

OUTDOOR AIR HANDLERS

Application Manual



 **STERLING**[®]
HVAC PRODUCTS





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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 50 years. This experience has allowed us to design and manufacture a complete line of outdoor air handlers 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 Engineered Products Rooftop Units have incorporated a multi digit "Model Number" in order to more comprehensively describe the product. With the Sterling Engineered Products "Model Number" we can offer the vast array of features found in this catalog 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.

Outdoor Air Handler Product Description

STERLING OUTDOOR AIR HANDLER UNITS

The Sterling Packaged Rooftop Air Handlers are designed to perform with heating, cooling and ventilating systems, and are suitable for commercial, institutional and industrial applications where external system pressure losses are as high as 3" W.C. Air Handler units are available in 8 standard arrangements and are divided into two classifications: "Standard" and "High-CFM" blower types. The "Standard" Air Handler units have a CFM range of 1,500 – 8,000 CFM (0.7 – 4.0 m³/s), and the "High-CFM" units have a range of 3,000 – 14,000 CFM (1.4 – 6.6 m³/s). All arrangements are ETL certified for safety and performance and are in compliance with the UL-1995 Standard for HVAC Equipment.

Air Handler units in the "Standard" arrangements consist of a blower cabinet that houses dampers, filters and blower in one cabinet. An optional Evaporative Cooling unit with 8 or 12" media may also be included with "Standard" blower type arrangements. The "High-CFM" arrangements utilize separate cabinet sections: a Damper/Filter cabinet with a "V" bank filter layout and a blower cabinet. An additional Cooling Coil cabinet capable of up to 20 tons and a CFM range of 1,600 – 6,300 (0.8 – 3.0 m³/s) is available to be added to certain "High-CFM" type units. This coil cabinet may also be suitable for installations of heating coils.

Both "Standard" and "High-CFM" Air Handle arrangements may also include a downturn Supply Air Plenum, Outside Air Intake Hood (with standard bird screen or optional moisture eliminators) and a Roof Curb. All arrangements are rail mounted.

Control and other electrical components are located in the main electrical cabinet. This cabinet is located out of the air stream as part of the blower transition at the discharge end of the unit (between the blower cabinet and Supply Air Plenum, if selected). For your safety and convenience, all Sterling Packaged Rooftop Air Handler Units include 24 Volt control circuit, 24 Volt in line Circuit Breaker, Blower Door Interlock Switch with Terminal Block Wiring.

All cabinets are constructed of rugged 18 ga. material and painted Cloud gray. Cabinet design includes hinged access doors, water tight sealed seams, insulated blower, filter and plenum sections and down-rolled (hat type) rails that mount tightly over roof curbs – all to ensure reliability and serviceability. In addition to standard convenience features, many accessory options such as Variable Frequency Drives, Remote Control Panel and Through the Base Utility Penetrations are available to increase application versatility.

Features and Benefits

- ETL UL-1995 Certified Packaged Units.
- CFM Ranges from 1,500 - 14,000 CFM.
- 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 and/or Cooling Coil Cabinet with Stainless Steel Drain Pan.
- Evaporative Cooling with standard 8 or optional 12" media (203 or 305 mm).
- Standard Insulated Roof Curbs (Optional Uninsulated Roof Curbs Available).
- Vibration Isolation Roof Curbs.
- Seismic Rated Roof Curbs.
- Adapter Roof Curbs.
- 18 ga. Cabinets, Painted Cloud Gray.
- 1 in. Washable Filters.
- Blower Door Safety Interlock Switch.
- Reverse Air Flow Safety Switch.
- 24 Volt Circuit Breaker.
- Printed Circuit Main Connection Board.
- Wiring Harnesses with Stamped Wire Numbers.
- Multiple Control Packages.

Engineered Products Unit Number Description

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

(Internal Use Only)

1, 2 - Unit Type [UT]

AH - Air Handler

3, 4 - Capacity [CA]

20 - Size 20 Cabinet
40 - Size 40 Cabinet

5 - Furnace Type/Access Side [FT]

A - Right Hand
B - Left Hand

Note: Right or left hand access is determined by facing the air inlet end of the unit.

6 - Furnace Material [FM]

0 - None

7 - Rooftop Arrangement [RA]

M - Air Handler (Standard)
N - Air Handler (Standard) / Plenum
P - Air Handler (Standard) / Evap. Cooling
R - Air Handler (Standard) / Evap. Cooling / Plenum
S - Air Handler (High CFM)
T - Air Handler (High CFM) / Plenum
U - Air Handler (High CFM) / Coil Cabinet
W - Air Handler (High CFM) / Coil Cabinet / Plenum
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

9 - Gas Type [GT]

0 - None

10 - Gas Control [GC]

0 - None

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/Magnetic Starter
K - 3/4 HP. w/Magnetic Starter
L - 1 HP. w/Magnetic Starter
M - 1-1/2 HP. w/Magnetic Starter
N - 2 HP. w/Magnetic Starter
P - 3 HP. w/Magnetic Starter
R - 5 HP. w/Magnetic Starter
S - 7-1/2 HP. w/Magnetic Starter
T - 10 HP. w/Magnetic Starter
U - 15 HP. w/Magnetic 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) (Horiz. Inlet)
2 - Outside Air w/Air Hood (Horiz. Inlet)
3 - Bottom Return Air (RA)
4 - Outside Air and Return Air (OA/RA)
5 - Outside and Return Air w/Air Hood
0 - None
Z - Other

15 - Air Control & Damper Arrangement [AC]

A - Outside Air 2 Pos. Motor / Spring Return
B - Return Air 2 Pos. Motor / Spring Return
C - OA/RA 2 Pos. / Spring Return
D - OA/RA Mod. Mtr. w/Mixed Air Control / Min. Pot.
E - OA/RA Mod. Mtr. w/Mixed Air Control / Min. Pot. / SR
G - OA/RA Mod. Mtr. w/Mixed Air Control
H - OA/RA Mod. Mtr. w/Mixed Air Control / SR
J - OA/RA Mod. Mtr. w/Min. Pot.
K - OA/RA Mod. Mtr. w/Min. Pot. / SR
L - OA/RA Mod. Mtr. w/Dry Bulb / Mixed Air Control / Min. Pot.
M - OA/RA Mod. Mtr. w/Dry Bulb / Mixed Air Control / Min. Pot. / SR
N - OA/RA Mod. Mtr. w/Enthalpy Controlled Economizer / SR
P - OA/RA Mod. Mtr. w/Pressure Control (Space Pressure)
Q - OA/RA Mod./Carbon Dioxide (CO₂) R/A Monitor
R - OA/RA Mod. Mtr. w/S-350-P Proportional Mixed Air Control / SR
S - OA/RA Mod. Mtr. w/0-10 VDC & 4-20 mA Analog Input (External Input)
T - OA/RA Mod. Mtr. w/0-10 VDC & 4-20 mA Analog Input / SR (External Input)
U - ASHRAE Cycle I (OA/RA 2 Pos. Mtr. w/Warm-up Stat / SR)
W - ASHRAE Cycle II (OA/RA Mod. Mtr. w/Warm-up Stat / Mixed Air / Min. Pot. / SR)
X - ASHRAE Cycle III (OA/RA Mod. Mtr. 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
B1 - Filters - 1" WA (Standard)
B2 - Filters - 2" WA
B3 - Filters - 2" TA
B4 - Filters - 1" 30%
B5 - Filters - 2" 30%
C1 - Evap. Cooler - Fill & Drain Kit
C2 - Evap. Cooler - 12" CELdek[®] Media
C3 - Evap. Cooler - Freezestat
C4 - 8" GLASdek[®] Media
C5 - 12" 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
G1 - Thermostat - T87K w/Subbase†
G2 - Thermostat - T87K w/Subbase & Guard†
G3 - Thermostat - T834N w/Subbase (Sterling Stat)†
G4 - Thermostat - TB8220U - 7 Day Programmable†
G5 - Thermostat - TH5220D (Two Stage)†
G6 - Locking Thermostat Cover†
H1 - Return Firestat
H2 - Supply Firestat
H3 - Time Delay Freezestat
H4 - Ambient Lockout
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
K3 - Status Lamp (Elec. Cabinet)
K5 - Air Flow Prove Switch†
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†
N2 - Through the Base Utility Penetration
N3 - Service Convenience Package
N6 - Doublewall 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)
Note: All thermostats are Mercury free.

† = Field Installed

Air Handler [AH] Selection

The following section contains stand-alone "Air Handler" information. It is necessary to complete the first 7 digits of the model from this section then refer to page 16 - 25 for model digits 8 - 16+.

Model Number items that do not apply, such as Gas Type [GT] digit 9 and Gas Control [GC] digit 10, need to be filled in with a "0-none" selection.

Select Unit Type
Unit Type [UT] Digits 1&2
AH - Air Handler

Select Capacity
Capacity [CA] Digit 3,4
20 - Size 20 Cabinet
40 - Size 40 Cabinet

Furnace Type/Access Side
Furnace Type [FT] Digit 5
A - Right Hand
B - Left Hand

Select Furnace Material
Furnace Material [FM] Digit 6
0 - None

Select Rooftop Arrangement
Rooftop Arrangement [RA] Digit 7

See below for Rooftop Arrangement [RA] digit 7 Air Handlers Information

Packaged Rooftop Arrangements

Air Handler [AH]

Unit Type [UT] Model Digits 1&2

Rooftop Arrangement [RA] Model Digit 7

Sterling Packaged Rooftop Units are ETL certified to UL-1995 standard for heating cooling and ventilating equipment. Units are available in one of 8 standard arrangements (Rooftop Arrangements [RA], Model digit 7). Air Handler units (Unit Type [UT] "AH") are suitable for commercial, institutional and industrial applications where external system pressure losses are as high as 3" W.C.

Rooftop Arrangements are divided into two classifications "Standard" and "High-CFM" Blower types. The "Standard" Air Handler units (Rooftop Arrangement [RA] "M,N,P,R") have a CFM range of 1,500 - 8,000 CFM (0.7 - 4.0 m³/s). The Standard Air Handler arrangement consists of a blower cabinet that houses dampers, filters and blower in one cabinet; an optional Evaporative cooling unit with standard 8 or optional 12" media may also be included.

The "High-CFM" Air Handler Units (Rooftop Arrangement [RA] "S & T") have a range of 3,000-14,000 CFM (1.4 - 6.6 m³/s). High CFM Air Handler units utilize a separate Damper/Filter cabinet with a "V" bank filter arrangement and a blower cabinet. Rooftop Arrangements "U & W" include an additional Cooling Coil cabinet capable of up to 20 tons and a CFM range of 1,600 - 6,300 (0.8 - 3.0 m³/s). This coil cabinet may also be suitable for field installations of heating coils.

Both "Standard" and "High-CFM" Air Handler arrangements may also include a downturn Supply Air Plenum, Outside Air Intake Hood with standard bird screen or optional moisture eliminators and a Roof Curb. All arrangements are rail mounted.

For your safety and convenience all Sterling Packaged Air Handler Units include a 24 Volt control circuit, 24 Volt in line Circuit Breaker, Blower Door Interlock Switch with Terminal Block Wiring. All wiring is processed at our factory as harness assemblies and each wire is permanently stamped with it's wire number.

All Cabinets are constructed of rugged 18 ga. material and painted Cloud gray. The modular design of the cabinetry ensures reliability as well as serviceability with hinged access doors, water tight sealed seams, insulated blower filter and plenum cabinets and down-rolled (hat type) rails that mount tightly over the roof curb.

Rooftop Arrangements [RA]

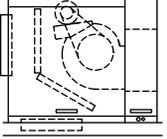
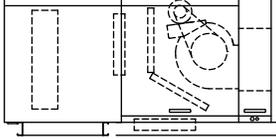
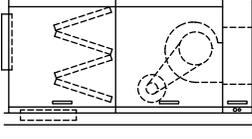
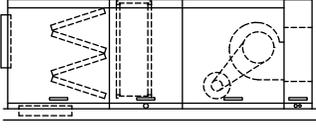
- M - Air Handler (STANDARD)
- N - Air Handler (STANDARD) / Plenum
- P - Air Handler (STANDARD) / Evap. Cooling
- R - Air Handler (STANDARD) / Evap. Cooling / Plenum
- S - Air Handler (HIGH-CFM)
- T - Air Handler (HIGH-CFM) / Plenum
- U - Air Handler (HIGH-CFM) / Coil Cabinet
- W - Air Handler (HIGH-CFM) / Coil Cabinet / Plenum



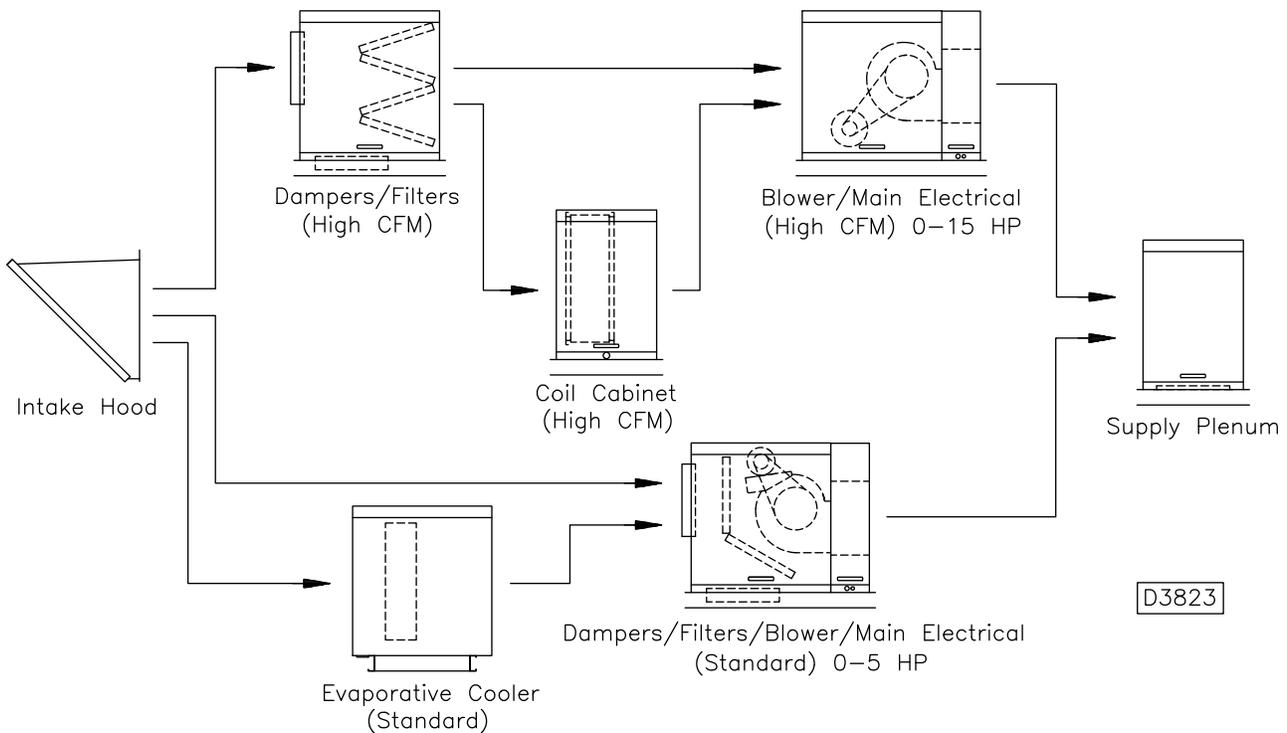
Air Handler

Packaged Rooftop Arrangement Reference

Air Handlers, Unit Type [UT] (AH)

<p>Standard Blower Rooftop Arrangements M, N</p>  <p>Capacity 20, 40 20 - 1,500-6,000 CFM, 1/2-5 HP. 40 - 4,000-8,000 CFM, 1/2-5 HP.</p> <p>ESP. 0.1 - 3.0 in. WC. Tables 1, 3</p>	<p>Standard Blower w/Evap. Rooftop Arrangements P, R</p>  <p>Capacity 20, 40 20 - 1,500-6,000 CFM, 1/2-5 HP. 40 - 4,000-8,000 CFM, 1/2-5 HP.</p> <p>ESP. 0.1 - 3.0 in. WC. Tables 1, 3</p>	<p>High CFM Blower Rooftop Arrangements S, T</p>  <p>Capacity 20, 40 20 - 3,000-8,000 CFM, 3/4-10 HP. 40 - 5,000-14,000 CFM, 3/4-15 HP.</p> <p>ESP. 0.1 - 3.0 in. WC. Tables 2, 4</p>	<p>High CFM Blower w/Cooling[*] Rooftop Arrangements U, W</p>  <p>Capacity 20, 40 20 - 1,600-4,400 CFM, 3/4-10 HP. 40 - 2,100-6,300 CFM, 3/4-15 HP.</p> <p>ESP. 0.1 - 3.0 in. WC. Tables 2, 4</p>
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* The maximum CFM for Rooftop Arrangements U and W 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/s).



Accessory Pressure Loss – Table 1

Rooftop Arrangements (M,N,P,R)

B/F/D	E
-------	---

PRESSURE LOSS (INCHES OF WATER)												
Capacity	CFM	Rainhood		Filters					Supply Air Plenum	Evaporative Media		Return or Outside Air Damper
		With Screen	Mstr.Elim.	Throwaway	Washable		Pleated			8"	12"	
				2"	1"	2"	1"	2"				
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
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

Accessory Pressure Loss – Table 2

Rooftop Arrangement (S,T,U,W)

F/D	B	E
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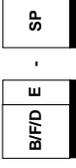
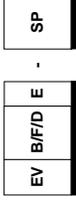
F/D	CC	B	E
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PRESSURE LOSS (INCHES OF WATER)											
Capacity	CFM	Rainhood		FILTERS					Supply Air Plenum	Return or Outside Air Damper	
		With Screen	Mstr.Elim.	Throwaway	Washable		Pleated				
				2"	1"	2"	1"	2"			
20	1,600	.02	.02	.03	<.01	<.01	.03	.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	
	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	

Note: Refer to Table 5 for DX Cooling Coil and Table 6 for Chilled Water Coil Pressure Losses (Rooftop Arrangements U,W).

Air Handler Performance — Table 3

Rooftop Arrangement [RA] (M,N,R,P)



Total Static Pressure (Inches of Water)

Capacity CFM	0.2		0.4		0.6		0.8		1		1.2		1.4		1.6		1.8		2		2.2		2.4		2.6		2.8		3					
	RPM	BHP	RPM	BHP																														
1,500	395	0.12	530	0.19	645	0.27	750	0.35	845	0.44	930	0.54	1010	0.65	1085	0.76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2,000	435	0.22	550	0.3	655	0.4	750	0.49	835	0.59	915	0.7	995	0.81	1065	0.93	1135	1.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,000	555	0.61	630	0.71	710	0.83	790	0.96	865	1.09	935	1.23	1000	1.37	1065	1.51	1125	1.66	1180	1.81	1240	1.96	1295	2.12	1350	2.28	1405	2.45	1455	2.62	-	-	-	-
4,000	700	1.33	750	1.47	805	1.61	865	1.75	930	1.9	990	2.07	1045	2.25	1105	2.43	1160	2.61	1210	2.8	1260	2.98	1310	3.17	1360	3.35	1405	3.54	1455	3.74	-	-	-	-
5,000	855	2.51	890	2.68	930	2.85	975	3.02	1020	3.19	1070	3.37	1120	3.55	1170	3.75	1220	3.96	1265	4.18	1310	4.4	1360	4.63	1400	4.86	-	-	-	-	-	-	-	-
5,500	935	3.3	965	3.49	1000	3.67	1040	3.86	1080	4.05	1120	4.24	1165	4.43	1210	4.63	1255	4.84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6,000	1015	4.25	1040	4.45	1075	4.65	1110	4.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,000	450	0.46	565	0.64	670	0.82	760	1.01	845	1.22	930	1.43	1005	1.66	1075	1.9	1140	2.15	1205	2.42	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5,000	510	0.79	605	0.99	700	1.21	785	1.44	860	1.67	935	1.91	1005	2.16	1070	2.42	1135	2.69	1200	2.97	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6,000	575	1.28	655	1.49	740	1.73	815	2	885	2.28	955	2.56	1020	2.84	1085	3.12	1140	3.41	1200	3.71	1255	4.02	1315	4.34	1365	4.67	1420	5	-	-	-	-	-	-
7,000	650	1.95	715	2.19	785	2.44	855	2.73	920	3.04	985	3.36	1045	3.68	1105	4	1160	4.33	1215	4.66	1270	4.99	-	-	-	-	-	-	-	-	-	-	-	-
8,000	725	2.83	780	3.1	840	3.38	905	3.67	965	3.99	1025	4.34	1080	4.71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

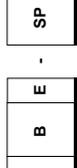
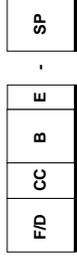
NOTES: 1. Refer to Table 1, page 7 for Accessory Pressure Loss(es).

2. Brake horsepower (BHP) includes drive losses.

3. "Total External Pressure (TSP)" is the sum of the units' Internal Accessory pressure loss(es) from Table 1 **plus** the external static pressure.

Air Handler Performance — Table 4

Rooftop Arrangement [RA] (S,T,U,W)



The maximum CFM for Rooftop Arrangements U and W Cooling Coil 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/s).

Total Static Pressure (Inches of Water)

Capacity CFM	0.2		0.4		0.6		0.8		1		1.2		1.4		1.6		1.8		2		2.2		2.4		2.6		2.8		3					
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP		
3,000	455	0.52	495	0.6	550	0.7	610	0.82	670	0.93	730	1.06	785	1.21	840	1.37	890	1.53	940	1.69	985	1.86	1030	2.02	1075	2.19	-	-	-	-	-	-		
4,000	575	1.13	610	1.24	645	1.35	680	1.47	720	1.61	760	1.76	810	1.92	855	2.07	900	2.23	940	2.4	985	2.58	1025	2.78	1070	2.9	1110	3.2	1150	3.41	-	-	-	-
5,000	695	2.11	730	2.27	760	2.41	790	2.55	815	2.68	840	2.83	870	2.99	905	3.17	940	3.36	975	3.56	1015	3.76	1050	3.95	1085	4.15	1120	4.35	1155	4.55	-	-	-	-
6,000	820	3.54	850	3.75	880	3.94	905	4.12	930	4.28	950	4.44	975	4.6	995	4.77	1020	4.96	1045	5.15	1070	5.36	1100	5.59	1130	5.82	1160	6.06	1190	6.3	-	-	-	-
7,000	945	5.51	975	5.78	1000	6.02	1025	6.24	1050	6.45	1070	6.64	1090	6.83	1105	7.02	1125	7.21	1145	7.4	1165	7.6	1185	7.81	1205	8.04	1225	8.28	1250	8.52	-	-	-	-
7,500	1005	6.74	1035	7.03	1060	7.3	1085	7.54	1110	7.77	1130	7.99	1150	8.19	1165	8.4	1185	8.59	1200	8.8	1215	9	1235	9.21	1255	9.43	1270	9.66	1290	9.91	-	-	-	-
8,000	1070	8.13	1095	8.45	1125	8.74	1145	9.01	1170	9.27	1190	9.5	1210	9.73	1225	9.95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
5,000	405	0.67	465	0.84	540	1.03	610	1.25	675	1.5	740	1.77	800	2.04	855	2.31	905	2.59	955	2.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6,000	470	1.08	510	1.26	570	1.48	630	1.71	690	1.95	745	2.22	800	2.53	855	2.85	905	3.17	955	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8,000	595	2.4	630	2.62	665	2.84	700	3.1	745	3.39	790	3.71	835	4.02	880	4.33	925	4.66	965	5.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10,000	730	4.52	760	4.81	785	5.07	810	5.34	840	5.64	870	5.96	900	6.31	935	6.7	975	7.1	1010	7.49	1045	7.88	1085	8.27	1120	8.66	-	-	-	-	-	-	-	-
12,000	860	7.64	890	8.01	915	8.35	935	8.67	960	8.99	980	9.32	1000	9.66	1025	10.04	1050	10.44	1080	10.88	1110	11.33	1140	11.8	1170	12.28	-	-	-	-	-	-	-	-
14,000	995	11.97	1020	12.41	1045	12.83	1065	13.22	1085	13.6	1105	13.97	1120	14.34	1140	14.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

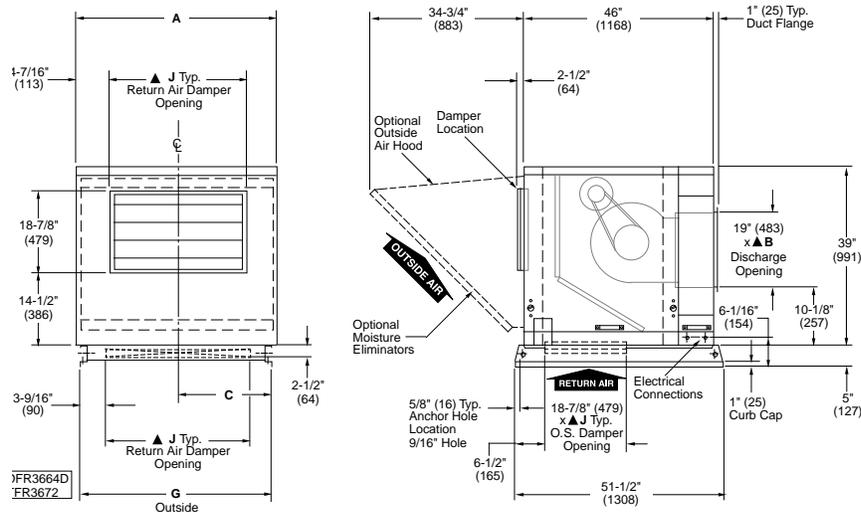
NOTES: 1. Refer to Table 2, page 7 for Accessory Pressure Loss(es).

2. Brake horsepower (BHP) includes drive losses.

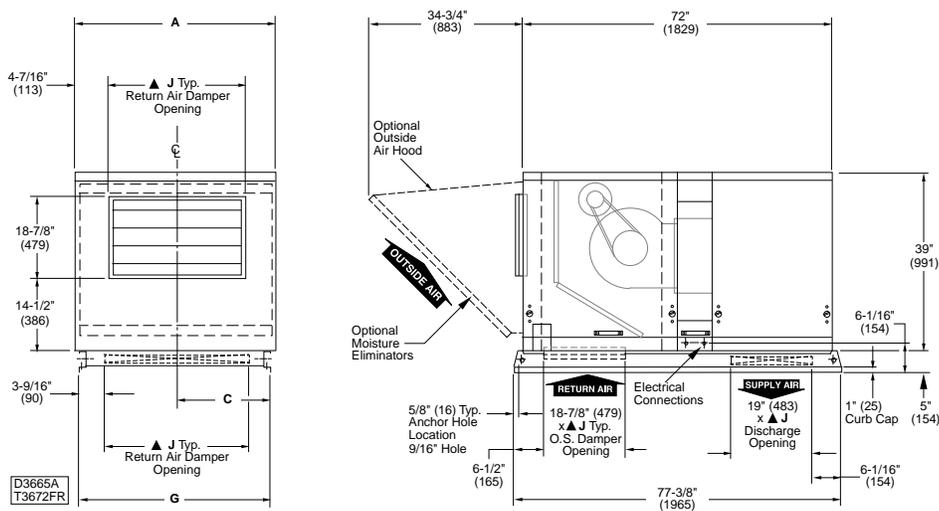
3. "Total External Pressure (TSP)" is the sum of the units' Internal Accessory pressure loss(es) from Table 2 **plus** the external static pressure.

Dimensional Data — Air Handlers

Rooftop Arrangement [RA] “M” Capacities [CA] 20 or 40 Unit Sizes (Right hand service access shown)



Rooftop Arrangement [RA] “N” Capacities [CA] 20 or 40 Unit Sizes (Right hand service access shown)



Capacity	A	B	C	G	▲J
20	43- 7/8 (1114)	23-13/16 (605)	21-15/16 (557)	42- 1/16 (1068)	35 (889)
40	60- 3/8 (1534)	45-13/16 (1164)	30- 3/16 (767)	58- 9/16 (1487)	51- 1/2 (1308)

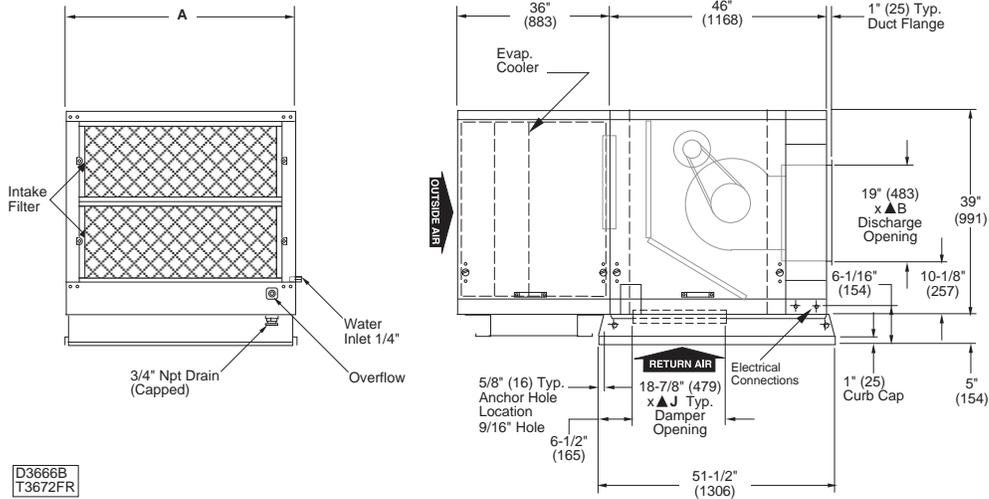
NOTES: Dimensions are in inches. Dimensions in parenthesis are in millimeters.

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

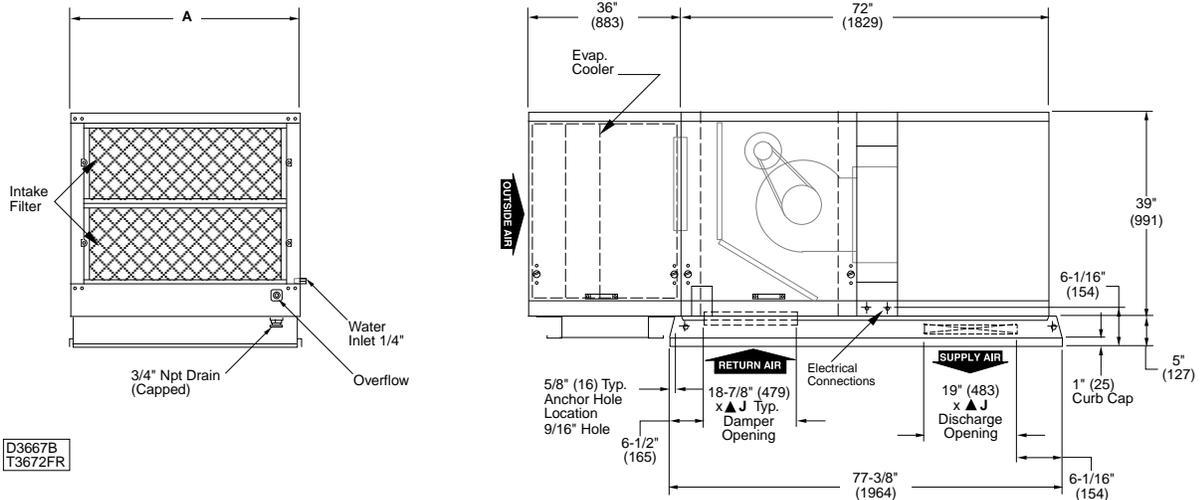
▲ “J” Dimension is also an inside dimension for the supply air opening (without damper).

Dimensional Data — Air Handlers

Rooftop Arrangement [RA] "P" Capacities [CA] 20 or 40 Unit Sizes (Right hand service access shown)



Rooftop Arrangement [RA] "R" Capacities [CA] 20 or 40 Unit Sizes (Right hand service access shown)



Capacity	A	B	C	G	▲J
20	43- 7/8 (1114)	23-13/16 (605)	21-15/16 (557)	42- 1/16 (1068)	35 (889)
40	60- 3/8 (1534)	45-13/16 (1164)	30- 3/16 (767)	58- 9/16 (1487)	51- 1/2 (1308)

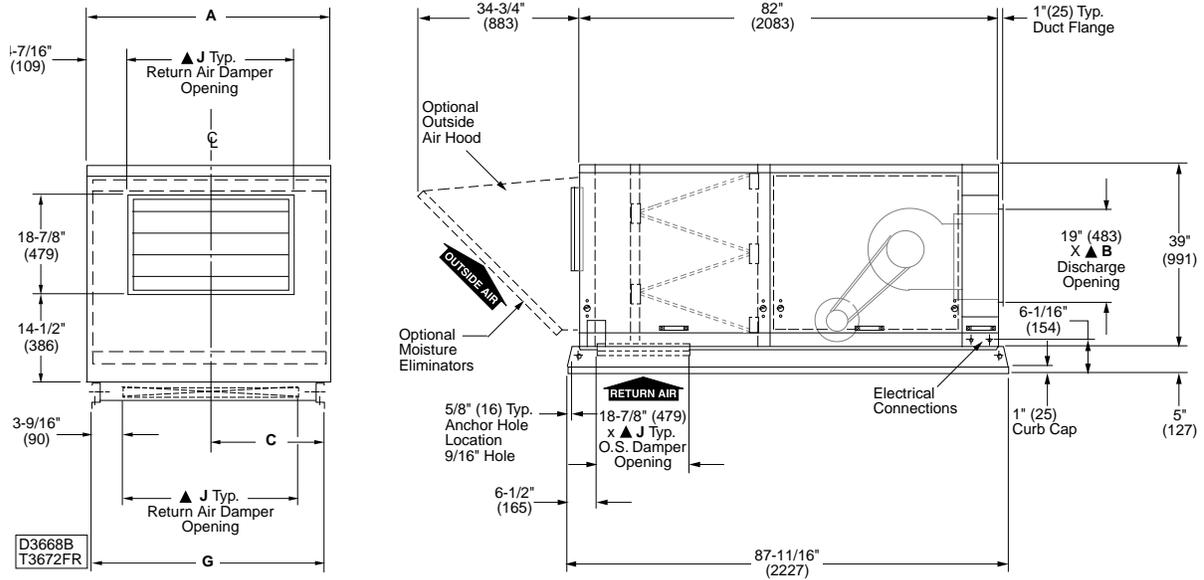
NOTES: Dimensions are in inches. Dimensions in parenthesis are in millimeters.

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

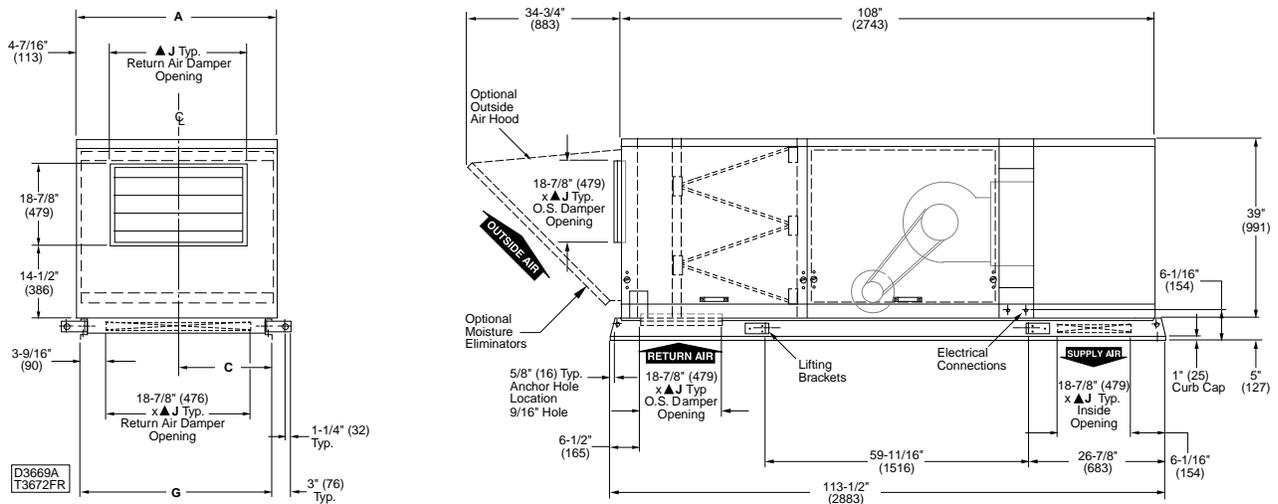
▲ "J" Dimension is also an inside dimension for the supply air opening (without damper).

Dimensional Data — Air Handlers

Rooftop Arrangement [RA] "S" Capacities [CA] 20 or 40 Unit Sizes (Right hand service access shown)



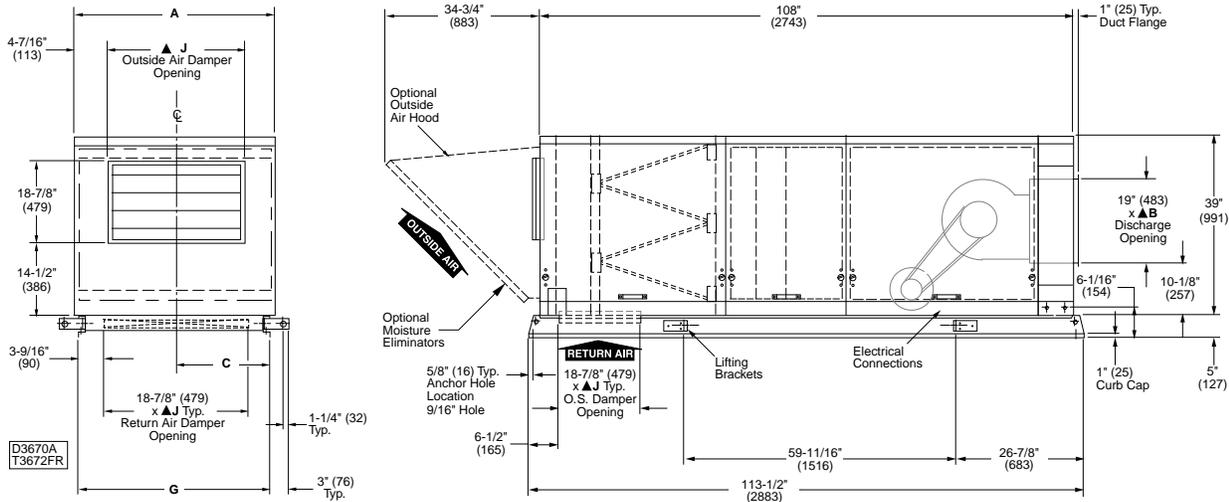
Rooftop Arrangement [RA] "T" Capacities [CA] 20 or 40 Unit Sizes (Right hand service access shown)



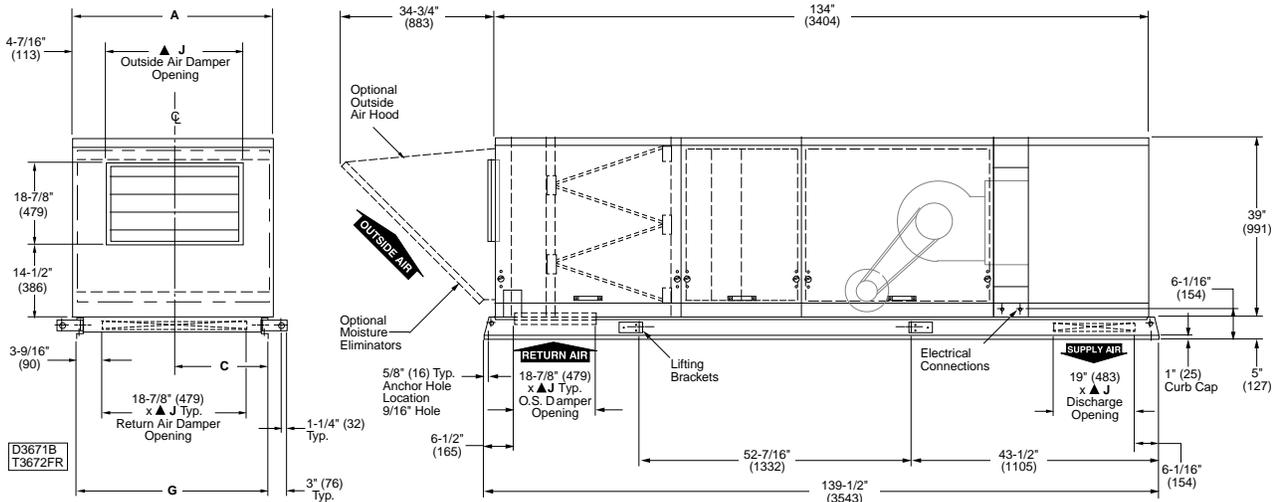
Refer to page 10 for tabulated dimensional data.

Dimensional Data — Air Handlers

Rooftop Arrangement [RA] “U” Capacities [CA] 20 or 40 Unit Sizes (Right hand service access shown)



Rooftop Arrangement [RA] “W” Capacities [CA] 20 or 40 Unit Sizes (Right hand service access shown)



Capacity	A	B	C	G	▲J
20	43- 7/8 (1114)	23-13/16 (605)	21-15/16 (557)	42- 1/16 (1068)	35 (889)
40	60- 3/8 (1534)	45-13/16 (1164)	30- 3/16 (767)	58- 9/16 (1487)	51- 1/2 (1308)

NOTES: Dimensions are in inches. Dimensions in parenthesis are in millimeters.

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

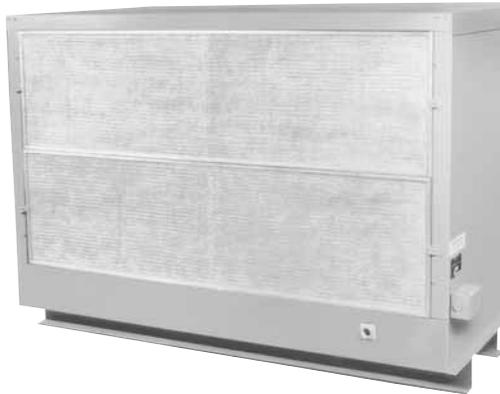
▲ "J" Dimension is also an inside dimension for the supply air opening (without damper).

Evaporative Cooling

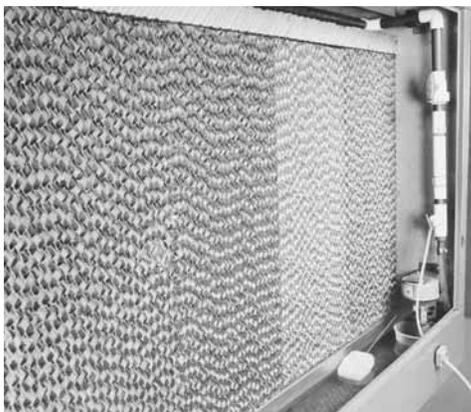
Rooftop Arrangement [RA] (P,R)

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.

Evaporative Coolers are also combined in Air Handler Unit Arrangements P and R. The Evaporative Cooler will replace the need for a 100% Outside Air Inlet Hood. If an Evaporative Cooler is to be installed upstream of a duct furnace, a 409 stainless steel heat exchanger is 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" depth media; a 2" distribution pad is included 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 Accessory [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. U.L. 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" aluminum mesh to remove insects, dust, and dirt from airflow.
- **Skid Rails** - With lifting and anchor holes. Optional adjustable platform curb assembly available, shipped separately (see Roof Curb Section).

Evaporative Cooling Unit

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°.

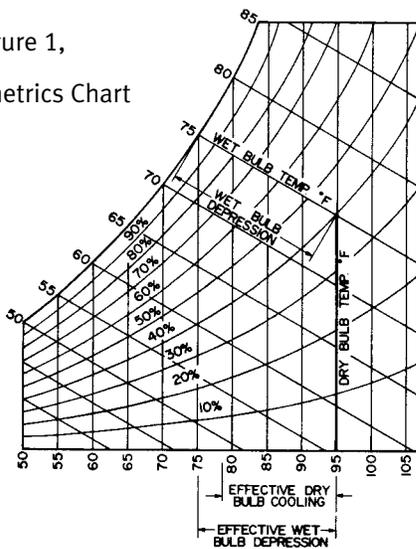
The efficiency of the Sterling Evaporative Cooler is determined by a variety of factors: geographical location, application, air change requirements, sufficient water supply, air flow, and maintenance. In most instances, efficiency is expected to be between 77% and 88%. Heat gains in the distribution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

Use the psychometrics 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,
Psychometrics Chart



Selection Method

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

- A. Using Figure 2, choose the geographical zone in which the unit is to be installed.
- B. Determine the internal load within the structure:

Normal Load: structures with normal people loads, and without high internal heat gains.

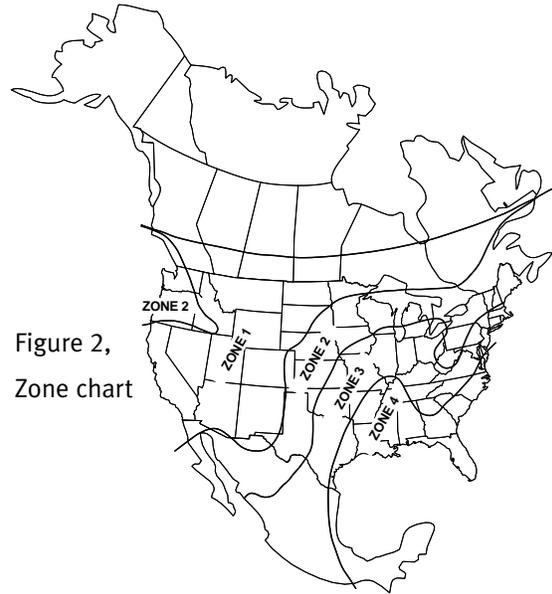


Figure 2,
Zone chart

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

- C. 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.
- D. Using table below, determine the required air changes per minute based on zone selection and the type of heat load.
- E. 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.

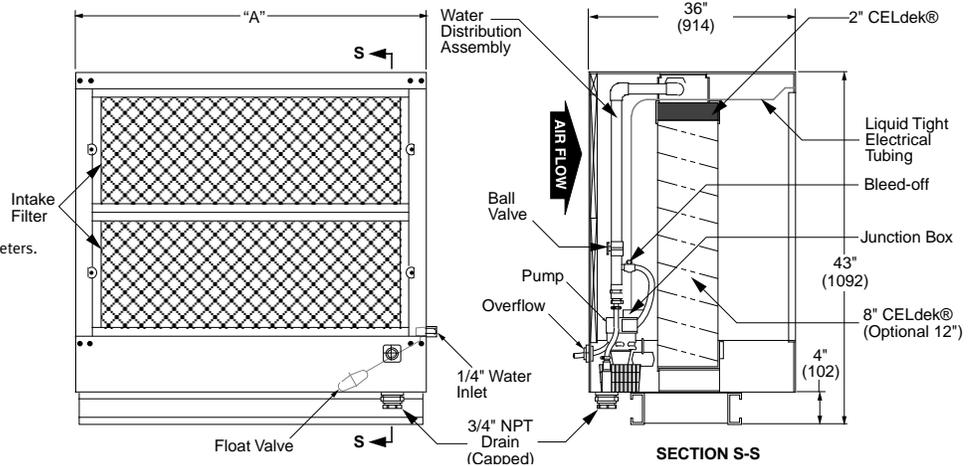
Air Changes Per Minute Table				
Type Heat Load	Zone			
	1	2	3	4
High Load/ High Gain	3/4	1	1-1/3	2
High Load/Normal Gain	1/2	3/4	1	1-1/3
Normal Load/High Gain	1/2	3/4	1	1-1/3
Normal Load/Normal Gain	1/2	1/2	3/4	1

Evaporative Cooling Unit

Capacity (CA)	A
20	43- 7/8 (1114)
40	60- 3/8 (1534)

NOTES:
Dimensions are in inches.
Dimensions in parenthesis are in millimeters.

D3673A



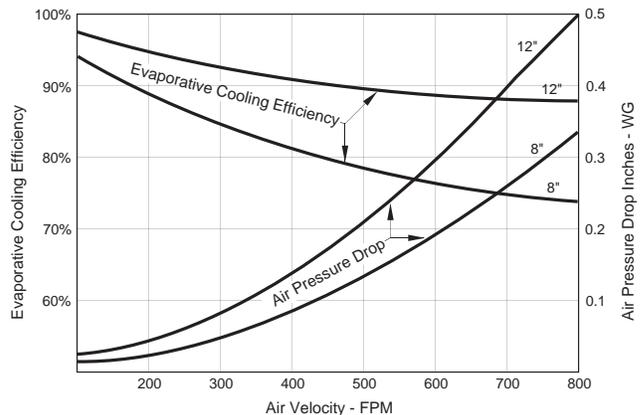
Performance and Dimensional Data

Capacity 20, 40	CFM		8" Saturation Efficiency Range		12" Saturation Efficiency Range		8" or 12" Media Face Area		Pressure Drop in. W.C. (KPa)		"A" Unit Width in. (mm)	Shipping Wt.* lb. (kg)	Operating Wt.* lb. (kg)
	(cu. m/s) MIN.	(cu. m/s) MAX.	MIN	MAX.	MIN	MAX.	Ft. ² (m ²)	In. (mm)	MIN.	MAX.			
20	1,600 (0.755)	5,500 (2.596)	77	88	88	92	9.38 (0.87)	31 x 43-9/16 (787) (1106)	0.03 (0.01)	0.20 (0.05)	43 3/4 (1111)	166 (75)	386 (175)
40	3,200 (1.510)	8,500 (4.012)	77	86	87	92	12.92 (1.20)	31 x 60 (787) (1524)	0.07 (0.02)	0.28 (0.07)	60 1/4 (1530)	206 (93)	509 (231)

* These weights are for the Evaporative Cooler Module only.

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" CELdek® as standard equipment. Optional 12" CELdek®, 8" and 12" GLASdek® are also available. A 2" distribution pad is used to disperse water evenly over the media.



EVAPORATIVE COOLER EFFICIENCY/A.P.D. CHART

Cooling Coil Options

Rooftop Arrangement [RA] (U,W) Coil Options [CO] Model Digit 8

Sterling Engineered Products also offers coil cabinets and factory installed coils with our Packaged Air Handlers. As standard equipment, we offer 4 or 6 row, single or dual circuit intertwine, DX (20 tons max.) or chilled water coils. Hot water and steam heating coils are also available. 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. 62-1989. The positive drain pan is designed for side outlet drainage piping.



Please refer to tables 5 and 6 for Cooling Coil Performance Data. If a cooling coil is to be installed upstream of a duct furnace, a 409 stainless steel heat exchanger is recommended.

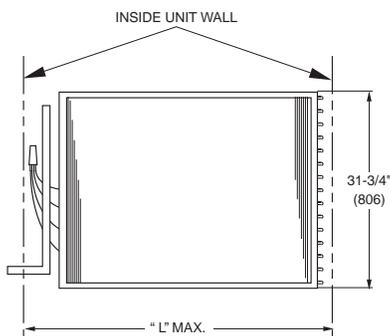
Rooftop Arrangements (U,W) should not exceed 6,300 CFM (3.0 m³/s) or face velocities of 600 FPM.

Please refer to "HVAC Engineered Products" Application Manual GEPC for detailed cooling coil selection procedure.

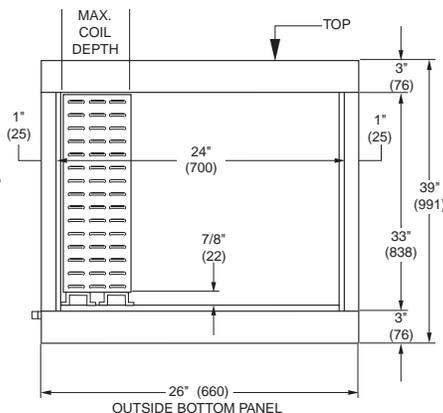
Coil Options [CO] Digit 8

- 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)

Maximum Coil Dimensions



Side Opening Of Cooling Module



Capacity (CA)	"L" Inside Max. Cabinet Openings
20	42- 1/4 (1073)
40	58-3/4 (1492)

NOTES:
Dimensions are in inches.
Dimensions in parenthesis are in millimeters.

Cooling Coil Options [CO] – Table 5

Rooftop Arrangements (U,W)

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

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)	4 Row					6 Row					
			Fin Spacing (FPF)	Coil Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. IN. W.C.	WT. (LBS.)	Fin Spacing (FPF)	Coil Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. IN. W.C.	WT. (LBS.)	
20	1600	217	72	58	56/55	0.10	80	85	70	53/52	0.18	113	
			84	62	55/54	0.11	82	104	74	52/51	0.21	119	
			104	67	54/53	0.14	86	128	78	50/50	0.23	126	
	2100	271	73	69	57/56	0.15	80	78	82	54/53	0.23	111	
			88	74	56/55	0.18	83	94	87	53/52	0.28	116	
			118	82	56/54	0.21	89	119	93	51/51	0.32	123	
	3000	407	72	88	60/57	0.29	80	80	112	55/54	0.45	111	
			95	98	58/56	0.36	84	102	122	54/53	0.56	118	
			117	106	56/55	0.41	89	122	129	53/52	0.61	124	
	4000	542	72	102	62/59	0.45	80	80	135	57/56	0.69	111	
			99	116	59/57	0.57	85	104	149	56/55	0.86	119	
			117	124	58/57	0.62	89	121	157	55/54	0.94	124	
	4400	596	85	106	62/59	0.52	82	80	143	57/56	0.79	111	
			96	120	60/58	0.64	85	106	159	56/55	1.00	119	
			129	130	58/57	0.73	91	113	163	55/55	1.03	121	
	40	3200	295	85	114	56/55	0.20	115	72	134	54/53	0.25	153
				122	127	55/54	0.21	126	90	143	52/52	0.32	161
				137	134	54/53	0.26	131	125	155	51/50	0.38	177
4000		369	82	128	58/56	0.26	114	72	157	55/54	0.37	153	
			107	143	56/55	0.33	122	90	168	54/53	0.46	161	
			131	154	55/54	0.37	129	109	177	52/52	0.51	170	
5000		464	81	145	60/58	0.37	114	87	179	56/55	0.55	160	
			107	164	57/56	0.47	122	93	196	55/54	0.66	163	
			132	178	56/55	0.52	129	109	206	54/53	0.71	170	
6000		553	81	160	61/58	0.48	114	85	200	57/56	0.72	159	
			108	182	58/57	0.61	122	100	224	55/54	0.89	166	
			126	194	57/56	0.66	127	113	233	55/54	0.94	172	
6500		599	77	163	62/59	0.53	112	80	205	58/57	0.79	156	
			105	187	59/58	0.67	121	93	229	56/55	0.96	163	
			116	196	58/57	0.71	124	105	238	55/55	1.01	168	

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)	4 Row					6 Row					
			Fin Spacing (FPF)	Coil Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. IN. W.C.	WT. (LBS.)	Fin Spacing (FPF)	Coil Capacity (MBH)	L.A.T. (DB / WB)	A.P.D. IN. W.C.	WT. (LBS.)	
20	1600	217	76	91	59/57	0.10	80	72	105	55/54	0.15	109	
			92	97	57/56	0.13	84	92	112	53/53	0.19	115	
			116	104	55/54	0.15	89	127	120	51/50	0.23	126	
	2100	271	80	106	62/59	0.17	81	72	130	56/55	0.24	109	
			91	116	59/58	0.20	84	87	137	55/54	0.27	113	
			117	123	57/56	0.23	89	104	144	53/53	0.33	119	
	3000	407	80	136	64/61	0.30	81	77	170	57/57	0.45	110	
			115	155	60/59	0.40	88	93	181	57/56	0.54	115	
			144	169	58/57	0.45	94	120	195	55/54	0.61	124	
	4000	542	83	159	67/63	0.47	82	94	205	60/59	0.81	115	
			115	184	63/61	0.60	88	97	221	59/58	0.84	117	
			141	200	61/59	0.68	94	112	232	57/57	0.91	121	
	4400	596	82	165	68/63	0.53	82	77	215	62/60	0.79	110	
			117	195	63/61	0.70	89	97	234	59/58	0.96	117	
			130	204	62/61	0.74	91	126	244	58/57	1.09	125	
	40	3200	295	86	173	60/58	0.19	115	89	206	55/54	0.32	161
				132	189	57/56	0.25	129	116	225	52/52	0.37	173
				130	200	56/55	0.26	129	147	235	51/51	0.42	187
4000		369	82	195	63/60	0.27	114	78	238	57/56	0.38	156	
			105	215	60/58	0.33	121	108	260	55/54	0.51	170	
			122	227	58/57	0.36	126	136	275	53/53	0.56	182	
5000		464	81	220	65/61	0.37	114	84	279	59/57	0.56	159	
			119	245	61/60	0.48	125	118	307	56/55	0.74	174	
			130	266	59/58	0.52	129	141	328	54/54	0.81	184	
6000		553	92	242	66/62	0.55	117	84	312	60/59	0.81	156	
			107	272	63/61	0.61	122	126	348	57/57	1.00	178	
			129	293	61/60	0.67	128	135	368	56/55	1.04	182	
6500		599	87	245	67/63	0.60	115	81	322	61/59	0.80	157	
			104	280	64/62	0.67	121	108	359	59/58	1.01	169	
			124	301	62/61	0.74	127	123	376	57/57	1.09	176	

Conversions: 2119 SCFM = 1m³/s, 196.8FPM = 1m/s, 3.412 MBH = 1kW, (°F-32) 5/9 = °C, 1 IN.W.C. = 248.8 Pa, 0.4536 kg = 1 lb.

- 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 6

Rooftop Arrangements (U,W)

Chilled Water Cooling Coil Performance Data

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

Capacity	Air Flow SCFM	Face Velocity FPM	4 Row					6 Row					
			Fin Spacing FPF	Coil Capacity MBH	L.A.T. DB / WB	A.P.D. IN. W.C.	WT. LBS.	Fin Spacing FPF	Coil Capacity MBH	L.A.T. DB / WB	A.P.D. IN. W.C.	WT. LBS.	
20	1800	243	84	78.8	53/ 52	0.14	83	84	93.5	50/ 49	0.21	113	
			90	84.0	52/ 51	0.15	86	103	98.0	49/ 48	0.24	119	
			111	90.0	51/ 50	0.17	90	123	101.2	48/ 47	0.26	125	
	3000	406	84	107.2	57/ 55	0.32	83	84	133.3	53/ 52	0.48	113	
			88	116.0	56/ 54	0.33	86	102	141.2	52/ 51	0.53	119	
			104	124.0	54/ 53	0.36	89	123	148.6	51/ 50	0.59	125	
	4300	582	84	127.5	60/ 58	0.54	83	84	163.3	55/ 54	0.82	113	
			102	138.0	58/ 56	0.60	86	103	175.0	54/ 53	0.91	119	
			124	149.0	57/ 56	0.67	91	125	186.0	53/ 52	1.00	126	
	40	2200	202	84	100.8	52/ 51	0.10	115	85	118.0	49/ 48	0.15	160
				95	105.0	52/51	0.11	119	92	120.0	48/ 48	0.16	163
				111	110.0	51/ 50	0.12	123	100	122.0	48/ 47	0.17	167
3500		322	84	136.0	55/ 54	0.22	115	84	165.4	52/ 51	0.33	159	
			102	146.0	54/ 53	0.25	121	101	174.0	50/ 50	0.37	167	
			122	155.0	53/ 52	0.27	127	125	183.0	49/ 49	0.41	178	
4900		451	84	162.5	58/ 56	0.38	115	84	203.2	54/ 53	0.56	159	
			102	175.2	56/ 55	0.42	121	102	216.0	53/ 52	0.63	168	
			124	188.1	55/ 54	0.46	127	124	228.0	52/ 51	0.69	178	
6300		580	84	181.9	60/ 58	0.54	115	84	231.0	56/ 55	0.81	159	
			104	198.0	58/ 57	0.60	121	104	249.0	54/ 54	0.89	168	
			103	213.0	57/ 56	0.60	213	125	264.0	53/ 53	0.98	178	

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

Capacity	Air Flow SCFM	Face Velocity FPM	4 Row					6 Row					
			Fin Spacing FPF	Coil Capacity MBH	L.A.T. DB / WB	A.P.D. IN. W.C.	WT. LBS.	Fin Spacing FPF	Coil Capacity MBH	L.A.T. DB / WB	A.P.D. IN. W.C.	WT. LBS.	
20	1800	243	84	111.8	57/ 55	0.14	83	84	132.8	52/ 51	0.21	113	
			101	119.0	55/ 54	0.16	86	101	138.6	50/ 50	0.24	118	
			126	127.0	53/ 52	0.18	91	123	144.0	49/ 48	0.26	125	
	3000	406	84	151.3	62/ 59	0.32	83	84	188.5	56/ 55	0.48	113	
			102	163.0	60/ 58	0.36	86	102	200.0	54/ 54	0.54	119	
			124	175.0	58/ 57	0.40	91	125	211.0	53/ 52	0.59	126	
	4300	582	84	179.2	66/ 62	0.54	83	84	230.2	60/ 58	0.81	113	
			103	195.0	64/ 61	0.60	86	104	248.0	58/ 57	0.90	119	
			126	211.0	61/ 60	0.66	91	127	264.0	46/ 55	1.00	126	
	40	2200	202	84	143.1	56/ 54	0.10	115	84	167.4	51/ 50	0.15	159
				91	147.0	55/ 53	0.11	117	93	171.0	50/ 49	0.17	163
				108	155.0	53/ 52	0.12	122	101	174.0	49/ 49	0.17	167
3500		322	84	192.1	60/ 58	0.22	115	84	234.2	54/ 53	0.33	159	
			102	206.0	58/ 56	0.25	121	102	247.0	53/ 52	0.37	168	
			124	220.0	56/ 55	0.27	127	125	259.0	51/ 51	0.41	178	
4900		451	84	228.6	64/ 60	0.38	115	84	286.6	58/ 56	0.56	159	
			103	248.0	61/ 59	0.42	121	103	306.0	56/ 55	0.62	168	
			125	266.0	59/ 58	0.45	128	125	323.0	55/ 54	0.68	178	
6300		580	84	255.4	66/ 62	0.53	115	84	326.3	60/ 59	0.79	159	
			104	279.0	64/ 61	0.59	121	105	352.0	58/ 57	0.88	169	
			126	301.0	62/ 60	0.65	128	127	374.0	57/ 56	0.98	179	

Conversions: 2119 SCFM = 1m³/s, 196.8FPM = 1m/s, 3.412 MBH = 1kW, (°F-32) 5/9 = °C, 1 IN.W.C. = 248.8 Pa, 0.4536 kg = 1 lb.

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.

Supply Voltage [SV]

Model Digit 11

The standard Supply Voltages for Sterling Engineered Products are listed below.

- | | |
|--------------------------------------------|-------------------------------------------|
| 1 - 115 VAC, Single Phase, 60 Cycle | 4 - 208 VAC, Three Phase, 60 Cycle |
| 2 - 208 VAC, Single Phase, 60 Cycle | 5 - 230 VAC, Three Phase, 60 Cycle |
| 3 - 230 VAC, Single 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 (TE)**
- 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 | M- 1 1/2 HP. with Magnetic Starter and IEC over current protection | 1 - 1 HP. with Variable Frequency Drive |
| B - 3/4 HP. with Contactor | N - 2 HP. with Magnetic Starter and IEC over current protection | 2 - 1 1/2 HP. with Variable Frequency Drive |
| C - 1 HP. with Contactor | P - 3 HP. with Magnetic Starter and IEC over current protection | 3 - 2 HP. with Variable Frequency Drive |
| D - 1 1/2 HP. with Contactor | R - 5 HP. with Magnetic Starter and IEC over current protection | 4 - 3 HP. with Variable Frequency Drive |
| E - 2 HP. with Contactor | S - 7 1/2 HP. with Magnetic Starter and IEC over current protection | 5 - 5 HP. with Variable Frequency Drive |
| G - 3 HP. with Contactor | T - 10 HP. with Magnetic Starter and IEC over current protection | 6 - 7 1/2 HP. with Variable Frequency Drive |
| H - 5 HP. with Contactor | U - 15 HP. with Magnetic Starter and IEC over current protection | 7 - 10 HP. with Variable Frequency Drive |
| J - 1/2 HP. with Magnetic Starter and IEC over current protection | | 8 - 15 HP. with Variable Frequency Drive |
| K - 3/4 HP. with Magnetic Starter and IEC over current protection | | |
| L - 1 HP. with Magnetic Starter and IEC over current protection | | |

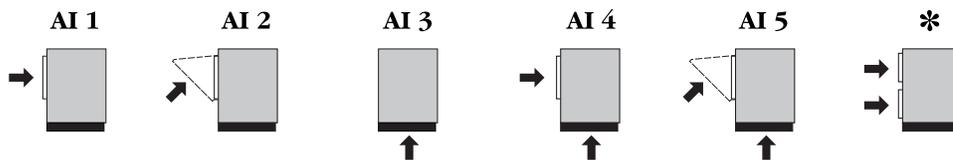
Note: Refer to Table 10, page 37 for Full Load Ampacity ratings for motors.

Air Inlet Configuration [AI]

Model Digit 14

The Air Inlet Configuration [AI] defines the entering air openings for Sterling Engineered Products. 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. Refer to accessory [AS] No. A2.



1 - Horizontal Inlet (100% Outside Air or 100% Return Air)

2 - Horizontal Inlet (100% Outside Air or 100% Return Air) with Intake Hood

3 - Bottom Return Air Opening

4 - Outside and Return Air Opening

5 - Outside and Return Air Opening with Intake Hood

*** Horizontal Outside and Return Air Openings. See Accessories Section [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.

D - Outside and Return air interlocked dampers with Modulating 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.

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.

G - Outside and Return air interlocked dampers with Modulating damper motor and Mixed air temperature control Outside and return air dampers modulate in response to the mixed air temperature setpoint.

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.

J - Outside and Return air interlocked dampers with Modulating damper motor and positioning potentiometer Outside and return air dampers open and close with respect to the setting of the positioning potentiometer.

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.

Air Control and Damper Arrangement [AC] *continued*

- L - Outside and Return air interlocked dampers with Modulating 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 set point 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.
- 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.
- 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.
- S - Outside and Return air interlocked dampers with Modulating 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 upon programmed parameters.
- 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. The 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.

A2- Horizontal Return Locates the return air opening under the outside air opening location. For units with both outside air 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 air inlet only.

Filters

B1- 1" Washable Filters (Standard)

B2- 2" Washable Filters

B3- 2" Throwaway Filters

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

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

Capacity [CA]	20	40
Rooftop Arrangement [RA] M,N,P,R (Qty.) Filter Size	(4)20 x 20	(6)20 x 20
Rooftop Arrangement [RA] S,T,U,W (Qty.) Filter Size	(8)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" CELdek® Media Optional high efficiency 12" media replaces standard 8" media.

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

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

C5 - 12" Glasdek® Optional 12" GLASdek® evaporative cooler media is available in lieu of the standard 8" 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 set points per day, field installed.

D2- 24 Hour Time Clock Provides single pole double throw (SPDT) relay output at setting time with Maximum 12 set points 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 weather resistant enclosure, field installed.
- E3- Remote Control Panel** Wall mounted and distinctively styled the “Sterling Remote Panel” offers 6 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]



AS - E3



AS - G3



AS - G4



AS - G5



AS - J2 AS - J3

- E4- Manual Blower Switch** Factory installed in the electrical cabinet to provide manual blower operation (On/Auto).

Duct and Room Thermostats

- F1- One Stage Duct Thermostat** Field installed, single pole double throw switching. 55°-175°F set point 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 set point 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. [3-1/2" W x 4-3/4" H x 1-3/8" D] Mercury free.
- G4- TB8220U Programmable Commercial Touchscreen Thermostat** Provides 7 day programmability for up to two 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°-95°F, Cooling 50-99°F [8" W x 4-5/8" H x 1-3/4" D] Mercury free.
- G5- TH5220D Two Stage Thermostat** Two stage heating and two stage cooling with system and fan switching and built in 10°F heating/cooling differential. Includes fan relay. Temperature ranges: Heating 40°-95°F, Cooling 50°-99°F [5-5/8" W x 3-1/2" H x 2-1/8" D] Mercury free.
- G6- TG511 Locking Thermostat Cover** Universal locking thermostat cover for use with all thermostats listed.

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 set point with manual reset. Factory mounted in the return air stream and set at 130°. This item is utilized as a reverse air flow switch.

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 on units with a downturn plenum and shipped loose for units with standard horizontal discharge.

H3- Time Delay Freezestat 30°-75°F setting range in 5°F increments with single pole double throw (SPDT) output. Time delay adjustment range – one minute to ten minutes in one 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 Intake air temperature sensor factory mounted for application specific control based on ambient air temperature. Control range 0°-100°F fixed 1°F differential.

Limits and Indicator Lamps

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”.

K5- Air Flow Prove Switch Field installed. A Dwyer 1910-0 pressure switch suitable for duct of plenum mounting, with a range of 0.15 - 0.5" W.C. is provided.

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 in to the Main Connection PC board in the electrical cabinet. Included with Packaged units including an evaporative cooler and outside return air dampers 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 included as standard for packaged units with 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” shipped loose unless otherwise specified.

Accessories [AS] *continued*

Disconnect Switches (NEMA-3R)

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

Convenience Accessories

N2- Through-The-Base Utility Penetrations Through the base utility penetrations allows the electric and coil connections to be passed through base and curb of the unit. This results in a reduction in the number of roof penetrations, thus enhancing the integrity of the roofing materials. Electrical and coil connections will enter the unit in the blower cabinet.

N3- 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. This accessory also includes option number N2.

N6- Double wall cabinet construction consists of a 24 gauge inner liner wall with 1" 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 ft. (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 set point, 0-10VDC or 4-20 mA signal will be sent from CO₂ sensor to VFD to modulate air flow between minimum set point and maximum CFM.

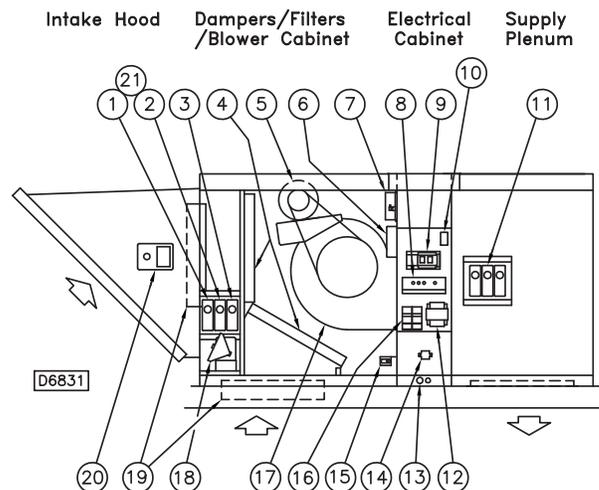
R5- CO₂ Mixed Air Factory supplied, field installed CO₂ monitor range 0 to 2,000 ppm, adjustable, for mounting in return air duct. Upon rise in CO₂ above field programmed set point, signal will drive return air damper to 100% closed and outside air damper to 100% open. 0-10VDC or 4-20 mA signal will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

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

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.

Component Locations



- | | |
|------------------------------------------------------------------|------------------------------------|
| 1. Mixed Air Controller | 10. Time Delay Freezestat |
| 2. Return Firestat | 11. Duct Thermostat |
| 3. Economizer | 12. Transformer |
| 4. Filters | 13. Electrical Wiring Inlet |
| 5. Blower Motor | 14. High Voltage Terminal Block |
| 6. Reverse Air Flow Switch | 15. Door Safety Switch |
| 7. Clogged Filter Switch | 16. Contactor |
| 8. High Voltage Barrier and Lamp and Circuit Breaker Mount | 17. Centrifugal Blower |
| 9. Main Connection Board with Fan Time Delay and Function Relays | 18. Damper Motor |
| | 19. Outside and Return Dampers |
| | 20. Enthalpy Controlled Economizer |
| | 21. Ambient Lockout |

Standard Roof Curb Kits[†]

**(RC001, RC002, RC005, RC006,
RC011 - RC013)**

Sterling roof curbs are available in various types depending upon your application needs. All curbs kits are knocked down for field assembly and are shipped separately. Curbs are typically available on a short lead time basis allowing the installer to set the curb in place prior to receiving the rooftop unit.

Standard curbs are 12" high. Factoring in the 4" unit base rail, overall height to the bottom of the rooftop unit is actually 16". All standard curbs are fully factory insulated.

Standard Rooftop Curb Kits RC002 and RC012 include an evaporative cooler platform.

†NOTE: See page 36 for Standard Roof Curb Kit Weights and Curb Kit Selection.

Uninsulated Roof Curb Kits

**(URC001, URC002, URC005, URC006,
URC011 - URC013)**

Sterling uninsulated roof curb kits are identical to the standard kits, with the exception of the insulation.

Roof Curb Ductwork

Adapter Kits

(RC016 - RC018)

Allows field installed supply and/or return duct work to be terminated at the roofcurb instead of at the unit. Can be used with any Sterling insulated or uninsulated curb.

Vibration Isolation and Seismic Curbs

Vibration isolation curbs are utilized in installations where slight rooftop vibration or noise is a concern. These curbs incorporate adjustable spring isolators into the roof curb which are specifically engineered and positioned to accommodate the rooftop unit.

Seismic curbs are designed to meet all local and federal building code seismic requirements by providing a reinforced curb constructed to allow rooftop units to be properly secured to the mounting structure and will withstand the regional seismic load.

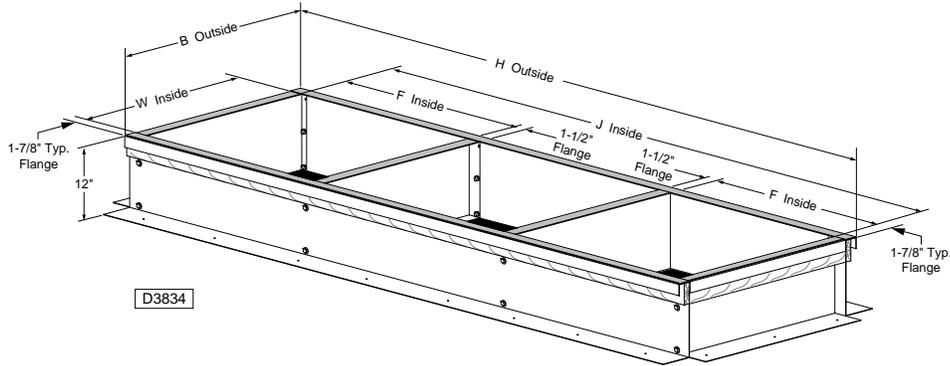
Contact Sterling for further information, including part numbers and pricing.

Adaptor Curbs

Adaptor curbs are designed for retrofit installations. With the use of an adaptor curb it is not necessary to remove the existing curb, thus eliminating extensive rooftop work, time and associated construction costs.

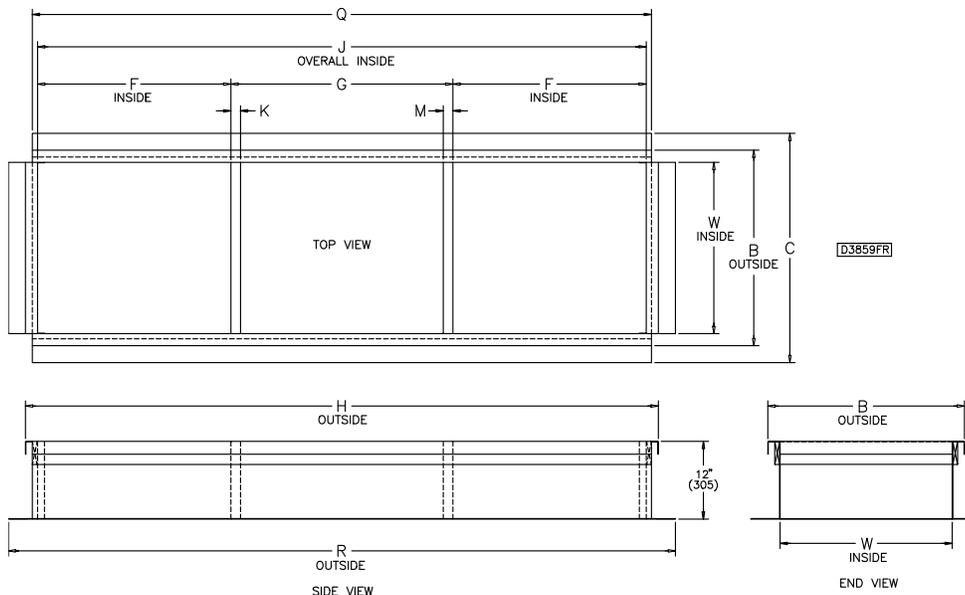
Provide us with the existing unit model number and curb dimensions and a custom adaptor curb will be supplied to accommodate the new rooftop unit.

Dimensional Data — Roof Curb Kits

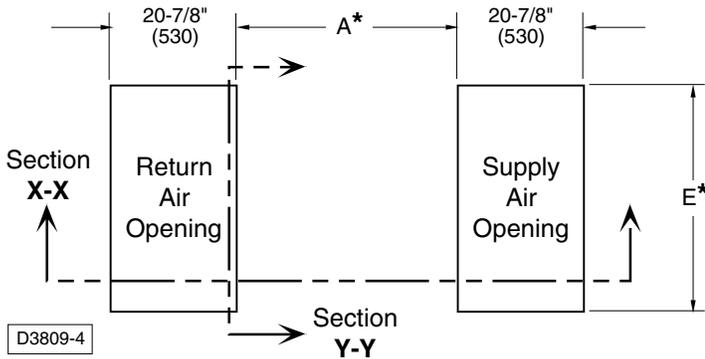


†Kit Number	Rooftop Arrangement [RA]	Capacity [CA]	F	G	H	J	Q	R	K	M
RC011*	M & P	20 or 40	N/A	N/A	45 ¹ / ₄ (1,149)	41 ¹ / ₂ (1,054)	43 ¹ / ₈ (1,095)	50 ¹ / ₂ (1,283)	N/A	N/A
RC012*										
RC001*	N & R	20 or 40	29 ⁵ / ₈ (752)	8 ¹ / ₈ (206)	71 ¹ / ₈ (1,806)	67 ⁷ / ₈ (1,711)	69 (1,753)	76 ⁷ / ₈ (1,940)	1 ¹ / ₂ (38)	1 ¹ / ₂ (38)
RC002*										
RC013*	S	20 or 40	38 ¹ / ₈ (968)	N/A	81 ⁷ / ₁₆ (2,069)	77 ¹¹ / ₁₆ (1,973)	79 ⁹ / ₁₆ (2,015)	86 ¹¹ / ₁₆ (2,202)	1 ¹ / ₂ (38)	N/A
RC006*	T & U	20 or 40	37 ³ / ₁₆ (944)	29 ³ / ₁₆ (741)	107 ⁹ / ₁₆ (2,726)	103 ⁹ / ₁₆ (2,630)	105 ³ / ₁₆ (2,672)	112 ⁹ / ₁₆ (2,859)	1 ¹ / ₂ (38)	1 ¹ / ₂ (38)
RC005*	W	20 or 40	37 ¹ / ₈ (943)	55 ¹ / ₄ (1,403)	133 ³ / ₄ (3,385)	129 ¹ / ₂ (3,289)	131 ¹ / ₄ (3,331)	138 ¹ / ₄ (3,518)	1 ¹ / ₂ (38)	1 ¹ / ₂ (38)
Curb Kit Number			W	B	C					
* -1	ALL	10, 15	26 ⁷ / ₁₆ (671)	30 ³ / ₁₆ (767)	35 ⁷ / ₁₆ (900)					
* -2	ALL	20, 25, 50	37 ⁷ / ₁₆ (951)	41 ³ / ₁₆ (1,046)	46 ⁷ / ₁₆ (1,179)					
* -3	ALL	30, 35, 60, 70	48 ⁷ / ₁₆ (1,203)	52 ³ / ₁₆ (1,325)	57 ⁷ / ₁₆ (1,459)					
* -4	ALL	40, 80, 12	53 ¹⁵ / ₁₆ (1,370)	57 ¹¹ / ₁₆ (1,465)	62 ¹⁵ / ₁₆ (1,599)					

*Curb Kit Suffix Legend	
Capacity	Suffix
20	-2
40	-4



Roof Curb Specifications



Unit Type [UT] "AH"

Capacity (CA)	E*†
20	37 (940)
40	53- 1/2 (1359)

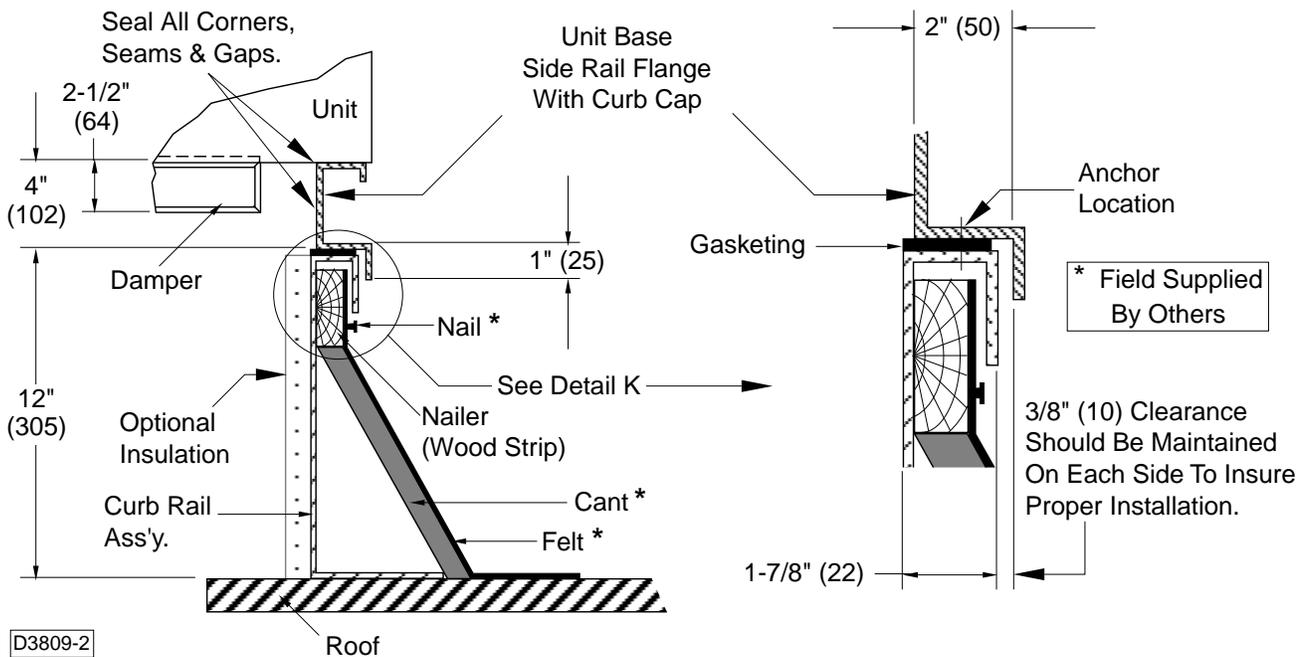
* All dimensions shown have been calculated to include a one (1) inch clearance around return and supply ducts.
 † E dimension also applies to the return air opening.

NOTES:
 Dimensions are in inches.
 Dimensions in parenthesis are in millimeters.

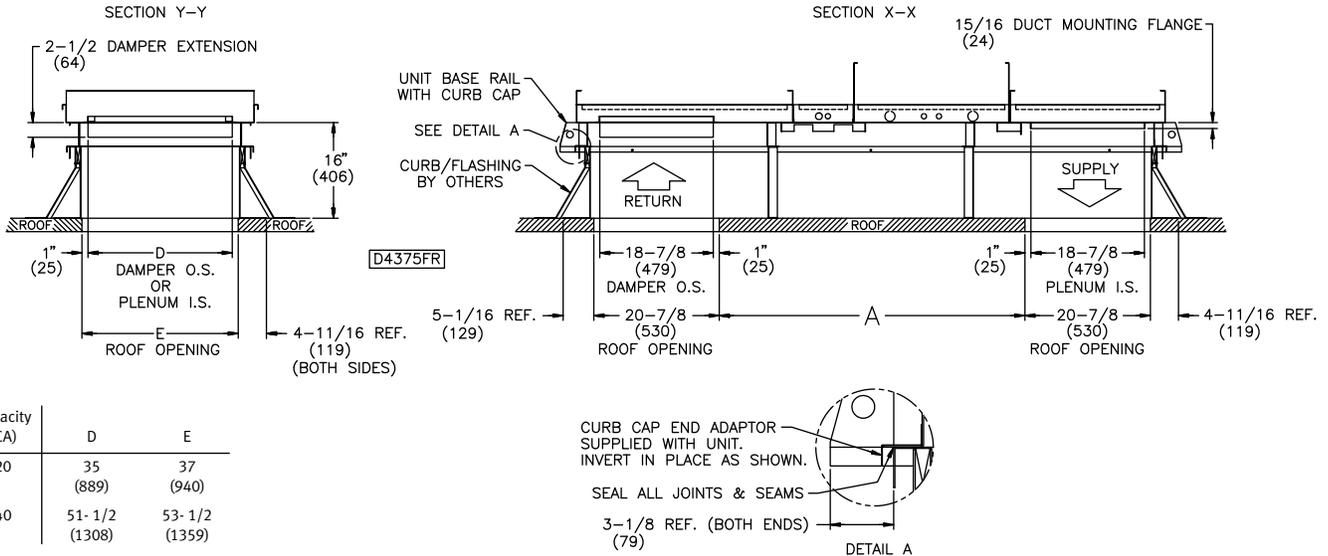
Furnace	**Rooftop Arrangement [RA]	Capacity [CA]	Unit Specifications (References)			* Dimension A	
			Blower		Coil		Supply Plenum
			Standard	High CFM			
<i>Unit Type [UT] "AH"</i>							
	N, R	20 or 40	✓			24 ⁷ / ₈ (631)	
	T	20 or 40		✓		61 ¹ / ₁₆ (1,551)	
	W	20 or 40		✓	✓	87 ⁷ / ₁₆ (2,211)	

** Rooftop Arrangements [RA] M, P, S & U are without a supply plenum. Use the same return air dimensions for these units rooftop openings. Refer to unit submittals for more detail.

Section Curb Side Rail - Detail K



Roof Curb Kit Assembly



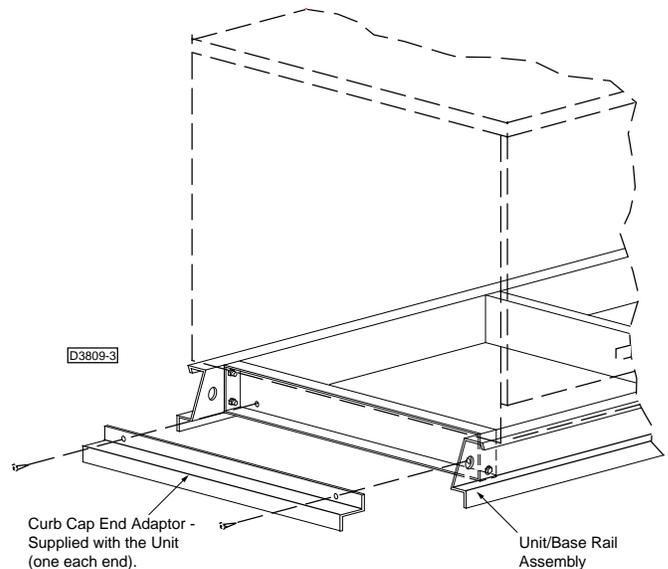
Capacity (CA)	D	E
20	35 (889)	37 (940)
40	51-1/2 (1308)	53-1/2 (1359)

NOTES:
 Dimensions are in inches.
 Dimensions in parenthesis are in millimeters.

See previous page for "A" dimensions and references to sections X-X and Y-Y.

Unit/Curb End Rail Assembly

For Field Installations: These Crossbrace/Curb Adapters (2 adapters ship with each rooftop arrangement) must be repositioned in the field when the unit is mounted on a curb or a platform (one for each end). Simply remove the screws, turn the piece over (end for end) and secure in place using the holes/hardware provided. **All joints and seams must be sealed completely in the field to prevent leaks.**



Engineered Products Specification Guide

A. General

A.1 Standards & Certifications

All units must be:

- A.1.a** ETL or UL Certified for electrical safety in compliance with UL 1995 safety standard for heating, ventilating and cooling equipment (see previous information).

A.2 Mechanical Arrangement

Rooftop unit will consist of a:

- A.2.a** Blower Section containing supply blower(s) and blower motor. The blower motor will be inter-locked electrically and disengage the blower motor and control circuit upon opening the service panel.
- A.2.b** 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.2.c** Rooftop 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.2.d** Filter Section will accommodate 1 or 2" washable, pleated high-efficiency filters, or 2" throwaway; and be of a V-bank design for minimal pressure drop.
- A.2.e** Supply plenum will be provided with down flow discharge.
- A.2.f** Return air will enter through a bottom return air opening.
- A.2.f.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.2.g** A Cooling Coil Section constructed of galvanized steel will be provided with the unit.
 - A.2.g.1** Direct Expansion (DX) Evaporator Coil certified by ARI will be provided.
 - A.2.g.2** Chilled Water Coil certified by ARI will be provided.
- A.2.h** An Evaporative Cooler with 8" CELdek® media will be provided. The Evaporative 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 re-circulating pump motor, two inch distribution pad, and corrosion resistant PVC water distribution tubes.
 - A.2.h.1** (opt.) An automatic Fill and Drain Kit will be provided for field installation.
 - A.2.h.2** (opt.) A platform Mounting Curb will be provided.
 - A.2.h.3** (opt.) High-Efficiency 12" deep CELdek® media will be provided.
 - A.2.h.4** (opt.) UL900 Class II fire rated 8" GLASdek® media will be provided.
 - A.2.h.5** (opt.) UL900 Class II fire rated 12" GLASdek® media will be provided.
- A.2.i** (opt.) The unit will mount on a factory supplied roof curb, that is shipped un-assembled with hardware package and gasket attached. Curb and rail will total 16 inches high and supplied with a cross-member which allows isolation of return and supply air streams. Curb will be:
 - (a) Insulated.
 - (b) (opt.) Spring Isolated.
 - (c) (opt.) Adapter Type.
 - (d) Seismic Rated.

A.3 Electrical Systems

- A.3.a** All electrical components and fixtures will carry UL or ETL listing, certification and/or recognition.
- A.3.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.3.c** Standard control relays will be socket mounted with terminal block connections.
- A.3.d** All high voltage wiring will be enclosed in flexible metallic sheathed BX cable and include an identifying marker corresponding to the wiring diagram.
- A.3.e** All control wiring will terminate at terminal strips (single point connection) and include an identifying marker corresponding to the wiring diagram.

A.4 Mounting

Rooftop unit will be mounted on metal rails with down-rolled outer edges with lifting and anchor holes and be suitable for slab or curb mounting.

A.5 Standard Safety Provisions

- A.5.a** Rooftop unit will be provided with a low voltage circuit breaker rated for 150% of the units normal 24 volt operating load.
- A.5.b** An access interlock switch will be installed in the blower compartment and will disengage the blower upon opening the service panel. An override or cheat switch will be incorporated into the interlock switch for serviceability.
- A.5.c** Warning labels will be visible in accessible areas of the rooftop where unsafe conditions could occur.

A.6 Optional Safety Provisions

- A.6.a** Rooftop 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.6.b** Rooftop 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.6.c** Rooftop unit will be provided with a Time Delay Freezestat with the sensing bulb located in the discharge air stream. Wired as an interlock to prevent cold air discharge.
- A.6.d** 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.

B. Cabinetry

- B.1** Cabinetry will be die-formed, 18 gauge Galvanized steel and finished in air-dry enamel.
- B.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.
- B.3** Supply Plenums and coil section (when provided) will be insulated with fire resistant, environmentally safe, odorless, one inch fiber material.

C. 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.

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D. Filter Rack

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

E. Intake Hood

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

F. 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.

G. Blower Motor

G.1 Type

G.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

G.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

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

G.2 Wiring

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

G.3 Control

Motor will be activated through a:

- (a) Relay. (std. 1/2 - 1 HP)
- (b) Contactor. (std. 1-1/2 - 5 HP)
- (c) Magnetic starter. (std. 7-1/2 - 15 HP)
- (d) Variable frequency drive. (opt.)

G.4 Motor Protection shall be provided with:

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

H. Damper Motor

H.1 Type

H.1.a Damper motor will be:

- (a) Two position with spring return.
- (b) Modulating.
- (c) Modulating with spring return.

H.1.b Motor will operate at 24 volts.

H.2 Wiring

Motor and control wiring will be harnessed with terminal block connections. Wire will have a temperature rating of at least 105°C.

I. 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 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.
- (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. 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.
- (g) 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 thermostatic controller located in the mixed air stream.
- (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 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.
- (j) Modulating motor with 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.
- (k) 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.
- (l) 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 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.
- (m) 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.
- (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 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.

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- (p) 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 pressure sensor located in the building. When the unit is off the motor will drive the outside air dampers full closed and the return air dampers full open.
- (q) 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 monoxide 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.
- (r) Modulating motor with spring return and inter-locked 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.
- (s) 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 4-20 mA or 0-10 VDC analog signal supplied by an external DDC controller.
- (t) 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 0-10 VDC 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.
- (u) 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).
- (w) 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).
- (x) 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).
- (y) Manual outside and return air dampers with manual quadrant will be provided.

J. 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) **Filters** Will consist of
 - d.1 1" Washable (Standard)
 - d.2 2" Washable (Optional)
 - d.3 2" Throwaway (Optional)
 - d.4 1" 30% Pleated (Optional)
 - d.5 2" 30% Pleated (Optional)
- (e) **Evaporative Cooler Accessories** Will include:
 - e.1 **Fill and Drain Kit** Will consist of a 3 way valve and relay for automatic fill and drain operation of the Evaporative Cooler.
 - e.2 **12" Celdek® Media** High Efficiency 12" Celdek® Media will be utilized in the Evaporative cooler.
 - e.3 **Freezestat** An automatic reset freezestat will be provided by the manufacturer to control the operation of the fill and drain kit.
 - e.4 **8" Glasdek®** Will be provided by the manufacture to conform with UL900 Class II fire rating requirements
 - e.5 **12" Glasdek®** Will be provided by the manufacture to conform with UL900 Class II fire rating requirements
- (f) **7 Day Time Clock** A 7 day time clock will be provided by the manufacturer and offer SPDT relay output and a maximum of 6 set points per day.
- (g) **24 Hour Time Clock** A 24 hour time clock will be provided by the manufacturer and offer SPDT relay output and a maximum of 12 set points per day.
- (h) **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.
- (i) **Convenience Outlet** A GFI with manual reset convenience outlet in a weather proof enclosure will be provided by the manufacturer for field installation requiring separate 115 volt service.
- (j) **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)
- (k) **Manual Blower Switch** A factory installed manual blower switch located in the electrical cabinet will be provided by the manufacturer.
- (l) **Duct Thermostats**
 - l.1 single stage duct thermostat with an operating range of 55-175°F and SPDT operation will be provided by the manufacturer.
 - l.2 two stage duct thermostat with an operating range of 55-175°F and SPDT operation will be provided by the manufacturer.
- (m) **Room Thermostats (All Mercury Free)**
 - m.1 **T87K Honeywell Thermostat w/Subbase** A single stage heating and subbase for fan on operation will be provided by the manufacturer.
 - m.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.
 - m.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.

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- m.4 **TB8220U Programmable Commercial Thermostat**
The manufacturer will provide a 7 day programmable thermostat capable of two stages of heating and two stages of cooling.
- m.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.
- m.6 **TG511 Locking Thermostat Cover** A Universal locking thermostat cover will be provided by the manufacturer.
- (n) **Return Firestat** A return firestat with a set point range of 130° - 270°F and SPDT switching capabilities will be provided by the manufacturer.
- (o) **Supply Firestat** A supply firestat with a setpoint range of 130° - 270°F and SPDT switching capabilities will be provided by the manufacturer.
- (p) **Time Delay Freezestat** A SPDT time delay freeze-stat with a set point range of 30° - 58°F and a 1 to 5 minute adjustable time delay will be provided by the manufacturer.
- (q) **Ambient Lockout** A factory mounted ambient lockout control for application specific control based on intake air temperature will be provided by the manufacturer.
- (r) **Interlock Relays**
 - r.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.
 - r.2 **24/115 Volt SPDT Relay** A relay with selectable coils voltages of 24 or 115 and SPDT 10 amp contacts will be provided by the manufacturer.
 - r.3 **24/115/230 Volt DPDT Relay** A relay with selectable coils voltages of 24, 115 or 230 and DPDT 10 amp contacts will be provided by the manufacturer.
 - r.4 **24 Volt 4PDT Relay** A relay with a coil voltage of 24 and 4PDT 10 amp contacts will be provided by the manufacturer.
- (s) **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.
- (t) **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" W.C.
- (u) **Field Installed Disconnect Switches**
 - u.1 30 amp Fused Disconnect Switch will be provided by the manufacturer to be field mounted.
 - u.2 30 amp Non Fused Disconnect Switch will be provided by the manufacturer to be field mounted.
 - u.3 60 amp Fused Disconnect Switch will be provided by the manufacturer to be field mounted.
 - u.4 60 amp Non Fused Disconnect Switch will be provided by the manufacturer to be field mounted.
- (v) **Variable Frequency Drive Options**
 - v.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.
 - v.2 **Factory Installed VFD** Will be provided by manufacturer to provide overload protection and soft start operation 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.
 - v.3 **Remote Keypad** Will be provided by manufacturer for field installation up to 100 ft. (30 Meters) from the drive. The remote keypad will duplicate the functionality of the drive's local keypad.
 - v.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 set point, 0-10VDC or 4-20 mA signal will be sent from CO₂ sensor to VFD to modulate air flow between minimum set point and maximum CFM.
 - v.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 set point, 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 set point and maximum CFM.
 - v.6 **Pressure Sensor** Will be provided by manufacturer for field installation. Pressure control range - 0.1 to +0.1" W.C. VFD will modulate motor speed based on 4-20 mA signal from pressure control sensor mounted in space to maintain field programmed set point.
 - v.7 **2-Speed VFD Relays** Factory installed DPDT relays provided to energize second speed setting. Relay coil will accept 24V, 115V and 230V.
 - v.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.
- (w) **Through – The – Base Utility Penetrations** Will be provided by the manufacturer. Electric and coil connections will enter the unit in the blower cabinet.
- (x) **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. Utility connections will be through-the-base. Through-the-base utility penetrations for the electric and coil connections will enter the unit in the blower cabinet.
- (y) **Double Wall Cabinet Construction** Will be factory installed and in accordance with the ASHRAE standard no. 62-1989. Double wall construction will be utilized in the Blower, Filtration, Coil and Down Discharge Plenum sections of the unit were applicable. 1" fiber material will be used between the cabinet walls for insulation purposes.

Approximate Unit Net and Ship Weights (lbs.) – Table 7

Air Handler Arrangements

NOTE: ALL UNIT WEIGHTS ARE LESS MOTOR, OUTSIDE AIR HOOD AND COOLING COILS W/DRAIN FAN.

Outside Air Hood w/Bird Screen Weight Adder

Capacity [CA]	
20	51
40	63

ROOFTOP ARRANGEMENT [RA] "M"

Unit Size	NET WT.	SHIP.WT.
20	403	616
40	513	744

ROOFTOP ARRANGEMENT [RA] "S"

Unit Size	NET WT.	SHIP.WT.
20	635	847
40	793	1023

ROOFTOP ARRANGEMENT [RA] "N"

Unit Size	NET WT.	SHIP.WT.
20	529	705
40	665	855

ROOFTOP ARRANGEMENT [RA] "T"

Unit Size	NET WT.	SHIP.WT.
20	788	1012
40	967	1207

ROOFTOP ARRANGEMENT [RA] "P"

Unit Size	NET WT.	SHIP.WT.
20	609	822
40	769	1000

ROOFTOP ARRANGEMENT [RA] "U"

Unit Size	NET WT.	SHIP.WT.
20	797	1021
40	987	1227

ROOFTOP ARRANGEMENT [RA] "R"

Unit Size	NET WT.	SHIP.WT.
20	735	959
40	921	1161

ROOFTOP ARRANGEMENT [RA] "W"

Unit Size	NET WT.	SHIP.WT.
20	936	1198
40	1152	1432

Cooling Coil Weight Adder

Refer to coil weights in Tables 5 and 6.

Double Wall Construction Adder

For units with double wall construction, add an additional 10% of the base unit weight.

Motor Shipping Weights (Approximate) – Table 8

	1 - (115/1/60)				2 - (208/1/60)				3 - (230/1/60)			
	1 ODP	2 TE	3 PEODP	4 PETE	1 ODP	2 TE	3 PEODP	4 PETE	1 ODP	2 TE	3 PEODP	4 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 ODP	2 TE	3 PEODP	4 PETE	1 ODP	2 TE	3 PEODP	4 PETE	1 ODP	2 TE	3 PEODP	4 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			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 ODP	2 TE	3 PEODP	4 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

Roof Curb Kits

Approximate Ship Weights (lbs.) — Table 9

†Kit Number	Rooftop Arrangement [RA]	Capacity [CA]	†Roof Curb Kit Suffix Number	
			-2	-4
RC001	N	20,40	133	161
RC002*	R	20, 40	163	191
RC005	W	20, 40	210	238
RC006	T	20, 40	179	207
	U	20, 40		
RC011	M	20, 40	85	112
RC012*	P	20, 40	115	142
RC013	S	20, 40	140	168

Roof Curb Ductwork Adapter Kits

	Usage per Roof Curb Kit	†Roof Curb Kit Suffix Number	
RC016** Return Air	RC001 thru RC013	6	7
RC017†† Supply Air	RC001, RC002	11	12
RC018†† Supply Air	RC005, RC006	11	12

* Roof Curb Kits RC002 and RC012 include the adjustable evaporative cooler platform.

**For units equipped with a return air opening.

† These weights also apply to the Uninsulated Roof Curb Kits URC001 - URC013.

†† For use with unit arrangements equipped with supply plenums.

† Curb Kit Suffix Legend	
Capacity	Suffix
20	-2
40	-4

Motor Electrical Data — Table 10

FULL LOAD CURRENT IN AMPERES

	1 - (115/1/60)				2 - (208/1/60)				3 - (230/1/60)			
	1 ODP	2 TE	3 PEODP	4 PETE	1 ODP	2 TE	3 PEODP	4 PETE	1 ODP	2 TE	3 PEODP	4 PETE
1/2 HP	7.2	8.0	5.2	4.6	3.7	4.0	2.8		3.8	4.0	2.6	2.3
3/4 HP	11.6	11.0	8.0	6.3	5.2	5.4	4.2		5.3	5.5	4.0	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	18.0	15.2	12.5	12.6	9.3	8.2			9.0	7.6	6.3	6.3
2 HP	21.0	23.0	17.6	17.6	11.3	11.7			10.5	8.1	8.8	8.8
3 HP	33.0	34.0			17.7	17.5			16.5	17.0		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					49.0				39.0	38.0		
15 HP												
	4 - (208/3/60)				5 - (230/3/60)				6 - (460/3/60)			
	1 ODP	2 TE	3 PEODP	4 PETE	1 ODP	2 TE	3 PEODP	4 PETE	1 ODP	2 TE	3 PEODP	4 PETE
1/2 HP	2.1	2.2	1.8	2.0	2.2	2.2	1.8	1.7	1.1	1.1	0.9	1.0
3/4 HP	3.0	3.2	2.5		3.4	2.8	2.4	2.8	1.7	1.4	1.2	1.4
1 HP	3.4	3.7	3.0	3.3	3.4	3.6	2.8	3.0	1.7	1.8	1.4	1.5
1-1/2 HP	4.8	5.0	4.3	4.5	4.8	4.8	4.2	4.1	2.4	2.4	2.1	2.1
2 HP	6.2		6.0	5.7	6.3		5.5	5.4	3.1		2.8	2.7
3 HP	9.2		8.5	8.6	8.6		8.0	8.2	4.3		4.0	4.1
5 HP			12.2	12.0			11.2	11.2			5.6	5.6
7-1/2 HP			21.0	21.0			19.2	18.8			9.6	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 ODP	2 TE	3 PEODP	4 PETE								
1/2 HP	0.8	0.9										
3/4 HP	1.1	1.1										
1 HP	1.3	1.5	1.1	1.1								
1-1/2 HP			1.7	1.6								
2 HP			2.1	2.2								
3 HP			3.1	3.1								
5 HP			5.2	5.2								
7-1/2 HP			7.6	7.6								
10 HP			10.0	10.0								
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

Notes

LIMITED WARRANTY

Sterling Gas-Fired 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 Gas Fired Products. See list price sheet GRPPS and replacement part selection catalog RRPC for listing and prices.

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
1 psig = 6.894 kPa	1,000 Btu/Cu. Ft. = 37.5 MJ/m ³
1 inch water column = 0.249	1 gallon = 3.785 L
1 pound = 0.453 kg	

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 proudly built in modern manufacturing facilities located across the US. 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 Canadian Standards Association, 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 know how. 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.



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