	.94	1070	1.07	1140	1.20	1200	1.33	1260	1.47
	73	2,500	250,000	197,500	625	.51	715	.63	795	.74	875	.86	945	.98	1015	1.10	1085	1.23	1150	1.37	1210	1.51	1270	1.66
	66	2,750			665	.66	750	.78	830	.90	905	1.03	970	1.16	1035	1.29	1100	1.43	1160	1.57	1225	1.72	1280	1.87
	61	3,000			710	.83	790	.96	865	1.10	935	1.23	1000	1.37	1065	1.51	1125	1.66	1180	1.81	1240	1.96	1295	2.12
30-C,D	91	2,400			585	.33	710	.47	835	.63	945	.81	1045	1.00	1140	1.20	1225	1.41	1305	1.62	1375	1.83	1445	2.05
	81	2,700			625	.43	740	.58	850	.75	960	.94	1055	1.14	1150	1.36	1235	1.58	1315	1.80	1390	2.04	1460	2.27
	73	3,000	300,000	237,000	665	.54	775	.72	875	.90	975	1.09	1070	1.30	1160	1.53	1245	1.76	1325	2.00	1395	2.25	1470	2.50
	66	3,300			705	.69	810	.87	905	1.07	1000	1.27	1085	1.49	1175	1.72	1255	1.97	1335	2.22	1405	2.48	1475	2.75
	61	3,600			750	.86	850	1.05	940	1.26	1025	1.47	1110	1.70	1190	1.94	1270	2.20	1345	2.46	1415	2.74	1485	3.02
35-C,D	91	2,800			485	.30	610	.44	720	.60	815	.77	905	.96	990	1.17	1070	1.40	1145	1.63	1215	1.87	1280	2.12
	82	3,100			510	.37	625	.52	730	.69	825	.87	910	1.07	990	1.28	1070	1.51	1140	1.75	1210	2.00	1280	2.26
	75	3,400			535	.46	645	.62	745	.79	840	.98	920	1.19	1000	1.40	1070	1.63	1140	1.88	1210	2.14	1275	2.41
	69	3,700	350,000	276,500	560	.56	665	.73	760	.91	850	1.11	935	1.32	1010	1.55	1080	1.78	1145	2.03	1210	2.29	1275	2.57
	64	4,000			590	.67	690	.86	780	1.05	865	1.26	945	1.48	1020	1.71	1090	1.95	1155	2.20	1220	2.47	1280	2.75
	61	4,200			605	.76	705	.95	790	1.15	875	1.36	950	1.59	1025	1.82	1095	2.07	1160	2.33	1225	2.60	1285	2.88
40-C,D	91	3,200			500	.38	620	.53	725	.70	820	.88	905	1.08	985	1.29	1060	1.52	1130	1.76	1205	2.01	1270	2.28
	81	3,600			535	.50	645	.66	740	.84	830	1.04	915	1.24	995	1.46	1065	1.69	1135	1.94	1200	2.20	1265	2.47
	73	4,000	400,000	316,000	570	.64	670	.82	760	1.01	845	1.22	930	1.43	1005	1.66	1075	1.90	1145	2.15	1205	2.42	1265	2.69
	66	4,400			605	.80	700	1.01	785	1.21	865	1.43	945	1.66	1020	1.90	1090	2.15	1155	2.41	1215	2.68	1275	2.96
	61	4,800			640	1.00	730	1.22	815	1.44	890	1.67	960	1.91	1035	2.16	1100	2.42	1165	2.69	1230	2.97	1285	3.26

- Notes: 1. Refer to Table 7 for "Accessory Pressure Losses".
 2. Values in Tables 7 and 8 are based on "Basic Packaged Unit" which includes pressure drop of the Duct Furnace and "System Effect" of the blower module.
 3. Unit leaving air temperature is limited to 150 °F (66 °C), and is equal to: [Entering Air Temperature + Duct Furnace(s) Temperature Rise]
 4. Brake Horsepower (BHP) includes drive losses.
 5. "Total Static Pressure" is the sum of the units' "Internal" accessory pressure loss(es) from Table 9, plus the external static pressure.
 6. Ratings shown are for elevations in U.S.A. up to 2,000 feet (610m) above sea level. Above 2,000 feet (610m), input must be derated four percent for each 1,000 feet (305m) above sea level. Also refer to note on page 7.

Accessory Pressure Loss — Table 9

Unit Type [UT] - “MS”

Indoor Arrangements [IA] - (B,D)

PRESSURE LOSS (INCHES OF WATER)

Capacity	CFM	(Opt'l) Airhood		Filters					Supply Air Plenum	Evaporative Cooling Pad		Return or Outside Air Damper
		With Screen	Mstr. Elim.	Throwaway	Washable		Pleated			8"	12"	
10	800	<.01	.01	.03	<.01	<.01	.03	.01	.02	.01	.02	.01
	900	.01	.01	.03	<.01	<.01	.03	.02	.02	.02	.02	.02
	1,100	.02	.02	.04	<.01	<.01	.04	.02	.03	.02	.04	.03
	1,200	.02	.02	.05	<.01	<.01	.05	.03	.04	.03	.04	.03
	1,500	.03	.04	.06	.01	.02	.07	.04	.06	.04	.07	.05
	2,000	.05	.07	.09	.02	.03	.12	.07	.10	.08	.12	.09
	2,500	.08	.11	.12	.03	.04	.17	.10	.15	.12	.18	.13
	3,000	.11	.15	.16	.04	.06	.23	.14	.22	.17	.26	.19
	3,500	.16	.21	.19	.06	.08	.30	.18	.29	.24	.35	.25
15	1,200	.02	.02	.05	<.01	<.01	.05	.03	.03	.03	.04	.03
	1,400	.03	.03	.06	<.01	.01	.06	.03	.03	.04	.06	.04
	1,600	.03	.04	.07	.01	.02	.08	.04	.04	.05	.07	.06
	1,800	.04	.05	.08	.02	.02	.10	.05	.06	.06	.09	.07
	2,000	.05	.07	.09	.02	.03	.12	.07	.07	.08	.12	.09
	2,500	.08	.11	.12	.03	.04	.17	.10	.11	.12	.18	.13
	3,000	.11	.15	.16	.04	.06	.23	.14	.15	.17	.26	.19
	3,500	.16	.21	.19	.06	.08	.30	.18	.21	.24	.35	.25
	4,000	.20	.27	—	.07	.11	.38	.23	.27	N/A	N/A	.33
4,500	.26	.34	—	.09	.14	—	—	.34	N/A	N/A	.42	
20	1,600	.02	.02	.05	<.01	.01	.06	.03	.02	.02	.03	.03
	1,800	.02	.03	.06	<.01	.01	.07	.04	.03	.02	.03	.03
	2,000	.02	.03	.07	.01	.02	.08	.04	.03	.03	.04	.04
	2,200	.03	.04	.08	.01	.02	.09	.05	.04	.03	.05	.05
	2,400	.03	.05	.09	.02	.02	.11	.06	.05	.04	.06	.05
	2,500	.04	.05	.09	.02	.03	.12	.07	.05	.04	.07	.06
	3,000	.05	.07	.12	.03	.04	.16	.09	.07	.06	.10	.08
	4,000	.09	.13	.17	.05	.07	.26	.16	.13	.11	.17	.15
	5,000	.15	.20	—	.07	.11	.38	.23	.21	.18	.27	.23
5,500	.18	.25	—	.09	.13	.44	.28	.25	.22	.32	.28	
25	2,000	.02	.03	.07	.01	.02	.08	.04	.02	.03	.04	.04
	2,250	.03	.04	.08	.02	.02	.10	.05	.03	.04	.05	.05
	2,500	.04	.05	.09	.02	.03	.12	.07	.04	.04	.07	.06
	2,750	.04	.06	.10	.02	.03	.14	.08	.04	.05	.08	.07
	3,000	.05	.07	.12	.03	.04	.16	.09	.05	.06	.10	.08
	4,000	.09	.13	.17	.05	.07	.26	.16	.09	.11	.17	.15
	4,500	.12	.16	—	.06	.09	.31	.19	.12	.15	.22	.19
	5,000	.15	.20	—	.07	.11	.38	.23	.14	.18	.27	.23
	5,500	.18	.25	—	.09	.13	.44	.28	.17	.22	.32	.28
30	2,400	.02	.03	.06	.01	.01	.07	.04	.02	.03	.04	.03
	2,700	.02	.03	.07	.01	.02	.09	.05	.03	.03	.05	.04
	3,000	.03	.04	.08	.02	.02	.10	.06	.03	.04	.06	.05
	3,300	.04	.05	.09	.02	.03	.12	.07	.04	.05	.07	.06
	3,600	.04	.06	.10	.02	.03	.14	.08	.05	.06	.09	.07
	4,000	.05	.08	.12	.03	.04	.17	.10	.06	.07	.11	.08
	5,000	.09	.12	.16	.04	.06	.24	.14	.09	.11	.17	.13
	6,000	.12	.17	—	.06	.09	.33	.20	.13	.16	.24	.19
	6,500	.14	.20	—	.07	.11	.38	.23	.16	.19	.29	.22
7,000	.17	.23	—	.09	.13	.43	.27	.18	.22	.33	.25	

Accessory Pressure Loss — Table 9 *continued*

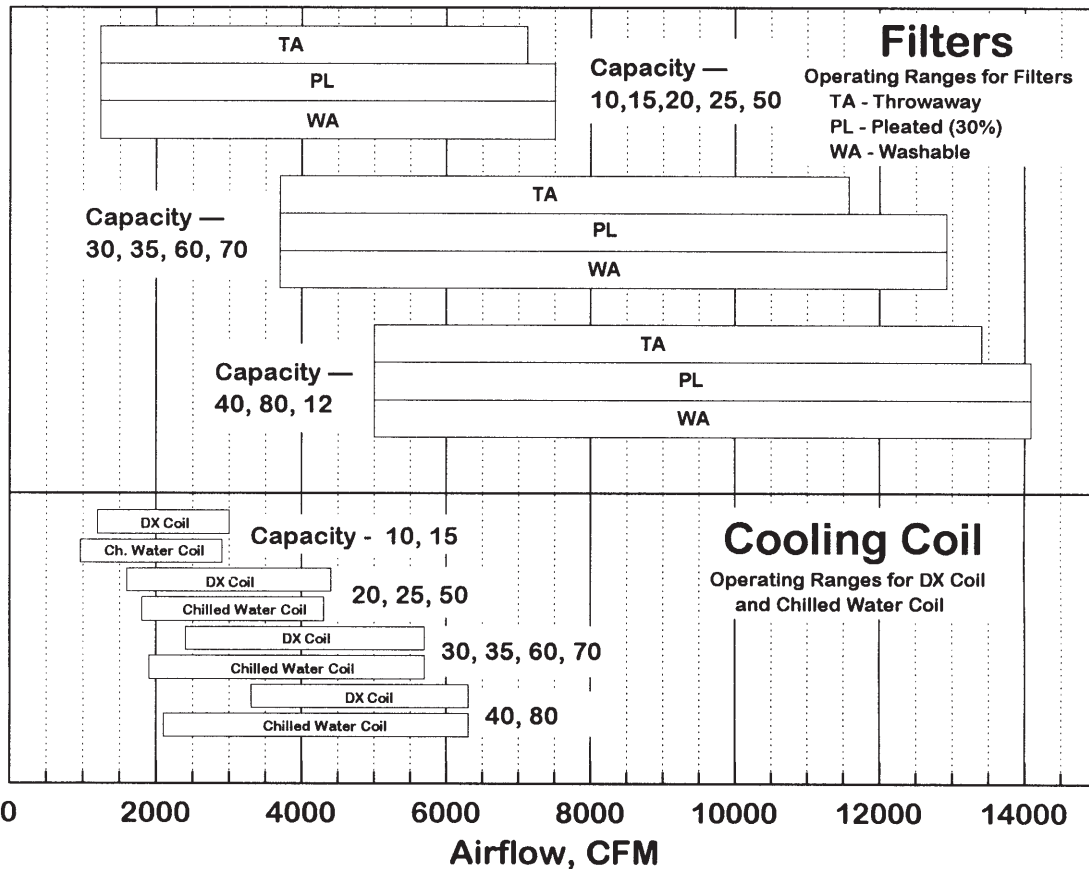
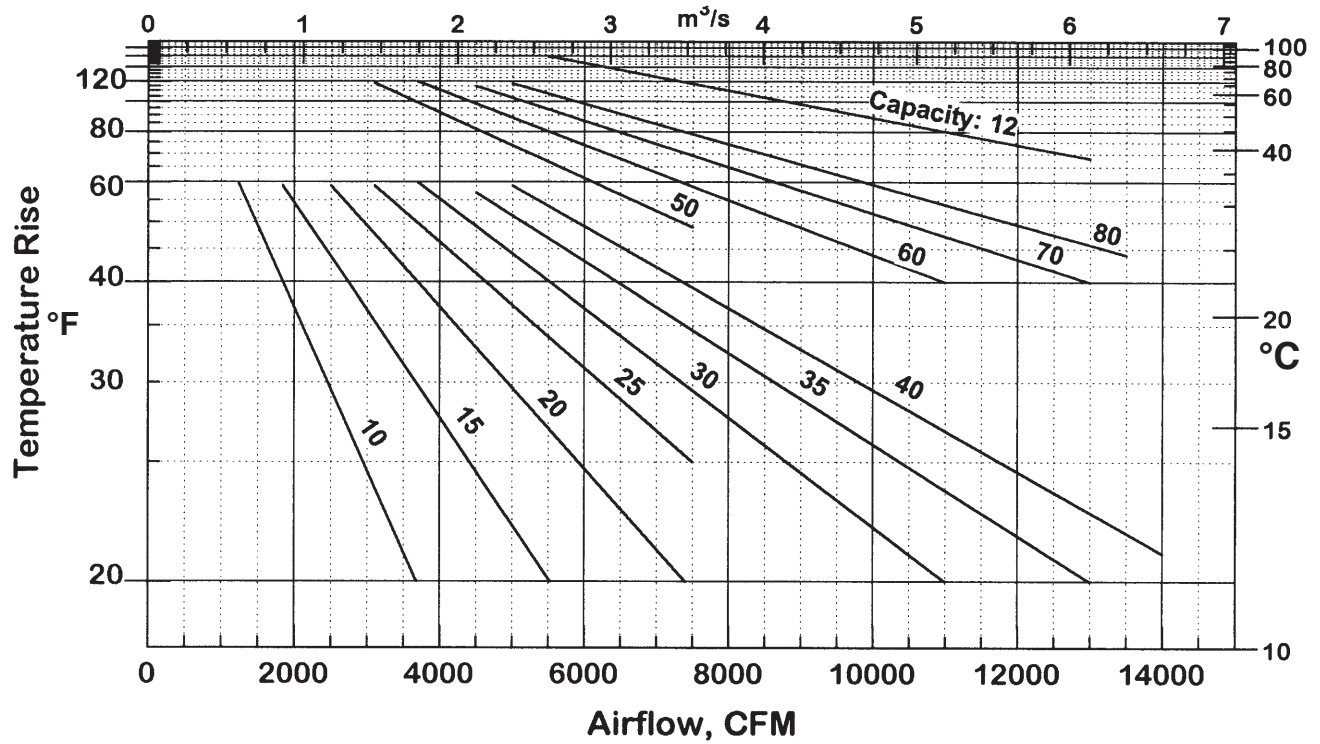
Unit Type [UT] - “MS”

Indoor Arrangements [IA] - (B,D)

		PRESSURE LOSS (INCHES OF WATER)										
Capacity	CFM	(Opt'l) Airhood		Filters					Supply Air Plenum	Evaporative Cooling Pad		Return or Outside Air Damper
		With Screen	Mstr. Elim.	Throwaway	Washable		Pleated			8"	12"	
				2"	1"	2"	1"	2"				
35	2,800	.03	.04	.07	.01	.02	.09	.05	.02	.04	.05	.04
	3,100	.03	.05	.08	.02	.02	.11	.06	.03	.04	.07	.05
	3,400	.04	.06	.10	.02	.03	.13	.07	.04	.05	.08	.06
	3,700	.05	.07	.11	.02	.03	.15	.08	.04	.06	.09	.07
	4,000	.05	.08	.12	.03	.04	.17	.10	.05	.07	.11	.08
	5,000	.09	.12	.16	.04	.06	.24	.14	.08	.11	.17	.13
	6,000	.12	.17	—	.06	.09	.33	.20	.11	.16	.24	.19
	7,000	.17	.23	—	.09	.13	.43	.27	.15	.22	.33	.25
	8,000	.22	.31	—	.11	.16	—	—	.19	.29	.44	.33
9,000	.28	.39	—	—	—	—	—	.24	N/A	N/A	.42	
40	3,200	.03	.04	.07	.01	.02	.09	.05	.02	.04	.06	.04
	3,600	.04	.05	.09	.02	.02	.11	.06	.03	.05	.07	.05
	4,000	.04	.06	.10	.02	.03	.13	.07	.04	.06	.09	.07
	4,400	.05	.07	.11	.03	.04	.15	.09	.05	.07	.11	.08
	4,800	.06	.09	.13	.03	.04	.18	.10	.05	.09	.13	.10
	5,000	.07	.10	.13	.03	.05	.19	.11	.06	.09	.14	.10
	6,000	.10	.14	.17	.05	.07	.26	.16	.08	.14	.20	.15
	7,000	.13	.19	—	.07	.09	.33	.21	.11	.18	.27	.20
	8,000	.17	.24	—	.09	.12	.42	.26	.15	.24	.36	.26
8,500	.20	.28	—	.10	.14	—	—	.17	.27	.41	.30	
50	3,000	.05	.07	.12	.03	.04	.16	.09	.05	.06	.10	.08
	3,500	.07	.10	.14	.04	.05	.21	.12	.07	.09	.13	.11
	4,000	.09	.13	.17	.05	.07	.26	.16	.09	.11	.17	.15
	4,500	.12	.16	—	.06	.09	.31	.19	.12	.15	.22	.19
	5,000	.15	.20	—	.07	.11	.38	.23	.14	.18	.27	.23
	5,500	.18	.25	—	.09	.13	.44	.28	.17	.22	.32	.28
60	3,700	.05	.07	.11	.02	.03	.15	.08	.05	.06	.09	.07
	4,000	.05	.08	.12	.03	.04	.17	.10	.06	.07	.11	.08
	5,000	.09	.12	.16	.04	.06	.24	.14	.09	.11	.17	.13
	6,000	.12	.17	—	.06	.09	.33	.20	.13	.16	.24	.19
	6,500	.14	.20	—	.07	.11	.38	.23	.16	.19	.29	.22
70	4,500	.07	.10	.14	.04	.05	.20	.12	.06	.09	.14	.11
	5,000	.09	.12	.16	.04	.06	.24	.14	.08	.11	.17	.13
	6,000	.12	.17	—	.06	.09	.33	.20	.11	.16	.24	.19
	7,000	.17	.23	—	.09	.13	.43	.27	.15	.22	.33	.25
8,000	.22	.31	—	.11	.16	—	—	.19	.29	.44	.33	
80	5,000	.07	.10	.13	.03	.05	.19	.11	.06	.09	.14	.10
	6,000	.10	.14	.17	.05	.07	.26	.16	.08	.14	.20	.15
	7,000	.13	.19	—	.07	.09	.33	.21	.11	.18	.27	.20
	8,000	.17	.24	—	.09	.12	.42	.26	.15	.24	.36	.26

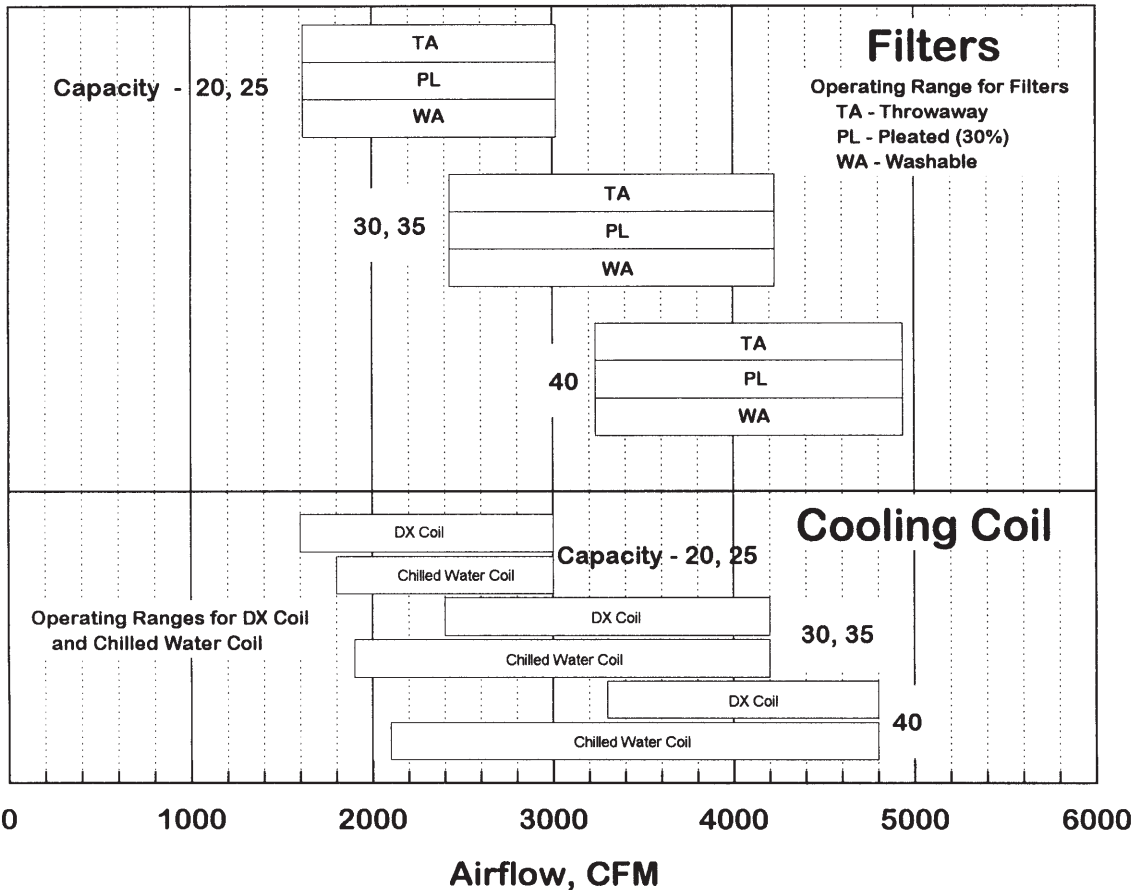
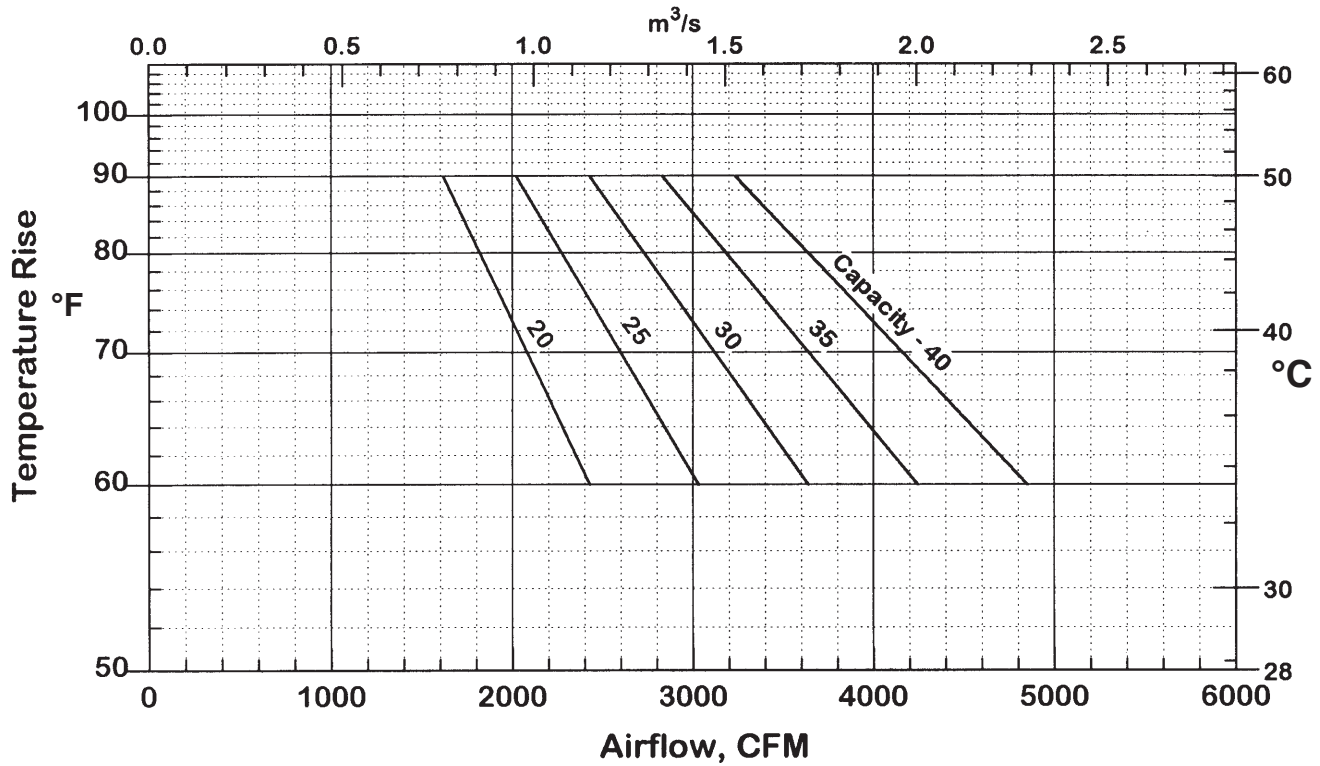
Quick Sizer Chart No. 5

Unit Type [UT] - "MS"; Furnace Type [FT] - (A,B) Standard Temperature Rise
 Indoor Arrangement [IA] - (G,K)



Quick Sizer Chart No. 6

Unit Type [UT] - "MS"; Furnace Type [FT] - (C,D) High Temperature Rise
 Indoor Arrangement [IA] - (K)



Performance — Table 11

Unit Type [UT] - “MS”; Furnace Type [FT] - (C,D) Standard Temperature Rise Indoor Arrangements [IA] - (K)

Capacity Furnace Type	TR (°F)	Input CFM	Input BTU/H	Output BTU/H	TOTAL STATIC PRESSURE (INCHES OF WATER)																			
					0.2		0.4		0.6		0.8		1		1.2		1.4		1.6		1.8		2	
					RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
20-C,D	91	1,600			380	.16	480	.24	565	.33	645	.42	710	.52	770	.63	830	.74	880	.86	930	.98	980	1.10
	81	1,800			400	.20	495	.29	580	.39	650	.49	720	.59	780	.70	835	.82	890	.94	940	1.07	985	1.20
	73	2,000	200,000	158,000	425	.26	510	.35	590	.45	665	.56	730	.67	790	.79	845	.91	900	1.04	950	1.17	995	1.31
	66	2,200			450	.33	530	.42	605	.53	675	.64	740	.76	800	.89	855	1.02	905	1.15	955	1.28	1000	1.43
	61	2,400			475	.40	550	.50	620	.61	690	.74	750	.87	810	1.00	865	1.13	915	1.27	965	1.41	1010	1.56
25-C,D	91	2,000			405	.24	495	.33	575	.43	650	.54	715	.65	780	.76	835	.89	890	1.01	940	1.14	985	1.28
	81	2,250			435	.32	515	.41	590	.52	660	.64	725	.76	785	.88	845	1.01	895	1.14	945	1.28	995	1.42
	73	2,500	250,000	197,500	465	.42	540	.52	610	.62	675	.75	740	.88	795	1.02	855	1.15	905	1.29	955	1.44	1000	1.58
	66	2,750			500	.53	565	.64	630	.75	695	.87	755	1.02	810	1.16	865	1.31	915	1.46	965	1.62	1010	1.77
	61	3,000			535	.67	595	.79	655	.90	710	1.03	770	1.17	825	1.33	875	1.49	925	1.65	975	1.81	1020	1.98
30-C,D	91	2,400			390	.25	510	.40	615	.60	700	.80	775	1.01	845	1.23	905	1.45	960	1.68	1010	1.92	1055	2.16
	84	2,600			405	.29	515	.45	615	.65	705	.86	780	1.09	850	1.31	910	1.55	965	1.79	1020	2.04	1065	2.29
	78	2,800			420	.33	520	.50	620	.70	710	.92	785	1.16	855	1.40	920	1.65	975	1.91	1025	2.16	1075	2.43
	73	3,000	300,000	237,000	435	.38	530	.56	625	.76	710	.99	790	1.24	860	1.49	925	1.76	980	2.02	1035	2.29	1085	2.57
	68	3,200			450	.44	540	.62	630	.83	715	1.06	790	1.32	865	1.59	930	1.86	985	2.14	1040	2.42	1090	2.71
	64	3,400			465	.51	555	.69	640	.91	720	1.14	795	1.40	865	1.68	930	1.97	990	2.26	1045	2.56	1100	2.86
	61	3,600			480	.58	565	.77	645	.99	725	1.23	800	1.49	870	1.78	935	2.08	995	2.38	1050	2.69	1105	3.00
35-C,D	85	3,000			385	.29	485	.46	575	.62	650	.81	715	1.00	775	1.21	835	1.44	885	1.67	935	1.90	980	2.15
	80	3,200			395	.34	495	.50	580	.68	655	.87	720	1.07	780	1.29	840	1.51	890	1.75	940	2.00	985	2.25
	75	3,400	350,000	276,500	410	.38	505	.56	585	.74	660	.94	725	1.14	785	1.36	840	1.60	895	1.84	945	2.09	990	2.35
	67	3,800			430	.49	520	.68	600	.88	670	1.09	735	1.31	795	1.54	855	1.78	905	2.03	955	2.29	1000	2.57
	64	4,000			445	.55	530	.74	610	.96	680	1.17	745	1.40	805	1.63	860	1.88	910	2.14	960	2.41	1005	2.68
	61	4,200			460	.62	540	.81	615	1.04	685	1.26	750	1.50	810	1.74	865	1.99	915	2.25	965	2.52	1010	2.81
40-C,D	88	3,300			390	.34	485	.51	575	.69	650	.88	715	1.08	775	1.30	835	1.52	885	1.76	935	2.01	985	2.27
	83	3,500			400	.38	495	.56	580	.75	655	.94	720	1.15	780	1.37	835	1.60	890	1.85	940	2.10	985	2.37
	73	4,000	400,000	316,000	430	.52	515	.70	595	.92	665	1.13	730	1.36	790	1.59	850	1.83	900	2.09	950	2.35	995	2.63
	65	4,500			460	.70	540	.88	615	1.11	680	1.35	745	1.60	805	1.85	860	2.10	910	2.37	960	2.65	1005	2.93
	58	5,000			495	.91	565	1.11	635	1.34	700	1.60	760	1.87	820	2.14	875	2.41	925	2.70	975	2.99	1020	3.29

- Notes: 1. Refer to Table 9 for “Accessory Pressure Losses”.
 2. Values in Tables 7 and 8 are based on “Basic Packaged Unit” which includes pressure drop of the Duct Furnace(s) and “System Effect” of the blower module.
 3. Unit leaving air temperature is limited to 150 °F (66 °C), and is equal to: [Entering Air Temperature + Duct Furnace(s) Temperature Rise]
 4. Brake Horsepower (BHP) includes drive losses.
 5. “Total Static Pressure” is the sum of the units’ “Internal” accessory pressure loss(es) from Table 9, plus the external static pressure.
 6. Ratings shown are for elevations between 0 and 2,000 feet (610m). For unit installation in the U.S.A. above 2,000 feet (610m), the unit input must be derated four percent for each 1,000 feet (305m) above sea level. Also refer to note on page 7.

Accessory Pressure Loss – Table 12

Unit Type [UT] - “MS”

Indoor Arrangements [IA] - (G,K)

		PRESSURE LOSS (INCHES OF WATER)							Supply	Return or
		(Opt'l) Airhood		Filters					Air	Outside Air
Capacity	CFM	With	Mstr. Elim.	Throwaway	Washable		Pleated		Plenum	Damper
		Screen		2"	1"	2"	1"	2"		
*10	800	<.01	.01	.01	<.01	<.01	<.01	<.01	.02	.01
	900	.01	.02	.01	<.01	<.01	<.01	<.01	.02	.02
	1,100	.02	.02	.02	<.01	<.01	.01	<.01	.03	.03
	1,200	.02	.03	.02	<.01	<.01	.02	<.01	.04	.03
	1,500	.03	.04	.02	<.01	<.01	.02	.01	.06	.05
	2,000	.06	.07	.04	<.01	<.01	.04	.02	.10	.09
	2,500	.09	.12	.05	<.01	.01	.05	.03	.15	.13
	3,000	.13	.17	.06	.01	.02	.07	.04	.22	.19
3,500	.18	.23	.08	.01	.02	.09	.05	.29	.25	
*15	1,200	.02	.03	.02	<.01	<.01	.02	<.01	.03	.03
	1,400	.03	.04	.02	<.01	<.01	.02	<.01	.03	.04
	1,600	.04	.05	.03	<.01	<.01	.03	.01	.04	.06
	1,800	.05	.06	.03	<.01	<.01	.03	.02	.06	.07
	2,000	.06	.07	.04	<.01	<.01	.04	.02	.07	.09
	2,500	.09	.12	.05	<.01	.01	.05	.03	.11	.13
	3,000	.13	.17	.06	.01	.02	.07	.04	.15	.19
	3,500	.18	.23	.08	.01	.02	.09	.05	.21	.25
4,000	.23	.30	.09	.02	.03	.12	.07	.27	.33	
4,500	.29	.38	.11	.02	.03	.14	.08	.34	.42	
20	1,600	.02	.02	.03	<.01	<.01	.03	.01	.02	.03
	1,800	.02	.03	.03	<.01	<.01	.03	.02	.03	.03
	2,000	.02	.03	.04	<.01	<.01	.04	.02	.03	.04
	2,200	.03	.04	.04	<.01	<.01	.04	.02	.04	.05
	2,400	.03	.05	.05	<.01	<.01	.05	.03	.05	.05
	2,500	.04	.05	.05	<.01	.01	.05	.03	.05	.06
	3,000	.05	.07	.06	.01	.02	.07	.04	.07	.08
	4,000	.09	.13	.09	.02	.03	.12	.07	.13	.15
	5,000	.15	.20	.12	.03	.04	.17	.10	.21	.23
	6,000	.21	.29	.16	.04	.06	.23	.14	.30	.33
	6,500	.25	.34	.17	.05	.07	.26	.16	.35	.39
7,000	.29	.40	.19	.06	.08	.30	.18	.40	.45	
7,400	.32	.45	-	.06	.09	.33	.20	.45	.50	
25	2,000	.02	.03	.04	<.01	<.01	.04	.02	.02	.04
	2,250	.03	.04	.04	<.01	<.01	.04	.02	.03	.05
	2,500	.04	.05	.05	<.01	.01	.05	.03	.04	.06
	2,750	.04	.06	.05	<.01	.01	.06	.03	.04	.07
	3,000	.05	.07	.06	.01	.02	.07	.04	.05	.08
	4,000	.09	.13	.09	.02	.03	.12	.07	.09	.15
	5,000	.15	.20	.12	.03	.04	.17	.10	.14	.23
	6,000	.21	.29	.16	.04	.06	.23	.14	.21	.33
	7,000	.29	.40	.19	.06	.08	.30	.18	.28	.45
7,500	.33	.46	-	.07	.09	.34	.21	.32	.52	
30	2,400	.02	.03	.02	<.01	<.01	.02	.01	.02	.03
	2,600	.02	.03	.03	<.01	<.01	.03	.01	.03	.04
	2,800	.03	.04	.03	<.01	<.01	.03	.01	.03	.04
	3,000	.03	.04	.03	<.01	<.01	.03	.02	.03	.05
	3,200	.03	.05	.03	<.01	<.01	.04	.02	.04	.05
	3,400	.04	.06	.04	<.01	<.01	.04	.02	.04	.06
	3,600	.04	.06	.04	<.01	<.01	.04	.02	.05	.07
	4,000	.05	.08	.05	<.01	.01	.05	.03	.06	.08
	6,000	.12	.17	.08	.02	.02	.10	.06	.13	.19
	8,000	.22	.31	.12	.03	.04	.17	.10	.24	.33
	10,000	.34	.48	.16	.04	.06	.24	.14	.37	.52
11,000	.41	.58	.18	.05	.08	.28	.17	.45	.63	

*Capacities 10 and 15 are available only on Indoor Arrangement “K”.

Notes: Refer to Tables 17A & 17B for DX Cooling Coil and Tables 18A & 18B for Chilled Water Coil Pressure Losses.

Accessory Pressure Loss — Table 12 *continued*

Unit Type [UT] - “MS”

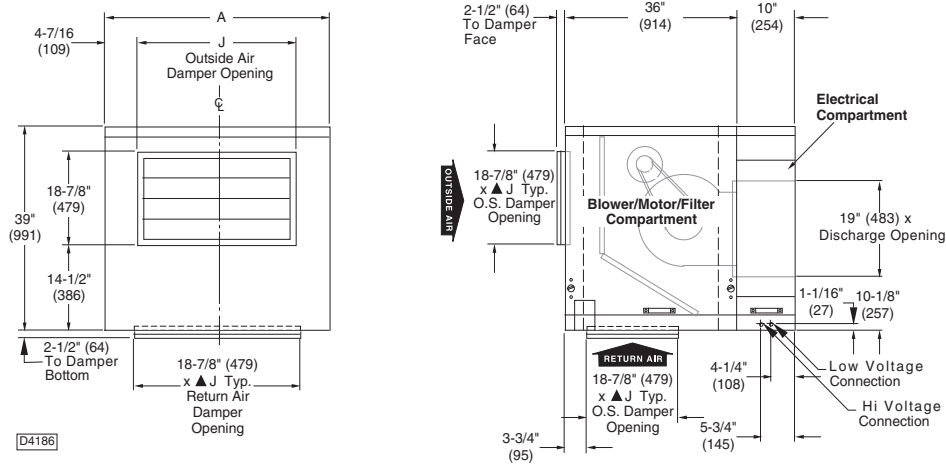
Indoor Arrangements [IA] - (G,K)

		PRESSURE LOSS (INCHES OF WATER)									
Capacity	CFM	(Opt'l) Airhood		Filters					Supply Air Plenum	Return or Outside Air Damper	
		With Screen	Mstr. Elim.	Throwaway 2"	Washable 1"	Washable 2"	Pleated 1"	Pleated 2"			
35	3,000	.03	.04	.03	<.01	<.01	.03	.02	.03	.05	
	3,200	.03	.05	.03	<.01	<.01	.04	.02	.03	.05	
	3,400	.04	.06	.04	<.01	<.01	.04	.02	.04	.06	
	3,600	.04	.06	.04	<.01	<.01	.04	.02	.04	.07	
	3,800	.05	.07	.04	<.01	<.01	.05	.03	.04	.08	
	4,000	.05	.08	.05	<.01	.01	.05	.03	.05	.08	
	4,500	.07	.10	.05	<.01	.01	.06	.03	.06	.11	
	6,000	.12	.17	.08	.02	.02	.10	.06	.11	.19	
	8,000	.22	.31	.12	.03	.04	.17	.10	.19	.33	
	10,000	.34	.48	.16	.04	.06	.24	.14	.30	.52	
	12,000	.49	.69	-	.06	.09	.33	.20	.43	.75	
13,000	.58	.81	-	.07	.11	.38	.23	.51	.88		
40	3,300	.03	.04	.03	<.01	<.01	.03	.02	.03	.05	
	3,500	.03	.05	.03	<.01	<.01	.03	.02	.03	.05	
	4,000	.04	.06	.04	<.01	<.01	.04	.02	.04	.07	
	4,500	.05	.08	.05	<.01	<.01	.05	.03	.05	.08	
	5,000	.07	.10	.05	<.01	.01	.06	.03	.06	.10	
	6,000	.10	.14	.07	.01	.02	.08	.04	.08	.15	
	8,000	.17	.24	.10	.02	.03	.13	.07	.15	.26	
	10,000	.27	.38	.13	.03	.05	.19	.11	.23	.41	
	12,000	.39	.55	.17	.05	.07	.26	.16	.34	.59	
	14,000	.53	.75	-	.07	.09	.33	.21	.46	.80	
50	3,100	.06	.08	.06	.01	.02	.08	.04	.06	.09	
	4,000	.09	.13	.09	.02	.03	.12	.07	.09	.15	
	5,000	.15	.20	.12	.03	.04	.17	.10	.14	.23	
	6,000	.21	.29	.16	.04	.06	.23	.14	.21	.33	
	7,000	.29	.40	.19	.06	.08	.30	.18	.28	.45	
	7,500	.33	.46	-	.07	.09	.34	.21	.32	.52	
60	3,700	.05	.07	.04	<.01	<.01	.05	.02	.05	.07	
	4,000	.05	.08	.05	<.01	.01	.05	.03	.06	.08	
	6,000	.12	.17	.08	.02	.02	.10	.06	.13	.19	
	8,000	.22	.31	.12	.03	.04	.17	.10	.24	.33	
	10,000	.34	.48	.16	.04	.06	.24	.14	.37	.52	
11,000	.41	.58	.18	.05	.08	.28	.17	.45	.63		
70	4,500	.07	.10	.05	<.01	.01	.06	.03	.06	.11	
	6,000	.12	.17	.08	.02	.02	.10	.06	.11	.19	
	8,000	.22	.31	.12	.03	.04	.17	.10	.19	.33	
	10,000	.34	.48	.16	.04	.06	.24	.14	.30	.52	
	12,000	.49	.69	-	.06	.09	.33	.20	.43	.75	
13,000	.58	.81	-	.07	.11	.38	.23	.51	.88		
80	5,000	.07	.10	.05	<.01	.01	.06	.03	.06	.10	
	6,000	.10	.14	.07	.01	.02	.08	.04	.08	.15	
	8,000	.17	.24	.10	.02	.03	.13	.07	.15	.26	
	10,000	.27	.38	.13	.03	.05	.19	.11	.23	.41	
	12,000	.39	.55	.17	.05	.07	.26	.16	.34	.59	
13,500	.49	.70	-	.06	.09	.31	.19	.43	.75		
12	7,400	.15	.21	.09	.02	.03	.11	.06	.13	.22	
	8,000	.17	.24	.10	.02	.03	.13	.07	.15	.26	
	10,000	.27	.38	.13	.03	.05	.19	.11	.23	.41	
	12,000	.39	.55	.17	.05	.07	.26	.16	.34	.59	
	13,000	.46	.65	.19	.06	.08	.30	.18	.40	.69	

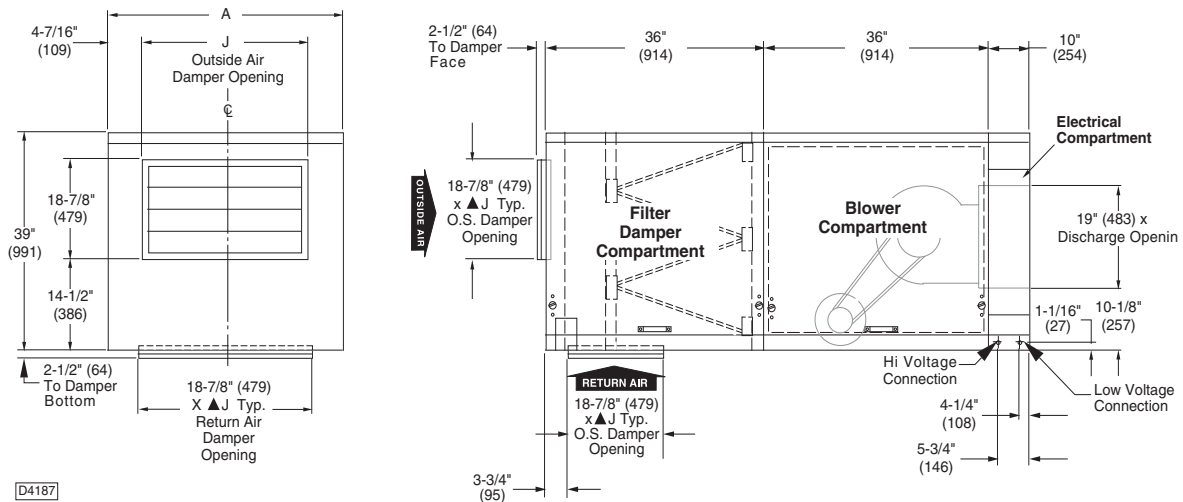
Notes: Refer to Tables 17A & 17B for DX Cooling Coil and Tables 18A & 18B for Chilled Water Coil Pressure Losses (Indoor Arrangement K).

Dimensional Data – Unit Modules

Standard Blower Module† Indoor Arrangements [IA] B, D Capacities [CA] 10 - 80 Unit Sizes (Right hand service access shown)



High CFM Blower Module*† Indoor Arrangements [IA] G, K Capacities [CA] 10 - 12 (Indoor Arrangement "G" shown)



Capacity	A	B	▲J
10/15*	32- 7/8 (835)	15- 9/16 (395)	24 (610)
20/25/50	43- 7/8 (1114)	23- 13/16 (605)	35 (889)
30/35	54- 7/8 (1394)	34- 13/16 (884)	46 (1168)
40/80/12	60- 3/8 (1534)	45- 13/16 (1164)	51- 1/2 (1308)

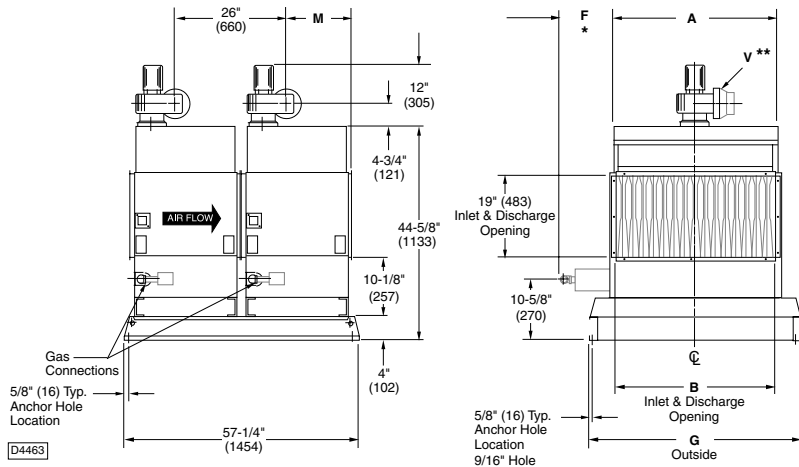
NOTES:
Dimensions are in inches
(Dimensions in parenthesis are in millimeters)

†The dimensions shown on these modules do not include the base/skid rails.

*Capacities [CA] 10 & 15 apply to Indoor Arrangement "K" only;
Indoor Arrangement "K" is similar to "G" with an additional 26" (660mm)
Coil Cabinet between Filter and Blower Compartments (unit widths are the same).

Dimensional Data — ME Arrangements — Table 13

Unit Type [UT] "ME", Indoor Arrangement [IA] "A" Capacities [CA] 50 - 80

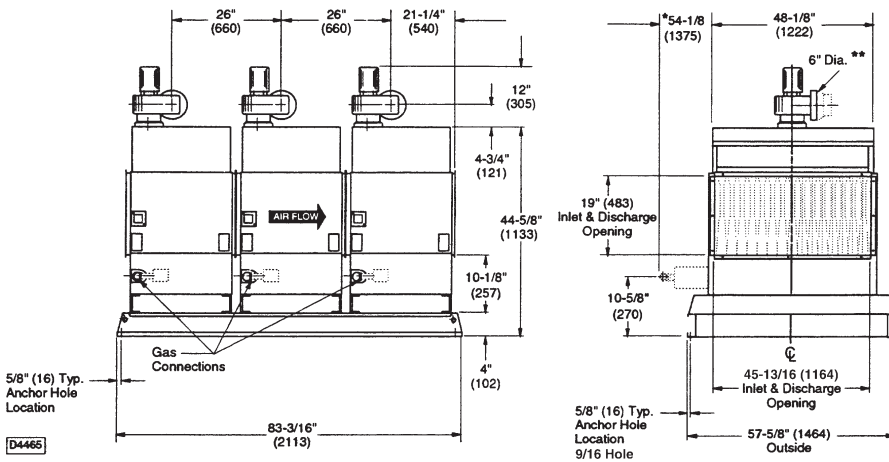


*"F" Dimension is the recommended clearance to service the burner drawer.

**"V" Dia. = Flue Opening
(ME - Power Vent Units Only).

Gas Inlet sizes: Natural Gas = 3/4" Dia.
LP Gas = 3/4" Dia.

Unit Type [UT] "ME" Capacities [CA] 12, Indoor Arrangement [IA] "A"



* Recommended clearance to service the burner drawer.

**6" Dia. = Flue Opening - The 5" to 6" increaser adaptor is supplied by the manufacturer for this model.

Gas Inlet sizes: Natural Gas = 3/4" Dia.
LP Gas = 3/4" Dia.

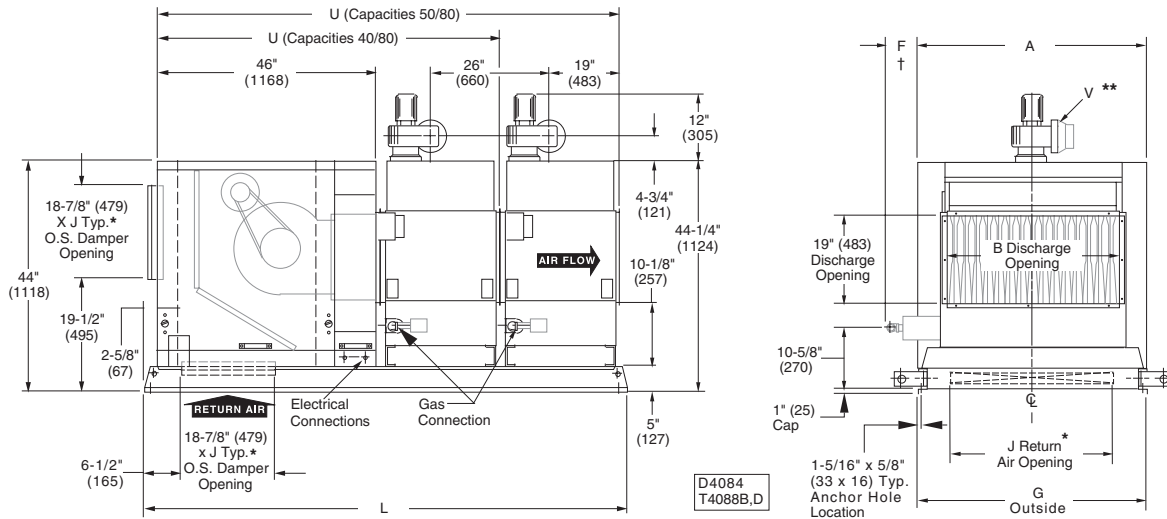
Table 13 - Dimensional Data

Capacity	A	B	*F	G	M	V Dia.**
50	31- 5/8 (803)	29- 5/16 (745)	37- 5/8 (956)	41- 1/8 (1045)	20- 1/4 (514)	5 (127)
60	37- 1/8 (943)	34- 13/16 (884)	43- 1/8 (1095)	52- 1/8 (1324)	20- 1/4 (514)	6 (152)
70	42- 5/8 (1083)	40- 5/16 (1024)	48- 5/8 (1235)	52- 1/8 (1324)	20- 1/4 (514)	6 (152)
80	48- 1/8 (1222)	45- 13/16 (1164)	54- 1/8 (1375)	57- 5/8 (1464)	21- 1/4 (540)	6 (152)

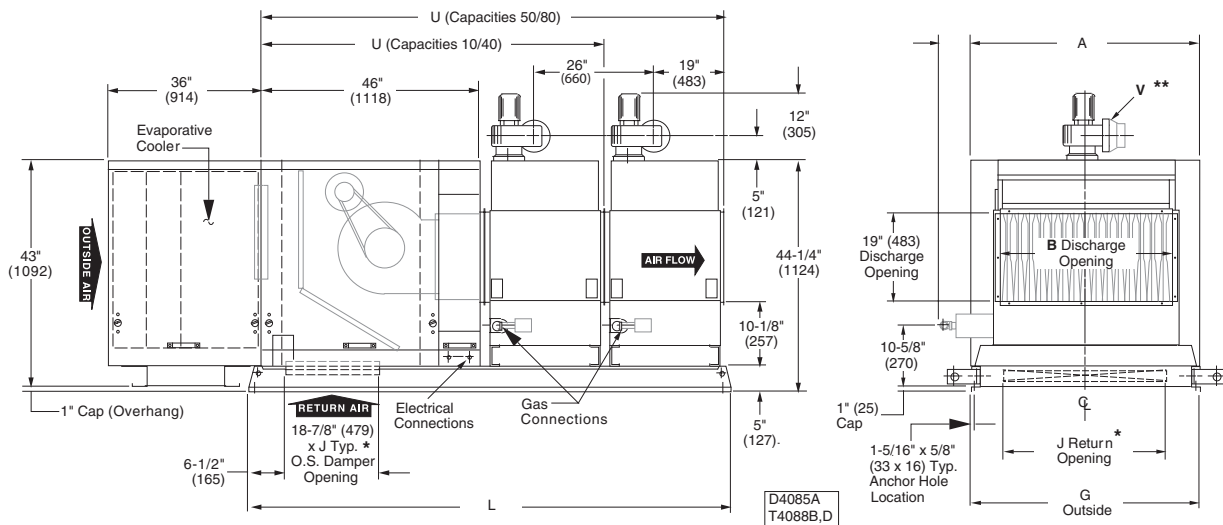
NOTES:
Dimensions are in inches
(Dimensions in parenthesis are in millimeters)

Dimensional Data — ME Arrangements

Unit Type [UT] “ME”
 Capacities [CA] 10 - 80,
 Indoor Arrangement [IA] “B”
 (Capacities [CA] 50-80 shown)



Unit Type [UT] “ME”
 Capacities [CA] 10 - 80
 Indoor Arrangement [IA] “D”
 (Capacities [CA] 50-80 shown)



See pages 33-36 for more dimensional information and specifications.

Dimensional Data — ME Arrangements — Table 14

Capacity	A	B	F†	G	J	L	M	U	V Dia.**
10	32- 7/8 (835)	15- 9/16 (395)	16- 3/8 (416)	31- 1/16 (789)	24 (610)	77- 3/8 (1965)	21- 1/4 (540)	73- 5/8 (1870)	4 (102)
15	32- 7/8 (835)	18- 5/16 (465)	20- 1/2 (521)	31- 1/16 (789)	24 (610)	77- 3/8 (1965)	20- 1/4 (514)	73- 5/8 (1870)	4 (102)
20	43- 7/8 (1114)	23-13/16 (605)	23- 1/2 (597)	42- 1/16 (1068)	35 (889)	77- 3/8 (1965)	20- 1/4 (514)	73- 5/8 (1870)	5 (127)
25	43- 7/8 (1114)	29- 5/16 (745)	31- 1/2 (800)	42- 1/16 (1068)	35 (889)	77- 3/8 (1965)	20- 1/4 (514)	73- 5/8 (1870)	5 (127)
30	54- 7/8 (1394)	34-13/16 (884)	34- 1/4 (870)	53- 1/16 (1348)	46 (1168)	77- 3/8 (1965)	20- 1/4 (514)	73- 5/8 (1870)	6 (152)
35	54- 7/8 (1394)	40- 5/16 (1024)	42- 1/4 (1073)	53- 1/16 (1348)	46 (1168)	77- 3/8 (1965)	20- 1/4 (514)	73- 5/8 (1870)	6 (152)
40	60- 3/8 (1534)	45-13/16 (1164)	48 (1219)	58- 9/16 (1487)	51- 1/2 (1308)	77- 3/8 (1965)	21- 1/4 (540)	73- 5/8 (1870)	6 (152)
50	43- 7/8 (1114)	29- 5/16 (745)	31- 1/2 (800)	42- 1/16 (1068)	35 (889)	103- 3/8 (2626)	20- 1/4 (514)	99- 5/8 (2530)	5 (127)
60	54- 7/8 (1394)	34-13/16 (884)	34- 1/4 (870)	53- 1/16 (1348)	46 (1168)	103- 3/8 (2626)	20- 1/4 (514)	99- 5/8 (2530)	6 (152)
70	54- 7/8 (1394)	40- 5/16 (1024)	42- 1/4 (1073)	53- 1/16 (1348)	46 (1168)	103- 3/8 (2626)	20- 1/4 (514)	99- 5/8 (2530)	6 (152)
80	60- 3/8 (1534)	45-13/16 (1164)	48 (1219)	58- 9/16 (1487)	51- 1/2 (1308)	103- 3/8 (2626)	21- 1/4 (540)	99- 5/8 (2530)	6 (152)

NOTES:

Dimensions are in inches (Dimensions in parenthesis are in millimeters).

“J” is an outside dimension for return air dampers.

† “F” Dimension is the recommended clearance to service the burner drawer.

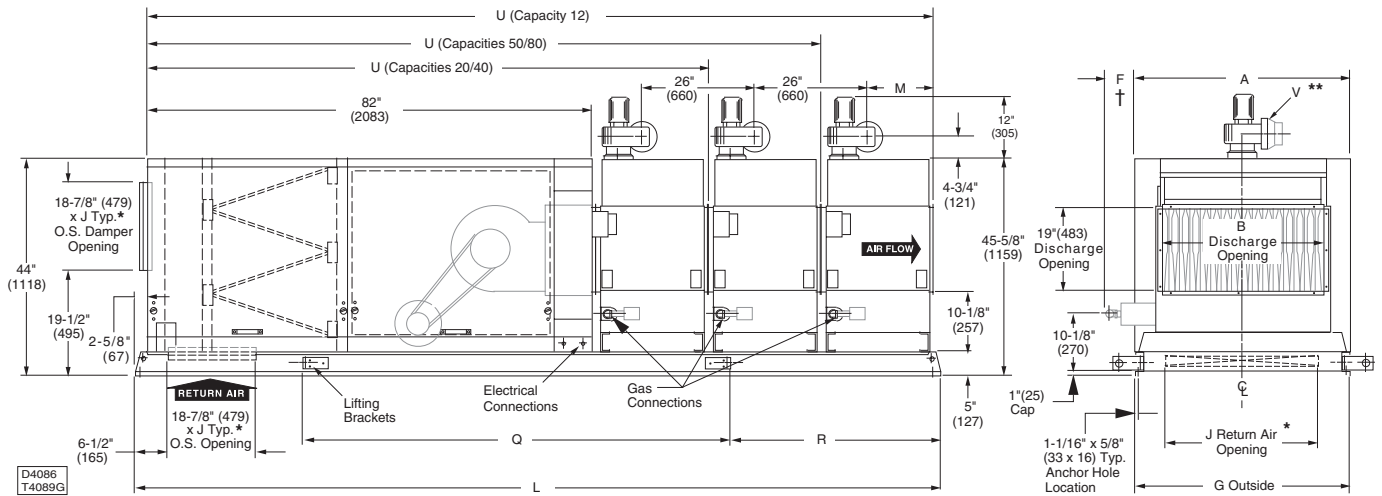
**“V” Dia. = Flue Opening (ME - Power Vent Units Only); the 4 to 5 inch flue reducer adaptor is to be field supplied/installed for unit capacities 10 & 15. The 5 to 6 inch flue increaser adaptor is supplied by the manufacturer for unit capacities 30, 35, 40, 60, 70, & 80 (required for each furnace's flue).

Gas Inlet sizes: Natural Gas and LP Gas: Capacities 10 thru 20 = 1/2 inch; Capacities 25 thru 80 = 3/4 inch.

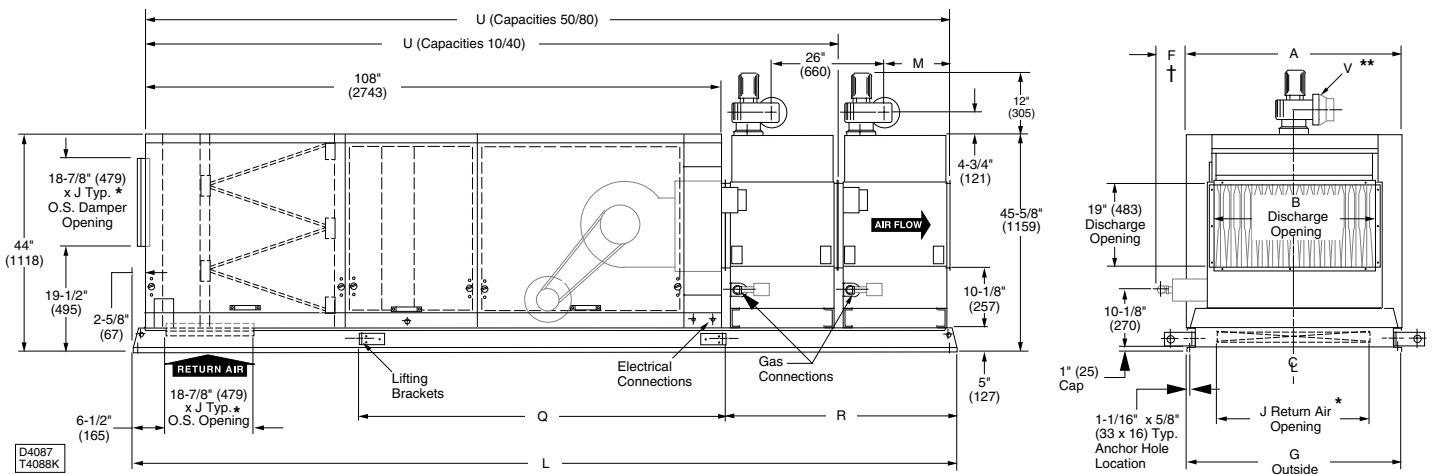
All dimensional drawings for the “B” and “D” Indoor Arrangement are shown as Dual Furnace Unit Capacities (50/80). The dimensional data for Single Furnace Capacities (10/40) are tabulated in table 14 accordingly for all capacities.

Dimensional Data — ME Arrangements

Unit Type [UT] “ME”
Capacities [CA] 20 - 12
Indoor Arrangement [IA] “G”
(Capacity [CA] 12 shown)



Unit Type [UT] “ME”
Capacities [CA] 10 - 80
Indoor Arrangement [IA] “K”
(Capacities [CA] 50-80 shown)



See pages 33-38 for more dimensional information and specifications.

Dimensional Data — ME Arrangements — Table 15

Capacity	A	B	F†	G	H	J	L [IA=G]	L [IA=K]	M	Q	R	U [IA=G]	U [IA=K]	V Dia.**
10	32- 7/8 (835)	15- 9/16 (395)	16- 3/8 (416)	31- 1/16 (789)	40- 5/8 (1032)	24 (610)	N/A	139-1/2 (3543)	21- 1/4 (540)	60- 5/16 (1532)	26- 5/8 (676)	N/A	134- 1/2 (3416)	4 (102)
15	32- 7/8 (835)	18- 5/16 (465)	20- 1/2 (521)	31- 1/16 (789)	45- 5/8 (1159)	24 (610)	N/A	139-1/2 (3543)	20- 1/4 (514)	60- 5/16 (1532)	26- 5/8 (676)	N/A	134- 1/2 (3416)	4 (102)
20	43- 7/8 (1114)	23-13/16 (605)	23- 1/2 (597)	42- 1/16 (1068)	45- 5/8 (1159)	35 (889)	113- 1/2 (2883)	139- 1/2 (3543)	20- 1/4 (514)	60- 5/16 (1532)	26- 5/8 (676)	108- 1/2 (26)	134- 1/2 (3416)	5 (127)
25	43- 7/8 (1114)	29- 5/16 (745)	31- 1/2 (800)	42- 1/16 (1068)	45- 5/8 (1159)	35 (889)	113- 1/2 (2883)	139- 1/2 (3543)	20- 1/4 (514)	60- 5/16 (1532)	26- 5/8 (676)	108- 1/2 (26)	134- 1/2 (3416)	5 (127)
30	54- 7/8 (1394)	34-13/16 (884)	34- 1/4 (870)	53- 1/16 (1348)	45- 5/8 (1159)	46 (1168)	113- 1/2 (2883)	139- 1/2 (3543)	20- 1/4 (514)	60- 5/16 (1532)	26- 5/8 (676)	108- 1/2 (26)	134- 1/2 (3416)	6 (152)
35	54- 7/8 (1394)	40- 5/16 (1024)	42- 1/4 (1073)	53- 1/16 (1348)	45- 5/8 (1159)	46 (1168)	113- 1/2 (2883)	139- 1/2 (3543)	20- 1/4 (514)	60- 5/16 (1532)	26- 5/8 (676)	108- 1/2 (26)	134- 1/2 (3416)	6 (152)
40	60- 3/8 (1534)	45-13/16 (1164)	48 (1219)	58- 9/16 (1487)	45- 5/8 (1159)	51- 1/2 (1308)	113- 1/2 (2883)	139- 1/2 (3543)	21- 1/4 (540)	60- 5/16 (1532)	26- 5/8 (676)	108- 1/2 (26)	134- 1/2 (3416)	6 (152)
50	43- 7/8 (1114)	29- 5/16 (745)	31- 1/2 (800)	42- 1/16 (1068)	45- 5/8 (1159)	35 (889)	139- 1/2 (3543)	165- 1/2 (4204)	20- 1/4 (514)	60-13/16 (1545)	35- 1/8 (892)	134- 1/2 (24)	160- 1/2 (4077)	5 (127)
60	54- 7/8 (1394)	34-13/16 (884)	34- 1/4 (870)	53- 1/16 (1348)	45- 5/8 (1159)	46 (1168)	139- 1/2 (3543)	165- 1/2 (4204)	20- 1/4 (514)	60-13/16 (1545)	35- 1/8 (892)	134- 1/2 (24)	160- 1/2 (4077)	6 (152)
70	54- 7/8 (1394)	40- 5/16 (1024)	42- 1/4 (1073)	53- 1/16 (1348)	45- 5/8 (1159)	46 (1168)	139- 1/2 (3543)	165- 1/2 (4204)	20- 1/4 (514)	60-13/16 (1545)	35- 1/8 (892)	134- 1/2 (24)	160- 1/2 (4077)	6 (152)
80	60- 3/8 (1534)	45-13/16 (1164)	48 (1219)	58- 9/16 (1487)	45- 5/8 (1159)	51- 1/2 (1308)	139- 1/2 (3543)	165- 1/2 (4204)	21- 1/4 (540)	60-13/16 (1545)	35- 1/8 (892)	134- 1/2 (24)	160- 1/2 (4077)	6 (152)
12	60- 3/8 (1534)	45-13/16 (1164)	48 (1219)	58- 9/16 (1487)	45- 5/8 (1159)	51- 1/2 (1308)	165- 1/2 (4204)	N/A	21- 1/4 (540)	86- 1/8 (2188)	35- 1/8 (892)	160- 1/2 (186)	N/A	6 (152)

NOTES:

The dimensional data is tabulated for single and dual furnace capacities accordingly.

Using table 15 (#T4088K/T4089G), Capacities 10 & 15 apply only to Arrangement “K”; Capacity 12 applies only to Arrangement “G”.

Dimensions are in inches (Dimensions in parenthesis are in millimeters).

“J” is an outside dimension for return air dampers.

† “F” Dimension is the recommended clearance to service the burner drawer.

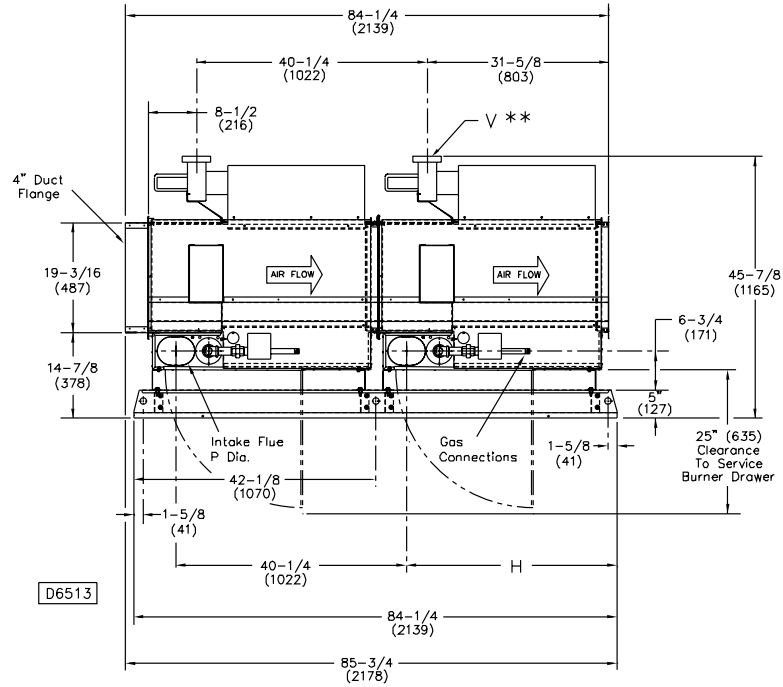
** “V” Dia. = Flue Opening (ME - Power Vent Units Only); the 4 to 5 inch flue reducer adaptor is to be field installed for unit capacities 10 & 15.

The 5 to 6 inch flue increaser adaptor is supplied by the manufacturer for unit capacities 30, 35, 40, 60, 70, 80 & 12 (required for each furnace’s flue).

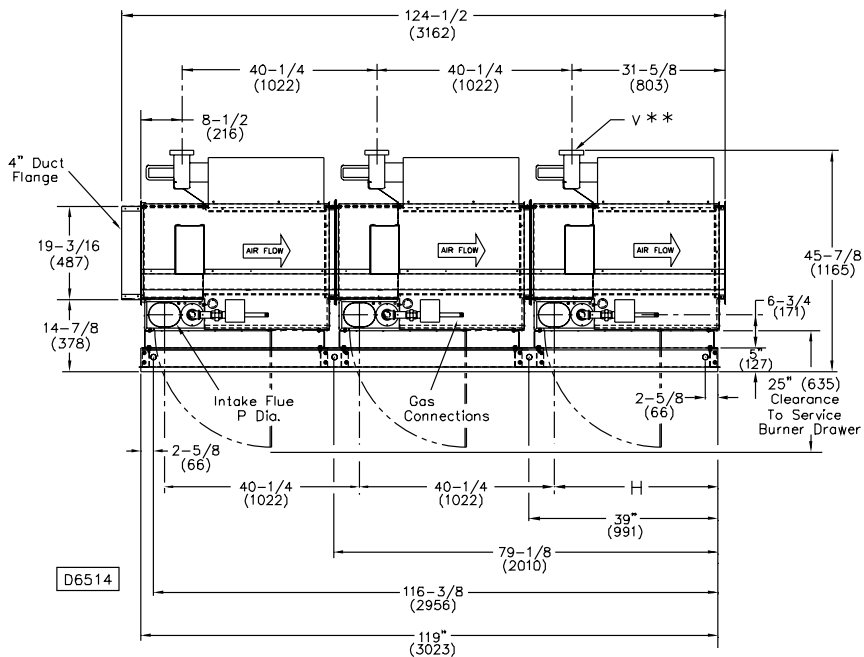
Gas Inlet sizes: Natural Gas and LP Gas: Capacities 10 thru 20 = 1/2 inch; Capacities 25 thru 12 = 3/4 inch.

Dimensional Data – MS Arrangements

Unit Type [UT] “MS”
Capacities [CA] 50 - 80
Indoor Arrangement [IA] “A”



Unit Type [UT] “MS”
Capacities [CA] 12
Indoor Arrangement [IA] “A”

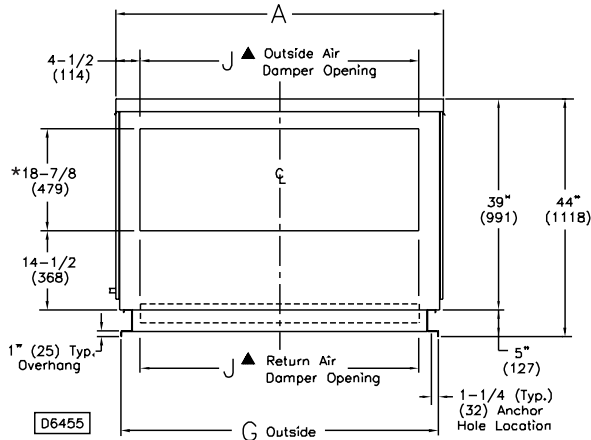


See page 40 for more dimensional information and specifications.

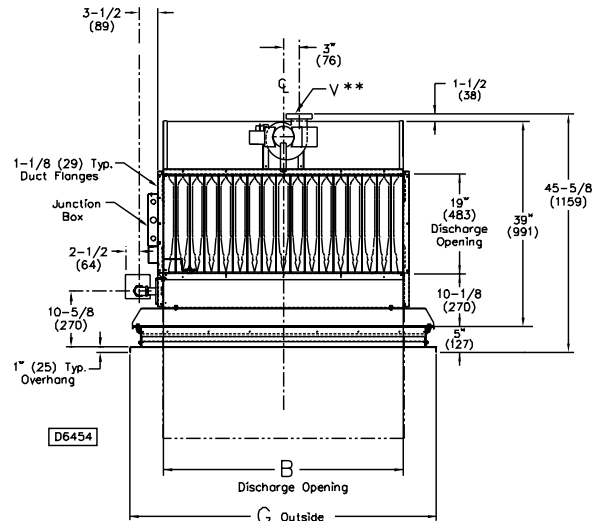
Dimensional Data – MS Arrangements – Table 16

Intake Air End View

Not applicable to [IA]-A or D
(See Evaporative Cooling specifications)



Discharge End View



Capacity	A	B	C	D	G	H	J▲	L	P***	U	V Dia.**	Gas Inlet	
												NAT	LP
10	32- 7/8 (835)	15- 9/16 (395)	16- 7/16 (418)	19- 3/8 (492)	30- 3/16 (767)	37- 7/16 (951)	24 (610)	N/A	4 RD (102)	N/A	4 (102)	1/2	1/2
15	32- 7/8 (835)	18- 5/16 (465)	16- 7/8 (418)	19- 3/8 (492)	30- 3/16 (767)	37- 7/16 (951)	24 (610)	N/A	4 RD (102)	N/A	4 (102)	1/2	1/2
20	43- 7/8 (1114)	23- 13/16 (605)	21- 15/16 (557)	24- 7/8 (632)	41- 3/16 (1046)	37- 7/16 (951)	35 (889)	N/A	5 RD (127)	N/A	5 (127)	1/2	1/2
25	43- 7/8 (1114)	29- 5/16 (745)	21- 15/16 (557)	24- 7/8 (632)	41- 3/16 (1046)	37- 7/16 (951)	35 (889)	N/A	5 RD (127)	N/A	5 (127)	3/4	3/4
30	54- 7/8 (1394)	34- 13/16 (884)	27- 7/16 (697)	30- 3/8 (772)	52- 3/16 (1326)	36- 11/16 (932)	46 (1168)	N/A	6 OV (152)	N/A	6 (152)	3/4	3/4
35	54- 7/8 (1394)	40- 5/16 (1024)	27- 7/16 (697)	30- 3/8 (772)	52- 3/16 (1326)	36- 11/16 (932)	46 (1168)	N/A	6 OV (152)	N/A	6 (152)	3/4	3/4
40	60- 3/8 (1534)	45- 13/16 (1164)	30- 3/16 (767)	33- 1/8 (841)	57- 11/16 (1465)	36- 11/16 (932)	51- 1/2 (1308)	N/A	6 OV (152)	N/A	6 (152)	3/4	3/4
50	43- 7/8 (1114)	29- 5/16 (745)	21- 15/16 (557)	24- 7/8 (632)	42- 1/16 (1068)	37- 7/16 (951)	35 (889)	N/A	5 RD (127)	N/A	5 (127)	3/4	3/4
60	54- 7/8 (1394)	34- 13/16 (884)	27- 7/16 (697)	30- 3/8 (772)	53- 1/16 (1348)	36- 11/16 (932)	46 (1168)	N/A	6 OV (152)	N/A	6 (152)	3/4	3/4
70	54- 7/8 (1394)	40- 5/16 (1024)	27- 7/16 (697)	30- 3/8 (772)	53- 1/16 (1348)	36- 11/16 (932)	46 (1168)	N/A	6 OV (152)	N/A	6 (152)	3/4	3/4
80	60- 3/8 (1534)	45- 13/16 (1164)	30- 3/16 (767)	33- 1/8 (841)	58- 9/16 (1487)	36- 11/16 (932)	51- 1/2 (1308)	181- 1/4 (4604)	6 OV (152)	177 (4495)	6 (152)	3/4	3/4
12	60- 3/8 (1534)	45- 13/16 (1164)	30- 3/16 (767)	33- 1/8 (841)	58- 9/16 (1487)	36- 11/16 (932)	51- 1/2 (1308)	218- 1/4 (5544)	6 OV (152)	217 (5512)	6 (152)	3/4	3/4

NOTES:

Unless otherwise noted the end views and dimensional data shown in the drawings and table are applicable to Indoor Arrangement [IA]-B, D, G, K. Dimensions are in inches (Dimensions in parenthesis are in millimeters).

"J"▲ Dimension is an outside dimension for the return air damper.

* This is an outside damper dimension.

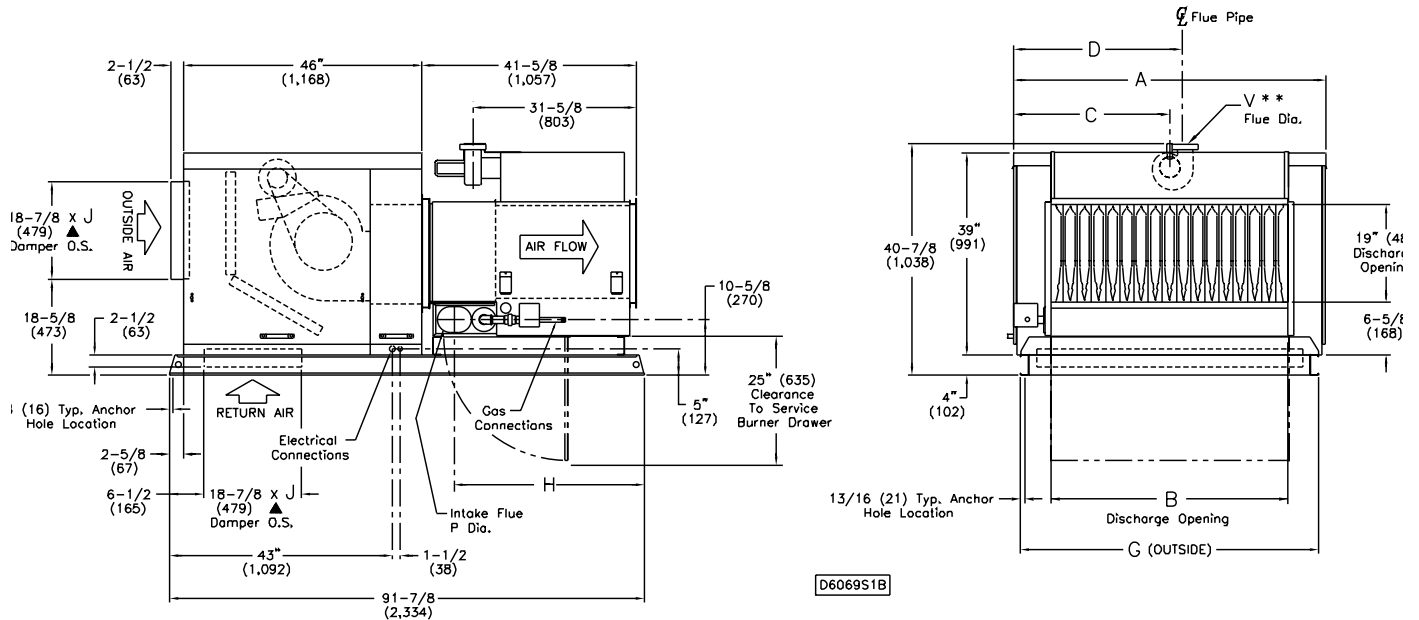
***"V" Dia. = Flue Opening: the 4 to 5 inch reducer adaptor is to be field installed for unit capacities 10 & 15.

The 5 to 6 inch increaser adaptor is supplied by the manufacturer for unit capacities 30, 35, 40, 60, 70, 80 & 12 (required for each furnace's flue).

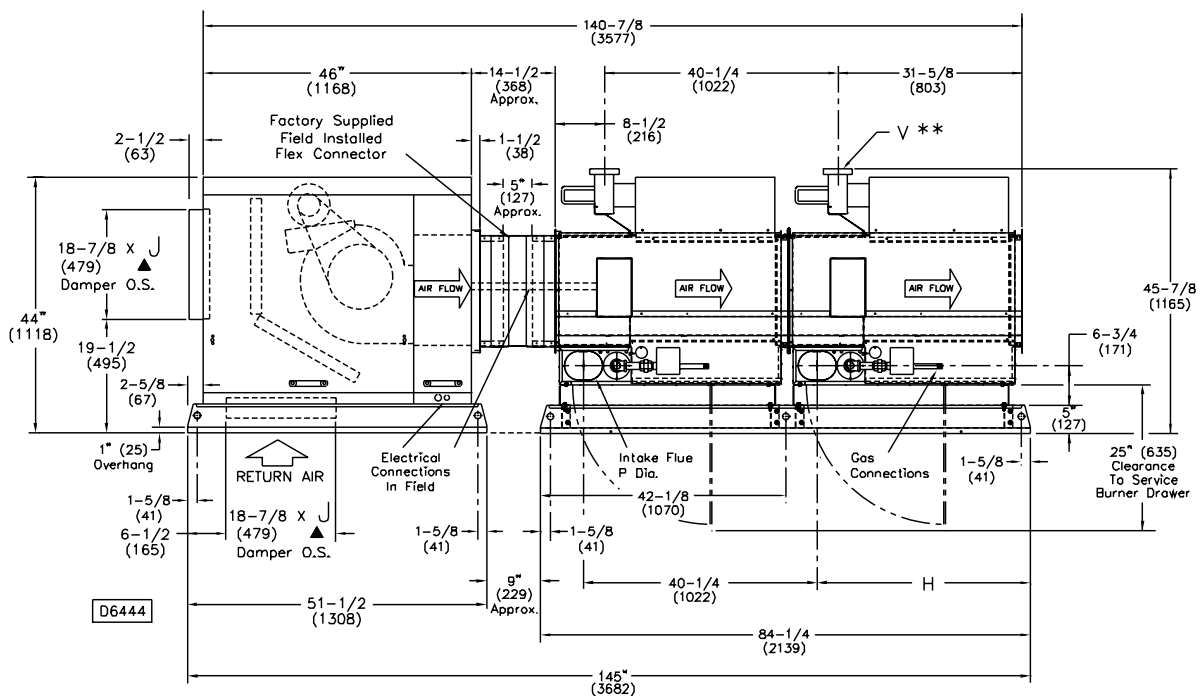
***RD = Round; OV = Oval

Dimensional Data – MS Arrangements

Unit Type [UT] “MS”
Capacities [CA] 10-40
Indoor Arrangement [IA] “B”



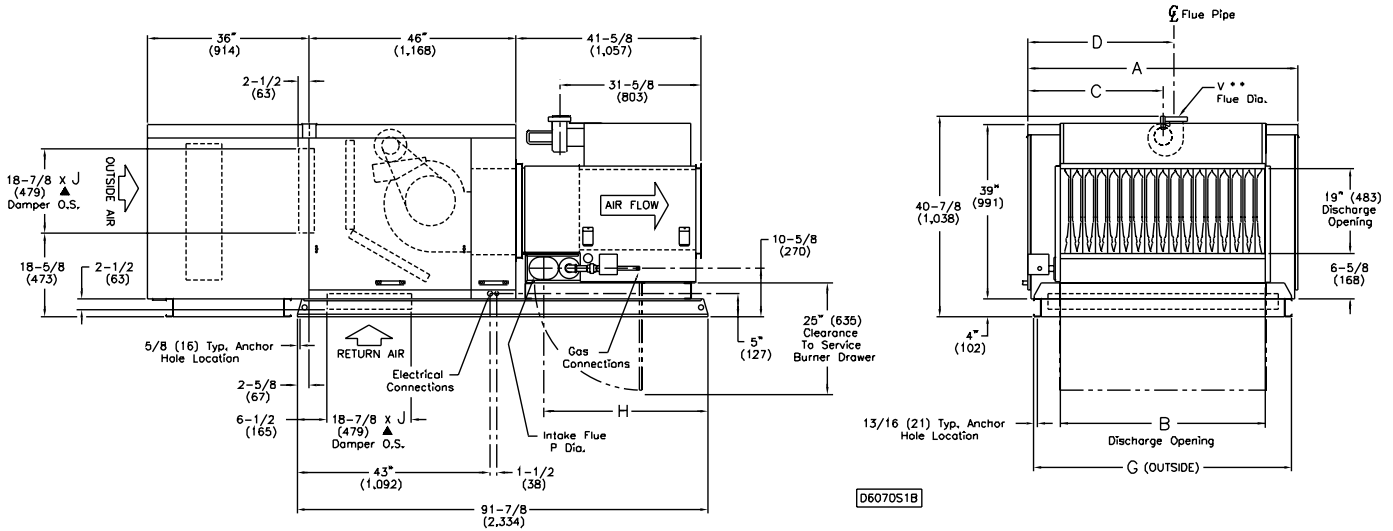
Unit Type [UT] “MS”
Capacities [CA] 50-80
Indoor Arrangement [IA] “B”



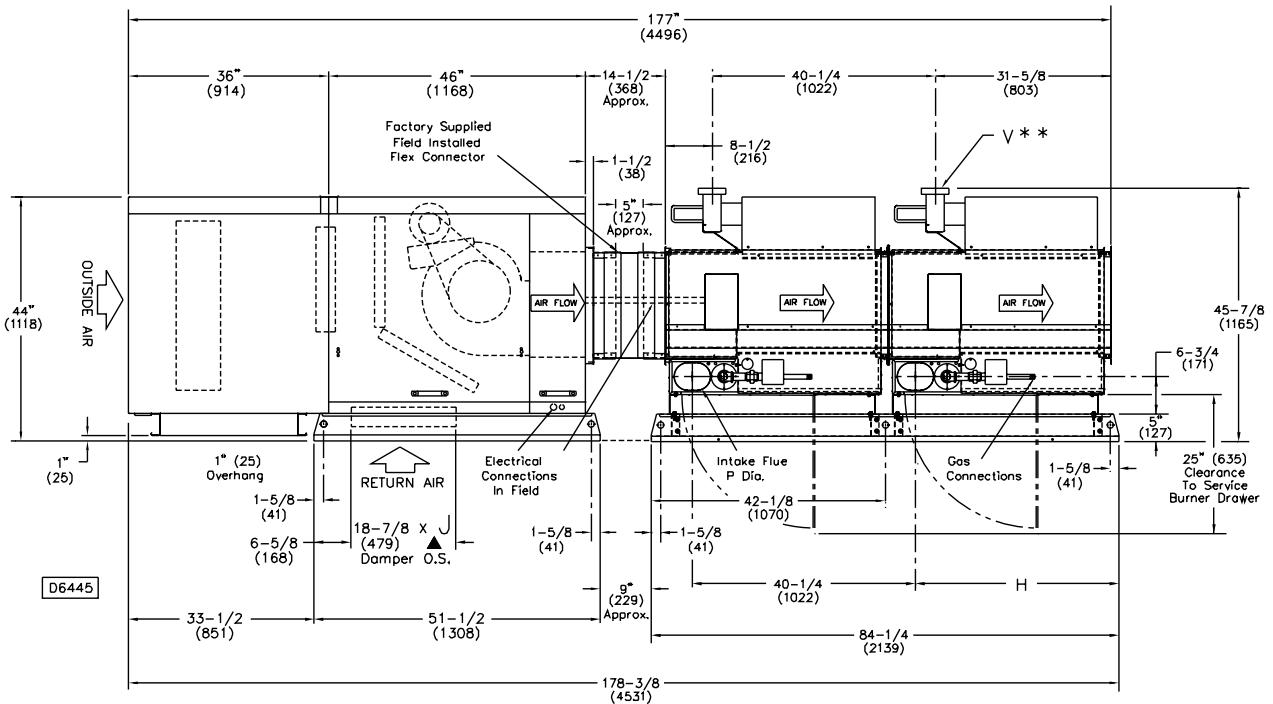
See page 40, Table 16, for more dimensional information.

Dimensional Data – MS Arrangements

Unit Type [UT] "MS" Capacities [CA] 10-40 Indoor Arrangement [IA] "D"



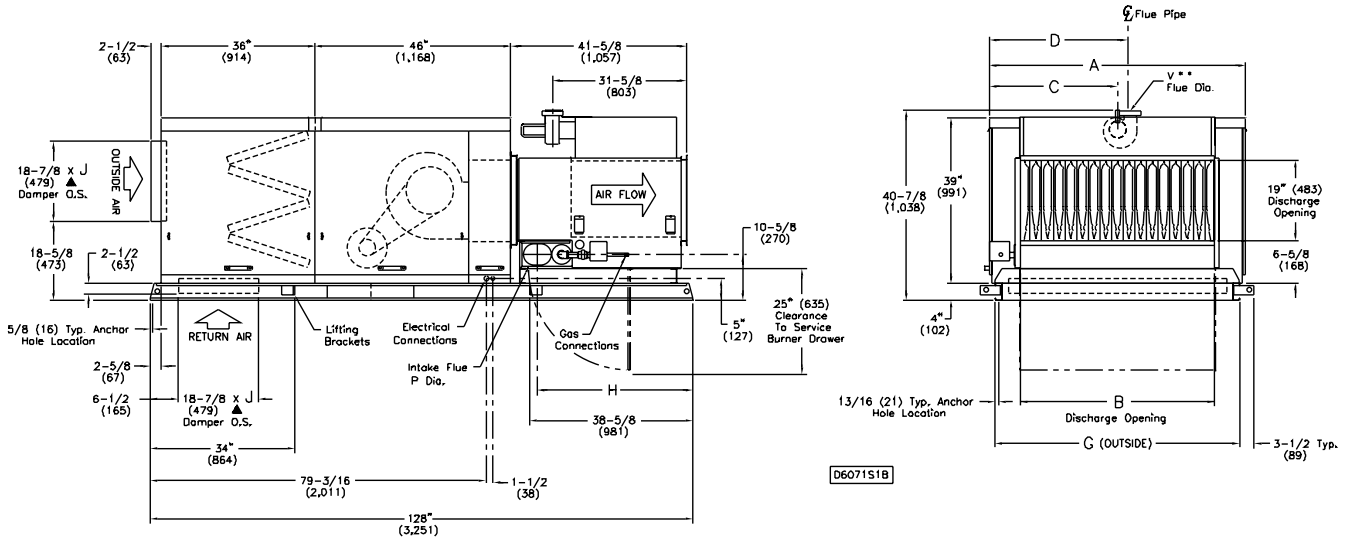
Unit Type [UT] "MS" Capacities [CA] 50-80 Indoor Arrangement [IA] "D"



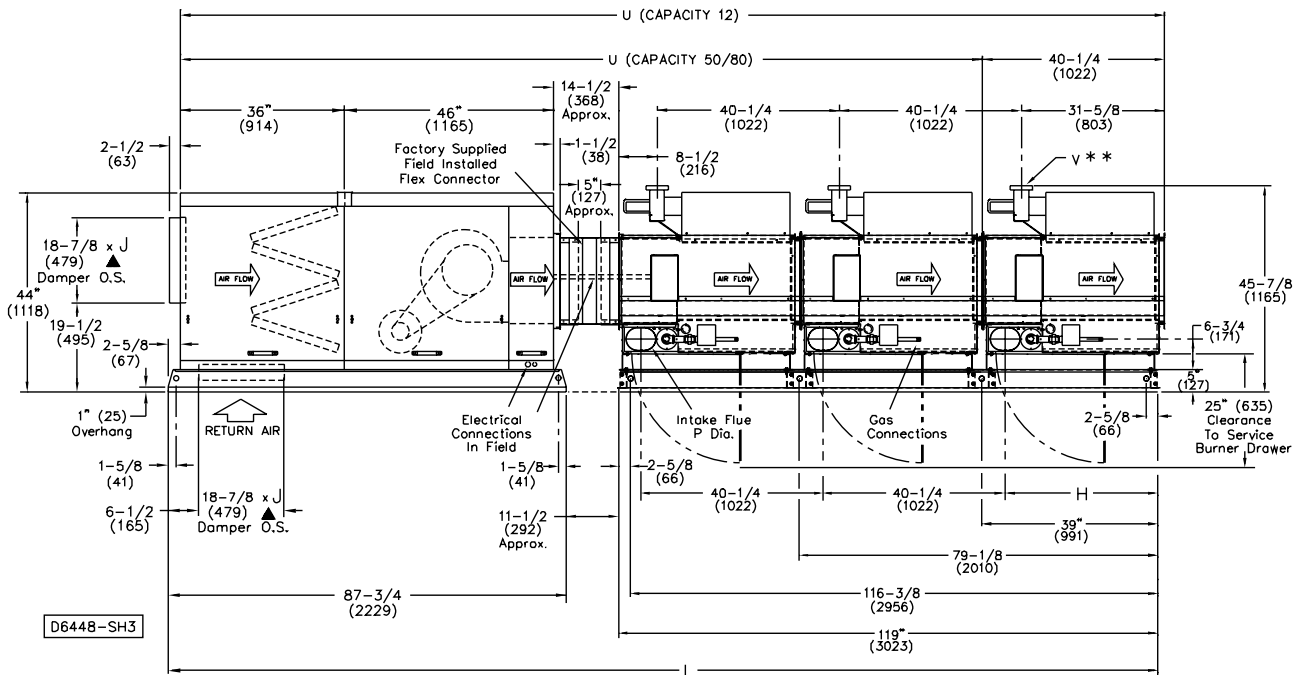
See page 40, Table 16, for more dimensional information.

Dimensional Data – MS Arrangements

Unit Type [UT] “MS”
Capacities [CA] 20-40
Indoor Arrangement [IA] “G”



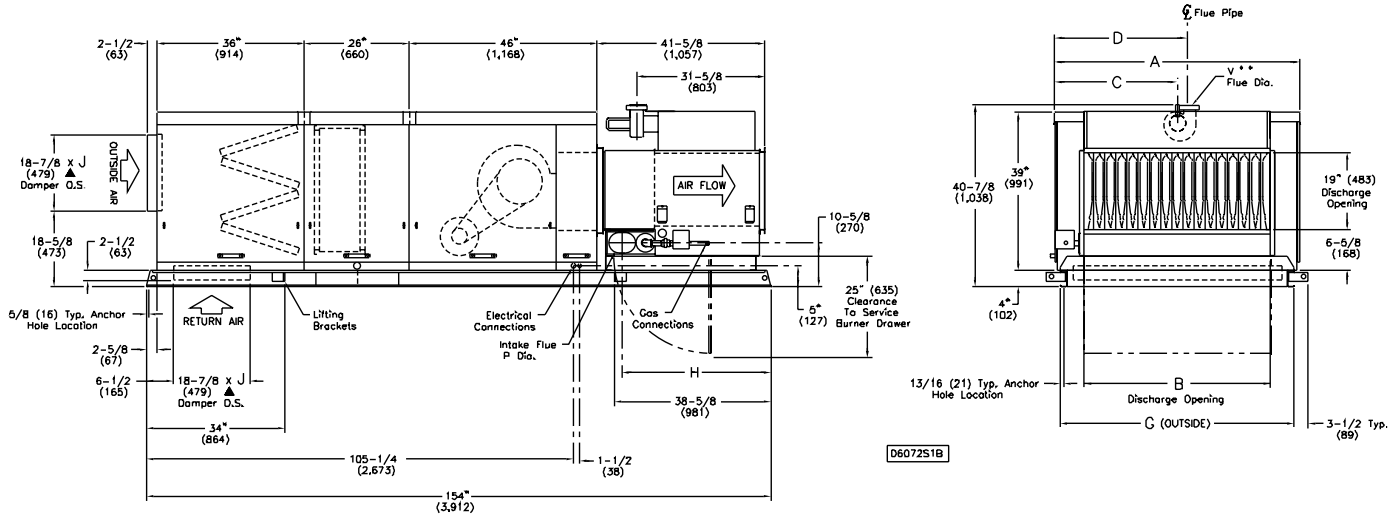
Unit Type [UT] “MS”
Capacities [CA] 50-12
Indoor Arrangement [IA] “G”
(Capacity [CA] 12 shown)



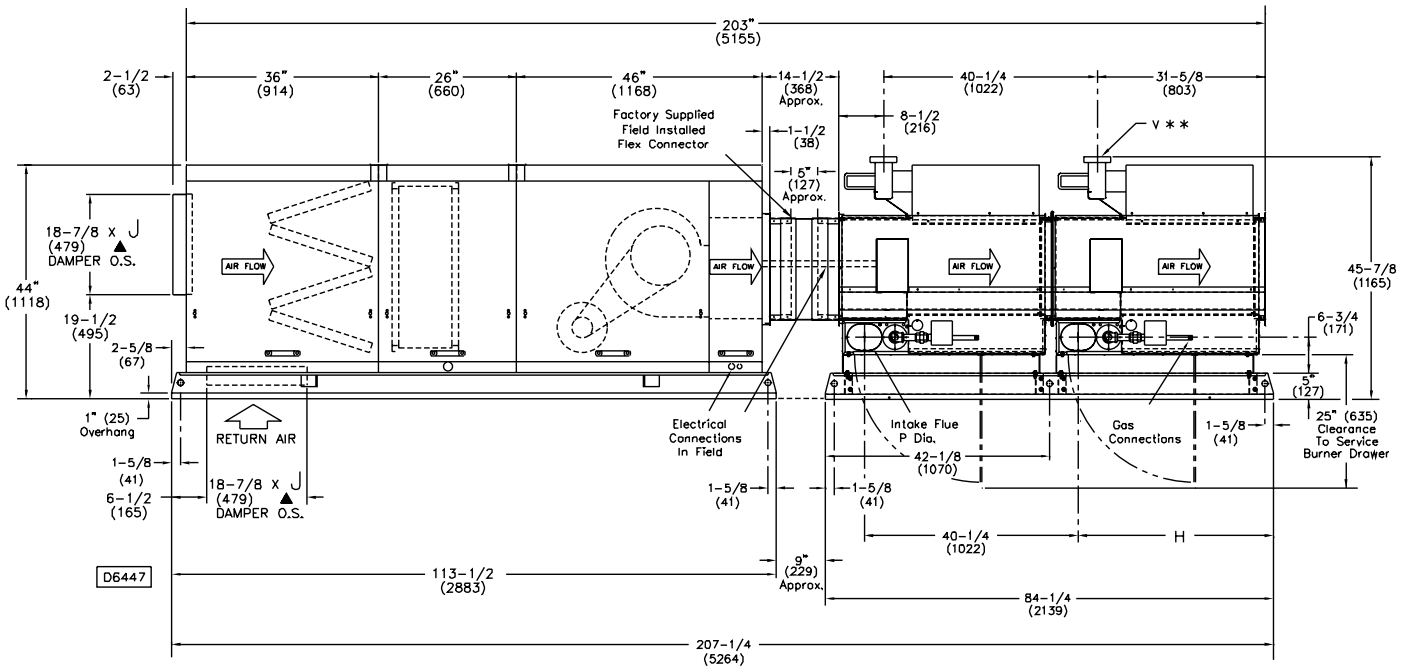
See page 40, Table 16, for more dimensional information.

Dimensional Data – MS Arrangements

Unit Type [UT] "MS" Capacities [CA] 10-40 Indoor Arrangement [IA] "K"



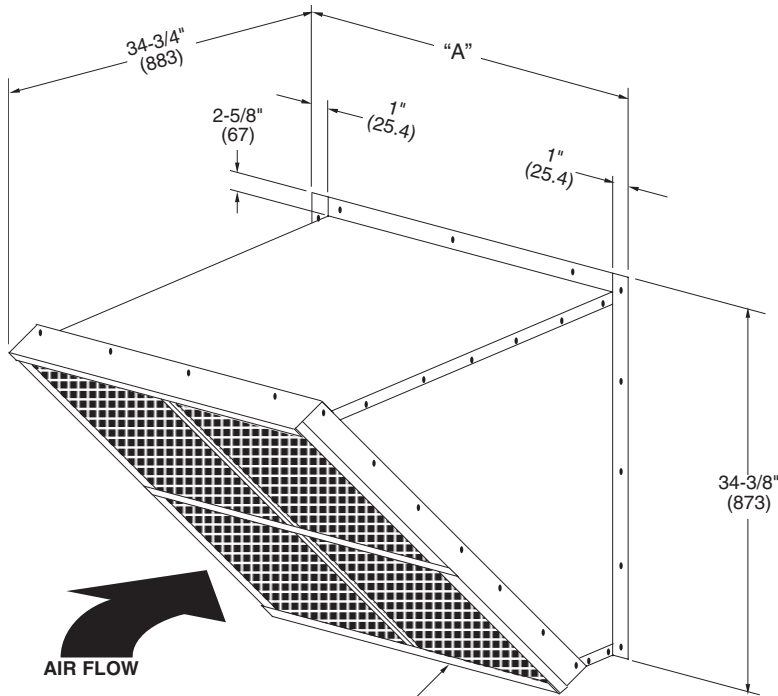
Unit Type [UT] "MS" Capacities [CA] 50-80 Indoor Arrangement [IA] "K"



See page 40, Table 16, for more dimensional information.

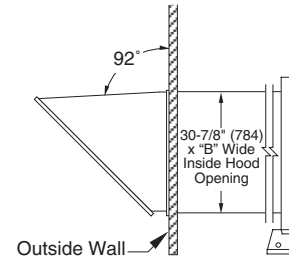
Dimensional Data – Unit Modules

Optional Air Intake Hood (shipped separately)



Capacity	A	B
10/15	31- 1/2 (800)	29- 1/4 (743)
20/25/50	42- 1/2 (1080)	40- 1/4 (1022)
30/35	53- 1/2 (1359)	51- 1/4 (1302)
60/70	59	56- 3/4 (1441)
40/80/12		

NOTES:
Dimensions are in inches
(Dimensions in parenthesis are in millimeters)



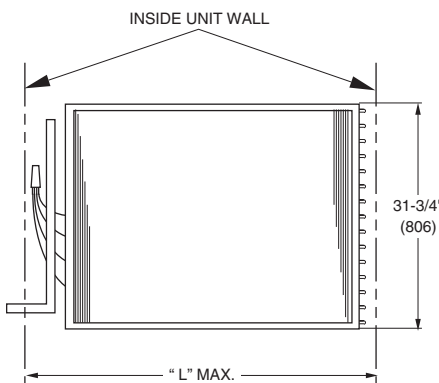
AIR FLOW

The (optional) Outside Air Hood is Equipped With A Bird Inlet Screen. Optional Moisture Eliminators Are Also Available.

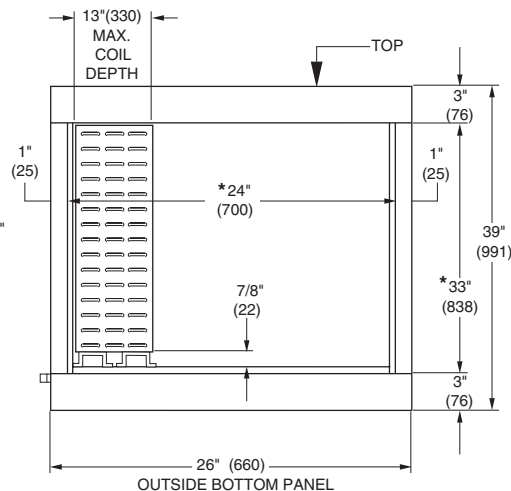
D4100

Coil Module

Maximum Coil Dimensions



Side Opening of Coil Module



Capacity	"L" Inside Max Cabinet Opening
10/15	31- 1/4 (794)
20/25/50	42- 1/4 (1073)
30/35	53- 1/4 (1353)
60/70	58- 3/4 (1492)
40/80	

NOTES:
Dimensions are in inches
(Dimensions in parenthesis are in millimeters)

Cooling Coil Options

Indoor Arrangement [IA] - (K)

Coil Options [CO] Model Digit 8

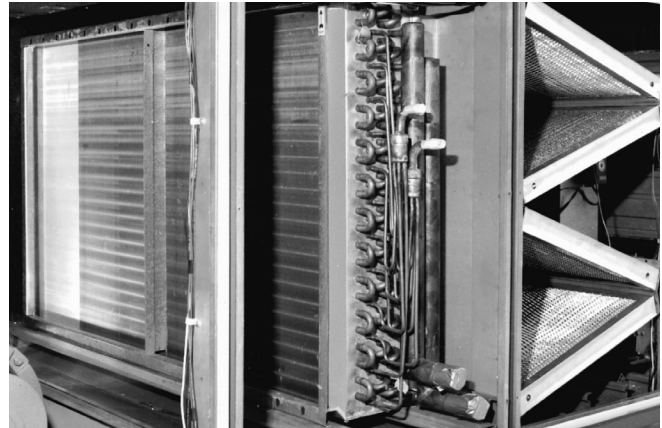
Sterling Indoor Make-Up Air Units also offers coil cabinets and cooling coils with our Packaged Indoor set of features. As standard equipment, we offer 4 or 6 row, single or dual circuit intertwine, DX (20 tons max.) or chilled water coils. Sterling coil cabinets feature draw through design to ensure even air flow across the coil face and a one piece 409 stainless steel positive drain drip pan conforming to ASHRAE standard No. 62.1-2004. The drip pan is designed for side outlet drainage piping. Please refer to tables 17A, 17B, 18A and 18B for Cooling Coil Performance Data.

Whenever a Cooling Coil is used upstream of a furnace section(s), Sterling HIGHLY recommends a 409 stainless steel heat exchanger(s) be used.

Indoor Arrangement (K) should not exceed 6,500 CFM (3.1 m³/s) or face velocities of 605 FPM (3.1 m/s).

Coil Options [CO] Digit 8

- A** - DX Coil, 4 Row, Single Circuit
- B** - DX Coil, 4 Row, Dual Circuit
- C** - DX Coil, 6 Row, Single Circuit
- D** - DX Coil, 6 Row, Dual Circuit
- E** - Chilled Water Coil, 4 Row
- G** - Chilled Water Coil, 6 Row
- O** - None
- Z** - Other (Special)



Cooling Coil Options [CO] – Table 17A

Indoor Arrangement (K) - DX Cooling Coil Performance Data (Ref. R-410A)

80 °F Entering Dry Bulb, 67 °F Entering Wet Bulb

Capacity based on 80 °F EDB, 67 °F EWB, 45 °F Sat. Suction, 100 °F Liquid

Unit Capacity (CA)	Air Flow (SCFM)	Face Velocity (FPM)	Fin Spacing (FPF)	Number of Rows				Fin Spacing (FPF)	Number of Rows											
				4					6											
				Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. Inch WC	WT (LBS)		Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. Inch WC	WT (LBS)								
10	1600	321	82	50	58 / 57	0.21	63.0													
			93	53	57 / 56	0.25	65.0													
			111	57	56 / 55	0.27	67.0													
	15	2400	481	80	63.5	61 / 58	0.38	63.1	98	82	56 / 56	0.68	88.7							
				108	73	58 / 57	0.49	67.0	117	88	55 / 55	0.75	92.7							
				134	80	57 / 56	0.55	70.6	146	95	54 / 54	0.87	98.8							
20		1600	321	82	50	58 / 57	0.21	63.0												
				93	53	57 / 56	0.25	65.0												
				111	57	56 / 55	0.27	67.0												
	25, 50	3000	601	81	72	62 / 59	0.53	63.0	86	80	61 / 57	0.68	86.0							
				106	82	60 / 58	0.67	66.0	100	85	57 / 56	0.73	89.0							
				131	90	58 / 57	0.75	70.0	122	92	55 / 55	0.82	93.0							
30, 60		2100	271	73	69	57 / 56	0.15	80.0	78	82	54 / 53	0.23	111.0							
				88	74	56 / 55	0.18	83.0	94	87	53 / 52	0.28	116.0							
				118	82	56 / 54	0.21	89.0	119	93	51 / 51	0.32	123.0							
	35, 70	4400	596	85	106	62 / 59	0.52	82.0	80	143	57 / 56	0.79	111.0							
				96	120	60 / 58	0.64	85.0	106	159	56 / 55	1.00	119.0							
				129	130	58 / 57	0.73	91.0	113	163	55 / 55	1.03	121.0							
40, 80		2500	339	95	88	56 / 55	0.27	85.0	107	108	53 / 52	0.43	120.1							
				125	97	55 / 54	0.32	91.1	139	116	51 / 51	0.49	130.0							
				157	104	53 / 53	0.37	97.7	160	120	51 / 50	0.55	136.5							
	40, 80	4400	596	85	106	62 / 59	0.52	82.0	80	143	57 / 56	0.79	111.0							
				96	120	60 / 58	0.64	85.0	106	159	56 / 55	1.00	119.0							
				129	130	58 / 57	0.73	91.0	113	163	55 / 55	1.03	121.0							
30, 60		2800	287	109	107	55 / 54	0.23	113.3	96	127	52 / 51	0.32	151.7							
				136	117	53 / 53	0.25	120.8	119	134	51 / 51	0.35	161.1							
				165	165	52 / 52	0.29	128.6	151	141	50 / 50	0.40	174.2							
	35, 70	5800	594	80	146	61 / 59	0.53	105.0	86	184	58 / 56	0.79	147.0							
				104	165	59 / 58	0.66	111.0	102	198	57 / 56	0.96	153.0							
				122	177	58 / 57	0.71	116.0	115	208	56 / 55	1.02	159.0							
40, 80		3200	328	101	116	56 / 55	0.23	111.3	93	139	53 / 52	0.39	150.4							
				137	128	54 / 54	0.31	120.9	123	150	51 / 51	0.44	162.8							
				166	136	53 / 53	0.36	128.9	151	157	50 / 50	0.50	174.2							
	40, 80	5800	594	80	146	61 / 59	0.53	105.0	86	184	58 / 56	0.79	147.0							
				104	165	59 / 58	0.66	111.0	102	198	57 / 56	0.96	153.0							
				122	177	58 / 57	0.71	116.0	115	208	56 / 55	1.02	159.0							
40, 80		3700	341	100	132	56 / 55	0.29	119.9	96	162	52 / 52	0.42	164.6							
				128	145	54 / 54	0.32	128.4	128	174	51 / 51	0.48	179.2							
				153	154	53 / 53	0.36	136.0	164	183	50 / 50	0.58	195.6							
	6500	599	77	163	62 / 59	0.53	112.0	80	205	58 / 57	0.79	156.0								
			105	187	59 / 58	0.67	121.0	93	229	56 / 55	0.96	163.0								
			116	196	58 / 57	0.71	124.0	105	238	55 / 55	1.01	168.0								

CONVERSIONS: 2119 SCFM = 1 m³/s, 196.8 FPM = 1 m/s, 3.412 MBH = 1 kW, (°F-32) 5/9 = °C, 1 Inch WC = 248.8 Pa, 1 LB. = 0.453 kg.

NOTES: 1) Data certified in accordance with ARI Standard 410.

2) Weight listed is the total weight of the dry coil.

3) Consult customer service department for special coil requirements.

Cooling Coil Options [CO] – Table 17B

Indoor Arrangement (K) - DX Cooling Coil Performance Data (Ref. R-410A)

95 °F Entering Dry Bulb, 74 °F Entering Wet Bulb

Capacity based on 95 °F EDB, 74 °F EWB, 45 °F Sat. Suction, 100 °F Liquid

Unit Capacity (CA)	Air Flow (SCFM)	Face Velocity (FPM)	Fin Spacing (FPF)	Number of Rows				Fin Spacing (FPF)	Number of Rows				
				4					6				
				Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. (Inch WC)	WT (LBS)		Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. (Inch WC)	WT (LBS)	
10	1600	321	72	75	64 / 60	0.19	62.0	73	90	59 / 57	0.29	83.0	
			89	82	61 / 59	0.24	64.0	86	95	57 / 56	0.35	86.0	
			122	91	58 / 57	0.24	68.0	104	101	55 / 55	0.39	90.0	
	2400	481	97	99	65 / 62	0.45	65.3	84	125	60 / 59	0.65	85.8	
			124	111	62 / 61	0.51	69.0	109	138	58 / 57	0.74	91.0	
			156	156	60 / 59	0.61	73.5	142	150	55 / 55	0.86	98.0	
	15	1600	321	72	75	64 / 60	0.19	62.0	73	90	59 / 57	0.29	83.0
				89	82	61 / 59	0.24	64.0	86	95	57 / 56	0.35	86.0
				122	91	58 / 57	0.24	68.0	104	101	55 / 55	0.39	90.0
3000		601	81	111	68 / 63	0.54	63.0	83	143	62 / 60	0.80	85.0	
			114	121	65 / 62	0.67	67.0	107	158	59 / 58	1.00	90.0	
			111	128	64 / 62	0.69	57.0	122	166	58 / 58	1.08	93.0	
20		2100	271	80	106	62 / 59	0.17	81.0	72	130	56 / 55	0.24	109.0
				91	116	59 / 58	0.20	84.0	87	137	55 / 54	0.27	113.0
				117	123	57 / 56	0.23	89.0	104	144	53 / 53	0.33	119.0
	4400	596	82	165	68 / 63	0.53	82.0	77	215	62 / 60	0.79	110.0	
			117	195	63 / 61	0.70	89.0	97	234	59 / 58	0.96	117.0	
			130	204	62 / 61	0.74	91.0	126	244	58 / 57	1.09	125.0	
	25, 50	2500	339	72	118	64 / 60	0.21	80.0	86	143	58 / 57	0.38	113.2
				93	130	61 / 59	0.27	84.4	107	154	56 / 55	0.43	120.0
				127	141	58 / 57	0.26	91.3	130	163	54 / 54	0.47	127.0
4400		596	82	165	68 / 63	0.53	82.0	77	215	62 / 60	0.79	110.0	
			117	195	63 / 61	0.70	89.0	97	234	59 / 58	0.96	117.0	
			130	204	62 / 61	0.74	91.0	126	244	58 / 57	1.09	125.0	
30, 60		2800	287	99	146	60 / 59	0.21	110.0	81	173	56 / 55	0.26	145.2
				128	161	58 / 57	0.24	118.0	101	185	54 / 54	0.32	153.0
				155	173	56 / 55	0.28	126.0	126	196	53 / 52	0.36	163.6
	5800	594	81	224	67 / 63	0.53	105.0	84	288	61 / 59	0.80	146.0	
			109	255	64 / 61	0.67	113.0	112	322	58 / 57	1.02	157.0	
			118	264	63 / 61	0.70	115.0	130	339	57 / 56	1.11	165.0	
	35, 70	3200	328	91	163	61 / 59	0.26	108.5	85	195	56 / 56	0.37	146.8
				135	181	58 / 57	0.30	120.0	113	212	54 / 54	0.42	158.3
				146	196	56 / 55	0.26	123.4	145	226	52 / 52	0.48	171.4
5800		594	81	224	67 / 63	0.53	105.0	84	288	61 / 59	0.80	146.0	
			109	255	64 / 61	0.67	113.0	112	322	58 / 57	1.02	157.0	
			118	264	63 / 61	0.70	115.0	130	339	57 / 56	1.11	165.0	
40, 80		3700	341	98	186	61 / 59	0.28	118.9	84	225	57 / 56	0.39	158.7
				126	206	58 / 57	0.31	127.5	106	245	54 / 54	0.44	169.1
				144	224	57 / 56	0.28	133.3	139	260	52 / 52	0.50	183.8
	6500	599	87	245	67 / 63	0.60	115.0	81	322	61 / 59	0.80	157.0	
			104	280	64 / 62	0.67	121.0	108	359	59 / 58	1.01	169.0	
			124	301	62 / 61	0.74	127.0	123	376	57 / 57	1.09	176.0	

CONVERSIONS: 2119 SCFM = 1 m³/s, 196.8 FPM = 1 m/s, 3.412 MBH = 1 kW, (°F-32) 5/9= °C, 1 Inch WC = 248.8 Pa, 1 LB. = 0.453 kg.

NOTES: 1) Data certified in accordance with ARI Standard 410.

2) Weight listed is the total weight of the dry coil.

3) Consult customer service department for special coil requirements.

Cooling Coil Options [CO] – Table 18A

Indoor Arrangement (K) - Chilled Water Cooling Coil Performance Data

80 °F Entering Dry Bulb, 67 °F Entering Wet Bulb

Capacity based on 80 °F EDB, 67 °F EWB, 45 °F EWT, 70 GPM

Unit Capacity (CA)	Air Flow (SCFM)	Face Velocity (FPM)	Fin Spacing (FPF)	Number of Rows				Fin Spacing (FPF)	Number of Rows				
				4					6				
				Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. Inch WC	WT (LBS)		Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. Inch WC	WT (LBS)	
10	1000	200	84	46	52 / 51	0.10	63.5	84	54	48 / 48	0.15	85.9	
			93	48	51 / 50	0.10	64.8	97	56	47 / 47	0.17	88.6	
			97	50	50 / 49	0.11	66.8	120	58	46 / 46	0.19	93.4	
	2400	480	84	80	58 / 56	0.41	63.5	85	102	53 / 53	0.62	86.1	
			112	90	56 / 54	0.48	67.4	116	112	51 / 51	0.73	92.6	
			152	100	53 / 53	0.59	73.0	157	121	50 / 49	0.91	101.2	
	15	1400	280	88	60	54 / 52	0.18	64.1	84	70	50 / 49	0.26	85.9
				130	68	51 / 50	0.22	70.0	100	74	49 / 49	0.30	89.3
				167	76	48 / 48	0.27	76.6	151	82	46 / 46	0.37	102.1
2900		581	84	94	59 / 56	0.54	65.0	84	112	55 / 54	0.81	85.9	
			122	102	56 / 55	0.66	68.8	114	125	53 / 52	0.96	92.2	
			157	122	53 / 53	0.81	75.2	153	145	50 / 50	1.19	102.6	
20		1800	243	84	78	53 / 52	0.14	82.5	84	93	49 / 49	0.21	113.1
				128	90	50 / 50	0.18	91.6	103	98	48 / 48	0.24	119.0
				168	96	48 / 48	0.22	99.8	159	105	46 / 46	0.30	136.3
	4300	582	84	127	60 / 57	0.54	82.5	84	163	55 / 54	0.82	113.1	
			115	145	57 / 56	0.64	88.9	110	179	53 / 53	0.94	121.1	
			157	162	55 / 54	0.80	97.6	150	196	52 / 51	1.15	133.5	
	25, 50	2300	311	84	92	55 / 53	0.21	82.5	84	111	51 / 50	0.31	113.1
				122	105	52 / 51	0.26	90.3	115	121	49 / 49	0.38	122.7
				163	120	49 / 49	0.32	101.0	153	132	47 / 47	0.44	137.7
4300		582	84	127	60 / 57	0.54	82.5	84	163	55 / 54	0.82	113.1	
			115	145	57 / 56	0.64	88.9	103	175	54 / 53	0.91	119.0	
			157	162	55 / 54	0.80	97.6	125	186	53 / 52	1.00	125.8	
30, 60		2700	276	84	112	54 / 53	0.17	106.5	84	134	50 / 50	0.26	146.9
				129	129	51 / 51	0.22	118.8	115	145	48 / 48	0.31	159.6
				160	143	49 / 48	0.25	130.2	155	157	46 / 46	0.37	180.3
	5700	583	84	165	60 / 57	0.55	106.5	84	211	56 / 55	0.82	146.9	
			102	179	58 / 57	0.60	111.5	102	226	54 / 54	0.89	154.3	
			125	194	57 / 56	0.67	117.7	126	241	53 / 53	1.00	164.1	
	35, 70	3200	327	84	124	55 / 54	0.23	106.5	84	151	51 / 51	0.34	146.9
				88	133	54 / 53	0.24	110.5	103	160	50 / 50	0.39	154.7
				156	152	51 / 51	0.33	126.2	124	167	49 / 49	0.42	163.3
5700		583	84	165	60 / 57	0.55	106.5	84	211	56 / 55	0.82	146.9	
			102	179	58 / 57	0.60	111.5	102	226	54 / 54	0.89	154.3	
			125	194	57 / 56	0.67	117.7	126	241	53 / 53	1.00	164.1	
40, 80		3700	340	84	140	56 / 54	0.24	115.2	84	171	52 / 51	0.36	159.2
				122	160	53 / 52	0.30	126.7	109	184	50 / 50	0.42	170.6
				162	174	51 / 51	0.36	138.9	160	200	48 / 48	0.54	193.9
	6300	580	84	181	60 / 57	0.54	115.2	84	231	56 / 55	0.81	159.2	
			104	198	58 / 57	0.60	121.2	104	249	54 / 54	0.89	168.4	
			146	225	56 / 55	0.73	134.0	125	264	53 / 53	0.98	177.9	

CONVERSIONS: 2119 SCFM = 1 m³/s, 196.8 FPM = 1 m/s, 3.412 MBH = 1 kW, (°F-32) 5/9= °C, 1 Inch WC = 248.8 Pa, 1 LB. = 0.453 kg.

NOTES: 1) Data certified in accordance with ARI Standard 410.

2) Weight listed is the total weight of the dry coil.

3) Consult customer service department for special coil requirements.

Cooling Coil Options [CO] – Table 18B

Indoor Arrangement (K) - Chilled Water Cooling Coil Performance Data 95 °F Entering Dry Bulb, 74 °F Entering Wet Bulb

Capacity based on 95 °F EDB, 74 °F EWB, 45 °F EWT, 70 GPM

Unit Capacity (CA)	Air Flow (SCFM)	Face Velocity (FPM)	Fin Spacing (FPF)	Number of Rows				Fin Spacing (FPF)	Number of Rows			
				4					6			
				Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. (Inch WC)	WT (LBS)		Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. (Inch WC)	WT (LBS)
10	1000	200	84	66	55 / 54	0.10	63.5	84	77	50 / 49	0.15	85.9
			94	69	54 / 53	0.11	64.9	114	82	48 / 48	0.18	92.2
			163	79	49 / 49	0.15	74.6	146	86	46 / 46	0.21	101.1
	2400	480	84	121	62 / 59	0.41	65.0	84	143	57 / 56	0.62	85.9
			120	130	60 / 58	0.50	68.6	107	155	55 / 54	0.71	90.7
			162	144	57 / 56	0.62	74.4	153	180	50 / 50	0.89	102.6
15	1400	280	84	83	58 / 56	0.18	63.5	84	100	50 / 49	0.26	85.9
			109	96	54 / 53	0.21	68.5	113	108	50 / 49	0.32	92.0
			160	107	50 / 50	0.26	75.6	155	114	48 / 48	0.37	100.8
	2900	581	84	123	66 / 62	0.54	63.5	84	159	59 / 58	0.81	85.9
			104	135	63 / 60	0.61	66.3	109	174	57 / 56	0.93	91.1
			125	145	61 / 59	0.66	69.3	152	192	54 / 54	1.15	100.2
20	1800	243	84	111	57 / 55	0.14	82.5	84	132	51 / 51	0.21	113.1
			101	119	55 / 54	0.16	86.0	106	140	49 / 49	0.24	119.9
			126	127	53 / 52	0.18	91.2	152	152	47 / 46	0.29	137.4
	4300	582	84	179	66 / 62	0.54	82.5	84	230	60 / 58	0.81	113.1
			103	195	64 / 61	0.60	86.4	112	254	57 / 56	0.93	121.8
			126	211	61 / 60	0.66	91.2	154	279	54 / 54	1.16	134.8
25, 50	2300	311	84	130	59 / 57	0.21	82.5	84	158	53 / 53	0.31	113.1
			111	144	56 / 55	0.25	88.1	110	170	51 / 51	0.37	121.1
			163	161	53 / 52	0.31	98.8	154	188	48 / 48	0.45	138.0
	4300	582	84	179	66 / 62	0.54	82.5	84	230	60 / 58	0.81	113.1
			103	195	64 / 61	0.60	86.4	112	254	57 / 56	0.93	121.8
			126	211	61 / 60	0.66	91.2	154	279	54 / 54	1.16	134.8
30, 60	2700	276	84	158	58 / 56	0.17	106.5	84	190	53 / 52	0.26	146.9
			110	174	55 / 54	0.20	113.6	106	202	51 / 50	0.30	155.9
			156	192	52 / 52	0.25	126.2	155	217	48 / 48	0.37	176.0
	5700	583	84	232	66 / 62	0.54	106.5	84	297	60 / 59	0.80	146.9
			110	260	63 / 61	0.61	113.6	112	328	58 / 57	0.92	158.4
			158	297	60 / 59	0.78	126.8	156	362	55 / 55	1.16	176.4
35, 70	3200	327	84	175	60 / 58	0.23	106.5	84	214	54 / 53	0.34	146.9
			108	192	57 / 56	0.26	113.1	109	230	52 / 52	0.40	157.1
			156	215	54 / 53	0.32	126.2	156	248	49 / 49	0.49	176.4
	5700	583	84	232	66 / 62	0.54	106.5	84	297	60 / 59	0.80	146.9
			111	261	63 / 61	0.61	113.9	112	328	58 / 57	0.92	158.4
			155	295	60 / 59	0.77	125.9	156	362	55 / 55	1.16	176.4
40, 80	3700	340	84	198	61 / 58	0.24	115.2	84	242	55 / 54	0.36	159.2
			114	221	57 / 56	0.29	124.3	111	262	52 / 52	0.43	171.6
			159	245	54 / 54	0.35	137.9	156	293	49 / 49	0.52	196.8
	6300	580	84	255	66 / 62	0.53	115.2	84	326	60 / 59	0.79	159.2
			104	279	64 / 61	0.59	121.2	110	358	58 / 57	0.90	171.1
			126	301	62 / 60	0.65	127.9	155	396	55 / 55	1.14	191.6

CONVERSIONS: 2119 SCFM = 1 m³/s, 196.8 FPM = 1 m/s, 3.412 MBH = 1 kW, (°F-32) 5/9= °C, 1 Inch WC = 248.8 Pa, 1 LB. = 0.453 kg.

NOTES: 1) Data certified in accordance with ARI Standard 410.

2) Weight listed is the total weight of the dry coil.

3) Consult customer service department for special coil requirements.

Gas Type [GT] Model Digit 9

Sterling Indoor Make-Up Air Heating systems are available from the factory equipped for Natural or LP gas. Natural gas units are equipped for altitudes up to 2,000 feet (610m.) above sea level. Please state altitude if above 2,000 feet (610m.) when placing your order for proper factory settings.

Gas Type [GT]

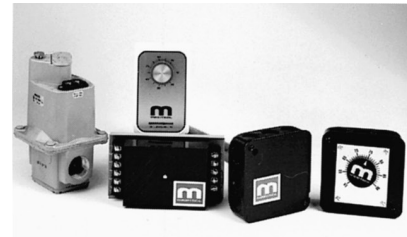
- 1 - Natural Gas with Standard Solid State Ignition Control
- 2 - Propane (LP) Gas with 100% Shutoff Solid State Ignition Control
- 3 - Natural Gas with 100% Shutoff Solid State Ignition Control

Gas Control [GC] Model Digit 10

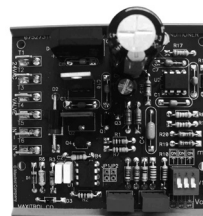
In order to meet your most demanding applications from Single Zone Single Stage to Multi Zone Multi Stage to Direct Digital Control (DDC) with turn down ratios as high as 6:1 and modulated output, Sterling offers the following factory installed gas controls. Providing the high quality and performance you've come to rely on with Sterling HVAC Products.

Gas Control [GC]

- A - One Stage Gas** Provides On/Off gas control in response to a room or duct thermostat.
- B - Two Stage Gas** Provides two stages of gas control Low 50% and High 100% rates of fire in response to a room or duct thermostat.
- H - Electronic Modulation with Room Sensing** Modulates from 100% to 50% of the units rated input in response to the setpoint setting of an electronic room sensor. Electronic Modulation is capable of maintaining discharge temperature within +/- 1 °F; 60-85 °F range.



GC - K



GC - L, M, N, P



GC - R, S, T



GC - U, W, X, Y

Gas Control [GC] *continued*

J - Electronic Modulation with Duct Sensing Modulates from 100% to 50% of the units rated input in response to the setting of a remote setpoint and an electronic duct sensor. Electronic Modulation is capable of maintaining discharge air temperature within +/- 1 °F; 55-90 °F.

K - Electronic Modulation with Duct Sensing and Override Stat Same as “J” with the addition of a room override stat. The room override stat signals the electronic controller in the event that room temperature has dropped below its setpoint. In response the electronic control increases the rate of modulated input to the unit in proportion to the difference between sensed room temperature and the setpoint.

L - Electronic Modulation with External 4-20 mA input, furnace one only Setup for the first furnace in multi furnace units with any additional furnaces being single stage. This Gas Control requires a Direct Digital Controller (DDC) or other external signal source. Modulates from 100% to 50% of the first furnaces rated input in response to an analog input of 4-20 mA from an external controller. Additional furnace sections of the unit are actuated by digital outputs from the external controller based upon the control program.

M - Electronic Modulation with External 4-20 mA input, all furnaces This Gas Control requires a Direct Digital Controller (DDC) or other external signal source. Modulates from 100% to 50% of the units rated input in response to an analog input of 4-20 mA from an external controller.

N - Electronic Modulation with External 0-10 VDC input, furnace one only Same as “L” except a 0-10 VDC input signal is required.

P - Electronic Modulation with External 0-10 VDC input, all furnaces Same as “M” except a 0-10 VDC input signal is required.

R - Remote Temperature Control, Two Stage Provides two stage control utilizing a T775 temperature controller, electronically sensing room or duct temperature and actuating stages based upon programmed setpoints and temperature differentials between stages.

S - Remote Temperature Control, Three Stage Same as “R” except with three stage control.

T - Remote Temperature Control, Four Stage Same as “R” except with four stage control.

U - S350 Modular Electronic Control System, Two Stage Basic system utilizes a controller module with discharge air sensor, setpoint and one stage output, a stage module with differential set point and one stage output and a display module with LCD display for temperature readout. The system stages the units rate of fire based upon sensed discharge air temperature, setpoint setting and differential setting between stages; -30 to 130 °F range.

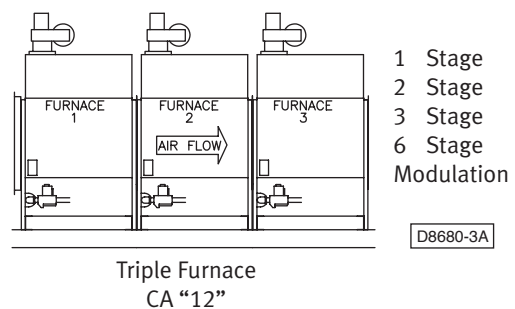
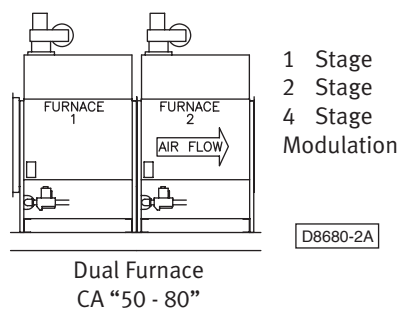
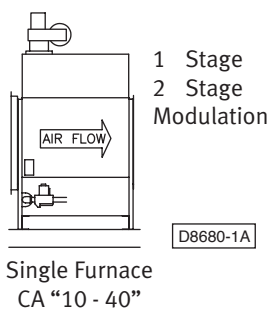
Note: When utilizing outside and return air with modulating damper refer to Air Control [AC] item “R” for the S350 proportional air control.

W - S350 Modular Electronic Control System, Three Stage Same as “U” with the addition of a stage module.

X - S350 Modular Electronic Control System, Four Stage Same as “U” with the addition of two stage modules.

Y - S350 Modular Electronic Control System, Six Stage Same as “U” with the addition of four stage modules.

Gas Control Reference



Supply Voltage [SV]

Model Digit 11

The standard Supply Voltages for Sterling Indoor Make-Up Air Units Products are listed below.

- 1 - 115 VAC, Single Phase, 60 Cycle
- 2 - 208 VAC, Single Phase, 60 Cycle
- 3 - 230 VAC, Single Phase, 60 Cycle

- 4 - 208 VAC, Three Phase, 60 Cycle
- 5 - 230 VAC, Three Phase, 60 Cycle
- 6 - 460 VAC, Three Phase, 60 Cycle
- 7 - 575 VAC, Three Phase, 60 Cycle

Motor Type [MT]

Model Digit 12

Blower Motors are available in Open Drip Proof, Totally Enclosed, Premium Efficiency Open Drip Proof and Premium Efficiency Totally Enclosed. Motors are ball bearing type with a resilient base and NEMA frame sizes from 48 to 256T. Windings are Class "B", 1800 RPM with service factors of 1/2-3/4 HP = 1.25 and 1-15 HP = 1.15. Motors are in compliance with the Energy Policy Act (EPACT) of 1992 and any of its latest editions.

- 1 - Open Drip Proof Motor (ODP)
- 2 - Totally Enclosed (TEFC)
- 3 - Premium Efficiency Open Drip Proof (PEODP)
- 4 - Premium Efficiency Totally Enclosed (PETE)

Motor Size [MS]

Model Digit 13

Motors are available from 1/2 to 15 HP Thermal Protection is automatic for most motors up to 5 HP, a Magnetic Starter with IEC (International Electrotechnical Commission) type over current protection must be used for motors without automatic thermal protection and motors above 5 HP

- A - 1/2 HP with Contactor
- B - 3/4 HP with Contactor
- C - 1 HP with Contactor
- D - 1 1/2 HP with Contactor
- E - 2 HP with Contactor
- G - 3 HP with Contactor
- H - 5 HP with Contactor
- J - 1/2 HP with Magnetic Starter and IEC over current protection

- K - 3/4 HP with Magnetic Starter and IEC over current protection
- L - 1 HP with Magnetic Starter and IEC over current protection
- M - 1 1/2 HP with Magnetic Starter and IEC over current protection
- N - 2 HP with Magnetic Starter and IEC over current protection
- P - 3 HP with Magnetic Starter and IEC over current protection
- R - 5 HP with Magnetic Starter and IEC over current protection
- S - 7 1/2 HP with Magnetic Starter and IEC over current protection
- T - 10 HP with Magnetic Starter and IEC over current protection
- U - 15 HP with Magnetic Starter and IEC over current protection

- 1 - 1 HP with Variable Frequency Drive
- 2 - 1 1/2 HP with Variable Frequency Drive
- 3 - 2 HP with Variable Frequency Drive
- 4 - 3 HP with Variable Frequency Drive
- 5 - 5 HP with Variable Frequency Drive
- 6 - 7 1/2 HP with Variable Frequency Drive
- 7 - 10 HP with Variable Frequency Drive
- 8 - 15 HP with Variable Frequency Drive

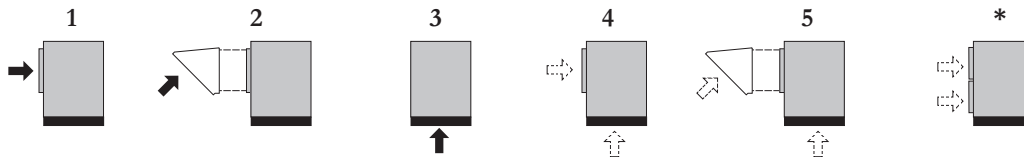
Note: Refer to Table 23, page 72 for Full Load Ampacity ratings for motors.

Air Inlet Configuration [AI]

Model Digit 14

The Air Inlet Configuration [AI] defines the entering air openings for Sterling Indoor Make-Up Air Units. This item does not include dampers and must match the required opening for Air Control and Damper Arrangement [AC]. A horizontal return air feature is offered on air inlet configurations 4 and 5 (includes moisture eliminators as standard when [AI] 5 is chosen). Refer to accessory [AS] No. A2. See Accessories [AS] A2 Horizontal Outside and Return Air Openings.*

- 1 - 100% Outside Air Opening (Horizontal Inlet) or 100% Return Air Opening.
- 2 - 100% Outside Air Opening with Intake Hood. (Horizontal Inlet) (Shipped separately)
- 3 - Bottom Return Air Opening.
- 4 - Outside and Return Air Opening.
- 5 - Outside and Return Air Opening with Intake Hood. (Shipped separately)
- * - Horizontal Outside and Return Openings. (See Accessories [AS] Model digit #16 [A2])



Air Control and Damper Arrangement [AC]

Model Digit 15

- A - Outside air damper with 2 Position spring return damper motor** Outside air damper opens upon energizing the unit blower motor.
- B - Return air damper with 2 Position spring return damper motor** Return air damper opens upon energizing the unit blower motor.
- C - Outside and Return air interlocked dampers with 2 Position spring return damper motor** Outside air damper opens and return air damper closes upon energizing the unit blower motor.
- E - Outside and Return air interlocked dampers with Modulating spring return damper motor, Mixed air temperature control and minimum position potentiometer** Outside and return air dampers modulate in response to the mixed air temperature setpoint and allow minimum outside air setting. When de-energized outside air dampers close and return air dampers open.
- H - Outside and Return air interlocked dampers with Modulating spring return damper motor and Mixed air temperature control** Outside and return air dampers modulate in response to the mixed air temperature setpoint. When de-energized outside air dampers close and return air dampers open.
- K - Outside and Return air interlocked dampers with Modulating spring return damper motor and positioning potentiometer** Outside and return air dampers open and close with respect to the setting of the positioning potentiometer. When de-energized outside air dampers close and return air dampers open.
- M - Outside and Return air interlocked dampers with Modulating spring return damper motor. Mixed air temperature control, minimum position potentiometer and Dry Bulb Economizer** Outside and return air dampers modulate in response to the mixed air temperature setpoint and allow minimum outside air setting. Dampers respond to the economizer when the outside air temperature is within the set point range by opening the outside and closing the return air damper to achieve free cooling effect. When de-energized outside air dampers close and return air dampers open.

Air Control and Damper Arrangement [AC] *continued*

- N - Outside and Return air interlocked dampers with Modulating spring return damper motor and Enthalpy Controlled Economizer** Outside and return air dampers modulate in response to the heat content of sensed mixed air. The air mixture is optimized to provide inlet air with the lowest possible load characteristics in both heating and cooling modes. When de-energized outside air dampers close and return air dampers open.
- P - Outside and Return air interlocked dampers with Modulating damper motor and Atmospheric Pressure sensor** Outside and return air dampers modulate in response to sensed building pressure, typically maintaining a slightly positive building pressure in order to reduce heat loss due to infiltration.
- Q - Outside and Return air interlocked dampers with Modulating damper motor and CO₂ (Carbon Dioxide) Monitor** Outside and return air dampers modulate in response to the CO₂ monitor set point. Monitor is located in the return air stream. On a rise in CO₂ level, the outside damper modulates open and the return air damper closes. A decrease in CO₂ level modulates the outside air damper closed and opens the return air damper. When the unit is de-energized, the damper motor will close the outside air damper and open the return air damper. Equipped with one normally open contact for alarm light or bell to guard against times of sustained high CO₂ levels. CO₂ monitor is shipped loose for field installation.
- R - Outside and Return air interlocked dampers with Modulating spring return damper motor and S350 Proportional Mixed air control** Outside and return air dampers modulate in response to the mixed air temperature setpoint, and allow minimum outside air setting. When de-energized outside air dampers close and return air dampers open.
- T - Outside and Return air interlocked dampers with Modulating spring return damper motor and 0-10VDC or 4-20mA input** Requires an external input signal from a Direct Digital Controller (DDC). Provides proportional control from a building management system or electronic controller based on programmed parameters. When de-energized outside air dampers close and return air dampers open.
- U - ASHRAE Cycle I** Outside and Return dampers with 2 Position spring return damper motor and warm-up thermostat. When energized dampers open in response to the warm-up thermostat preventing cold air starts.
- W - ASHRAE Cycle II** Outside and Return air interlocked dampers with Modulating spring return damper motor. Mixed air temperature control, minimum position potentiometer and warm-up thermostat. Outside and return air dampers modulate in response to the mixed air temperature setpoint and allow minimum outside air setting once the warm-up thermostat has been satisfied. When de-energized outside air dampers close and return air dampers open.
- X - ASHRAE Cycle III** Outside and Return air interlocked dampers with Modulating spring return damper motor. Mixed air temperature control and warm-up thermostat. Outside and return air dampers modulate in response to the mixed air temperature setpoint once the warm-up thermostat has been satisfied. When de-energized outside air dampers close and return air dampers open.
- Y - Manual Outside and return air dampers** Dampers are locked into position utilizing a manual quadrant for field adjustment.

Accessories [AS]

Model Digit 16/+

Mechanical Accessories

A1- Moisture Eliminators Use in place of the bird screen with an Outside Air Hood. This metal wire filter is designed to collect water droplets/mists and drain them to the bottom of the filter. This item includes an electrically interlocked differential pressure switch with indicator lamp in case of blockage. Standard on units with optional horizontal return (Accessories option A2).

A2- Horizontal Return Locates the return air opening under the outside air opening location. For units with both Outside and Return Air Openings [AI] Model Digit #14 (4) or (5). Includes moisture eliminators as standard when [AI] 5 is chosen.

A3- Low Leak Damper This item includes vinyl blade edge seals with a standard opposed blade galvanized steel damper and neoprene nylon bushings. For outside side air inlet only.

A5- 409 Stainless Steel Drip Pan Replaces the standard aluminized steel furnace drip pan (MU and ME only).

A6- High Altitude Unit Unit is orificed for altitudes above 2000 feet (610m).* Two stage units include a factory installed delay timer, allowing the unit to initially fire at 100% for 10 sec. then drop back to low fire and respond to thermostat demand.

***Note:** Specify altitude when over 2000 feet (610m).

A7- High Pressure Regulator Required where main line pressure exceeds 14 inch WC (1/2 psig). Regulator to reduce gas pressure to acceptable range. One regulator per furnace required, shipped separately. When placing order, choose regulator based on main line gas pressure.

A8- Input Derate** Unit is derated up to 50% for specific design applications.

**** Note:** Specify altitude when over 2000 feet (610m). Unit performance must be adjusted for percentage of de-rate.

Filters

B1- 1 inch Washable Filters (Standard)

B2- 2 inch Washable Filters

B3- 2 inch Throwaway Filters

B4- 1 inch High Efficiency 30% Filters
(MERV 8)

B5- 2 inch High Efficiency 30% Filters
(MERV 8)

Capacity [CA]	10,15	20, 25, 50	30, 35, 60, 70	40, 80,12
Indoor Arrangement [IA] B, D (Qty.)Filter Size	(4)16 x 20	(4)20 x 20	(4)16 x 20 (2)20 x 20	(6)20 x 20
Indoor Arrangement [IA] G, K (Qty.)Filter Size	(8)16 x 20	(8)20 x 20	(8)16 x 20 (4)20 x 20	(12)20 x 20

Evaporative Cooler Accessories

C1- Fill & Drain Kit Includes 3 way valve and relay for automatic fill and drain for Evaporative Cooling units. Field installed.

C2- 12 inch CELdek® Media Optional high efficiency 12 inch media replaces standard 8 inch media.

C3- Freezestat Automatic shutoff and drain upon meeting outside air setpoint when used with "Fill and Drain kit".

C4 - 8 inch GLASdek® Optional 8 inch GLASdek® evaporative cooler media is available in lieu of the standard 8 inch Celdek®. GLASdek® media is manufactured from a wettable fiberglass and is designed for applications requiring UL900 Class II fire rating.

C5 - 12 inch Glasdek® Optional 12 inch GLASdek® evaporative cooler media is available in lieu of the standard 8 inch Celdek®. GLASdek® media is manufactured from a wettable fiberglass and is designed for applications requiring UL900 Class II fire rating.

Time Clocks

D1- 7 Day Time Clock Provides single pole double throw (SPDT) relay output at setpoint time with maximum 6 setpoints per day, field installed.

D2- 24 Hour Time Clock Provides single pole double throw (SPDT) relay output at setting time with maximum 12 setpoints per day, field installed.

Accessories [AS] *continued*

Electrical Accessories

- E1- Clogged Filter Switch** Factory installed differential pressure switch with clogged filter indicator lamp located in the main electrical cabinet.
- E2- Ground Fault Convenience Outlet 115VAC** G.F.I. outlet with manual reset in a weatherproof enclosure, field installed.
- E3- Remote Control Panel** Wall mounted and distinctively styled the “Sterling Remote Panel” offers six LED status lamps with System On/Off, Fan Auto/On, Heat Auto/Off, Cool Auto/Off, Auxiliary On/Off switching and Modulating damper potentiometer mounting. Designed for E-Z Installation with plug-in terminal block wiring and wall mounting bracket. Field installed. (Auxiliary On/OFF may be used with Evaporative Cooler Fill & Drain Kit or exhaust fan)
[6-1/4" W X 3-3/4" H X 1-3/8" D]
- E4- Manual Blower Switch** Factory installed in the electrical cabinet to provide manual blower operation (On/Off).

Duct and Room Thermostats

- F1- One Stage Duct Thermostat** Field installed, single pole double throw switching. 55°-175 °F. setpoint range.
[2" W x 5-5/8" H x 2- 7/16" D]
- F2- Two Stage Duct Thermostat** Field installed, single pole double throw switching; 55°-175 °F. setpoint range.
[2" W x 5-5/8" H x 2- 7/16" D]
- G1- T87K Thermostat with Subbase** Single stage heating thermostat. Subbase includes fan switching relay. Standard round styling suitable for any decor; 40°- 90 °F. range. Mercury free.
- G2- T87K Thermostat with Subbase & Guard** Same features as “G1” except a tamper proof guard is included.
- G3- T834N Sterling Thermostat with Subbase** Single stage heating thermostat with fan switch. Manufactured exclusively for Sterling with the “Sterling” logo embossed on the face plate; 50°- 90 °F. range.
[2-3/8" W x 4-3/4" H x 1-1/2" D] Mercury free.

- G4- TH8320R Programmable Commercial Touchscreen Thermostat** Provides 7 day programmability for 2 stages of heating and two stages of cooling. Includes a terminal to enable an economizer or control a lighting panel when used as a time of day relay. Temperature ranges: heating 40°- 90 °F, cooling 50°- 99 °F.
[4-5/8" W x 4-15/16" H x 1-1/8" D] Mercury free.
- G5- TH5220D Two Stage Thermostat** Two stage heating and 2 stage cooling with system and fan switching and built in 10°F heating / cooling differential. Includes fan relay. Temperature range: heating 40°- 90 °F, cooling 50°- 99 °F.
[5-13/16" W x 3-9/16" H x 1-1/2" D] Mercury free.
- G6 - TG511 Locking Thermostat Cover** Universal locking thermostat cover for use with all thermostats listed.



AS - D2



AS - E3



AS - G3



AS - G4



AS - G5



AS - J2 AS - J3

Accessories [AS] *continued*

Freeze and Fire Protection

H1- Return Firestat 130°- 270 °F setting range with single pole double throw (SPDT) output. The Return Firestat is electrically interlocked to shut down the unit upon reaching the setpoint with manual reset. Factory mounted in the return air stream and set at 130 °F. This item is utilized as a reverse air flow switch and included as standard with Sterling Packaged Indoor units. Order with Indoor Arrangement [IA] "A" when applicable.

H2- Supply Firestat 130°- 270 °F setting range with single pole double throw (SPDT) output. The Supply Firestat is electrically interlocked to shut down the unit upon reaching the setpoint with manual reset. Factory mounted in the supply air stream.

H3 - Time Delay Freezestat 30°- 75 °F setting range in 5 °F increments with single pole double throw (SPDT) output. Time delay adjustment range – 1 minute to 10 minutes in 1 minute increments. Manual reset by turning unit disconnect off then on. The freezestat is electrically interlocked to ensure minimum discharge air temperature. Factory mounted in the electrical compartment. Sensing bulb will be factory mounted in the supply air stream on units with a downturn plenum. Units with standard horizontal discharge will need to have the sensing bulb field installed in the supply duct work.

H4 - Ambient Lockout Factory mounted. Disengages duct furnace(s) from firing in times of mild ambient temperatures. Control range 0°- 100 °F fixed 1 °F differential.

H6 - Ambient Lockout – Dual Furnace Factory mounted. Prevents firing of second furnace when first furnace is able to satisfy complete load as well as prevents firing of heating system at field selectable high ambient temperatures. Control range 0°- 100 °F fixed 1 °F differential.

H7 - Ambient Lockout – Triple Furnace Factory mounted. Prevents firing of second furnace when first furnace is able to satisfy complete load, prevents firing of third furnace when first and second furnaces are able to satisfy complete load as well as prevents firing of heating system at field selectable high ambient temperatures. Control range 0°- 100 °F fixed 1 °F differential.

Interlock Relays

J1- 24 Volt DPDT Relay Plug-in, Type 2, Form C relay with 24 volt coil and double pole double throw 10 amp. contacts. This relay plugs into the Main Connection PC board in the electrical cabinet. Included with Packaged units utilizing an evaporative cooler (Indoor Arrangements [IA] "D") or may be utilized as an exhaust fan interlock. When energized at terminal "K2" of the main connection board, the blower is engaged and outside air dampers are opened to 100% position. Factory installed.

J2- 24/115 Volt SPDT Relay This relay has selectable coil voltage of 24 or 115 volts and single pole double throw 10 amp contacts with LED On indicator lamp. Relay is utilized as an auxiliary relay when "J1" does not apply for exhaust fan interlock or digital interface with an external control. Factory mounted and wired when applicable.

J3- 24/115/230 Volt DPDT Relay This relay has selectable coil voltage of 24, 115 or 230 volts and double pole double throw 10 amp contacts. Relay is utilized as an auxiliary relay for general purpose duty. Factory mounted and wired when applicable.

J4- 24 Volt 4PDT Relay This relay has a coil voltage of 24 volts and four pole double throw 10 amp contacts. Relay is utilized as standard for packaged units that include an Evaporative Cooler or Coil Cabinet and may be utilized as an auxiliary relay for general purpose duty. Factory mounted and wired when applicable.

Note: Relays "J2", "J3" and "J4" are shipped loose unless otherwise specified.

Limits and Indicator Lamps

K1- Manual Reset High Limit Switch This field installed, non-cycling type limit opens on temperature rise at 200 °F and disengages heating.

K2- High / Low Gas Pressure Limits High / Low gas pressure limits disengage heating upon detecting either low line pressure or high manifold pressure. Factory Installed.

K3- Status Lamps Long life factory installed LED lamps located in the electrical cabinet. The status lamps are designed as a troubleshooting aid and setup for indicating Power On, Fan On, Heating energized at furnace one, two, three and cooling energized when applicable.

Note: Blocked inlet and Clogged filter indicator lamps are standard with "A1" and "E1".

K4- Fan Time Delay The solid state fan time delay is standard with all packaged rooftop arrangements except Indoor Arrangement [IA] "A" duct furnace (50-12), only. The fan time delay provides a 60 second delay on and 120 second delay off, for blower operation.

K5- Air Flow Prove Switch Factory installed. A Dwyer 1910-0 pressure switch suitable for duct or plenum mounting, with a range of 0.15 - 0.5 " WC is provided. Field adjusted to appropriate setpoint.

Accessories [AS] *continued*

Disconnect Switches (NEMA-3R)

- L1- 30 Amp. Fused Disconnect** Field installed.
- L2- 30 Amp. Non Fused Disconnect** Field installed.
- L3- 60 Amp. Fused Disconnect** Field installed.
- L4- 60 Amp. Non Fused Disconnect** Field installed.

Venting and Convenience Accessories

- M2- Vent Caps** 4, 5 or 6 inch outdoor vent caps for flue termination. Field Installed.
- M3- Adapters (4-5 in.)** Required on “ME” and “MS” units Capacities [CA] 10 and 15. Reduces 5 inch power venter discharge to recommended 4 inch vent pipe. Field installed.
- M4- Vertical Concentric Vent Kit (MS units only)** Allows for single pipe vent penetration for both the combustion and exhaust air in a vertical position (rooftop).
- M5- Horizontal Concentric Vent Kit (MS units only)** Allows for single pipe vent pipe penetration for both the combustion and exhaust air in a horizontal position (sidewall).
- M5- Service Convenience Package** Includes a factory mounted switch type fused disconnect and GFI convenience outlet mounted behind a hinged access door on the units' blower section. Both items are accessible from the outside of the unit via a weather proof hinged access door.
- M6- Double Wall Cabinet Construction** Consists of a 24-gauge inner liner wall with 1 inch 1-1/2 lb. density insulation. Available on the filter / damper, blower, coil and plenum cabinets only.

VFD Options

- R1- Field Installed VFD** Replaces the Magnetic Starter and provides soft start operation, prolonging the life of blowers and bearings as well as reducing start up noise. All VFD's are UL approved and are manufactured with a NEMA 1 plenum rated enclosure. “R1” field installed VFD is standard for Motor Size [MS] selections 1-8. For a factory installed option, see “R2”.
- R2- Factory Installed VFD** UL approved with a NEMA 1 plenum rated enclosure, is mounted in the unit blower cabinet with a remote programming keypad located in the electrical cabinet.
- R3- Remote Keypad** Allows operation of drive up to 100 feet (30 Meters) from the drive and duplicates the functionality of the drive's local keypad. Shipped loose for field installation.
- R4- CO₂ Sensor 100% Outside Air** Factory supplied, field installed CO₂ monitor range 0 to 2,000 ppm, adjustable, for mounting in occupied space. Upon rise in CO₂ above field programmed setpoint, 0-10VDC or 4-20 mA signal will be sent from CO₂ sensor to VFD to modulate air flow between minimum setpoint and maximum CFM.

R5- CO₂ Mixed Air Factory supplied, field installed CO₂ monitor range 0 to 2,000 ppm, adjustable, for mounting in return air duct. Upon rise in CO₂ above field programmed setpoint, signal will drive return air damper to 100% closed and outside air damper to 100% open. 0-10VDC or 4-20 mA signal will be sent from CO₂ sensor to VFD to modulate air flow between minimum setpoint and maximum CFM.

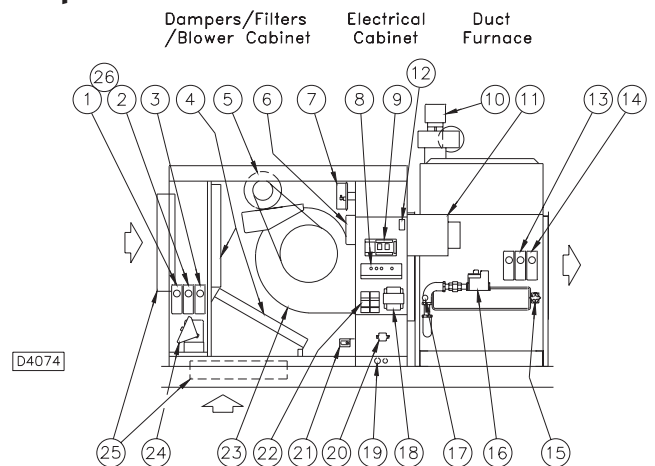
R6- Pressure Sensor Factory supplied, field installed pressure control, range -0.1 to +0.1" WC VFD will modulate motor speed based on 4-20 mA signal from pressure control sensor mounted in space to maintain field programmed setpoint.

R7- 2-Speed VFD Relays Factory installed relays provided to energize second speed setting. Relay coil will accept 24V, 115V and 230V.

R8- 3-Speed VFD Relays Factory installed relays provided to energize second and third speed settings. Relay coil will accept 24V, 115V and 230V.

R9- VFD Enclosure A factory installed NEMA-3R enclosure will be provided to protect the VFD in outdoor applications. Enclosure includes a small electric heater and vent fan to protect the VFD in ambient temperatures of -30 – 115°F (-34 – 46°C). Note: Enclosure only available when factory installed VFD is selected and an airflow prove switch is required.

Component Locations



[ME Unit Shown]

- | | |
|--|---------------------------------|
| 1. Mixed Air Controller | 12. Time Delay Freezestat |
| 2. Return Firestat | 13. Supply Firestat |
| 3. Economizer | 14. Duct Thermostat |
| 4. Filters | 15. Primary Safety Limit |
| 5. Blower Motor | 16. Gas Valve |
| 6. Reverse Air Flow Switch | 17. High Limit Safety Switch |
| 7. Clogged Filter Switch | 18. Transformer |
| 8. High Voltage Barrier and Lamp and Circuit Breaker Mount | 19. Electrical Wiring Inlet |
| 9. Main Connection Board with Fan Time Delay and Function Relays | 20. High Voltage Terminal Block |
| 10. Power Venter/Motor Assembly (Includes relay and air pressure switch) | 21. Door Safety Switch |
| 11. Junction Box/Ignitor | 22. Contactor |
| | 23. Centrifugal Blower |
| | 24. Damper Motor |
| | 25. Outside and Return Dampers |
| | 26. Ambient Lockout |

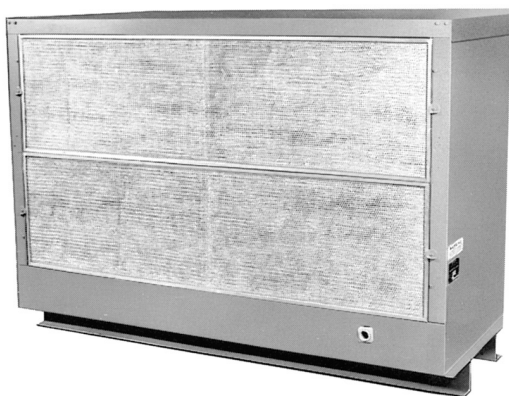
Evaporative Cooling Module

Unit Type [UT] ME or MS

Indoor Arrangement [IA] - (D)

Evaporative Cooling is the simplest and most-cost effective cooling method without the use of mechanical refrigeration. Sterling Evaporative Cooling systems meet a wide range of commercial, industrial, and institutional heating and ventilating requirements. The Evaporative Cooler saves up to 80% on utility charges, requires little maintenance, and replaces exhausted, stale, indoor air with cool, clean, filtered outdoor air.

The quiet, dependable Evaporative Cooler Module is available in four sizes from 800 CFM to 8500 CFM (0.4-4.0 m³/s), to be mated with packaged indoor make-up air units capacities [CA] 10 thru 80. When an Evaporative Cooler is to be installed upstream of our duct furnace section(s), a 409 stainless steel heat exchanger is HIGHLY recommended.



Evaporative Cooler Module



Internal View Evaporative Cooler

STANDARD FEATURES

- **High Cooling Efficiency** - Up to 88% saturation efficiency with standard 8" depth of CELdek® media, and up to 92% saturation efficiency with optional 12 inch depth media; 2 inch distribution pad to disperse water evenly. CELdek® media is impregnated with insoluble anti-rot salts and rigidifying saturants. The unique design of the CELdek® pads optimizes air and water mixing for maximum cooling.
- **Optional 8" or 12" GLASdek® Media** is also available. See Accessories [AS] Options C4 and C5.
- **Recirculating Pump** - Factory wired, sealed design, durable, thermally protected motor. Permanently lubricated bearings. Standard 115 Volt, 50/60 cycle. Optional 230V motor. Protective basket screen. UL recognized.
- **Heavy-Duty Stainless Steel Water Tank** - Stainless steel sump tank and water distributor designed to resist rust, corrosion, and scaling.
- **Ball Valve** - Single-entry ball valve regulates water flow using a 1/4 turn handle.
- **Bleed-Off** - Prevents excessive concentration of minerals in sump water.
- **Float Valve** - Brass float valve and rod with plastic float. Maintains proper water level in sump for most efficient operation. Factory installed in cabinet.
- **Drain and Overflow** - Drain is capped. Overflow controlled by float level allowing slight continued overflow. Optional automatic fill and drain kit is available for field installation.
- **Water Distribution** - Copper water distributor tube for corrosion-free operation and low maintenance.
- **Intake Filters** - Removable intake filters of easy-to-clean 1 inch aluminum mesh to remove insects, dust, and dirt from airflow.
- **Skid Rails** - With lifting and anchor holes. Optional platform curb assembly available, shipped separately (see Roof Curb Section)
- **Available** on capacities 10 thru 80 MBH for 800 CFM to 8500 CFM (0.4 m³/s to 4.0 m³/s), utilizing only 4 different cabinet widths.

Evaporative Cooling Module

Performance

Evaporative Cooling is most commonly used in areas where the relative humidity is low and the dry bulb temperatures are high. However, cooling through evaporation can be used in most areas.

Evaporative cooling is best utilized whenever the wet bulb depression (difference between dry and wet bulb temperature) is a minimum of 15°.

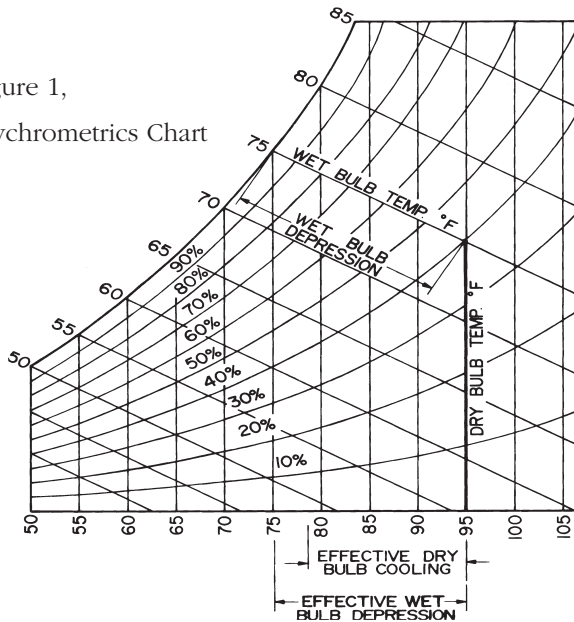
The efficiency of the Sterling Evaporative Cooler is determined by a variety of factors: geographical location, application, air change requirements, sufficient water supply, air flow, and maintenance. In most instances, efficiency is expected to be between 77% and 88%. Heat gains in the distribution system will effect the final output temperature.

Use the psychrometrics chart (shown in Figure 1) or actual humidity temperature readings to estimate the leaving dry bulb temperature at the outlet of the Evaporative Cooler.

Example:

1. Entering Dry Bulb: 95 °F
2. Entering Wet Bulb: 75 °F
3. Wet Bulb Depression (95 °F - 75 °F) = 20 °F
4. Effective Wet Bulb Depression (20 °F x .85) = 17 °F
5. Leaving Dry Bulb Temperature (95 °F - 17 °F) = 78 °F
6. Leaving Wet Bulb = Entering Wet Bulb = 75 °F

Figure 1,
Psychrometrics Chart



Selection Method

The easiest method for selecting an evaporative cooler, is to first determine the required number of air changes per minute.

- Using Figure 2, choose the geographical zone in which the unit is to be installed.
- Determine the internal load within the structure:
 - Normal Load:** structures with normal people loads, and without high internal heat gains.

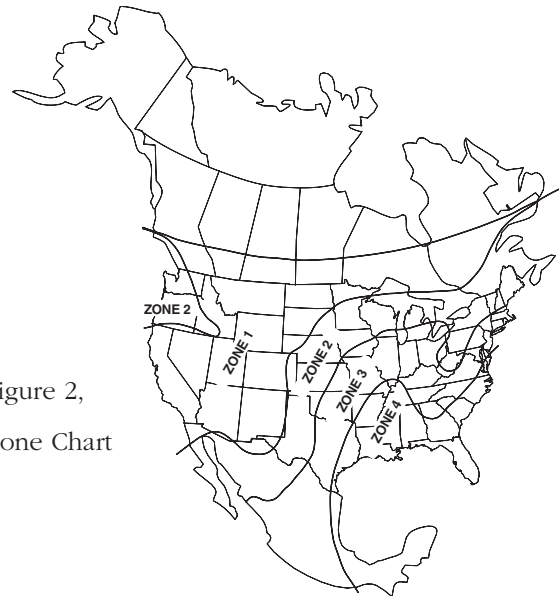


Figure 2,
Zone Chart

High Load: Structures with high equipment loads (i.e. factories, laundromats, beauty salons, restaurant kitchens, etc.), and structures with high occupancy (nightclubs, arenas, etc.)

- Determine whether the structure has normal or high heat gains:

Normal Gain: Structures that have insulated roofs, or are in shaded areas. Structures that have two or more stories, or facing directions with no sun.

High Gain: Structures that have uninsulated roofs, unshaded areas, or rooms that are exposed to sun.

- Using table below, determine the required air changes per minute based on zone selection and the type of heat load.
- Finally, determine the air quantity for the space chosen, by calculating the volume (L x W x H). Multiply this volume by the air changes per minute.

Example:

1. Structure Dimensions: 25 L x 24 W x 10 H = 6000 Ft³
2. Exterior Load Type: Normal
3. Interior Load Type: Normal
4. Location: Dallas, Texas- Zone 3
5. Air Changes Per Minute: 3/4
6. Evaporative Cooler Requirements:
 - 6000 ft³ x 3/4 Air Change / minute- 4500 CFM Required
 - See Evaporative Cooler Performance Chart for unit size that would best apply.

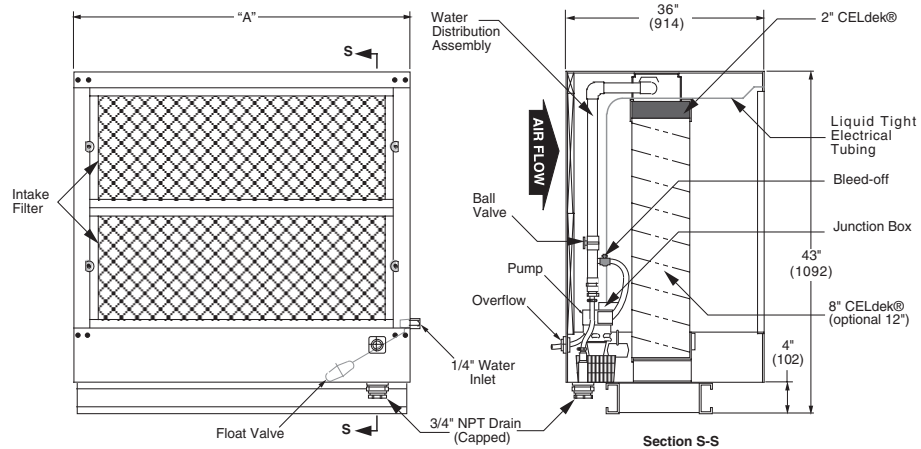
Air Changes Per Minute Table				
Type Heat Load	Zone			
	1	2	3	4
High Load/ High Gain	3/4	1	1-1/3	2
High Load/Normal Gain	1/2	3/4	1	1-1/3
Normal Load/High Gain	1/2	3/4	1	1-1/3
Normal Load/Normal Gain	1/2	1/2	3/4	1

Evaporative Cooling Module

Capacity	A
10/15	32- 7/8 (835)
20/25/50	43- 7/8 (1114)
30/35 60/70	54- 7/8 (1394)
40/80/12	60-3/8 (1534)

NOTES:
Dimensions are in inches
(Dimensions in parenthesis are in millimeters)

D3673A



Refer to pages 35 (ME) or 42 (MS) for additional unit dimensions for arrangement "D".

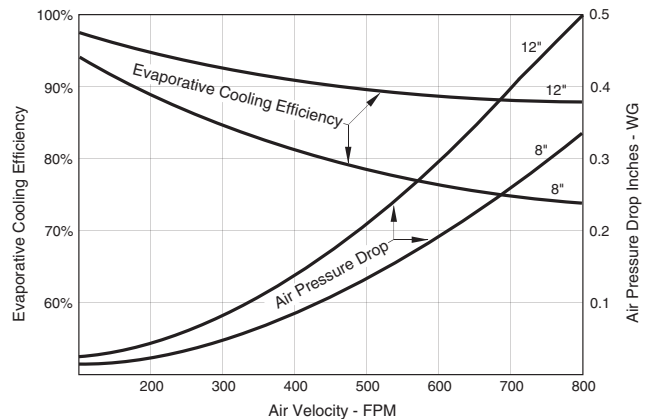
Performance and Dimensional Data

Capacity 10-80	CFM		8" Saturation Efficiency Range		12" Saturation Efficiency Range		8" or 12" Media Face Area		Pressure Drop		"A" Unit Width	Shipping Wt.*	Operating Wt.*
	(cu. m/s) MIN.	(cu. m/s) MAX.	MIN.	MAX.	MIN.	MAX.	Ft. ² (m ²)	Inch (mm)	inch WC (kPa)	(kPa)			
10,15	800	4,500	78	88	89	92	7.01	31 X 32-9/16	0.03	0.23	32-3/4	137	301
	(0.378)	(2.124)											
20,25,50	1,600	5,500	77	88	88	92	9.38	31 X 43-9/16	0.03	0.20	43-3/4	166	386
	(0.755)	(2.596)											
30,35,60,70	2,400	8,500	77	86	88	92	11.75	31 X 54-9/16	0.05	0.30	54-3/4	192	468
	(1.133)	(4.012)											
40,80	3,200	8,500	77	86	87	92	12.92	31 X 60	0.07	0.28	60-1/4	206	509
	(1.510)	(4.012)											

*These weights are for the Evaporative Module only; see Table 21, page 70 for Arrangement "D" Total Unit Weights.

CELdek® EVAPORATIVE MEDIA

The Sterling Evaporative Cooler utilizes high efficiency CELdek® media. CELdek® is made from a special cellulose paper, impregnated with insoluble anti-rot salts and rigidifying saturants. The cross fluted design of the pads induces highly-turbulent mixing of air and water for optimum heat and moisture transfer. Sterling Evaporative coolers utilize 8 inch CELdek® as standard equipment. Optional 12 inch CELdek®, 8 inch and 12 inch GLASdek® are also available. A 2 inch distribution pad is used to disperse water evenly over the media.



EVAPORATIVE COOLER EFFICIENCY/A.P.D. CHART

Indoor Make-Up Air Handler Products Specification Guide

A. General

A.1 Standards & Certifications

All units must be:

- A.1.a** ETL Certified duct furnace(s) which conform to the latest ANSI standards for efficiency and safe performance.
- A.1.b** Electrical safety is in compliance with UL 1995 safety standard for heating, ventilating and cooling equipment.

A.2 Fuel Types

Indoor unit will be suitable for operation with:

- (a) Natural Gas.
- (b) LP (propane) Gas.

A.3 Mechanical Arrangement

Indoor unit will consist of a:

A.3.a Furnace section consisting of a:

- (a) Single Furnace (100-400 MBh units)
- (b) Dual Furnace (500-800 MBh units)
- (c) Triple Furnace (1200 MBh units)

The firing rate of each furnace will not exceed 400 MBh and will contain its own Heat Exchanger, Flue Collector, Venting, Burners, Safety and Ignition Controls.

A.3.b Blower Section containing supply blower(s) and blower motor. The blower motor will be interlocked electrically and disengage the blower motor and control circuit upon opening the service panel.

A.3.c Electrical Cabinet that is isolated from the air stream with a non removable access panel interior to the outer service panel. Provision for component mounting, wire routing and high voltage isolation.

A.3.d Indoor unit will be provided with:

- (a) Outside air and Return air opposed blade dampers.
- (b) Outside air opposed blade dampers.
- (c) Return air opposed blade dampers.
- (d) No dampers.

A.3.e Filter Section will accommodate 1 inch or 2 inch washable, or pleated high-efficiency filters; or 2 inch throwaway and be of a V-bank design for minimal pressure drop.

A.3.g Return air will enter through a bottom return air opening.

A.3.g.1 (opt.) For units with both outside and return air, return air opening will be located horizontally on the rear of the unit under the outside air inlet.

A.3.h A Cooling Coil Section constructed of 20-gauge galvanized steel may be provided with the unit.

A.3.h.1 Direct Expansion (DX) Evaporator Coil certified by ARI may be provided.

A.3.h.2 Chilled Water Coil certified by ARI will be provided.

A.3.i An Evaporative Cooler with 8 inch CELdek® media may be provided. The Evap. cooler will be of a self cleaning design with a stainless steel water tank, regulated water flow and overflow protection. The cooler will have a cabinet assembly of heavy-gauge aluminized steel with weatherproof finish, a U.L. recognized thermally protected sealed recirculating pump motor, two inch distribution pad, and corrosion resistant PVC water distribution tubes.

A.3.i.1 (opt.) An automatic Fill and Drain Kit may be provided for field installation.

A.3.i.2 (opt.) High-Efficiency 12 inch deep CELdek® media may be provided.

A.3.i.3 (opt.) UL900 Class II fire rated 8 inch GLASdek® media will be provided.

A.3.i.4 (opt.) UL900 Class II fire rated 12 inch GLASdek® media will be provided.

A.4 Electrical Systems

A.4.a All electrical components and fixtures will carry UL or ETL listing, certification and/or recognition.

A.4.b All wire will be rated to meet or exceed electrical requirements for voltage, ampacity, dielectric strength of sheathing and temperature rating per location.

A.4.c Standard control relays will be socket mounted with terminal block connections.

A.4.d All high voltage wiring is enclosed in flexible metallic sheathed BX cable and include an identifying marker corresponding to the wiring diagram.

A.4.e All control wiring will terminate at terminal strips (single point connection) and include an identifying marker corresponding to the wiring diagram.

A.5 Mounting

Indoor unit will be mounted on metal rails with lifting and anchor holes and be suitable for slab or suspension mounting. **Additional Field Furnished Supports are required for unit arrangement lengths longer than 104 inches that are to be suspended.**

A.6 Standard Safety Provisions

A.6.a Indoor unit is provided with a low voltage circuit breaker rated for 150% of the unit's normal 24 volt operating load.

A.6.b An access interlock switch is installed in the blower compartment and will disengage the blower upon opening the service panel. An override or cheat switch shall be incorporated into the interlock switch for serviceability.

A.6.c Each duct furnace will be provided with a primary limit switch 24V high temperature limit switch and a (redundant) combination gas valve.

A.6.d Indoor units will contain a Reverse Air Flow Interlock Switch. The normally closed switch when activated will cause gas valves to close.

A.6.e A Drafter Prove switch is installed in all power vented units and disengage gas flow if for any reason the drafter has failed to operate.

A.6.f Warning labels will be visible in accessible areas of the installation where unsafe conditions could occur.

A.7 Optional Safety Provisions (opt.)

A.7.a A high pressure interlock switch and shutoff valve will be provided for each furnace section.

A.7.b A low pressure interlock switch and shutoff valve will be provided for each furnace section.

A.7.c A flame fault indicator relay will be provided for each duct furnace with provision for remote indicator connection.

A.7.d Indoor unit will be provided with a Firestat located in the return air stream. If the return air temperature reaches the set point (typically 130 °F) the unit will close all gas valves, return dampers to their normal position and shut down the blower.

A.7.e Indoor unit will be provided with a Firestat located in the supply air stream. If the supply air temperature reaches the set point (typically 150 °F) the unit will close all gas valves, return dampers to their normal position and shut down the blower.

A.7.f Indoor unit will be provided with a Time Delay Freeze-stat with the sensing bulb located in the discharge air stream. Wired as an interlock to prevent cold air discharge.

A.7.g Indoor unit will be provided with a manually reset high limit switch wired in series to the lead furnace high limit. If the set point is reached the gas valve will close and the blower will continue to run until the sensed temperature is below the set point.

A.7.h A Clogged Filter Pressure Switch with adjustable operating range and normally open switch will be installed to sense increased suction pressure by the blower due to filter obstruction. Provision for remote indication will be provided by terminal block connection points.

A.7.i Indoor unit will be provided with an Ambient Lockout Thermostat and wired as an interlock to prevent duct furnace(s) from firing during times of mild ambient temperatures.

B. Burners

B.1 Burners will be die formed with stamped porting and stainless steel port protectors to prevent scale or foreign matter from obstructing the burner ports. Burner construction will consist of: (std.) Corrosion Resistant Aluminized Steel. (opt.) Type 409 Stainless Steel.

B.2 Burners must be individually removable for ease of cleaning and servicing.

B.3 (opt.) Burners will be fitted with orifices suitable for higher elevations.(over 2000 feet).

Indoor Make-Up Air Handler Products Specification Guide

continued

C. Heat Exchanger

The Heat Exchanger construction will consist of:
(std.) 20-gauge aluminized steel tube sections, and 18-gauge aluminized steel headers.
(opt.) 20-gauge 409 stainless steel tube sections, and 20-gauge headers.
(opt.) 20-gauge 321 stainless steel tube sections, and 20-gauge headers.

D. Venting System

D.1 The Flue Collector construction will consist of:
(std.) Corrosion resistant aluminized steel.
(opt.) Type 409 stainless steel.

D.2 Units are power vented.

E. Drip Pan (ME only)

The Positive Drain Drip Pan construction will consist of:
(std.) Corrosion resistant aluminized steel
(opt.) Type 409 stainless steel.

F. Cabinetry

F.1 Cabinetry will be die-formed, 20-gauge galvanized steel and finished in air-dry enamel.

F.2 Hinged Access Doors will be provided by the manufacturer on the blower and filter cabinet doors. Doors will be double wall construction and incorporate dual quick opening tool-less latches. Door stops will be included to prevent against closure while open.

F.3 Filter, Damper and Blower sections and cooling coil section will be insulated with fire resistant, environmentally safe, odorless, one-inch fiber material.

G. Dampers

Dampers will be of the opposed blade type, constructed of galvanized steel with neoprene nylon bushings, blades to be mechanically interlocked.
(opt.) Low Leak Damper (outside air only) will be of the opposed blade type, constructed of galvanized steel with neoprene nylon bushings and vinyl blade edge seals; blades to be mechanically interlocked.

H. Filter Rack

Filter Rack will be constructed of galvanized steel with access through the side service panel.

I. Intake Hood (optional) (shipped separately)

Intake hood will be constructed of galvanized steel and include a:
(std) bird screen.
(opt) moisture eliminator.

J. Supply Blower

Supply Blower will be belt driven, forward curved, centrifugal type blower assembly, statically and dynamically balanced with double inlet. The blower wheel will be fixed on a shaft, supported with super quiet rubber cartridges for vibration isolation, and ball bearing.

K. Blower Motor

K.1 Type

K.1.a Motor will be Single Speed, Ball Bearing Drive, Permanently Lubricated, EPACT compliant, Standard NEMA Frame Size and Service Factor, with Resilient Base and Class "B" Windings:

- (a) Open Drip Proof
- (b) Totally Enclosed
- (c) Premium Efficiency, Open Drip Proof
- (d) Premium Efficiency, Totally Enclosed

K.1.b Motor will operate at:

- (a) 115V/1/60
- (b) 208V/1/60
- (c) 230V/1/60
- (d) 208V/3/60
- (e) 230V/3/60
- (f) 460V/3/60
- (g) 575V/3/60

K.1.c Motor will have a horse power rating of: (1/2 - 15 HP)

K.2 Motor wiring will be enclosed in flexible metallic sheathed BX conduit.

K.3 Control-Motor will be activated through a:

- (a) Contactor. (std. 1/2 - 5 HP)
- (b) Magnetic starter. (std. 7-1/2 - 15 HP)
- (c) Variable Frequency Drive (1-15 HP)

K.4 Motor Protection will be provided with:

- (a) Internal thermal protection.
(Relay/Contactor actuated)
- (b) IEC overload protection. (Magnetic starter)

L. Gas and Ignition Systems

L.1 Ignition System

A solid state ignition control system which ignites the pilot by spark during each cycle of operation will be provided. When pilot flame is proven, main burner valve will open to allow gas flow to burners. Pilot and burners must be extinguished during the off cycle.

(opt.) Ignition system will be 100% shutoff type.

L.2 Valve

Indoor units will be provided with a gas valve suitable for NEC Class 2 use, for a maximum inlet of 0.5-psi (14 inch WC) on natural gas. The 24 volt combination automatic gas valves must include a main operating valve, pilot safety valve, pressure regulator, manual main and pilot shutoff valve and adjustable pilot valve.

(opt.) Unit will be provided with a high pressure gas regulator valve.

M. Gas Controls

(a std.) **Single Stage** Unit will be provided with one stage of heat. Ignition is the full rate of the furnace's rated input.

(b) **Two Stage** Unit will be provided with two stages of heat. Ignition will be at low fire (one half) of the rated input.

(c) **Electronic Modulating Gas** Unit will be provided with modulated heat output. An automatic valve in series with the modulating valve will be provided to cycle the unit. Ignition will be at full fire (100 percent rated input) and modulate the gas input from 100 to 50% rated input.

The Modulating Gas valve will operate in response to:

- (1) Room Thermostat
- (2) Duct Thermostat with remote temperature adjustment.
- (3) Duct Thermostat with remote temperature adjustment and an override room thermostat which will increase the rate of modulated input to the unit in proportion to the difference in room temperature.

(d) **Electronic Modulating Gas DDC** Unit will be provided with modulated heat output. An automatic valve in series with the modulating valve will be provided to cycle the unit. Ignition will be at full fire (100% rated input) and modulate the gas input from 100 to 50% of the rated input. The modulating gas valve will operate in response to a 4-20 mA input from an external DDC control.

(e) **Electronic Modulating Gas DDC** Unit will be provided with modulated heat output. An automatic valve in series with the modulating valve will be provided to cycle the unit. Ignition will be at full fire (100% rated input) and modulate the gas input from 100 to 50% of the rated input. The modulating gas valve will operate in response to a 0-10 VDC input from an external DDC control.

(f) **Three Stage** (Triple Furnace Units) Unit will be provided with one stage of heat per furnace. Ignition will be determined by an Electronic Step Control. Each stage of fire will have no less than a 4 °F temperature differential setting. The unit will fire at one third (33%) of the rooftop unit's rated input per stage. Furnace One will always fire first and disengage last.

(g) **Four Stage** Unit will be provided with two stages of heat per furnace. Ignition will be determined by an Electronic Step Control. Each stage of fire will have no less than a 4 °F temperature differential setting. The unit will fire at one quarter (25%) of the rooftop unit's rated input per stage. Furnace One will always fire first and disengage last.

(h) **Six Stage** (Triple Furnace Units) Unit will be provided with two stages of heat per furnace. Ignition will be determined by an Electronic Step Control. Each stage of fire will have no less than a 4 °F temperature differential setting. The unit will fire at one sixth (16.5%) of the rooftop unit's rated input per stage. Furnace One will always fire first and disengage last.

Indoor Make-Up Air Handler Products Specification Guide

continued

- (i) **One Stage with Electronic Modulation DDC** (Dual Furnace Units) Unit will be provided with modulated heat output on furnace one and one stage of heat on furnace two. Ignition will be determined by an Electronic Step Control. Each stage of fire will have no less than a 4 °F temperature differential setting. The rooftop unit will fire at approximately one half (50%) of the rooftop unit's rated input and modulate from 50 - 25% fire on furnace one. Additional stages of fire will engage as the 50% of fire has been maintained for the duration of a delay setting at the electronic step control with respect to each set point. Furnace One will always fire first and disengage last.
 - (j) **Two Stage with Electronic Modulation DDC** (Triple Furnace Units) Unit will be provided with modulated heat output on furnace one and one stage of heat on furnace two and three. Ignition will be determined by an Electronic Step Control. Each stage of fire will have no less than a 4 °F temperature differential setting. The rooftop unit will fire at approximately one third (33%) of the rooftop unit's rated input and modulate from 33 - 16.5% fire on furnace one. Additional stages of fire will engage as the 33% of fire has been maintained for the duration of a delay setting at the electronic step control with respect to each set point. Furnace One will always fire first and disengage last.
- N. Damper Motor**
- N.1 Type**
- N.1.a** Damper motor will be:
 - (a) Two position with spring return.
 - (b) Modulating with spring return.
 - N.1.b** Motor will operate at 24 volts.
- N.2 Wiring** Motor and control wiring will be harnessed with terminal block connections. Wire will have a temperature rating of at least 105 °C outside of the duct furnace.
- O. Damper Control**
- (a) Two position spring return motor with outside air damper will be provided. The motor will power the outside air damper full open when the unit is on and full closed when the unit is off.
 - (b) Two position spring return motor with return air damper will be provided. The motor will power the return air damper full open when the unit is on and full closed when the unit is off.
 - (c) Two position spring return motor with interlocked outside and return air dampers will be provided. The motor will power either the outside air damper full open and the return air damper full closed or the outside air damper full closed and the return air damper full open in response to an outside air temperature sensor. When the unit is off the motor will drive the outside air dampers full closed and the return air dampers full open.
 - (d) Modulating motor with spring return and interlocked outside and return air dampers will be provided. The motor will modulate the position of the outside and return air dampers in response to a thermostatic controller located in the mixed air stream. Units will also be provided with a minimum position potentiometer for minimum outside air damper position. When the unit is off the motor will drive the outside air dampers full closed and the return air dampers full open.
 - (e) Modulating motor with spring return and interlocked outside and return air dampers will be provided. The motor will modulate the position of the outside and return air dampers in response to a thermostatic controller located in the mixed air stream. When the unit is off the motor will drive the outside air dampers full closed and the return air dampers full open.
 - (f) Modulating motor with spring return and interlocked outside and return air dampers will be provided. The motor will position the outside and return air dampers in response to a manually set potentiometer. When the unit is off the motor will drive the outside air dampers full closed and the return air dampers full open.
 - (g) Modulating motor with spring return and interlocked outside and return air dampers will be provided. The motor will modulate the position of the outside and return air dampers in response to a thermostatic controller and dry bulb located in the mixed air stream. Units will also be provided with a minimum position potentiometer for minimum outside air damper position. When the unit is off the motor will drive the outside air dampers full closed and the return air dampers full open.
 - (h) Modulating motor with spring return and interlocked outside and return air dampers will be provided. The motor will modulate the position of the outside and return air dampers in response to an enthalpy controlled economizer. When the unit is off the motor will drive the outside air dampers full closed and the return air dampers full open.
 - (i) Modulating motor and interlocked outside and return air dampers will be provided. The motor will modulate the position of the outside and return air dampers in response to a pressure sensor located in the building.
 - (j) Modulating motor with interlocked outside and return air dampers will be provided. The motor will modulate the position of the outside and return air dampers in response to a carbon dioxide (CO₂) monitor located in the return air duct. When the unit is off the motor will drive the outside air dampers full closed and the return air dampers full open. Alarm contacts will be provided to guard against sustained high CO₂ levels.
 - (k) Modulating motor with spring return and interlocked outside and return air dampers will be provided. The motor will modulate the position of the outside and return air dampers in response to a solid state mixed air sensor and S-350 proportional controller. When the unit is off the motor will drive the outside air dampers full closed and the return air dampers full open.
 - (l) Modulating motor with spring return and interlocked outside and return air dampers will be provided. The motor will modulate the position of the outside and return air dampers in response to a 4-20 mA or 0-10VDC analog signal supplied by an external DDC controller. When the unit is off the motor will drive the outside air dampers full closed and the return air dampers full open.
 - (m) Two position spring return motor with interlocked outside and return air dampers will be provided. The motor will power the outside air damper full open after a warm up period determined by a minimum supply air temperature sensor when the unit is on, and full closed when the unit is off. (ASHRAE Cycle I)
 - (n) Modulating motor with spring return and interlocked outside and return air dampers will be provided. The motor will modulate the position of the outside and return air dampers in response to a thermostatic controller located in the mixed air stream after a warm up period determined by a minimum supply air temperature sensor. Units will also be provided with a minimum position potentiometer for minimum outside air damper position. (ASHRAE Cycle II)
 - (o) Modulating motor with spring return and interlocked outside and return air dampers will be provided. The motor will modulate the position of the outside and return air dampers in response to a thermostatic controller located in the mixed air stream after a warm up period determined by a minimum supply air temperature sensor. Units will also be provided with a minimum position potentiometer for minimum outside air damper position. When the unit is off the motor will drive the outside air dampers full closed and the return air dampers full open. (ASHRAE Cycle III)
 - (p) Manual outside and return air dampers with manual quadrant will be provided.

Indoor Make-Up Air Handler Products Specification Guide

continued

P. Accessories

- (a) **Moisture Eliminators** Moisture eliminators will be provided by the manufacturer to eliminate the possibility of moisture carryover entering the unit through the outside air hood. A differential pressure switch and indicator light will be provided in case of blockage.
- (b) **Horizontal Rear Return** Return air will be located horizontally on the rear of the unit under the outside air inlet. Moisture eliminators will be provided by the manufacturer for the outside air hood.
- (c) **Low Leak Dampers** Low leak dampers with vinyl blade edge seams and neoprene nylon bushings will be provided by the manufacturer. Dampers will be of the galvanized steel opposed blade type.
- (d) **409 Stainless Steel Drip Pan (ME only)** Will be provide by the manufacturer in the furnace section.
- (e) **High Altitude Unit** Unit will be orificed for operation at _____ feet above sealevel elevation. Two stage units will include a factory installed delay timer allowing the unit to initially fire at 100% for ten seconds and then operate under the direction of the gas valve controller.
- (f) **High Pressure Regulator** Will be provided by the manufacturer to reduce the incoming gas pressure to specified main line gas pressure (inches of water column), up to 14 inch WC
- (g) **Input Derate** Unit will be derate _____ % of rated input, up to 50%.
- (h) **Filters** Will consist of
 - h.1 1 inch Washable (Standard)
 - h.2 2 inch Washable (Optional)
 - h.3 2 inch Throwaway (Optional)
 - h.4 1 inch 30% Pleated (Optional)
 - h.5 2 inch 30% Pleated (Optional)
- (i) **Evaporative Cooler Accessories** will include.
 - i.1 **Fill and Drain Kit** Will consist of a 3 way valve and relay for automatic fill and drain operation of the Evaporative Cooler.
 - i.2 **12 inch Celdek® Media** High Efficiency 12" Celdek® Media will be utilized in the Evaporative cooler.
 - i.3 **Freezestat** An automatic reset freezestat will be provided by the manufacturer to control the operation of the fill and drain kit.
 - i.4 **8 inch Glasdek®** Will be provided by the manufacturer to conform with UL900 Class II fire rating requirements.
 - i.5 **12 inch Glasdek®** Will be provided by the manufacturer to conform with UL900 Class II fire rating requirements.
- (j) **7 Day Time Clock** A seven day time clock will be provided by the manufacturer and offer SPDT relay output and a maximum of six setpoints per day.
- (k) **24 Hour Time Clock** A 24 hour time clock will be provided by the manufacturer and offer SPDT relay output and a maximum of twelve setpoints per day.
- (l) **Clogged Filter Switch** A factory installed clogged filter switch with indicator light located in the main electrical cabinet or remote control panel (when specified) will be provided by the manufacturer.
- (m) **Convenience Outlet** A GFI with manual reset convenience outlet in a weather proof enclosure will be provided by the manufacturer and field installed and require a separate 115 volt service.
- (n) **Remote Control Panel** A wall mounted "Sterling" design control panel will be provided by the manufacturer. The panel will consist of a non metallic enclosure and 6 LED status lamps. The lamps will indicate System on/off, Fan on/off, Heat on/off, Cool on/off, Auxiliary on/off (Evaporative cooler on/off or Exhaust fan operation) and modulating damper control (when specified).
- (o) **Manual Blower Switch** A factory installed manual blower switch located in the electrical cabinet will be provided by the manufacturer.
- (p) **Duct Thermostats**
 - p.1 single stage duct thermostat with an operating range of 55°-175 °F and SPDT operation will be provided by the manufacturer.
 - p.2 two stage duct thermostat with an operating range of 55°-175 °F and SPDT operation will be provided by the manufacturer.
- (q) **Room Thermostats (All Mercury free)**
 - q.1 **T87K Honeywell Thermostat w/ Subbase A** single stage heating and subbase for fan on operation will be provided by the manufacturer.
 - q.2 **T87K Honeywell Thermostat w/ Subbase and Guard** A single stage heating thermostat including a subbase for fan operation and tamper proof guard will be provided by the manufacturer.
 - q.3 **T834N Thermostat with Subbase A** single stage heating thermostat with fan switch with a 50°-90 °F operating range will be provided by the manufacturer.
 - q.4 **TH8320R Programmable Commercial Thermostat** The manufacturer will provide a 7 day programmable thermostat capable of two stages of heating and two stages of cooling.
 - q.5 **TH5220D Two Stage Thermostat** The manufacturer will provide a two stage heating and two stage cooling thermostat with system and fan switching and built in 10 °F heating / cooling differential.
 - q.6 **TG511 Locking Thermostat Cover** A Universal locking thermostat cover. Will be provided by the manufacturer.
- (r) **Return Firestat** A return firestat with a setpoint range of 130° - 270 °F and SPDT switching capabilities will be provided by the manufacturer.
- (s) **Supply Firestat** A supply firestat with a setpoint range of 130° - 270 °F and SPDT switching capabilities will be provided by the manufacturer.
- (t) **Time Delay Freezestat** A SPDT time delay freezestat with a setpoint range of 30° - 75 °F and a 1 to 10 minute adjustable time delay will be provided by the manufacturer.
- (u) **Ambient Lockouts**
 - u.1 **Ambient Lockout** A factory mounted ambient lockout control capable of disengaging the duct furnace during times of mild temperatures will be provided by the manufacturer.
 - u.2 **Ambient Lockout – Dual Furnace** A factory mounted ambient lockout control capable of preventing firing of second furnace when first furnace is able to satisfy complete load as well as preventing firing of heating system at field selectable high ambient temperatures.
 - u.3 **Ambient Lockout – Triple Furnace** A factory mounted ambient lockout control capable of preventing firing of second furnace when first furnace is able to satisfy complete load, preventing firing of third furnace when first and second furnaces are able to satisfy complete load as well as preventing firing of heating system at field selectable high ambient temperatures.

Indoor Make-Up Air Handler Products Specification Guide

continued

- (v) **Interlock Relays**
 - v.1 **24 volt DPDT relay** A 24 volt type 2 Form C relay with 24 volt coil and DPDT 10 amp contacts will be provided by the manufacturer. The relay will be capable of plugging into the main connection PC board and will be utilized as an exhaust fan interlock.
 - v.2 **24/115 volt SPDT relay** A relay with selectable coil voltages of 24 or 115 and SPDT 10 amp contacts will be provided by the manufacturer.
 - v.3 **24/115/230 volt DPDT relay** A relay with selectable coil voltages of 24, 115 or 230 and DPDT 10 amp contacts will be provided by the manufacturer.
 - v.4 **24 volt 4PDT relay** A relay with a coil voltage of 24 and 4PDT 10 amp contacts will be provided by the manufacturer.
- (w) **Manual Reset High Limit Switch** Will be provided by the manufacturer to disengage the furnace at a temperature of 200 °F. The switch will be of the non-recycling manual reset type.
- (x) **High / Low Gas Pressure Switches** Will be provide by the manufacturer to disengage the furnace(s) upon detection of high manifold or low incoming line pressures.
- (y) **Status Lamps** Long life factory installed LED lamps will be provided in the electrical cabinet by the manufacturer to aid in troubleshooting and equipment setup. Power on, Fan on, Heating energized at furnace one, two or three and cooling energized will be provided when applicable.
- (z) **Air Flow Prove Switch** Will be provided by the manufacturer to verify airflow through the unit. The switch will be a Dwyer 1910-0 pressure switch suitable for duct mounting with a range of .15 – .50" WC
- (aa) **Field Installed Disconnect Switches**
 - aa.1 30 amp fused disconnect switch, NEMA-3R rated, will be provided by the manufacturer to be field mounted.
 - aa.2 30 amp non fused disconnect switch, NEMA-3R rated, will be provided by the manufacturer to be field mounted.
 - aa.3 60 amp fused disconnect switch, NEMA-3R rated, will be provided by the manufacturer to be field mounted.
 - aa.4 60 amp non fused disconnect switch, NEMA-3R rated, will be provided by the manufacturer to be field mounted.
- (bb) **Variable Frequency Drive Options**
 - bb.1 **Field Installed VFD** Will be provided by manufacturer to provide overload protection and soft start operation. VFD to be UL approved manufactured with a NEMA 1 plenum rated enclosure.
 - bb.2 **Factory Installed VFD** Will be provided by manufacturer to provide overload protection and soft start operation. VFD to be UL approved manufactured with a NEMA 1 plenum rated enclosure. VFD to be factory mounted in the unit blower cabinet and factory wired with a remote programming keypad located in the electrical cabinet.
 - bb.3 **Remote Keypad** Will be provided by manufacturer for field installation up to 100 feet (30 Meters) from the drive. The remote keypad will duplicate the functionality of the drive's local keypad.
 - bb.4 **CO₂ Sensor 100% Outside Air** Will be provided by manufacturer for field installation. CO₂ monitor range 0 to 2,000 ppm, adjustable, for mounting in occupied space. Upon rise in CO₂ above field programmed setpoint, 0-10VDC or 4-20 mA signal will be sent from CO₂ sensor to VFD to modulate air flow between minimum setpoint and maximum CFM.
 - bb.5 **CO₂ Mixed Air** Will be provided by manufacturer for field installation. CO₂ monitor range 0 to 2,000 ppm, adjustable, for mounting in return air duct. Upon rise in CO₂ above field programmed setpoint, signal will drive return air damper to 100% closed and outside air damper to 100% open. 0-10VDC or 4-20 mA signal will be sent between CO₂ sensor to VFD to modulate air flow between minimum setpoint and maximum CFM.
 - bb.6 **Pressure Sensor** Will be provided by manufacturer for field installation. Pressure control range -0.1 to +0.1" WC VFD will modulate motor speed based on 4-20 mA signal from pressure control sensor mounted in space to maintain field programmed setpoint
 - bb.7 **2-Speed VFD Relays** Factory installed DPDT relays provided to energize second speed setting. Relay coil will accept 24V, 115V and 230V.
 - bb.8 **3-Speed VFD Relays** Factory installed DPDT relays provided to energize second and third speed settings. Relay coil will accept 24V, 115V and 230V.
- (cc) **Service Convenience Package** Will be factory installed by the manufacturer. The service convenience package will consist of a factory mounted switch type disconnect and GFI convenience outlet mounted on the hinged access door.
- (dd) **Double Wall Cabinet Construction** Will be factory installed and in accordance with the latest edition of ASHRAE standard no. 62 and 62.1. Double wall construction will be utilized in the Blower, Filtration and Coil sections of the unit were applicable. 1 inch fiber material will be used between the cabinet walls for insulation purposes.

Unit Selection Procedure

Selection Procedure

Step 1

To properly select a unit, two of the three following items must be known - Temperature Rise (TR) required, Cubic Feet per Minute of air delivery (CFM) required, Output (BTU/H OUT) required. From any two of these items the third item can be determined, as well as the Input (BTU/H IN) required as follows. (The value 1.085 represents a constant.)

$$TR = BTU/H \text{ Out} \div (1.085 \times CFM)$$

$$CFM = BTU/H \div (1.085 \times TR)$$

$$BTU/H \text{ Out} = (CFM \times 1.085) \times TR$$

$$BTU/H \text{ In} = BTU/H \text{ out} \div \text{Efficiency} .80$$

With any two of the three required values, match these requirements to a unit with the nearest Input (BTU/H), Temperature Rise (TR) and Air Flow (CFM) capabilities keeping in mind that - **BTU/H OUT** = BTU/H IN x Efficiency.

Refer to the "Packaged Indoor Arrangement Reference" page 9 (ME) or page 20 (MS) to match a Capacity range (BTU/H), Air Delivery (CFM) and Temperature Rise (TR) with a Indoor Arrangement and proceed to the Chart and Tables listed for that arrangement.

The top portion of Charts 1 and 2 (ME) or Charts 3, 4, 5 and 6 (MS) allows the use of Temperature Rise and CFM to determine Capacity, or Temperature Rise and Capacity to determine CFM, or Capacity and CFM to determine Temperature Rise. Follow the top chart down to the corresponding filter and cooling range for the selection.

Step 2

Once Capacity, Temperature Rise and CFM have been determined, go to the Accessory Pressure Losses Table for the arrangement and calculate pressure losses for unit accessories. Add the losses for Filters, Dampers, Rainhood with Screen or Moisture Eliminators (if used at ductwork inlet), Evaporative Cooler or Cooling Coil and losses due to Duct Work (External Static Pressure) to determine the Total External Pressure.

Step 3A 2000 feet altitude and below

Refer to the Performance Table for the selection and determine RPM and BHP for the Total External Pressure. Go to the table row that most closely matches unit Capacity, Temperature Rise and CFM, follow the row out to the column that equals the Total External pressure for RPM and BHP values.

Step 3B Above 2000 feet altitude

To correct for Altitude, go to Table 19 Correction Factors for Altitude. From Table 19 determine the correction factor from Temperature and Altitude for the system. Correct the ESP from Duct Work to actual ESP for altitude then add SP from accessories as shown below. Refer to the Performance Table for the selected unit. Go to the row that most closely matches unit Capacity, Temperature Rise and CFM, follow the row out to the column that equals the corrected Total External Pressure for RPM and BHP values. The BHP value can now be corrected to Actual BHP for altitude as shown below.

$$\text{Total External Pressure} = \text{Duct ESP} \times \text{Factor} + \text{Accs. SP}$$

$$\text{Actual BHP} = \text{Cat. BHP} \div \text{Factor}$$

$$\text{Corrected BTU/HR. Input} = \text{Catalog BTU/HR. Input} \div \text{Factor}$$

$$\text{Corrected BTU/HR. Output} = \text{Catalog BTU/HR. Input} \times \text{Efficiency}$$

Table 19. Correction Factors for Altitude

		Altitude (Feet) and Barometric Pressure ("In. Hg")						
Temp	Altitude	0'	500'	1000'	1500'	2000'	2500'	3000'
F	BP	39.92	29.38	28.86	28.33	27.82	27.31	26.82
-40		0.79	0.81	0.82	0.84	0.85	0.87	0.88
0		0.87	0.88	0.90	0.92	0.93	0.95	0.97
40		0.94	0.96	0.98	1.00	1.01	1.03	1.05
70		1.00	1.02	1.04	1.06	1.08	1.10	1.12
80		1.02	1.04	1.06	1.08	1.10	1.12	1.14
100		1.06	1.08	1.10	1.12	1.14	1.16	1.18
120		1.90	1.11	1.13	1.16	1.18	1.20	1.22

		Altitude (Feet) and Barometric Pressure ("In. Hg")					
Temp	Altitude	3500'	4000'	4500'	5000'	5500'	6000'
F	BP	26.32	25.84	25.36	24.9	24.43	23.98
-40		0.90	0.92	0.93	0.95	0.97	0.99
0		0.99	1.00	1.02	1.04	1.06	1.08
40		1.07	1.09	1.11	1.13	1.16	1.18
70		1.14	1.16	1.18	1.20	1.22	1.25
80		1.16	1.18	1.20	1.22	1.25	1.27
100		1.20	1.22	1.25	1.27	1.29	1.32
120		1.24	1.27	1.29	1.31	1.34	1.37

Cooling Coil Selection Procedure

Cooling Coils

Cooling coils are used in air handling systems to cool and dehumidify an air stream for comfort purposes. To reduce the cooling load in buildings, most applications recirculate a large percentage of the air. Usually recirculated air is 75-80% of the airflow with the remainder being outside fresh air. Some codes require 100% outside air, particularly for hospitals and schools. Also many engineers specify higher percentages of outside air to meet the requirements of ASHRAE Standard 62.1-2004 "Ventilation for Acceptable Indoor Air Quality".

- A.** In order to select the least expensive coil to meet the specified performance criteria the following information is required:
- Unit Size
 - Airflow in SCFM or ACFM and Altitude. (see "Fan Selection at Altitude")
 - Entering air Dry Bulb and Wet Bulb temperatures based on ratio of outside to return air.
 - Cooling load MBH (1000's BTU/Hr) or leaving air Wet Bulb.
- B.** For chilled water coils the following additional information is required (refer to Tables 18A and 18B):
- Fluid type: water, ethylene glycol, propylene glycol and percent of mixture.
 - Entering fluid temperature °F.
 - Leaving fluid temperature °F or rate of flow GPM.
 - Chilled water tables are based on:
 - 45 °F entering water temperature.
 - Entering air temperature of 80 °F DB/67 °F WB.
 - Data is certified in accordance with ARI Standard 410.
 - Capacities based on 95 °F DB/74 °F WB information is also shown - see Table 18B. For other than these conditions, please consult the factory.
- C.** For DX (refrigerant) coils, the following additional information is required (refer to tables 17A and 17B).
- Refrigerant type.
 - Suction temperature °F.
 - Liquid temperature °F.
 - Type of circuiting desired.
 - Hot gas bypass required?
 - DX tables are based on:
 - 45 °F suction temperature.
 - Entering air temperature of 80 °F DB/67 °F WB.
 - R-410A refrigerant.
 - 100 °F liquid temperature.
 - Data is certified in accordance with ARI Standard 410.
 - For other than these conditions see Table 17B or please consult the factory.
- D.** When specifying a coil one of the most important pieces of information is the airflow in SCFM. As stated in the "Fan Selection at Altitude" section SCFM means STANDARD CFM or air at a density of 0.075 lb./cu. feet A fan must be selected using ACFM or ACTUAL CFM. A cooling coil or heating coil must be selected using SCFM. Up to an altitude of approx. 1,500 feet above sea level very little error would be introduced in the selection of a cooling coil. For altitudes above 1,500 feet above sea level the coil must be selected using SCFM. The relationship between ACFM and SCFM is shown by the following equation.
- $$SCFM = ACFM \times (\text{Actual Density} \div 0.075)$$

The term "0.075 ÷ Actual Density" is referred to as the density correction factor, here in called the "Factor". This factor can be found in Table 19. The aforementioned equation can then be re-written as:

$$SCFM = (ACFM \div \text{Factor}).$$

Example: A cooling coil must be selected at 5,000 feet altitude. The unit delivers 10,000 ACFM. What is the SCFM? At 5,000 feet altitude, the factor from Table 19 is 1.20 therefore:

$$SCFM = 10,000 ACFM \div 1.20 = 8,333 SCFM$$

- E.** The entering air temperatures, both wet bulb and dry bulb must also be considered when selecting a coil. A majority of units usually use recirculated air with a percentage of outside air. The cooling coil must be selected using the mixed air temperature entering the coil.

The following example shows how to calculate the mixed air temperature.

25% Outside air at 95 °F DB/75 °F WB
75% recirculated air at 78 °F DB/67 °F WB

The mixed dry bulb is simply the proportional value between the outside and recirculated dry bulb temperatures.

$$(.25 \times 95) + (.75 \times 78) = 82.3 \text{ °F}$$

The mixed wet bulb temperatures must be calculated using either the humidity ratio from a psychrometric chart or from Table 20 "The enthalpy of saturated air at various wet bulb temperatures".

Using Table 13, the enthalpy of the outside air at 75 °F WB is 38.62 BTU/lb. and the recirculated air at 67 °F WB is 31.63 BTU/lb.; the mixed enthalpy is:

$$(.25 \times 38.62) + (.75 \times 31.63) = 33.38 \text{ BTU/lb.}$$

Using this value in Table 20, the interpolated wet bulb temperature is 69.1 °F. Therefore, the final mixed temperatures are:

$$82.3 \text{ °F DB}/69.1 \text{ °F WB}$$

Table 20
Enthalpy of Saturated Air at
Various Wet Bulb Temperatures

Wet Bulb Temp.	BTU per Pound	Wet Bulb Temp.	BTU per Pound	Wet Bulb Temp.	BTU per Pound
50.0	20.38	60.0	26.41	70.0	34.13
50.5	20.64	60.5	26.75	70.5	34.56
51.0	20.91	61.0	27.10	71.0	34.99
51.5	21.18	61.5	27.46	71.5	35.43
52.0	21.45	62.0	27.82	72.0	35.87
52.5	21.73	62.5	28.18	72.5	36.32
53.0	22.01	63.0	28.55	73.0	36.77
53.5	22.30	63.5	28.92	73.5	37.23
54.0	22.59	64.0	29.29	74.0	37.69
54.5	22.89	64.5	29.67	74.5	38.15
55.0	23.18	65.0	30.06	75.0	38.62
55.5	23.49	65.5	30.44	75.5	39.09
56.0	23.80	66.0	30.84	76.0	39.57
56.5	24.11	66.5	31.23	76.5	40.05
57.0	24.42	67.0	31.63	77.0	40.53
57.5	24.74	67.5	32.04	77.5	41.02
58.0	25.07	68.0	32.45	78.0	41.52
58.5	25.40	68.5	32.86	78.5	42.01
59.0	25.73	69.0	33.28	79.0	42.52
59.5	26.07	69.5	33.70	79.5	43.02

Approximate Unit Net and Ship Weights (lbs) – Table 21

NOTE: ALL UNIT WEIGHTS ARE LESS MOTOR, OUTSIDE AIR HOOD (SHIPPED SEPARATELY) AND COOLING COILS W/ DRAIN PAN
 For units ordered with optional double wall construction [Digit 16 (N6)], add an additional 10% of the base unit weight.
 For units ordered with cooling coil [Digit 7 (K)], refer to coil weights in Tables 17A, 17B, 18A and 18B.

INDOOR ARRANGEMENT [IA] "A"					INDOOR ARRANGEMENT [IA] "B"						
	NET WT	SHIP WT		NET WT	SHIP WT		NET WT	SHIP WT		NET WT	SHIP WT
MS-10	256	367	ME-10	262	373	MS-10	576	742	ME-10	583	749
MS-15	307	418	ME-15	298	409	MS-15	627	793	ME-15	619	785
MS-20	365	484	ME-20	356	475	MS-20	740	916	ME-20	731	907
MS-25	405	524	ME-25	395	514	MS-25	781	957	ME-25	771	947
MS-30	469	596	ME-30	455	582	MS-30	907	1092	ME-30	893	1078
MS-35	510	637	ME-35	495	622	MS-35	958	1143	ME-35	943	1128
MS-40	558	690	ME-40	543	675	MS-40	1032	1222	ME-40	1018	1208
MS-50	795	952	ME-50	777	934	MS-50	1195	1423	ME-50	1175	1403
MS-60	914	1081	ME-60	885	1052	MS-60	1377	1616	ME-60	1349	1588
MS-70	994	1161	ME-70	964	1131	MS-70	1468	1707	ME-70	1438	1677
MS-80	1087	1259	ME-80	1058	1230	MS-80	1589	1833	ME-80	1561	1805
MS-12	1617	1820	ME-12	1573	1776						

INDOOR ARRANGEMENT [IA] "D"					INDOOR ARRANGEMENT [IA] "G"						
	NET WT	SHIP WT		NET WT	SHIP WT		NET WT	SHIP WT		NET WT	SHIP WT
MS-10	705	904	ME-10	712	911	MS-20	982	1206	ME-20	973	1197
MS-15	757	956	ME-15	749	948	MS-25	1025	1249	ME-25	1015	1239
MS-20	893	1102	ME-20	884	1093	MS-30	1218	1452	ME-30	1204	1438
MS-25	935	1144	ME-25	925	1134	MS-35	1261	1495	ME-35	1246	1480
MS-30	1083	1301	ME-30	1069	1287	MS-40	1343	1583	ME-40	1329	1569
MS-35	1134	1352	ME-35	1119	1337	MS-50	1427	1689	ME-50	1407	1669
MS-40	1220	1443	ME-40	1206	1429	MS-60	1677	1951	ME-60	1649	1923
MS-50	1348	1595	ME-50	1328	1575	MS-70	1759	2033	ME-70	1729	2003
MS-60	1554	1812	ME-60	1526	1784	MS-80	1886	2166	ME-80	1858	2138
MS-70	1644	1902	ME-70	1614	1872	MS-12	2420	2741	ME-12	2376	2697
MS-80	1777	2040	ME-80	1749	2012						

INDOOR ARRANGEMENT [IA] "K"					OPTIONAL OUTSIDE AIR HOOD W/BIRD SCREEN Weight Adder (Shipped Separately)				
	NET WT	SHIP WT		NET WT	SHIP WT	Capacity [CA]	WT	Capacity [CA]	WT
MS-10	886	1137	ME-10	893	1144	10	43	50	51
MS-15	937	1188	ME-15	929	1180	15	43	60	59
MS-20	1132	1394	ME-20	1123	1385	20	51	70	59
MS-25	1174	1436	ME-25	1164	1426	25	51	80	63
MS-30	1385	1659	ME-30	1371	1645	30	59	12	63
MS-35	1428	1702	ME-35	1413	1687	35	59		
MS-40	1519	1799	ME-40	1505	1785	40	63		
MS-50	1614	1915	ME-50	1594	1934				
MS-60	1881	2195	ME-60	1853	2207				
MS-70	1964	2278	ME-70	1934	2288				
MS-80	2099	2420	ME-80	2071	2432				

Motor Shipping Weights (Approximate lbs) – Table 22

	1 - (115/1/60)				2 - (208/1/60)				3 - (230/1/60)			
	1	2	3	4	1	2	3	4	1	2	3	4
	ODP	TE	PEODP	PETE	ODP	TE	PEODP	PETE	ODP	TE	PEODP	PETE
1/2 HP	20	24	32	30	21	24	32		21	24	32	30
3/4 HP	23	30	30	41	23	30	30		25	30	30	41
1 HP	32	32	40	44	32	32			32	32	40	44
1-1/2 HP	40	41	47	57	40	41			40	41	47	57
2 HP	42	67	65	64	50	67			42	48	65	64
3 HP	78	86			78	86			78	86		90
5 HP					87				87	99	95	
7-1/2 HP					134	138			134	138		
10 HP					165				140	161		
15 HP												
	4 - (208/3/60)				5 - (230/3/60)				6 - (460/3/60)			
	1	2	3	4	1	2	3	4	1	2	3	4
	ODP	TE	PEODP	PETE	ODP	TE	PEODP	PETE	ODP	TE	PEODP	PETE
1/2 HP	19	18	22	22	19	18	22	22	19	18	22	22
3/4 HP	27	26	27		27	22	27	31	27	22	27	31
1 HP	24	26	36	37	24	26	36	37	24	26	36	37
1-1/2 HP	28	34	40	42	28	34	40	42	28	34	40	42
2 HP	35		46	49	35		46	49	35		46	49
3 HP	48		69	69	48		69	69	48		69	69
5 HP			76	77			76	77			76	77
7-1/2 HP	1		117	136			117	136			117	136
10 HP			128	158			128	158			128	158
15 HP			217	255			217	255			217	255
	7 - (575/3/60)											
	1	2	3	4								
	ODP	TE	PEODP	PETE								
1/2 HP	22	18										
3/4 HP	20	22										
1 HP	28	26	33	38								
1-1/2 HP			40	42								
2 HP			46	48								
3 HP			66	69								
5 HP			74	91								
7-1/2 HP			114	143								
10 HP			145	153								
15 HP			234	302								

Motor Type (MT) Legend:

ODP - Open Drip Proof

TE - Totally Enclosed

PEODP - Premium Efficiency Open Drip Proof

PETE - Premium Efficiency Totally Enclosed

Motor Electrical Data – Table 23

FULL LOAD CURRENT IN AMPERES

	1 - (115/1/60)				2 - (208/1/60)				3 - (230/1/60)			
	1	2	3	4	1	2	3	4	1	2	3	4
	ODP	TE	PEODP	PETE	ODP	TE	PEODP	PETE	ODP	TE	PEODP	PETE
1/2 HP	7.2	8.6	4.6	4.6	3.7		2.8		3.8	4.3	2.3	2.3
3/4 HP	11.6	11.0	6.5	6.3	5.2	5.4	3.4		5.0	5.5	3.3	3.2
1 HP	13.0	13.4	8.6	8.5	6.6	6.8			6.5	6.7	4.3	4.3
1-1/2 HP	18.2	18.0	12.5	12.6	9.1	8.4			9.1	8.0	6.3	6.3
2 HP	21.0	23.0	17.6	17.6	11.3	11.5			10.5	8.1	8.8	8.8
3 HP	33.5	28.0			17.4	14.6			16.8	14.0		11.8
5 HP					23.5				21.0	23.0	19.1	
7-1/2 HP					33.0	31.0			31.0	29.0		
10 HP										38.0		
15 HP												
	4 - (208/3/60)				5 - (230/3/60)				6 - (460/3/60)			
	1	2	3	4	1	2	3	4	1	2	3	4
	ODP	TE	PEODP	PETE	ODP	TE	PEODP	PETE	ODP	TE	PEODP	PETE
1/2 HP	2.3	2.0	1.8	1.7	2.2	2.5	1.8	2.0	1.1	1.0	0.9	1.0
3/4 HP	3.0	3.2	2.5		3.4	3.0	2.4	2.8	1.7	1.5	1.2	1.4
1 HP	3.4	3.7	3.1	3.1	3.4	3.4	3.0	3.1	1.7	1.7	1.5	1.5
1-1/2 HP	5.1	5.0	4.5	4.5	5.2	4.6	4.4	4.4	2.6	2.3	2.2	2.2
2 HP	6.2		5.8	6.0	6.0		5.8	5.8	3.0		2.9	2.9
3 HP	9.2		8.5	9.0	8.6		8.4	8.4	4.3		4.2	4.2
5 HP			12.8	11.8			12.0	11.8			6.0	5.9
7-1/2 HP			20.4	21.0			19.4	18.8			9.7	9.4
10 HP			26.0	27.0			25.0	25.0			12.5	12.5
15 HP			37.4	38.9			35.4	37.0			17.7	18.5
	7 - (575/3/60)											
	1	2	3	4								
	ODP	TE	PEODP	PETE								
1/2 HP	0.8	0.8										
3/4 HP	1.1	1.1										
1 HP	1.3	1.7	1.2	1.2								
1-1/2 HP			1.8	1.8								
2 HP			2.3	2.4								
3 HP			3.4	3.2								
5 HP			5.3	5.3								
7-1/2 HP			7.8	7.6								
10 HP			10.0	9.6								
15 HP			14.1	15.1								

Motor Type (MT) Legend:

- ODP - Open Drip Proof
- TE - Totally Enclosed
- PEODP - Premium Efficiency Open Drip Proof
- PETE - Premium Efficiency Totally Enclosed

Unit Configurations/Submittal Index

Single Furnace Units

	Unit Type (UT): ME MS	Submittal Number
IA "B" CA (10/40)		ME-40-B MS-40-B
IA "D" CA (10/40)		ME-40-D MS-40-D
IA "G" CA (20/40)		ME-40-G MS-40-G
IA "K" CA (10/40)		ME-40-K MS-40-K

Dual Furnace Units

	Unit Type (UT): ME MS	Submittal Number
IA "A" CA (50/80)		ME-80-A MS-80-A
IA "B" CA (50/80)		ME-80-B MS-80-B
IA "D" CA (50/80)		ME-80-D MS-80-D
IA "G" CA (50/80)		ME-80-G MS-80-G
IA "K" CA (50/80)		ME-80-K MS-80-K

IA = Indoor Arrangement (Digit #7)

CA= Capacity (Digits #3 and #4)

Refer to Complete Unit Number Designation
in Application Manual

Legend:

B/F/D = Standard Blower/Filter/Damper Module

B = Hi CFM Blower Module

F/D = Hi CFM Filter/Damper Module

CC = Cooling Coil Module

EV = Evap. Cooler Module

Triple Furnace Units

	Unit Type (UT): ME MS	Submittal Number
IA "A" CA (12)		ME-12-A MS-12-A
IA "G" CA (12)		ME-12-G MS-12-G

Notes

Notes

Mestek

Mestek's corporate headquarters is located in Westfield, Massachusetts, the same location where Company operations began in 1946.

Mestek is a large and growing multidivisional Company that holds a leadership position in the residential and commercial building finned-tube heating equipment industry. It has become a major supplier of gas-fired heating equipment and is a leading manufacturer of fire, smoke, and air control dampers used in the HVAC systems of office buildings, hospitals, and schools. In addition, it is rapidly building toward a leadership position as a manufacturer of coil stock handling systems for the metal stamping and forming industries.

Mestek's products are built in modern manufacturing facilities located throughout the U.S. and Canada. A nationwide network of aggressive, experienced sales representatives, distributors, and wholesalers keep Mestek products flowing to the marketplace.

The Mestek products meet the stringent performance standards of CSA International, Underwriters Laboratory, ETL and other highly regarded industry associations. Building at this level of quality while paying attention to cost has consistently given Mestek products extra appeal in the marketplace.

The Company's representatives and wholesalers have been carefully selected to assure the highest possible level of product experience and knowhow. The competence and product knowledge of the headquarters staff is unmatched. Thus whatever the product or where ever you're located, specifying Mestek gives you the combination of top quality and complete technical support with the application of the product.

SALES OFFICE:

260 North Elm Street, Westfield, Mass. 01085
(413) 564-5540 • Fax (413) 562-5311
www.sterlinghvac.com

LIMITED WARRANTY

Sterling HVAC Products are warranted by Sterling to be free from defects in material and workmanship for a period of one (1) year from the date of shipment from Sterling's Plant.

Sterling will repair or replace, at its option, any components which, upon inspection, it finds to be defective, provided that the unit has been operated within its listed capacity, installed in accordance with the furnished instructions, has not been misused or subject to negligence and has received reasonable and necessary maintenance. This warranty does not cover labor or other costs incurred in repairing, removing, installing, servicing or handling of parts or complete products.

This warranty does not cover loss due to corrosion by chemicals precipitated in the air such as halogenated hydrocarbons.

Sterling will in no event be liable for incidental or consequential damages of any kind.

The buyer must request written permission from Sterling to return defective components and then must send them with all transportation charges prepaid to the plant designated in the written permission.

This warranty is extended only to the original owner of the unit.

REPLACEMENT PARTS

Replacement parts are available for all current and most obsolete Sterling HVAC Products.

In the interest of product improvement Sterling reserves the right to make changes without notice.

Unless otherwise specified, the following conversions may be used for calculating SI unit measurements:

1 cubic foot = 0.028 m ³	1,000 Btu per hour = 0.293 kW
1 foot = 0.305 m	liter/second = CFM x 0.472
1 inch = 25.4 mm	meter/second = FPM ÷ 196.8 ³
1 psig = 6.894 kPa	1,000 Btu/Cu. Feet = 37.5 MJ/m ³
1 inch water column = 0.249 kPa	1 gallon = 3.785 L
1 pound = 0.453 kg	



260 NORTH ELM ST. WESTFIELD, MA 01085
(413) 564-5540 • FAX: (413) 562-5311
www.sterlinghvac.com

