

LENNOX**DSS1-180 & DSS1-260 solarmate™ HEAT PUMP
SINGLE PACKAGE ROOFTOP UNITS**

HEAT PUMPS

PACKAGED

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April 1, 1978

*181,000 to 237,000 Btuh Total Cooling Capacity

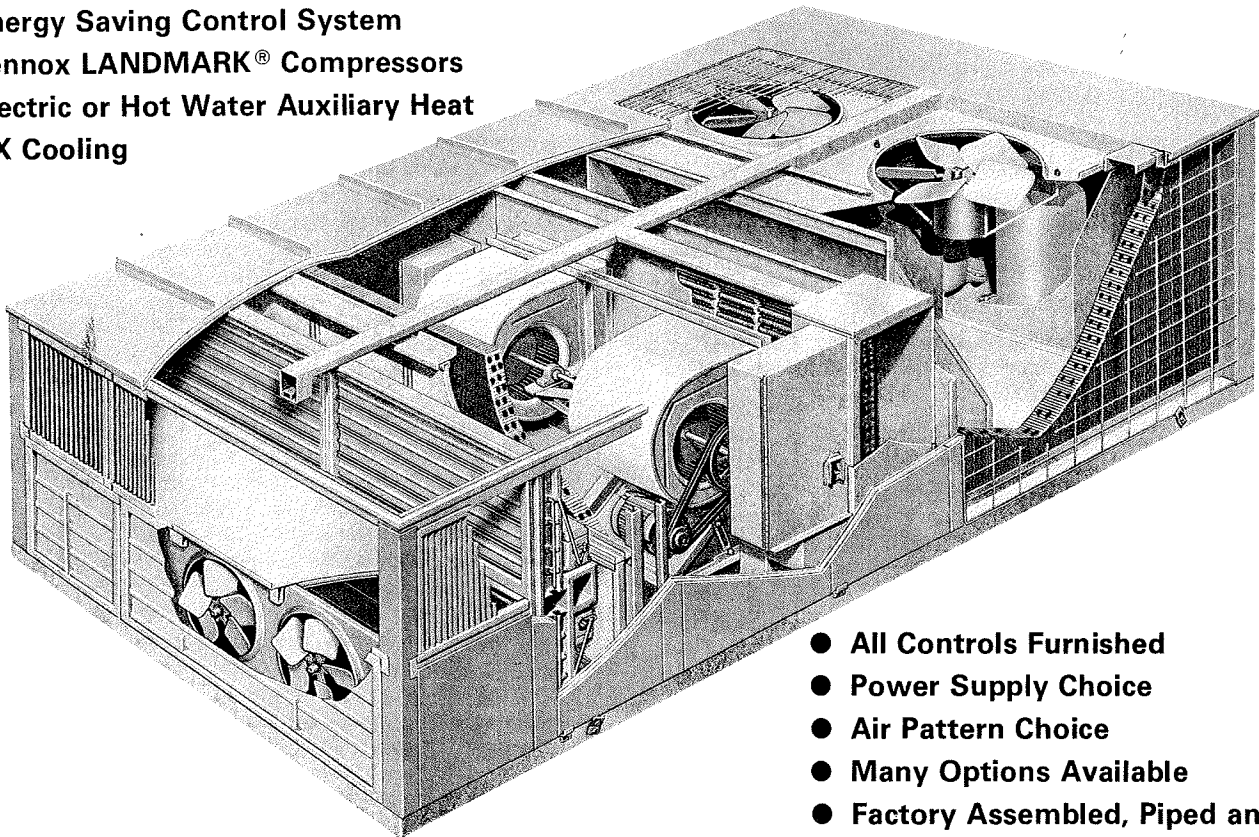
*175,000 to 230,000 Btuh Total Heating Capacity

Optional Electric Heat 410,000 Btuh Max.

Optional Hot Water 550,000 Btuh Max.

*At ARI Standard Test Conditions

- Outdoor Enameled Galvanized Steel Casing
- Energy Saving Control System
- Lennox LANDMARK® Compressors
- Electric or Hot Water Auxiliary Heat
- DX Cooling



- All Controls Furnished
- Power Supply Choice
- Air Pattern Choice
- Many Options Available
- Factory Assembled, Piped and Wired

**Single Package Rooftop Heat Pump Units Feature Maximum Operating Efficiency,
Energy Savings and Minimum Installation Costs**

The DSS1 Heat Pump Single Zone Unit incorporates a complete Heat-Vent-Cool system (including outdoor unit) of highly engineered, integrated components in a weatherproof, low silhouette single package. The Lennox DSS1 heat pump is ideally suited for installation in a wide variety of commercial and institutional buildings. Only one source of energy is needed at a building with the all electric heat pump. There is no need for a flue or combustion air intake. The energy saving control system finely matches the supply air temperature to the load requirements of a building with maximum operating efficiency. Factory assembled units are designed for easy installation, maximum accessibility and ease of service. Units are designed for rooftop installation with bottom handling of supply and return air. A separate roof mounting frame (optional) mates to the bottom of the DSS1 unit and when flashed into the roof permits weatherproof duct connection and entry into the structure. A choice of three frames is available; standard frame, combination supply and return air frame and adapter frame for horizontal discharge. Roof mounted equipment saves valuable interior floor space, keeps sound outdoors, provides ease of service access without disturbing occupants of the building and permits easy concealment of ducts in drop ceilings.

The most effective energy conservation measures have been utilized in the design of the DSS1 units and include: Enthalpy control providing maximum use of outdoor air for cooling. Dual outdoor coil refrigeration circuits for more partial load efficiency. Supply air blowers operate with minimum resistance, horsepower and operat-

ing cost. Solid-state electronic control system provides energy conservation operation and superior comfort performance, the year around.

The single package units are available with a choice of options including: supplementary electric or hot water heat, POWER SAVER® fresh air control, twin supply air blower drive and motor selection, exhaust fans, and roof mounting frames. All necessary controls including a disconnect switch (optional) are factory installed and wired. All of these features provide almost unlimited flexibility in application and system design.

The DSS1 units make it possible to specify an entire rooftop single zone comfort system, including all equipment and controls, from one manufacturing source. This permits dealing only with Lennox for complete service and parts on the entire system. Lennox is and wants to be totally responsible for all the equipment and also for controls operation when furnished by Lennox.

The heat pump DX heating-cooling consists of two separate and complete independent refrigeration systems including separate Lennox LANDMARK® compressors and their independent outdoor coil with fan and a separate circuit in the single indoor coil. Equipment is shipped factory assembled. Cooling system has been thoroughly tested and rated according to ARI Standard test conditions. Blower data is from unit tests conducted in the Lennox Laboratory air test chamber. Units and components within are bonded for grounding to meet safety standards for servicing required by U.L. and NEC. Each unit is test operated at the factory.

NOTE — Specifications, Ratings and Dimension subject to change without notice.

FEATURES

Electronic Lennox Energy Saving Control System — The solid-state electronic control system measures the deviation between room temperature and set point and then controls the supply air temperature to meet the load requirements. The control system consists of a room temperature sensing transmitter (thermostat) supply air sensor, load analyzer control module with heat-cool logic control relays plus a spring return mixed air/ventilation damper actuator with infinite resolution for blending outdoor air with return air. This solid-state system will operate the equipment to automatically match its output to the load with minimum space temperature variation. To accomplish this the room transmitter is continuously comparing space temperature deviation with supply air temperature and sending a varying load signal to the load control module. The heat-cool logic relays in the control module then cycle the mechanical equipment to match the output to the load condition. Also the system will often balance with a constant supply air temperature that will allow the system to "coast" with only the blowers operating for as long as the balanced condition continues. Should the load requirement change the controls will immediately respond to match supply air temperature to the load. With this control system troubleshooting is simple because the load analyzer signal transmitted by the room sensing transmitter reflects the load and indicates system performance. The load analyzer signal can be monitored at the room temperature sensing transmitter or the load analyzer control module mounted on the unit.

Supplementary Electric Heat — Available in 30 Kw thru 120 Kw sizes. Helix wound nichrome heating elements are exposed directly in the air stream resulting in instant heat transfer, lower coil temperatures and long service life. Elements are accurately located and insulated from the support frame by high quality insulators. Two stage electric heat is controlled by the load analyzer control module. Time delay relays bring the elements on and off the line in sequence and in response to demand, with a time delay between each element. Safety controls include a discharge air limit control with fixed temperature off setting (automatic reset) located in the supply air stream and a secondary limit control with fixed temperature setting (automatic reset) located in the heating section. In addition, heaters are equipped with high temperature thermal safety devices providing positive protection in the event of overheating. Outdoor air temperature thermostat locks out part of electric heat during mild weather, preventing short-cycling and conserving fuel.

Supplementary Hot Water Heat — A factory installed hot water coil can be furnished with coil only (less controls) and with or without a three-way modulating valve. A factory installed freeze stat terminates power to damper actuator closing outside air dampers, activates valve and starts pump to circulate water during freezing conditions. A glycol solution may also be used in the system to provide freeze protection. Lennox designed and built coil is constructed of precisely spaced ripple-edged aluminum fins machine fitted to copper tubes. Each joint is silver soldered and coil is thoroughly tested under pressure to insure leak proof construction.

Heat Pump System — Complete factory sealed refrigeration system consists of compressors, outdoor coils and direct drive fans, indoor coil and twin blowers, expansion and check valves, service valves, safety controls, accumulator, reversing valve, high capacity driers, refrigerant lines connected and a full operating charge of refrigerant. Lennox LANDMARK compressors and their independent refrigerant circuits, outdoor coils and fans give staging control to fit varying heating and cooling load requirements. A clock timer defrost control gives a defrost cycle (if needed) every 90 minutes at temperatures below 45°F and above 23°F. At temperatures below 23°F the system will defrost every 6 hours. A pressure switch mounted on the outdoor coil determines when the defrost cycle is required and also when to terminate a cycle.

Indoor and Outdoor Coils — Lennox designed and fabricated coils are constructed of precisely spaced ripple-edged aluminum fins machine fitted to copper tubes for maximum strength and excellent heat transfer. Each joint is silver soldered and coil is thoroughly tested under pressure to insure leak proof construction. The two separate circuits of the indoor coil are face split. Each circuit has its own independent expansion and check valve, separate outdoor coil section and complete refrigerant charge. Indoor coil drain pan is constructed of corrosion resistant heavy gauge galvanized steel. Equipped with two galvanized pipe drain outlets.

Outdoor Coil Section — Direct drive fans (two) draw large air volumes uniformly through the large dual outdoor coils resulting in high refrigerant cooling capacity. The outdoor coils are located in the unit to obtain maximum cooling surface area. Each coil has its own expansion and check valve. Outdoor air enters through grilles on both sides of the unit and is discharged out the top. Fans are resiliently mounted. Motors are overload protected and equipped with a moisture protection shield. Compressors are mounted on resiliently rubber mounts in a separate enclosed compartment, isolating them from the weather. Control box is conveniently located for service access with all controls factory installed and wired. A outdoor coil fan guard is furnished.

Dependable Lennox LANDMARK Compressors — Units are equipped with two L2 single speed compressors. The large casing, spring loaded discharge valve, high suction intake ports and crankcase heater result in effective "slugging" protection. In addition, a belly band crankcase heater is furnished for extra slugging protection at low ambients. Crankshaft is statically and dynamically balanced and has patented 3 mode oil pumping for positive pressure lubrication. Contoured piston for increased volumetric efficiency. Strategically located discharge mufflers result in extremely quiet operation. Motor is located within refrigerant flow pattern resulting in low motor winding temperatures. Twin internally mounted motor in-winding temperature sensing thermostats provide safe operation. High pressure control (automatic reset) is furnished in the compressor terminal box. The entire running gear assembly is spring mounted within the sealed shell and the compressor is installed in the unit on resilient rubber mounts assuring quiet and vibration free operation.

Powerful Supply Air Blowers — Twin centrifugal blowers mounted on a single shaft deliver large air volumes with low power consumption. The blower assemblies are mounted to a rugged angle iron frame with the entire blower and frame assembly vibration isolated on rubber mounts. Ball bearings are permanently sealed and lubricated. Blower wheels are statically and dynamically balanced. Design of motor mounting base permits quick and simple belt tension adjustment or belt changing. A choice of motor horsepower and drives is available. Motors are overload protected.

Exhaust Fans — Direct drive exhaust fans provide system pressure relief. Fans are interlocked to run when the return air dampers are closed and the supply air blowers are operating. Motors are overload protected.

Exhaust Dampers — Pressure operated extruded aluminum dampers ride in nylon bearings. Damper blades are equipped with seal gaskets resulting in tight seal and quiet operation. Damper blades prevent blow-back during off cycle.

Outside Air Damper (Manual) — Units are available with outdoor air dampers only, with the dampers linked for manual operation. Dampers may be adjusted and locked to provide up to 25% fixed minimum outdoor air.

Outside Air Intake — Outdoor air enters through corrosion resistant grilles designed to minimize moisture entry. An eliminator section traps rain and keeps it from entering the air handling sections. The trapped moisture is eliminated through drainage outlets in the base section.

Weatherproof Casing — Rugged cabinet construction provides maximum strength, resistance to stress and complete protection from the weather. Entire cabinet and base section is constructed of heavy gauge galvanized steel. All exterior panels have a durable finish of outdoor enamel. A five station wash metal preparation assures a perfect bonding surface for the finish coat of baked-on enamel. The side and access panels consist of an outer panel (painted) and inner panel snap locked and riveted together and separated by 3 inch thick (1/2 lb. density) fiberglass insulation compressed to 2 inch thickness. In addition, the base is insulated with 1/2 inch thick (6 lb. density) fiberglass insulation and the top panels with 3 inch thick (1/2 lb. density) fiberglass insulation. All service access panels are hinged and equipped with locking type door latches. Base rails serve as a galvanized drain pan which traps and drains out any moisture entering the unit. Hoisting lugs are provided in the base for rigging.

Thermostat Choice — A solid-state room temperature sensing transmitter (thermostat) and a wall plate adapter for mounting to a standard electrical box is available. A wide "no load" band solid-state room temperature sensing transmitter (thermostat) is also available as a specified option for use with automatic heat-to-cool changeover. The wide "no load" transmitter has integral differential of approximately six degrees (6°F) between the room temperature that creates a demand for heating and that which causes the load analyzer control module to initiate mechanical refrigeration cooling. The reverse procedures occur in a change from a cooling requirement to one for heating. Both transmitters are available with exposed set point and indicating thermometer or with concealed set point and locking screw cover. In addition, On-Off or Heat-Cool switching options are available.

Firestats (Fire Protection Thermostats) — Furnished as standard equipment. Firestats (manual reset) mounted in the return air and supply air stream will shut off the unit completely when either firestat detects excessive air temperatures. Firestats will not be furnished when smoke detector controls are specified with unit.

POWER SAVER Solid-State Controls — Optional equipment controls fresh air entry and "Free Cooling" with outdoor air. Mechanically linked outdoor and return air dampers are provided with seal gaskets for tight seal and quiet operation. The formed dampers ride in nylon bearings. The positioning of these dampers is accomplished by a spring return damper actuator with infinite resolution. Room sensing transmitter, morning warm-up control located in the return air stream and enthalpy control located in the outdoor air stream regulate damper operation. The enthalpy control senses the total heat content of the outdoor air. This unique control prevents excessive moisture laden outdoor air that will add to the cooling load from entering the unit and yet permits cool dry air capable of cooling to enter, thus taking full advantage of outdoor air for free cooling. Damper actuator and controls are factory wired and installed. An optional remote minimum fresh air control is available. Control installed in the conditioned space will allow manual adjustment of the fresh air intake to meet fresh air code requirements or to introduce fresh air at will.

Standard Frame Filters — Available with a choice of 2 inch thick throwaway frame fiberglass media filters, 2 inch thick permanent steel frames with fiberglass media throwaway pads or washable aluminum frame filters with multilayered expanded aluminum mesh media coated with a water soluble adhesive with a high dust holding capacity. Use RP products coating no. 418 (P-8-5069) for reoilng. Filter rack is designed to hold optional 1 inch frame pre-filters for additional air filtering efficiency. Sliding tracks in filter rack permits ease of removal and replacement for service.

Frame Pre-filters — Aluminum frame type 1 inch thick air filters with washable or vacuum cleanable polyurethane filter media coated with oil for increased efficiency. Use RP products filter coating No. 418 (P-8-5069) for reoilng. Easily accessible for cleaning. Available with standard frame filters.

Roof Mounting Frame — Exactly fits the perimeter of the DSS1 unit. It is flashed into the roof and mates to the DSS1 base section where the base insulation completes the sealing and weatherproofing job. A 2 x 4 nailer is secured to the frame sides to facilitate flashing.

FRAME OPTIONS:

- 1 — Standard frame 14 inches high and approved by the National Roofing Contractors Association. Model number RMF3-17614 (176 inches long).
- 2 — Frame 24 inches high for combination supply and return air distribution system. Model number RMFSR3-17624 (176 inches long).
- 3 — Horizontal discharge adapter frame 24 inches high. Adapts to the standard RMF3 frame for horizontal supply and return air applications. Model number AFHD3-17624 (176 inches long). In addition, a horizontal RMFHDAK3 discharge adapter kit is required and must be ordered extra. Kit modifies the standard RMF3 frame for usage with the horizontal adapter frame.

Frames are shipped knocked down and are easily field assembled. See frame dimension drawings and installation detail sketch.

Optional Combination Supply And Return Diffusers — Lennox offers two different styles of air diffusers. The RTD step-down model extends below ceiling level when installed. The FD model is almost flush with the ceiling when installed. Supply air is discharged through the outside air grilles and return air enters through the center grille on both models. Adjustable vanes are available on both models for air distribution. See specification table for ordering.

Optional Supply And Return Duct — Provides connection of combination supply and return diffuser. Furnished in nominal 4 ft. lengths and constructed of 1" thick fiberglass duct board with an aluminum exterior. Shipped knocked down with the tape, staples and instructions for field assembly. See specification table for order no. and mounting detail drawings for sizes.

Optional Smoke Detector Controls — The photo cell smoke detectors are designed to detect the presence of smoke within the system and to actuate the blower motor controls and other devices to: (1) Shut off the entire system or (2) Shuts down supply blower, closes outside air and return air dampers and runs exhaust fans. Terminals are also available for connection of remote alarm circuits. Actuation occurs when smoke within the unit exceeds a density that is sufficient to obscure light by a factor of 2% to 4% per foot. A key switch is provided for periodic test. Two detectors (P-8-11081) are provided, one is located in the return air section and one in the blower section downstream from the air filters. In addition, a remote test/reset control (P-8-11081 — one for each detector) may be provided which acts as a remote test station.

Optional Remote Readout Panel — RP5-1 Remote Readout control Panel, (90A43) and RP2-00-1 Rough-In Box (BM1-5358) is available for all applications. From one centrally located spot within the structure the operation of the DSS1 may be checked at a glance. Signal lights indicate: System On, Heating Inoperative, Condensing Unit Inoperative and Dirty Filter. In addition, the panel has a system switch for shutting down the equipment, a manual override timer switch for after hours occupancy and a switch for shutting off condensing unit of the system. Factory installed night setback controls (including a 7 day clock timer P-8-10952) are available and must be ordered extra.

Optional Night Setback Controls — Equipment is factory wired for night setback operation. In mild climates a choice of a manual system switch or automatic programming is available as options to turn off the entire unit. For colder climates the system room transmitter (thermostat) controls both day and night operation. An additional thermostat is not required. Manual (BM-4762) or 12 hour timer (BM-4761) field installed night setback kits are available to override existing night setback controls. The switch or timer is mounted on a stainless steel plate which fits two standard electrical outlet boxes located in the wall. A 7 day clock timer (P-8-10952 with carryover) factory installed in the DSS1 programs the equipment, or the unit may be controlled by a remote time clock.

Optional Blower Powered Mixing Damper Boxes — ZDB1 series mixing air boxes with a cfm range of 270 to 1900 are available for zone control cooling applications. For complete data see Accessories Section — page 7.

SPECIFICATIONS AND RATINGS

Model Number		DSS1-180	DSS1-260	
Cooling Capacity	At ARI Standard Test Conditions	Total capacity (Btuh)	181,000	237,000
		S/T Ratio	.72	.72
		Compressor watts	16,950	23,550
High Temperature Heating Capacity	At ARI Standard Test Conditions	Total capacity (Btuh)	175,000	230,000
		Compressor watts	13,500	18,000
Low Temperature Heating Capacity	At ARI Standard Test Conditions	Total capacity (Btuh)	97,000	133,000
		Compressor watts	10,200	13,700
Outdoor Coils	Net face area (sq. ft.)		36.6	36.6
	Tube diameter & No. of rows		1/2 — 3	1/2 — 4
	Fins per inch		13	13
Outdoor Fans	Diameter (in.) & No. of blades		(2) 26 — 5	(2) 26 — 5
	Total air volume (cfm)		15,600	15,200
	Motor horsepower		(2) 1 hp	(2) 1 hp
	Watts input (total)		2300	2400
Indoor Coil	Net face area (sq. ft.)		23.4	23.4
	Tube diameter — No. of rows		1/2 — 3	1/2 — 4
	Fins per inch		15	15
Heating Options	*Electric Heating Capacity Range (Btuh)	2 elements	86,000/102,000	
		3 elements	129,000/154,000	
		4 elements	172,000/205,000	
		5 elements	215,000/256,000	
		6 elements	258,000/307,000	
		7 elements	301,000/358,000	
		8 elements	344,000/410,000	
**Hot Water heating capacity range (Btuh)		200,000 — 550,000		
Hot Water Coil	Net face area (sq. ft.)		13.5	
	Tube diameter — No. of rows		1/2 — 2	
	Fins per inch		15	
	Water line connections (Inlet — Outlet)		See Valve Selection Curves	
Supply Air Blowers	Blower wheel nominal diameter x width (in.)		(2) 15 x 15	
	Motor horsepower (minimum — maximum)		3 — 10 hp	
	Air volume range (cfm)		6000 — 10,000	
Exhaust Fans	Diameter (in.) & No. of blades		(3) 22 — 5	
	Total air volume (cfm)		9000	
	Motor horsepower		(3) 1/2 hp	
	Watts input (total)		1670	
Filter Options	Standard frame filters No. & size (in.)		(4) 20 x 20 x 2 — (4) 20 x 25 x 2	
	Frame pre-filters No. & size (in.)		(4) 20 x 20 x 1 — (4) 20 x 25 x 1	
Frame Options	Roof mounting frame		RMF3-17614	
	Ceiling supply & return mounting frame		RMFSR3-17624	
	Horizontal discharge frame		AFHD3-17624	
	Horizontal discharge kit		RMFHDAK3	
Supply & Return Air Duct	RTD Diffuser		BM-7893	
	FD Diffuser		BM-7833	
Supply & Return Step-Down Diffuser		RTD-185/275		
Supply & Return Flush Diffuser		FD-275 and †FD-275-D		
Evaporator condensate drain connections IPF (in.)		1-1/4		
Electrical characteristics		208 to 600 volt — 60 Hertz — 3 phase		

*See Electric heat rating table for capacities at various voltages.

**Hot water capacity range shown is possible with varying supply conditions and air volumes. See coil capacity curves.

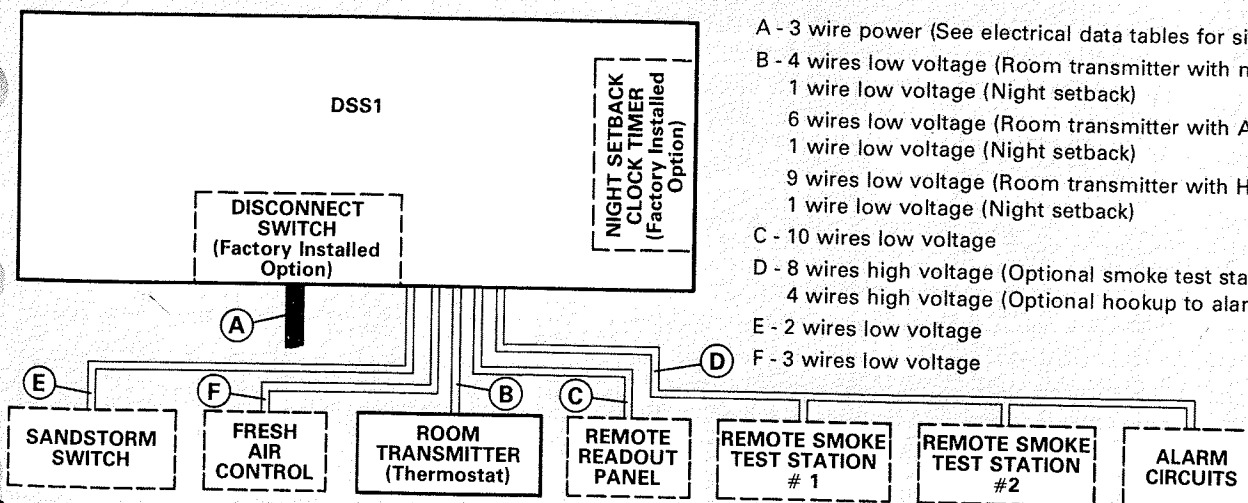
†Flush diffuser with adjustable baffle blades.

DSS1-180 AND DSS1-260 ELECTRIC HEAT RATINGS

No. of Elements	KW Input /Element	No. of Steps	Volts Input	208V, 240V 480V, 600V	220V 440V, 550V	230V 560V, 575V
				2	2@ 15	2
			Btuh Output	102,000	86,000	94,000
3	3@ 15	3	KW Input	45.0	37.8	41.4
			Btuh Output	154,000	129,000	141,000
4	4@ 15	4	KW Input	60.0	50.4	55.1
			Btuh Output	205,000	172,000	188,000
5	5@ 15	5	KW Input	75.0	63.0	68.9
			Btuh Output	256,000	215,000	235,000
6	6@ 15	6	KW Input	90.0	75.6	82.7
			Btuh Output	307,000	258,000	282,000
*7	7@ 15	6	KW Input	105.0	88.2	96.5
			Btuh Output	358,000	301,000	329,000
*8	8@ 15	6	KW Input	120.0	100.8	110.3
			Btuh Output	410,000	344,000	376,000

*Not available with 208-230 voltage units.

FIELD WIRING



- A - 3 wire power (See electrical data tables for sizing)
- B - 4 wires low voltage (Room transmitter with non-switching subbase)
1 wire low voltage (Night setback)
6 wires low voltage (Room transmitter with AUTO-OFF subbase)
1 wire low voltage (Night setback)
9 wires low voltage (Room transmitter with HEAT-OFF-COOL subbase)
1 wire low voltage (Night setback)
- C - 10 wires low voltage
- D - 8 wires high voltage (Optional smoke test stations)
4 wires high voltage (Optional hookup to alarm system)
- E - 2 wires low voltage
- F - 3 wires low voltage

NOTE — All wiring must be in accordance with regulations of the National Electrical Code (NEC) or Canadian Electrical Code (CEC) and other appropriate governing bodies.

ELECTRICAL DATA

DSS1-180 HEAT PUMP WITH ELECTRIC HEAT

Nom. Volt. (3 ph)	Nom. KW Input	Without Exhaust Fans				With Exhaust Fans			
		Minimum Circuit Ampacity				3 hp Supply Air Blower Motor	5 hp Supply Air Blower Motor	7-1/2 hp Supply Air Blower Motor	10 hp Supply Air Blower Motor
		Supply Air Blower Motor hp				Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity
		3	5	7-1/2	10	(3) 1/2 hp Exhaust Fan Motors	(3) 1/2 hp Exhaust Fan Motors	(3) 1/2 hp Exhaust Fan Motors	(3) 1/2 hp Exhaust Fan Motors
208	30	185.3	190.1	199.3	205.4	194.3	199.1	208.3	214.4
	45	237.4	242.2	251.4	257.5	246.4	251.2	260.4	266.5
	60	289.5	294.3	303.5	309.6	298.5	303.3	312.5	318.6
	75	341.6	346.4	355.6	361.7	350.6	355.4	364.6	370.7
	90	393.8	398.6	407.8	413.9	402.8	407.6	416.8	422.9
230	30	169.7	174.3	181.3	188.3	178.7	183.3	190.3	197.3
	45	214.8	219.4	226.4	233.4	223.8	228.4	235.4	242.4
	60	259.9	264.5	271.5	278.5	268.9	273.5	280.5	287.5
	75	305.	309.6	316.6	323.6	314.0	318.6	325.6	332.6
	90	350.2	354.8	361.8	368.8	359.2	363.8	370.8	377.8
460	30	85.2	87.5	91.0	94.5	89.7	92.0	95.5	99.0
	45	107.8	110.1	113.6	117.1	112.3	114.6	118.1	121.6
	60	130.4	132.7	136.2	139.7	134.9	137.2	140.7	144.2
	75	153.0	155.3	158.8	162.3	157.5	159.8	163.3	167.8
	90	175.7	178.0	181.5	185.0	180.2	182.5	186.0	189.5
	105	198.3	200.6	204.1	207.6	202.8	205.1	208.6	212.1
	120	220.9	223.2	226.7	230.2	225.4	227.7	231.2	234.7
575	30	68.7	70.6	73.2	76.3	72.3	74.2	76.8	79.9
	45	86.8	88.7	91.3	94.4	90.4	92.3	94.9	98.0
	60	104.9	106.8	109.4	112.5	108.5	110.4	113.0	116.1
	75	123.0	124.9	127.5	130.6	126.6	128.5	131.1	134.2
	90	141.2	143.1	145.7	148.8	144.8	146.7	149.3	152.4
	105	159.3	161.2	163.8	166.9	162.9	164.8	167.4	170.5
	120	177.4	179.3	181.9	185.0	181.0	182.9	185.5	188.6

NOTE — Refer to National Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires at least 75C (167F).

ELECTRICAL DATA

DSS1-260 HEAT PUMP WITH ELECTRIC HEAT

Nom. Volt. (3 ph)	Nom. KW Input	Without Exhaust Fans				With Exhaust Fans			
						3 hp Supply Air Blower Motor	5 hp Supply Air Blower Motor	7-1/2 hp Supply Air Blower Motor	10 hp Supply Air Blower Motor
		Minimum Circuit Ampacity				Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity
		Supply Air Blower Motor hp				(3) 1/2 hp Exhaust Fan Motors	(3) 1/2 hp Exhaust Fan Motors	(3) 1/2 hp Exhaust Fan Motors	(3) 1/2 hp Exhaust Fan Motors
		3	5	7-1/2	10				
280	30	206.4	211.2	220.4	226.5	215.4	220.2	229.4	235.5
	45	258.5	263.3	272.5	278.6	267.4	272.3	281.5	287.6
	60	310.6	315.4	324.6	330.7	319.6	324.4	333.6	339.7
	75	362.7	367.5	376.7	382.8	371.7	376.5	385.7	391.8
	90	414.9	419.7	428.9	435.	423.9	428.7	437.9	444.0
230	30	190.8	195.4	202.4	209.4	199.8	204.4	211.4	218.4
	45	235.9	240.5	247.5	254.5	234.9	249.5	256.5	263.5
	60	281.0	285.6	292.6	299.6	290.0	294.6	301.6	308.6
	75	326.1	330.7	337.7	344.7	335.1	339.7	346.7	353.7
	90	371.3	375.9	382.9	389.9	380.3	384.9	391.9	398.9
460	30	95.7	98.0	101.5	105.0	100.2	102.5	106.0	109.5
	45	118.3	120.6	124.1	127.6	122.8	125.1	128.6	132.1
	60	140.9	143.2	146.7	150.2	145.4	147.7	151.2	154.7
	75	163.5	165.8	169.3	172.8	168.0	170.3	173.8	178.3
	90	186.2	188.5	192.0	195.5	190.7	193.0	196.5	200.0
	105	208.8	211.1	214.6	218.1	213.3	215.6	219.1	222.6
	120	231.4	233.7	237.2	240.7	235.9	238.2	241.7	245.2
575	30	76.7	78.6	81.2	84.3	80.3	82.2	84.8	87.9
	45	94.8	96.7	99.3	102.4	98.4	100.3	102.9	106.0
	60	112.9	114.8	117.4	120.5	116.5	118.4	121.0	124.1
	75	131.0	132.9	135.5	138.6	134.6	136.5	139.1	142.2
	90	149.2	151.1	153.7	156.8	152.8	154.7	157.3	160.4
	105	167.3	169.2	171.8	174.9	170.9	172.8	175.4	178.5
	120	185.4	187.3	189.9	193.0	189.0	190.9	193.5	196.6

NOTE — Refer to National Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 75C (167F).

DSS1-180-260 HEAT PUMP WITH OR WITHOUT HOT WATER

Voltage (three phase)	Without Exhaust Fans			With Exhaust Fans		
	Supply Air Blower Motor hp	Heat Pump with or without Hot Water Minimum Circuit Ampacity		Exhaust Fan Motor hp	Heat Pump with or without Hot Water Minimum Circuit Ampacity	
		DSS1-180	DSS1-260		DSS1-180	DSS1-260
208	3	81.0	102.1	3 (1/2)	90.0	111.1
	5	85.8	106.9	3 (1/2)	94.8	115.9
	7-1/2	95.0	116.1	3 (1/2)	104.0	125.1
	10	101.1	122.2	3 (1/2)	110.1	131.2
230	3	79.4	100.5	3 (1/2)	88.4	109.5
	5	84.0	105.1	3 (1/2)	93.0	114.1
	7-1/2	91.0	112.1	3 (1/2)	100.0	121.1
	10	98.0	119.1	3 (1/2)	107.0	128.1
460	3	39.9	50.4	3 (1/2)	44.4	54.9
	5	42.2	52.7	3 (1/2)	46.7	57.2
	7-1/2	45.7	56.2	3 (1/2)	50.2	60.7
	10	49.2	59.7	3 (1/2)	53.7	64.2
575	3	31.9	39.9	3 (1/2)	35.5	43.5
	5	33.8	41.8	3 (1/2)	37.4	45.4
	7-1/2	36.4	44.4	3 (1/2)	40.0	48.0
	10	39.5	47.5	3 (1/2)	43.1	51.1

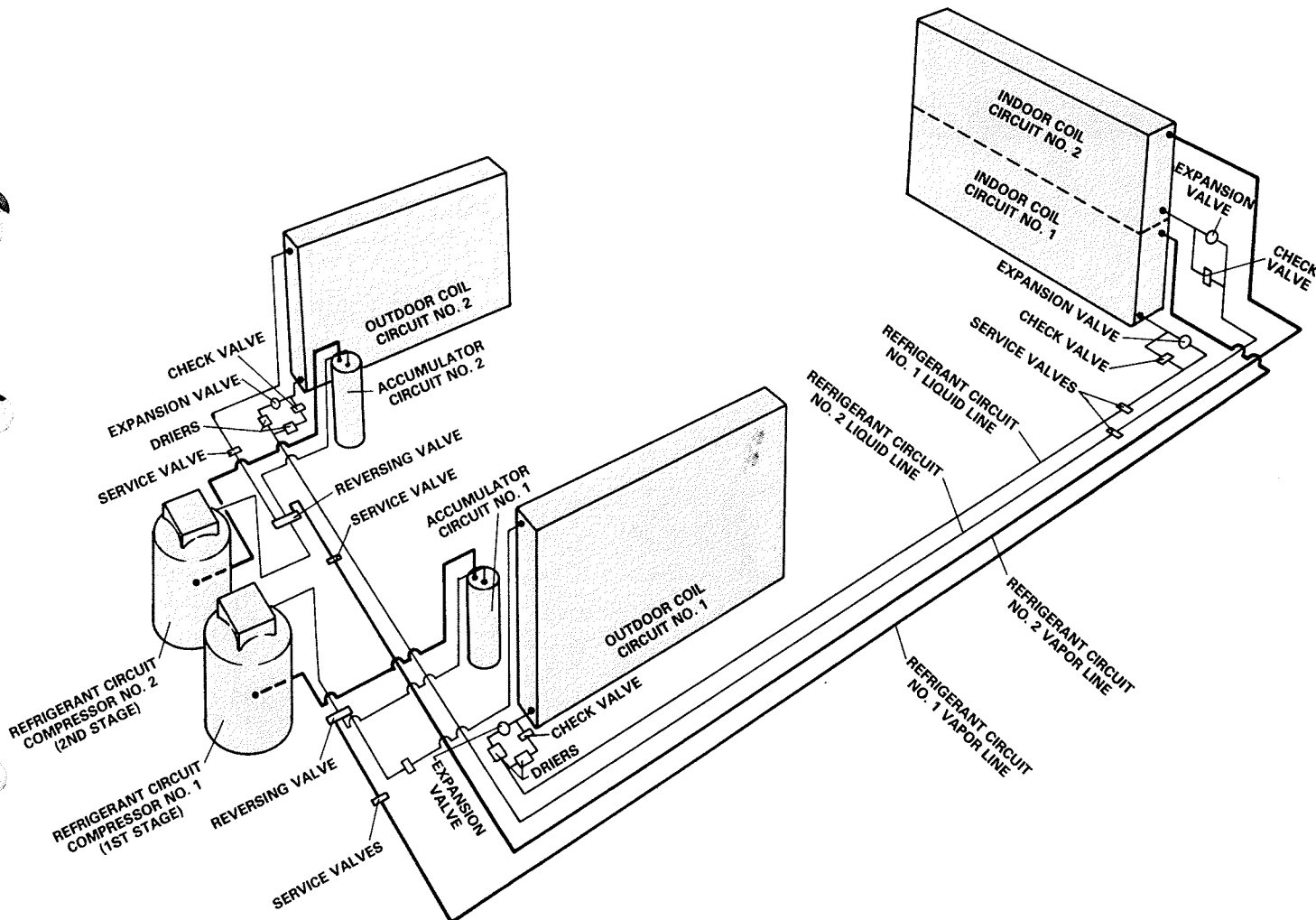
NOTE — Refer to National Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 75C (167F).

ELECTRICAL DATA

DSS1-180-260 HEAT PUMP AND ELECTRIC HEAT

Voltage (three) phase			208V	230V	460V	575V
DSS1-180 Compressor 1		Rated load amps	28.9	28.9	14.5	11.6
		Power factor	.85	.85	.85	.85
		Locked rotor amps	185.0	185.0	93.0	73.0
DSS1-180 Compressor 2		Rated load amps	22.5	22.5	11.3	9.1
		Power factor	.85	.85	.85	.85
		Locked rotor amps	129.0	129.0	65.3	51.6
DSS1-260 Compressor 1		Rated load amps	40.6	40.6	20.3	16.2
		Power factor	.85	.85	.85	.85
		Locked rotor amps	240	240	128	88
DSS1-260 Compressor 2		Rated load amps	28.9	28.9	14.5	11.6
		Power factor	.85	.85	.85	.85
		Locked rotor amps	185.0	185.0	93.0	73.0
Condenser Fan Motors — (2) 1 hp		Full load amps (each)	4.3	4.3	2.2	1.7
		Locked rotor amps (each)	21.6	21.6	10.8	9.0
Supply Air Blower Motor	3	Full load amps	11.4	10.0	5.0	4.0
		Locked rotor amps	77.2	69.0	34.5	27.5
	5	Full load amps	16.2	14.6	7.3	5.9
		Locked rotor amps	119.5	105.0	52.5	40.0
	7-1/2	Full load amps	25.4	21.6	10.8	8.5
		Locked rotor amps	160.0	132.0	66.0	56.0
	10	Full load amps	31.5	28.6	14.3	11.6
		Locked rotor amps	203.0	191.0	95.5	70.0
Exhaust Fan Motors (3)	1/2 hp (1 phase)	Full load amps (each)	3.0	3.0	1.5	1.2
		Locked rotor amps (each)	6.0	6.0	2.8	2.3
Electric heat full load amps/element — 15 KW			41.7	36.1	18.1	14.5
.5 KVA Control power transformer FLA (all models)			2.4	2.2	1.1	.9

REFRIGERANT PIPING



ROOF MOUNTING FRAMES

Roof Mounting Frame

Mounting frames are shipped knocked down in a compact package for ease in transportation and lifting to the rooftop. Bolts and rugged joint plates are furnished to secure the sections together at the job site. Holes are provided in the frame sections and joining plates. The entire weight of the unit is transferred uniformly to the mounting frame.

Roof Mounting Frame Supports

The roof mounting frame can be installed directly on the deck or setting on the roof supports under the deck. When the frame sets directly on the deck adequate structural strength in the deck is required. When installing the frames on support members under the deck the following support specifications apply:

1 — With joint plates bolted the maximum frame span or cantilever between supports is:

	Span	Cantilever
14" high frame.....	50"	58"
24" high frame.....	70"	62"
14" & 24" high frames.....	86"	66"

2 — With joint plates welded to frame the maximum frame span or cantilever is:

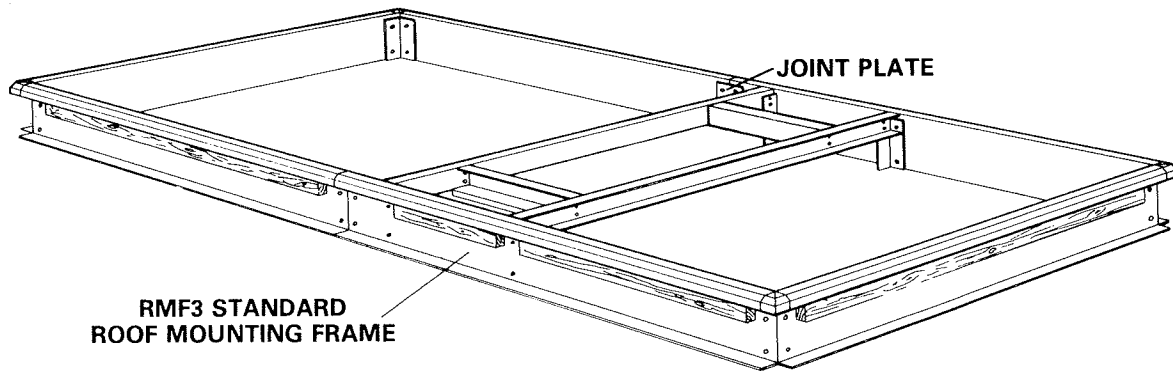
	Span	Cantilever
14" high frame.....	128"	77"
24" high frame.....	217"	No Limit
14" & 24" high frames.....	252"	No Limit

3 — There must be at least 32 inches of frame in contact with the roof supports.

Model No.	RMF3-17614	RMFSR3-17624	RMF3-17614 AFHD3-17624
Mounting Frame Height	14 inches	24 inches	14 & 24 inches
*Frame moment of inertia (I) In. ⁴	86	330	362
*Frame section modulus $\frac{I}{C}$ In. ³	12.3	27.5	30.2
Mounting frame weight (lb./ft. of length)	6.1	9.1	9.4

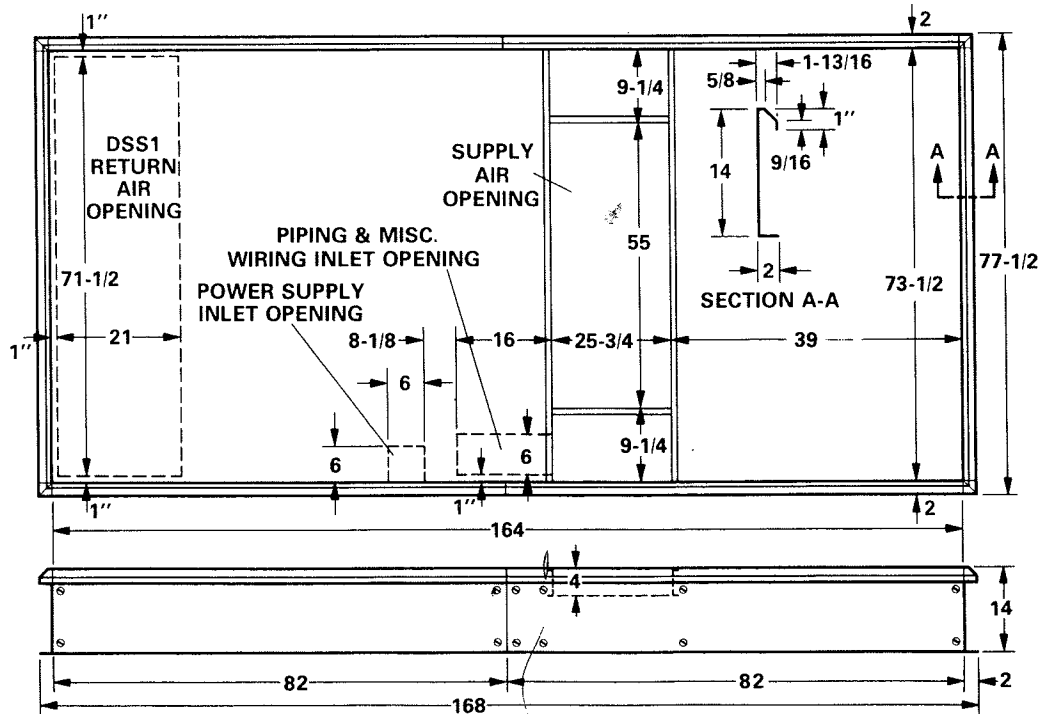
*Includes both sides of roof mounting frame.

RMF3-17614 MOUNTING FRAME



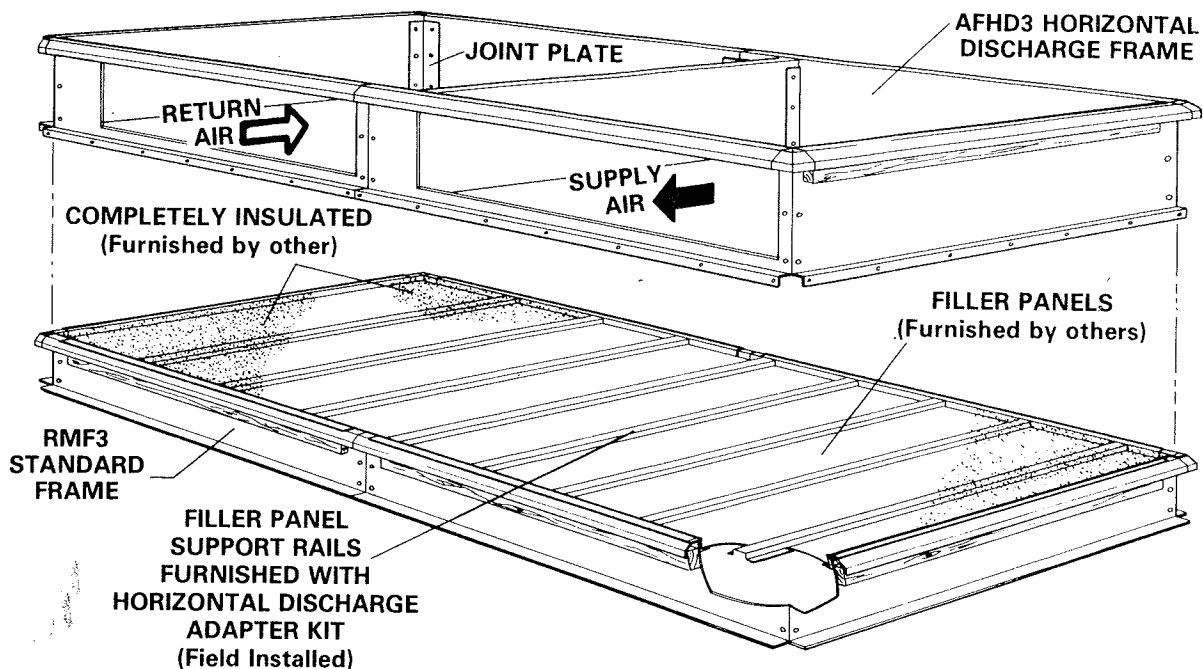
ROOF MOUNTING FRAME DIMENSIONS (inches)

RMF3-17614 MOUNTING FRAME



ROOF MOUNTING FRAMES

AFHD3-17624 HORIZONTAL ADAPTOR FRAME

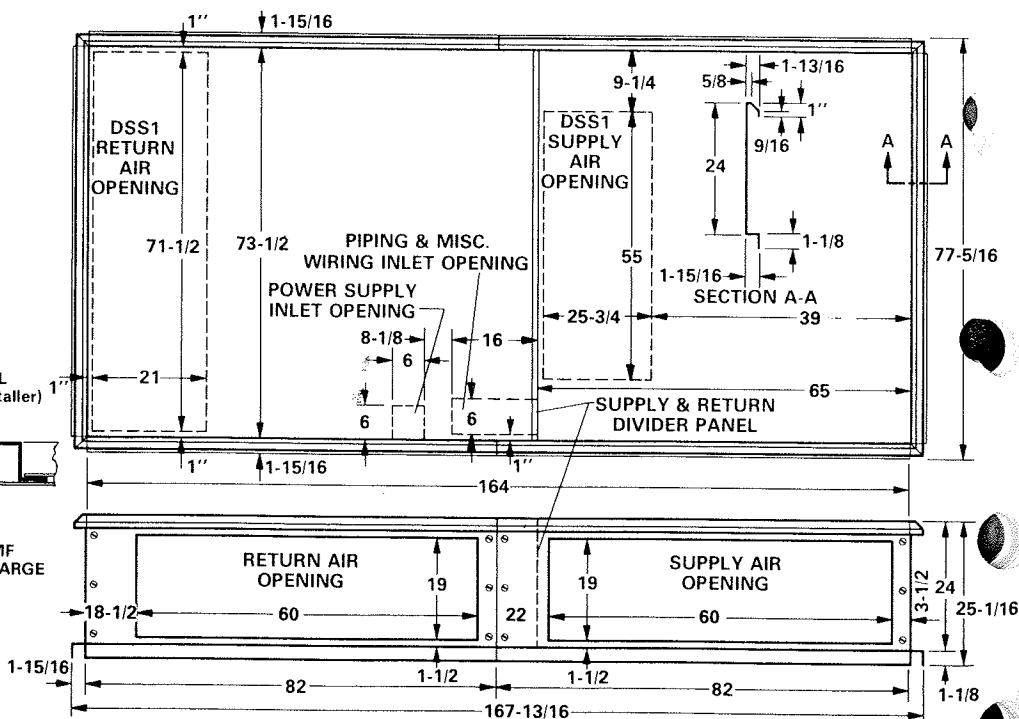
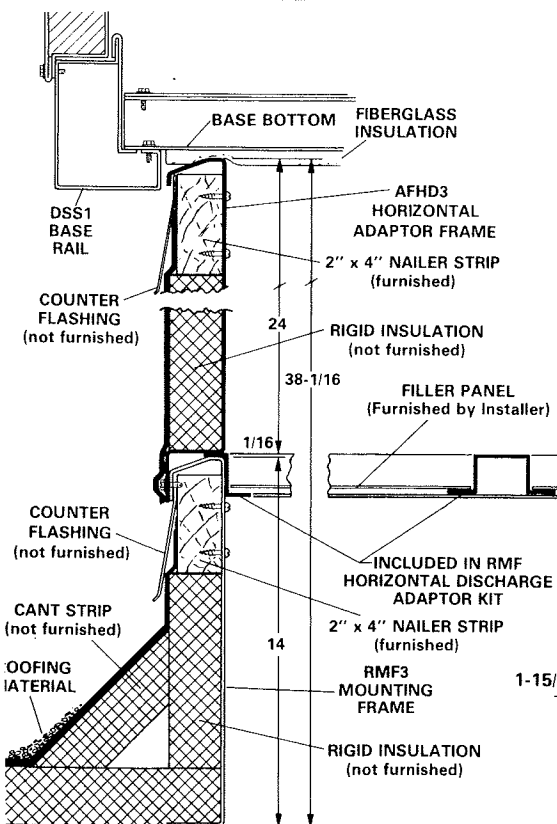


NOTE — Filler panel support rails are 73-1/4 inches long. See Installation Instructions for recommended size and location of filler panels.

ROOF MOUNTING FRAME DIMENSIONS (inches)

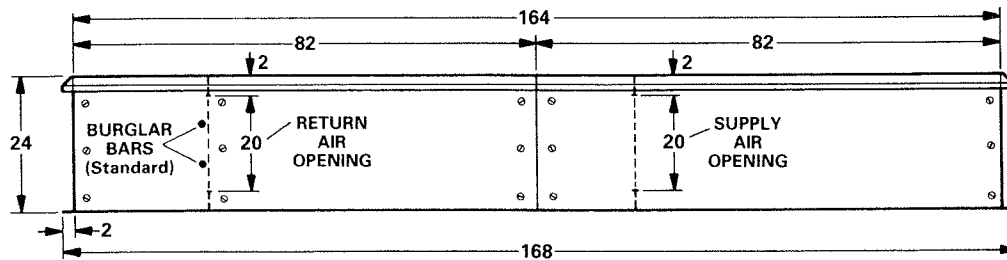
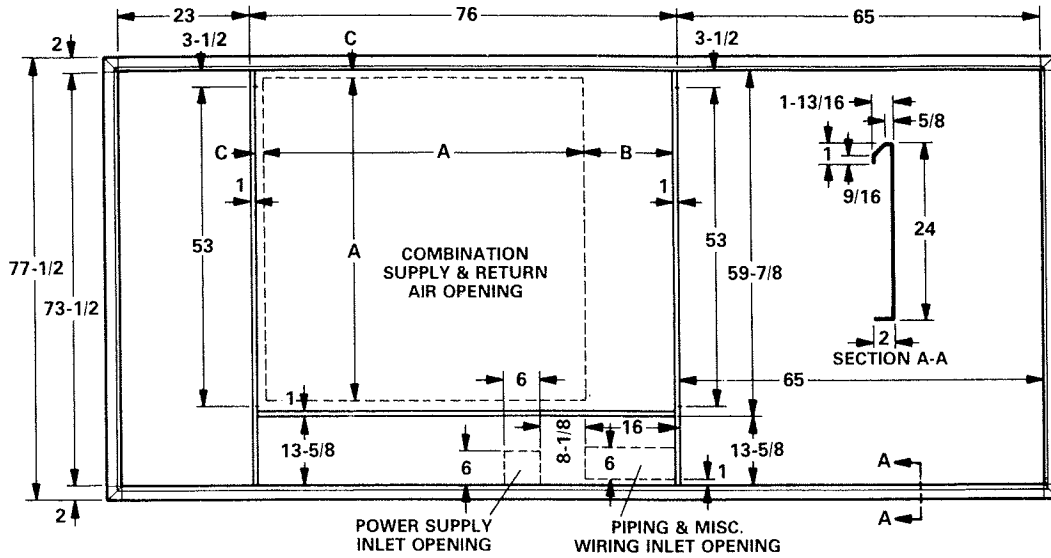
AFHD3-17624 ADAPTOR FRAME DETAIL

AFHD3-17624 HORIZONTAL ADAPTOR FRAME



ROOF MOUNTING FRAMES

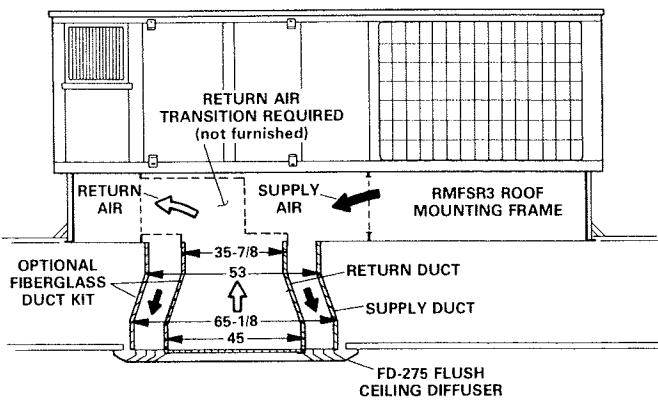
RMFSR3-17624 COMBINATION CEILING SUPPLY & RETURN ROOF MOUNTING FRAME



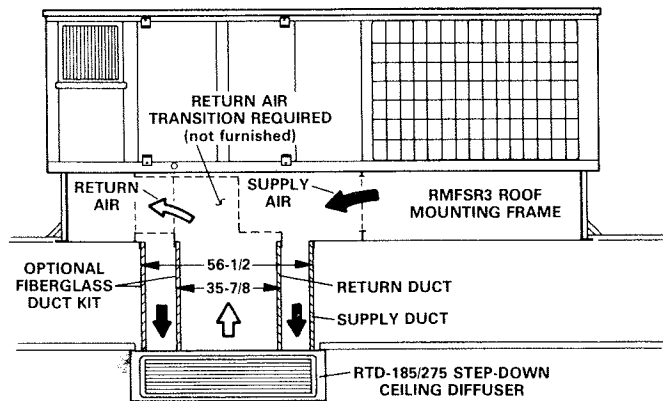
Diffuser	A	B	C
RTD-185/275	56-1/2	15-3/4	1-11/16
FD-275	53	17-1/2	3-7/16

COMBINATION CEILING SUPPLY AND RETURN AIR DISTRIBUTION SYSTEM

Rooftop Unit With Optional Fiberglass Duct For Flush Diffuser Applications



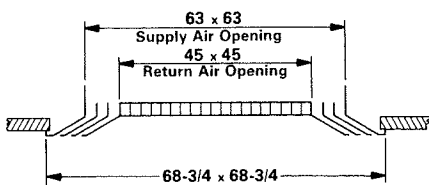
Rooftop Unit With Optional Fiberglass Duct For Step-Down Applications



NOTE — Supply & Return fiberglass duct is 48" long and may be trimmed to length required for installation.

CEILING DIFFUSERS

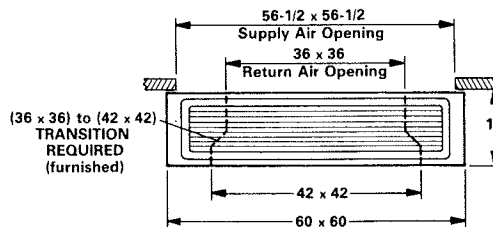
FD Flush



13.50 sq. ft. Free Supply Area Provided.

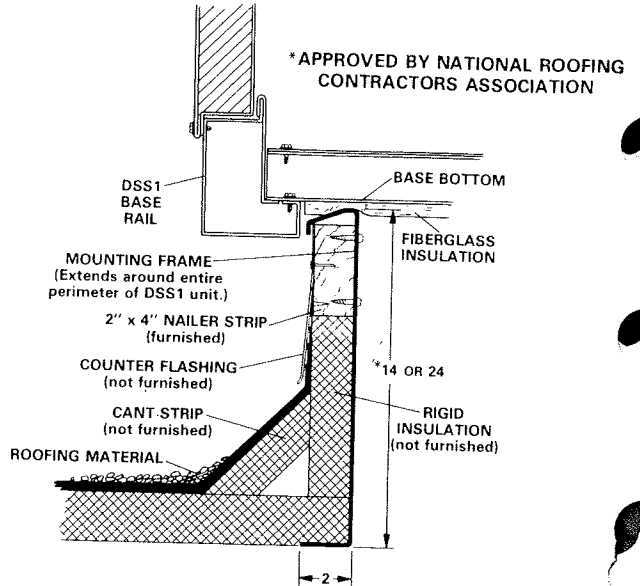
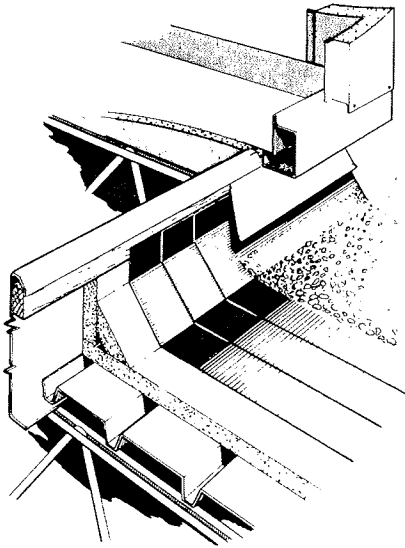
NOTE — Also available with adjustable baffle blades. Same dimensions as above.

RTD Step-down



(4) 12 x 48 Supply Air Grills Furnished
(1) 42 x 42 Return Air Grill Furnished

ROOF MOUNTING FRAME DETAILS



UNIT NET WEIGHT, CENTER OF GRAVITY AND CORNER WEIGHTS

COMPONENTS		Total Net Weight (lbs.)	Moment in "X" Direction
Basic unit DSS1-180 & DSS1-260		2150	140,800
Roof Mounting	RMF3-17614	255	22,400
Frame	RMFSR3-17624	500	44,000
Options	AFHD3-17624	415	36,500
Cooling	Complete System DSS1-180-260	1300	59,400
Heating	Electric Section	200	14,600
Options	Hot water Coil	150	7300
Supply Air Blower	(3-5-7-1/2) DSS1-180-260	150	46,900
Motor (hp)	(10) DSS1-180-260	180	48,500
POWER SAVER	DSS1-180-260	150	36,000
Exhaust Fans	DSS1-180-260	80	13,600
Supply & Return Air Duct (RTD Diffuser)		65	7600
Supply & Return Air Duct (FD Diffuser)		97	11,400
RTD Supply & Return Air Diffuser		172	20,200
FD Supply & Return Air Diffuser		69	8100

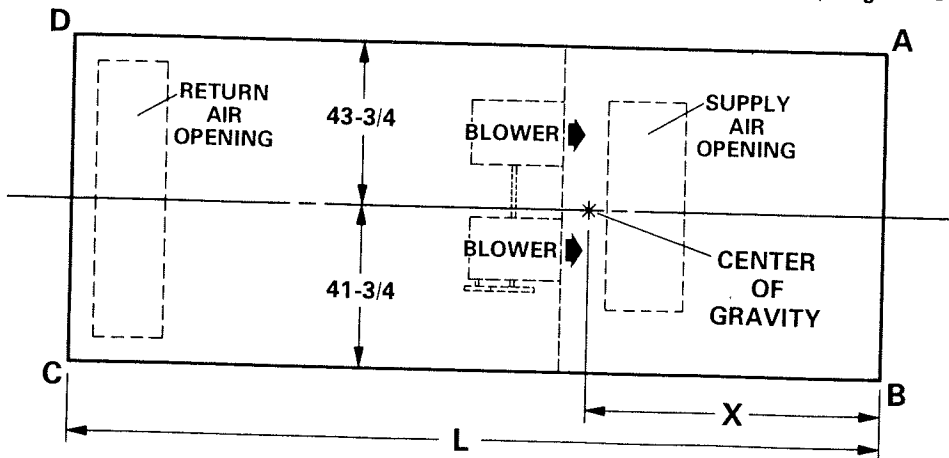
How to calculate center of gravity:

- 1 — Add up **System Components** wts. to arrive at **Total Net Wt.**
- 2 — Add up **Moment in "X" Direction** figures to arrive at a total.
- 3 — Divide total **Moment in "X" Direction** by **Total Wt.** to obtain **"X"**.

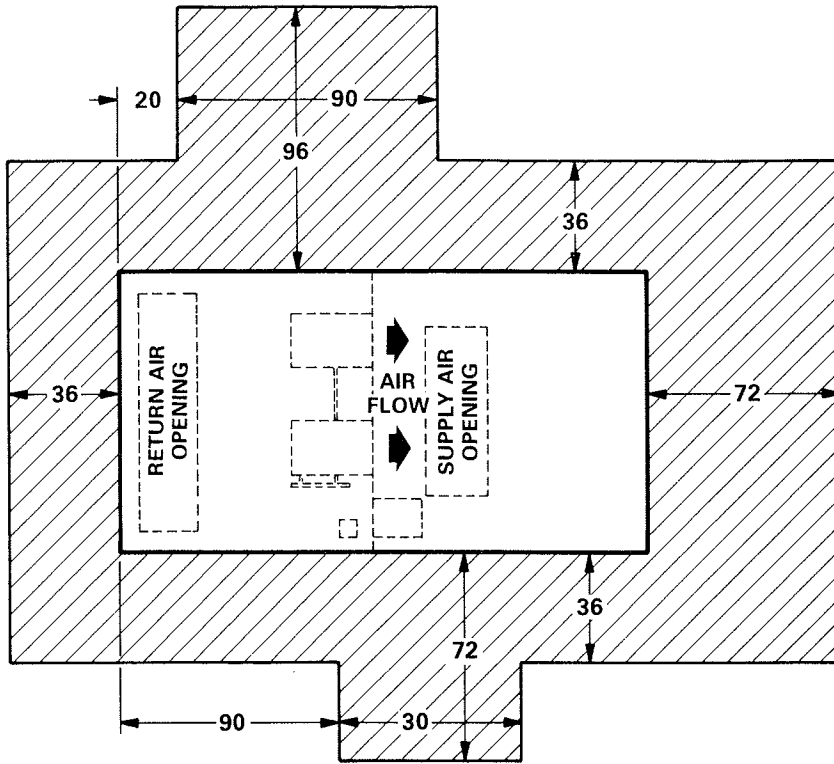
How to calculate corner weight:

$$A \ \& \ B = (\text{Weight of Unit}) \left(\frac{L-X}{L} \right)$$

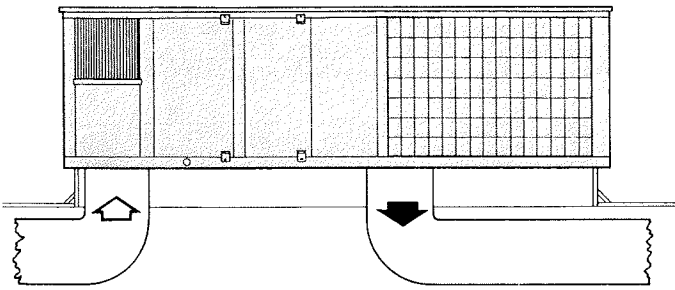
$$C \ \& \ D = (\text{Weight of Unit}) \left(\frac{X}{L} \right)$$



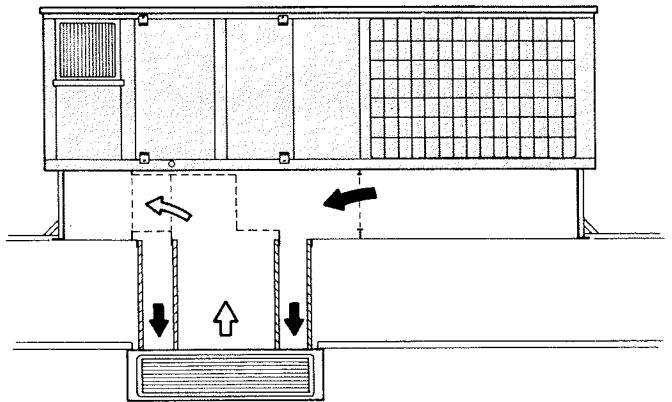
SERVICE CLEARANCES



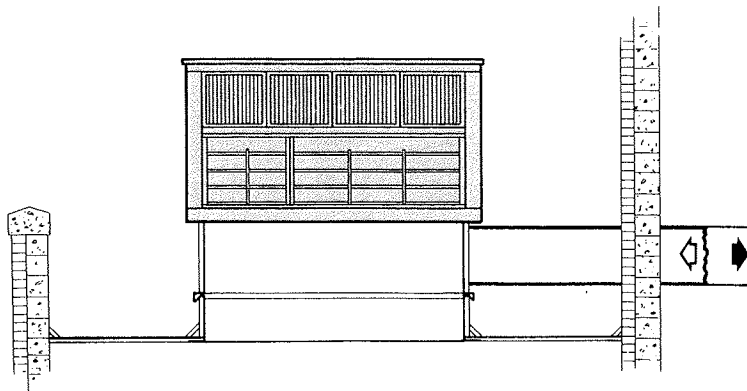
AIR PATTERN CHOICE



Separate Supply and Return Air (Double) Duct Application.



Combination Ceiling Supply and Return Air Duct Application.



Horizontal Supply and Return Air (Side by Side) Duct Application.

BLOWER DATA

DSS1-180-260 SUPPLY AIR BLOWER PERFORMANCE

Air Volume (cfm)	STATIC PRESSURE EXTERNAL TO UNIT (Inches Water Gauge)																					
	0		.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	---	---	---	---	545	1.3	600	1.7	655	2.1	700	2.4	740	2.7	780	3.1	815	3.4	850	3.8	880	4.2
6500	---	---	---	---	580	1.7	635	2.1	685	2.5	730	2.8	770	3.2	805	3.6	835	3.9	870	4.3	900	4.7
7000	---	---	560	1.7	615	2.1	670	2.5	715	2.9	755	3.3	795	3.7	830	4.1	860	4.5	890	4.9	890	5.3
7500	580	2.2	630	2.5	680	2.8	720	3.2	760	3.6	800	4.0	835	4.4	870	4.9	900	5.3	930	5.8	960	6.3
8000	625	2.6	670	3.0	715	3.4	755	3.8	795	4.2	830	4.6	865	5.1	895	5.6	925	6.0	955	6.5	980	6.9
8500	660	3.1	705	3.5	750	4.0	790	4.4	825	4.9	860	5.4	890	5.9	920	6.3	950	6.8	975	7.2	1000	7.6
9000	700	3.8	745	4.2	785	4.7	825	5.3	860	5.7	890	6.2	920	6.7	950	7.2	975	7.7	1000	8.1	1025	8.6
9500	745	4.6	785	5.1	825	5.6	860	6.1	890	6.6	920	7.2	950	7.6	975	8.1	1000	8.5	1025	9.0	1050	9.6
10,000	790	5.6	825	6.1	860	6.6	890	7.1	920	7.6	950	8.1	975	8.6	1000	9.0	1025	9.5	1050	10.0	1075	10.6

NOTE — The chart above is based on operation with electric heat, indoor coil, 100% return air, Power Saver and 2" frame filters in place.

MINIMUM CFM REQUIREMENTS

Model No.		Minimum Air Volume (cfm)	
		DSS1-180	DSS1-260
Electric	30-90 KW	6000	7500
	Heat	105-120 KW	7000
Heat Pump		6000	7500

EXHAUST FAN PERFORMANCE

Air Volume (cfm Exhausted)	Static Pressure External To Unit (Return Air System — Inches Water Gauge)
9050	0
8450	.05
7900	.10
7300	.15
6700	.20
6050	.25

CEILING SUPPLY AIR THROW DATA

Air Volume (cfm)	Radius of Diffusion (Feet)	
	*RTD Step-down	**Flush
6000	34	23
7000	39	27
8000	45	30
9000	50	34
10,000	56	38

*Four sides open and terminates at a point where conditioned air reaches a velocity of 50 fpm at the ceiling.

**Four sides open and terminates at a point where conditioned air reaches a velocity of 35 fpm at the ceiling.

BLOWER DRIVE SELECTION

Using total air volume (cfm) and system Static Pressure External to Unit (inches water gauge) requirements determine from Blower Performance Chart Rpm and Bhp required for job. Specify Bhp, exact Rpm and power characteristics required when ordering. The correct motor and pulleys will be factory installed. The following table lists Motor hp and Rpm range of drive setups available with each motor.

SUPPLY AIR BLOWER

Nominal Motor hp	Maximum Usable hp	*Rpm Range Of All Available Drive Setups @1720 Rpm Motor Speed
3	3.45	566 — 720
5	5.75	750 — 905
7-1/2	8.63	890 — 1070
10	11.5	†890, 950, 1010, 1070

NOTE — The maximum usable hp of motors furnished by Lennox are shown in table. If other motors of comparable hp are used be sure to keep within the service factor limitations outlined on the motor nameplate. In Canada nominal horsepower is maximum usable horsepower.

*Specify exact Bhp, Rpm and power characteristics required when ordering.
†Fixed pulley's at rpm increments shown.

FD CEILING DIFFUSER RECOMMENDED MAX. AIR FLOW

Ceiling Height (feet)	8	9	10	12	15	20
Air Flow (cfm) per side	200	350	550	900	1500	4000

NOTE — This data is based on differentials between 15 and 25 degrees.

ACCESSORY PRESSURE DROP

Air Volume (cfm)	Total Pressure Drop (inches water gauge)					
	1" Frame Pre-filters	2 Row Hot Water Coil	RTD Combination Ceiling Supply and Return			FD Ceiling Supply & Return
			2 Sides Open	3 Sides Open	4 Sides Open	
6000	.04	.07	.54	.42	.36	.20
6500	.05	.09	.64	.50	.42	.23
7000	.05	.10	.74	.58	.49	.27
7500	.06	.12	.85	.66	.56	.31
8000	.07	.13	.97	.76	.64	.35
8500	.08	.15	----	.85	.72	.40
9000	.09	.16	----	.96	.81	.45
9500	.10	.18	----	----	.90	.50
10,000	.11	.20	----	----	1.00	.55

NOTE — Power Saver pressure drop is not appreciable.

DSS1-180 COOLING CAPACITY — 1st Stage

Indoor Air 80F Dry Bulb		Outdoor Air Temperature Entering Outdoor Coil (F)															
Entering Wet Bulb Degrees (F)	Air Volume (cfm)	65				75				85				95			
		Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt
63	6000	106,000	.80	7600	13.9	101,000	.82	8200	12.3	96,000	.85	8850	10.8	90,000	.88	9500	9.5
	6750	108,000	.83	7700	14.0	103,000	.85	8300	12.4	98,000	.88	8950	10.9	92,000	.92	9600	9.6
	7500	109,000	.86	7800	14.0	105,000	.88	8400	12.5	100,000	.91	9050	11.0	94,000	.96	9700	9.7
67	6000	115,000	.64	8000	14.4	110,000	.66	8600	12.8	105,000	.68	9250	11.4	99,000	.70	9900	10.0
	6750	117,000	.66	8100	14.4	112,000	.68	8700	12.9	107,000	.70	9350	11.4	101,000	.72	10,000	10.1
	7500	118,000	.68	8200	14.4	114,000	.70	8800	13.0	109,000	.73	9450	11.5	103,000	.75	10,100	10.2
71	6000	124,000	.51	8400	14.8	119,000	.52	9000	13.2	113,000	.53	9650	11.7	106,000	.54	10,300	10.3
	6750	126,000	.52	8500	14.8	121,000	.53	9100	13.3	115,000	.54	9750	11.8	108,000	.55	10,400	10.4
	7500	128,000	.53	8600	14.9	123,000	.54	9200	13.4	117,000	.55	9850	11.9	110,000	.56	10,500	10.5

*NOTE — Btuh/Watt column reflects compressor operation only.

DSS1-180 COOLING CAPACITY

Indoor Air 80F Dry Bulb		Outdoor Air Temperature Entering Outdoor Coil (F)															
Entering Wet Bulb Degrees (F)	Air Volume (cfm)	85				95				105				115			
		Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt
63	6000	173,000	.86	14,900	11.6	163,000	.89	16,100	10.1	152,000	.92	17,250	8.8	140,000	.96	18,500	7.6
	6750	176,000	.90	15,050	11.7	166,000	.93	16,250	10.2	155,000	.96	17,400	8.9	143,000	1.00	18,700	7.6
	7500	179,000	.93	15,200	11.8	168,000	.97	16,400	10.2	157,000	1.00	17,550	8.9	145,000	1.00	18,850	7.7
67	6000	189,000	.69	15,550	12.2	178,000	.71	16,800	10.6	167,000	.73	18,050	9.3	155,000	.75	19,400	8.0
	6750	193,000	.71	15,700	12.3	181,000	.73	16,950	10.7	170,000	.76	18,200	9.3	158,000	.79	19,600	8.1
	7500	196,000	.74	15,850	12.4	184,000	.76	17,100	10.8	172,000	.79	18,350	9.4	160,000	.82	19,750	8.1
71	6000	204,000	.53	16,250	12.6	192,000	.55	17,500	11.0	181,000	.56	18,800	9.6	168,000	.57	20,200	8.3
	6750	209,000	.55	16,400	12.7	196,000	.56	17,650	11.1	184,000	.58	18,950	9.7	171,000	.60	20,400	8.4
	7500	212,000	.56	16,550	12.8	199,000	.57	17,800	11.2	187,000	.59	19,100	9.8	174,000	.62	20,550	8.5

*NOTE — Btuh/Watt column reflects compressor operation only.

DSS1-260 COOLING CAPACITY — 1st Stage

Indoor Air 80F Dry Bulb		Outdoor Air Temperature Entering Outdoor Coil (F)															
Entering Wet Bulb Degrees (F)	Air Volume (cfm)	65				75				85				95			
		Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt
63	7500	140,000	.84	11,200	12.5	134,000	.87	11,700	11.5	127,000	.90	12,300	10.3	119,000	.94	12,900	9.2
	8500	142,000	.88	11,300	12.6	136,000	.91	11,800	11.5	129,000	.94	12,400	10.4	121,000	.98	13,000	9.3
	9500	144,000	.92	11,400	12.6	138,000	.95	11,900	11.6	131,000	.99	12,500	10.5	123,000	1.00	13,100	9.4
67	7500	153,000	.67	11,800	13.0	146,000	.69	12,300	11.9	138,000	.72	12,900	10.7	129,000	.74	13,600	9.5
	8500	155,000	.69	11,900	13.0	148,000	.71	12,400	11.9	140,000	.74	13,000	10.8	132,000	.77	13,700	9.6
	9500	157,000	.71	12,000	13.1	150,000	.74	12,500	12.0	142,000	.77	13,100	10.8	134,000	.80	13,800	9.7
71	7500	161,000	.53	12,400	13.0	155,000	.54	12,900	12.0	148,000	.55	13,500	11.0	140,000	.56	14,300	9.7
	8500	164,000	.54	12,500	13.1	158,000	.55	13,000	12.2	151,000	.57	13,600	11.1	143,000	.58	14,400	9.9
	9500	167,000	.55	12,600	13.3	161,000	.57	13,100	12.3	154,000	.58	13,700	11.2	145,000	.60	14,500	10.0

*NOTE — Btuh/Watt column reflects compressor operation only.

DSS1-260 COOLING CAPACITY

Indoor Air 80F Dry Bulb		Outdoor Air Temperature Entering Outdoor Coil (F)															
Entering Wet Bulb Degrees (F)	Air Volume (cfm)	85				95				105				115			
		Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt	Total Cooling Capacity (Btuh)	Sens. To Total Ratio (S/T)	Comp. Motor Watts Input	*Btuh/ Watt
63	7500	227,000	.84	20,900	10.9	213,000	.87	22,200	9.6	200,000	.90	23,800	8.4	186,000	.94	25,200	7.4
	8500	231,000	.88	21,100	10.9	217,000	.91	22,400	9.7	204,000	.95	24,000	8.5	189,000	.99	25,400	7.4
	9500	235,000	.92	21,250	11.1	220,000	.96	22,550	9.8	207,000	1.00	24,200	8.6	192,000	1.00	25,600	7.5
67	7500	247,000	.67	21,900	11.3	233,000	.70	23,350	10.0	218,000	.72	24,900	8.8	203,000	.75	26,400	7.7
	8500	252,000	.70	22,100	11.4	237,000	.72	23,550	10.1	222,000	.75	25,100	8.8	207,000	.78	26,600	7.8
	9500	256,000	.72	22,250	11.5	241,000	.75	23,700	10.2	225,000	.78	25,300	8.9	210,000	.81	26,800	7.8
71	7500	268,000	.53	22,900	11.7	253,000	.54	24,400	10.4	238,000	.56	26,000	9.2	222,000	.57	27,500	8.1
	8500	273,000	.55	23,100	11.8	258,000	.56	24,600	10.5	242,000	.58	26,200	9.2	226,000	.59	27,700	8.2
	9500	277,000	.56	23,250	11.9	262,000	.58	24,750	10.6	246,000	.59	26,400	9.3	229,000	.61	27,900	8.2

*NOTE — Btuh/Watt column reflects compressor operation only.

HEATING RATINGS

DSS1-180 HEATING CAPACITY — 1st Stage

Indoor Coil Air Volume (cfm) 70F db	Outdoor Air Temperature Entering Outdoor Coil (F)							
	65		55		45		35	
	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input
6000	129,000	9600	112,000	8600	94,000	7700	75,000	7000
6750	131,000	9300	113,000	8450	95,000	7500	76,000	6900
7500	132,000	9100	114,000	8300	96,000	7450	76,000	6850

NOTE — Heating capacities include the effect of defrost cycles in the temperature range where they occur.

DSS1-180 HEATING CAPACITY

Indoor Coil Air Volume (cfm) 70F db	Outdoor Air Temperature Entering Outdoor Coil (F)									
	65		45		25		5		-15	
	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input
6000	231,000	16,600	169,000	13,350	110,000	10,900	76,000	9350	52,000	8350
6750	236,000	16,200	170,000	13,100	111,000	10,800	76,000	9300	52,000	8300
7500	240,000	15,800	171,000	12,850	111,000	10,700	77,000	9250	52,000	8300

NOTE — Heating capacities include the effect of defrost cycles in the temperature range where they occur.

DSS1-180 HEATING PERFORMANCE — 1st Stage at 6750 cfm Indoor Coil Air Volume

*Outdoor Temperature (Degree F)	Compressor Motor Watts Input	Total Output (Btuh)
65	9300	131,000
60	8900	122,000
55	8450	113,000
50	8000	105,000
45	7550	95,000
40	7200	85,000
35	6900	76,000
30	6600	70,000

*Outdoor temperature at 70% relative humidity. Indoor temperature at 70°.

DSS1-180 HEATING PERFORMANCE at 6750 cfm Indoor Coil Air Volume

*Outdoor Temperature (Degree F)	Compressor Motor Watts Input	Total Output (Btuh)
65	16,200	236,000
60	15,400	218,000
55	14,600	202,000
50	13,800	187,000
45	13,100	170,000
40	12,400	151,000
35	11,800	133,000
30	11,300	122,000
25	10,800	111,000
20	10,400	103,000
15	10,000	93,000
10	9600	84,000
5	9300	76,000
0	9050	70,000
-5	8800	64,000
-10	8550	58,000
-15	8300	52,000
-20	8100	46,000

*Outdoor temperature at 70% relative humidity. Indoor temperature at 70°.

HEATING RATINGS

DSS1-260 HEATING CAPACITY — 1st Stage

Indoor Coil Air Volume (cfm) 70F db	Outdoor Air Temperature Entering Outdoor Coil (F)							
	65		55		45		35	
	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input
7500	171,000	12,700	149,000	11,400	124,000	10,300	99,000	9100
8500	173,000	12,300	151,000	11,200	125,000	10,100	100,000	9000
9500	175,000	12,000	152,000	11,000	126,000	9900	100,000	8950

NOTE — Heating capacities include the effect of defrost cycles in the temperature range where they occur.

DSS1-260 HEATING CAPACITY

Indoor Coil Air Volume (cfm) 70F db	Outdoor Air Temperature Entering Outdoor Coil (F)									
	65		45		25		5		-15	
	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input	Total Heating Capacity (Btuh)	Comp. Motor Watts Input
7500	304,000	22,200	222,000	18,000	149,000	14,800	106,000	12,700	71,000	11,450
8500	308,000	21,600	225,000	17,600	150,000	14,650	106,000	12,600	71,000	11,400
9500	312,000	21,000	227,000	17,300	151,000	14,500	107,000	12,550	71,000	11,350

NOTE — Heating capacities include the effect of defrost cycles in the temperature range where they occur.

DSS1-260 HEATING PERFORMANCE — 1st Stage at 8500 cfm Indoor Coil Air Volume

*Outdoor Temperature (Degree F)	Compressor Motor Watts Input	Total Output (Btuh)
65	12,200	173,000
60	11,750	162,000
55	11,200	151,000
50	10,650	140,000
45	10,100	125,000
40	9500	112,000
35	9000	100,000
30	8550	92,000

*Outdoor temperature at 70% relative humidity.
Indoor temperature at 70°.

DSS1-260 HEATING PERFORMANCE at 8500 cfm Indoor Coil Air Volume

*Outdoor Temperature (Degree F)	Compressor Motor Watts Input	Total Output (Btuh)
65	21,600	308,000
60	20,500	288,000
55	19,500	268,000
50	18,500	248,000
45	17,600	225,000
40	16,700	201,000
35	16,000	178,000
30	15,300	164,000
25	14,650	150,000
20	14,050	142,000
15	13,500	129,000
10	13,000	117,000
5	12,600	106,000
0	12,300	96,000
-5	12,000	87,000
-10	11,700	79,000
-15	11,400	71,000
-20	11,150	63,000

*Outdoor temperature at 70% relative humidity. Indoor temperature at 70°.

GUIDE SPECIFICATIONS

Prepared for the guidance of architects, consulting engineers and mechanical contractors.

General — Furnish and install a roof mounted single package single zone heat pump unit complete with automatic controls. The single zone system unit shall be a standard product of a firm regularly engaged in the manufacture of heating-cooling equipment. The manufacturer shall have parts and service available throughout the United States and Canada.

The installed weight shall not be more than lbs. The equipment shall be shipped completely factory assembled, precharged, piped and wired internally ready for field connections. In addition, manufacturer shall test operate the system at the factory before shipment.

Roof Mounting Frame — Furnish and install a steel roof mounting frame. It shall mate to the bottom perimeter of the equipment. When flashed into the roof it shall make a unit mounting curb and provide weatherproof duct connection and entry into the conditioned area. Flashing shall be the responsibility of a roofing contractor. The 14 inch high frame shall be approved by National Roofing Contractors Association.

Air Distribution — Equipment shall be capable of bottom handling of conditioned air. All air distribution ducts shall be fiberglass or ga. galvanized steel insulated with inch thick lb. density fiberglass or equivalent.

Furnish and install a (flush or step-down) combination ceiling supply and return grille. It shall be capable of not less than . . . ft. radius of effective throw.

Preformed fiberglass duct shall be available for connection of the combination ceiling supply and return air diffuser to the single package unit.

DX Cooling System — The total certified cooling capacity shall not be less than Btuh with an indoor coil air volume of cfm, an entering wet bulb air temperature of . . . F and outdoor air db temperature . . . F. The compressor power input shall not exceed Kw at these conditions.

Heating System — The total certified heating capacity shall not be less than Btuh with an indoor coil air volume of . . . cfm, an entering dry bulb temperature of . . . F and an outdoor coil entering air temperature of . . . F. The total compressor power input shall not exceed Kw at the above conditions.

The coils shall be non-ferrous construction with aluminum fins mechanically bonded to copper tubes. All coils shall be factory pressure leak tested. The system shall consist of (2) independent refrigeration systems including compressor, outdoor coils with expansion and check valves, outdoor coil fans, indoor coil with expansion and check valves, accumulator, reversing valve, driers and defrost control. The outdoor coils shall have sub-cooling rows. The compressors shall be internally spring mounted and have positive crankshaft lubrication, crankcase heater, high pressure switch, compressor monitor and motor in-winding temperature sensing thermostats.

Supplementary Electric Heating System — The certified total heating capacity output shall be Btuh with Kw input at . . . volts power supply.

Heating elements shall be nichrome bare wire exposed directly to the air stream. Time delay relay shall bring the elements on and off in sequence with a time delay between each element. Safety controls shall consist of a discharge air limit control, secondary limit control and thermal safety fuses.

Supplementary Hot Water Heating System — The certified total heating capacity output shall be Btuh with a heating coil air volume of cfm, at water entering temperature of . . . F and a flow rate of gpm and an entering air temperature of . . . F. A three way modulating water valve shall be available. The coil shall be of non-ferrous construction with aluminum fins mechanically bonded to copper tubes. Factory installed freeze-stat shall provide freeze-up protection. Coil shall be factory pressure leak tested.

Electronic Energy Saving Control System — Shall consist of a room temperature sensing transmitter (set point adjustable 55°F to 85°F), a supply air sensor and a load analyzer control module with circuit board and heat-cool logic relays to operate the mechanical equipment. Morning warm-up control and enthalpy control shall regulate a modulating damper actuator to provide outdoor air, return air and mixed air volume requirements. The room transmitter and supply air sensor shall have elements with an electrical resistance that varies with temperature. The load analyzer control module shall provide a 24 volt DC regulated power supply to the room transmitter and heat-cool logic relays. The room transmitter shall convert the room temperature variations from set point into a proportionally varying DC voltage. The supply air sensor located in the supply air stream, shall sense the air temperature and provide a signal which combines with the room transmitter signal to give the resultant output load signal. (The voltage signal produced by a 1 degree change at the room transmitter shall equal the signal produced by a 20 degree change at the supply air sensor.) As a result of the supply sensor signal the control system shall respond not only to the room temperature deviations from set point but also the effect of the outdoor air and the mechanical systems response to the load. The load analyzer control module shall operate the mechanical equipment, through the heat-cool logic relays according to the amount of the voltage (signal) received. The logic relays are sensitive to varying voltages and in conjunction with the modulating voltage signals for the mixed air ventilation damper actuator shall be programmed to operate the mechanical equipment automatically as required, through the heating or cooling and ventilating cycles. The load analyzer control module shall also provide a central location for troubleshooting and identification of improper wiring.

Controls — All controls shall be the sole responsibility of the mechanical equipment manufacturer and shall be installed, wired and tested.

Casing and Frame — All external surfaces shall be painted (outdoor enamel) heavy gauge galvanized steel. All galvanized side panels and access panels shall be insulated with 3 inch thick (12 lb. density) fiberglass insulation compressed to 2 inch thickness between the outer panel and inner panel. The interlocking top panels shall be insulated with 3 inch thick (12 lb. density) fiberglass insulation. The base section shall be insulated with 12 inch thick (6 lb. density) fiberglass insulation. Base rails shall be equipped with a series of drainage outlets for moisture removal. Hoisting lugs shall be provided in the base for rigging. All service access panels shall be hinged and equipped with locking type door latches.

Service Access — All components, wiring and inspection areas shall be completely accessible through removable panels.

(continued on next page)

GUIDE SPECIFICATIONS

(continued)

Supply Air Blowers — Twin centrifugal supply air blowers shall have permanently lubricated ball bearings, adjustable belt drives and motor mount where belt tension can be easily adjusted. The entire assembly shall be floated on resilient rubber mounts. Blowers shall be capable of deliveringcfm at an external static pressure of inches water gauge requiring bph and rpm.

Exhaust Fans — Shall be direct drive blade type fans. Motors shall be overload protected. Fans shall exhaust air through pressure relief dampers.

Exhaust Dampers — Damper blades shall ride in nylon bearings. Blades shall be gasketed for tight seal and quiet operation.

POWER SAVER — Furnish and install complete with controls an air mixing damper assembly including outside air and return air dampers. Damper blades shall ride in nylon bearings and be equipped with gaskets for tight seal. Damper actuator shall be spring return with infinite resolution and adjustable for minimum position setting.

Outside Air Dampers (Manual) — Dampers shall be linked for manual operation and adjustable for minimum position setting. Damper blades shall ride in nylon bearings and be gasketed for tight seal.

Frame Filters — Shall be available with either 2 inch thick disposable frame type fiberglass media filters or 2 inch thick permanent steel frames with throwaway fiberglass media or washable aluminum frame filters with multilayered expanded aluminum mesh media. Filter rack shall have provisions for addition of pre-filters. Total free area shall be sq. ft.

Frame Pre-filters — Shall be available with standard frame filters. Filter media shall be 1 inch thick washable or vacuum cleanable polyurethane, coated with oil, in aluminum frames.

Smoke Detector Controls — Shall be available to detect the presence of smoke within the system and actuate the supply air blower motor and exhaust fan motor controls and other devices to prevent the spread of smoke throughout the conditioned area.

Firestats — Shall be furnished to terminate equipment operation in case of excessive air temperature. Shall be manual reset.

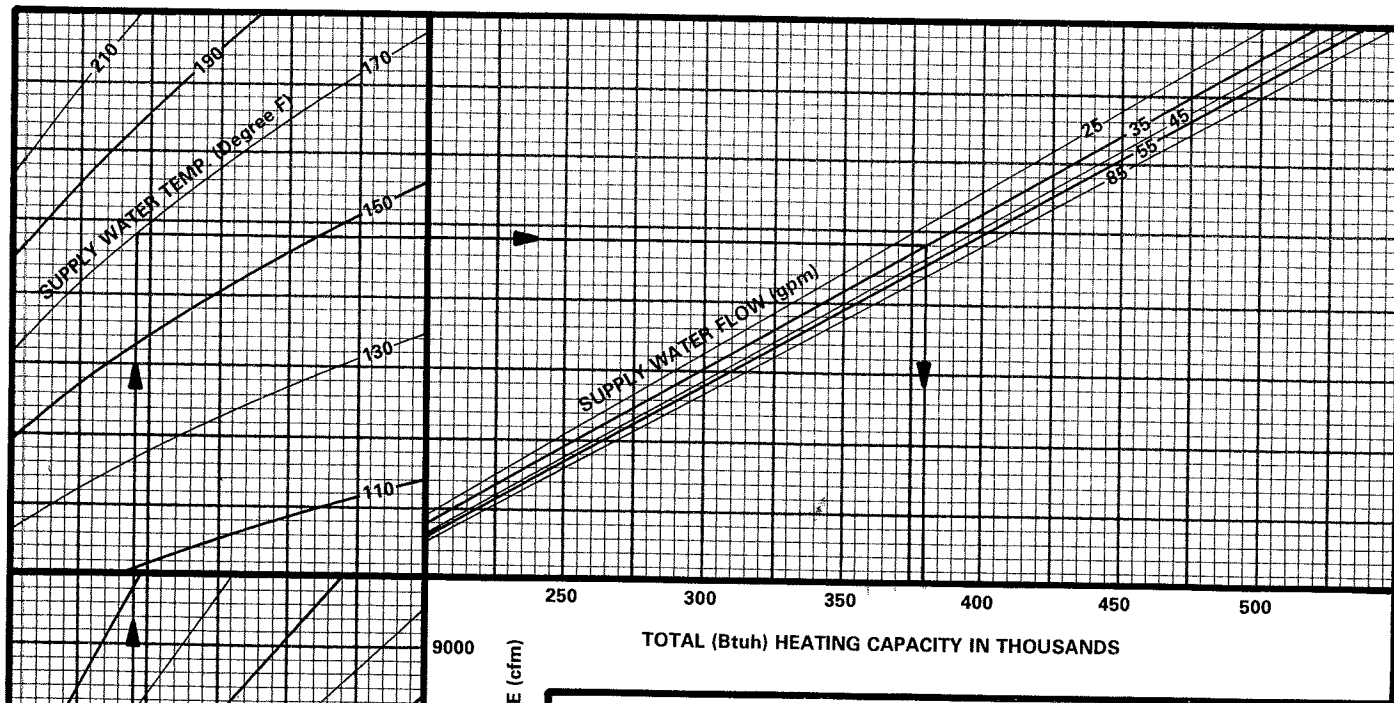
Night Setback Controls — Complete controls shall be available to program the equipment for automatic or manual day-night operation.

Remote Readout Panel — Shall be available for installation within the conditioned area to control and observe equipment operation. The panel shall include signal lights to indicate: system on, heating inoperative, condensing unit inoperative and dirty filter. 7 day time clock, factory installed in the unit, shall provide night setback operation.

Blower Powered Mixing Damper Boxes — Shall be available for zone control system cooling applications. Furnish and install complete with controls an air mixing blower powered unit including conditioned air dampers, recirculated air dampers and direct drive blower(s). Capable of delivering cfm at an external static pressure of inches water gauge. The blower powered unit shall install in the duct system with the structure.

Approval — All electrical components shall have U.L. Listing. All wiring shall be in compliance with NEC or CEC.

DSS1-180/260 HOT WATER HEATING CAPACITY



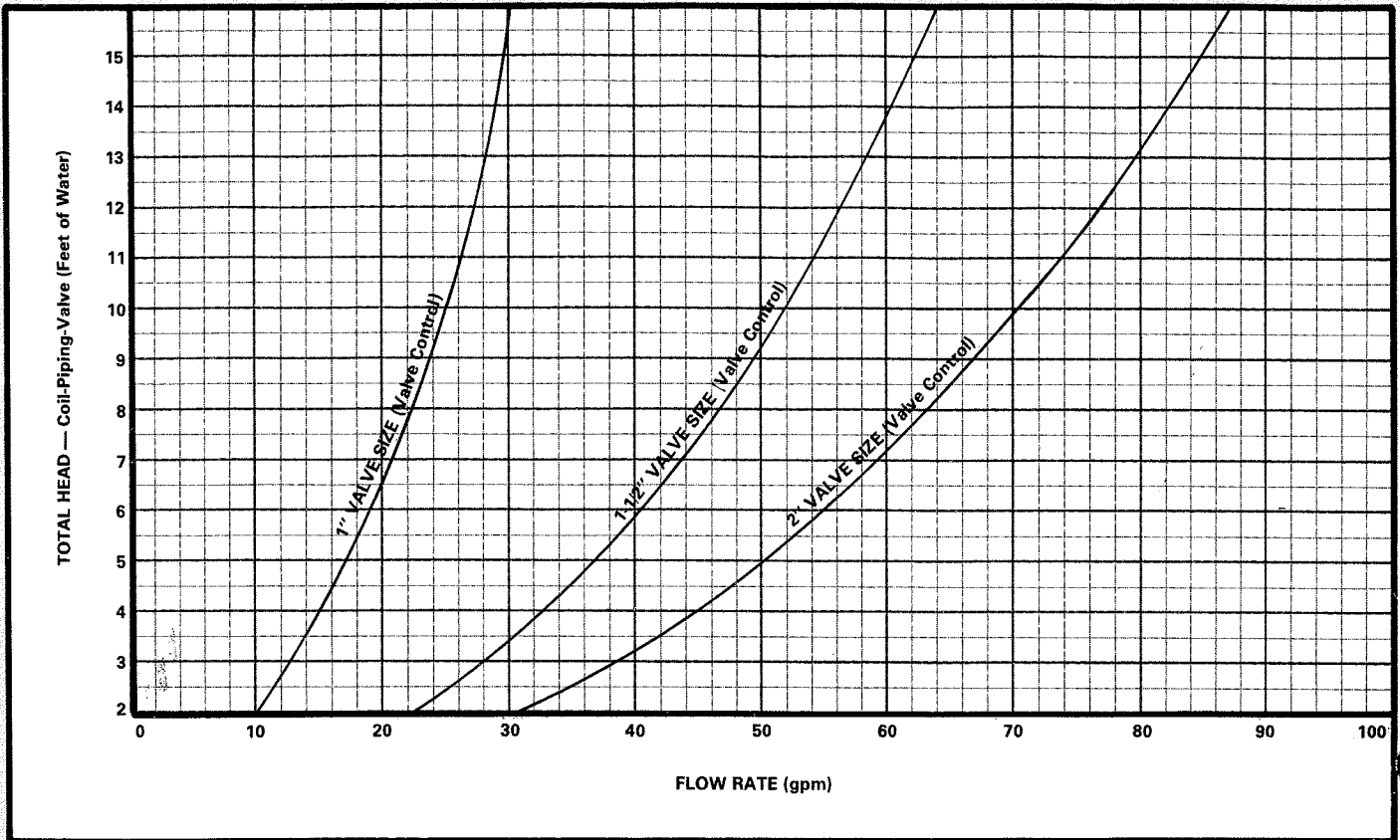
$$\text{Water T.D.} = \frac{\text{Btuh}}{500 \times \text{gpm}}$$

$$\text{Air T.R.} = \frac{\text{Btuh}}{1.08 \times \text{cfm}}$$

HOT WATER WITH GLYCOL SOLUTION CAPACITY CORRECTION FACTOR CHART
Multiply rating in hot water capacity chart by correction factor below.

% Glycol	Correction Factor
0	1.00
10	.97
20	.94
30	.91
40	.87
50	.84

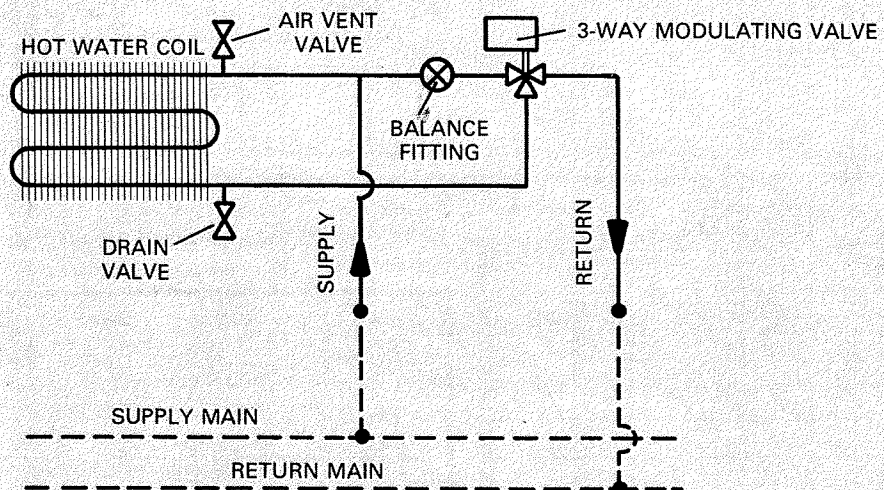
DSS1-180/260 HOT WATER VALVE SELECTION



**HOT WATER WITH GLYCOL SOLUTION
PRESSURE DROP CORRECTION FACTOR CHART**
Multiply figure in pressure drop chart by
correction factor below.

% Glycol	Correction Factor
0	1.00
10	1.07
20	1.14
30	1.22
40	1.31
50	1.40

MODULATING VALVE CONTROL SYSTEM PIPING



———— PIPING AND CONTROLS FURNISHED
AND FACTORY INSTALLED

----- PIPING FURNISHED BY INSTALLER