



DIRECT MULTIZONE SYSTEM DMS4-185 — DMS4-275 DMS4-300 — DMS4-360

ENGINEERING DATA
COMBINATION UNITS

DIRECT MULTIZONE
SYSTEMS

Page 51 a

May 15, 1977

Supersedes 11-1-74

Rooftop Heating-Cooling-Ventilating with Multizone Control

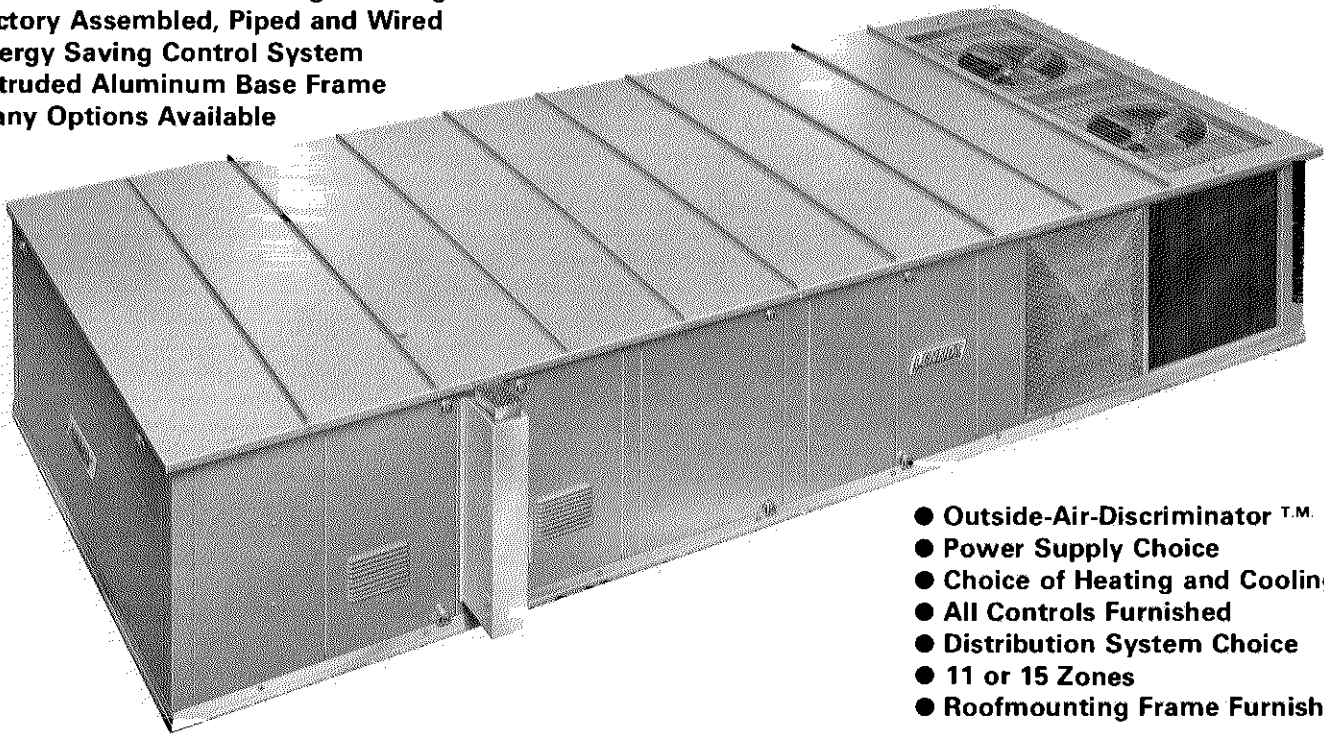
Gas Heat-700,000 Btuh Max. — Electric Heat-358,000 Btuh Max.

Hot Water 750,000 Btuh Max.—Steam Heat 742,000 Btuh Max.

Chilled Water Cooling-550,000 Btuh Max.

DX Cooling—196,000 to 338,000 Btuh @ ARI Conditions—Air Volume—10,000 cfm Maximum

- Outdoor Enameled Galvanized Steel Casing
- Heat-Cool-Vent in One Single Package
- Factory Assembled, Piped and Wired
- Energy Saving Control System
- Extruded Aluminum Base Frame
- Many Options Available



- Outside-Air-Discriminator ^{T.M.}
- Power Supply Choice
- Choice of Heating and Cooling
- All Controls Furnished
- Distribution System Choice
- 11 or 15 Zones
- Roofmounting Frame Furnished

Versatile Applications, Energy Conservation And Single Source For Comfort Responsibility Available With Direct Multizone Systems

The Lennox DMS4 heating-cooling-ventilating unit is the most sophisticated and significant factory-assembled equipment on the market today. The most effective measures in terms of energy conservation have been utilized in all phases of operation in the design of the DMS4. Efficient energy conservation design features consist of: Enthalpy control providing maximum use of outdoor air for cooling. Outside-Air-Discriminator ^{T.M.} reduces primary energy consumption. Cold deck evaporator eliminates excess partial load cooling. Multiple condenser coil refrigeration circuits for more partial load efficiency. Two-speed lead compressor for greater first stage efficiency. Indoor condenser heat coil reduces requirement of primary heating energy. Supply air blowers operate with the minimum resistance, horsepower and operating cost. Multiple heat sections or two stage power burners for maximum load control and efficiency. Solid-state electronic control system reduces heat-cool differential. The many energy utilization characteristics of the DMS4 conserves valuable natural energy resources and reduces operating costs.

The DMS4 system is a complete Heat-Vent-Cool assembly (including condensing unit) of highly engineered, integrated components in a weatherproof, low silhouette single package. All necessary controls including a disconnect are factory installed, wired and approved by appropriate approval agencies.

All models are available with a choice of options including; gas, electric, hot water, or steam heat and chilled water cooling or self contained DX air conditioning with a complete refrigerant charge, POWER SAVER[®] fresh air control, twin supply air blowers with drive and motor selection, return air blower, indoor condenser heat and several choices of air filters. Complete controls are also furnished. Units are also available as cooling-ventilating models only,

less the heating components. Air distribution is 11 or 15 zone multizone control at the unit or double duct with independent mixing dampers at each zone. A rugged and practical roof mounting frame is furnished. Also provided as standard equipment is the Solid-State Electronic Lennox Energy Saving hot and cold deck control system. All of these features provide almost unlimited flexibility in application and system design.

The DMS4 units make it possible to specify an entire rooftop multizone 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 as part of the package by Lennox.

The DX cooling system consists of two separate and completely independent refrigeration systems including separate Lennox LANDMARK[®] compressors and their independent condenser with fans and a separate circuit in the single evaporator coil. If cooling is not required initially the unit is available without the evaporator coil, compressors and condensing unit section. Future add-on cooling may be accomplished two ways. The evaporator coil can be factory installed with a standard production remote condensing unit and controls installed at a later date or the coil, controls and a remote condensing unit can all be installed later when cooling is required. Equipment is shipped factory assembled. Factory installed disconnect and control wiring terminal block permit quick field wiring connections. Cooling system has been thoroughly tested and rated according to ARI Standard 210 test conditions. Life cycle testing of the heat exchanger in the Lennox Laboratory proves long life of the heating element. Units are test operated at the factory before shipment.

SPECIFICATIONS AND RATINGS

Model No.		DMS4-185	DMS4-275	†DMS4-185/275	DMS4-300	DMS4-360	
Cooling Capacity	At ARI Standard 210 Test Conditions	Total capacity (Btuh)	196,000	278,000	210,000	304,000	338,000
		S/T ratio	.77	.77	.80	.77	.73
		Compressor watts	19,600	27,900	20,400	34,000	42,000
Condenser Coils	Net face area (sq. ft.)	(2) — 12.6	(2) — 12.6	(2) — 12.6	(2) — 12.7	(2) — 12.7	
	Tube diameter & No. of rows	3/8 — 2	3/8 — 4	3/8 — 2	3/8 — 6	3/8 — 6	
	Fins per inch	18	18	18	15	15	
Condenser Fans	Diameter (in.) & No. of blades	(2) — 26 — 5	(2) — 26 — 5	(2) — 26 — 5	(2) — 30 — 6	(2) — 30 — 6	
	Total air volume (cfm)	15,400	13,600	13,600	15,200	15,200	
	Motor hp	(2) — 1	(2) — 1	(2) — 1	(2) — 2	(2) — 2	
	Watts input (total)	2,800	2,800	2,800	5,000	5,000	
Evaporator Coil	Net face area (sq. ft.)	15.3	15.3	15.3	15.3	15.3	
	Tube diameter — No. of rows — Fins per inch	1/2 — 4 — 13	1/2 — 6 — 13	1/2 — 6 — 13	1/2 — 6 — 13	1/2 — 6 — 13	
Chilled water cooling capacity range (Btuh)		140,000 — 550,000					
Chilled Water Coil	Net face area (sq. ft.)	15.3					
	Tube diameter — No. of rows — Fins per inch	1/2 — 6 — 13					
Heating Options	Gas piping connections IPS (in.)	Natural	1-1/4				
		Propane	1-1/4				
	Gas heating capacities (Nat. or Propane) Maximum input/output (Btuh)		*275,000 — 206,250				
			**350,000 — 262,500				
			**500,000 — 375,000				
			***700,000 — 525,000				
	††Electric Heating capacity range (Btuh)	3 elements	115,300 — 153,500				
		4 elements	153,500 — 204,600				
		5 elements	191,800 — 255,800				
		6 elements	230,200 — 306,900				
7 elements		268,500 — 358,000					
Hot water heating capacity range (Btuh)	50,000 — 750,000						
Steam heating capacity range (Btuh)	299,000 — 742,000						
Hot Water Coil	Net face area (sq. ft.)	10.4					
	Tube diameter — No. of rows — Fins per inch	1/2 — 3 — 10					
Steam Coil	Net face area (sq. ft.)	9.9					
	Tube diameter — No. of rows — Fins per inch	1/2 — 2 — 10					
Hot Water, Steam & Chilled Water coil connection Inlet & Outlet		See Valve Selection Curves					
Filter Options	Standard frame filter size (in.) & free area (sq. ft.)	(3) — 20 x 20 x 1 — (5) — 20 x 25 x 1 — (25.7)					
	Bag filter free area (sq. ft.)	465.0					
Supply Air Blowers	Blower wheel nominal diam. x width (in.)	(2) 15 x 15					
	Motor horsepower (minimum — maximum)	3 — 10					
	Air volume range (cfm)	5,000 — 10,000					
Return Air Blower	Wheel diameter (in.)	40 — backward curved blades					
	Motor horsepower (minimum — maximum)	1-1/2 — 3					
	Air volume range (cfm)	5,000 — 10,000					
Condensate drain connection I.P.M. (in.)		1-1/4					
Electrical characteristics		208 to 600 volt — 60 hertz — 3 phase					

*Single stage heating natural gas only.

**Two stage heating natural gas only.

***Dual heat exchangers in series.

†Mix match model, uses DMS4-185 condensing section and DMS4 275 evaporator section.

††See electric heat rating table for capacities at various voltages.

NOTE — Hot water and chilled water capacity ranges shown are possible with varying supply conditions and air volumes. See coil capacity curves. Steam capacity ranges are possible with varying steam pressure and air volume. See steam rating charts.

MANY OPTIONS AND FEATURES IN A FLEXIBLE SINGLE PACKAGE ROOFTOP DIRECT MULTIZONE SYSTEM

ELECTRONIC LENNOX ENERGY SAVING 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) for each zone, supply air sensor for each zone load analyzer control module with zone circuit board and heat-cool logic control relays, zone damper actuator for each zone plus a mixed air/ventilation damper actuator with infinite resolution for blending outdoor air with return air. This system operates the unit equipment to automatically match its output to the load requirements with minimum space temperature variation. To accomplish this, the zone with the greatest cooling load will have its zone damper open full to the cold deck and will control the cold deck temperature to just match the load requirement in that zone. A cold deck modulating limit control regulates cooling operation to fit varying cooling load requirements. The zone with the greatest heating load will have its zone damper open full to the hot deck and will control the hot deck temperature to just match the load requirement in that zone. The other zones in the system (with their individual room temperature sensing transmitters and supply air sensors) will blend supply air to match the supply air temperature to the load in each individual zone. Also the system will often balance so that the same supply air temperature will be nearly right for each zone. The system can then "coast" with only the blowers operating for as long as the balanced condition continues. Should the load requirement in any zone change the controls will immediately respond to match supply air temperature to the load in that zone. In addition, when optional POWER SAVER and Condenser Heat are ordered, the right amount of outdoor air or indoor condenser coil heat is automatically furnished and utilized in the system to maintain temperature and minimize mechanical heating and cooling. With this control system troubleshooting is simple because the load analyzer signal transmitted by the room sensing transmitter reflects the load on the zone 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. All zones of the system may be checked at one accessible point, the load analyzer control module.

POWER SAVER SOLID-STATE CONTROLS

Optional equipment controls fresh air entry and "Free Cooling" with outdoor air. Outside and return air damper blades are provided with gaskets for tight seal and quiet operation. The formed dampers ride in nylon bearings. Structures that have high internal gains quite often require cooling at low outdoor air temperature. Lennox POWER SAVER eliminates the need for mechanical cooling at these temperatures by using outdoor air for cooling. Modulating limit control located in the cold deck, morning warm-up control located in return air stream, enthalpy control located in the outdoor air stream and Outside-Air-Discriminator 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. The POWER SAVER equipment may also be specified less controls with the dampers linked for manual operation. It is recommended electric heat units equipped with the POWER SAVER should have the Outside-Air-Discriminator and indoor condenser heat coil included in the system. 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.

● CONTROL OPTIONS

Night Setback — Equipment is wired to receive night setback controls. In mild climates a manual system switch (not furnished), or automatic programming turns off the entire unit. For colder climates a "night thermostat" located in an average zone controls the conditioned area to a preset fuel saving temperature. Manual (BM-4762) or 12 hour timer (BM-4761) 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. An optional skip-day clock timer (indoor/outdoor-12 hr carryover) P-8-3744 mounted in the DMS4 programs the equipment. In addition, a 7 day time clock (indoor/outdoor) P-8-10213 and skip-a-day clock (indoor) P-8-4168 are also available as options.

Remote Readout Panel — From one centrally located spot within the structure the operation of the DMS can be checked at a glance. Signal lights indicate; System On, Combustion Lockout, Condensing Unit Inoperative and Dirty Filter. See bulletin (Page 71) in Accessories section. When panel is used for night setback operation the following controls must be ordered extra; night thermostat, subbase, adapter plate and time clock.

Zone Control System — Factory installed damper motor choice.

Control System	Damper Motor
ZC16.....	Modulating (non spring return)
ZC14.....	Modulating (spring return)
ZC15.....	Pneumatic Actuator

(See Pneumatic Controls bulletin, Page 75)

● SUPPLY SYSTEM CHOICE

11 or 15 Zones — Located at unit with assembly matching width of unit. Zone dampers can be mechanically linked to be driven by a single damper motor. 4 zones per motor maximum. Damper blades are equipped with gaskets for tight seal and quiet operation.

Balancing Dampers — Located at each zone outlet in unit. Permits manual system balance and lock in place after air adjustment is accomplished.

Double Duct — Discharge head is located within the unit. Hot and cold ducts run length of building with branch lines feeding mixing boxes in each zone. A choice of mixing boxes is available. See Mixing Box bulletin (Page 73) in this section.

Dual Duct Splitter — A combination zone and double duct system application is also available. The duct system supply air outlets, in the unit, may be factory arranged in almost any combination desired.

● OUTSIDE-AIR-DISCRIMINATOR T.M. SOLID-STATE CONTROL

The energy saving Outside-Air-Discriminator will automatically drive the POWER SAVER to the minimum position when the energy required to maintain the hot deck is greater than the energy input to operate the first stage of mechanical cooling. This will occur on a demand of 15KW for electric heat, first stage heat demand for gas heat and 30% of the heat demand for hot water and steam heat. If cooling is still required to meet the cold deck demand, the first stage of mechanical cooling will be energized. The indoor condenser heat coil will then be available to meet the hot deck demand. When there is no hot deck demand, the POWER SAVER will cycle on the cold deck demand. Safety controls are furnished to provide necessary protection for compressors operating at low ambients.

● POWERFUL BLOWERS

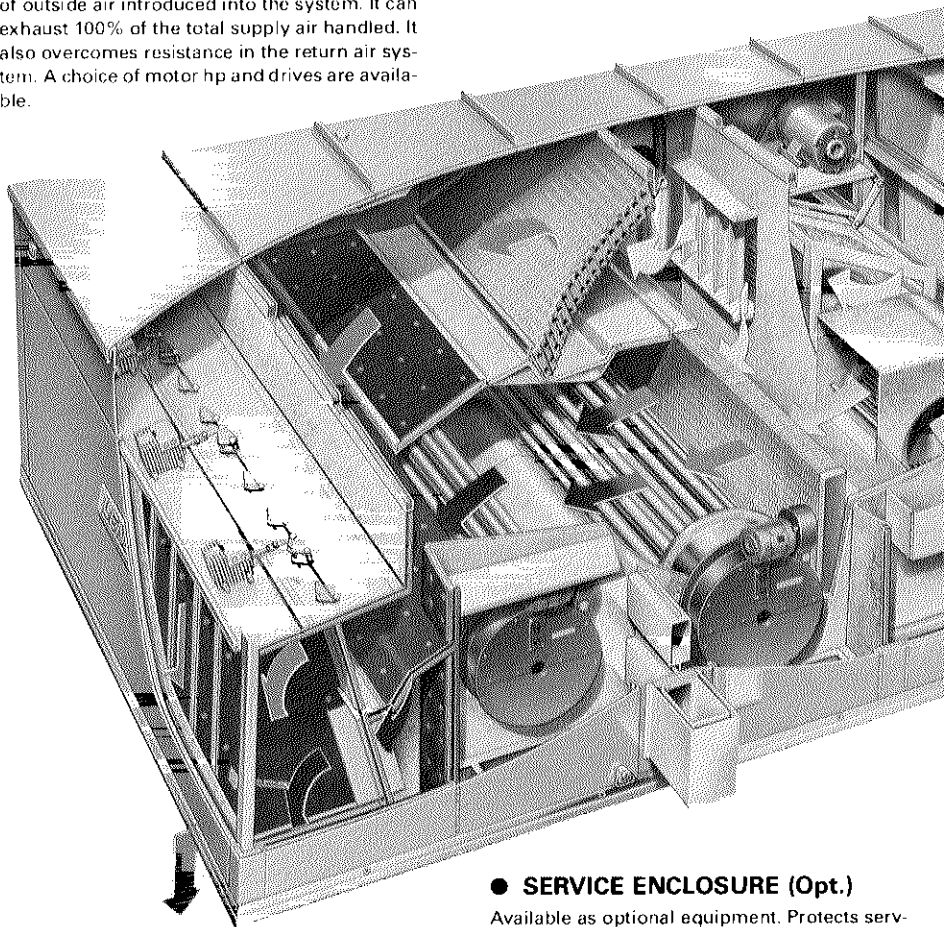
Twin 15" x 15" blowers deliver large air volumes with low power consumption. The blower assemblies are mounted to a rugged angle iron frame with the entire blower and frame assembly vibration isolated on rubber mounts. Equipped with permanently lubricated ball bearings. Blower wheels are statically and dynamically balanced. Pivoted motor mounting base permits quick and simple belt tension adjustment or belt changing. A choice of motor hp and drives is available.

● PRESSURE CONVERTER

Mounted to blower discharge snout giving increased performance by converting the kinetic energy of the high velocity blower discharge to static pressure. The converter also gives uniform air distribution.

● RETURN AIR BLOWER (Opt.)

Exhausts air in direct proportion to the amount of outside air introduced into the system. It can exhaust 100% of the total supply air handled. It also overcomes resistance in the return air system. A choice of motor hp and drives are available.



● SMOKE DETECTOR CONTROLS (Opt.)

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 OA & RA dampers and runs RA blower. 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 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 may be provided which acts as a remote test station.

● SERVICE ENCLOSURE (Opt.)

Available as optional equipment. Protects service area from inclement weather during servicing. See Page 25 in Accessories section.

● FILTER OPTIONS

Standard Frame Filters — Generous filter area consists of one inch, 20 pores per inch polyurethane media mounted in rugged individual galvanized metal frames. They are easily accessible for servicing. The filter rack is 4" thick which makes room for 3" of additional filtering material — such as activated charcoal.

Bag Filters — Highly efficient bag filters are available as optional equipment. Filters are easily accessible for service. Standard frame filters may be used as prefilters to extend the service life of the bag filters.

● READY TO OPERATE

Equipment is shipped assembled with all controls wired and piped. A complete refrigerant charge is furnished. Factory installed disconnect and control wiring terminal block allow quick field wiring connections.

● THERMOSTAT CHOICE

A solid-state room temperature sensing transmitter (thermostat) is furnished for each zone. A wall plate adaptor is furnished for mounting to a standard electrical box. An energy conserving wide "no load" band solid-state room temperature sensing transmitter (thermostat) is available as specified option. The wide "no load" band transmitter has an integral differential of approximately six degrees (6°) between room temperatures where that zone has terminated all heating (or cooling) demand and that which causes the load analyzer control module to change the cold deck (or hot deck) temperature. (e.g. As the need for heating reduces in a zone and the cold deck damper full opens, an additional 6" rise must occur before the control module initiates any change in the cold deck temperature. 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. Specify type desired when ordering.

● CONTROL OPTIONS

Night Setback — Equipment is wired to receive night setback controls. In mild climates a manual system switch (not furnished), or automatic programming turns off the entire unit. For colder climates a "night thermostat" located in an average zone controls the conditioned area to a preset fuel saving temperature. Manual (BM-4762) or 12 hour timer (BM-4761) 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. An optional skip-day clock timer (indoor/outdoor, 12 hr carryover) P-8-3744 mounted in the DMS4 programs the equipment. In addition, a 7 day time clock (indoor/outdoor) P-8-10213 and skip-a-day clock (indoor) P-8-4168 are also available as options.

Remote Readout Panel — From one centrally located spot within the structure the operation of the DMS can be checked at a glance. Signal lights indicate; System On, Combustion Lockout, Condensing Unit Inoperative and Dirty Filter. See bulletin (Page 71) in Accessories section. When panel is used for night setback operation the following controls must be ordered extra; night thermostat, subbase, adapter plate and time clock.

Zone Control System — Factory installed damper motor choice.

Control System	Damper Motor
ZC16.....	Modulating (non-spring return)
ZC14.....	Modulating (spring return)
ZC15.....	Pneumatic Actuator

(See Pneumatic Controls bulletin, Page 75)

● SUPPLY SYSTEM CHOICE

11 or 15 Zones — Located at unit with assembly matching width of unit. Zone dampers can be mechanically linked to be driven by a single damper motor. 4 zones per motor maximum. Damper blades are equipped with gaskets for tight seal and quiet operation.

Balancing Dampers — Located at each zone outlet in unit. Permits manual system balance and lock in place after air adjustment is accomplished.

Double Duct — Discharge head is located within the unit. Hot and cold ducts run length of building with branch lines feeding mixing boxes in each zone. A choice of mixing boxes is available. See Mixing Box bulletin (Page 73) in this section.

Dual Duct Splitter — A combination zone and double duct system application is also available. The duct system supply air outlets, in the unit, may be factory arranged in almost any combination desired.

● OUTSIDE-AIR-DISCRIMINATOR T.M. SOLID-STATE CONTROL

The energy saving Outside-Air-Discriminator will automatically drive the POWER SAVER to the minimum position when the energy required to maintain the hot deck is greater than the energy input to operate the first stage of mechanical cooling. This will occur on a demand of 15KW for electric heat, first stage heat demand for gas heat and 30% of the heat demand for hot water and steam heat. If cooling is still required to meet the cold deck demand, the first stage of mechanical cooling will be energized. The indoor condenser heat coil will then be available to meet the hot deck demand. When there is no hot deck demand, the POWER SAVER will cycle on the cold deck demand. Safety controls are furnished to provide necessary protection for compressors operating at low ambients.

● POWERFUL BLOWERS

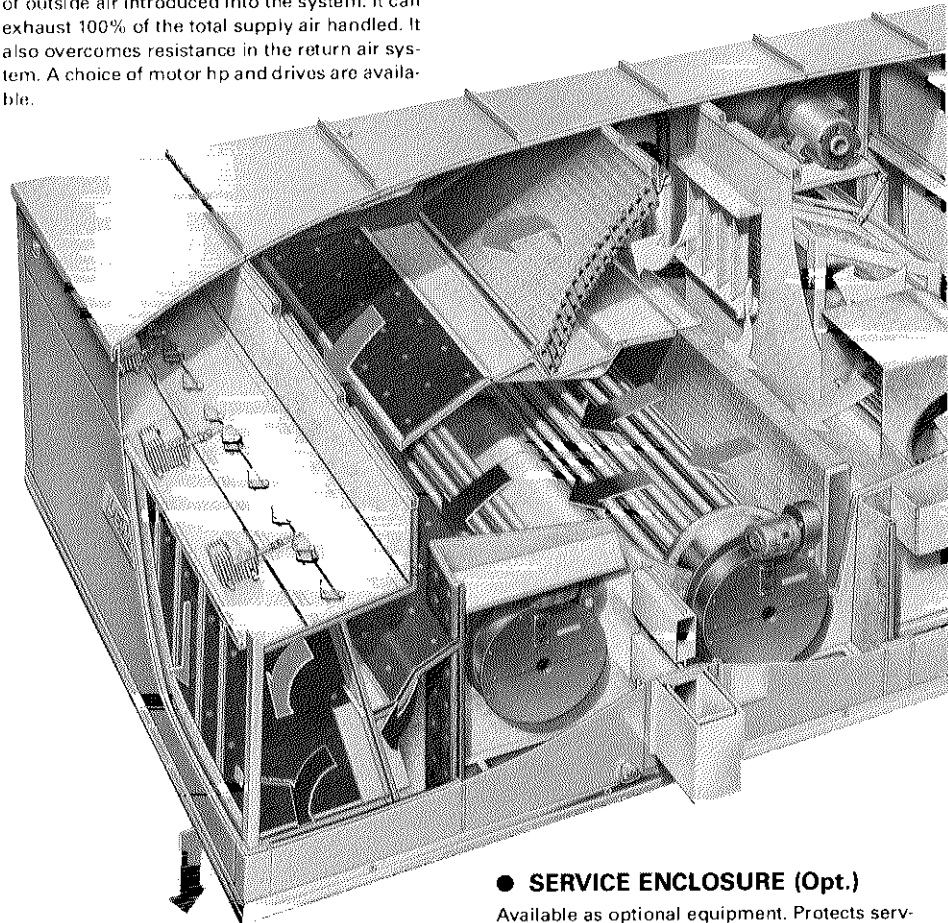
Twin 15" x 15" blowers deliver large air volumes with low power consumption. The blower assemblies are mounted to a rugged angle iron frame with the entire blower and frame assembly vibration isolated on rubber mounts. Equipped with permanently lubricated ball bearings. Blower wheels are statically and dynamically balanced. Pivoted motor mounting base permits quick and simple belt tension adjustment or belt changing. A choice of motor hp and drives is available.

● PRESSURE CONVERTER

Mounted to blower discharge snout giving increased performance by converting the kinetic energy of the high velocity blower discharge to static pressure. The converter also gives uniform air distribution.

● RETURN AIR BLOWER (Opt.)

Exhausts air in direct proportion to the amount of outside air introduced into the system. It can exhaust 100% of the total supply air handled. It also overcomes resistance in the return air system. A choice of motor hp and drives are available.



● THERMOSTAT CHOICE

A solid-state room temperature sensing transmitter (thermostat) is furnished for each zone. A wall plate adaptor is furnished for mounting to a standard electrical box. An energy conserving wide "no load" band solid-state room temperature sensing transmitter (thermostat) is available as specified option. The wide "no load" band transmitter has an integral differential of approximately six degrees (6°) between room temperatures where that zone has terminated all heating (or cooling) demand and that which causes the load analyzer control module to change the cold deck (or hot deck) temperature. (e.g. As the need for heating reduces in a zone and the cold deck damper full opens, an additional 6° rise must occur before the control module initiates any change in the cold deck temperature. 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. Specify type desired when ordering.

● SMOKE DETECTOR CONTROLS (Opt)

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 OA & RA dampers and runs RA blower. 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 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 may be provided which acts as a remote test station.

● SERVICE ENCLOSURE (Opt.)

Available as optional equipment. Protects service area from inclement weather during servicing. See Page 25 in Accessories section.

● FILTER OPTIONS

Standard Frame Filters — Generous filter area consists of one inch, 20 pores per inch polyurethane media mounted in rugged individual galvanized metal frames. They are easily accessible for servicing. The filter rack is 4" thick which makes room for 3" of additional filtering material — such as activated charcoal.

Bag Filters — Highly efficient bag filters are available as optional equipment. Filters are easily accessible for service. Standard frame filters may be used as prefilters to extend the service life of the bag filters.

● READY TO OPERATE

Equipment is shipped assembled with all controls wired and piped. A complete refrigerant charge is furnished. Factory installed disconnect and control wiring terminal block allow quick field wiring connections.

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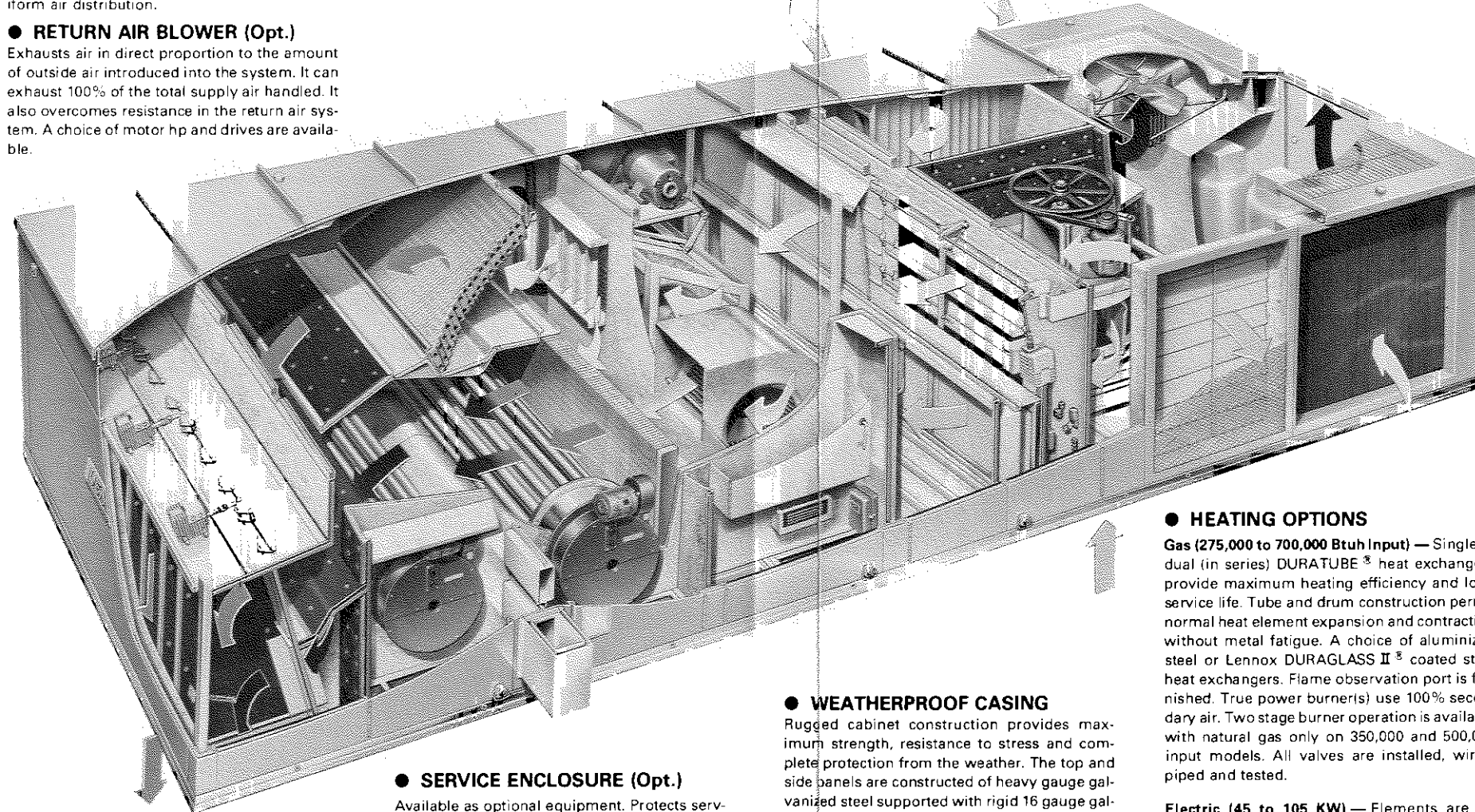
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● FILTER OPTIONS

Standard Frame Filters — Generous filter area consists of one inch, 20 pores per inch polyurethane media mounted in rugged individual galvanized metal frames. They are easily accessible for servicing. The filter rack is 4" thick which makes room for 3" of additional filtering material — such as activated charcoal.

Bag Filters — Highly efficient bag filters are available as optional equipment. Filters are easily accessible for service. Standard frame filters may be used as prefilters to extend the service life of the bag filters.

● READY TO OPERATE

Equipment is shipped assembled with all controls wired and piped. A complete refrigerant charge is furnished. Factory installed disconnect and control wiring terminal block allow quick field wiring connections.

● SAFETY CONTROLS

Gas fired models have a prepurge timer and electronic flame sensor. All models have fire-stats located in the blower compartment and return air area. Blower switch terminates heat-cool operation in event of abnormal operating conditions. All motors are overload protected. NEC or CEC approved fusing, wiring and disconnect are standard.

● HOISTING LUGS AND SLING

Four 4 gauge steel lugs with hoisting sling attached are furnished as standard. Installer has only to attach hoisting equipment to sling and place unit in desired location. Each lug will handle a load of 4 G's.

● WEATHERPROOF CASING

Rugged cabinet construction provides maximum strength, resistance to stress and complete protection from the weather. The top and side panels are constructed of heavy gauge galvanized steel supported with rigid 16 gauge galvanized steel interior panels. Exterior panels have a durable finish coat of outdoor enamel. The top panels are joined with 3/16" diameter rubber tubing in the bottom of each standing seam. Side panels are sealed with polyurethane.

● INSULATION

All side panels and top panels are insulated with 1-1/2 inch thick (1-1/2 lb. density-mat faced) fiberglass insulation. In addition the base is insulated with 1 inch thick (6 lb. density) fiberglass insulation and protected by the 16 ga. galvanized drain pan.

● ACCESS PANELS

Equipped with locking type door handles. Heating, blower and filter panels are hinged.

● UNITIZED FRAME AND BASE

Base frame is constructed of 6061-T6 extruded aluminum. All support members are 16 gauge galvanized steel. Entire bottom is a galvanized drain pan which traps and drains off moisture.

● ROOF MOUNTING FRAME

A rugged 14" National Roofing Contractors Association approved roof mounting frame (MF3-26514) exactly fits the perimeter of the DMS4 unit. It is flashed into the roof and mates to the DMS4 extruded aluminum base frame where a neoprene sponge gasket completes the sealing and weatherproofing job. A 2 x 4 nailer is secured to the sides of the frame to facilitate flashing. It is also available 8" high (MF3-2568) (not NRCA approved.)

● COMBUSTIBLE ADAPTER FRAME (Optional)

The AF7-275 adapter frame is used where the MF3 roof mounting frame is installed on combustible material. The adapter frame isolates the warm air plenum from combustible material.

● HEATING OPTIONS

Gas (275,000 to 700,000 Btuh Input) — Single or dual (in series) DURATUBE[®] heat exchangers provide maximum heating efficiency and long service life. Tube and drum construction permit normal heat element expansion and contraction without metal fatigue. A choice of aluminumized steel or Lennox DURAGLASS II[®] coated steel heat exchangers. Flame observation port is furnished. True power burner(s) use 100% secondary air. Two stage burner operation is available with natural gas only on 350,000 and 500,000 input models. All valves are installed, wired, piped and tested.

Electric (45 to 105 KW) — Elements are nichrome bare wire exposed directly to the hot deck air stream. Equipped with manual reset backup limits. Sequence controller brings elements on line sequentially and in response to demand with time delay between each element.

Hot Water Coil (50,000 to 750,000 Btuh) — A factory installed hot water coil is available with a three-way modulating valve. Coil is pressure leak tested. Factory installed freestat terminates power to damper motor closing OA damper, opens valve and starts pump (if used) to insure water circulation during freezing conditions. In addition a glycol solution may be used in the system to provide freeze protection.

Steam Heat (299,000 to 742,000 Btuh) — Steam coil is factory installed. Factory installed piping includes a modulating steam valve and float. Coil is pressure leak tested to insure leak proof construction. Factory installed freestat terminates power to damper motor closing OA damper and also opens valve during freezing conditions. Steam trap kit P-8-6212 is available for field installation and must be ordered extra.

● OUTSIDE AIR INTAKE

Outside air enters through corrosion resistant grilles. An eliminator section traps rain and keeps it from entering the air handling sections. The trapped moisture is eliminated through drainage holes.

● EXHAUST DAMPERS

Extruded aluminum dampers ride in nylon bearings. Damper blades are equipped with seal gaskets resulting in a tight seal and quiet operation.

● CONDENSER SECTION

Two Lennox LANDMARK compressors and their independent refrigerant circuits, condensers and fans give staging control to fit varying cooling load requirements. In addition the No. 1 refrigerant circuit is equipped with capacity reduction. A portion of the compressor discharge gas is by-passed directly into the refrigerant distributor, maintaining full refrigerant flow and compressor cooling. DMS4-185,275 models are equipped with two single speed L2 compressors. DMS4-300 uses the L2 and the nominal 15 ton L6 two speed compressor. DMS4-360 incorporates the L6 two speed and the nominal 15 ton L2 single speed compressor. DMS4-300 & 360 models are equipped with a hot gas by-pass solenoid valve which closes the by-pass on high speed first stage compressor operation to assure maximum operating economy. Compressors have the same reliable parts and design as the original L2. In addition the 15 ton compressors have a sightglass, flange fitting for suction line connection and two speed operation (L6 model only) for additional capacity reduction. Two speed control provides maximum efficiency and operation economy during periods of reduced load. See capacity chart. A condenser coil guard is available as optional equipment and must be ordered extra.

● INDOOR CONDENSER HEAT (Opt.)

Available as optional equipment (required with Outside-Air-Discriminator system). It is activated by the first stage of the heating controller when compressor No. 1 is running. The coil is located in the hot deck and will continue to give approximately 95,000 (DMS4-185), 125,000 (DMS4-275) and 155,000 (DMS4-300;360) Btuh of heat as long as compressor No. 1 is operating and there is a demand for heat. If compressor No. 1 is not operating, the entire heating load is handled by the gas, electric, hot water or steam components.

● EVAPORATOR COIL

Lennox designed and built evaporator has ripple edge aluminum fins machine fitted to copper tubes. The two separate circuits are circuited in row depth. Each circuit has its own independent expansion valve, separate condensing section and complete refrigerant charge. Pressure leak tested to insure leak proof construction.

● CHILLED WATER COOLING

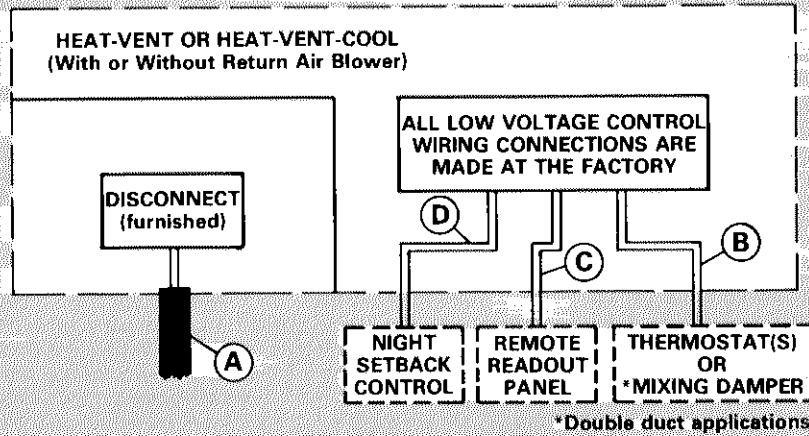
Six row single circuit coil with factory installed modulating valve. Water line inlet openings are provided in cabinet for ease of entry. Coil is constructed of aluminum fins mechanically fitted to copper tubes. Pressure leak tested to insure leak proof construction. A glycol solution may be used in the system to provide coil freeze-up protection.

● APPROVALS

Gas Model design is A.G.A. certified or C.G.A. approved. U.L. Listing is pending on hot water, electric heat models and cooling models. All electrical components are U.L. Listed. Wiring is according to NEC or CEC. I.R.I. and F.M. construction is available.

FIELD WIRING

NOTE — Correct size unit disconnect is furnished and factory installed.



- A — Single power supply — 3 wires minimum (For 208, 230, 460 and 575 volt models)
- B — 4 wire low voltage (From terminal strip to room temperature sensing transmitter [Thermostat].)
 - 3 wire low voltage 1 signal wire to each transmitter [Thermostat]. 2 power supply wires, 24 VDC. (When double duct mixing boxes with electronic load analyzer are used.)
- C — 11 wire low voltage (From terminal strip to optional remote readout control panel.)
- D — 2 wire low voltage (From terminal strip to night setback or system switch.)

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.

ELECTRIC HEAT DATA

ELECTRIC HEAT RATINGS

Elements	No. of Steps	Volts Input	208V	220/240V	440/480V	550/600V
3	6	Kw Input	33.8	37.7/45.0	37.7/45.0	37.7/45.0
		Btuh Output	115,300	128,000/153,500	128,000/153,000	128,000/153,000
4	8	Kw Input	45.0	50.5/60.0	50.5/60.0	50.5/60.0
		Btuh Output	153,500	169,800/204,600	169,800/204,600	169,800/204,600
5	10	Kw Input	56.3	63.0/75.0	63.0/75.0	63.0/75.0
		Btuh Output	191,800	212,300/255,800	212,300/255,800	212,300/255,800
6	12	Kw Input	67.5	75.6/90.0	75.6/90.0	75.6/90.0
		Btuh Output	230,200	254,700/306,900	254,700/306,900	254,700/306,900
7	14	Kw Input	78.8	88.4/105.0	88.4/105.0	88.4/105.0
		Btuh Output	268,500	297,200/358,000	297,200/358,000	297,200/358,000

NOTE — Ratings do not include blower motor heat.

SINGLE POWER SUPPLY-DMS4-300 DX COOLING AND ELECTRIC HEAT

Voltage (3 ph)	Number of Elements	WITHOUT RETURN AIR BLOWER				WITH RETURN AIR BLOWER							
		Supply Air Blower Motor hp				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	
		3	5	7-1/2	10	Return Air Blower Motor hp		Return Air Blower Motor hp		Return Air Blower Motor hp		Return Air Blower Motor hp	
						1-1/2	3	1-1/2	3	1-1/2	3	1-1/2	3
Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	
208	3	207.7	213.8	221.3	227.9	213.4	218.3	219.5	224.4	227.0	231.9	233.6	238.5
	4	207.7	213.8	221.3	227.9	213.4	218.3	219.5	224.4	227.0	231.9	233.6	238.5
	5	218.4	226.0	235.4	243.7	224.1	229.0	231.7	236.6	241.1	246.0	249.4	254.3
	6	257.6	265.2	274.6	282.9	263.3	268.2	270.9	275.8	280.3	285.2	288.6	293.5
	7	299.2	306.8	316.2	324.4	306.3	312.4	313.9	320.0	323.3	329.4	331.5	337.7
230	3	205.6	211.2	218.0	224.2	210.8	215.2	216.4	220.8	223.2	227.6	229.4	233.8
	4	205.6	211.2	218.0	224.2	210.8	215.2	216.4	220.8	223.2	227.6	229.4	233.8
	5	246.3	253.3	261.8	269.3	251.5	255.9	258.5	262.9	267.0	271.4	274.5	278.9
	6	293.6	300.6	309.1	316.6	300.1	305.6	307.1	312.6	315.6	321.1	323.1	328.6
	7	338.7	345.7	354.2	361.7	345.2	330.7	352.2	357.7	360.7	366.2	368.2	373.7
460	3	102.3	105.1	108.5	111.5	104.9	107.1	107.7	109.9	110.9	113.3	114.1	116.3
	4	102.3	105.1	108.5	111.9	104.9	107.1	107.7	109.9	110.9	113.3	114.5	116.7
	5	124.0	127.5	131.8	135.5	127.2	130.0	130.8	133.5	135.0	137.8	138.8	141.5
	6	146.5	150.0	154.3	158.0	149.7	152.5	153.3	156.0	157.5	160.3	161.3	164.0
	7	169.0	172.5	176.8	180.5	172.2	175.0	175.8	178.5	180.0	182.8	183.8	186.5
575	3	80.1	82.3	85.2	87.2	82.0	83.8	84.2	86.0	87.1	88.9	89.1	90.9
	4	80.4	83.1	86.7	89.3	82.5	84.3	85.2	87.0	88.8	90.6	91.4	93.2
	5	98.4	101.1	104.7	107.3	100.5	102.3	103.2	105.0	106.8	108.6	109.4	111.2
	6	116.4	119.1	122.7	125.3	118.5	120.3	121.2	123.0	124.8	126.6	127.4	129.2
	7	135.2	138.0	141.6	144.1	137.9	140.1	140.6	142.9	144.2	146.5	146.8	149.0

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

SINGLE POWER SUPPLY-DMS4-360 DX COOLING AND ELECTRIC HEAT

Voltage (3 ph)	Number of Elements	WITHOUT RETURN AIR BLOWER				WITH RETURN AIR BLOWER							
		Supply Air Blower Motor hp				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	
		3	5	7-1/2	10	Return Air Blower Motor hp		Return Air Blower Motor hp		Return Air Blower Motor hp		Return Air Blower Motor hp	
						1-1/2	3	1-1/2	3	1-1/2	3	1-1/2	3
Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	Minimum Circuit Ampacity	
208	3	228.0	234.1	241.6	248.2	233.7	238.6	239.8	244.7	247.3	252.2	253.9	258.8
	4	228.0	234.1	241.6	248.2	233.7	238.6	239.8	244.7	247.3	252.2	253.9	258.8
	5	228.0	234.1	241.6	248.2	233.7	238.6	239.8	244.7	247.3	252.2	253.9	258.8
	6	257.6	265.2	274.6	282.9	263.3	268.2	270.9	275.8	280.3	285.2	288.6	293.5
	7	299.2	306.8	316.2	324.4	306.3	312.4	313.9	320.0	323.3	329.4	331.5	337.7
230	3	223.2	228.8	235.6	241.6	228.9	232.8	234.0	238.4	240.8	245.2	246.8	251.2
	4	223.2	228.8	235.6	241.6	228.9	232.8	234.0	238.4	240.8	245.2	246.8	251.2
	5	246.3	253.3	261.8	269.3	251.5	255.9	258.5	262.9	267.0	271.4	274.5	278.9
	6	293.6	300.6	309.1	316.6	300.1	305.6	307.1	312.6	315.6	321.1	323.1	328.6
	7	338.7	345.7	354.2	361.7	345.2	330.7	352.2	357.7	360.7	366.2	368.2	373.7
460	3	111.6	114.4	117.8	120.8	114.2	116.4	117.0	119.2	120.4	122.6	123.4	125.6
	4	111.6	114.4	117.8	120.8	114.2	116.4	117.0	119.2	120.4	122.6	123.4	125.6
	5	124.0	127.5	131.8	135.5	127.2	130.0	130.8	133.5	135.0	137.8	138.8	141.5
	6	146.5	150.0	154.3	158.0	149.7	152.5	153.3	156.0	157.5	160.3	161.3	164.0
	7	169.0	172.5	176.8	180.5	172.2	175.0	175.8	178.5	180.0	182.8	183.8	186.5
575	3	89.3	91.5	94.4	96.4	91.4	93.2	93.6	95.4	96.5	98.3	98.5	100.3
	4	89.3	91.5	94.4	96.4	91.4	93.2	93.6	95.4	96.5	98.3	98.5	100.3
	5	98.4	101.1	104.7	107.3	100.5	102.3	103.2	105.0	106.8	108.6	109.4	111.2
	6	116.4	119.1	122.7	125.3	118.5	120.3	121.2	123.0	124.8	126.6	127.4	129.2
	7	135.2	138.0	141.6	144.1	137.9	140.1	140.6	142.9	144.2	146.5	146.8	149.0

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

DMS4-185 & DMS4-185/275 DX COOLING AND ELECTRIC HEAT ELECTRICAL DATA

Voltage (three phase)		208V	230V	460V	575V	
Compressors		Full load amps (each)	31.8	31.8	14.6	11.9
		Power factor	.85	.85	.85	.85
		Locked rotor amps (each)	185.0	185.0	93.0	76.0
Condenser Fan Motors		Full load amps (each)	4.7	4.3	2.2	1.7
		Horsepower	(2) - 1	(2) - 1	(2) - 1	(2) - 1
Supply Air Blower Motor	3 hp	Full load amps	10.6	9.6	4.8	3.9
		Locked rotor amps	70.0	64.0	32.0	26.0
	5 hp	Full load amps	16.7	15.2	7.6	6.1
		Locked rotor amps	101.0	92.0	46.0	37.0
	7-1/2 hp	Full load amps	24.2	22.0	11.0	9.0
		Locked rotor amps	154.7	150.0	75.0	56.0
	10 hp	Full load amps	30.8	28.0	14.0	11.0
		Locked rotor amps	194.0	175.0	87.5	70.0
Return Air Blower Motor	1-1/2 hp	Full load amps	5.7	5.2	2.6	2.1
		Locked rotor amps	44.0	31.6	15.8	12.8
	3 hp	Full load amps	10.6	9.6	4.8	3.9
		Locked rotor amps	70.0	64.0	32.0	26.0
2 KVA transformer full load amps (all models)		9.6	8.7	4.4	3.5	
Electric heat full load amps/element (3 minimum - 7 maximum)		31.3	36.1	18.0	14.4	

DMS4-185 & DMS4-185/275 AIR COND. WITH OR WITHOUT GAS, CHILLED WATER, HOT WATER OR STEAM ELECTRICAL DATA

Voltage (three phase)	Without Return Air Blower			With Return Air Blower		
	Supply Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat	Return Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat
		Minimum Circuit Ampacity	Minimum Circuit Ampacity		Minimum Circuit Ampacity	Minimum Circuit Ampacity
208	3	22.8	106.0	1-1/2	28.5	111.7
		30.4	112.1	3	33.4	116.6
	5	39.8	119.6	1-1/2	36.1	117.8
		48.1	126.2	3	41.0	122.7
	7-1/2	48.1	126.2	1-1/2	45.5	125.3
		5	102.9	108.5	3	50.4
	10	20.7	102.9	1-1/2	53.8	131.9
		27.7	108.5	3	58.7	136.8
230	3	36.2	115.3	1-1/2	25.9	108.1
		43.7	121.3	3	30.3	112.5
	5	43.7	121.3	1-1/2	32.9	113.7
		3	102.9	3	37.3	118.1
	7-1/2	10.4	48.6	1-1-2	41.4	120.5
		13.9	51.4	3	45.8	124.9
	10	18.2	54.8	1-1/2	48.9	126.5
		21.9	57.8	3	53.3	130.9
460	3	10.4	48.6	1-1/2	13.0	51.2
		13.9	51.4	3	15.2	53.4
	5	18.2	54.8	1-1/2	16.5	54.0
		21.9	57.8	3	18.7	56.2
	7-1/2	8.4	39.4	1-1-2	20.8	57.4
		11.1	41.6	3	23.0	59.6
	10	14.7	44.5	1-1/2	24.5	60.4
		17.3	46.5	3	26.7	62.6
575	3	8.4	39.4	1-1/2	10.5	41.5
		11.1	41.6	3	12.3	43.0
	5	14.7	44.5	1-1/2	13.2	43.7
		17.3	46.5	3	15.0	45.5
	7-1/2	10.5	41.5	1-1/2	16.8	46.6
		12.3	43.0	3	18.6	48.4
	10	13.2	43.7	1-1/2	19.4	48.6
		15.0	45.5	3	21.2	50.4

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

ELECTRICAL DATA

DMS4-275 DX COOLING AND ELECTRIC HEAT ELECTRICAL DATA

Voltage (three phase)		208V	230V	460V	575V	
Compressors	Full load amps (each)	46.7	46.7	22.8	16.5	
	Power factor	.85	.85	.85	.85	
	Locked rotor amps (each)	240.0	240.0	128.0	92.0	
Condenser Fan Motors	Full load amps (each)	4.7	4.3	2.2	1.7	
	Horsepower	(2)-1	(2) 1	(2)-1	(2) 1	
Supply Air Blower Motor	3 hp	Full load amps	10.6	9.6	4.8	3.9
		Locked rotor amps	70.0	64.0	32.0	26.0
	5 hp	Full load amps	16.7	15.2	7.6	6.1
		Locked rotor amps	101.0	92.0	46.0	37.0
	7-1/2 hp	Full load amps	24.2	22.0	11.0	9.0
		Locked rotor amps	154.7	150.0	75.0	56.0
	10 hp	Full load amps	30.8	28.0	14.0	11.0
		Locked rotor amps	194.0	175.0	87.5	70.0
Return Air Blower Motor	1-1/2 hp	Full load amps	5.7	5.2	2.6	2.1
		Locked rotor amps	44.0	31.6	15.8	12.8
	3 hp	Full load amps	10.6	9.6	4.8	3.9
		Locked rotor amps	70.0	64.0	32.0	26.0
2 KVA transformer full load amps (all models)		9.6	8.7	4.4	3.5	
Electric heat full load amps/element (3 minimum – 7 maximum)		31.3	36.1	18.0	14.4	

DMS4-275 AIR CONDITIONING WITH OR WITHOUT GAS, CHILLED WATER, HOT WATER OR STEAM ELECTRICAL DATA

Voltage (three phase)	Without Return Air Blower				With Return Air Blower			
	Supply Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat	Return Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat	Return Air Blower Motor hp	
		Minimum Circuit Ampacity	Minimum Circuit Ampacity		Minimum Circuit Ampacity	Minimum Circuit Ampacity		
208	3	22.8	139.5	1-1/2	28.5	145.2	3	
				3	33.4	150.1	3	
	5	30.4	145.6	1-1/2	36.1	151.3	3	
				3	41.0	156.2	3	
	7-1/2	39.8	153.1	1-1/2	45.5	158.8	3	
230	3	20.7	136.4	1-1/2	25.9	141.6	3	
				3	30.3	146.0	3	
	5	27.7	142.0	1-1/2	32.9	147.2	3	
				3	37.3	151.6	3	
	7-1/2	36.2	148.8	1-1-2	41.4	154.0	3	
460	3	10.4	67.1	1-1/2	13.0	69.7	3	
				3	15.2	71.9	3	
	5	13.9	69.9	1-1/2	16.5	72.5	3	
				3	18.7	74.7	3	
	7-1/2	18.2	73.3	1-1-2	20.8	75.9	3	
575	3	8.4	49.7	1-1/2	10.5	51.8	3	
				3	12.3	53.6	3	
	5	11.1	51.9	1-1/2	13.2	54.0	3	
				3	15.0	55.8	3	
	7-1/2	14.7	54.8	1-1/2	16.8	56.9	3	
10			3	18.6	58.7	3		
			1-1/2	19.4	58.9	3		
			3	21.2	60.7	3		

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

ELECTRICAL DATA

DMS4-300 DX COOLING AND ELECTRIC HEAT ELECTRICAL DATA

Voltage (three phase)		208V	230V	460V	575V	
Compressor 1	Full load amps	70.0	66.0	33.0	26.4	
	Power factor	.85	.85	.85	.85	
	Locked rotor amps	412.0	375.0	188.0	151.0	
Compressor 2	Full load amps	46.7	46.7	22.8	16.5	
	Power factor	.85	.85	.85	.85	
	Locked rotor amps	240.0	240.0	128.0	92.0	
Condenser Fan Motors	Full load amps (each)	8.6	7.8	3.9	3.1	
	Horsepower	(2)-2	(2)-2	(2)-2	(2)-2	
Supply Air Blower Motor	3 hp	Full load amps	10.6	9.6	4.8	3.9
		Locked rotor amps	70.0	64.0	32.0	26.0
	5 hp	Full load amps	16.7	15.2	7.6	6.1
		Locked rotor amps	101.0	92.0	46.0	37.0
	7-1/2 hp	Full load amps	24.2	22.0	11.0	9.0
		Locked rotor amps	155.0	150.0	75.0	56.0
	10 hp	Full load amps	30.8	28.0	14.0	11.0
		Locked rotor amps	194.0	175.0	88.0	70.0
Return Air Blower Motor	1-1/2 hp	Full load amps	5.7	5.2	2.6	2.1
		Locked rotor amps	44.0	31.6	15.8	12.8
	3 hp	Full load amps	10.6	9.6	4.8	3.9
		Locked rotor amps	70.0	64.0	32.0	26.0
2 KVA transformer full load amps (all models)		9.6	8.7	4.4	3.5	
Electric heat full load amps/element (3 minimum - 7 maximum)		31.3	36.1	18.0	14.4	

DMS4-300 AIR CONDITIONING WITH OR WITHOUT GAS, CHILLED WATER, HOT WATER OR STEAM ELECTRICAL DATA

Voltage (three phase)	Without Return Air Blower				With Return Air Blower			
	Supply Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat	Return Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat		
		Minimum Circuit Ampacity	Minimum Circuit Ampacity		Minimum Circuit Ampacity	Minimum Circuit Ampacity		
208	3	22.8	168.6	1-1/2	28.5	174.3		
		30.4	174.7	3	33.4	179.2		
	5	30.4	174.7	1-1/2	36.1	180.4		
		39.8	182.2	3	41.0	185.3		
	7-1/2	39.8	182.2	1-1/2	45.5	187.9		
		48.1	188.8	3	50.4	192.8		
	10	48.1	188.8	1-1/2	53.8	194.5		
		48.1	188.8	3	58.7	199.4		
230	3	20.7	160.5	1-1/2	25.9	165.7		
		27.7	166.1	3	30.3	170.1		
	5	27.7	166.1	1-1/2	32.9	171.3		
		36.2	172.9	3	37.3	175.7		
	7-1/2	36.2	172.9	1-1-2	41.4	178.1		
		43.7	178.9	3	45.8	182.5		
	10	43.7	178.9	1-1/2	48.9	184.1		
		43.7	178.9	3	53.3	188.5		
460	3	10.4	79.8	1-1/2	13.0	82.4		
		13.9	82.6	3	15.2	84.6		
	5	13.9	82.6	1-1/2	16.5	85.2		
		18.2	86.0	3	18.7	87.4		
	7-1/2	18.2	86.0	1-1-2	20.8	88.4		
		21.9	89.0	3	23.0	90.8		
	10	21.9	89.0	1-1/2	24.5	91.6		
		21.9	89.0	3	26.7	93.8		
575	3	8.4	62.1	1-1/2	10.5	64.0		
		11.1	64.3	3	12.3	65.8		
	5	11.1	64.3	1-1/2	13.2	66.2		
		14.7	67.2	3	15.0	68.0		
	7-1/2	14.7	67.2	1-1/2	16.8	69.1		
		17.3	69.2	3	18.6	70.9		
	10	17.3	69.2	1-1/2	19.4	71.1		
		17.3	69.2	3	21.2	72.9		

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

ELECTRICAL DATA

DMS4-275 DX COOLING AND ELECTRIC HEAT ELECTRICAL DATA

Voltage (three phase)			208V	230V	460V	575V
Compressors	Full load amps (each)		46.7	46.7	22.8	16.5
	Power factor		.85	.85	.85	.85
	Locked rotor amps (each)		240.0	240.0	128.0	92.0
Condenser Fan Motors	Full load amps (each)		4.7	4.3	2.2	1.7
	Horsepower		(2)–1	(2)–1	(2)–1	(2)–1
Supply Air Blower Motor	3 hp	Full load amps	10.6	9.6	4.8	3.9
		Locked rotor amps	70.0	64.0	32.0	26.0
	5 hp	Full load amps	16.7	15.2	7.6	6.1
		Locked rotor amps	101.0	92.0	46.0	37.0
	7-1/2 hp	Full load amps	24.2	22.0	11.0	9.0
		Locked rotor amps	154.7	150.0	75.0	56.0
	10 hp	Full load amps	30.8	28.0	14.0	11.0
		Locked rotor amps	194.0	175.0	87.5	70.0
Return Air Blower Motor	1-1/2 hp	Full load amps	5.7	5.2	2.6	2.1
		Locked rotor amps	44.0	31.6	15.8	12.8
	3 hp	Full load amps	10.6	9.6	4.8	3.9
		Locked rotor amps	70.0	64.0	32.0	26.0
2 KVA transformer full load amps (all models)			9.6	8.7	4.4	3.5
Electric heat full load amps/element (3 minimum – 7 maximum)			31.3	36.1	18.0	14.4

DMS4-275 AIR CONDITIONING WITH OR WITHOUT GAS, CHILLED WATER, HOT WATER OR STEAM ELECTRICAL DATA

Voltage (three phase)	Without Return Air Blower				With Return Air Blower		
	Supply Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat	Return Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat	
		Minimum Circuit Ampacity	Minimum Circuit Ampacity		Minimum Circuit Ampacity	Minimum Circuit Ampacity	
208	3	22.8	139.5	1-1/2	28.5	145.2	
				3	33.4	150.1	
	5	30.4	145.6	1-1/2	36.1	151.3	
				3	41.0	156.2	
	7-1/2	39.8	153.1	1-1/2	45.5	158.8	
				3	50.4	163.7	
	10	48.1	159.7	1-1/2	53.8	165.4	
				3	58.7	170.3	
230	3	20.7	136.4	1-1/2	25.9	141.6	
				3	30.3	146.0	
	5	27.7	142.0	1-1/2	32.9	147.2	
				3	37.3	151.6	
	7-1/2	36.2	148.8	1-1-2	41.4	154.0	
				3	45.8	158.4	
	10	43.7	154.8	1-1/2	48.9	160.0	
				3	53.3	164.4	
460	3	10.4	67.1	1-1/2	13.0	69.7	
				3	15.2	71.9	
	5	13.9	69.9	1-1/2	16.5	72.5	
				3	18.7	74.7	
	7-1/2	18.2	73.3	1-1-2	20.8	75.9	
				3	23.0	78.1	
	10	21.9	76.3	1-1/2	24.5	78.9	
				3	26.7	81.1	
575	3	8.4	49.7	1-1/2	10.5	51.8	
				3	12.3	53.6	
	5	11.1	51.9	1-1/2	13.2	54.0	
				3	15.0	55.8	
	7-1/2	14.7	54.8	1-1/2	16.8	56.9	
				3	18.6	58.7	
	10	17.3	56.8	1-1/2	19.4	58.9	
				3	21.2	60.7	

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

ELECTRICAL DATA

DMS4-300 DX COOLING AND ELECTRIC HEAT ELECTRICAL DATA

Voltage (three phase)		208V	230V	460V	575V	
Compressor 1	Full load amps	70.0	66.0	33.0	26.4	
	Power factor	.85	.85	.85	.85	
	Locked rotor amps	412.0	375.0	188.0	151.0	
Compressor 2	Full load amps	46.7	46.7	22.8	16.5	
	Power factor	.85	.85	.85	.85	
	Locked rotor amps	240.0	240.0	128.0	92.0	
Condenser Fan Motors		Full load amps (each)	8.6	7.8	3.9	3.1
		Horsepower	(2)–2	(2)–2	(2)–2	(2)–2
Supply Air Blower Motor	3 hp	Full load amps	10.6	9.6	4.8	3.9
		Locked rotor amps	70.0	64.0	32.0	26.0
	5 hp	Full load amps	16.7	15.2	7.6	6.1
		Locked rotor amps	101.0	92.0	46.0	37.0
	7-1/2 hp	Full load amps	24.2	22.0	11.0	9.0
		Locked rotor amps	155.0	150.0	75.0	56.0
	10 hp	Full load amps	30.8	28.0	14.0	11.0
		Locked rotor amps	194.0	175.0	88.0	70.0
Return Air Blower Motor	1-1/2 hp	Full load amps	5.7	5.2	2.6	2.1
		Locked rotor amps	44.0	31.6	15.8	12.8
	3 hp	Full load amps	10.6	9.6	4.8	3.9
		Locked rotor amps	70.0	64.0	32.0	26.0
2 KVA transformer full load amps (all models)		9.6	8.7	4.4	3.5	
Electric heat full load amps/element (3 minimum - 7 maximum)		31.3	36.1	18.0	14.4	

DMS4-300 AIR CONDITIONING WITH OR WITHOUT GAS, CHILLED WATER, HOT WATER OR STEAM ELECTRICAL DATA

Voltage (three phase)	Without Return Air Blower				With Return Air Blower		
	Supply Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat	Return Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat	
		Minimum Circuit Ampacity	Minimum Circuit Ampacity		Minimum Circuit Ampacity	Minimum Circuit Ampacity	
208	3	22.8	168.6	1-1/2	28.5	174.3	
				3	33.4	179.2	
	5	30.4	174.7	1-1/2	36.1	180.4	
				3	41.0	185.3	
	7-1/2	39.8	182.2	1-1/2	45.5	187.9	
				3	50.4	192.8	
	10	48.1	188.8	1-1/2	53.8	194.5	
				3	58.7	199.4	
230	3	20.7	160.5	1-1/2	25.9	165.7	
				3	30.3	170.1	
	5	27.7	166.1	1-1/2	32.9	171.3	
				3	37.3	175.7	
	7-1/2	36.2	172.9	1-1-2	41.4	178.1	
				3	45.8	182.5	
	10	43.7	178.9	1-1/2	48.9	184.1	
				3	53.3	188.5	
460	3	10.4	79.8	1-1/2	13.0	82.4	
				3	15.2	84.6	
	5	13.9	82.6	1-1/2	16.5	85.2	
				3	18.7	87.4	
	7-1/2	18.2	86.0	1-1-2	20.8	88.4	
				3	23.0	90.8	
	10	21.9	89.0	1-1/2	24.5	91.6	
				3	26.7	93.8	
575	3	8.4	62.1	1-1/2	10.5	64.0	
				3	12.3	65.8	
	5	11.1	64.3	1-1/2	13.2	66.2	
				3	15.0	68.0	
	7-1/2	14.7	67.2	1-1/2	16.8	69.1	
				3	18.6	70.9	
	10	17.3	69.2	1-1/2	19.4	71.1	
				3	21.2	72.9	

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

ELECTRICAL DATA

DMS4-360 DX COOLING AND ELECTRIC HEAT ELECTRICAL DATA

Voltage (three phase)		208V	230V	460V	575V		
Compressor 1	Full load amps	70.0	66.0	33.0	26.4		
	Power factor	.85	.85	.85	.85		
	Locked rotor amps	412.0	375.0	188.0	151.0		
Compressor 2	Full load amps	67.0	64.3	32.1	25.7		
	Power factor	.85	.85	.85	.85		
	Locked rotor amps	398.0	361.0	181.0	144.0		
Condenser Fan Motors	Full load amps (each)	8.6	7.8	3.9	3.1		
	Horsepower	(2)–2	(2)–2	(2)–2	(2)–2		
Supply Air Blower Motor	3 hp	Full load amps	10.6	9.6	4.8	3.9	
		Locked rotor amps	70.0	64.0	32.0	26.0	
	5 hp	Full load amps	16.7	15.2	7.6	6.1	
		Locked rotor amps	101.0	92.0	46.0	37.0	
	7-1/2 hp	Full load amps	24.2	22.0	11.0	9.0	
		Locked rotor amps	155.0	150.0	75.0	56.0	
	10 hp	Full load amps	30.8	28.0	14.0	11.0	
		Locked rotor amps	194.0	175.0	88.0	70.0	
	Return Air Blower Motor	1-1/2 hp	Full load amps	5.7	5.2	2.6	2.1
			Locked rotor amps	44.0	31.6	15.8	12.8
		3 hp	Full load amps	10.6	9.6	4.8	3.9
			Locked rotor amps	70.0	64.0	32.0	26.0
2 KVA transformer full load amps (all models)		9.6	8.7	4.4	3.5		
Electric heat full load amps/element (3 minimum – 7 maximum)		31.3	36.1	18.0	14.4		

DMS4-360 AIR CONDITIONING WITH OR WITHOUT GAS, CHILLED WATER, HOT WATER OR STEAM ELECTRICAL DATA

Voltage (three phase)	Without Return Air Blower			With Return Air Blower			
	Supply Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat	Return Air Blower Motor hp	Gas, Steam or Hot Water Heat & Chilled Water	Air Cond. w/ or w/o Gas, Steam or Hot Water Heat	
		Minimum Circuit Ampacity	Minimum Circuit Ampacity		Minimum Circuit Ampacity	Minimum Circuit Ampacity	
208	3	22.8	188.9	1-1/2	28.5	194.6	
				3	33.4	199.5	
	5	30.4	195.0	1-1/2	36.1	200.7	
				3	41.0	205.6	
	7-1/2	39.8	202.5	1-1/2	45.5	208.2	
				3	50.4	213.1	
	10	48.1	209.1	1-1/2	53.8	214.8	
				3	58.7	219.7	
	230	3	20.7	178.1	1-1/2	25.9	183.3
					3	30.3	187.7
5		27.7	183.7	1-1/2	32.9	188.9	
				3	37.3	193.3	
7-1/2		36.2	190.5	1-1/2	41.4	195.7	
				3	45.8	200.1	
10		43.7	196.5	1-1/2	48.9	201.7	
				3	53.3	206.1	
460		3	10.4	89.1	1-1/2	13.0	91.7
					3	15.2	93.9
	5	13.9	91.9	1-1/2	16.5	94.5	
				3	18.7	96.7	
	7-1/2	18.2	95.3	1-1/2	20.8	97.9	
				3	23.0	100.1	
	10	21.9	98.3	1-1/2	24.5	100.9	
				3	26.7	103.1	
	575	3	8.4	71.3	1-1/2	10.5	73.4
					3	12.3	75.2
5		11.1	73.5	1-1/2	13.2	75.6	
				3	15.0	77.4	
7-1/2		14.7	76.4	1-1/2	16.8	78.5	
				3	18.6	80.3	
10		17.3	78.4	1-1/2	19.4	80.5	
				3	21.2	82.3	

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

BLOWER DATA

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 tables list Motor hp and Rpm range of the drive setups available with each motor.

RETURN AIR BLOWER

Nominal Motor Hp	Maximum Usable Hp	Rpm Range Of All Available Drive Setups @ 1720 Rpm Motor Speed
1-1/2	1.72	330-430
3	3.45	445-545

SUPPLY AIR BLOWER

Nominal Motor Hp	Maximum Usable Hp	Rpm Range Of All Available Drive Setups @ 1720 Rpm Motor Speed
3	3.45	595-925
5	5.75	595-925
7-1/2	8.63	825-1175
10	11.5	*960 — 1030 — 1095 — 1160

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 factory limitations outlined on the motor nameplate. In Canada nominal horsepower is maximum usable horsepower.

*Fixed pulley at rpm increments shown.

NOTE — Specify exact Bhp, Rpm and power characteristics required when ordering.

MINIMUM HORSEPOWER REQUIREMENTS AS REQUIRED BY A.G.A.

Gas Input (Btuh)	Minimum Supply Air Blower Motor Required	*Minimum Return Air Blower Motor Required
350,000	3 hp	1-1/2 hp
500,000	3 hp	1-1/2 hp
700,000	7-1/2 hp	1-1/2 hp

*Return air blower is optional and not required in all applications.

DMS4-185-275-300-360 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	---	---	---	---	---	---	---	615	1.5	660	1.7	700	1.9	730	2.1	765	2.3	795	2.5	830	2.7	860	3.0	
6500	---	---	---	---	610	1.6	650	1.8	685	2.1	725	2.3	755	2.5	785	2.7	820	2.9	850	3.1	880	3.3	905	3.7
7000	---	---	605	1.7	640	2.0	680	2.2	715	2.5	750	2.7	780	2.9	810	3.1	845	3.3	875	3.5	905	3.7	930	4.2
7500	610	1.7	645	2.0	675	2.3	710	2.5	740	2.8	775	3.1	805	3.3	840	3.5	870	3.7	900	4.0	930	4.2	955	4.7
8000	650	2.2	680	2.5	710	2.7	745	3.0	775	3.2	805	3.5	835	3.7	865	4.0	895	4.2	925	4.5	955	4.7	980	5.3
8500	690	2.7	720	3.0	750	3.2	780	3.5	805	3.7	835	4.0	865	4.2	895	4.5	920	4.8	950	5.0	980	5.3	1005	6.0
9000	725	3.2	755	3.4	785	3.7	810	3.9	840	4.2	870	4.4	900	4.7	925	5.0	950	5.4	980	5.7	1010	6.3	1035	6.6
9500	760	3.7	790	3.9	815	4.2	845	4.4	870	4.7	900	4.9	925	5.2	955	5.6	980	5.9	1010	6.3	1035	6.8	1060	7.2
10,000	800	4.2	825	4.4	850	4.7	880	4.9	905	5.2	930	5.4	955	5.7	980	6.1	1010	6.5	1035	6.8	1060	7.2	1095	8.1

NOTE — The above chart is based on the maximum hp condition of zone dampers in the intermediate position, standard frame filters and 20% outside air. Return air blower is not included. For full cooling or full heating, cfm will be reduced approximately 10% with 1 heat exchanger, electric heat, steam or 4 row coil or 20% with 2 heat exchangers, hot water or 6 row coil.

RETURN AIR BLOWER PERFORMANCE

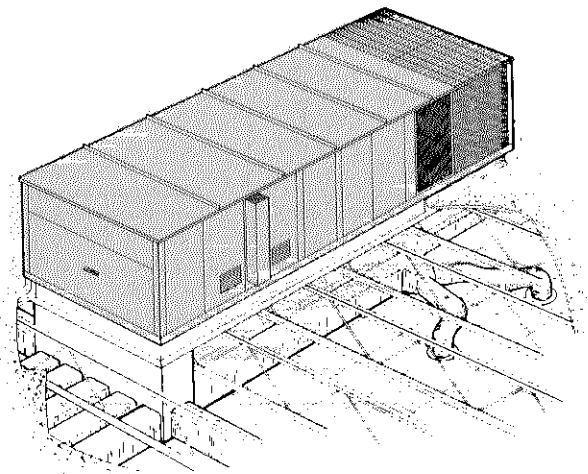
Air Volume (cfm)	STATIC PRESSURE EXTERNAL TO UNIT (Return Air System) — (Inches Water Gauge)												
	0		.10		.20		.30		.40		.50		
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
5000	---	---	---	---	---	---	---	345	.8	380	1.0	415	1.3
5500	---	---	---	---	---	---	---	330	.7	360	.9	395	1.1
6000	---	---	---	---	---	---	---	345	.8	375	1.0	410	1.2
6500	---	---	---	---	---	---	---	345	.8	375	1.0	410	1.2
7000	---	---	---	---	---	---	---	345	.8	375	1.0	410	1.2
7500	---	---	---	---	---	---	---	345	.8	375	1.0	410	1.2
8000	340	.7	375	1.0	410	1.3	440	1.6	470	1.9	500	2.2	
8500	365	.9	390	1.2	425	1.5	455	1.8	490	2.2	515	2.5	
9000	385	1.0	405	1.3	445	1.6	475	2.0	505	2.4	530	2.7	
9500	405	1.3	430	1.6	460	1.9	490	2.2	515	2.6	540	2.9	
10,000	430	1.5	455	1.8	480	2.1	505	2.4	530	2.7	555	3.1	

PRESSURE DROP OF OPTIONAL BAG FILTERS

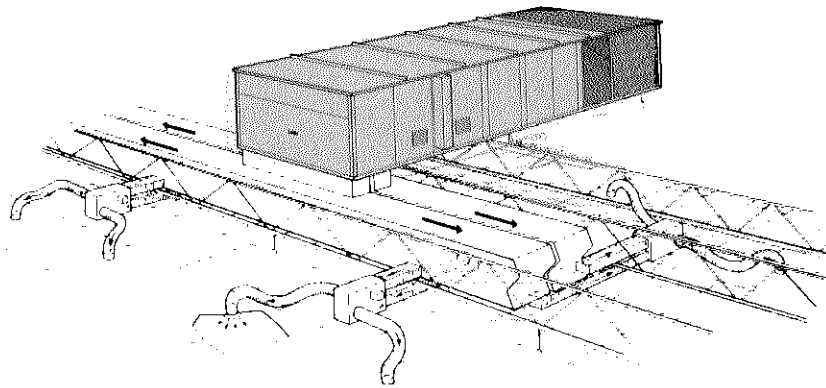
Air Volume (cfm)	Bag Filters *Pressure Drop (inches water gauge)
5000	.07
5500	.07
6000	.08
6500	.08
7000	.09
7500	.09
8000	.10
8500	.11
9000	.12
9500	.13
10,000	.14

*When optional filters are used pressure drop shown must be added to system resistance when selecting Rpm & Bhp requirements.

NOTE — Frame filter resistance has been deducted from figures shown in table.



Zone distribution system.
Mixing dampers located at unit.



Double duct distribution system with zone damper boxes.
Mixing dampers remote from unit

APPLICATION AND SYSTEM DESIGN

This *Application and System Design* section outlines some basic application data and installation hints which should be followed. Consideration should be given to roof loading, roof flashing, clearances, sound treatment and volume dampers.

Roofmounting 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.

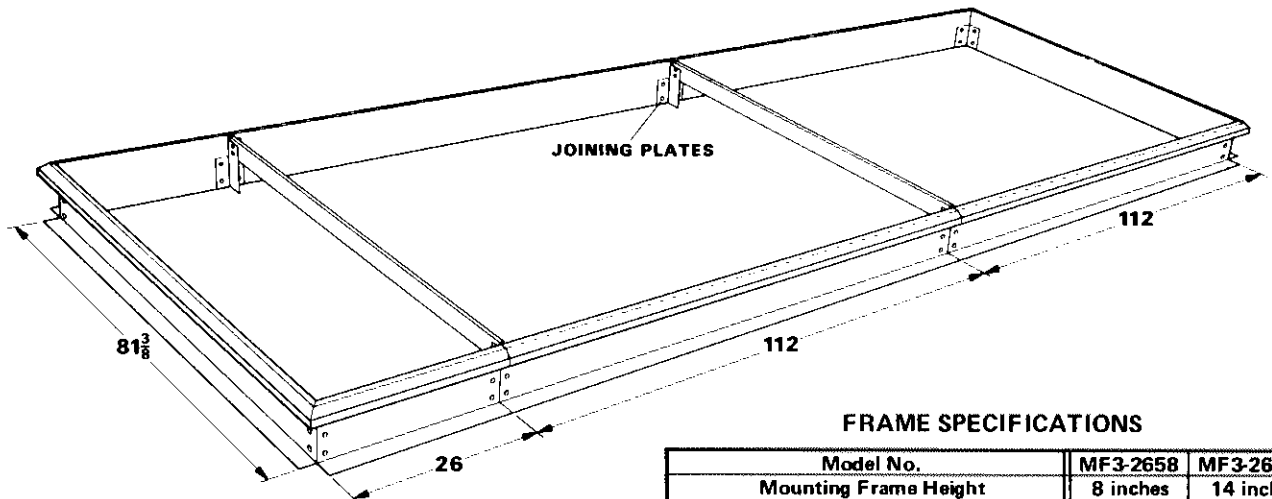
Roofmounting Frame Supports

The roofmounting 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 between supports is 5 feet.
- 2—With joint plates welded to frame the maximum frame span or cantilever is:

	Span	Cantilever
8" high frame	11 feet	6 feet
14" high frame	16 feet	9 feet

- 3—A bolted joint cannot be included in a cantilever. If the roof mounting frame is cantilevered more than 6 feet the joint plate and frame (closest to the overhang) must be welded.
- 4—There must be at least 32 inches of frame in contact with the roof supports.

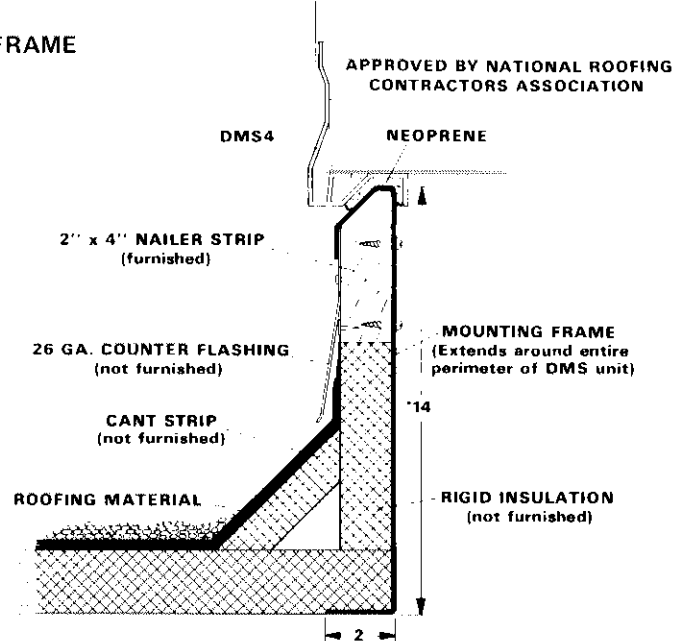
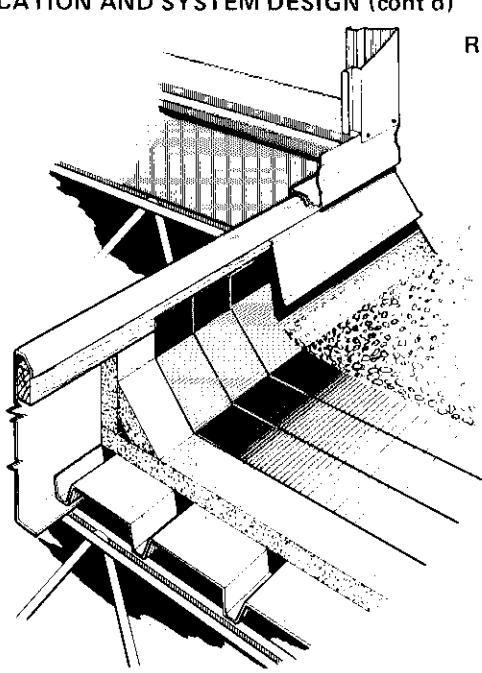


FRAME SPECIFICATIONS

Model No.	MF3-2658	MF3-26514
Mounting Frame Height	8 inches	14 inches
*Frame moment of inertia (I)	20 in. ⁴	77 in. ⁴
*Frame section modulus $\frac{I}{C}$	4.8 in. ³	10.7 in. ³
Mounting frame weight (lb./ft. of length)	4.2	6.1
Mounting frame design strength (psi)	20,000	

*Includes both sides of roof mounting frame.

ROOF MOUNTING FRAME



*An 8" high frame is also available for special applications. It is not NRCA approved.

APPROVED BY NATIONAL ROOFING CONTRACTORS ASSOCIATION

UNIT NET WEIGHT, CENTER OF GRAVITY AND CORNER WEIGHTS

Components		Total Net Weight (lbs)	Moment in "X" Direction	Moment in "Y" Direction
Basic unit		2,525	331,000	+7,500
**11 zone mounting frame		370	49,000	0
**AF7-275 combustible adaptor frame		30	----	----
Blower Motor And Drives	3 hp	70	8,000	+1,400
	5 hp	75	8,000	+1,500
	7-1/2 hp	90	10,000	+1,800
	10 hp	130	14,000	+2,600
Heating Options	1 gas heat exchanger	295	19,000	+5,800
	2 gas heat exchangers	495	28,000	+8,200
	Electric Section	255	14,000	-2,200
	Hot water coil	155	9,000	-500
	Steam Coil	125	7,000	-400
Cooling	Evaporator/Chilled Water only	270	18,000	-1,100
	Complete system (DMS4-185)	1,530	304,000	-3,400
	Complete system (DMS4-275)	1,725	339,000	-3,800
	Complete system (DMS4-300)	1,830	341,000	-3,800
	Complete system (DMS4-360)	1,875	342,000	-3,800
POWER SAVER System		40	6,000	+1,000
Filter	Frame	75	10,000	----
	bag	75	10,000	----
Return air blower		275	56,000	+4,600
Distribution Head	11 zone (E.P.)	375	5,000	0
	11 zone (MOD.)	425	6,000	0
	15 zone (E.P.)	475	6,000	0
	15 zone (MOD.)	525	7,000	0
	Double Duct	180	2,000	0
**SE1-87 Service Enclosure		345	----	----
**SEK1-87-22 Service Enclosure Kit		45	----	----

How to calculate center of gravity:

- 1 — Add up System Component wts. to arrive at Total Net Wt.
- 2 — Add up Moment in "X" Direction figures to arrive at a total.
- 3 — Add up Moment in "Y" Direction figures to arrive at a total.
- 4 — Divide total Moment in "X" Direction by Total Wt. to obtain "X".
- 5 — Divide total Moment in "Y" Direction by Total Wt. to obtain "Y" Dimension.

How to calculate corner weights:

$$A = (\text{Wt. of unit}) \frac{(265 - X)(43 + Y)}{23,000}$$

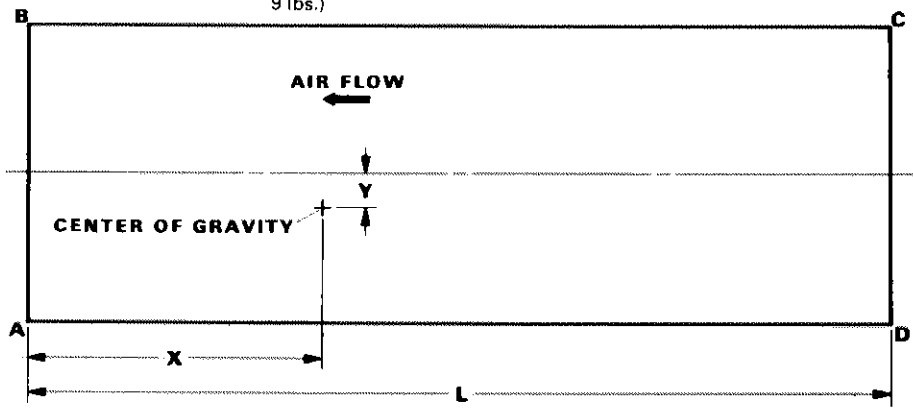
$$B = (\text{Wt. of unit}) \frac{(265 - X)(43 - Y)}{23,000}$$

$$C = (\text{Wt. of unit}) \frac{(X)(43 - Y)}{23,000}$$

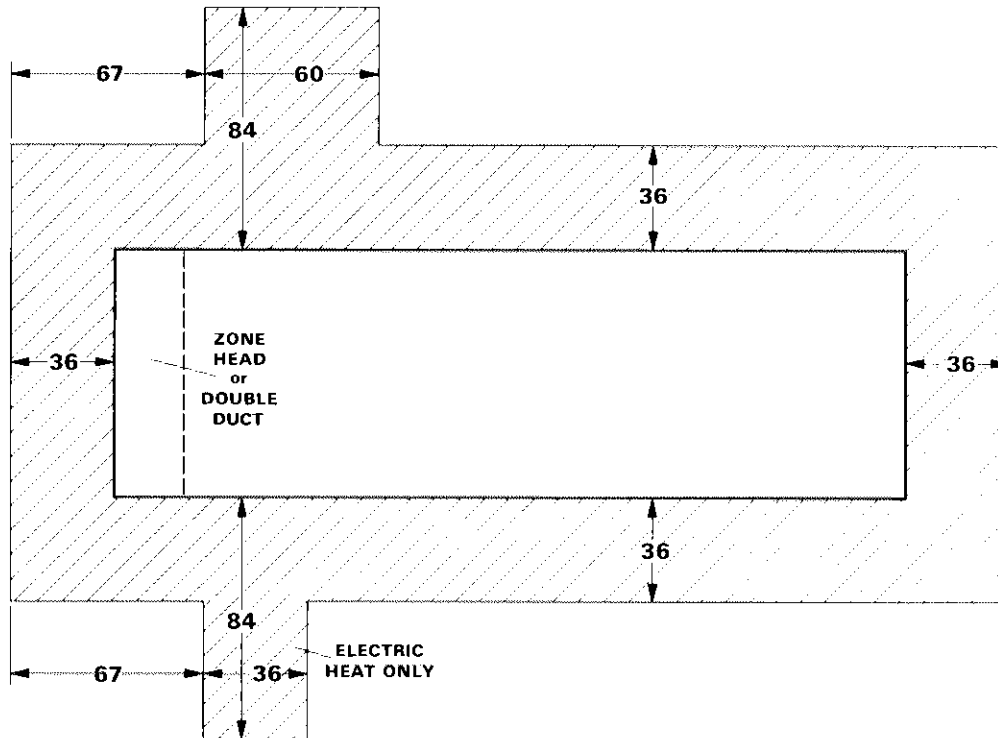
$$D = (\text{Wt. of unit}) \frac{(X)(43 + Y)}{23,000}$$

**Do not include in hoisting weight.
E.P. = Electrical proportioning damper motor.

Moment is in inch lbs.
MOD. = Modulating damper motor (Each motor weighs 9 lbs.)



SERVICE CLEARANCES



RETURN AIR SYSTEMS, ACOUSTICAL TREATMENT AND VOLUME DAMPERS

Return Air

Return air systems are generally one of two types:

- 1—Ducted return air system
- 2—Open plenum return air system (Sandwich space)

The ducted return air system offers the feature of lining the duct with insulation giving the ultimate in acoustical treatment.

The open plenum system eliminates the cost of return air ducts and is extremely flexible. In a building with relocatable interior walls it is much easier to change the location of a ceiling grille than reroute a ducted return system.

Acoustical Treatment

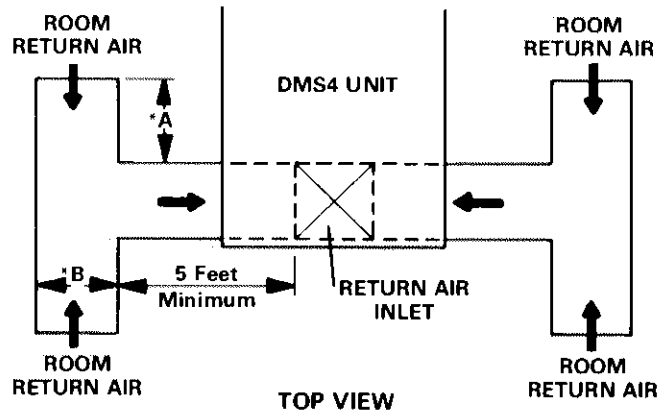
It is recommended to insulate the supply duct to reduce duct loss or gain and to prevent condensation. Use 1-1/2 lbs. density on ducts which deliver air velocities up to 1500 fpm.

3 lb. density or neoprene coated is recommended for ducts which handle air at velocities greater than 1500 fpm. Insulation can be 1/2" or 1" thick and can be on the outside or inside of the duct.

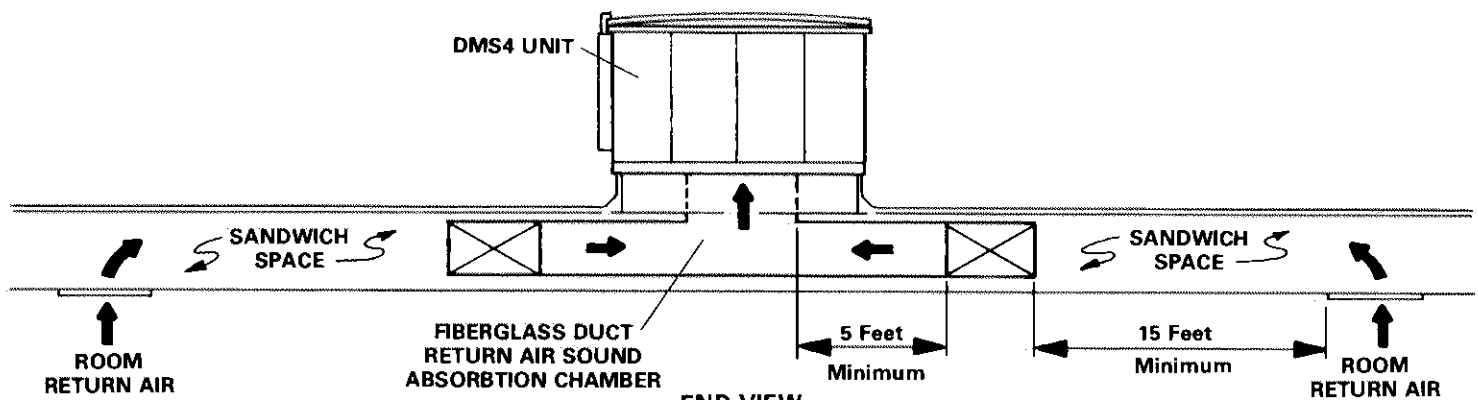
Where any rooftop equipment utilizes the sandwich space for the return air system a return air chamber such as shown below should be connected to the air inlet opening. This reduces air handling sound transmission through the thin ceiling panels. It should be sized not to exceed 1500 fpm return air velocity. It can be of fiberglass duct or fiberglass lined metal duct. It is recommended not to install a ceiling return air grille within 15' of the duct inlet. The illustration below is just one recommended way to build an acoustical trap and has been used with good results.

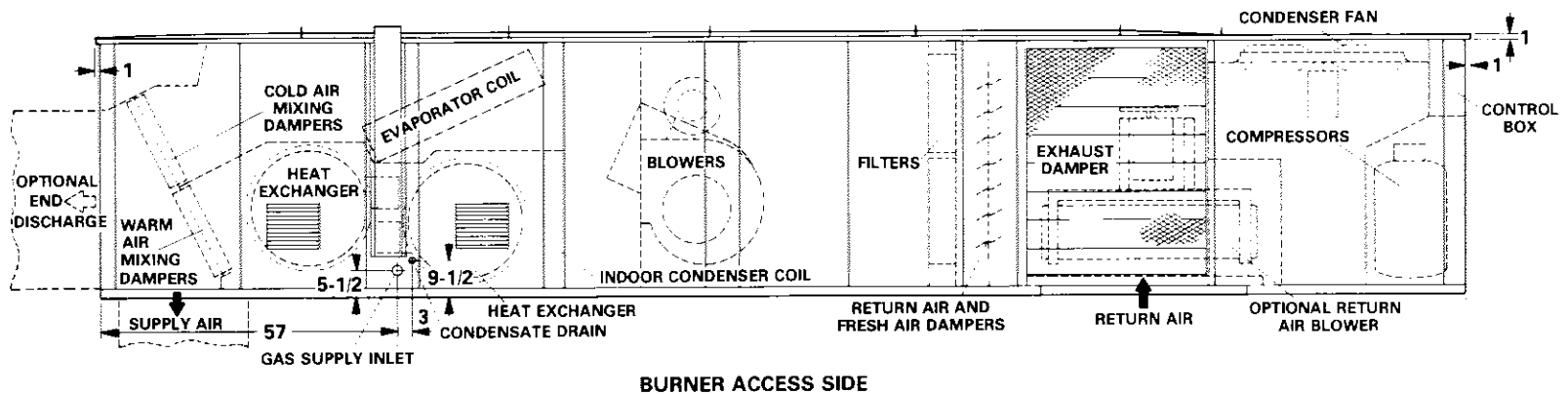
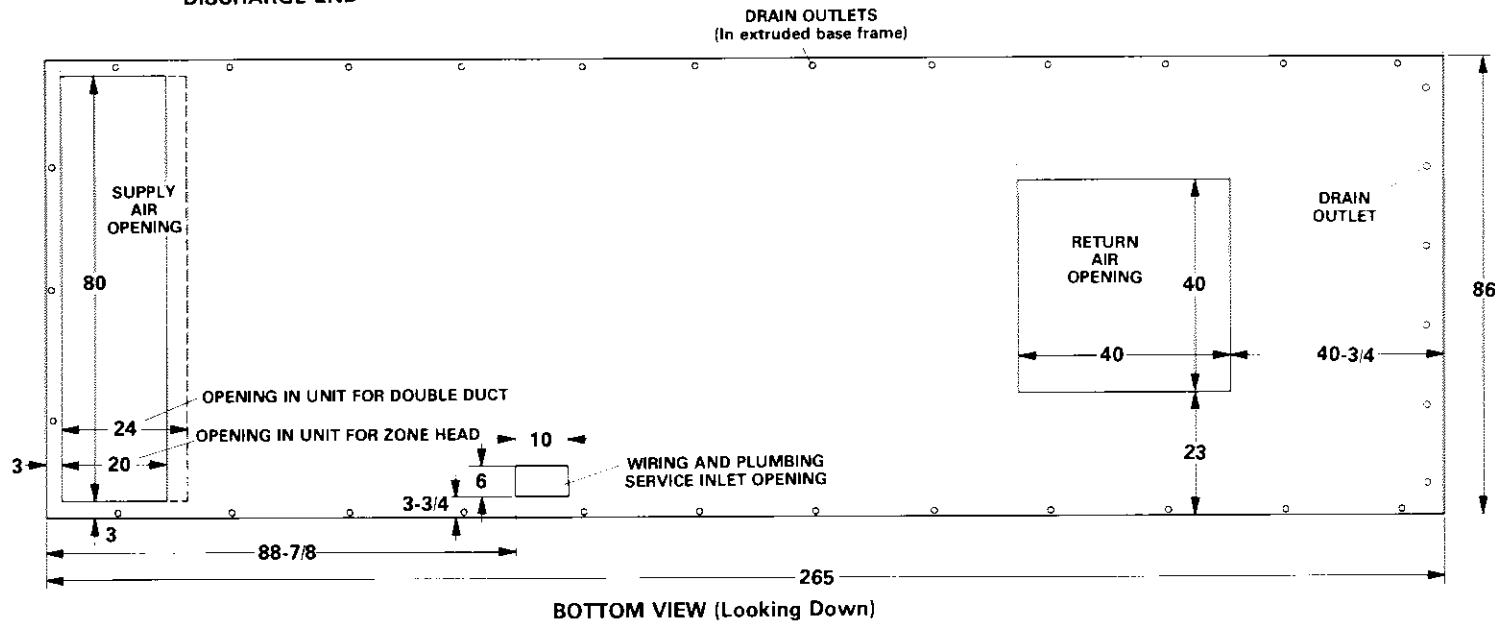
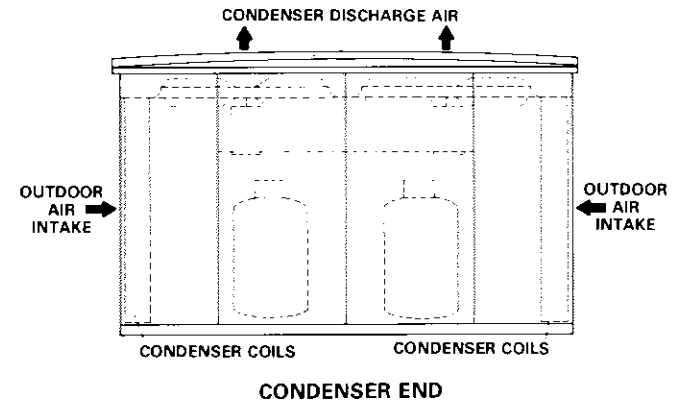
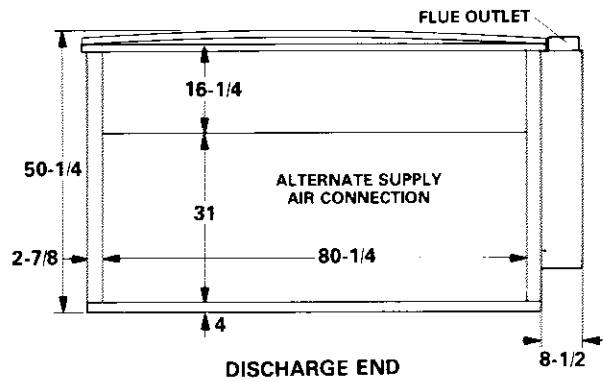
Volume Dampers

Volume dampers are important to good system design. Lengths of supply runs vary and are usually of the same cubics, therefore balancing dampers should be used in each supply branch run. Balancing dampers are furnished and factory installed on the zone model units. The dampers are located in each zone at the air discharge end of the unit at bottom of the air outlet. The installer must furnish and install the balancing dampers for double duct applications. Dampers should be installed between mixing box and diffuser outlet.



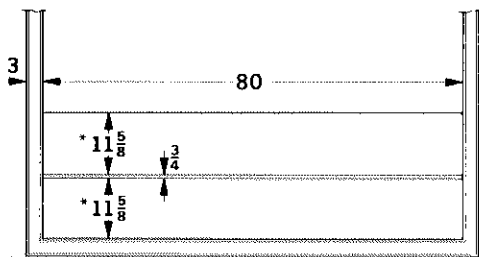
*NOTE — Dimension "A" must exceed dimension "B" to avoid direct air intake which increases return air noise.



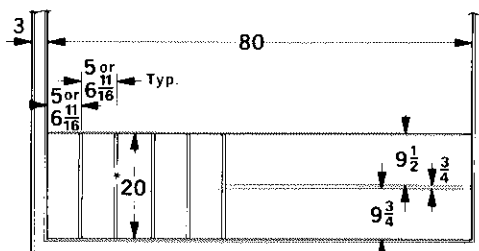


DIMENSIONS (inches)

SUPPLY AIR CONNECTIONS

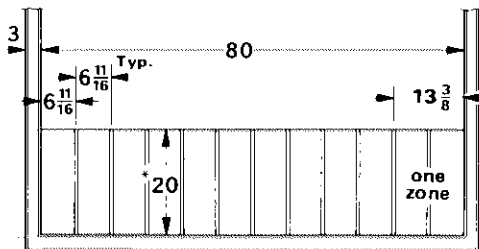


SUPPLY AIR CONNECTIONS FOR
DOUBLE DUCT APPLICATIONS

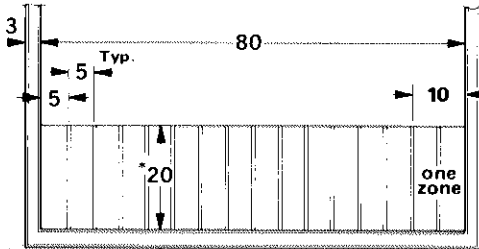


DUAL DUCT SPLITTER
SUPPLY AIR CONNECTIONS FOR COMBINATION
ZONE AND DOUBLE DUCT APPLICATIONS

*Opening in bottom
of DMS4 unit.

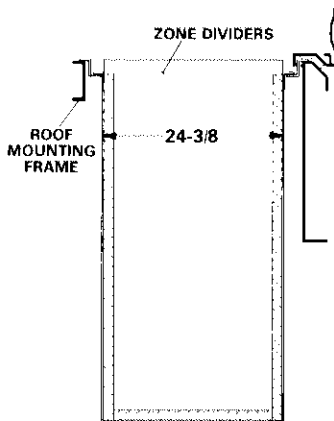


SUPPLY AIR CONNECTIONS
FOR 11 OR LESS ZONES

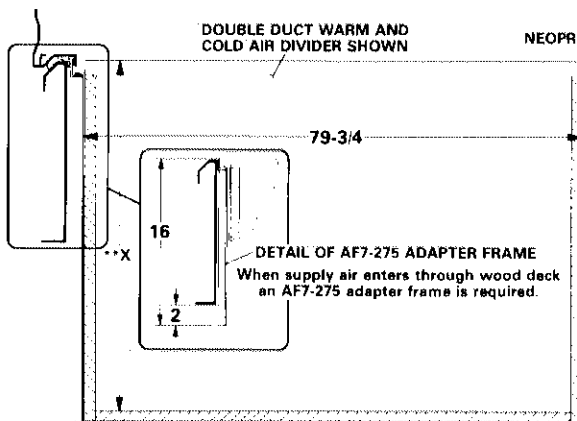


SUPPLY AIR CONNECTIONS
FOR 15 OR LESS ZONES

SUPPLY AIR PLENUMS

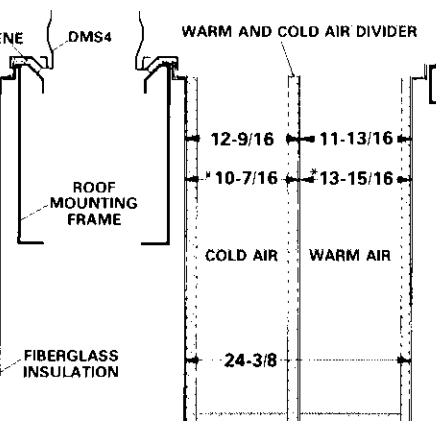


SIDE VIEW OF ZONE HEAD
PLENUM CONSTRUCTION



**Dimension will vary with depth required.

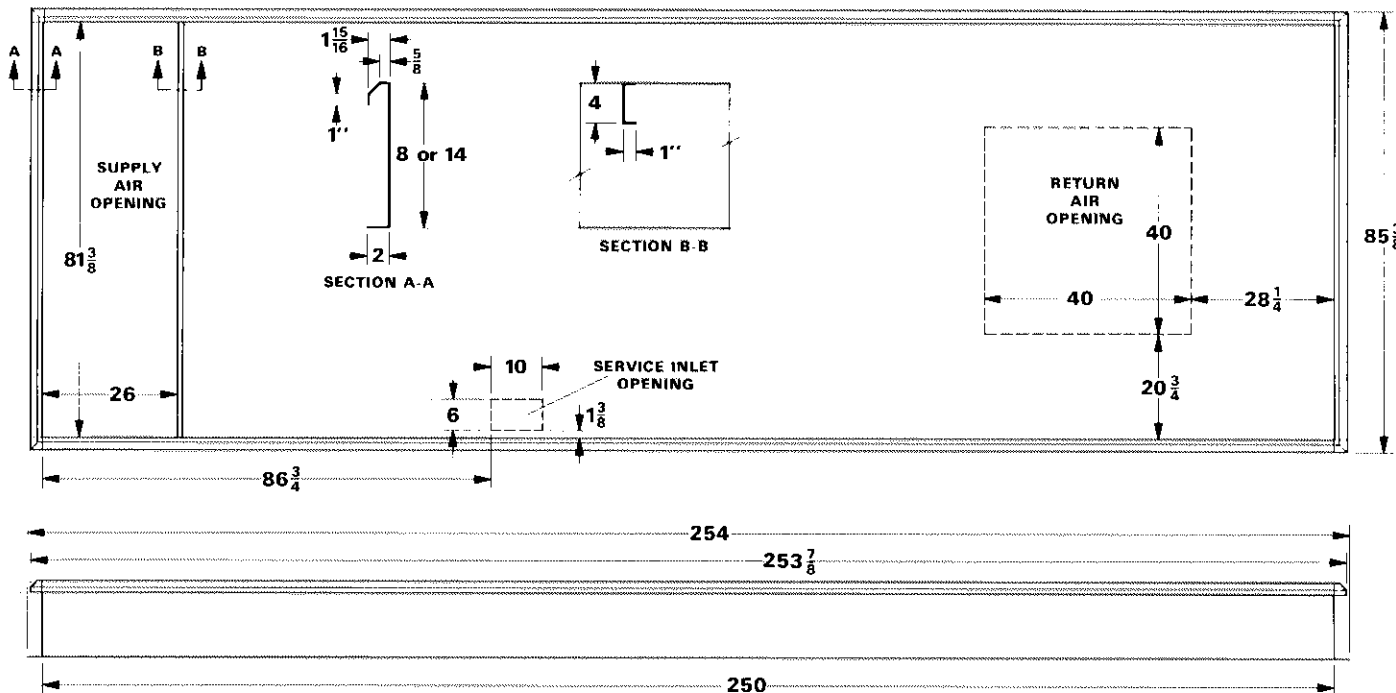
END VIEW

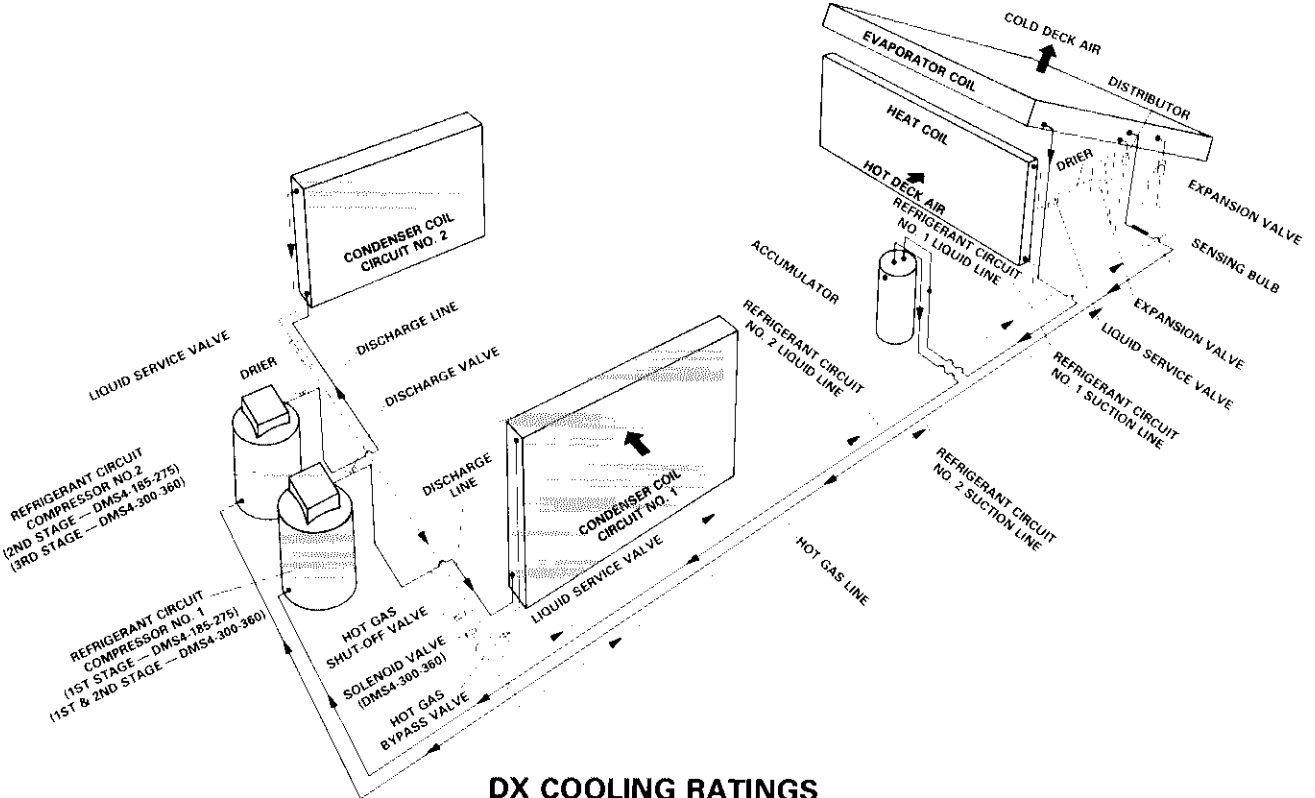


*Divider location for combination zone and
double duct (dual duct splitter) application.

SIDE VIEW OF DOUBLE DUCT
PLENUM CONSTRUCTION

ROOF MOUNTING FRAME (11 or 15 ZONE HEAT & DOUBLE DUCT)





**DX COOLING RATINGS
DMS4-185 COOLING CAPACITY**

Evaporator Air 80F Dry Bulb		Outdoor Air Temperature Entering Condenser Coil (F)											
		85			95			105			115		
Entering Wet Bulb (F)	Air Volume (cfm)	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input
63	6000	188,000	.88	17,200	177,000	.91	18,500	167,000	.94	19,900	157,000	.98	21,100
	6750	191,000	.92	17,400	180,000	.94	18,700	170,000	.98	20,100	159,000	1.00	21,300
	7500	194,000	.95	17,600	182,000	.99	18,900	172,000	1.00	20,300	161,000	1.00	21,500
67	6000	202,000	.70	18,000	191,000	.72	19,300	180,000	.74	20,800	169,000	.76	22,000
	6750	206,000	.73	18,200	194,000	.75	19,500	183,000	.77	21,000	172,000	.80	22,300
	7500	209,000	.75	18,400	196,000	.78	19,700	186,000	.80	21,200	175,000	.83	22,500
71	6000	217,000	.54	18,800	205,000	.55	20,100	194,000	.57	21,700	182,000	.58	23,000
	6750	221,000	.56	19,000	208,000	.57	20,300	197,000	.59	21,900	185,000	.60	23,300
	7500	224,000	.57	19,200	211,000	.59	20,500	200,000	.60	22,100	187,000	.62	23,500

DMS4-275 COOLING CAPACITY

Evaporator Air 80F Dry Bulb		Outdoor Air Temperature Entering Condenser Coil (F)											
		85			95			105			115		
Entering Wet Bulb (F)	Air Volume (cfm)	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input
63	8800	269,000	.91	24,800	254,000	.95	26,400	238,000	.98	28,000	225,000	1.00	29,800
	9900	273,000	.96	25,100	258,000	.99	26,600	242,000	1.00	28,200	228,000	1.00	30,000
67	8800	290,000	.73	26,000	274,000	.75	27,700	258,000	.77	29,300	243,000	.79	31,100
	9900	294,000	.75	26,300	278,000	.77	27,900	261,000	.80	29,500	246,000	.83	31,300
71	8800	310,000	.56	27,100	293,000	.57	28,900	276,000	.59	30,400	261,000	.60	32,200
	9900	315,000	.58	27,400	297,000	.59	29,100	281,000	.61	30,700	264,000	.63	32,500

DMS4-185-275 (Mix-Match) COOLING CAPACITY

Evaporator Air 80F Dry Bulb		Outdoor Air Temperature Entering Condenser Coil (F)											
		85			95			105			115		
Entering Wet Bulb (F)	Air Volume (cfm)	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input
63	6000	199,000	.90	17,900	187,000	.93	19,100	176,000	.96	20,500	165,000	1.00	21,700
	6750	203,000	.94	18,100	191,000	.97	19,300	180,000	1.00	20,700	168,000	1.00	22,000
	7500	206,000	.98	18,300	194,000	1.00	19,500	183,000	1.00	20,900	170,000	1.00	22,200
67	6000	215,000	.71	18,700	202,000	.73	20,000	191,000	.75	21,500	179,000	.78	22,800
	6750	220,000	.74	18,900	206,000	.77	20,200	195,000	.79	21,700	182,000	.82	23,000
	7500	224,000	.77	19,100	210,000	.80	20,400	200,000	.82	22,000	186,000	.85	23,300
71	6000	230,000	.55	19,400	217,000	.56	20,800	205,000	.58	22,400	192,000	.59	23,700
	6750	236,000	.57	19,700	221,000	.58	21,000	209,000	.60	22,700	196,000	.62	24,000
	7500	240,000	.59	19,900	225,000	.60	21,200	213,000	.62	22,900	199,000	.64	24,200

DX COOLING RATING
DMS4-300 COOLING CAPACITY

Evaporator Air 80F Dry Bulb		Outdoor Air Temperature Entering Condenser Coil (F)											
		85			95			105			115		
Entering Wet Bulb (F)	Air Volume (cfm)	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input
63	9,000	293,000	.90	30,200	280,000	.93	32,200	266,000	.95	34,900	252,000	.98	39,100
	10,000	297,000	.94	30,500	285,000	.96	32,600	272,000	.99	35,400	257,000	1.00	39,500
67	9,000	314,000	.73	31,600	299,000	.74	33,600	284,000	.76	36,300	267,000	.79	40,300
	10,000	319,000	.75	31,900	304,000	.77	34,000	287,000	.79	36,600	270,000	.82	40,600
71	9,000	339,000	.56	33,000	322,000	.57	35,000	304,000	.59	37,000	284,000	.60	41,700
	10,000	343,000	.58	33,300	326,000	.59	35,300	307,000	.61	38,000	287,000	.62	42,400

DMS4-360 COOLING CAPACITY

Evaporator Air 80F Dry Bulb		Outdoor Air Temperature Entering Condenser Coil (F)											
		85			95			105			115		
Entering Wet Bulb (F)	Air Volume (cfm)	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Comp. Motor Watts Input
63	9,000	325,000	.85	37,400	312,000	.87	39,800	296,000	.89	43,500	279,000	.92	49,300
	10,000	332,000	.88	37,900	318,000	.90	40,400	302,000	.93	44,000	284,000	.96	49,700
67	9,000	349,000	.69	39,200	333,000	.70	41,600	315,000	.72	45,100	295,000	.74	50,800
	10,000	355,000	.71	39,600	338,000	.73	42,000	319,000	.75	45,600	299,000	.77	51,200
71	9,000	373,000	.54	40,900	356,000	.55	43,300	337,000	.56	47,600	316,000	.58	57,400
	10,000	379,000	.56	41,300	361,000	.57	43,800	340,000	.58	49,500	320,000	.59	59,900

DMS4-300 AND DMS4-360 COOLING CAPACITY (1st Stage-Low Speed Operation)

Evaporator Air 80F Dry Bulb		Outdoor Air Temperature Entering Condenser Coil (F)								
		65			75			85		
Entering Wet Bulb (F)	Air Volume (cfm)	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Compressor Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Compressor Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible To Total Ratio (S/T)	Compressor Motor Watts Input
63	4000	104,000	.90	7700	100,000	.91	8000	97,000	.93	8400
	5000	107,000	.95	7800	103,000	.97	8100	100,000	.99	8500
	6000	110,000	1.00	7900	106,000	1.00	8200	103,000	1.00	8600
67	4000	112,000	.72	8000	108,000	.73	8300	104,000	.74	8600
	5000	115,000	.76	8000	111,000	.77	8400	107,000	.79	8700
	6000	117,000	.80	8100	113,000	.81	8400	109,000	.83	8800
71	4000	121,000	.56	8200	117,000	.57	8500	112,000	.58	8900
	5000	124,000	.58	8200	119,000	.59	8600	114,000	.60	8900
	6000	125,000	.61	8300	120,000	.62	8600	115,000	.63	9000

STEAM HEAT RATINGS
STEAM HEATING CAPACITY

Air Volume (cfm)	Steam Pressure (psi)									
	0		5		10		15		25	
	Heating Capacity (Btuh)	Leaving Air Temp. (Degrees F)	Heating Capacity (Btuh)	Leaving Air Temp. (Degrees F)	Heating Capacity (Btuh)	Leaving Air Temp. (Degrees F)	Heating Capacity (Btuh)	Leaving Air Temp. (Degrees F)	Heating Capacity (Btuh)	Leaving Air Temp. (Degrees F)
5000	343,000	124	377,000	130	405,000	135	428,000	139	467,000	146
6000	380,000	119	418,000	125	449,000	129	474,000	133	517,000	140
7000	411,000	114	452,000	120	486,000	124	513,000	128	560,000	134
8000	443,000	111	487,000	116	522,000	120	552,000	124	602,000	130
9000	468,000	108	515,000	113	553,000	117	585,000	120	637,000	126
10,000	497,000	106	547,000	111	587,000	114	621,000	117	677,000	123

NOTE — Based on 60F entering air temperature.

Steam Coil Capacity Correction Factor Chart

Multiply rating in steam coil capacity chart by correction factor below.

Entering Air Temperature (Degrees F)	*Steam Pressure (psig)				
	0	5	10	15	25
80	0.868	0.880	0.889	0.899	0.903
70	0.934	0.940	0.944	0.950	0.952
60	1.000	1.000	1.000	1.000	1.000
50	1.066	1.060	1.056	1.050	1.048
40	1.132	1.120	1.111	1.101	1.097

NOTE — Leaving Air Temp. = Ent. Air Temp. + $\frac{\text{Btuh Capacity}}{1.08 \times \text{cfm}}$

GUIDE SPECIFICATIONS

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

General — Furnish and install a roof mounted multizone (heating or heating-cooling unit) with all controls, ducts and zone dampers. The Multizone system shall be a standard product of a firm regularly engaged in manufacture of heating-cooling equipment. The manufacturer shall have parts and service available throughout the United States and Canada.

Roof Mounting Frame — A hot dipped galvanized steel mounting frame shall be furnished. It shall conform exactly to the shape of the system and contoured to accept the base of the equipment. Flashing shall be the responsibility of a roofing contractor. The 14" high frame shall be approved by National Roofing Contractors Association.

Air Distribution — Shall be (double duct with remote zone dampers or zone dampers located at the unit or a combination of both, dual duct splitter).

All air distribution ducts shall be fiberglass or ga. galvanized steel insulated with inch thick lb. density fiberglass or equivalent.

Balancing dampers shall be located at each zone outlet and be equipped with locking devices.

DX Cooling System — The total certified cooling capacity shall not be less than Btuh with an evaporator air volume of cfm, an entering wet bulb air temperature of F and outdoor air db temperature of F. The compressor power input shall not exceed Kw at these 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) totally independent refrigeration systems including compressor, condenser coil, condenser fan and evaporator coil with expansion valve. The condenser coils shall have sub-cooling rows. The compressors shall be internally spring mounted and have positive crankshaft lubrication, crankcase heater, discharge temperature limiter, high and low pressure switches, compressor monitor, current and temperature sensing motor overloads.

Condenser Indoor Heat — The refrigeration system shall have an indoor condenser coil which delivers Btuh of heat to the conditioned area whenever the system requires simultaneous heating and cooling. It shall be located in the hot deck.

Chilled Water System — The total certified cooling capacity shall not be less than Btuh with a cooling coil air volume of cfm, an entering wet bulb air temperature of F with a flow rate of gpm and an entering water temperature of F.

The water coil shall be non-ferrous construction with aluminum fins bonded to copper tubes. It shall be factory pressure leak tested. A modulating motorized water valve shall be factory installed.

Gas Heating System — The certified total heating capacity output shall be Btuh with a gas input of Btuh. Automatic controls furnished as standard equipment shall give two stage operation, except on propane fired single heat exchanger models single stage operation only is available. Cylindrical tube and drum heat exchanger shall be constructed of (aluminized steel or glass coated steel). Stainless steel power burner(s) shall have pre-purge, intermittent spark ignition (continuous pilot flame during main burner operation), 100% safety shutoff controls, electronic flame sensing controls, series gas valves and fan controls to terminate blower operation at night. Staging control shall be with separate gas valves. An automatic safety shutoff valve shall be furnished.

Electric Heating System — The certified total heating capacity output shall be Btuh at volts power supply. Heating elements shall be nichrome bare wire exposed directly to the air stream and be equipped with manual reset backup limits. They shall be controlled by a sequence controller with 1st stage controlling condenser heat.

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. Coil shall be factory pressure leak tested. Factory installed freeze-stat shall provide coil freeze-up protection.

Steam Heating System — The certified total heating capacity output shall be Btuh, with an air volume of cfm at an entering air temperature of F and lbs. steam pressure. A modulating steam valve and float shall be factory installed. The coil shall be of non-ferrous construction with aluminum fins mechanically bonded to copper tubes. It shall be factory pressure leak tested. Coil shall be self draining and distributed to provide even temperature across the unit. A steam trap shall be available for field installation. Factory installed freeze-stat shall provide coil freeze-up protection.

Electronic Energy Saving Control System — Shall consist of a room temperature sensing transmitter (set point adjustable 55°F to 85°F) for each zone, a supply air sensor for each zone, zone damper actuators for each zone and a load analyzer control module with circuit board and heat-cool logic relays to operate the mechanical equipment. Modulating limit control, morning warm-up control and enthalpy control shall regulate a modulating damper actuator to provide outdoor air, return air and mixed air volume requirements. Shall be equipped with Outside-Air-Discriminator which will automatically drive the POWER SAVER dampers to the minimum position when the energy required to maintain the hot deck is greater than the energy input to operate the first stage of mechanical cooling. 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 duct, shall sense the supplied 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 to 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 zone damper actuators and mixed air ventilation damper actuator shall be programmed to operate the mechanical equipment automatically in sequence, as required, through the cooling, ventilating and heating cycles. The load analyzer control module shall also provide a central location for troubleshooting and identification of improper wiring.

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