



## Heating and Air Conditioning

### TECHNICAL GUIDE

**R-410A  
SPLIT-SYSTEM  
AIR-COOLED CONDENSING UNITS  
AND AIR HANDLERS**

### PREDATOR® SERIES

**YC090-240 and YD120-240  
CONDENSING UNIT MODELS**

**PC090-240 and PD180-240  
HEAT PUMP UNIT MODELS**

**NC090-240 and ND120-240  
AIR HANDLING UNIT MODELS**

**7.5 - 20 Ton  
60 Hertz**

### Description

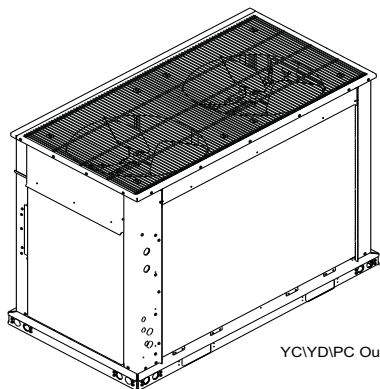
Predator® condensing units and heat pumps are completely assembled, piped and wired at the factory to provide a single-piece unit for shipment and rigging. Each unit is pressurized with a holding charge of refrigerant R-410A for storage and/or shipping.

The compact design, clean styling, small footprint, and quiet operation make these condensing units and heat pumps suitable for almost any outdoor location. On rooftops... because they weigh much less than a single package unit of similar capacity and are much easier to rig and support. On the ground... because the footprint is compact allowing a variety of applications.

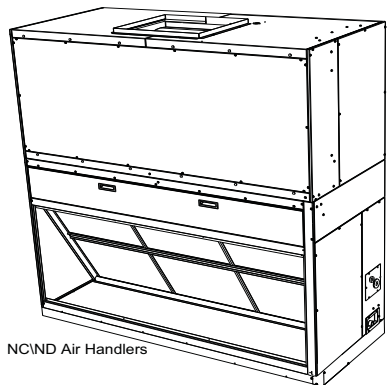
Both the Predator® condensing units and heat pumps are equipped with reliable Simplicity® microprocessor controls to assure proper operation and unit protection for long product life. Products from 10 to 20 tons are available in single or dual (2 or 4 pipe) refrigerant circuits for redundancy in operation and various application choices such as one outdoor unit matched with two indoor units.

The Predator® air handling units are completely assembled units, including a well-insulated cabinet, a DX cooling coil with copper tubing, aluminum fins, expansion valve(s), distributor(s), 2" throwaway filters, a centrifugal blower, a blower motor, an adjustable belt drive, a blower motor contactor and a small holding charge of refrigerant R-410A.

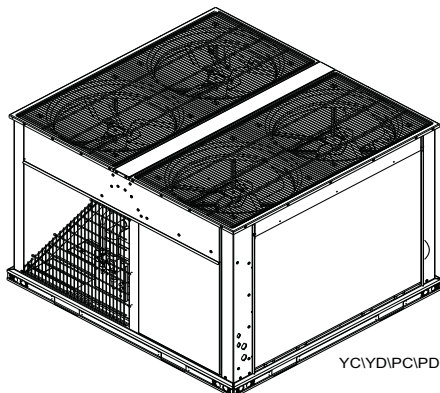
Units are shipped in the vertical position ready for field installation, but can be easily converted to horizontal position. An added benefit of the Predator® air handling units is they are designed to operate with either a condensing unit or a heat pump and no field modification or special unit is required for heat pump applications.



YC\YD\PC Outdoor Units



NC\ND Air Handlers



YC\YD\PC\PD Outdoor Units



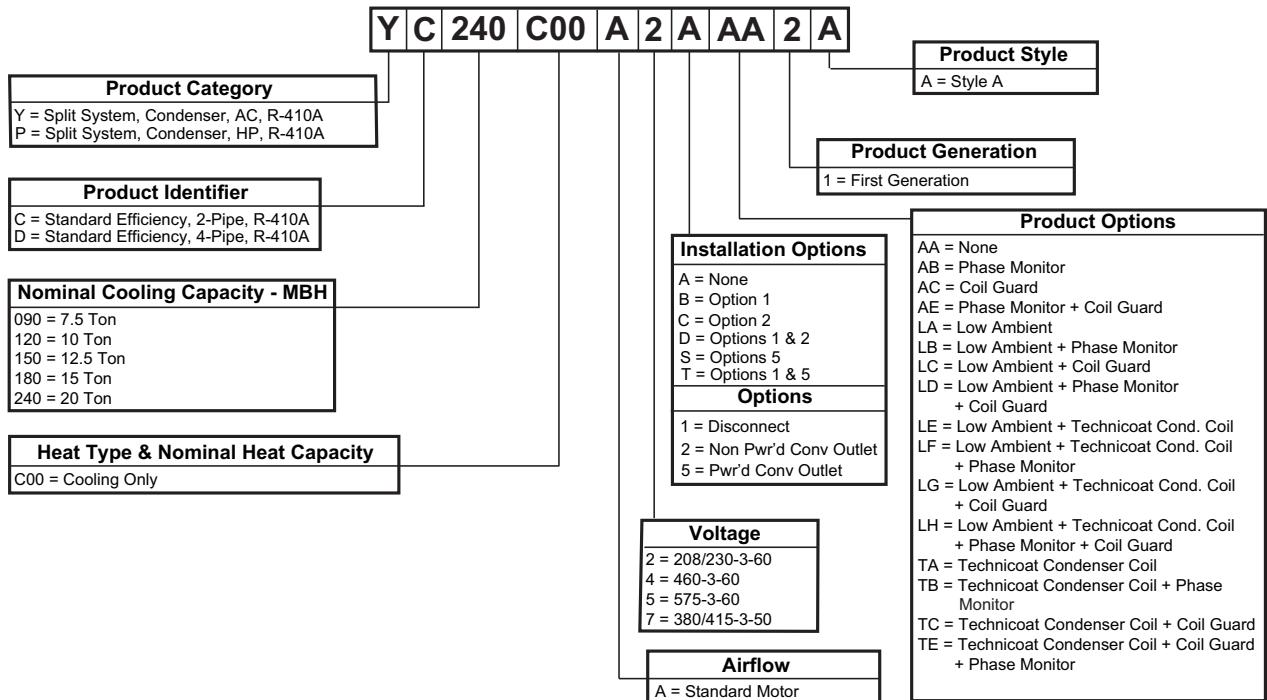
ISO 9001  
Certified Quality  
Management System

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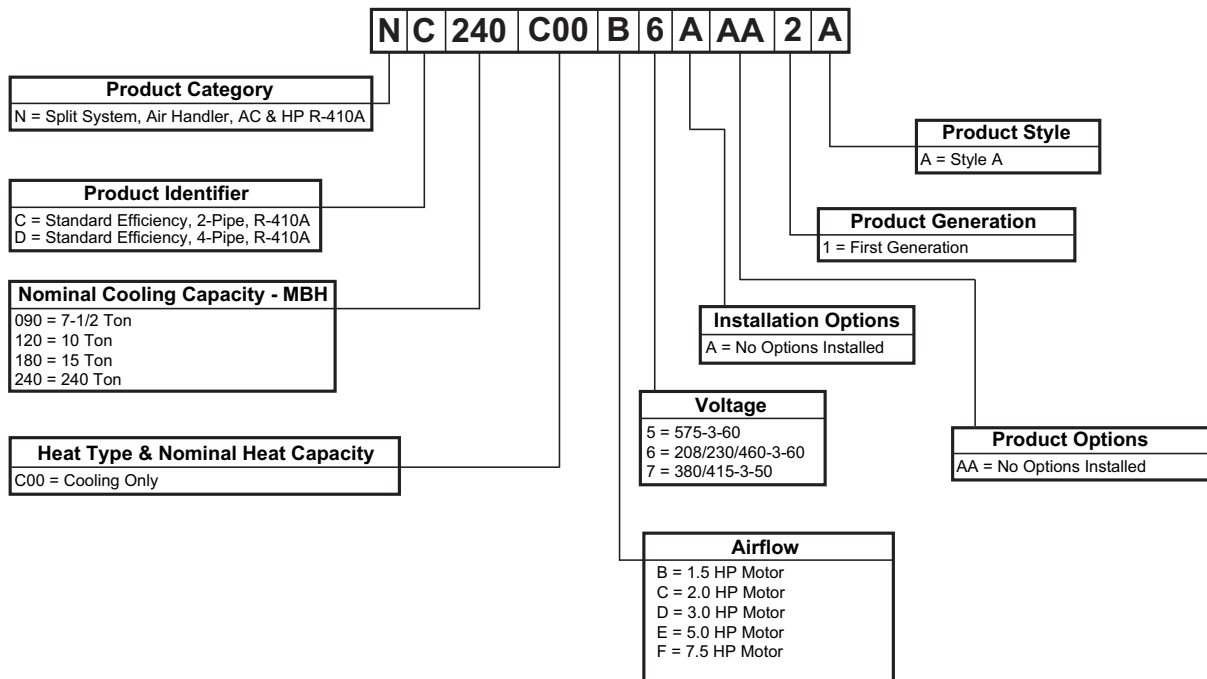
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## Nomenclature

### Configured Split Condenser Model Number Nomenclature



### Configured Split Air Handler Model Number Nomenclature



## Condensing Unit Features and Benefits

### Features

- Meets or exceeds ASHRAE 90.1 standards.
- Scroll compressors provide both high efficiency and reliability.
- Simplicity® Controls
- Dual refrigerant circuits on PD and YD models.
- Condensing unit coils are constructed of reliable and durable Micro-Channel aluminum tube and fins for long lasting, efficient operation. Micro-Channel technology provides exceptional durability along with reduced product weight and less refrigerant charge. Heat pumps units are equipped with aluminum fin, copper tube coils providing durability, reliability and value.
- Multiple condensing unit and air handler match-ups provide a wide range of application choices from oversized indoor motors to dual indoor units matched-up with single outdoor units.
- Crankcase heaters that will be de-energized when compressors are operating.
- Both high and low pressure controls. Since these controls are self-contained, there are no capillary lines to be damaged.
- Internal compressor motor protection.
- Class 2, 24-volt thermostat control circuit protected by a re-settable breaker.
- Standard factory installed service valves.
- Filter-driers are shipped in the unit's control box for field installation in the liquid line leaving the outdoor unit.
- Copper stub-outs are factory mounted on the suction and liquid lines to simplify the field piping connections.
- Simplicity® Controls provide stable cooling operation at ambient temperatures down to 40°F with low ambient kits available for operation to 0°F.
- Capacity staging for more economical operation and stable temperature levels within the conditioned space.
- Simplicity® Controls prevent the unit from cycling on safety control with "Three Outs" technology preventing nuisance trips, but protecting the equipment when valid operational issues are experienced.
- Simplicity® Controls monitor each safety independently (High pressure, low pressure, low voltage) allowing ease of troubleshooting if any problems arise.
- Inherently protected condenser fan motors.
- Technicoated outdoor coils for sea coast or corrosive environment applications.
- Factory installed disconnect to allow power to be removed from the unit when performing periodic maintenance or for service.

- Factory installed powered or non-powered 115 volt GFI outlet.
- Factory installed phase monitor to protect the unit from phase loss or phase reversal.

### Benefits

The Predator® condensing units and heat pumps can be applied on a rooftop or at ground level... due to their ample sub-cooling capacity which allows them to be located three or more stories below the evaporator coil.

After assembly, the unit is pressurized with a combination of Refrigerant R-410A and nitrogen for pressure testing and additional leak testing. During this pressure test, the operation of the high pressure control is checked. As the unit is being evacuated and dehydrated, the operation of the low pressure control is also checked.

Every compressor, condenser fan motor, crankcase heater, and electrical control circuit is checked to assure a trouble-free start-up and years of reliable operation. The condenser fan guards are vinyl-coated to provide additional rust protection and to enhance the appearance of the unit. Compressors are mounted on rubber isolators to reduce the transmission of vibration. Vertical discharge condenser fans direct sound upward and away from any surrounding structures.

All sheet metal parts are constructed of commercial grade galvanized steel. After fabrication, each part is thoroughly cleaned to remove any grease or dirt from its surfaces. The external parts are coated with a powder paint to assure a quality finish for many years. This UL approved coating system has passed the 1000 hour, 20% salt spray test per ASTM Standard B117.

All condensing unit and heat pump models include a 5-year limited warranty on the compressor(s) and 1-year limited warranty on all other parts. The matching line of air handling units carries a 1-year limited parts warranty.

### Outdoor Unit Accessories

Coil Guards: Wireform coil guards for added protection of outdoor coils. Designed to mount on each side of the product if required to provide protection from minor impacts or large debris.

Hail Guards: Hood type hail guards designed to protect the outdoor coils from hail. Can be installed on a single side or both to provide protection from storms that may produce hail.

Low Ambient Kits: Kits designed to allow the cooling only units to operate between 0°F and 40°F in the cooling mode. Standard cooling is allowed to 40°F. (Not designed for operation on heat pump units).

## Air Handling Unit Features and Benefits

### Features

These air handlers can be arranged for a variety of air discharge patterns in either the horizontal or vertical position. Refer to the unit installation instructions for other application possibilities.

### Benefits

Air handling units are designed with two distinct modules to provide maximum application flexibility. All are shipped as single packages with the blower module mounted on top of the coil module. The blower module can be repositioned in the field to meet a large number of vertical and horizontal applications.

The blower module includes the blower wheels along with factory-mounted motor and drive. All models offer two motor horsepower options to meet both standard and high static airflow requirements. The coil module includes direct expansion coils, 2 in. throwaway filters with the option to accept 4" filters, liquid line solenoid valves for capacity reduction, thermal expansion valves, distributors and a non-corrosive, composite condensate drain pan.

Every air handling coil is pressurized with air and leak tested under water. After the headers are brazed onto the coil and the coil is installed in the unit, the coil is pressurized with a combination of Refrigerant R-410A and nitrogen for pressure testing and additional leak testing. After the coil is evacuated and dehydrated, it is pressurized with a holding charge of Refrigerant R-410A for storage and/or shipping.

These air handlers, combined with condensing units, provide years of quiet, efficient and dependable operation. These units are manufactured under ISO 9001 Quality System Certification.

### Unit Installation

Units may be bottom-supported or ceiling-suspended and can be arranged to meet almost any space or duct requirements. Each unit is available with a choice of blower motors horsepower and other accessories to make them suitable for most applications.

**Blower Motors:** Different HP motors are available for each unit to meet almost any air delivery requirement. All motors are UL approved, have permanently lubricated ball bearings and are factory-mounted within the insulated cabinet of the units to minimize the transmission of sound to the surrounding space.

Air Handling units are available in either two or four pipe configurations from 7.5 to 20 tons. The dual and single circuit options provide a wide variety of application and unit match-up possibilities.

### Factory-Mounted Components

**Part Load Operation:** These air handlers with DX (Direct Expansion) coils rated at 10 tons of capacity and above have multiple coils with pre-piped distributors, expansion valves and solenoid valves. Field modifications are not required for part load operations. Capacity reduction not only provides economical operation, but also maintains stable temperature and humidity levels in the conditioned space.

**Easy Service:** Serviceable expansion valves are provided on every unit. These valves are factory-installed to provide many years of trouble-free operation. If service is required, it is not necessary to unbrazed any joints. The expansion valves also include a tee fitting to allow easy installation of hot gas bypass if required.

**Coil Protection:** The indoor coils of these air handlers can be factory Technicoated to provide extended life to the indoor coil in standard applications and additional corrosion protection on those applications in sea coast or corrosive environments.

**Blower Motors:** Different HP motors are available for each unit to meet almost any air delivery requirement. 1.5-5 HP motors are inherently protected. 7.5 HP will come equipped with a motor starter and overload protection.

### Accessories

**Base Sections:** Base sections can be used to elevate units above the floor. If desired, a moderate percentage of outdoor air may be introduced through these sections by cutting an access opening to accommodate the outdoor air duct connection. These bases include a durable finish to match the evaporator blower unit. The base may have to be insulated for certain applications.

**Hot Water Coils:** Drainable water coils are available for field installation between the blower and the coil modules of both horizontal and vertical units. Since their casings match the dimensions and the finish of the basic units, they become an integral part of the unit after installation. The coils slide out of their casings for easy installation. Hot water coils have copper tubes that have been mechanically expanded into aluminum fins. Both headers are located on the same end of the coil. Coils are leak-tested at 325 psig under water and dried before their connections are capped for storage and shipping.

**Steam Coils:** Steam coils are available for installation between the blower and coil modules of both horizontal and vertical units. Since the casing matches the dimensions and the finish of the basic unit, it becomes an integral part of the unit after installation. The coil slides out of the casings for easy installation and is pitched in the casings to facilitate condensate drainage. The coil has copper tubes that have been mechanically expanded into aluminum fins. Both headers are located on the same end of the coil. The coil is leak-tested at 325 psig and dried before the connections are capped for storage and shipping.

## Guide Specifications

### Split System Cooling Only Condensing Units Models: YC090-240, YD120-240 & Split System Heat Pump Models: PC090-240, PD180-240

#### General

- Factory assembled, single piece, air cooled condensing unit designed for outdoor installation.
- Factory wired, piped, and tested for leakage and functionality to assure trouble-free installation and start-up.
- Rated in accordance with ARI Standard 340/360.
- Manufactured in a facility registered under the ISO 9002 manufacturing quality standard.
- Designed and tested in accordance with ASHRAE 15 Safety Code for Mechanical Refrigeration and comply with NEC.
- Cooling performance rated in accordance with DOE and ARI test procedures.
- CSA listed and classified to UL 1995/CAN/CSA No. 236- M90 standards.
- One year limited parts warranty on complete unit with an additional four year compressor warranty.

#### Unit Operating Characteristics

Operating Range shall be between 125° F to 40° F in cooling as standard from factory.

- The capacity of the condensing unit shall meet or exceed \_\_\_\_\_ Btuh at a suction temperature of \_\_\_\_\_ F. The power consumption at full load shall not exceed \_\_\_\_\_ kW.
- The combination of the condensing unit and the evaporator or fan coil unit shall have a total net cooling capacity of \_\_\_\_\_ Btuh or greater at conditions of \_\_\_\_\_ cfm entering-air temperature at the evaporator at \_\_\_\_\_ F wet bulb and \_\_\_\_\_ F dry bulb, and air entering the condensing unit at \_\_\_\_\_ F.
- The system shall have an EER of \_\_\_\_\_ Btuh/ Watt or greater at standard ARI conditions.

#### Installer Shall

- Furnish York® air-cooled condensing units, heat pump or equivalent in accordance with the performance schedule shown on the plans, and
- Unit shall be stored and handled in accordance with unit manufacturer's instructions.
- Install each unit as shown on the plans in accordance with the manufacturer's recommendations and all applicable national and local codes

#### Unit Construction

- Constructed of zinc-coated, galvanized steel.
- Exterior surfaces bonded and coated with baked enamel finish by a powder paint process capable of withstanding a minimum of 1000 salt spray hours according to ASTM B117.
- Cabinet screws that comply with ASTM B117 salt spray test for a minimum of 750 hours.
- Permanently attached heavy-gage perimeter base rails with forklift slots and lifting holes.
- Removable access panels to all internal components.
- Separate access panel to controls.
- Access panels to allow outdoor coil cleaning.

#### Compressor(s)

- Hermetic scroll type, internally protected with high-pressure relief and over temperature protection.
- Two stage units operate in 50% capacity increments.
- Suction gas cooled
- Voltage range of  $\pm 10\%$  of unit nameplate voltage.
- Neoprene isolators minimize sound transmission and vibration.
- Belly-band crankcase heaters keep refrigerant from diluting sump oil.
- Full charge of compressor oil

#### Outdoor Condenser Unit Coils

- Draw thru configuration
- Constructed with Micro-channel aluminum fins and aluminum tubing. All refrigerant tubing must share a common header.

#### Heat Pump Unit Outdoor Unit Coils

- Draw thru configuration
- Constructed with aluminum plate fins mechanically bonded to seamless internally enhanced copper tubes with all joints brazed.

#### Condenser Fans

- Direct driven propeller-type fans
- Statically and dynamically balanced
- Aluminum blades riveted to corrosion resistant steel spider brackets.
- Arranged for vertical air discharge.
- Equipped with PVC coated steel wire safety guards.

#### Condenser Motors

- Totally enclosed, air over cooled.
- Inherent overload protection.
- Permanently lubricated bearings.

- Must cycle to allow cooling operation down to 40°F.

### Refrigerant Piping

- Solid core filter-drier(s) ship loose for field installation.
- Liquid and suction line service valves with gauge ports.
- Suction and discharge line service ports accessible from unit. Ports capped for leak prevention.
- Liquid line magnetic check valves
- Holding charge of R410A refrigerant.

### Electrical Requirements

- Single-point connection electrical power.
- Nominal unit electrical characteristics shall be \_\_\_\_\_ v, 3-ph, 60 Hz. The unit shall be capable of satisfactory operation within voltage limits of \_\_\_\_\_ v to \_\_\_\_\_ v.
- Condenser fan motors and secondary of transformers shall be grounded.

### Unit Controls

- All 24-volt control circuit, powered by a 24 volt transformer(s) and protected by a resettable breaker.
- Conventional thermostat must provide operation for both condensing units and heat pumps without an "O" output from the thermostat.
- Low voltage terminal strip for simple hook-up.
- Compressor motor protection shuts down unit for motor over-current, over-temperature or low voltage conditions.
- Safety lockouts provide reset capability at the space thermostat or base unit should any of the following standard safety devices trip and shut off compressor:
  - a. Loss-of-charge/Low-pressure switch.
  - b. High-pressure switch.
  - c. Control board diagnostics and fault code display.
  - d. Safety lockouts send a 24 volt signal to the control board's "X" terminal, allowing notification to the user via the thermostat fault light (if present).
  - e. Control board shall retain last 5 fault codes in non-volatile memory, which will not be lost in the event of a power loss. An LED (light-emitting diode) indicator flashes a fault code that indicates which safety switch has tripped.

### Non-fused Disconnect Switch

- Factory-installed, internally mounted.
- Accessible from outside the unit.
- NEC and UL approved non-fused switch.
- Provides power off lockout capability.

### Convenience Outlet

- Factory-installed, internally mounted.
- Accessible from outside the unit.
- 115V, 15 amp GFI receptacle with independent fuse protection.
- Required voltage provided by factory-installed step-down transformer or field supplied 115v circuit.

### Low-ambient Head Pressure Control

- Standard operation down to 40 °F without a low ambient kit.
- Operation down to 0°F with a field-installed low ambient kit accessory. The controller modulates the fan motor speed in response to liquid line temperature or pressure.

### Coil Guard

Factory or field installed decorative grille shall be placed on the units to protect condenser coil after installation.

### Hail Guard Package

Field installed hail guard package shall protect coils against damage from hail and other flying debris.

### Phenolic Coated Condenser Coils

Special phenolic coating available as a factory option on both outdoor and indoor coils.

### Each Unit Shall Be:

- Covered by a 1-year limited parts warranty on the complete unit and 5-year on compressor(s).
- In current production with published literature available to check performance, limitations, specifications, power requirements, dimensions, operation and appearance.
- Indoor unit shall be equipped with a V-belt drive option that will permit the blower RPM to be adjusted to meet the CFM requirements of the air delivery system. (Refer to Technical Guide for Airflow Capabilities.)

### Each Unit Enclosure Shall Have:

- Exterior panels of 18 gauge steel, finished with baked enamel to provide a long lasting quality appearance
- Removable panels to provide easy access to the internal components for maintenance and service on condensing units, heat pumps and air handlers
- All handling units must have a filter rack that accepts both 2" and 4" filters.
- The dimensions of each unit shall not exceed those specified in the manufacture's literature.

- The minimum application clearances for condensing units, heat pumps and air handlers must meet those specified in the manufacturer's literature.

**The Blower Motor Shall:**

- Be mounted within the insulated cabinet to minimize the transmission of sound to the surrounding space, and any motor 7.5 HP or greater must have a service factor of 1.15.

**The Evaporator Coil Shall:**

- Consist of copper tubes arranged in staggered rows, mechanically expanded into aluminum fins,
- Be draw-through, and
- Include factory-mounted distributors, expansion valves and solenoid valves for capacity reduction.

**The Blower Wheels Shall:**

Be dynamically balanced to minimize the levels of sound and vibration generated by the unit.



## Physical Data Indoor Unit

Component	Models						
	NC090	NC120	ND120	NC180	ND180	NC240	ND240
Nominal Tonnage	7 1/2	10	10	15	15	20	20
<b>DIMENSIONS (inches)</b>							
Length	30.0	30.0	30.0	33.0	33.0	30.0	30.0
Width	56.0	56.0	56.0	74.5	74.5	98.5	98.5
Height	65.0	65.0	65.0	75.0	75.0	65.0	65.0
<b>WEIGHTS (lb)</b>							
Unit Shipping	405	512	512	681	681	874	874
Unit Operating With							
Standard Motor and Drive	381	468	468	632	632	816	816
High Static Motor and Drive	385	492	492	661	661	854	854
<b>INDOOR BLOWER (Forward Curve)</b>							
Diameter x Width	12 x 12	15 x 15	15 x 15	18 x 18	18 x 18	15 x 15	15 x 15
Quantity	1	1	1	1	1	2	2
<b>INDOOR COIL</b>							
Face area (Sq. Ft.)	10.6	10.6	10.6	18.3	18.3	20.0	20.0
Rows	3	4	4	3	4	4	3
Fins per inch	15	15	15	15	15	15	15
Tube diameter	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Circuitry Type	Interlaced	Interlaced	Interlaced	Interlaced	Interlaced	Interlaced	Interlaced
Refrigerant Control	TXV	TXV	TXV	TXV	TXV	TXV	TXV
Operating Charge (lb)	4	6	6	10	10	10	10
<b>SYSTEM DATA</b>							
No. Refrigeration Circuits	1	1	2	1	2	1	2
Suction Line OD (in.)	1 1/8	1 3/8	1 1/8	1 5/8	1 1/8	1 5/8	1 3/8
Liquid Line OD (in.)	5/8	7/8	5/8	7/8	5/8	7/8	7/8
<b>FILTERS</b>							
Size and Quantity Per Model (In.)	16 x 25 x 2	4	4	4	---	---	8
	20 x 24 x 2	---	---	---	6	6	---
<b>FACE AREA (SQ. FT.)</b>							
Size and Quantity Per Model (In.)	16 x 25 x 4	4	4	4	---	---	8
	18 x 24 x 4	---	---	---	6	6	---
<b>FACE AREA (SQ. FT.)</b>							
	11.1	11.1	11.1	18.0	18.0	22.2	22.2

### Air Handling Unit Limitations

Model	Power Supply Voltage	Voltage Variation		Supply Air Range CFM		Entering Air Temperature Degrees °F			
						Cooling DB/WB		Heating DB <sup>1</sup>	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
NC090	208/230-3-60	187	253	2,250	3,750	65/57	90/77	40	80
	460-3-60	414	506	2,250	3,750	65/57	90/77	40	80
	575-3-60	540	630	2,250	3,750	65/57	90/77	40	80
NC120	208/230-3-60	187	253	3,000	5,000	65/57	90/77	40	80
	460-3-60	414	506	3,000	5,000	65/57	90/77	40	80
	575-3-60	540	630	3,000	5,000	65/57	90/77	40	80
ND120	208/230-3-60	187	253	3,000	5,000	65/57	90/77	40	80
	460-3-60	414	506	3,000	5,000	65/57	90/77	40	80
	575-3-60	540	630	3,000	5,000	65/57	90/77	40	80
NC180	208/230-3-60	187	253	4,500	7,500	65/57	90/77	40	80
	460-3-60	414	506	4,500	7,500	65/57	90/77	40	80
	575-3-60	540	630	4,500	7,500	65/57	90/77	40	80
ND180	208/230-3-60	187	253	4,500	7,500	65/57	90/77	40	80
	460-3-60	414	506	4,500	7,500	65/57	90/77	40	80
	575-3-60	540	630	4,500	7,500	65/57	90/77	40	80
NC240	208/230-3-60	187	253	6,000	10,000	65/57	90/77	40	80
	460-3-60	414	506	6,000	10,000	65/57	90/77	40	80
	575-3-60	540	630	6,000	10,000	65/57	90/77	40	80
ND240	208/230-3-60	187	253	6,000	10,000	65/57	90/77	40	80
	460-3-60	414	506	6,000	10,000	65/57	90/77	40	80
	575-3-60	540	630	6,000	10,000	65/57	90/77	40	80

<sup>1</sup> Heating Min/Max temperatures apply to steam and hot water coils. NOTE: Do not apply steam to hot water coils.

## Cooling and Heating Ratings

### Cooling And Heating Rating

Outdoor Unit	Condensing Unit Only			Indoor Unit	System Cooling Capacity <sup>1</sup>				Heating Capacity <sup>1</sup>				Rated Airflow (CFM)
	Gross Capacity <sup>2</sup> (MBH)	KW	EER		Gross Capacity <sup>3</sup> (MBH)	EER	IEER	IPLV	High Outdoor		Low Outdoor		
									Gross Capacity <sup>2</sup> (MBh)	COP	Gross Capacity <sup>2</sup> (MBh)	COP	
PC120 <sup>4</sup>	N/A	N/A	N/A	NC090	92	11.0	11.4	---	82	3.3	49	2.3	3000
PC120 <sup>4</sup>	N/A	N/A	N/A	NC120	124	11.0	11.4	11.8	109	3.3	63	2.1	4000
PC180 <sup>4</sup>	N/A	N/A	N/A	NC180	180	10.6	11.5	12.4	168	3.3	104	2.3	6000
PD180 <sup>4</sup>	N/A	N/A	N/A	ND180	180	10.6	11.5	12.0	168	3.4	103	2.4	6000
PC240 <sup>4</sup>	N/A	N/A	N/A	NC240	238	10.6	12.4	12.5	216	3.3	139	2.5	8000
PD240 <sup>4</sup>	N/A	N/A	N/A	ND240	238	10.6	11.7	12.1	220	3.4	124	2.2	8000
YC090	85	6.8	12.4	NC090	94	11.2	13.0	---	N/A	N/A	N/A	N/A	3000
YC090	85	6.8	12.4	NC120	99	11.9	13.0	---	N/A	N/A	N/A	N/A	3000
YC120	110	9.3	11.9	NC120	124	11.4	12.5	12.9	N/A	N/A	N/A	N/A	4000
YD120	108	9.1	11.8	ND120	124	11.2	11.2	11.6	N/A	N/A	N/A	N/A	4000
YC150	133	11.6	11.5	NC180	150	11.0	13.3	13.8	N/A	N/A	N/A	N/A	5000
YD150	136	11.5	11.8	ND180	150	11.0	12.1	12.3	N/A	N/A	N/A	N/A	5000
YC180	160	13.4	12.0	NC180	181	11.2	12.2	12.5	N/A	N/A	N/A	N/A	6000
YC180	160	13.4	12.0	NC240	190	11.7	12.7	12.5	N/A	N/A	N/A	N/A	6000
YD180	166	12.3	13.4	ND180	181	11.2	11.6	12.4	N/A	N/A	N/A	N/A	6000
YD180	166	12.3	13.4	(2)NC090	187	11.2	--	--	N/A	N/A	N/A	N/A	6000
YD180	166	12.3	13.4	(2)NC120	187	11.2	--	--	N/A	N/A	N/A	N/A	6000
YD180	166	12.3	13.4	ND240	190	11.7	13.4	11.2	N/A	N/A	N/A	N/A	6000
YC240	233	17.5	13.2	NC240	242	11.3	13.6	13.1	N/A	N/A	N/A	N/A	8000
YD240	222	17.3	12.8	ND240	242	11.3	11.9	12.6	N/A	N/A	N/A	N/A	8000
YD240	222	17.3	12.8	(2)NC120	240	11.6	--	--	N/A	N/A	N/A	N/A	8000

<sup>1</sup> Certified in accordance with the Unitary Large Equipment certification program, which is based on ARI Standard 340/360.

<sup>2</sup> Condensing unit only ratings are at 45°F SST and 95°F entering-air temperature.

<sup>3</sup> Gross capacity does not include heat added by blower motor. Refer to appropriate table for blower horsepower.

<sup>4</sup> Heat Pumps designed for matched systems only.

#### LEGEND

EER = Energy Efficiency Ratio

ARI = Air Conditioning and Refrigeration Institute

IPLV = Integration Part-Load Value

IEER = Integrated Energy Efficiency Ratio

## Airflow Performance

### NC090 Upflow and Horizontal Airflow Performance

#### NC090 Upflow

(CFM)	Available External Static Pressure - IWG																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Std. 1.5 HP & Field Supplied Drive				Standard 1.5 HP & Drive						High Static 2 HP & Drive									
2250					754	0.8	828	0.9	902	1.0	988	1.1	1051	1.3	1116	1.4	1183	1.5		
2500			707	0.8	777	0.9	851	1.0	925	1.1	996	1.3	1059	1.4	1124	1.5	1191	1.7		
2750			735	0.9	805	1.1	879	1.2	953	1.3	1012	1.4	1076	1.6	1141	1.7				
3000	705	1.0	767	1.1	837	1.2	911	1.3	973	1.5	1035	1.6	1099	1.7	1164	1.9				
3250	741	1.1	802	1.3	872	1.4	947	1.5	1002	1.7	1064	1.8	1127	2.0						
3500	780	1.4	842	1.5	912	1.6	974	1.8	1035	1.9	1097	2.1	1161	2.2						
3750	823	1.6	884	1.7	954	1.9	1012	2.0	1072	2.2	1134	2.3	Exceeds BHP Limitations							

1. Airflow performance includes dry evaporator coil. See Static Resistance table for additional applications.
2. See RPM Selection table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.746 ÷ nameplate rated motor efficiency.

#### NC090 Horizontal

(CFM)	Available External Static Pressure - IWG																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Std. 1.5 HP & Field Supplied Drive				Standard 1.5 HP & Drive						High Static 2 HP & Drive									
2250					747	0.8	816	0.9	889	1.0	954	1.2	1013	1.3	1071	1.5	1128	1.6		
2500			703	0.8	768	0.9	837	1.0	909	1.1	977	1.2	1036	1.4	1094	1.5	1151	1.7		
2750			728	0.9	793	1.0	862	1.1	934	1.2	998	1.4	1056	1.5	1114	1.7				
3000	696	0.9	757	1.1	822	1.2	891	1.3	961	1.4	1019	1.6	1077	1.7	1135	1.9				
3250	729	1.1	790	1.3	855	1.4	924	1.5	984	1.6	1042	1.8	1100	1.9	1159	2.1				
3500	766	1.3	826	1.5	892	1.6	953	1.6	1010	1.9	1069	2.0	1127	2.2						
3750	806	1.6	867	1.7	932	1.8	984	1.9	1041	2.1	1099	2.3	Exceeds BHP Limitations							

1. Airflow performance includes dry evaporator coil. See Static Resistance table for additional applications.
2. See RPM Selection table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.746 ÷ nameplate rated motor efficiency.

## NC/ND120 Upflow and Horizontal Airflow Performance

### NC/ND120 Upflow

(CFM)	Available External Static Pressure - IWG																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Std. 2 HP & Field Supplied Drive				Standard 2 HP & Drive								High Static 3 HP & Drive							
2500					671	0.8	728	0.9	788	1.0	853	1.1	926	1.3	975	1.5	1026	1.6	1077	1.7
2750					684	0.9	741	1.0	801	1.1	866	1.2	933	1.4	982	1.6	1032	1.7	1084	1.8
3000					701	1.0	757	1.1	817	1.3	882	1.4	941	1.5	991	1.7	1041	1.8	1092	2.0
3250			664	1.0	719	1.1	776	1.3	836	1.4	903	1.5	952	1.7	1002	1.8	1052	2.0		
3500			685	1.1	741	1.3	797	1.4	858	1.5	917	1.7	966	1.9	1015	2.0	1066	2.2		
3750	653	1.1	709	1.3	764	1.4	821	1.6	884	1.7	933	1.9	982	2.0	1031	2.2	1082	2.3		
4000	679	1.3	735	1.5	790	1.6	847	1.8	903	1.9	952	2.1	1001	2.3	1050	2.4				
4250	707	1.5	762	1.6	818	1.8	875	1.9	924	2.1	973	2.3	1022	2.5	1072	2.7				
4500	737	1.7	792	1.9	850	2.0	899	2.2	948	2.4	997	2.6	1046	2.8						
4750	768	1.9	824	2.1	877	2.2	926	2.5	975	2.7	1024	2.9	1073	3.0						
5000	801	2.1	856	2.3	906	2.5	956	2.8	1005	3.0	1053	3.2	High Static 3 HP & Field Supplied Drive							

1. Airflow performance includes dry evaporator coil. See Static Resistance table for additional applications.
2. See RPM Selection table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.746 ÷ nameplate rated motor efficiency.

### NC/ND120 Horizontal

(CFM)	Available External Static Pressure - IWG																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Std. 2 HP & Field Supplied Drive				Standard 2 HP & Drive								High Static 3 HP & Drive							
2500					686	0.8	730	0.9	778	0.9	840	1.0	917	1.3	964	1.5	1011	1.6	1060	1.7
2750					698	0.9	742	1.0	790	1.0	852	1.1	924	1.4	971	1.6	1019	1.7	1067	1.9
3000					714	1.0	758	1.1	806	1.1	868	1.2	935	1.6	981	1.7	1029	1.9	1078	2.0
3250			684	1.0	734	1.2	778	1.2	826	1.3	902	1.6	948	1.7	995	1.9	1042	2.0		
3500			707	1.2	757	1.3	801	1.4	849	1.4	917	1.7	964	1.9	1010	2.0	1058	2.2		
3750	669	1.2	734	1.4	784	1.5	828	1.6	890	1.7	936	1.9	982	2.1	1029	2.2	1076	2.4		
4000	699	1.4	764	1.6	814	1.7	858	1.8	910	2.0	956	2.1	1002	2.3	1049	2.4				
4250	732	1.6	798	1.8	847	1.9	887	2.0	933	2.2	978	2.4	1025	2.5	1071	2.7				
4500	769	1.8	834	2.0	884	2.1	911	2.3	957	2.4	1003	2.6	1049	2.8						
4750	808	2.1	874	2.3	891	2.3	937	2.5	983	2.7	1029	2.9	1075	3.1						
5000	850	2.3	873	2.4	919	2.6	965	2.8	1011	3.0	1057	3.2	High Static 3 HP & Field Supplied Drive							

1. Airflow performance includes dry evaporator coil. See Static Resistance table for additional applications.
2. See RPM Selection table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.746 ÷ nameplate rated motor efficiency.

### NC/ND180 Upflow and Horizontal Airflow Performance

#### NC/ND180 Upflow

(CFM)	Available External Static Pressure - IWG																	
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Std. 3 HP & Field Supplied Drive				Standard 3 HP & Drive				High Static 5 HP & Drive									
4500					583	1.1	634	1.3	688	1.5	738	1.9	782	2.3	827	2.6		
4750					592	1.2	643	1.4	700	1.8	744	2.1	788	2.4	833	2.7		
5000					602	1.2	653	1.4	707	1.9	751	2.2	795	2.6	840	2.9		
5250					613	1.3	664	1.5	716	2.1	759	2.4	804	2.7	848	3.1		
5500			577	1.1	625	1.4	676	1.6	725	2.3	768	2.6	813	2.9	857	3.2		
5750			590	1.2	638	1.4	689	1.7	735	2.5	778	2.8	822	3.1				
6000			603	1.3	651	1.6	702	2.3	745	2.7	789	3.0	833	3.3				
6250			617	1.5	664	1.7	714	2.6	757	2.9	801	3.2	845	3.5				
6500	587	1.4	631	1.6	679	1.8	726	2.8	769	3.1	813	3.4	857	3.8				
6750	601	1.6	645	1.8	693	2.0	739	3.0	782	3.4	826	3.7						
7000	616	1.8	660	2.0	710	2.9	753	3.3	796	3.6	839	3.9						
7250	632	2.1	675	2.3	725	3.2	767	3.6	810	3.9	854	4.2						
7500	647	2.3	691	2.5	740	3.5	782	3.9	825	4.2	High Static 5 HP & Field Supplied Drive							

1. Airflow performance includes dry evaporator coil. See Static Resistance table for additional applications.
2. See RPM Selection table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.746 ÷ nameplate rated motor efficiency.

#### NC/ND180 Horizontal

(CFM)	Available External Static Pressure - IWG																	
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Std. 3 HP & Field Supplied Drive				Standard 3 HP & Drive				High Static 5 HP & Drive									
4500					585	1.5	634	1.6	687	1.8	735	2.0	780	2.5	827	2.7	875	2.9
4750					595	1.6	644	1.7	697	1.9	741	2.4	787	2.7	834	2.9		
5000					605	1.7	655	1.8	708	2.0	749	2.6	795	2.9	842	3.1		
5250					617	1.8	666	2.0	719	2.1	757	2.8	804	3.1	851	3.3		
5500			582	1.8	629	1.9	678	2.1	731	2.3	767	3.0	813	3.2	860	3.4		
5750			594	1.9	642	2.1	691	2.2	737	2.4	778	3.2	824	3.4	871	3.7		
6000			608	2.1	655	2.2	705	2.4	744	3.1	789	3.4	835	3.7				
6250			622	2.2	670	2.4	719	2.6	756	3.3	801	3.6	847	3.9				
6500	589	2.2	637	2.4	684	2.6	733	2.7	769	3.6	814	3.9	860	4.1				
6750	604	2.4	652	2.6	699	2.8	738	3.5	782	3.8	827	4.1	873	4.4				
7000	620	2.6	667	2.8	715	3.0	752	3.8	796	4.1	841	4.4						
7250	636	2.8	683	3.0	731	3.2	766	4.1	811	4.4	856	4.7						
7500	652	3.0	700	3.2	738	4.0	781	4.4	825	4.7	High Static 5 HP & Field Supplied Drive							

1. Airflow performance includes dry evaporator coil. See Static Resistance table for additional applications.
2. See RPM Selection table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.746 ÷ nameplate rated motor efficiency.

### NC/ND240 Upflow and Horizontal Airflow Performance

#### NC/ND240 Upflow

(CFM)	Available External Static Pressure - IWG																					
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0		2.2	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Std. 5 HP & Field Supplied Drive				High Static 5 HP & Drive								High Static 7.5 HP & Drive									
6000					732	2.2	789	2.6	846	2.9	900	3.1	959	4.0	1008	4.5	1056	4.9	1102	5.2	1146	5.3
6250			685	1.9	742	2.3	799	2.7	856	3.0	910	3.3	967	4.2	1016	4.7	1064	5.1	1110	5.4	1154	5.5
6500			696	2.1	752	2.5	809	2.8	866	3.2	920	3.4	976	4.4	1025	4.9	1072	5.3	1118	5.6		
6750			706	2.2	763	2.6	820	3.0	877	3.3	935	4.0	985	4.6	1034	5.1	1081	5.5	1127	5.8		
7000			718	2.4	774	2.8	831	3.2	888	3.5	945	4.2	994	4.8	1043	5.3	1091	5.7	1137	6.0		
7250			729	2.6	786	3.0	843	3.3	900	3.6	954	4.5	1004	5.0	1053	5.5	1100	5.9	1146	6.2		
7500			741	2.8	798	3.1	855	3.5	912	3.8	965	4.7	1014	5.3	1063	5.8	1111	6.2				
7750	700	2.6	754	2.9	810	3.3	868	3.7	925	4.3	975	4.9	1025	5.5	1074	6.0	1121	6.4				
8000	712	2.8	767	3.1	823	3.5	881	3.9	936	4.6	986	5.2	1036	5.8	1085	6.3	1132	6.7				
8250	726	3.0	780	3.3	837	3.7	894	4.1	948	4.9	998	5.5	1047	6.0	1096	6.5	1144	6.9				
8500	740	3.2	794	3.6	850	3.9	908	4.3	959	5.1	1010	5.8	1059	6.3	1108	6.8						
8750	754	3.4	808	3.8	865	4.2	922	4.8	972	5.4	1022	6.0	1071	6.6	1120	7.1						
9000	768	3.6	823	4.0	879	4.4	934	5.1	984	5.7	1034	6.4	1084	6.9	1133	7.4						
9250	783	3.9	838	4.3	894	4.6	947	5.4	997	6.1	1047	6.7	1097	7.2								
9500	799	4.1	853	4.5	910	4.9	961	5.8	1011	6.4	1061	7.0	1110	7.6								
9750	815	4.4	869	4.8	925	5.5	974	6.1	1024	6.7	1074	7.3	1124	7.9								
10000	831	4.7	885	5.0	939	5.9	988	6.5	1038	7.1	1088	7.7	1138	8.3								

1. Airflow performance includes dry evaporator coil. See Static Resistance table for additional applications.
2. See RPM Selection table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.746 ÷ nameplate rated motor efficiency.

#### NC/ND240 Horizontal

(CFM)	Available External Static Pressure - IWG																					
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0		2.2	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Std. 5 HP & Field Supplied Drive		Standard 5 HP & Drive										High Static 7.5 HP & Drive									
6000			708	2.0	754	2.3	801	2.6	849	2.8	898	2.9	976	4.0	1021	4.4	1066	4.8	1111	5.1	1155	5.3
6250			715	2.1	761	2.4	808	2.7	856	2.9	906	3.0	984	4.2	1029	4.6	1074	5.0	1118	5.3	1163	5.5
6500			723	2.3	769	2.6	816	2.8	864	3.0	917	3.9	991	4.4	1036	4.8	1081	5.2	1126	5.4		
6750			731	2.4	777	2.7	824	3.0	872	3.2	925	4.1	999	4.6	1044	5.0	1089	5.3	1134	5.6		
7000			740	2.5	786	2.8	833	3.1	881	3.3	933	4.3	1007	4.7	1052	5.2	1097	5.5	1142	5.8		
7250			749	2.7	796	3.0	842	3.3	890	3.5	941	4.5	1015	4.9	1060	5.3	1105	5.7	1150	6.0		
7500	712	2.6	759	2.9	806	3.2	852	3.4	900	3.6	949	4.7	1024	5.1	1069	5.5	1114	5.9	1158	6.2		
7750	722	2.8	770	3.0	816	3.3	863	3.6	915	4.4	964	4.9	1033	5.3	1078	5.8	1123	6.1				
8000	733	2.9	781	3.2	827	3.5	874	3.8	924	4.6	973	5.1	1042	5.5	1087	6.0	1132	6.3				
8250	745	3.1	793	3.4	839	3.7	886	4.0	936	4.8	985	5.3	1052	5.8	1096	6.2	1141	6.5				
8500	757	3.3	805	3.6	851	3.9	898	4.2	947	5.1	996	5.6	1062	6.0	1107	6.4	1152	6.8				
8750	770	3.6	818	3.8	864	4.1	912	4.8	961	5.3	1010	5.8	1072	6.3	1117	6.7						
9000	784	3.8	831	4.1	878	4.4	923	5.1	972	5.6	1021	6.1	1083	6.5	1128	6.9						
9250	798	4.0	845	4.3	893	4.9	944	5.4	995	5.9	1045	6.3	1094	6.8	1139	7.2						
9500	812	4.3	859	4.6	905	5.2	956	5.7	1007	6.2	1058	6.6	1106	7.1	1151	7.5						
9750	827	4.5	869	5.1	917	5.5	968	6.0	1020	6.5	1071	6.9	1118	7.4								
10000	842	4.8	891	5.4	940	5.8	991	6.3	1043	6.8	1094	7.3	1131	7.7								

1. Airflow performance includes dry evaporator coil. See Static Resistance table for additional applications.
2. See RPM Selection table to determine desired motor sheave setting and to determine the maximum continuous BHP.
3. kW = BHP x 0.746 ÷ nameplate rated motor efficiency.

**RPM Selection**

Unit Model		HP	Max BHP	Motor Sheave	Blower Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Fully Closed
NC090	Std.	1.5	1.73	1VL40	AK69	N/A	690	743	796	849	902	955
	HS	2	2.30	1VL40	AK56	N/A	863	929	995	1062	1128	1194
NC/ND120	Std.	2	2.30	1VL40	AK74	N/A	641	690	739	789	838	887
	HS	3	3.45	1VP56	AK84	N/A	906	949	992	1035	1078	1121
NC/ND180	Std.	3	3.45	1VP50	AK114	N/A	565	596	627	659	690	721
	HS	5	5.75	2VP50	2B5V94	707	745	782	819	856	894	N/A
NC/ND240	Std.	5	5.75	2VP50	2B5V94	686	722	758	794	830	866	N/A
	HS	7.5	8.63	2VP65	2B5V94	925	960	996	1031	1067	1103	1138



## Additional Static Resistance

Model	CFM	Wet Indoor <sup>1</sup> Coil	2" Filters	Electric Heat kW				
				10	16	26	36	50
NC090	2250	0.03	0.10	0.01	0.02	0.03	0.04	---
	2500	0.03	0.11	0.01	0.02	0.03	0.05	---
	2750	0.02	0.11	0.01	0.03	0.04	0.07	---
	3000	0.02	0.12	0.01	0.03	0.05	0.08	---
	3250	0.01	0.13	0.02	0.04	0.06	0.09	---
	3500	0.00	0.14	0.02	0.04	0.07	0.10	---
	3750	0.00	0.15	0.02	0.05	0.08	0.12	---
NC/ND120	3000	0.08	0.12	0.01	0.03	0.05	0.08	---
	3250	0.07	0.13	0.02	0.04	0.06	0.09	---
	3500	0.07	0.14	0.02	0.04	0.07	0.10	---
	3750	0.06	0.15	0.02	0.05	0.08	0.12	---
	4000	0.05	0.16	0.03	0.06	0.09	0.14	---
	4250	0.04	0.18	0.03	0.06	0.10	0.15	---
	4500	0.03	0.19	0.03	0.07	0.11	0.17	---
NC/ND180	4750	0.02	0.21	0.04	0.08	0.13	0.19	---
	5000	0.00	0.23	0.04	0.09	0.14	0.21	---
	4500	0.07	0.11	0.03	0.07	0.11	0.17	0.21
	4750	0.06	0.11	0.04	0.08	0.13	0.19	0.22
	5000	0.06	0.11	0.04	0.09	0.14	0.21	0.24
	5250	0.06	0.12	0.05	0.10	0.15	0.23	0.26
	5500	0.05	0.12	0.05	0.11	0.17	0.25	0.29
	5750	0.05	0.12	0.06	0.12	0.19	0.28	0.32
	6000	0.05	0.13	0.06	0.13	0.20	0.30	0.35
	6250	0.04	0.14	0.07	0.14	0.22	0.33	0.38
	6500	0.03	0.14	0.07	0.15	0.24	0.35	0.42
6750	0.03	0.15	0.08	0.17	0.26	0.38	0.47	
7000	0.02	0.16	0.08	0.18	0.28	0.41	0.50	
7250	0.01	0.16	0.09	0.19	0.30	0.44	0.53	
7500	0.00	0.17	0.10	0.20	0.32	0.47	0.56	

Model	CFM	Wet Indoor Coil	2" Filters	Electric Heat kW		
				20	32	52
NC/ND240	6000	0.08	0.12	0.01	0.03	0.05
	6250	0.08	0.13	0.02	0.03	0.05
	6500	0.08	0.13	0.02	0.04	0.06
	6750	0.07	0.14	0.02	0.04	0.06
	7000	0.07	0.14	0.02	0.04	0.07
	7250	0.06	0.15	0.02	0.05	0.07
	7500	0.06	0.16	0.02	0.05	0.08
	7750	0.05	0.16	0.02	0.05	0.08
	8000	0.05	0.17	0.03	0.06	0.09
	8250	0.04	0.18	0.03	0.06	0.09
	8500	0.04	0.19	0.03	0.06	0.10
	8750	0.03	0.20	0.03	0.07	0.11
	9000	0.02	0.21	0.03	0.07	0.11
	9250	0.01	0.22	0.04	0.08	0.12
	9500	0.00	0.23	0.04	0.08	0.13
	9750	0.00	0.24	0.04	0.09	0.13
10000	0.00	0.25	0.04	0.09	0.14	

<sup>1</sup> Pressure drop added by condensate over a dry coil.

**CFM Static Pressure and Power-Altitude and Temperature Corrections**

The information below should be used to assist in application of product when being applied at altitudes at or exceeding 1000 feet above sea level.

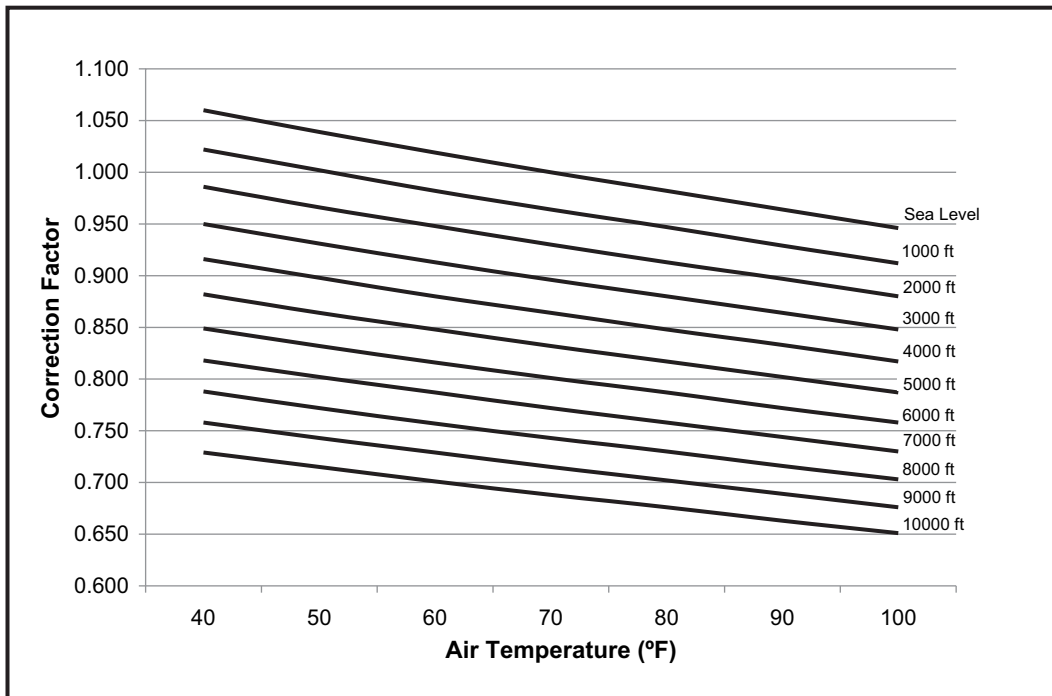
The air flow rates listed in the standard blower performance tables are based on standard air at sea level. As the altitude or temperature increases, the density of air decreases. In

order to use the indoor blower tables for high altitude applications, certain corrections are necessary.

A centrifugal fan is a "constant volume" device. This means that, if the rpm remains constant, the CFM delivered is the same regardless of the density of the air. However, since the air at high altitude is less dense, less static pressure will be generated and less power will be required than a similar application at sea level. Air density correction factors are shown in Table Figure and Figure Figure 1.

### Altitude/Temperature Correction Factors

Air Temp.	Altitude (Ft.)										
	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
40	1.060	1.022	0.986	0.950	0.916	0.882	0.849	0.818	0.788	0.758	0.729
50	1.039	1.002	0.966	0.931	0.898	0.864	0.832	0.802	0.772	0.743	0.715
60	1.019	0.982	0.948	0.913	0.880	0.848	0.816	0.787	0.757	0.729	0.701
70	1.000	0.964	0.930	0.896	0.864	0.832	0.801	0.772	0.743	0.715	0.688
80	0.982	0.947	0.913	0.880	0.848	0.817	0.787	0.758	0.730	0.702	0.676
90	0.964	0.929	0.897	0.864	0.833	0.802	0.772	0.744	0.716	0.689	0.663
100	0.946	0.912	0.880	0.848	0.817	0.787	0.758	0.730	0.703	0.676	0.651



**Figure 1: Altitude/Temperature Correction Factors**

The examples below will assist in determining the airflow performance of the product at altitude.

**Example 1:** What are the corrected CFM, static pressure, and BHP at an elevation of 5,000 ft. if the blower performance data is 6,000 CFM, 1.5 IWC and 4.0 BHP?

**Solution:** At an elevation of 5,000 ft. the indoor blower will still deliver 6,000 CFM if the rpm is unchanged. However, the Altitude/Temperature Correction Factors table must be used to determine the static pressure and BHP. Since no temperature data is given, we will assume an air temperature of 70°F. The table shows the correction factor to be 0.832.

$$\text{Corrected static pressure} = 1.5 \times 0.832 = 1.248 \text{ IWC}$$

$$\text{Corrected BHP} = 4.0 \times 0.832 = 3.328$$

**Example 2:** A system, located at 5,000 feet of elevation, is to deliver 6,000 CFM at a static pressure of 1.5". Use the unit

blower tables to select the blower speed and the BHP requirement.

**Solution:** As in the example above, no temperature information is given so 70°F is assumed.

The 1.5" static pressure given is at an elevation of 5,000 ft. The first step is to convert this static pressure to equivalent sea level conditions.

$$\text{Sea level static pressure} = 1.5 / .832 = 1.80"$$

Enter the blower table at 6000 sCFM and static pressure of 1.8". The rpm listed will be the same rpm needed at 5,000 ft.

Suppose that the corresponding BHP listed in the table is 3.2. This value must be corrected for elevation.

$$\text{BHP at 5,000 ft.} = 3.2 \times .832 = 2.66$$

### Drive Selection

1. Determine Upflow or Horizontal supply duct Application.
2. Determine desired airflow.
3. Calculate or measure the amount of external static pressure.
4. Using the operating point, determined from steps 1, 2 & 3, locate this point on the appropriate supply air blower performance table. (Linear interpolation may be necessary.)
5. Noting the RPM and BHP from step 4, locate the appropriate motor and/or drive on the RPM selection table.
6. Review the BHP compared to the motor options available. Select the appropriate motor and, or drive.
7. Review the RPM range for the motor options available. Select the appropriate drive if multiple drives are available for the chosen motor.
8. Determine turns open to obtain the desired operation point.

### Example

1. 3250 CFM
2. 1.4 iwg
3. Using the supply air blower performance table below, the following data point was located: 1100 RPM & 1.8 BHP.
4. Using the RPM selection table below, Model X is found.
5. 1.8 BHP exceeds the maximum continuous BHP rating of the 1.5 HP motor. The 2 HP motor is required.
6. 1100 RPM is within the range of the 2 HP drives.
7. Using the 2 HP motor and drive, 1 turn open will achieve 1128 RPM.

### Airflow Performance

#### Example Supply Air Blower Performance

(CFM)	Available External Static Pressure - IWG																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Standard 1.5 HP & Drive								High Static 2 HP & Drive											
3000	696	0.9	757	1.1	822	1.2	891	1.3	961	1.3	1019	1.5	1077	1.6	1135	1.8				
3250	729	1.1	790	1.3	855	1.4	924	1.5	984	1.6	1042	1.7	1100	1.8	1159	2.0				
3500	766	1.3	826	1.5	892	1.6	953	1.6	1010	1.8	1069	1.9	1127	2.0						

### RPM Selection

Unit Model	HP	Max BHP	Motor Sheave	Blower Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turn Open	Fully Closed	
X	Std.	1.5	1.73	1VL40	AK69	N/A	690	743	796	849	902	955
	HS	2	2.30	1VL40	AK56	N/A	863	929	995	1062	1128	1194

**Table X: Electrical data - Electric Heat**

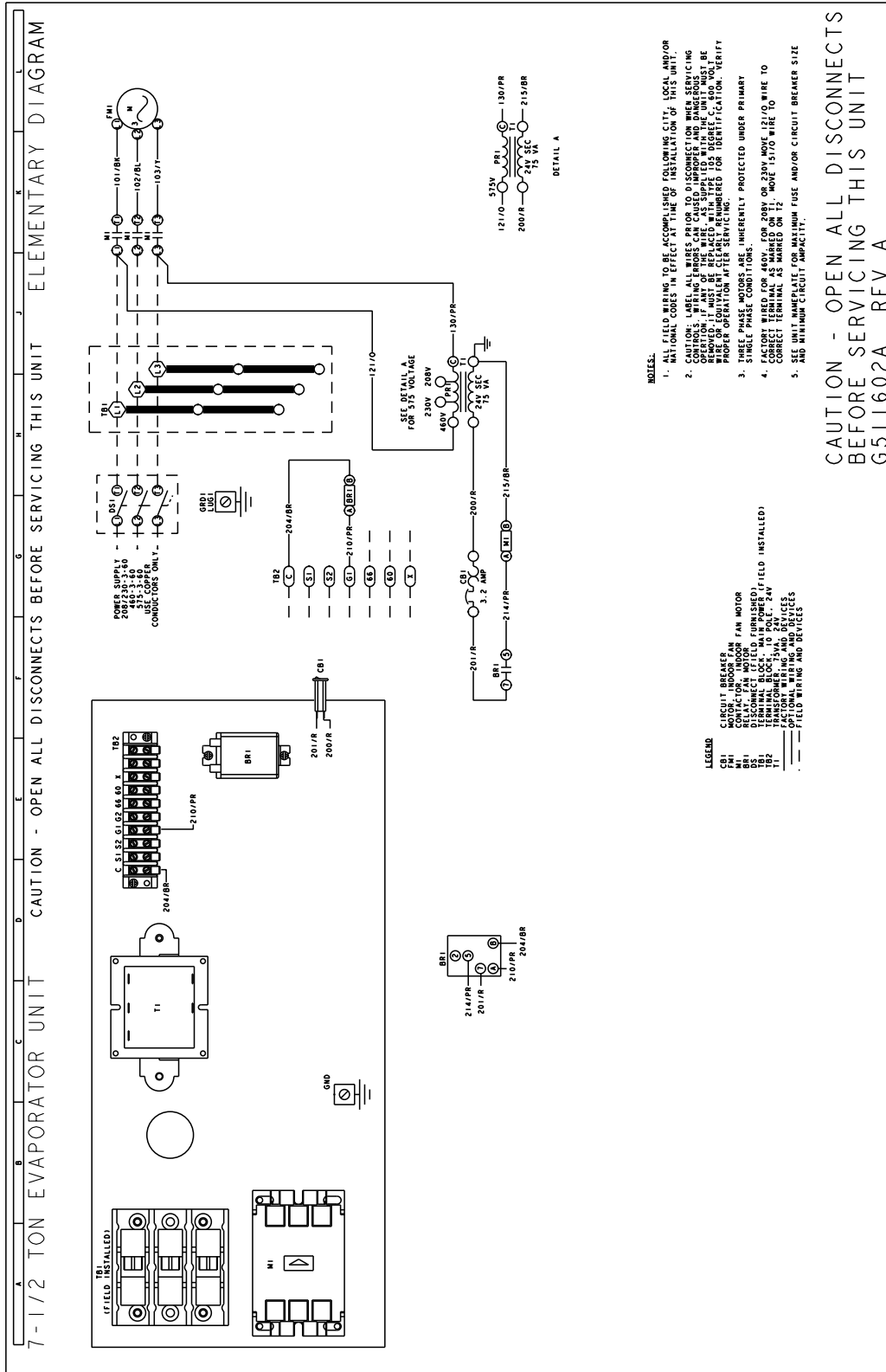
MOTOR HP	Power Supply	Supply Blower Motor FLA	Electric Heat Option				MCA <sup>1</sup> (Amps)	Max. Fuse <sup>2</sup> / Breaker <sup>3</sup> Size (Amps)
			Model	KW	Stages	Amps		
<b>NH-07C00B</b>								
1.5	208-3-60	5.0	None	---	---	---	6.3	15
			10 KW	7.5	1	20.8	32.3	35
			16 KW	12	2	33.4	47.9	50
			26 KW	19.5	2	54.2	74.0	80
			36 KW	27	2	75.1	100.1	110
	230-3-60	5.2	None	--	---	---	6.5	15
			10 KW	10	1	24.1	36.6	40
			16 KW	16	2	38.5	54.6	60
			26 KW	26	2	62.5	84.7	90
			36 KW	36	2	86.6	114.8	125
	460-3-60	2.5	None	---	---	---	3.1	15
			10 KW	10	1	12.0	18.2	20
			16 KW	16	2	19.2	27.2	30
			26 KW	26	2	31.3	42.2	45
			36 KW	36	2	43.3	57.3	60
	575-3-60	2.0	None	---	---	---	2.5	15
			10 KW	10	1	9.6	14.5	15
			16 KW	16	2	15.4	21.7	25
			26 KW	26	2	25.0	33.8	35
			36 KW	36	2	34.6	45.8	50
<b>NH-07C00C, (NH/NJ)-10C00C</b>								
2.0	208-3-60	6.6	None	---	---	---	8.3	15
			10 KW	7.5	1	20.8	34.3	35
			16 KW	12	2	33.4	49.9	50
			26 KW	19.5	2	54.2	76.0	80
			36 KW	27	2	75.1	102.1	110
	230-3-60	6.8	None	--	---	---	8.5	15
			10 KW	10	1	24.1	38.6	40
			16 KW	16	2	38.5	56.6	60
			26 KW	26	2	62.5	86.7	90
			36 KW	36	2	86.6	116.8	125
	460-3-60	3.4	None	---	---	---	4.3	15
			10 KW	10	1	12.0	19.3	20
			16 KW	16	2	19.2	28.3	30
			26 KW	26	2	31.3	43.3	45
			36 KW	36	2	43.3	58.4	60
	575-3-60	2.4	None	---	---	---	3.0	15
			10 KW	10	1	9.6	15.0	20
			16 KW	16	2	15.4	22.2	25
			26 KW	26	2	25.0	34.3	35
			36 KW	36	2	34.6	46.3	50
<b>(NH/NJ)-10C00D, (NH/NJ)-15C00D* (NH/NJ)-15C00D MODELS ONLY</b>								
3.0	208-3-60	9.6	None	---	---	---	12.0	15
			10 KW	7.5	1	20.8	38.1	40
			16 KW	12	2	33.4	53.7	60
			26 KW	19.5	2	54.2	79.8	80
			36 KW	27	2	75.1	105.8	110
			50 KW*	37.6	2	104.2	116.2	125
	230-3-60	9.4	None	---	---	---	11.8	15
			10 KW	10	1	24.1	41.8	45
			16 KW	16	2	38.5	59.9	60
			26 KW	26	2	62.5	89.9	90
			36 KW	36	2	86.6	120.0	125
			50 KW*	50	2	120.3	132.0	150
	460-3-60	4.7	None	---	---	---	5.9	15
			10 KW	10	1	12.0	20.9	25
			16 KW	16	2	19.2	29.9	30
			26 KW	26	2	31.3	45.0	45
			36 KW	36	2	43.3	60.0	70
			50 KW*	50	2	60.1	66.0	70
	575-3-60	3.6	None	---	---	---	4.5	15
			10 KW	10	1	9.6	16.5	20
16 KW			16	2	15.4	23.7	25	
26 KW			26	2	25.0	35.8	40	
36 KW			36	2	34.6	47.8	50	
50 KW*			50	2	48.1	52.6	60	



(NC/ND)180C00E									
5.0	208-3-60	14.0	None	---	---	---	17.5	20	
			10 KW	7.5	1	20.8	43.6	45	
			16 KW	12	2	33.4	59.2	60	
			26 KW	19.5	2	54.2	85.3	90	
			36 KW	27	2	75.1	111.3	125	
	230-3-60	14.0	None	---	---	---	17.5	20	
			10 KW	10	1	24.1	47.6	50	
			16 KW	16	2	38.5	65.6	70	
			26 KW	26	2	62.5	95.7	100	
			36 KW	36	2	86.6	125.8	150	
	460-3-60	7.0	None	---	---	---	8.8	15	
			10 KW	10	1	12.0	23.8	25	
			16 KW	16	2	19.2	32.8	35	
			26 KW	26	2	31.3	47.8	50	
			36 KW	36	2	43.3	62.9	70	
	575-3-60	5.2	None	---	---	---	6.5	15	
			10 KW	10	1	9.6	18.5	20	
			16 KW	16	2	15.4	25.7	30	
			26 KW	26	2	25.0	37.8	40	
			36 KW	36	2	34.6	49.8	50	
50 KW	50	2	48.1	54.6	60				
(NC/ND)240C00E									
5.0	208-3-60	14.0	None	---	---	---	17.5	20	
			20 KW	15	1	41.7	69.6	70	
			32 KW	24	2	66.7	100.9	110	
			52 KW	39.1	2	108.4	125.9	150	
	230-3-60	14.0	None	---	---	---	17.5	20	
			20 KW	20	1	48.1	77.6	80	
			32 KW	32	2	77.0	113.7	125	
			52 KW	52	2	125.1	142.6	150	
	460-3-60	7.0	None	---	---	---	8.8	15	
			20 KW	20	1	24.1	38.8	40	
			32 KW	32	2	38.5	56.9	60	
			52 KW	52	2	62.5	71.3	80	
	575-3-60	5.2	None	---	---	---	6.5	15	
			20 KW	20	1	19.2	30.6	35	
			32 KW	32	2	30.8	45.0	45	
			52 KW	52	2	50.0	56.5	60	
	(NC/ND)240C00F								
	7.5	208-3-60	21.7	None	---	---	---	27.1	30
				20 KW	15	1	41.7	79.2	80
				32 KW	24	2	66.7	110.5	125
52 KW				39.1	2	108.4	135.5	150	
230-3-60		20.0	None	---	---	---	25.0	25	
			20 KW	20	1	48.1	85.1	90	
			32 KW	32	2	77.0	121.2	125	
			52 KW	52	2	125.1	150.1	175	
460-3-60		10.0	None	---	---	---	12.5	15	
			20 KW	20	1	24.1	42.6	45	
			32 KW	32	2	38.5	60.6	70	
			52 KW	52	2	62.5	75.0	80	
575-3-60		7.8	None	---	---	---	9.8	15	
			20 KW	20	1	19.2	33.8	35	
			32 KW	32	2	30.8	48.2	50	
			52 KW	52	2	50.0	59.8	60	

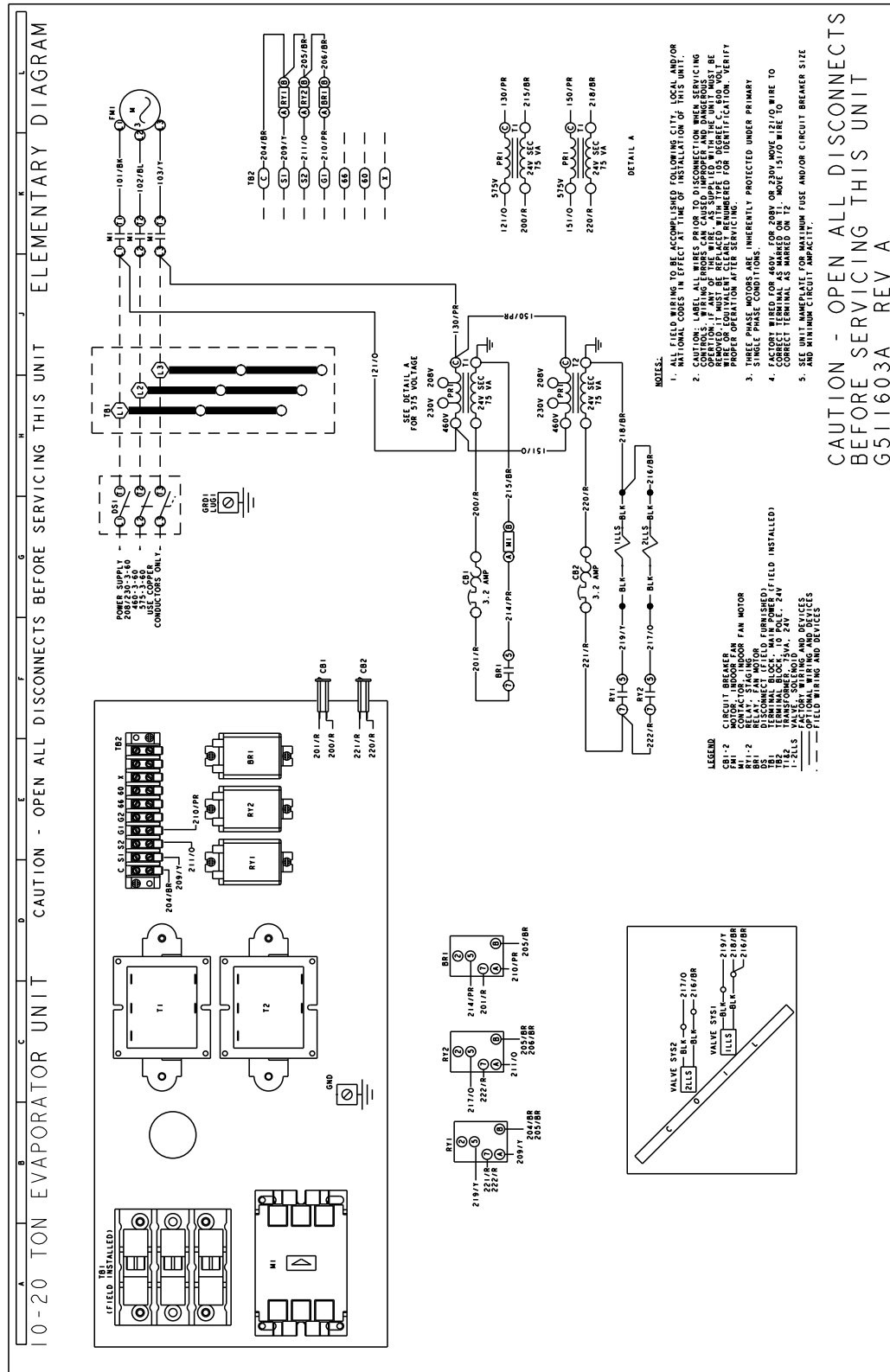
# Air Handling Units

## Typical NC090 Wiring Diagram



**CAUTION - OPEN ALL DISCONNECTS  
BEFORE SERVICING THIS UNIT  
G511602A REV A**

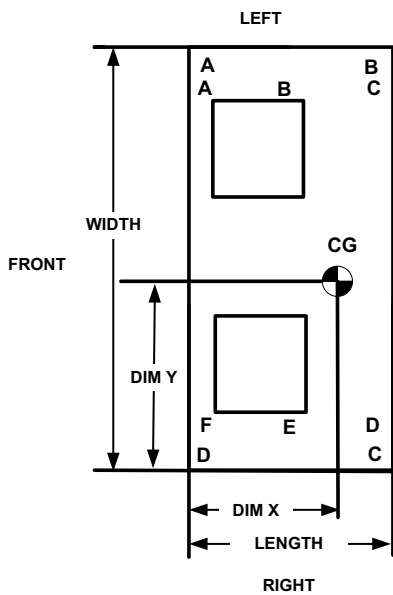
Typical NC/ND120 thru 240 Wiring Diagram



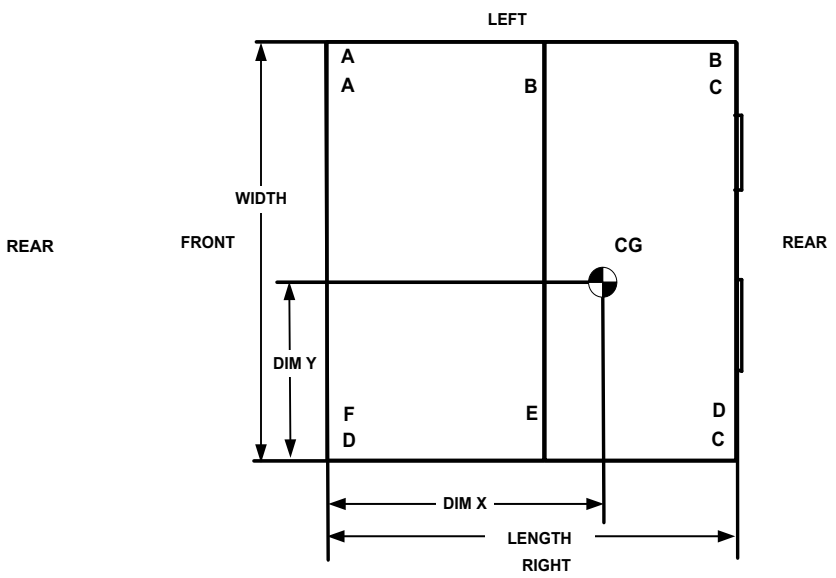


### Corner Weights & Center of Gravity NC/ND Units

Model	Options	Weight (lbs.)		Center of Gravity (in.)		4 Point Load Location (lbs.)				6 Point Load Location (lbs.)					
		Shipping	Operating	X	Y	A	B	C	D	A	B	C	D	E	F
Vertical Airflow															
NC 090	Std. Mtr. and Drv.	357	381	30	30	102	102	88	88	68	68	68	59	59	59
	High Static Mtr. and Drv.	357	385	30	30	103	103	89	89	69	69	69	60	60	60
NC/ND120	Std. Mtr. and Drv.	422	468	30	30	125	125	109	109	84	84	84	72	72	72
	High Static Mtr. and Drv.	422	492	31	29	123	132	123	115	81	85	89	83	79	76
NC/ND180	Std. Mtr. and Drv.	560	632	36	36	139	167	178	148	90	101	115	122	108	96
	High Static Mtr. and Drv.	560	661	36	35.5	143	172	189	157	93	104	118	130	114	102
NC/ND240	Std. Mtr. and Drv.	715	816	32	48	186	212	223	195	121	132	145	152	139	127
	High Static Mtr. and Drv.	715	854	32	47	190	217	238	208	124	135	148	162	148	136
Horizontal Airflow															
NC 090	Std. Mtr. and Drv.	357	381	15	30	102	102	88	88	68	68	68	59	59	59
	High Static Mtr. and Drv.	357	385	15	30	103	103	89	89	69	69	69	60	60	60
NC/ND120	Std. Mtr. and Drv.	422	468	15	30	125	125	109	109	84	84	84	72	72	72
	High Static Mtr. and Drv.	422	492	15.5	29	123	132	123	115	81	85	89	83	79	76
NC/ND180	Std. Mtr. and Drv.	560	632	18	36	139	167	178	148	90	101	115	122	108	96
	High Static Mtr. and Drv.	560	661	18	35.5	143	172	189	157	93	104	118	130	114	102
NC/ND240	Std. Mtr. and Drv.	715	816	16	48	186	212	223	195	121	132	145	152	139	127
	High Static Mtr. and Drv.	715	854	16	47	190	217	238	208	124	135	148	162	148	136

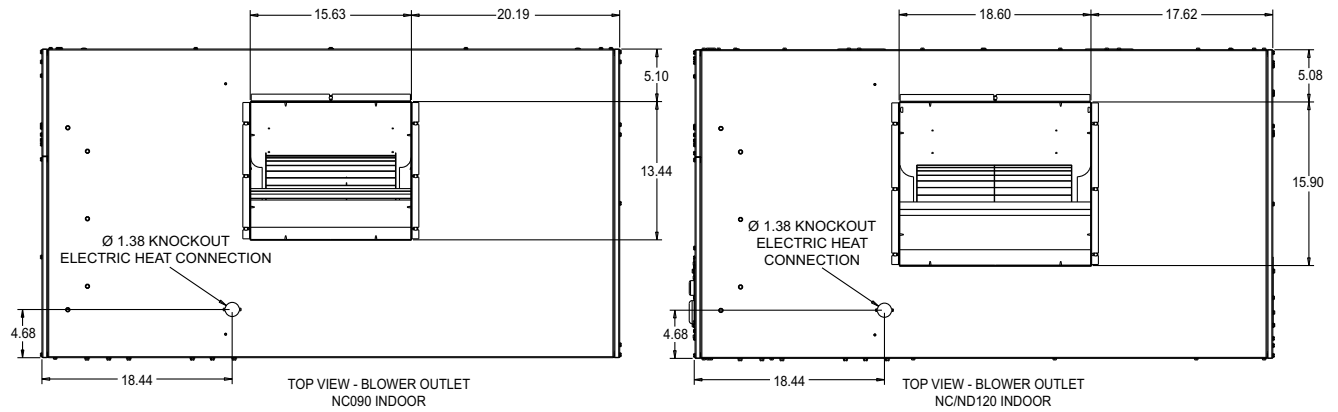


VERTICAL POSITION

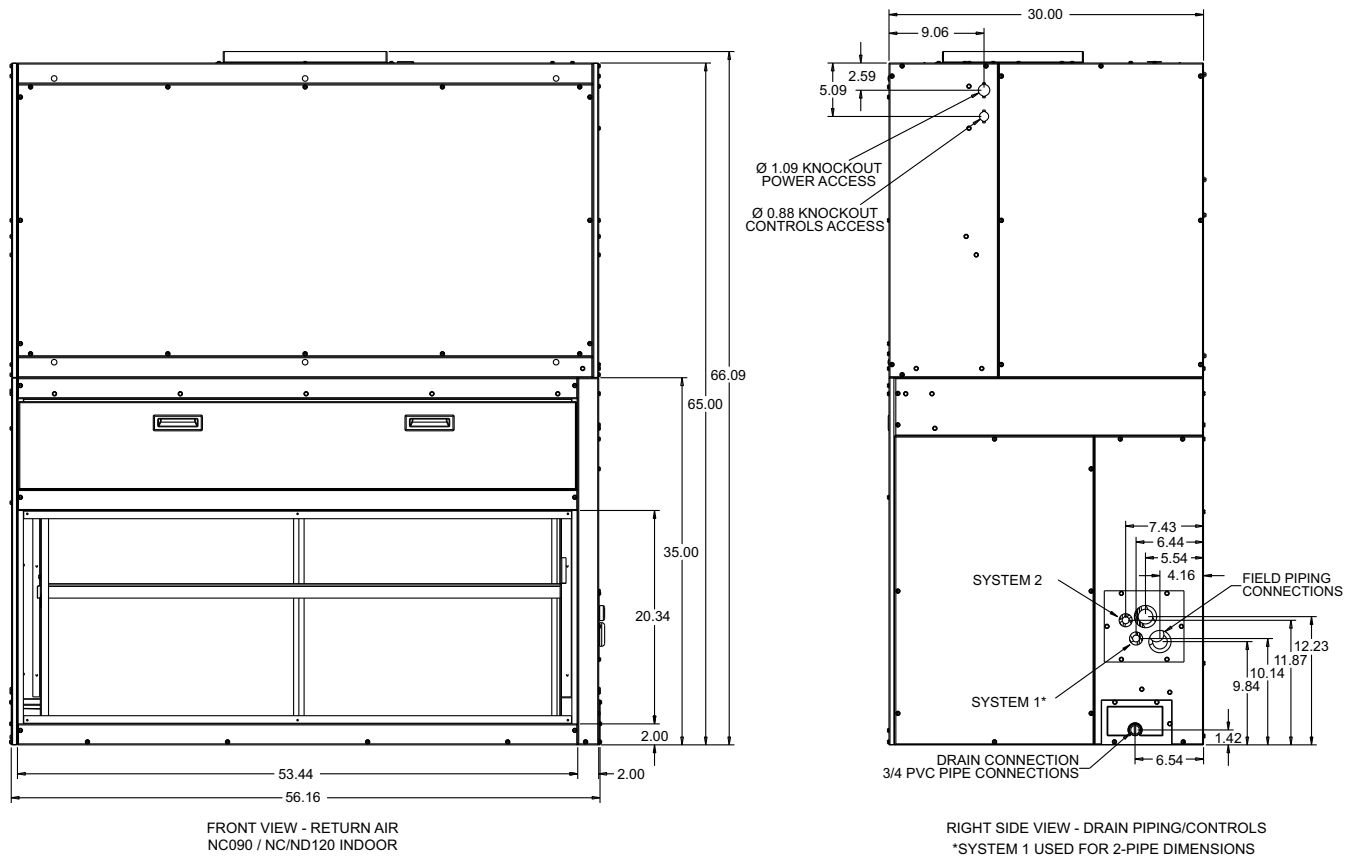


HORIZONTAL POSITION

**TOP VIEW**

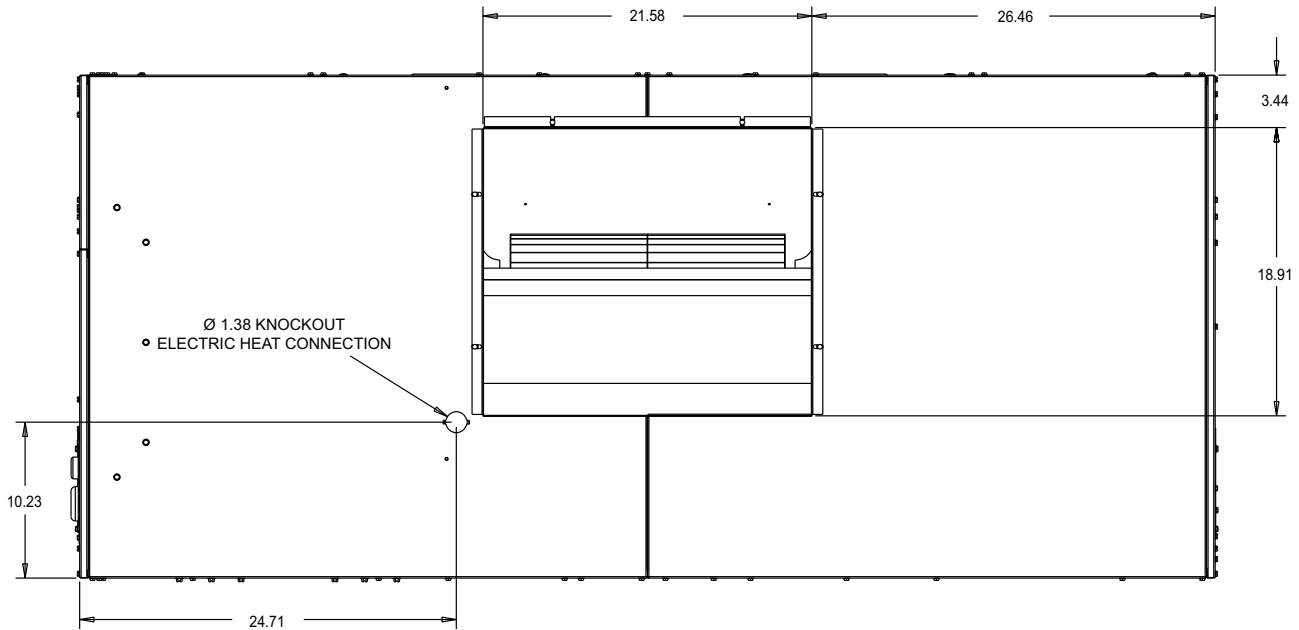


**FRONT AND SIDE VIEW**



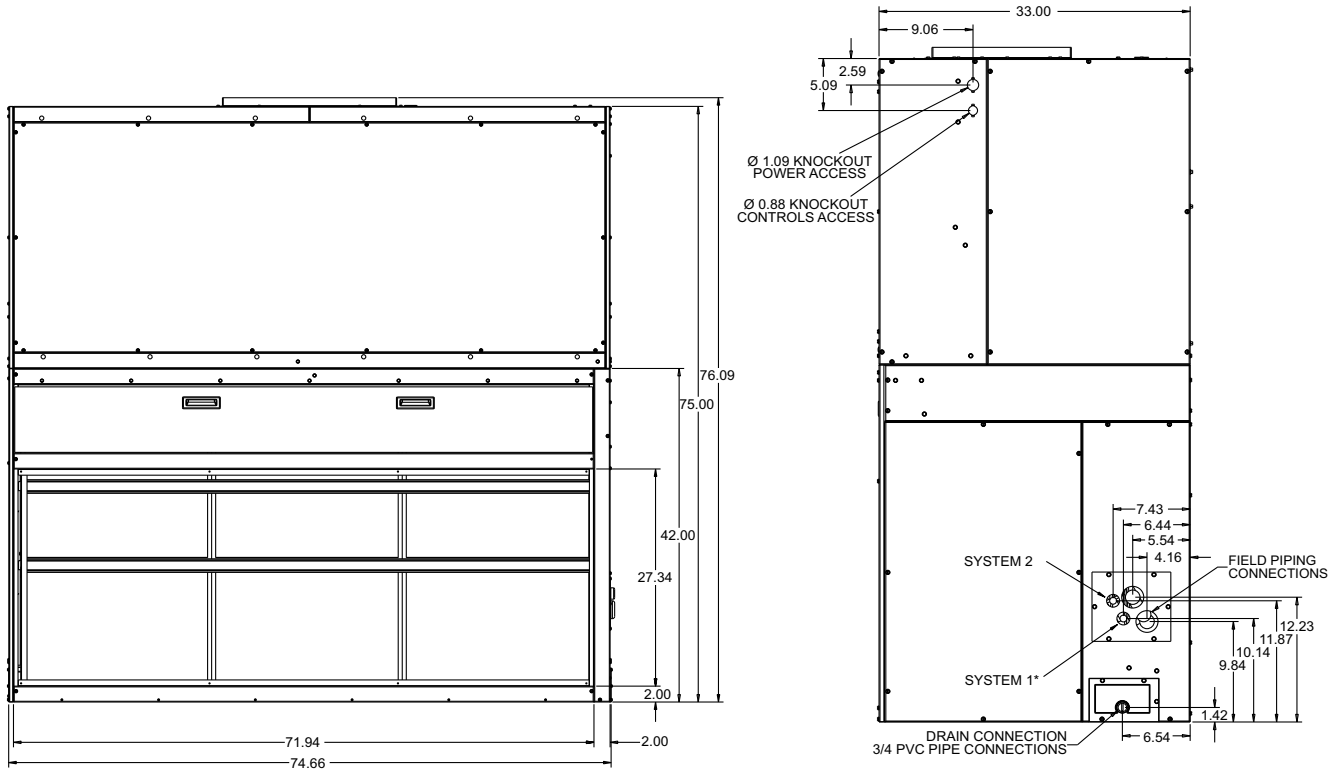
**Unit Dimensions NC090/120 and ND120**

**TOP VIEW**



TOP VIEW - BLOWER OUTLET  
NC/ND180 INDOOR

**FRONT AND SIDE VIEW**

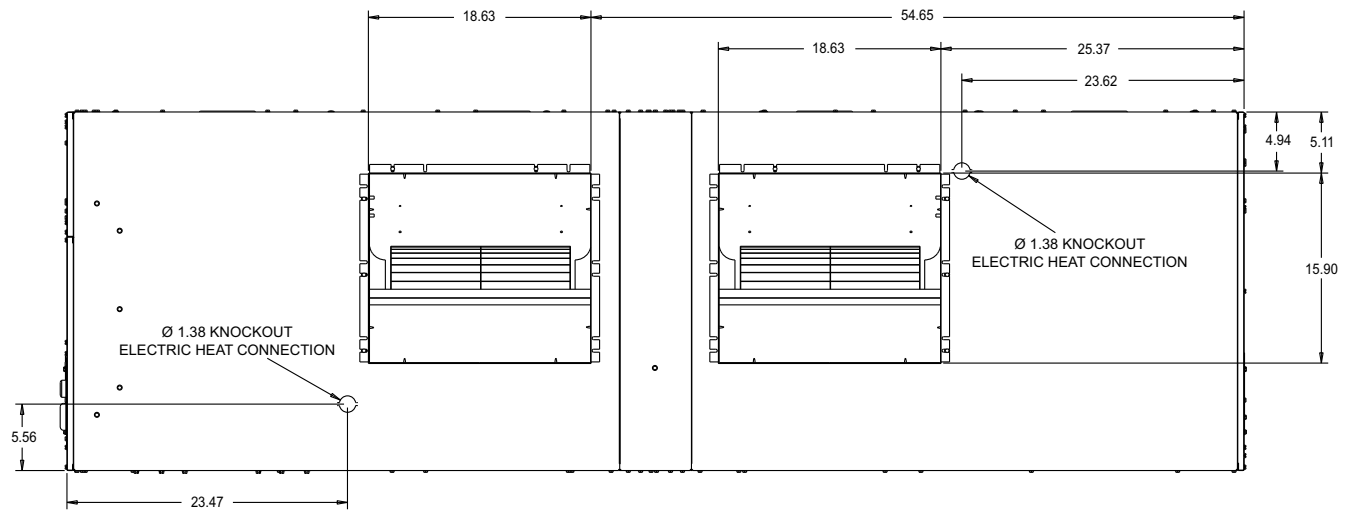


FRONT VIEW - RETURN AIR  
NC/ND180 INDOOR

RIGHT SIDE VIEW - DRAIN PIPING/CONTROLS  
\*SYSTEM 1 USED FOR 2-PIPE DIMENSIONS

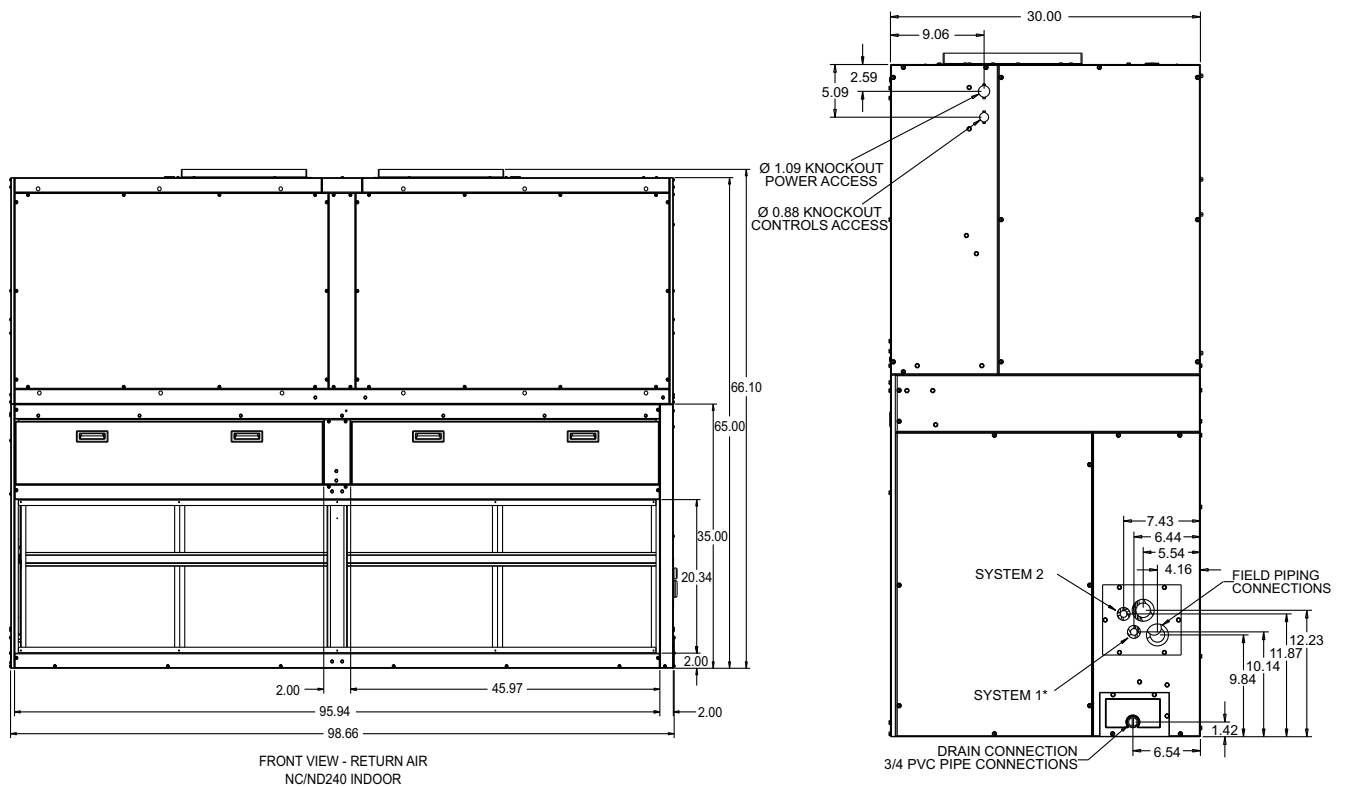
**Unit Dimensions NC/ND180**

**TOP VIEW**



TOP VIEW - BLOWER OUTLET  
NC/ND240 INDOOR

**FRONT AND SIDE VIEW**



**Unit Dimensions NC/ND240**

**PIPING, ELECTRICAL AND DUCT OPENING CONNECTION SIZES**

MODEL	NC090	NC120	ND120	NC180	ND180	NC240	ND240
<b>SYSTEM DATA</b>							
No. Refrigeration Circuits	1	1	2	1	2	1	2
Suction Line OD (in.)	1 1/8	1 3/8	1 1/8	1 5/8	1 1/8	1 5/8	1 3/8
Liquid Line OD (in.)	5/8	7/8	5/8	7/8	5/8	7/8	7/8
Power Wiring Knockout	1	1	1	1	1	1	1
Control Wiring Knockout	7/8	7/8	7/8	7/8	7/8	7/8	7/8
Electric Heat Wiring Knockout	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Drain Line Fitting PVC Stub	3/4	3/4	3/4	3/4	3/4	3/4	3/4
<b>BLOWER OUTLET</b>							
Number	1	1	1	1	1	2	2
Width	13.4	15.9	15.9	18.9	18.9	15.9	15.9
Length	15.6	18.6	18.6	21.6	21.6	18.6	18.6
<b>RETURN AIR INLET</b>							
Width	20.3	20.3	20.3	27.3	27.3	20.3	20.3
Length	53.4	53.4	53.4	71.9	71.9	95.9	95.9

**Minimum Clearances**

<b>Minimum Clearances</b>	
<b>Top with Supply Air Opening<sup>1</sup></b>	24"
<b>Front with Return Air Opening</b>	24"
<b>Right Side with access for Piping, Power &amp; Control Wiring Connections<sup>2</sup></b>	24"
<b>Left Side</b>	24"
<b>Rear<sup>3</sup></b>	N/A
<b>Bottom<sup>4</sup></b>	N/A

<sup>1</sup> This dimension will vary if an electric heater, a supply air plenum or a base is used.

<sup>2</sup> This dimension is required for normal installation and service.

<sup>3</sup> Although no clearance is required for service and operation, some clearance may be required for routing the power and control wiring.

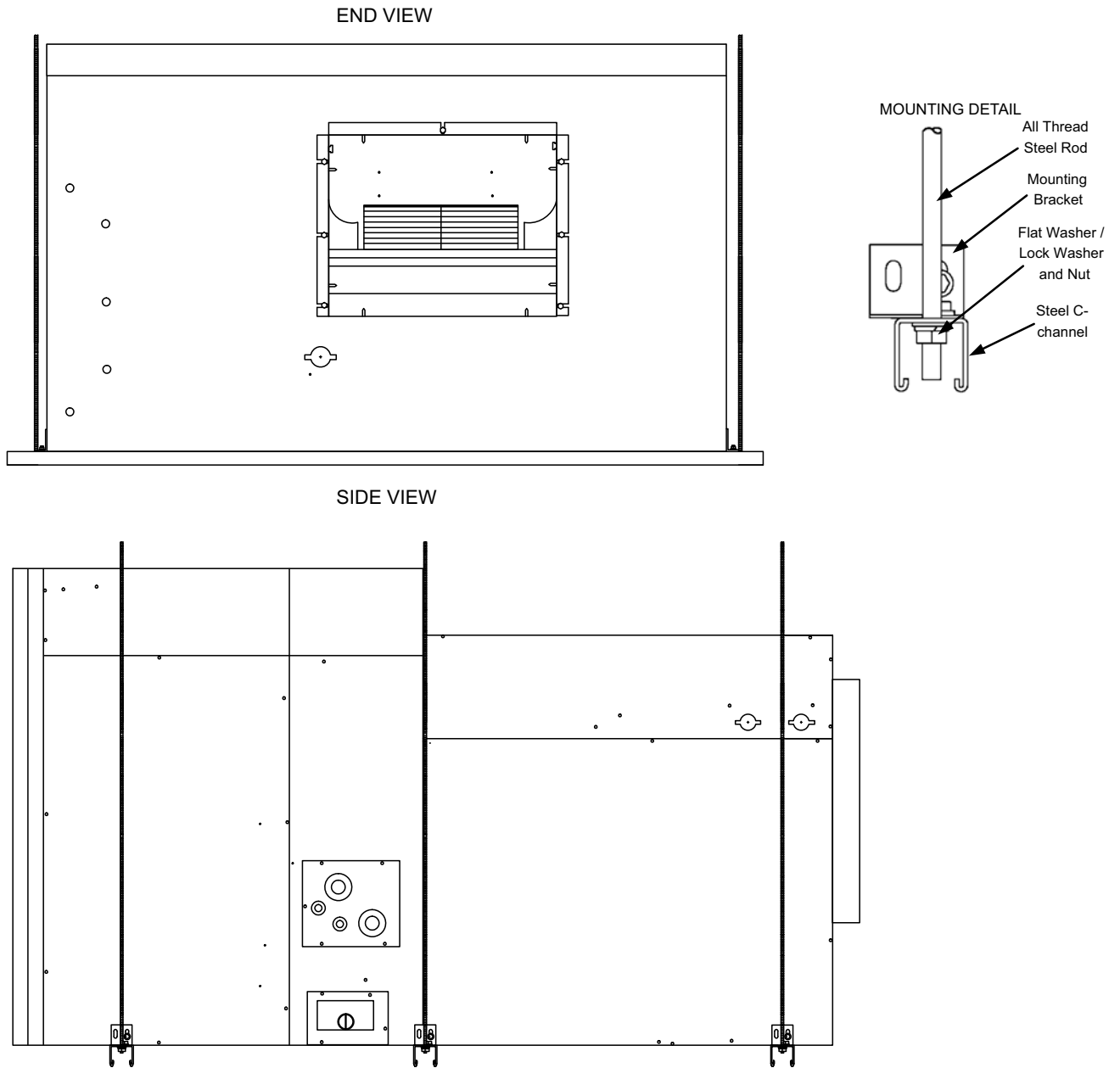
<sup>4</sup> Allow enough clearance to trap the condensate drain line.

**Note:** If the coil has to be removed, the blower section can be unbolted and set aside and the coil can be lifted out the top of the evaporator section.

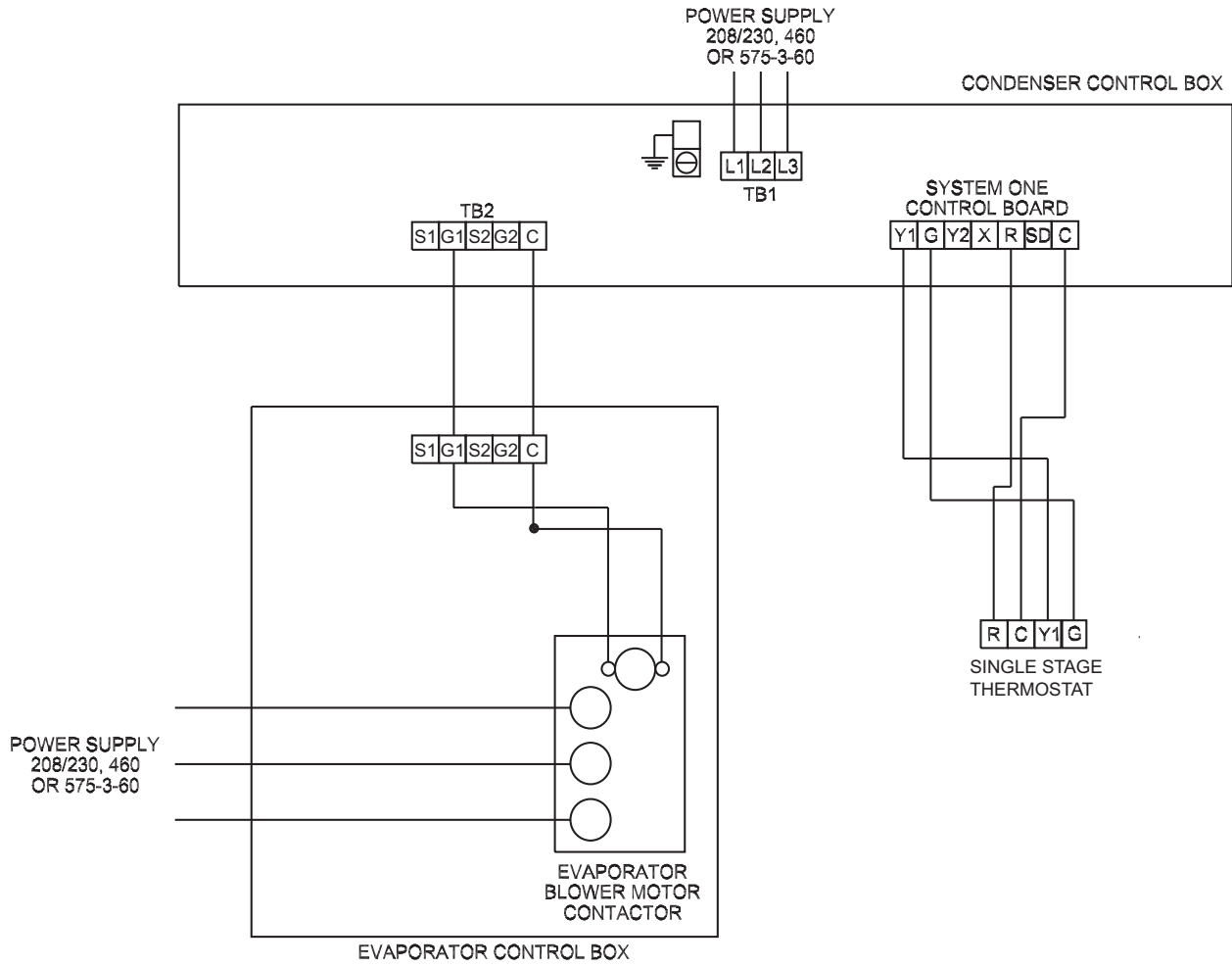
**Mounting**

The split air handling units can be applied in various horizontal positions. The Typical Suspension of AHU's From Ceiling Figure shows recommended suspension rigging using properly sized all-thread and metal c-channel. All

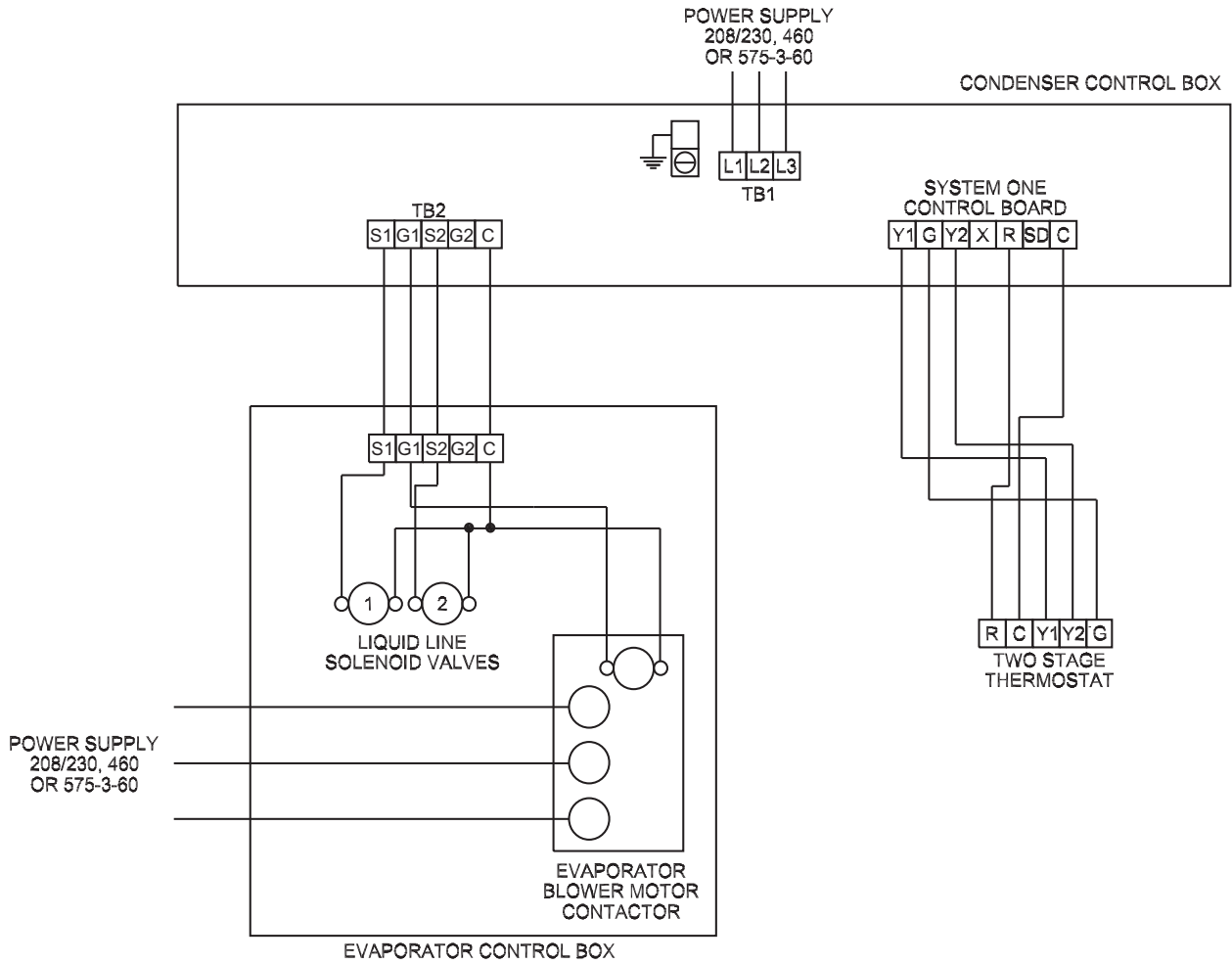
components to suspend an AHU must be field supplied. Please refer to the units total weight, center of gravity and corner weights. (Horizontal position) shown in the appropriate table for proper support sizing.



**Typical Suspension of AHU's From Ceiling**

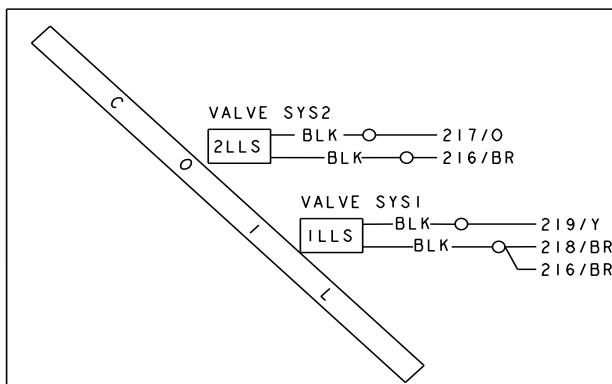


Typical Field Wiring Diagram - NC090 Unit



**Typical Field Wiring Diagram - NC/ND120 thru 240 Unit**

**NOTE:** On non NC/ND Air Handler models isolation relays must be installed to avoid overloading on 75 VA transformer on the condensing unit.



**NC/ND120 - 240 Liquid Line Solenoid Wiring**



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