



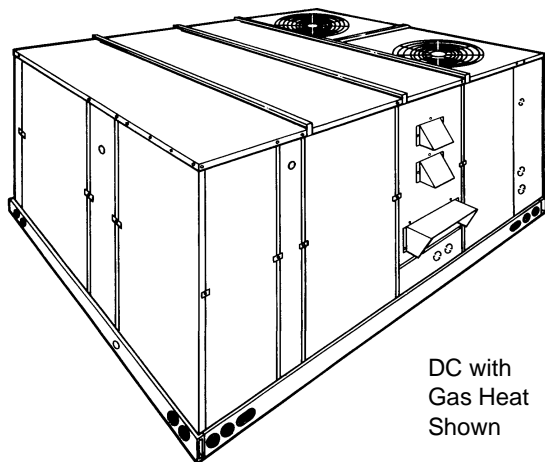
## Heating and Air Conditioning

### TECHNICAL GUIDE (R-407C)

#### SINGLE PACKAGE COOL-ONLY and COOL-HEAT GAS/ELECTRIC AIR CONDITIONERS

DC180 & 240

(WORLD 50 HZ)



DC with  
Gas Heat  
Shown

### SUNLINE™ 2000



ISO 9001  
Certified Quality  
Management System

### DESCRIPTION

Sunline 2000™ units are highly efficient, convertible rooftops. All models have dual refrigerant circuits for efficient part load operation. Although the units are primarily designed for curb mounting on a roof, they can also be slab-mounted at ground level or set on steel beams above a finished roof.

These units are designed and manufactured under ISO 9002 Quality System Certification.

Cooling only, cooling with gas heat and cooling with supplemental electric heat units are available with a wide variety of field-installed accessories to make them suitable for almost every application.

All units are self-contained and assembled on full perimeter base rails. The base rails have holes in the four corners for overhead rigging.

Every unit is completely piped, wired, charged and tested at the factory to simplify the field installation and to provide years of dependable operation. Powder paint cabinets provide an exceptionally durable finish with the 1000 hour salt spray process per ASTM-B117 test standard.

All models are available with three different outdoor air damper accessories:

- Single enthalpy economizer
- Single enthalpy economizer with power exhaust
- Motorized outdoor air intake damper
- Barometric Relief Damper

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## DESCRIPTION (Cont'd.)

All models (including those with an economizer) are suitable for either downflow or sideflow duct connections. Models with factory installed Power Exhaust are only suitable for bottom duct connections. For downflow duct, remove the sheet metal panels from the supply and return air openings through the base of the unit. For sideflow duct, replace the supply and return air panels on the rear of the unit with a side duct flange accessory.

A fixed outdoor air intake assembly is shipped in the return air compartment of all units without an economizer or motorized outdoor air damper option. The assembly includes a rain hood with a damper that can be set for 10, 15 or 25% outdoor air. With bottom duct connections, the intake damper assembly should be mounted over the opening in the return air panel. With horizontal ductwork, it should be mounted on the return air duct.

All supply air blowers are equipped with a belt drive that can be adjusted to meet the exact requirements of the job. A high static drive option is available for applications with a higher CFM and/or static pressure requirement.

All compressors include crankcase heat and internal pressure relief. Every refrigerant circuit includes an expansion valve, a liquid line filter-drier, a discharge line high pressure switch and a suction line with a freestat and low pressure loss of charge switch.

- **Simplicity® Controls** - Simplicity® control boards have standardized a number of features previously available only as options or by utilizing additional controls.
- **Low Ambient** - An integrated low-ambient control allows all units to operate in the cooling mode down to 0°F outdoor ambient without additional assistance. Optionally, the control board can be programmed to lockout the compressors when the outdoor air temperature is low or when free cooling is available.

### CAUTION

The Simplicity® control board used in this product will effectively operate the cooling system down to 0°F when this product is applied in a comfort cooling application for people. An economizer is typically included in this type of application. When applying this product for process cooling applications (computer rooms, switchgear, etc.), please reference applications bulletin AE-011-07 or call the applications department for Unitary Products @ 1-877-UPG-SERV for guidance. Additional accessories may be needed for stable operation at temperatures below 30°F.

- **Anti-Short Cycle Protection** - To aid compressor life, an anti-short cycle delay is incorporated into the standard controls. Compressor reliability is further ensured by programmable minimum run times. For testing, the anti short cycle delay can be temporarily overridden with the push of a button.
- **Fan Delays** - Fan on and fan off delays are fully programmable. Furthermore, the heating and cooling fan delay times are independent of one another. All units are programmed with default values based upon their configuration of cooling and heat.
- **Safety Monitoring** - The control board monitors the high and low-pressure switches, the freestats, the gas valve, if applicable, and the temperature limit switch on gas and electric heat units. The unit control board will alarm on ignition failures, compressor lockouts and repeated limit switch trips.
- **Nuisance Trip Protection and Strikes** - To prevent nuisance trouble calls, the control board uses a "three times, you're out" philosophy. The high and low-pressure switches and the freestats must trip three times within two hours before the unit control board will lock out the associated compressor.
- **On Board Diagnostics** - Each alarm will energize a trouble light on the thermostat, if so equipped, and flash an alarm code on the control board LED. Each high and low-pressure switch alarm as well as each freestat alarm has its own flash code. The control board saves the five most recent alarms in memory, and these alarms can be reviewed at any time. Alarms and programmed values are retained through the loss of power.

All gas heat models are built with two heating sections for two equal stages of capacity control. Each section includes a durable heat exchanger with aluminized steel tubes, a redundant gas valve, spark ignition, power venting, an ignition module for 100% shut-off and all of the safety controls required to meet the latest ANSI standards.

The gas supply piping can be routed into the heating compartment through a hole in the base pan of the unit or through a knockout in the piping panel on the front of the unit.

All electric heat models are wired for a single power source and include a bank of nickel chromium elements mounted at the discharge of the supply air blower to provide a high velocity and uniform distribution of air across the heating elements. Every element is fully protected against excessive current and temperature by fuses and two thermal limit switches.

The power supply wiring can be routed into the control box through a threaded pipe connection in the base pan of the unit. It can also be routed knockout in the wiring panel on the front of the unit.

All models are available with factory mounted BAS Control. Options are Novar, Honeywell, Johnson, or CPC.

Phenolic Coated Evaporator and Condenser Coils - Special coating process that utilizes Technicoat 10-1" processes. Coating is applied by total immersion of the complete coil for maximum protection.

## FIELD-INSTALLED ACCESSORIES

- **SINGLE INPUT ELECTRONIC ENTHALPY ECONOMIZERS** - Includes a slide-in / plug-in damper assembly with fully modulating spring-return motor actuator capable of introducing up to 100% outdoor air with nominal 1% leakage type dampers.

The enthalpy system contains one sensor that monitors the outdoor air and determines when the air is cool enough and dry enough to provide free cooling.

The rainhood is painted to match the basic unit and must be field-assembled before installing.

Power exhaust is not available as a field installed option.

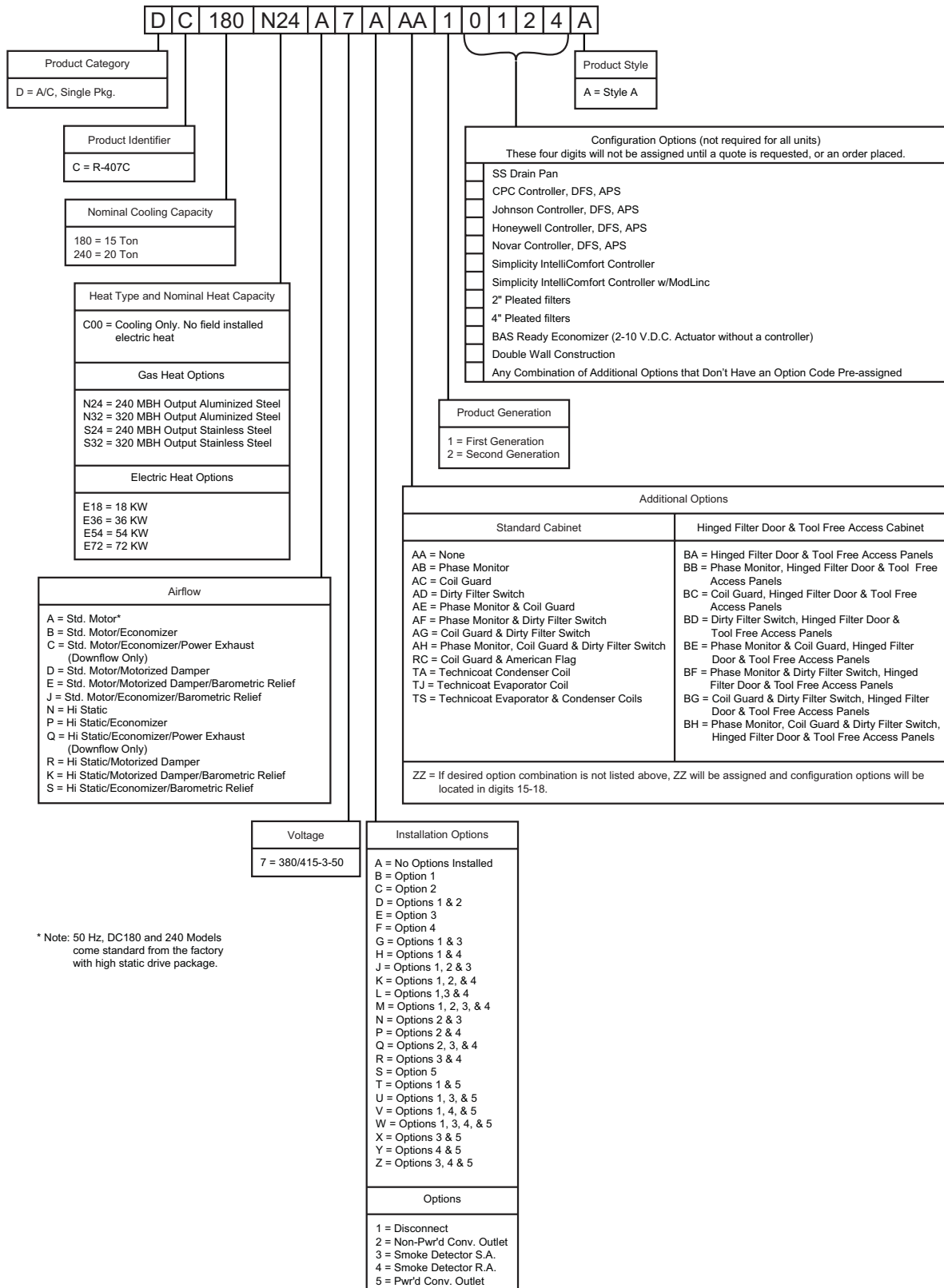
- **DUAL INPUT ELECTRONIC ENTHALPY CONTROL KIT** - This kit contains the required components to convert a Single Enthalpy Economizer to Dual Enthalpy.
- **MOTORIZED OUTDOOR AIR INTAKE DAMPER** - Includes a slide-in / plug-in damper assembly with a 2-position, spring return motor actuator which opens to some pre-set position whenever the supply air blower is operating and will drive fully closed when the blower unit shuts down.
- **BAROMETRIC RELIEF DAMPER** - This damper accessory can be used to relieve internal building air pressure on units with an economizer without power exhaust. This

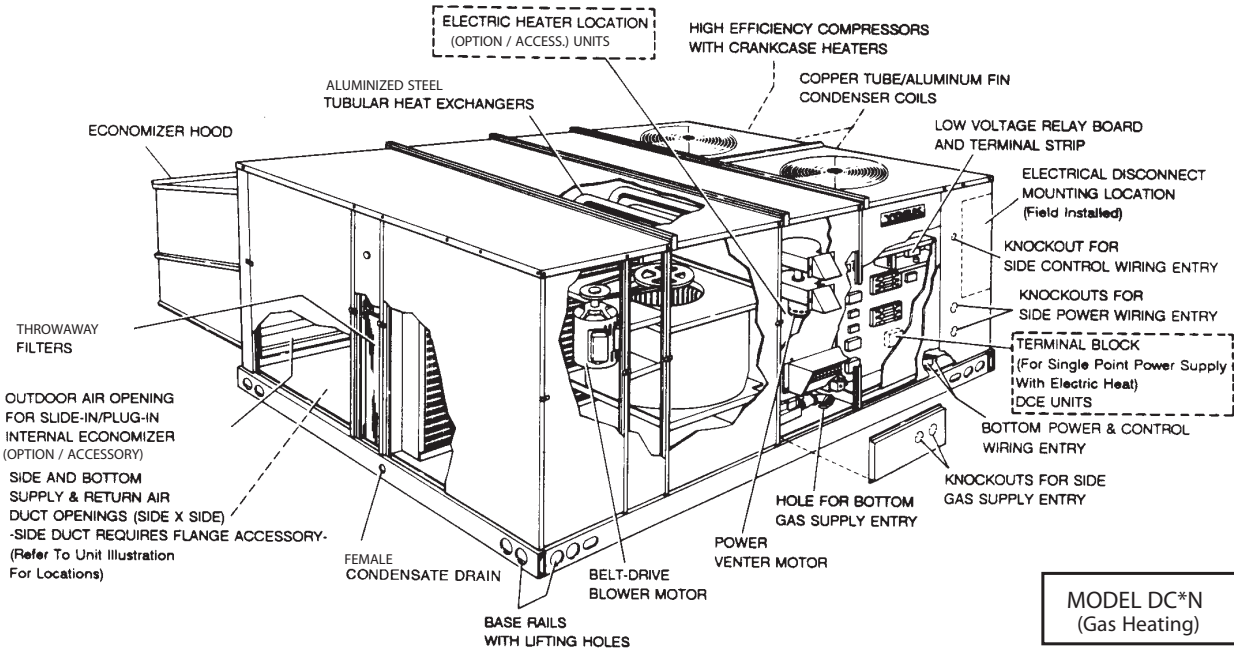
accessory includes a rain hood, a bird screen and a fully assembled damper. With bottom duct connections, the damper should be mounted over the opening in the return air panel. With horizontal ductwork, the accessory should be mounted on the return air duct.

- **ROOF CURBS** - 356mm (14 in.) high roof curbs provide a water-tight seal between the unit and the finished roof. These full perimeter curbs meet the requirements of the National Roofing Contractors Association (NRCA) and are shipped knocked-down for field assembly.  
  
They're designed to fit inside the base rails of the unit and include both a wood nailing strip and duct hanger supports.
- **SIDE DUCT FLANGES** - 25mm (1 in.) flanges replace the supply and return air panels on the rear of the unit to accommodate horizontal duct connections. These flanges can also be used individually for bottom supply/horizontal return or horizontal supply/bottom return.
- **WOOD SKID** - Allows unit to be handled with 90" forks.
- **CO<sub>2</sub> SENSOR** - Senses CO<sub>2</sub> levels and automatically overrides the economizer when levels rise above the present limits.
- **COIL GUARD** - Customers can purchase a coil guard kit to protect the condenser coil from damage.
- **PHASE MONITORS** - Designed to prevent unit damage. The phase monitor will shut the unit down in an out-of-phase condition.

# PRODUCT NOMENCLATURE

## 15-20 Ton Sunline Model Number Nomenclature





**MODEL DC\*N**  
(Gas Heating)

**FIGURE 1 - SUNLINE 2000™ DC180-240**

**TABLE 1: CAPACITY RATINGS - ELECTRIC HEATING**

Model	Electric Heat <sup>1</sup> Nominal Capacity, kW
DC180	18, 36, 54, 72
DC240	18, 36, 54, 72

1. Heaters available as factory-installed options or field-installed accessories - all with single point power supply.

**TABLE 2: CAPACITY RATINGS - GAS HEATING**

Model	Gas Heat Capacity				
	Input Mbh/kW	Output Mbh/kW	Gas Rate cfh/ m <sup>3</sup> /h	Temp. Rise (°F / °C) At Full Input	
				Min.	Max.
DC180N24	300 / 85.2	240 / 70.3	279 / 7.9	20 / 11	50 / 28
DC240N24					

NOTE: Gas Heaters are shipped available for natural gas, but can be converted to L.P. / propane gas with a field-installed conversion accessory. All gas units are two-stage heating. First stage is 50% of total.

\* Based on net input and 2nd. -H family, G20 (methane) net fuel value (9.97 kWh/m<sup>3</sup>)

**TABLE 3: SOUND POWER RATING<sup>1</sup>**

UNIT SIZE	CFM	ESP	BLOWER		SOUND POWER (db 10 <sup>-12</sup> Watts)									
					Octave Band Centerline Frequency (Hz)								SWL dB(A)	dB(A) @ 10Ft. <sup>2</sup>
					IWG	RPM	BHP	63	125	250	500	1,000		
DC180	6,000	1.00	1,080	4.60	99	99	89	82	84	77	72	67	89	56
DC240	8,000	1.00	1,120	6.65	102	102	92	85	87	80	75	70	92	59

1. These values have been accessed using a model of sound propagation from a point source into the hemispheric/free field. The dBA values provided are to be used for reference only. Calculation of dBA values cover matters of system design and the fan manufacture has no way of knowing the details of each system. This constitutes an expectation to any specification or guarantee requiring a dBA value or sound data in any other form than sound power level ratings.

2. At a distance of 10 feet from the blower.

**TABLE 4: DC180 COOLING CAPACITIES (m<sup>3</sup>/s AIR FLOW) - 15 TON (METRIC)**

AIR ON COOLING COIL		TOTAL CAP. <sup>1</sup> Kw	POWER INPUT <sup>2</sup> Kw	SENSIBLE CAPACITY <sup>1</sup> , kW					
M <sup>3</sup> /S	WB °C			ENTERING DRY BULB, °C					
				32	30	28	26	24	22
<b>@ 35°C Temperature on Condenser Coil</b>									
3.40	23	56.5	16.6	53	46	39	32	25	-
	21	54.5	16.4	55	51	44	37	30	23
	19	52.5	16.2	53	53	49	42	35	28
	17	50.8	15.9	51	51	51	44	37	30
	15	49.0	15.8	49	49	49	45	39	32
2.80	23	53.7	16.4	49	43	37	31	25	-
	21	51.9	16.2	52	47	41	35	29	23
	19	50.1	16.0	50	50	45	39	33	27
	17	48.4	15.8	48	48	47	42	36	29
	15	46.6	15.6	47	47	47	43	38	32
2.10	23	49.2	16.2	40	35	30	26	21	-
	21	47.5	15.9	43	38	34	29	25	20
	19	45.9	15.7	46	42	38	33	28	24
	17	44.4	15.5	44	44	39	35	30	25
	15	42.6	15.3	43	43	41	36	32	27
<b>@ 41°C Temperature on Condenser Coil</b>									
3.40	23	52.7	18.1	50	43	37	30	24	-
	21	50.9	17.9	51	47	41	35	28	22
	19	49.0	17.6	49	49	45	39	32	26
	17	47.4	17.4	47	47	47	41	35	28
	15	45.7	17.2	46	46	46	42	36	29
2.80	23	50.0	17.9	46	40	34	29	23	-
	21	48.4	17.7	48	44	38	33	27	21
	19	46.7	17.5	47	47	42	37	31	26
	17	45.1	17.2	45	45	44	39	33	27
	15	43.5	17.0	43	43	43	41	35	29
2.10	23	45.9	17.6	37	33	28	24	20	-
	21	44.3	17.4	40	36	32	27	23	19
	19	42.8	17.1	43	39	35	31	26	22
	17	41.4	16.9	41	41	37	32	28	24
	15	39.7	16.7	40	40	38	34	30	25
<b>@ 46°C Temperature on Condenser Coil</b>									
3.40	23	49.8	19.9	49	42	35	28	21	-
	21	47.6	19.5	48	47	40	33	26	19
	19	45.1	19.0	45	45	45	38	31	24
	17	44.3	19.0	44	44	44	39	33	26
	15	43.4	18.9	43	43	43	40	33	26
2.80	23	48.0	19.8	45	39	33	27	21	-
	21	45.6	19.3	46	43	37	31	25	19
	19	43.4	18.9	43	43	42	36	30	24
	17	42.5	18.8	42	42	42	37	31	25
	15	41.6	18.8	42	42	42	39	33	27
2.10	23	44.7	19.7	37	32	27	23	18	-
	21	42.5	19.2	40	36	31	26	22	17
	19	40.5	18.7	41	39	35	30	26	21
	17	39.6	18.6	40	40	36	31	27	22
	15	38.8	18.6	39	39	37	33	28	23
<b>@ 52°C Temperature on Condenser Coil</b>									
3.40	23	44.7	22.0	44	38	32	26	19	-
	21	42.7	21.5	43	42	36	30	24	17
	19	40.6	21.0	41	41	40	34	28	22
	17	39.8	21.0	40	40	40	35	29	23
	15	39.0	20.9	39	39	39	36	30	24
2.80	23	43.1	21.9	40	35	29	24	19	-
	21	41.0	21.3	41	39	34	28	23	17
	19	39.0	20.9	39	39	38	32	27	21
	17	38.2	20.8	38	38	38	33	28	23
	15	37.4	20.8	37	37	37	35	29	24
2.10	23	40.2	21.7	33	29	25	20	16	-
	21	38.2	21.1	36	32	28	24	20	15
	19	36.4	20.7	36	35	31	27	23	19
	17	35.6	20.6	36	36	32	28	24	20
	15	34.8	20.6	35	35	33	29	25	21

1. These capacities are gross ratings. For net capacity, deduct the heat of the supply air blower motor. Refer to the appropriate Blower Performance Table for the kW of the supply air blower motor.
2. These ratings include the condenser fan motors (Total 2.1 kW) and the compressor motors but not the supply air blower motor.

**TABLE 5: DC180 COOLING CAPACITIES (CFM AIR FLOW) - 15 TON**

AIR ON COOLING COIL		TOTAL CAP. <sup>1</sup> MBH	POWER INPUT <sup>2</sup> Kw	SENSIBLE CAPACITY <sup>1</sup> , MBH					
CFM	WB °F			ENTERING DRY BULB, °F					
				90	86	82	80	75	72
<b>@ 95°F Temperature on Condenser Coil</b>									
7200	73	193	16.6	182	157	134	111	87	-
	70	186	16.4	186	173	150	127	102	79
	67	179	16.2	179	179	166	142	118	95
	63	173	15.9	173	173	173	150	127	102
	59	167	15.8	167	167	167	155	132	108
5930	73	183	16.4	166	145	125	105	84	-
	70	177	16.2	177	160	140	119	99	78
	67	171	16.0	171	171	155	134	114	93
	63	165	15.8	165	165	162	142	121	100
	59	159	15.6	159	159	159	148	128	108
4450	73	168	16.2	135	119	103	87	72	-
	70	162	15.9	147	131	115	100	84	69
	67	157	15.7	157	144	128	112	96	81
	63	151	15.5	151	150	134	118	102	87
	59	145	15.3	145	145	140	124	108	93
<b>@105°F Temperature on Condenser Coil</b>									
7200	73	180	18.1	169	147	125	103	81	-
	70	174	17.9	174	162	140	118	96	74
	67	167	17.6	167	167	155	133	110	89
	63	162	17.4	162	162	162	140	118	96
	59	156	17.2	156	156	156	145	123	100
5930	73	171	17.9	155	136	117	98	78	-
	70	165	17.7	165	150	131	111	92	73
	67	160	17.5	160	160	145	125	106	87
	63	154	17.2	154	154	151	132	113	93
	59	148	17.0	148	148	148	138	119	100
4450	73	157	17.6	126	111	96	82	67	-
	70	151	17.4	137	122	108	93	79	64
	67	146	17.1	146	134	119	105	90	75
	63	141	16.9	141	140	125	110	96	81
	59	136	16.7	136	136	131	116	101	86
<b>@ 115°F Temperature on Condenser Coil</b>									
7200	73	170	19.9	168	143	120	97	73	-
	70	162	19.5	162	160	137	113	89	66
	67	154	19.0	154	154	153	129	106	83
	63	151	19.0	151	151	151	134	111	88
	59	148	18.9	148	148	148	137	113	89
5930	73	164	19.8	153	133	112	92	71	-
	70	156	19.3	156	148	128	107	86	66
	67	148	18.9	148	148	143	122	102	81
	63	145	18.8	145	145	145	127	107	86
	59	142	18.8	142	142	142	132	111	91
4450	73	153	19.7	125	109	93	77	62	-
	70	145	19.2	137	122	106	90	74	59
	67	138	18.7	138	134	119	103	87	71
	63	135	18.6	135	135	123	107	92	76
	59	132	18.6	132	132	127	111	95	80
<b>@ 125°F Temperature on Condenser Coil</b>									
7200	73	153	22.0	151	129	108	87	65	-
	70	146	21.5	146	144	123	102	80	59
	67	138	21.0	138	138	138	116	95	74
	63	136	21.0	136	136	136	121	100	79
	59	133	20.9	133	133	133	123	101	80
5930	73	147	21.9	138	119	101	82	64	-
	70	140	21.3	140	133	115	96	78	59
	67	133	20.9	133	133	128	110	92	73
	63	130	20.8	130	130	130	114	96	78
	59	128	20.8	128	128	128	119	100	82
4450	73	137	21.7	112	98	84	70	55	-
	70	130	21.1	124	109	95	81	67	53
	67	124	20.7	124	121	107	92	78	64
	63	122	20.6	122	122	111	97	82	68
	59	119	20.6	119	119	114	100	86	72

1. These capacities are gross ratings. For net capacity, deduct the heat of the supply air blower motor. Refer to the appropriate Blower Performance Table for the kW of the supply air blower motor.
2. These ratings include the condenser fan motors (Total 2.1 kW) and the compressor motors but not the supply air blower motor.



TABLE 6: DC240 COOLING CAPACITIES (m<sup>3</sup>/s AIR FLOW) - 20 TON (METRIC)

AIR ON COOLING COIL		TOTAL CAP. <sup>1</sup> Kw	POWER INPUT <sup>2</sup> Kw	SENSIBLE CAPACITY <sup>1</sup> , kW ENTERING DRY BULB, °C					
M <sup>3</sup> /S	WB °C			32	30	28	26	24	22
				@ 35°C Temperature on Condenser Coil					
4.40	23	73.9	21.4	70	60	51	42	33	-
	21	71.3	21.1	71	66	57	49	39	30
	19	68.7	20.8	69	69	64	55	45	36
	17	66.4	20.5	66	66	66	57	49	39
	15	64.1	20.3	64	64	64	59	51	41
3.80	23	70.2	21.1	64	56	48	40	32	-
	21	67.8	20.9	68	61	54	46	38	30
	19	65.5	20.6	66	66	59	51	44	36
	17	63.2	20.3	63	63	62	54	46	38
	15	60.9	20.1	61	61	61	57	49	41
2.80	23	64.4	20.8	52	46	40	33	27	-
	21	62.1	20.5	56	50	44	38	32	26
	19	60.1	20.2	60	55	49	43	37	31
	17	58.0	19.9	58	57	51	45	39	33
	15	55.7	19.6	56	56	54	48	42	36
@ 41°C Temperature on Condenser Coil									
4.40	23	68.7	23.8	65	56	48	39	31	-
	21	66.3	23.5	66	62	53	45	36	28
	19	63.9	23.2	64	64	59	51	42	34
	17	61.7	22.8	62	62	62	53	45	36
	15	59.6	22.6	60	60	60	55	47	38
3.80	23	65.2	23.5	59	52	45	37	30	-
	21	63.1	23.3	63	57	50	42	35	28
	19	60.9	22.9	61	61	55	48	41	33
	17	58.8	22.6	59	59	58	50	43	36
	15	56.6	22.4	57	57	57	53	46	38
2.80	23	59.8	23.2	48	42	37	31	25	-
	21	57.7	22.8	52	47	41	36	30	24
	19	55.8	22.5	56	51	46	40	34	29
	17	53.9	22.2	54	53	48	42	36	31
	15	51.8	21.9	52	52	50	44	39	33
@ 46°C Temperature on Condenser Coil									
4.40	23	64.6	26.7	64	55	46	37	28	-
	21	61.7	26.1	62	61	52	43	34	25
	19	58.6	25.4	59	59	58	49	40	31
	17	57.4	25.4	57	57	57	51	42	33
	15	56.3	25.3	56	56	56	52	43	34
3.80	23	62.3	26.6	58	51	43	35	27	-
	21	59.2	25.9	59	56	49	41	33	25
	19	56.3	25.3	56	56	54	47	39	31
	17	55.2	25.2	55	55	55	48	41	33
	15	54.0	25.2	54	54	54	50	42	35
2.80	23	58.0	26.3	47	41	35	29	23	-
	21	55.2	25.6	52	46	40	34	28	22
	19	52.6	25.1	53	51	45	39	33	27
	17	51.4	25.0	51	51	47	41	35	29
	15	50.3	25.0	50	50	48	42	36	30
@ 52°C Temperature on Condenser Coil									
4.40	23	58.1	29.9	57	49	41	33	25	-
	21	55.5	29.3	56	55	47	39	31	23
	19	52.7	28.5	53	53	52	44	36	28
	17	51.6	28.5	52	52	52	46	38	30
	15	50.6	28.4	51	51	51	47	39	31
3.80	23	56.0	29.8	52	45	38	31	24	-
	21	53.2	29.0	53	51	44	36	30	23
	19	50.6	28.4	51	51	49	42	35	28
	17	49.6	28.2	50	50	50	43	36	30
	15	48.6	28.2	49	49	49	45	38	31
2.80	23	52.2	29.5	43	37	32	26	21	-
	21	49.6	28.7	47	42	36	31	25	20
	19	47.3	28.1	47	46	41	35	30	24
	17	46.3	28.0	46	46	42	37	31	26
	15	45.2	28.0	45	45	43	38	33	27

1. These capacities are gross ratings. For net capacity, deduct the heat of the supply air blower motor. Refer to the appropriate Blower Performance Table for the kW of the supply air blower motor.
2. These ratings include the condenser fan motors (Total 2.1 kW) and the compressor motors but not the supply air blower motor.

TABLE 7: DC240 COOLING CAPACITIES (CFM AIR FLOW) - 20 TON

AIR ON COOLING COIL		TOTAL CAP.. <sup>1</sup> MBH	POWER INPUT <sup>2</sup> Kw	SENSIBLE CAPACITY <sup>1</sup> , MBH					
CFM	WB °F			ENTERING DRY BULB, °F					
				90	86	82	80	75	72
<b>@ 95°F Temperature on Condenser Coil</b>									
9320	73	252	21.4	237	206	175	145	113	-
	70	243	21.1	243	227	196	165	134	103
	67	234	20.8	234	234	217	186	155	124
	63	227	20.5	227	227	227	196	165	134
	59	219	20.3	219	219	219	203	172	141
8050	73	239	21.1	218	190	164	137	109	-
	70	231	20.9	231	210	183	156	129	102
	67	224	20.6	224	224	203	175	149	122
	63	216	20.3	216	216	212	185	159	131
	59	208	20.1	208	208	208	194	167	141
5930	73	220	20.8	176	156	135	114	94	-
	70	212	20.5	192	171	151	131	110	90
	67	205	20.2	205	188	167	147	126	105
	63	198	19.9	198	196	175	155	134	113
	59	190	19.6	190	190	183	163	142	121
<b>@105°F Temperature on Condenser Coil</b>									
9320	73	234	23.8	221	191	163	135	105	-
	70	226	23.5	226	211	182	154	125	96
	67	218	23.2	218	218	201	173	144	115
	63	211	22.8	211	211	211	182	154	125
	59	203	22.6	203	203	203	189	160	131
8050	73	223	23.5	202	177	152	127	102	-
	70	215	23.3	215	195	170	145	120	95
	67	208	22.9	208	208	189	163	138	114
	63	201	22.6	201	201	197	172	147	122
	59	193	22.4	193	193	193	180	156	131
5930	73	204	23.2	164	145	125	106	87	-
	70	197	22.8	179	159	140	122	103	83
	67	190	22.5	190	175	156	136	117	98
	63	184	22.2	184	182	163	144	125	105
	59	177	21.9	177	177	170	151	132	113
<b>@ 115°F Temperature on Condenser Coil</b>									
9320	73	220	26.7	217	186	156	126	95	-
	70	211	26.1	211	208	177	147	116	86
	67	200	25.4	200	200	199	168	137	107
	63	196	25.4	196	196	196	175	144	114
	59	192	25.3	192	192	192	177	146	116
8050	73	213	26.6	199	173	145	119	93	-
	70	202	25.9	202	192	166	138	112	86
	67	192	25.3	192	192	185	159	133	105
	63	188	25.2	188	188	188	165	138	112
	59	184	25.2	184	184	184	172	144	118
5930	73	198	26.3	162	141	121	100	80	-
	70	188	25.6	178	158	137	117	97	76
	67	179	25.1	179	175	154	134	113	93
	63	176	25.0	176	176	160	139	119	98
	59	172	25.0	172	172	165	144	124	103
<b>@ 125°F Temperature on Condenser Coil</b>									
9320	73	198	29.9	195	167	140	113	85	-
	70	189	29.3	189	187	160	132	104	77
	67	180	28.5	180	180	179	151	124	96
	63	176	28.5	176	176	176	157	130	103
	59	173	28.4	173	173	173	160	131	104
8050	73	191	29.8	179	155	131	107	83	-
	70	181	29.0	181	173	149	124	101	77
	67	173	28.4	173	173	167	143	119	95
	63	169	28.2	169	169	169	148	124	101
	59	166	28.2	166	166	166	154	130	106
5930	73	178	29.5	146	127	109	90	72	-
	70	169	28.7	160	142	124	105	87	68
	67	161	28.1	161	157	139	120	102	83
	63	158	28.0	158	158	144	125	107	89
	59	154	28.0	154	154	148	130	111	93

1. These capacities are gross ratings. For net capacity, deduct the heat of the supply air blower motor. Refer to the appropriate Blower Performance Table for the kW of the supply air blower motor.
2. These ratings include the condenser fan motors (Total 2.1 kW) and the compressor motors but not the supply air blower motor.

## CFM, STATIC PRESSURE, AND POWER - ALTI-TUDE 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 9 and Figure 1.

**TABLE 8: ALTITUDE CORRECTION FACTORS (°C/METER)**

AIR TEMP °C	ALTITUDE (METER)										
	0	305	610	914	1219	1524	1829	2134	2438	2743	3048
4.4	1.060	1.022	0.986	0.950	0.916	0.882	0.849	0.818	0.788	0.758	0.729
10	1.039	1.002	0.966	0.931	0.898	0.864	0.832	0.802	0.772	0.743	0.715
15.5	1.019	0.982	0.948	0.913	0.880	0.848	0.816	0.787	0.757	0.729	0.701
21	1.000	0.964	0.930	0.896	0.864	0.832	0.801	0.772	0.743	0.715	0.688
26.6	0.982	0.947	0.913	0.880	0.848	0.817	0.787	0.758	0.730	0.702	0.676
32	0.964	0.929	0.897	0.864	0.833	0.802	0.772	0.744	0.716	0.689	0.663
38	0.946	0.912	0.880	0.848	0.817	0.787	0.758	0.730	0.703	0.676	0.651

**TABLE 9: ALTITUDE CORRECTION FACTORS (°F/FEET)**

AIR TEMP °F	ALTITUDE (FEET)										
	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

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, Table 9 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. Table 9 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.

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

## Altitude/Temperature Conversion Factor

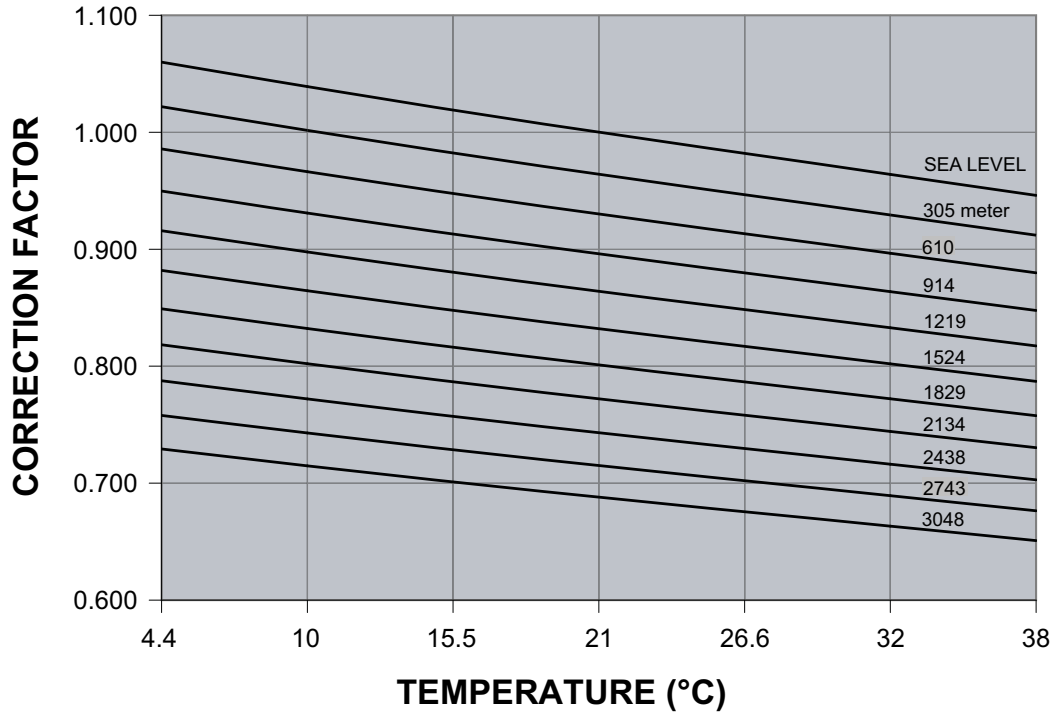


FIGURE 1 - ALTITUDE/TEMPERATURE CONVERSION FACTOR (°C/METER)

## Altitude/Temperature Conversion Factor

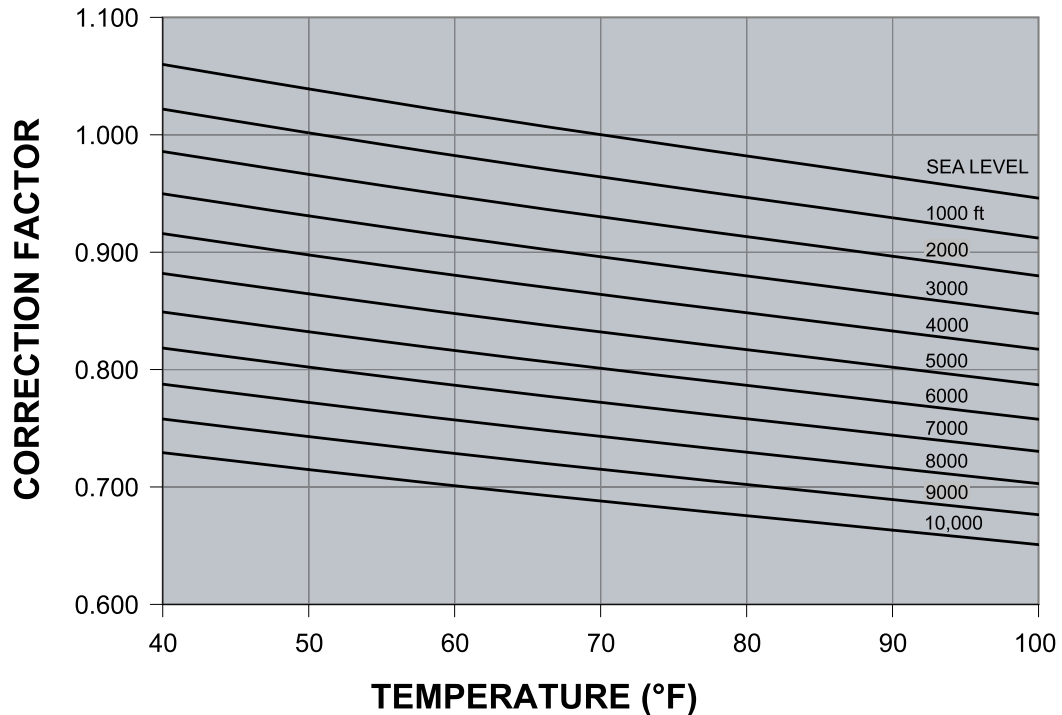


FIGURE 2 - ALTITUDE/TEMPERATURE CONVERSION FACTOR (°F/FEET)

**TABLE 10: DC180 SUPPLY AIR WITH DOWNFLOW DUCT APPLICATIONS**

BLOWER SPEED, (RPM)	MOTOR PULLEY (TURNS OPEN)*	AIRFLOW														
		2.10 m <sup>3</sup> /s			2.45 m <sup>3</sup> /s			2.80 m <sup>3</sup> /s			3.10 m <sup>3</sup> /s			3.40 m <sup>3</sup> /s		
		ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)
<b>HIGH STATIC DRIVE (m<sup>3</sup>/s)</b>																
1030	6.0	357	2.4	2.8	316	2.8	3.4	253	3.3	3.9	183	3.7	4.5	97	4.2	5.0
1070	5.0	405	2.5	3.0	362	3.0	3.6	298	3.5	4.2	226	3.9	4.7	-	-	-
1115	4.0	461	2.7	3.2	416	3.2	3.8	351	3.7	4.4	278	4.2	5.0	-	-	-
1155	3.0	514	2.9	3.4	468	3.4	4.0	401	3.9	4.7	-	-	-	-	-	-
1200	2.0	577	3.1	3.7	529	3.6	4.3	461	4.1	5.0	-	-	-	-	-	-
1240	1.0	636	3.3	3.9	587	3.8	4.5	-	-	-	-	-	-	-	-	-
BLOWER SPEED, (RPM)	MOTOR PULLEY (TURNS OPEN)*	AIRFLOW														
		4450 CFM			5190 CFM			5930 CFM			6565 CFM			7200 CFM		
		ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)
<b>HIGH STATIC DRIVE (CFM)</b>																
1030	6.0	1.4	3.2	2.8	1.3	3.8	3.4	1.0	4.4	3.9	0.7	5.0	4.5	0.4	5.6	5.0
1070	5.0	1.6	3.4	3.0	1.5	4.0	3.6	1.2	4.7	4.2	0.9	5.3	4.7	-	-	-
1115	4.0	1.9	3.6	3.2	1.7	4.3	3.8	1.4	5.0	4.4	1.1	5.6	5.0	-	-	-
1155	3.0	2.1	3.9	3.4	1.9	4.5	4.0	1.6	5.2	4.7	-	-	-	-	-	-
1200	2.0	2.3	4.1	3.7	2.1	4.8	4.3	1.8	5.5	5.0	-	-	-	-	-	-
1240	1.0	2.6	4.4	3.9	2.4	5.1	4.5	-	-	-	-	-	-	-	-	-

NOTES: 1. Blower performance includes fixed outdoor air, 2" T/A filters, a dry evaporator coil and no electric heat.

2. Refer to Table 14 for additional static resistances.

ESP = External Static Pressure available for the supply and return air duct system. All internal unit resistances have been deducted from the total static pressure of the blower.

\* Do **NOT** close the pulley below 1 turn open.

\*\* Factory setting.

**TABLE 11: DC240 SUPPLY AIR WITH DOWNFLOW DUCT APPLICATIONS**

BLOWER SPEED, (RPM)	MOTOR PULLEY (TURNS OPEN)*	AIRFLOW														
		2.80 m <sup>3</sup> /s			3.30 m <sup>3</sup> /s			3.80 m <sup>3</sup> /s			4.10 m <sup>3</sup> /s			4.40 m <sup>3</sup> /s		
		ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)
<b>HIGH STATIC DRIVE (m<sup>3</sup>/s)</b>																
895	6.0	312	3.5	4.0	268	3.7	4.3	198	4.2	4.8	143	4.6	5.2	79	5.1	5.8
930	5.0	362	3.7	4.3	318	4.0	4.5	248	4.5	5.1	193	4.9	5.6	129	5.4	6.2
970	4.0	421	4.0	4.5	377	4.2	4.9	306	4.8	5.5	252	5.2	6.0	187	5.8	6.6
1005	3.0	473	4.2	4.8	429	4.5	5.1	359	5.1	5.8	304	5.6	6.4	240	6.1	7.0
1045	2.0	535	4.4	5.0	491	4.8	5.5	420	5.4	6.2	365	5.9	6.8	-	-	-
1080	1.0	590	4.6	5.3	546	5.0	5.8	475	5.7	6.5	420	6.2	7.1	-	-	-

BLOWER SPEED, (RPM)	MOTOR PULLEY (TURNS OPEN)*	AIRFLOW														
		5930 CFM			6990 CFM			8050 CFM			8685 CFM			9320 CFM		
		ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)
<b>HIGH STATIC DRIVE (CFM)</b>																
895	6.0	1.3	4.7	4.0	1.1	5.0	4.3	0.8	5.6	4.8	0.6	6.1	5.2	0.3	6.8	5.8
930	5.0	1.5	5.0	4.3	1.3	5.3	4.5	1.0	6.0	5.1	0.8	6.6	5.6	0.5	7.2	6.2
970	4.0	1.7	5.3	4.5	1.5	5.7	4.9	1.2	6.4	5.5	1.0	7.0	6.0	0.8	7.8	6.6
1005	3.0	1.9	5.6	4.8	1.7	6.0	5.1	1.4	6.8	5.8	1.2	7.4	6.4	1.0	8.2	7.0
1045	2.0	2.1	5.9	5.0	2.0	6.4	5.5	1.7	7.3	6.2	1.5	7.9	6.8	-	-	-
1080	1.0	2.4	6.2	5.3	2.2	6.8	5.8	1.9	7.7	6.5	1.7	8.4	7.1	-	-	-

NOTES: 1. Blower performance includes fixed outdoor air, 2" T/A filters, a dry evaporator coil and no electric heat.

2. Refer to Table 14 for additional static resistances.

ESP = External Static Pressure available for the supply and return air duct system. All internal unit resistances have been deducted from the total static pressure of the blower.

\* Do **NOT** close the pulley below 1 turn open.

\*\* Factory setting.

**TABLE 12: DC180N240 SUPPLY AIR WITH DOWNFLOW DUCT APPLICATIONS**

BLOWER SPEED, (RPM)	MOTOR PULLEY (TURNS OPEN)*	AIRFLOW														
		2.10 m <sup>3</sup> /s			2.45 m <sup>3</sup> /s			2.80 m <sup>3</sup> /s			3.10 m <sup>3</sup> /s			3.40 m <sup>3</sup> /s		
		ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)
<b>HIGH STATIC DRIVE (m<sup>3</sup>/s)</b>																
1030	6.0	378	2.3	2.7	321	2.7	3.2	258	3.2	3.8	199	3.6	4.4	134	4.2	5.0
1070	5.0	417	2.4	2.9	361	2.9	3.4	299	3.4	4.1	240	3.9	4.7	-	-	-
1115	4.0	461	2.6	3.1	407	3.1	3.7	345	3.7	4.4	286	4.2	5.0	-	-	-
1155	3.0	502	2.8	3.3	448	3.3	4.0	387	3.9	4.7	-	-	-	-	-	-
1200	2.0	548	3.0	3.6	495	3.6	4.3	435	4.2	5.0	-	-	-	-	-	-
1240	1.0	590	3.2	3.8	538	3.8	4.6	-	-	-	-	-	-	-	-	-
BLOWER SPEED, (RPM)	MOTOR PULLEY (TURNS OPEN)*	AIRFLOW														
		4450 CFM			5190 CFM			5930 CFM			6565 CFM			7200 CFM		
		ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)
<b>HIGH STATIC DRIVE (CFM)</b>																
1030	6.0	1.5	3.1	2.7	1.3	3.6	3.2	1.0	4.3	3.8	0.8	4.9	4.4	0.5	5.6	5.0
1070	5.0	1.7	3.3	2.9	1.4	3.8	3.4	1.2	4.5	4.1	1.0	5.2	4.7	-	-	-
1115	4.0	1.9	3.5	3.1	1.6	4.1	3.7	1.4	4.9	4.4	1.2	5.6	5.0	-	-	-
1155	3.0	2.0	3.7	3.3	1.8	4.4	4.0	1.6	5.2	4.7	-	-	-	-	-	-
1200	2.0	2.2	4.0	3.6	2.0	4.8	4.3	1.7	5.6	5.0	-	-	-	-	-	-
1240	1.0	2.4	4.3	3.8	2.2	5.1	4.6	-	-	-	-	-	-	-	-	-

NOTES: 1. Blower performance includes fixed outdoor air, 2" T/A filters, a dry evaporator coil and no electric heat.

2. Refer to Table 14 for additional static resistances.

ESP = External Static Pressure available for the supply and return air duct system. All internal unit resistances have been deducted from the total static pressure of the blower.

\* Do **NOT** close the pulley below 1 turn open.

\*\* Factory setting.

**TABLE 13: DC240N240 SUPPLY AIR WITH DOWNFLOW DUCT APPLICATIONS**

BLOWER SPEED, (RPM)	MOTOR PULLEY (TURNS OPEN)*	AIRFLOW														
		2.80 m <sup>3</sup> /s			3.30 m <sup>3</sup> /s			3.80 m <sup>3</sup> /s			4.10 m <sup>3</sup> /s			4.40 m <sup>3</sup> /s		
		ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)	ESP (Pa)	Output (kW)	Input (kW)
<b>HIGH STATIC DRIVE (m<sup>3</sup>/s)</b>																
895	6.0	361	2.8	3.2	249	3.5	4.0	114	4.3	4.9	22	4.7	5.4	-	-	-
925	5.0	400	2.9	3.4	290	3.7	4.2	157	4.5	5.1	66	5.0	5.7	-	-	-
955	4.0	439	3.1	3.6	332	3.9	4.4	201	4.7	5.4	112	5.2	6.0	15	5.8	6.6
990	3.0	486	3.3	3.8	381	4.1	4.7	254	5.0	5.7	166	5.5	6.3	70	6.1	7.0
1020	2.0	527	3.5	4.0	425	4.3	5.0	299	5.2	6.0	213	5.8	6.7	119	6.4	7.3
1050	1.0	569	3.7	4.2	469	4.6	5.2	346	5.5	6.3	261	6.1	7.0	-	-	-
1080	0.0	612	3.9	4.4	514	4.8	5.5	393	5.8	6.6	310	6.4	7.3	-	-	-
BLOWER SPEED, (RPM)	MOTOR PULLEY (TURNS OPEN)*	AIRFLOW														
		5930 CFM			6990 CFM			8050 CFM			8685 CFM			9320 CFM		
		ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)	ESP (iwg)	Output (bhp)	Input (kW)
<b>HIGH STATIC DRIVE (CFM)</b>																
895	6.0	1.5	3.7	3.2	1.0	4.7	4.0	0.5	5.7	4.9	0.1	6.3	5.4	-	-	-
925	5.0	1.6	3.9	3.4	1.2	4.9	4.2	0.6	6.0	5.1	0.3	6.7	5.7	-	-	-
955	4.0	1.8	4.2	3.6	1.3	5.2	4.4	0.8	6.3	5.4	0.4	7.0	6.0	0.1	7.8	6.6
990	3.0	2.0	4.4	3.8	1.5	5.5	4.7	1.0	6.7	5.7	0.7	7.4	6.3	0.3	8.2	7.0
1020	2.0	2.1	4.7	4.0	1.7	5.8	5.0	1.2	7.0	6.0	0.9	7.8	6.7	0.5	8.6	7.3
1050	1.0	2.3	4.9	4.2	1.9	6.1	5.2	1.4	7.4	6.3	1.0	8.2	7.0	-	-	-
1080	0.0	2.5	5.2	4.4	2.1	6.4	5.5	1.6	7.7	6.6	1.2	8.5	7.3			

NOTES: 1. Blower performance includes fixed outdoor air, 2" T/A filters, a dry evaporator coil and no electric heat.

2. Refer to Table 14 for additional static resistances.

ESP = External Static Pressure available for the supply and return air duct system. All internal unit resistances have been deducted from the total static pressure of the blower.

\* Do **NOT** close the pulley below 1 turn open.

\*\* Factory setting.



**TABLE 14: STATIC RESISTANCES<sup>1</sup> - EXTERNAL STATIC PRESSURE DROP**

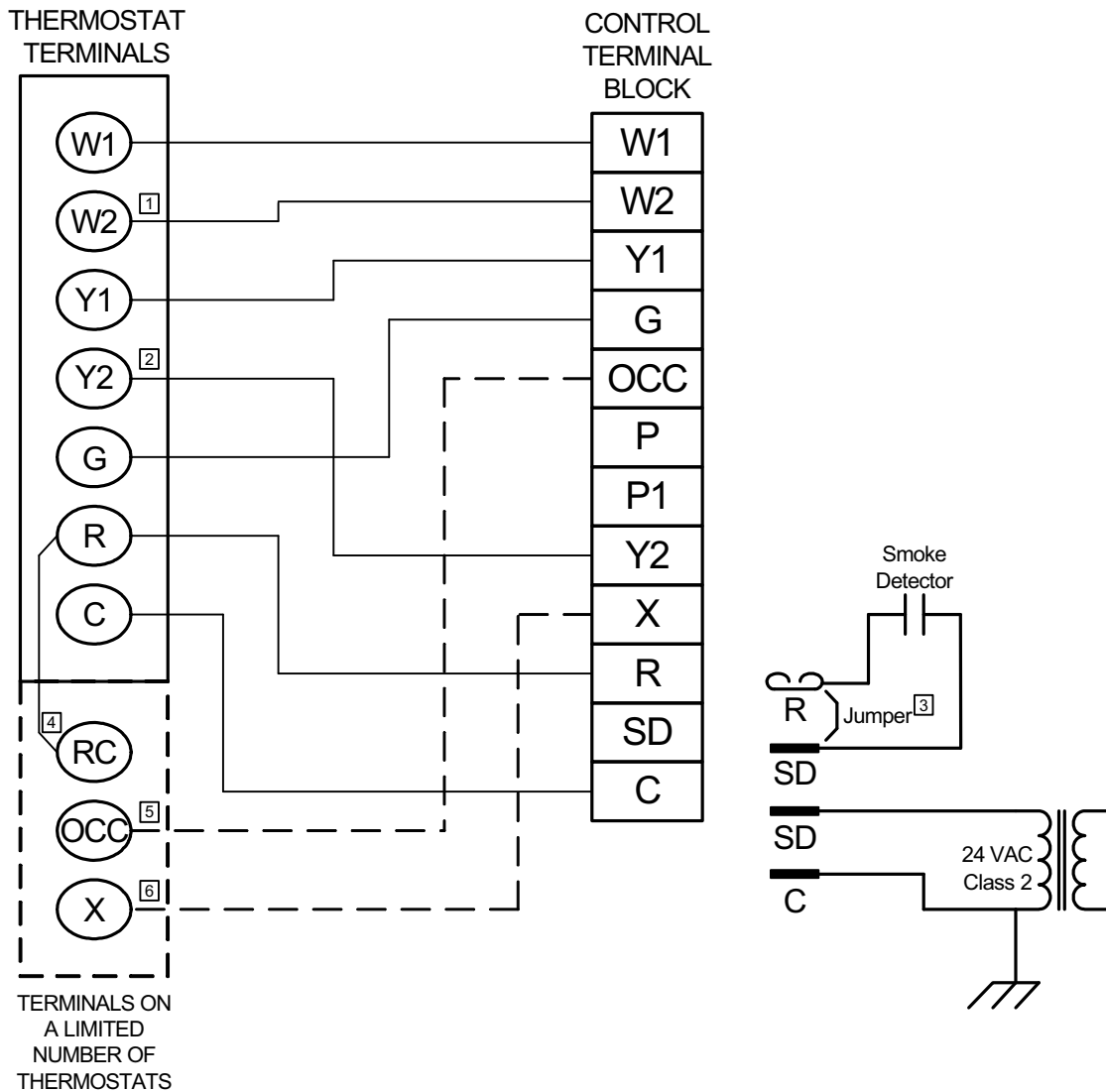
DESCRIPTION		EXTERNAL STATIC PRESSURE RESISTANCE, Pa / IWG					
		m <sup>3</sup> /s / CFM					
		DC180			DC240		
		2.1 / 4500	2.8 / 6000	3.4 / 7200	2.8 / 6000	3.8 / 8000	4.4 / 9400
WET COIL		24.8 / 0.1	24.8 / 0.1	24.8 / 0.1	24.8 / 0.1	24.8 / 0.1	24.8 / 0.1
ELECTRIC HEAT OPTIONS	18 kW	24.8 / 0.1	24.8 / 0.1	24.8 / 0.1	24.8 / 0.1	24.8 / 0.1	24.8 / 0.1
	36 kW	24.8 / 0.1	50.0 / 0.2	74.4 / 0.3	24.8 / 0.1	50.0 / 0.2	74.4 / 0.3
	54 kW	50.0 / 0.2	74.4 / 0.3	99.2 / 0.4	50.0 / 0.2	74.4 / 0.3	99.2 / 0.4
	72 kW	50.0 / 0.2	99.2 / 0.4	149.0 / 0.6	50.0 / 0.2	99.2 / 0.4	149.0 / 0.6
ECONOMIZER OPTION		24.8 / 0.1	24.8 / 0.1	24.8 / 0.1	24.8 / 0.1	24.8 / 0.1	24.8 / 0.1
HORIZONTAL DUCT CONNECTIONS		50.0 / 0.2	74.4 / 0.3	124.0 / 0.5	50.0 / 0.2	74.4 / 0.3	124.0 / 0.5

1. Deduct these resistance values from the available unit ESP values listed in the respective blower performance table except for Horizontal Duct Connections.  
Add the Horizontal Duct Connection values due to less airflow resistance.

**TABLE 15: BLOWER MOTOR AND DRIVE DATA**

UNIT SIZE	BLOWER RANGE (RPM)	MOTOR <sup>1</sup>			ADJUSTABLE MOTOR PULLEY <sup>2</sup>			FIXED BLOWER PULLEY			BELT (NOTCHED)			
		kW / HP	FRAME SIZE	EFF. (%)	PITCH DIA. (mm/in.)	BORE (mm/in.)	DESIG- NATION	PITCH DIA. (mm/in.)	BORE (mm/in.)	DESIG- NATION	PITCH LENGTH (mm/in.)	DESIG- NATION	QTY	
HIGH STATIC DRIVE <sup>3</sup>	180	1030-1240	3.7 / 5.0	184T	84	124-150 4.9-5.9	29 / 1-1/8	1VP62	175 / 6.9	25 / 1	BK75	1773 / 69.8	BX68	1
	240	895-1080	5.6 / 7.5	213T	87	147-178 5.8-7.0	35 / 1-3/8	1VP75	239 / 9.4	30 / 1-3/16	BK100	2103 / 82.8	BX81	1

1. All motors are totally enclosed, fan cooled (TEFC), 1450 RPM with solid bases and a 1.15 service factor.
2. Do NOT close this pulley below the minimum number of turns open.
3. High Static Drive is standard on 50 Hz models.



- 1 Second stage heating not required on single stage heating units.
- 2 Second stage cooling not required on single stage cooling units.
- 3 Jumper is required if there is no Smoke Detector circuit.
- 4 Jumper is required for any combination of R, RC, or RH.
- 5 OCC is an output from the thermostat to indicate the Occupied condition.
- 6 X is an input to the thermostat to display Error Status conditions.

**FIGURE 3 - Simplicity<sup>®</sup> CONTROL WIRING DIAGRAM**

**TABLE 16: DC ELECTRICAL DATA - COOLING ONLY UNITS AND UNITS WITH GAS HEAT**

UNIT SIZE	POWER SUPPLY	COMPRESSORS				OUTDOOR FAN MOTOR, (#1 & #2) FLA, EACH	SUPPLY AIR BLOWER MOTOR, (FLA)		TOTAL UNIT AMPACITY (AMPS)		MAX. FUSE SIZE <sup>1</sup>
		RLA		LRA			3.7 kW 5 HP	5.6 kW 5 HP	3.7 kW 5 HP	5.6 kW 5 HP	
		#1	#2	#1	#2						
180	380/415-3-50	19.2	9.6	124	62	2.1	8.6	-	46.0	-	50
240	380/414-3-50	20.7	20.7	130	130	2.1	-	11.7	-	62.5	80

1. Dual element, time delay fuse or HACR breaker.  
Based on 105°C insulated copper conductors in conduit.

**TABLE 17: ELECTRIC HEAT CORRECTION FACTORS**

NOMINAL VOLTAGE	VOLTAGE	kW CAP. MULTIPLIER
380	380	0.627
415	415	0.75

**TABLE 18: DC ELECTRICAL DATA - UNITS WITH SUPPLEMENTAL ELECTRIC HEATING**

UNIT SIZE	POWER SUPPLY (VOLTS)	HEATER OPTION				MINIMUM CIRCUIT AMPACITY (AMPS)	MAXIMUM FUSE SIZE <sup>1</sup>
		MODEL	OUTPUT KW	STAGES	AMPS		
180	380-3-50	E018	11.3	1	17.1	46.0	50
		E036	22.6	2	34.3	53.3	60
		E054	33.8	2	51.4	74.6	80
		E072	45.1	2	68.6	96.0	100
	415-3-50	E018	13.5	1	18.7	46.0	50
		E036	26.9	2	37.4	57.2	60
		E054	40.4	2	56.2	80.6	90
		E072	53.8	2	74.9	85.2	100
240	380-3-50	E018	11.3	1	17.1	62.5	80
		E036	22.6	2	34.3	62.5	80
		E054	33.8	2	51.4	80.6	90
		E072	45.1	2	68.6	100.3	110
	415-3-50	E018	13.5	1	18.7	57.5	60
		E036	26.9	2	37.4	61.2	70
		E054	40.4	2	56.2	84.6	90
		E072	53.8	2	74.9	89.2	100

1. Slow blow type fuse  
Based on 105°C copper conductors.

**TABLE 19: VOLTAGE LIMITATIONS**

POWER SUPPLY	VOLTAGE	
	MIN.	MAX.
380/415-3-50	342	456

TABLE 20: DC PHYSICAL DATA

MODELS		DC180	DC240		
EVAPORATOR BLOWER	CENTRIFUGAL BLOWER (Dia. x Wd.) in.	15x15	18x15		
	(Dia. x Wd.) mm.	381x381	457x381		
	FAN MOTOR HP/kW	5/3.7	7.5/5.6		
EVAPORATOR COIL	ROWS DEEP	3	3		
	FINS PER In./25mm	13.5			
	FACE AREA Ft. <sup>2</sup> /m <sup>2</sup>	15.5/1.45	20.5/1.92		
CONDENSER FAN (Two Per Unit)	PROPELLER DIA. In./mm (Each)	30/762			
	FAN MOTOR HP/kW (Each)	1/0.7			
	NOM. AIRFLOW TOTAL CFM (Each)	6,000	8,000		
	m <sup>3</sup> /s (Each)	2.83	3.78		
CONDENSER COIL	ROWS DEEP	2	2		
	FINS PER In./25mm	13	20		
	FACE AREA Ft. <sup>2</sup> /m <sup>2</sup>	36/3.35	43.3/4.02		
COMPRESSOR (Qty. Per Unit)	5 TON HERMETIC (RECIP.)	1	~		
	10 TON TANDEM (RECIP.)	1 <sup>1</sup>	~		
	10 TON SCROLL	~	2		
	12.5 TON	~	~		
FILTERS	QUANTITY PER UNIT (16" X 20" X 2" or 4") In. (406 X 508 X 51 or 102) mm.	~	4		
	QUANTITY PER UNIT (16" X 25" X 2" or 4") In. (406 X 508 X 51 or 102) mm.	~	4		
	QUANTITY PER UNIT (18" X 24" X 2" or 4") In. (457 X 610 X 51 or 102) mm.	5	~		
	TOTAL FACE AREA Ft. <sup>2</sup> /m <sup>2</sup>	15/1.40	20/1.87		
CHARGE	REFRIGENT 407C Lb./kg.	SYSTEM No.1	16/7.25	18/8.16	
		SYSTEM No. 2	7.5/8.4	18/8.16	
OPERATING WEIGHTS Lb. / kg	BASIC UNIT	COOLING ONLY		1900/862	2100/952
		GAS / ELECTRIC	N24	2100/952	2300/1043
			N32	2140/971	2340 /1061
	OPTIONS	ECONOMIZER		160/73	
		ECONOMIZER WITH POWER EXHAUST		245/111	
		MOTORIZED DAMPER		150/68	
		ELECTRIC HEATER	18 KW	25/11	
			36 KW	30/14	
	54 KW		35/16		
	72 KW		40/18		
	ACCESSORIES	ROOF CURB		175/79	185/84
		BAROMETRIC DAMPER		45/20	
		ECONOMIZER / MOTORIZED DAMPER RAIN HOOD		55/25	
		ECONOMIZER / POWER EXHAUST RAIN HOOD		90/41	
		WOOD SKID <sup>2</sup>		200/91	220/100

1. This compressor will be energized first.

2. Allows handling of unit using 90 In./2300 mm. long forks

R-407 units may require a super heat and sub-cooling check at the job site to ensure proper charge and operation.

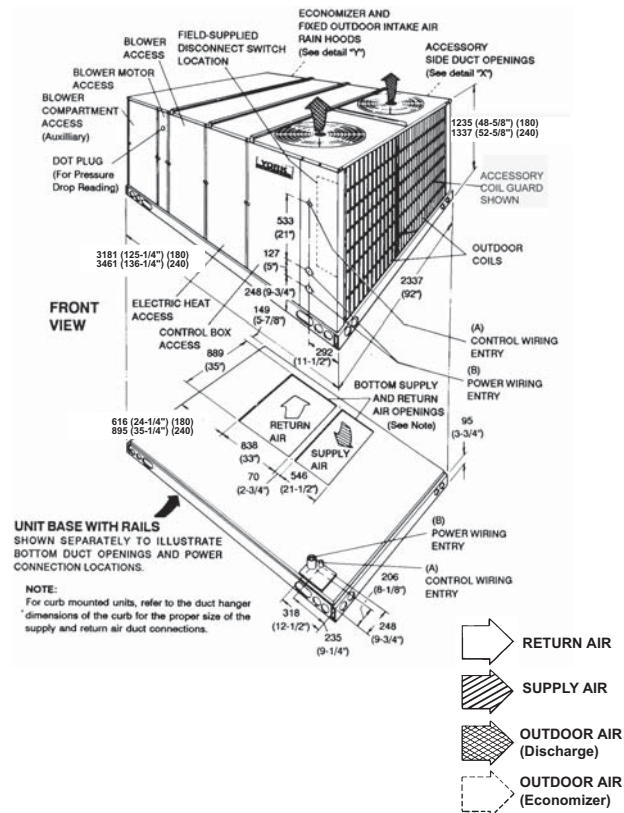


FIGURE 4 - UNIT DIMENSIONS - DC COOL & COOL/ELECTRIC HEAT

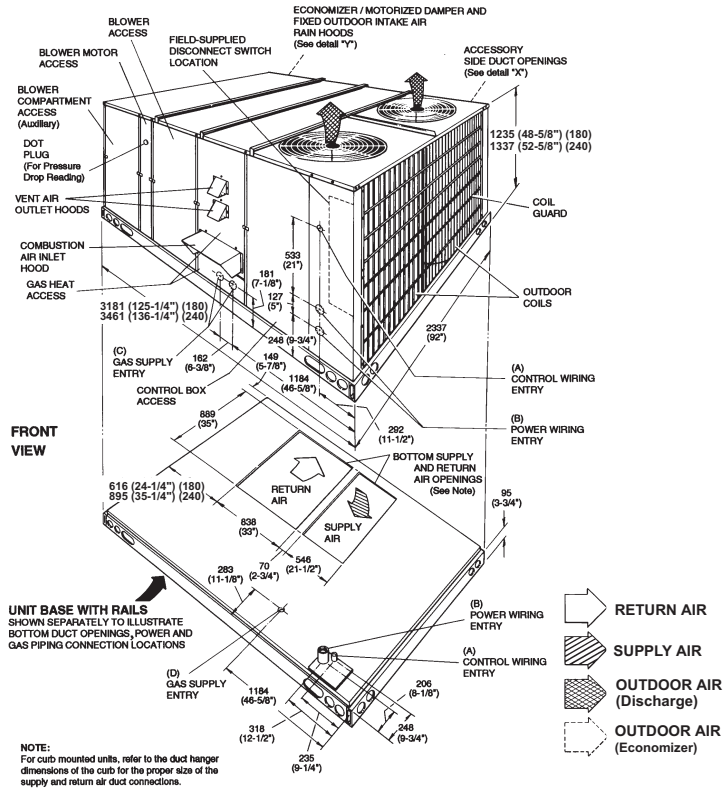


FIGURE 5 - UNIT DIMENSIONS - DC GAS HEAT

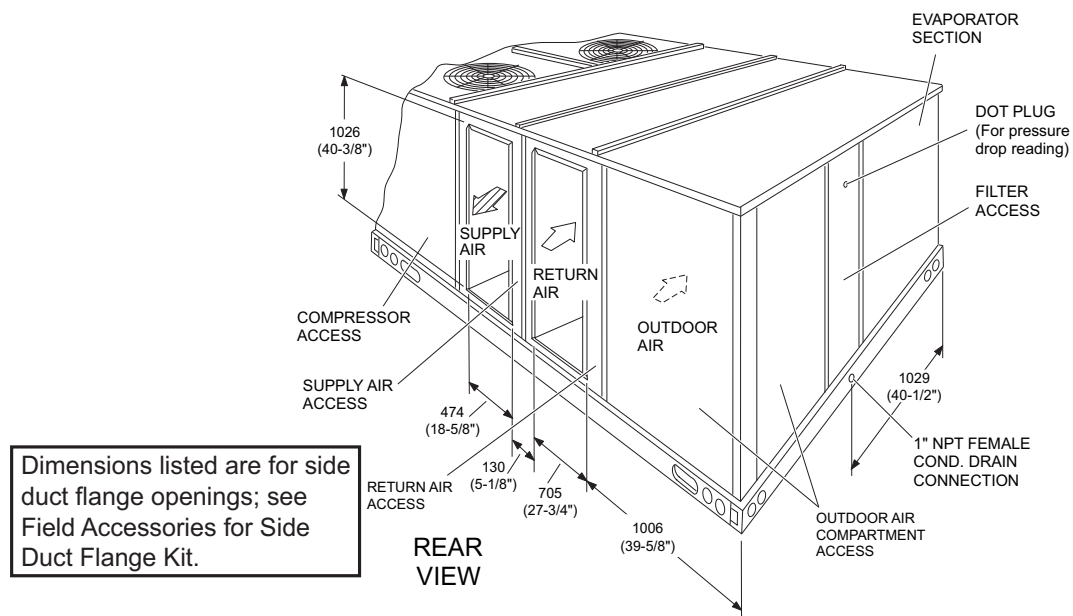
**TABLE 21: UTILITIES ENTRY DATA**

HOLE	OPENING SIZE (DIA.) (MM/IN.)	USED FOR	
A	29/1-1/8" KO	Control Wiring	Side
	19/3/4" NPS (Fem.)		Bottom
B	92/3-5/8" KO	Power Wiring	Side
	76/3" NPS (Fem.)		Bottom
C	60/2-3/8" KO	Gas Piping (Front) <sup>1</sup>	
D	43/1-11/16" Hole	Gas Piping (Bottom) <sup>1, 2</sup>	

1. One-inch gas piping NPT required.

2. Opening in the bottom of the unit can be located by the slice in the insulation.

NOTE: All entry holes should be field sealed to prevent rain water entry into the building.

**FIGURE 6 - REAR VIEW DIMENSIONS**

**NOTE:** Units are shipped with the bottom duct openings covered. An accessory flange kit is available for connecting side ducts.

**For bottom duct applications:**

1. Remove the side panels from the supply and return air compartments to gain access to the bottom supply and return air duct covers.
2. Remove and discard the bottom duct covers. Duct openings are closed with sheet metal covers except when the unit includes a power exhaust option. The covering consists of a heavy black paper composition.
3. Replace the side supply and return air compartment panels.

**For side duct applications:**

1. Replace the side panels on the supply and return air compartments with the side duct flange accessory kit panels.

2. Connect ductwork to the flanges on those panels.

**TABLE 22: MINIMUM CLEARANCES (MM/IN.)**

LOCATION	CLEARANCE
Front	914/36"
Rear	610/24" (Less Economizer) 1245/49" (With Economizer)
Left Side (Filter Access)	610/24" (Less Economizer) 914/36" (With Economizer) <sup>3</sup>
Right Side (Cond. Coil)	914/36"
Below Unit <sup>1</sup>	0/0"
Above Unit <sup>2</sup>	1829/72" With 914/36" Maximum Horizontal Overhang (For Condenser Air Discharge)

1. Units may be installed on combustible floors made from wood or class A, B, or C roof covering material.
2. Units must be installed outdoors. Overhanging structures or shrubs should not obstruct condenser air discharge outlet.
3. If economizer is factory installed, the unassembled rain hood must be removed from its side along position in front of evaporator coil, or in the outdoor air compartment, prior to final installation.

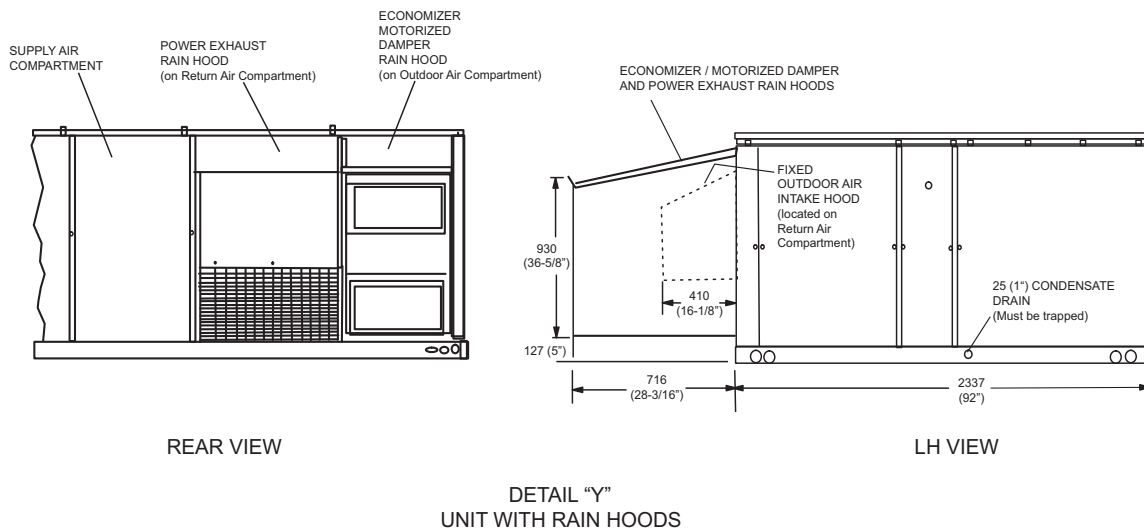
**NOTE: ELEC / ELEC Models:** Units and ductwork are approved for zero clearance to combustible material when equipped with electric heaters.

**GAS / ELEC Models:** A 25mm/1" clearance must be provided between any combustible material and the supply air ductwork for a distance of .9 meter/3 feet from the unit.

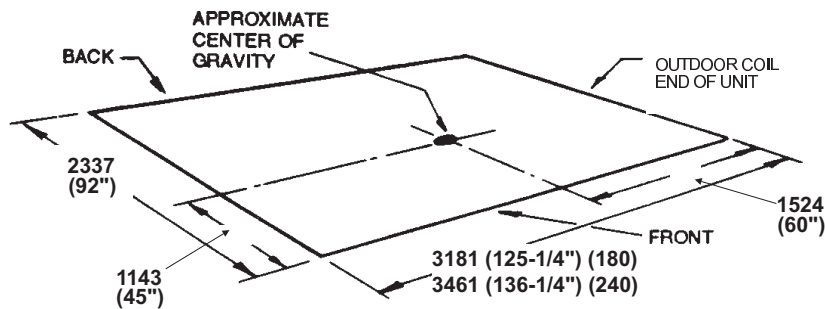
The products of combustion must not be allowed to accumulate within a confined space and recirculate.

Locate unit so that the vent air outlet hood is at least:

- .9 meters/3 feet above any force air inlet located within 3.0 meters/10 horizontal feet (excluding those integral to the unit).
- 1.2 meters/4 feet below, four horizontal feet from, or one foot above any door or gravity air inlet into the building.
- 1.2 meters/4 feet from electric and gas meters, regulators and relief equipment.

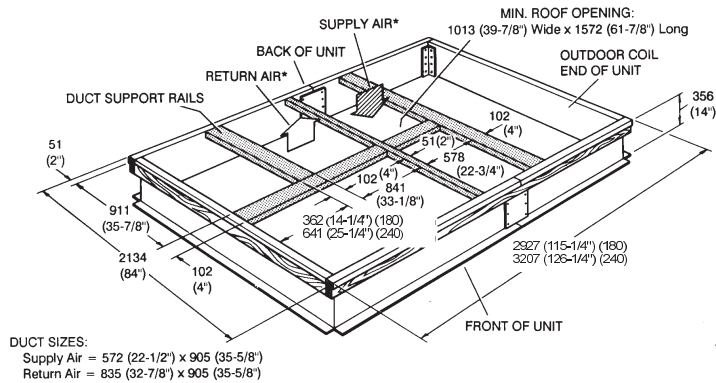


**FIGURE 7 - UNIT CLEARANCES AND RAINHOOD DIMENSIONS (15 & 20 TON)**



**FIGURE 8 - CENTER OF GRAVITY**

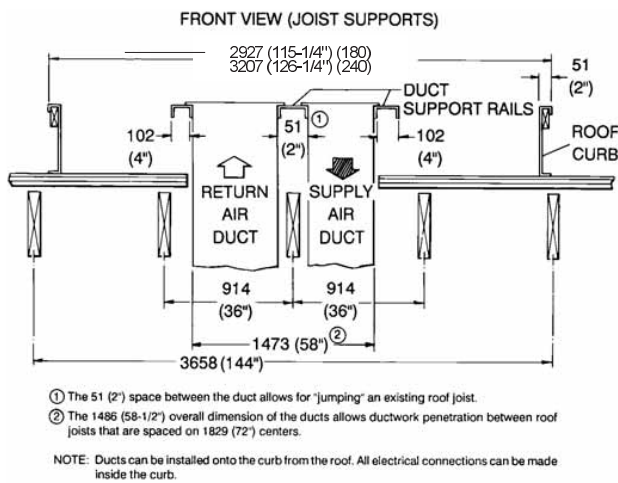




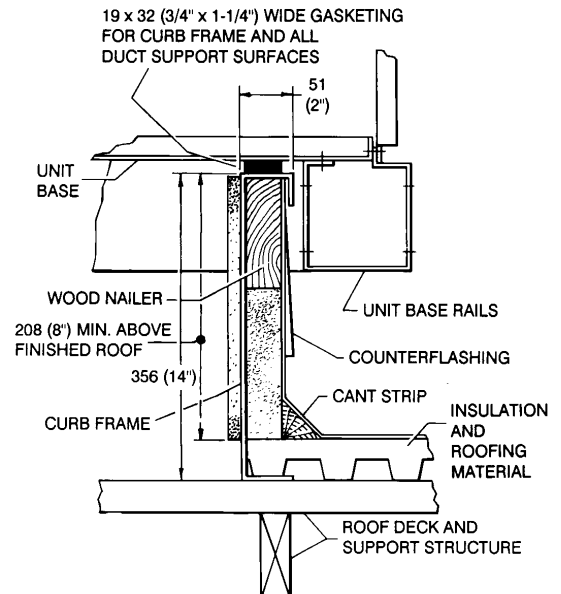
**FIGURE 9 - ROOF CURB DIMENSIONS (ALL MODELS)**

\* Supply and Return air (including duct support rails) as shown, are typical for Downflow duct applications

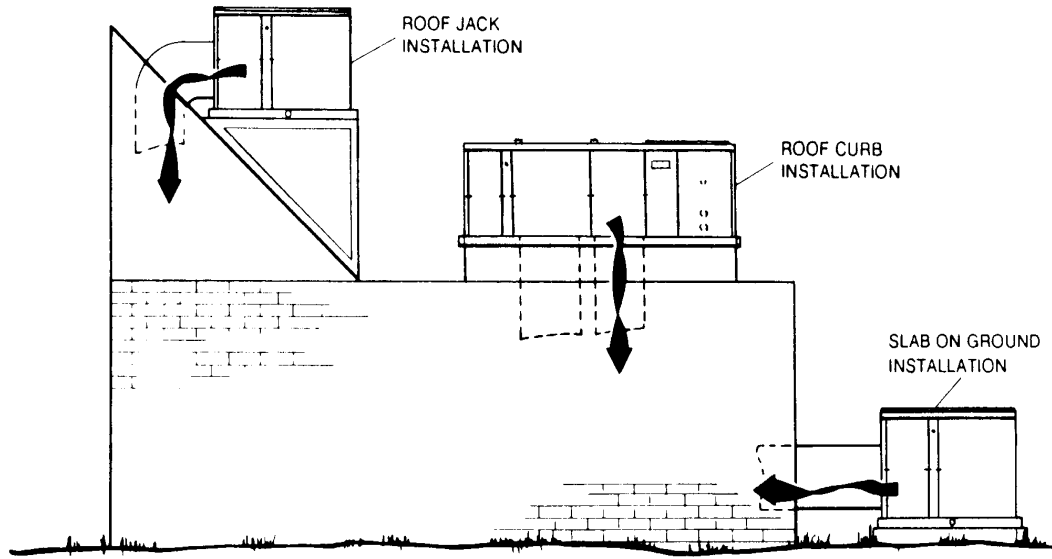
For location of Sideflow duct applications (on back of unit), refer to Unit Dimension details.



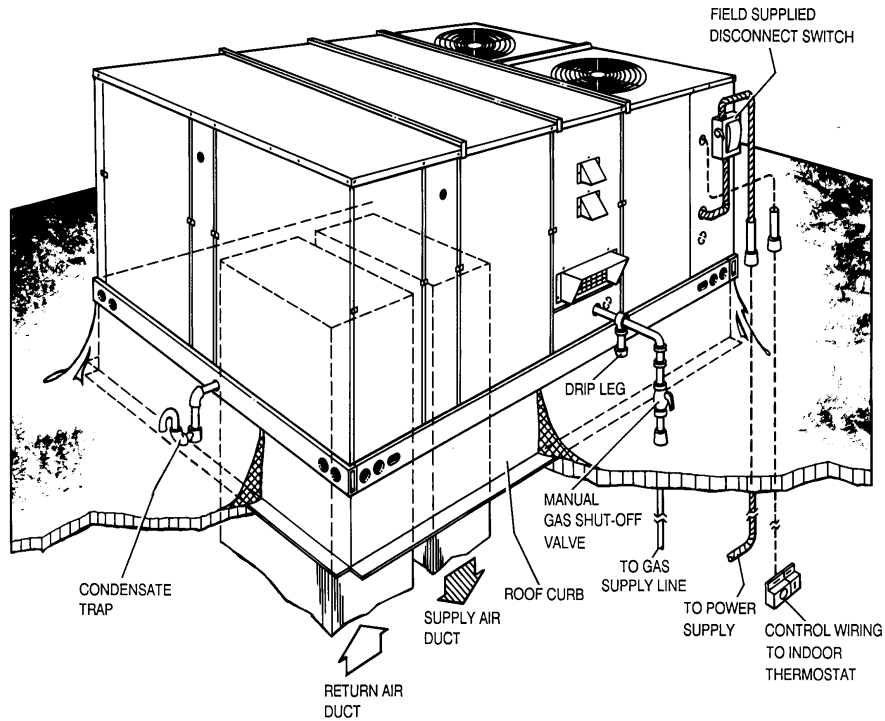
**FIGURE 10 - ROOF CURB BENEFITS**



**FIGURE 11 - UNIT CURB AND APPLICATIONS**



**FIGURE 12 - TYPICAL APPLICATION**



**FIGURE 13 - TYPICAL ROOF-TOP INSTALLATION (GAS/ELECTRIC UNIT SHOWN)**