



Heating and Air Conditioning

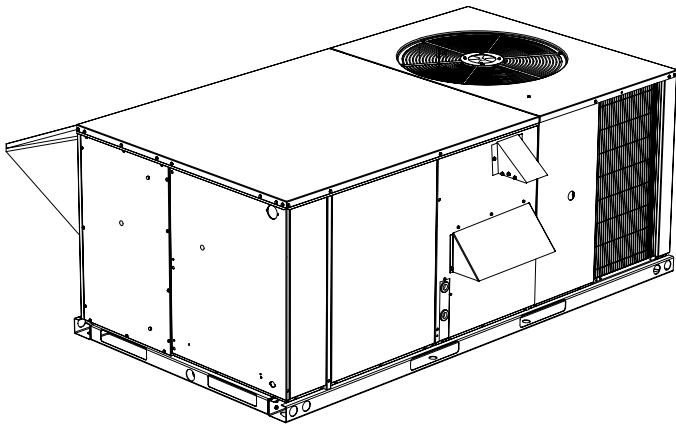
TECHNICAL GUIDE

SINGLE PACKAGE GAS/ELECTRIC UNITS AND SINGLE PACKAGE AIR CONDITIONERS

D(HE, HG) 036, 048 & 060

3, 4 & 5 NOMINAL TONS

12.2 THROUGH 13.2 SEER



DESCRIPTION

YORK Sunline Ultra® units are convertible single package air conditioners with a common cabinet and a common roof curb for the 3, 4 and 5 ton sizes. The units were designed for light commercial and commercial applications. They can easily be installed on a roof curb, slab, roof jack or frame.

All units include:

- Powder Paint finish that meets ASTM-B-117 1000 hour salt spray standards
- Permanently lubricated motors
- Bottom or side air discharge configuration capability (field convertible)
- Manufactured under the quality standards of ISO9001
- Copper tube/aluminum fin coils
- Easy access to all components
- Rigging holes in base rails for lifting
- Fork lift slots on three sides
- Single point power connection
- Complete factory package - tested, charged and wired
- Belt Drive Indoor Blower
- CSA agency listing on all units

WARRANTY

- Factory Limited Parts Warranty
- One-year parts warranty
- A Five-year parts warranty on the compressor and electric heat elements.
- Ten-year parts warranty on the gas-fired heat exchangers.



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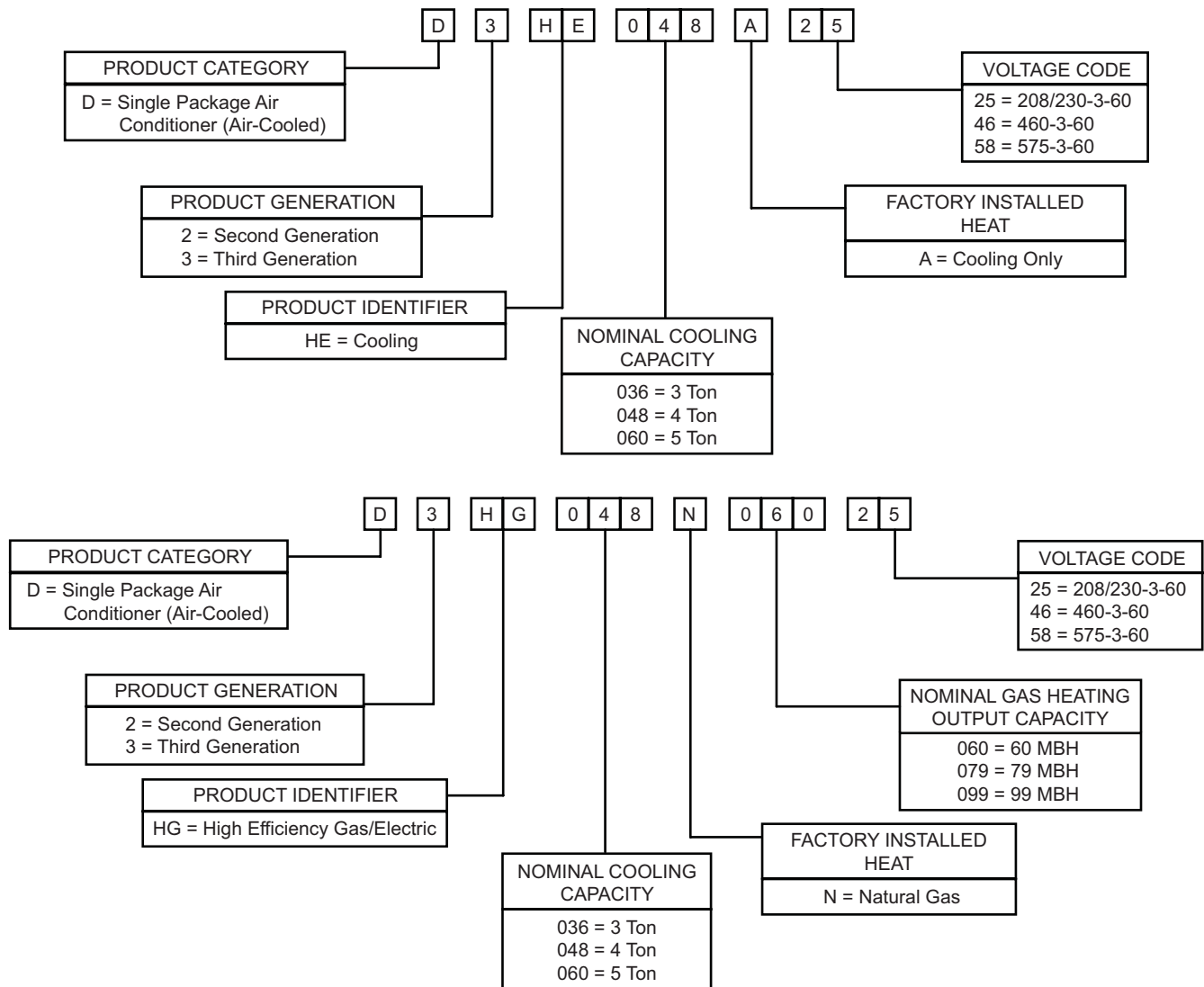
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PRODUCT NOMENCLATURE



FEATURES

All units are self-contained and assembled on full perimeter base rails with forklift holes on three sides and holes 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.

All models (including those with an economizer) are suitable for either bottom or horizontal duct connections. For bottom duct, remove the sheet metal panels from the supply and return air openings through the base of the unit. For horizontal duct, remove the supply and return air panels on the rear of the unit.

All models are available with the "factory mounted" outdoor air damper option:

- Single enthalpy economizer

Supply air blowers are equipped with a belt drive that can be adjusted to meet the exact requirements of the job.

All compressors are equipped with internal pressure relief. Every refrigerant circuit includes a liquid line filter-drier, a high pressure switch and a suction line with a freeze-stat and low pressure/loss of charge switch to protect all system components.

- 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.
 - **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 and 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 freeze-stats, the gas valve, if applicable, and the temperature limit switch on gas heat units. The unit control board will

alarm on ignition failures, compressor lockouts and repeated limit switch trips.

- **Nuisance Trip Protection** - To prevent nuisance trouble calls, the control board uses a "three strikes, you're out" philosophy. The high and low-pressure switches and the freeze-stats must trip three times within two hours before the unit control board will lock out the 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 freeze-stat 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 units have long lasting powder paint cabinets with 1000 hour salt spray test approval under ASTM-B117 procedures.

All models are CSA listed.

- **Warranty** - All models include a one-year limited parts warranty on the complete unit. Compressors and electric heater elements carry a five-year warranty. Gas heat exchangers carry a 10-year parts warranty.
- **Gas Heat Operation** - All single phase models with gas heat have minimum annual fuel utilization efficiency (AFUE) of 80%. All three phase models with gas heat have minimum steady state efficiency of 80%. Each section includes a durable heat exchanger with aluminized steel, 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.

- **Electric Heat Operation** - 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 temperature by thermal limit switches.

The power supply wiring can be routed into the control box through a threaded pipe connection (field supplied) in the base pan of the unit or through a knockout in the wiring panel on the side of the unit.

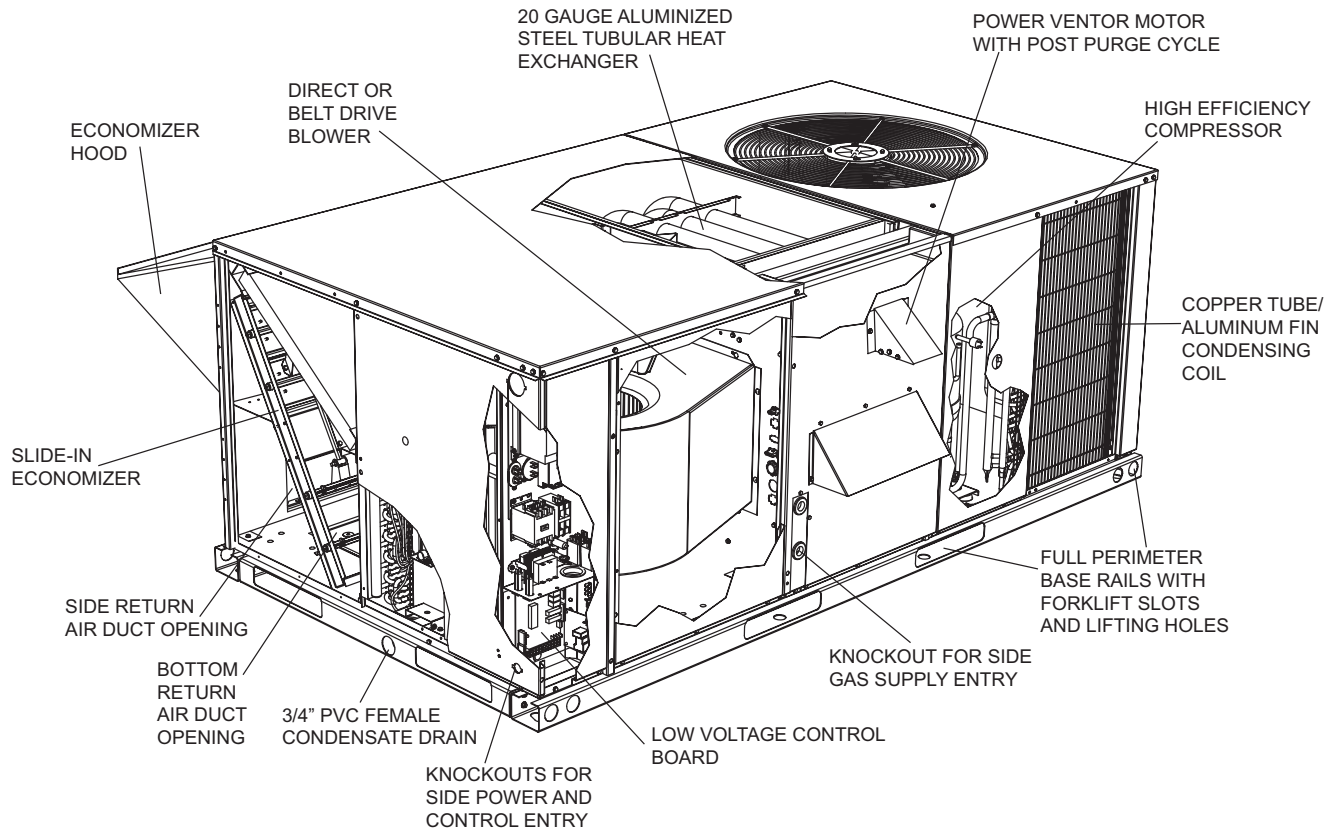


FIGURE 1 - UNIT CUTAWAY

FACTORY-INSTALLED OPTIONS

- **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.

- **PHENOLIC COATED 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.

- **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.

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

- **ELECTRIC HEATERS** wired for single point power supply. These nickel chromium heater elements are provided with limit and automatic reset capability to prevent operation at excessive temperatures.
- **ROOF CURBS** - Eight and fourteen-inch 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.

Roof curbs are designed to fit inside the base rails of the unit and include both a wood nailing strip and duct hanger supports.

- **HIGH ALTITUDE NATURAL GAS** - Burner orifices and pilot orifices are provided for proper furnace operation at altitudes up to 6,000 feet.
- **PROPANE** - Burner orifices, pilot orifices and gas valve parts are provided to convert a natural gas furnace to propane.
- **HIGH ALTITUDE PROPANE** - Burner orifices and pilot orifices are provided for proper furnace operation at altitudes up to 6,000 feet. This accessory supplements the basic propane conversion kit.
- **LOW NOX KIT** - Required to reduce the emission of nitrogen oxides below 40 nano grams per joule.
- **POWER EXHAUST** - Our single input economizer options are available with power exhaust. Whenever the outdoor air intake dampers are opened for free cooling, the exhaust fan will be energized to prevent the conditioned space from being over-pressurized during economizer operation.

The power exhaust option can only be used on bottom duct configurations.

- **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.
- **ENTHALPY ACCESSORY CONTROL KIT** - This kit contains the required components to convert a single enthalpy economizer to dual enthalpy.
- **BURGLAR BARS** - Mount in the supply and return openings to prevent entry into the duct work.
- **FLUE EXHAUST EXTENSION KIT** - In locations with wind or weather conditions which may interfere with proper exhausting of furnace combustion products, this kit can be installed to prevent the flue exhaust from entering nearby fresh air intakes.
- **COIL GUARD** - Customers can purchase a coil guard kit to protect the condenser coil from damage. This is not a hail guard kit.
- **HAIL GUARD** - Hail Guard kit is available to prevent unit from hail damage. This is a sloped hood that fits above the condenser coil.
- **GAS PIPING KIT** - This kit supplies all necessary fittings and shut off valve.

TABLE 1: SOUND POWER RATING¹

UNIT SIZE	CFM	ESP	BLOWER		SOUND POWER (db 10 ⁻¹² Watts)									
					Octave Band Centerline Frequency (Hz)								SWL dB(A)	dB(A) @ 10Ft. ²
					63	125	250	500	1,000	2,000	4,000	8,000		
036	1,200	0.6	LOW	0.60	84	84	74	67	69	62	57	52	74	41
048	1,600	0.55	HIGH	0.80	85	85	75	68	70	63	58	53	75	42
060	2,000	0.45	HIGH	1.00	86	86	76	69	71	64	59	54	76	43

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 2: CAPACITY RATINGS - (ARI 210/240)¹

MODEL	MBH	EER ²	SEER ³
DHE036	42.5	11.1	12.25
DHE048	46.5	11.4	13.20
DHE060	57.0	10.6	12.20

1. 80/67°F Indoor and 95°F outdoor.
2. EER = Energy Efficiency Ratio at full load - the cooling capacity in Btu's per hour (Btuh) divided by the power input in watts, expressed in Btuh per watt (Btuh/watt).
3. SEER = Seasonal Energy Efficiency Ratio.

TABLE 3: GAS HEAT RATINGS¹

MODEL	MBH INPUT	MBH OUTPUT	AFUE (%)	TEMP RISE °F
DHG036N040	50	40	80.9	15 - 45
DHG036N079	100	80	80.5	40 - 70
DHG048N060	75	60	80.9	25 - 55
DHG048N099	125	100	80.3	45 - 75
DHG060N079	100	80	80.5	25 - 55
DHG060N099	125	100	80.3	35 - 65

1. All units are single-stage heating.

TABLE 4: D(HE, HG) 036 COOLING CAPACITIES (3 TON)

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL																	
		85°F									95°F								
		TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹							TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹						
				ENTERING DRY BULB, °F									ENTERING DRY BULB, °F						
CFM	WB °F			86	83	80	77	74	71	68			86	83	80	77	74	71	68
1500	72	55.2	3.18	35.2	30.7	26.2	21.8	17.3	-	-	51.5	3.44	34.1	29.7	25.2	20.7	16.2	-	-
	67	49.1	3.13	41.7	37.2	32.8	28.3	23.8	19.4	14.9	45.8	3.35	40.2	35.7	31.3	26.8	22.3	17.8	13.4
	62	44.7	3.05	44.7	43.6	39.1	34.6	30.1	25.7	21.2	41.2	3.30	41.2	41.2	38.8	34.3	29.8	25.3	20.9
	57	42.4	3.05	42.4	42.4	42.4	37.9	33.4	29.0	24.5	39.9	3.35	39.9	39.9	39.9	35.4	31.0	26.5	22.0
1350	72	55.2	3.18	35.2	30.7	26.2	21.8	17.3	-	-	50.0	3.41	31.5	27.5	23.6	19.6	15.6	-	-
	67	49.1	3.13	41.7	37.2	32.8	28.3	23.8	19.4	14.9	44.5	3.32	37.2	33.2	29.2	25.3	21.3	17.3	13.3
	62	44.7	3.05	44.7	43.6	39.1	34.6	30.1	25.7	21.2	40.0	3.27	40.0	39.2	36.3	32.3	28.3	24.3	20.3
	57	42.4	3.05	42.4	42.4	42.4	37.9	33.4	29.0	24.5	38.8	3.32	38.8	38.8	37.5	33.5	29.6	25.6	21.6
1200	72	51.9	3.15	30.0	26.5	23.0	19.5	-	16.0	-	48.6	3.38	28.9	25.4	21.9	18.4	14.9	-	-
	67	46.1	3.10	35.7	32.2	28.7	25.2	21.7	18.2	14.7	43.2	3.29	34.2	30.7	27.2	23.7	20.2	16.7	13.2
	62	42.0	3.02	41.2	37.7	34.2	30.7	27.2	23.7	20.2	38.9	3.23	38.9	37.2	33.7	30.2	26.7	23.2	19.8
	57	39.8	3.03	39.8	39.8	37.3	33.8	30.3	26.8	23.3	37.6	3.29	37.6	37.6	35.1	31.6	28.1	24.6	21.1
1050	72	49.4	3.12	27.3	24.3	21.2	18.2	-	15.2	-	46.4	3.36	26.2	23.2	20.2	17.2	14.1	-	-
	67	43.9	3.07	32.6	29.6	26.5	23.5	20.5	17.4	14.4	41.2	3.27	31.1	28.1	25.0	22.0	19.0	16.0	12.9
	62	40.0	2.99	37.7	34.7	31.6	28.6	25.6	22.5	19.5	37.1	3.21	36.2	34.1	31.1	28.0	25.0	22.0	18.9
	57	37.9	3.00	37.9	37.0	34.5	31.4	28.4	25.4	22.3	35.9	3.27	35.9	34.9	32.3	29.3	26.3	23.2	20.2
900	72	46.9	3.09	24.6	22.1	19.5	16.9	14.4	-	-	44.2	3.34	23.6	21.0	18.4	15.9	13.3	-	-
	67	41.7	3.04	29.5	26.9	24.4	21.8	19.2	16.7	14.1	39.3	3.25	28.0	25.4	22.9	20.3	17.7	15.2	12.6
	62	38.0	2.96	34.2	31.6	29.1	26.5	23.9	21.4	18.8	35.4	3.20	33.5	30.9	28.4	25.8	23.2	20.7	18.1
	57	36.0	2.97	36.0	34.2	31.7	29.1	26.5	24.0	21.4	34.2	3.25	34.2	32.1	29.5	27.0	24.4	21.8	19.3

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL																	
		105°F									115°F								
		TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹							TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹						
				ENTERING DRY BULB, °F									ENTERING DRY BULB, °F						
CFM	WB °F			86	83	80	77	74	71	68			86	83	80	77	74	71	68
1500	72	47.6	3.65	32.3	27.8	23.3	18.9	14.4	-	-	43.6	3.85	30.4	26.0	21.5	17.0	12.5	-	-
	67	42.5	3.56	39.0	34.5	30.0	25.6	21.1	16.6	12.1	39.3	3.76	37.8	33.3	28.8	24.3	19.9	15.4	10.9
	62	38.0	3.49	38.0	38.0	36.6	32.1	27.6	23.1	18.7	34.8	3.67	34.8	34.8	34.4	29.9	25.4	20.9	16.5
	57	37.4	3.54	37.4	37.4	37.4	32.9	28.5	24.0	19.5	34.9	3.73	34.9	34.9	34.9	30.5	26.0	21.5	17.0
1350	72	46.5	3.62	29.7	25.8	21.8	17.8	13.8	-	-	42.9	3.83	28.0	24.0	20.0	16.0	12.0	-	-
	67	41.6	3.53	36.0	32.0	28.0	24.0	20.1	16.1	12.1	38.6	3.74	34.8	30.8	26.8	22.8	18.8	14.9	10.9
	62	37.1	3.46	37.1	36.6	34.1	30.1	26.1	22.2	18.2	34.2	3.66	34.2	34.0	32.0	28.0	24.0	20.0	16.0
	57	36.5	3.52	36.5	36.5	35.2	31.2	27.2	23.3	19.3	34.3	3.72	34.3	34.3	32.9	28.9	24.9	21.0	17.0
1200	72	45.4	3.60	27.2	23.7	20.2	16.7	12.2	-	-	42.2	3.82	25.5	22.0	18.5	15.0	11.5	-	-
	67	40.6	3.51	33.0	29.5	26.0	22.5	19.0	15.5	12.0	37.9	3.73	31.8	28.3	24.8	21.3	17.8	14.3	10.8
	62	36.2	3.44	36.2	35.2	31.7	28.2	24.7	21.2	17.7	33.6	3.64	33.6	33.1	29.6	26.1	22.6	19.1	15.6
	57	35.7	3.49	35.7	35.7	33.0	29.5	26.0	22.5	19.0	33.7	3.70	33.7	33.7	30.9	27.4	23.9	20.4	16.9
1050	72	43.2	3.57	24.6	21.6	18.5	-	12.5	-	-	40.1	3.78	22.9	19.9	16.9	13.8	10.8	-	-
	67	38.7	3.48	29.9	26.9	23.8	20.8	17.8	14.7	11.7	36.1	3.69	28.7	25.7	22.6	19.6	16.6	13.5	10.5
	62	34.5	3.41	33.9	32.1	29.0	26.0	23.0	19.9	16.9	32.0	3.61	31.6	30.0	27.0	23.9	20.9	17.9	14.9
	57	34.0	3.47	34.0	32.9	30.3	27.2	24.2	21.2	18.1	32.1	3.67	32.1	30.9	28.2	25.1	22.1	19.1	16.0
900	72	41.1	3.54	22.0	19.4	16.8	14.3	11.7	-	-	38.0	3.75	20.4	17.8	15.2	12.7	10.1	-	-
	67	36.7	3.45	26.8	24.2	21.7	19.1	16.5	14.0	11.4	34.2	3.66	25.6	23.0	20.4	17.9	15.3	12.7	10.2
	62	32.8	3.39	31.5	28.9	26.4	23.8	21.2	18.7	16.1	30.3	3.58	29.5	26.9	24.4	21.8	19.2	16.7	14.1
	57	32.3	3.44	32.3	30.1	27.5	24.9	22.4	19.8	17.2	30.4	3.64	30.4	28.0	25.4	22.9	20.3	17.7	15.2

1. These capacities are gross ratings. For net capacity, determine the kW of the supply air blower from the SUPPLY AIR BLOWER PERFORMANCE Tables, multiply this value by 3.415 MBH/kW to determine the motor heat, and deduct this heat from the gross capacity of the unit.
2. These ratings include the compressor and the condenser fan motors but not the supply air blower motor. The total condenser fan motor power input is 0.36kW. Refer to SUPPLY AIR BLOWER PERFORMANCE Tables for the kW of the supply air blower motor.

NOMINAL RATING

TABLE 5: D(HE, HG) 048 COOLING CAPACITIES (4 TON)

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL																	
		85°F										95°F							
		TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹								TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹					
				ENTERING DRY BULB, °F										ENTERING DRY BULB, °F					
CFM	WB °F			86	83	80	77	74	71	68			86	83	80	77	74	71	68
2000	72	59	3.3	46	40	34	28	23	-	-	55	3.5	43	37	32	26	20	-	-
	67	53	3.2	53	49	43	38	32	26	21	49	3.4	49	47	41	35	30	24	-
	62	47	3.2	47	47	47	42	36	30	25	44	3.4	44	44	44	38	32	26	-
	57	47	3.1	47	47	47	41	35	29	24	43	3.3	43	43	43	37	31	26	-
1800	72	58	3.3	42	37	32	27	22	-	-	54	3.5	40	35	30	25	20	-	-
	67	53	3.2	50	46	41	35	30	25	20	48	3.4	47	44	39	33	28	23	-
	62	47	3.2	47	47	46	41	36	31	26	43	3.4	43	43	43	38	33	28	-
	57	46	3.1	46	46	46	41	35	30	25	42	3.3	42	42	42	37	32	27	-
1600	72	57	3.3	39	34	30	25	21	-	-	53	3.5	37	33	28	23	19	-	-
	67	52	3.2	47	42	38	33	29	24	19	48	3.4	45	41	36	32	27	22	-
	62	46	3.2	46	46	45	41	36	32	27	42	3.4	42	42	43	39	34	30	-
	57	45	3.1	45	45	45	40	36	31	27	41	3.3	41	41	41	37	32	28	-
1400	72	54	3.2	35	31	27	23	19	-	-	51	3.5	34	30	26	22	17	-	-
	67	49	3.1	43	39	35	31	27	23	19	45	3.4	41	37	33	29	25	21	-
	62	43	3.1	43	43	42	38	34	30	26	40	3.4	40	40	40	36	32	28	-
	57	43	3.1	43	43	41	37	33	29	25	39	3.3	39	39	38	34	30	26	-
1200	72	51	3.2	32	29	25	22	18	-	-	48	3.5	30	27	23	20	16	-	-
	67	46	3.1	39	35	32	28	25	21	18	42	3.5	37	34	30	27	23	20	-
	62	41	3.1	41	41	38	35	31	28	24	38	3.4	38	38	36	33	29	26	-
	57	40	3.0	40	40	38	34	31	27	24	37	3.4	37	37	35	31	28	24	-

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL																	
		105°F										115°F							
		TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹								TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹					
				ENTERING DRY BULB, °F										ENTERING DRY BULB, °F					
CFM	WB °F			86	83	80	77	74	71	68			86	83	80	77	74	71	68
1500	72	50	3.8	41	35	30	24	18	-	-	45	4.0	39	33	28	22	16	-	-
	67	45	3.7	45	44	39	33	27	22	16	40	4.0	40	40	37	31	25	20	-
	62	39	3.6	39	39	39	34	28	22	17	35	3.8	35	35	35	30	24	18	-
	57	39	3.6	39	39	39	33	27	22	16	35	3.8	35	35	35	29	23	18	-
1350	72	50	3.8	38	33	28	23	18	-	-	45	4.0	36	31	26	21	16	-	-
	67	44	3.7	44	41	36	31	26	21	16	40	4.0	40	39	34	29	24	19	-
	62	39	3.6	39	39	40	35	30	25	20	35	3.9	35	35	37	32	27	22	-
	57	38	3.6	38	38	38	33	28	23	18	34	3.8	34	34	34	29	24	19	-
1200	72	49	3.8	35	31	26	21	17	-	-	45	4.1	33	29	24	20	15	-	-
	67	44	3.7	43	39	34	30	25	20	16	40	4.1	40	37	32	27	23	18	-
	62	39	3.6	39	39	41	37	32	27	23	35	3.9	35	35	39	34	30	25	-
	57	38	3.6	38	38	38	33	29	24	19	34	3.8	34	34	34	30	25	20	-
1050	72	47	3.8	32	28	24	20	16	-	-	43	4.0	30	26	22	18	14	-	-
	67	42	3.7	39	35	31	27	23	19	15	38	4.0	37	34	29	25	21	17	-
	62	37	3.6	37	37	38	33	29	25	21	33	3.8	33	33	35	31	27	23	-
	57	36	3.5	36	36	35	31	27	23	18	33	3.7	33	33	31	27	23	19	-
900	72	44	3.7	29	25	22	18	15	-	-	41	3.9	27	24	20	17	13	-	-
	67	40	3.7	36	32	29	25	21	18	14	36	3.9	34	30	27	23	20	16	-
	62	35	3.6	35	35	34	30	27	23	20	32	3.8	32	32	32	28	25	21	-
	57	34	3.5	34	34	32	28	25	21	18	31	3.7	31	31	29	25	22	18	-

- These capacities are gross ratings. For net capacity, determine the kW of the supply air blower from the SUPPLY AIR BLOWER PERFORMANCE Tables, multiply this value by 3.415 MBH/kW to determine the motor heat, and deduct this heat from the gross capacity of the unit.
- These ratings include the compressor and the condenser fan motors but not the supply air blower motor. The total condenser fan motor power input is 0.36kW. Refer to SUPPLY AIR BLOWER PERFORMANCE Tables for the kW of the supply air blower motor.

NOMINAL RATING

TABLE 6: D(HE, HG) 060 COOLING CAPACITIES (5 TON)

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL																		
		85°F									95°F									
		TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹								TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹						
				ENTERING DRY BULB, °F										ENTERING DRY BULB, °F						
CFM	WB °F			86	83	80	77	74	71	68			86	83	80	77	74	71	68	
2500	72	82	4.3	56	50	43	37	30	-	-	76	4.6	54	48	41	34	28	-	-	
	67	70	4.2	67	61	54	48	41	34	28	65	4.5	65	58	51	45	38	31	25	
	62	67	4.0	67	67	66	59	52	46	39	62	4.5	62	62	62	55	49	42	35	
	57	66	4.0	66	66	66	59	52	46	39	61	4.4	61	61	61	54	47	41	34	
2250	72	78	4.3	53	47	41	35	29	-	-	73	4.6	50	44	38	32	26	-	-	
	67	67	4.2	63	57	51	45	39	33	27	62	4.5	60	54	48	42	36	30	24	
	62	64	4.0	64	64	62	56	50	44	38	60	4.4	60	60	59	53	47	41	35	
	57	63	4.0	63	63	63	57	51	45	39	58	4.4	58	58	58	52	46	40	34	
2000	72	75	4.3	49	43	38	33	27	-	-	70	4.6	46	41	36	30	25	-	-	
	67	64	4.2	58	53	48	42	37	32	26	60	4.5	56	50	45	39	34	29	23	
	62	61	4.0	61	61	58	52	47	42	36	57	4.4	57	57	55	50	45	39	34	
	57	60	4.0	60	60	59	54	49	43	38	56	4.4	56	56	56	50	45	39	34	
1750	72	72	4.3	44	40	35	30	25	-	-	67	4.6	43	38	33	28	24	-	-	
	67	62	4.2	53	49	44	39	34	30	25	58	4.5	51	46	41	37	32	27	22	
	62	59	4.0	59	57	53	48	44	39	34	55	4.4	55	54	51	46	42	37	32	
	57	58	4.0	58	57	55	50	45	40	36	54	4.4	54	54	51	47	42	37	32	
1500	72	69	4.2	40	36	32	28	24	-	-	65	4.6	39	34	30	26	22	-	-	
	67	59	4.1	48	44	40	36	32	28	23	56	4.5	46	42	38	34	30	26	21	
	62	56	4.0	56	53	49	44	40	36	32	53	4.4	53	51	47	43	39	35	30	
	57	55	4.0	55	54	50	46	42	37	33	52	4.4	52	51	47	43	39	35	30	

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL																		
		105°F									115°F									
		TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹								TOTAL CAP. ¹ MBH	POWER INPUT ² kW	SENSIBLE CAPACITY ¹						
				ENTERING DRY BULB, °F										ENTERING DRY BULB, °F						
CFM	WB °F			86	83	80	77	74	71	68			86	83	80	77	74	71	68	
2500	72	68	5.0	51	44	38	31	25	-	-	61	5.3	48	41	35	28	21	-	-	
	67	60	4.8	60	55	49	42	35	29	22	55	5.1	55	53	46	39	33	26	20	
	62	56	4.8	56	56	56	49	43	36	29	50	5.1	50	50	50	43	37	30	23	
	57	55	4.7	55	55	55	48	42	35	28	49	5.0	49	49	49	43	36	29	23	
2250	72	67	4.9	48	42	36	30	24	-	-	60	5.3	45	39	33	27	21	-	-	
	67	58	4.8	57	52	46	40	34	28	22	54	5.1	53	50	44	38	32	26	20	
	62	55	4.7	55	55	54	48	42	36	30	49	5.0	49	49	49	43	37	31	25	
	57	54	4.7	54	54	53	47	41	35	29	49	5.0	49	49	49	43	37	31	25	
2000	72	65	4.9	44	39	33	28	23	-	-	60	5.2	42	36	31	26	20	-	-	
	67	57	4.8	54	48	43	38	32	27	22	54	5.1	52	47	41	36	30	25	20	
	62	53	4.7	53	53	52	46	41	36	30	49	5.0	49	49	48	43	37	32	26	
	57	52	4.7	52	52	52	46	41	36	30	48	5.0	48	48	48	42	37	32	26	
1750	72	62	4.9	40	35	31	26	21	-	-	56	5.2	38	33	28	24	19	-	-	
	67	54	4.8	49	44	40	35	30	25	21	51	5.0	47	42	38	33	28	23	19	
	62	51	4.7	51	50	48	43	38	33	29	46	5.0	46	46	44	39	34	30	25	
	57	50	4.6	50	50	48	43	38	33	29	46	4.9	46	46	44	39	34	29	25	
1500	72	59	4.9	36	32	28	24	20	-	-	53	5.2	34	30	26	22	18	-	-	
	67	52	4.7	44	40	36	32	28	24	20	48	5.0	43	38	34	30	26	22	18	
	62	48	4.7	48	47	43	39	35	31	27	43	4.9	43	43	40	36	32	27	23	
	57	47	4.6	47	47	43	39	35	31	27	43	4.9	43	43	40	36	31	27	23	

- These capacities are gross ratings. For net capacity, determine the kW of the supply air blower from the SUPPLY AIR BLOWER PERFORMANCE Tables, multiply this value by 3.415 MBH/kW to determine the motor heat, and deduct this heat from the gross capacity of the unit.
- These ratings include the compressor and the condenser fan motors but not the supply air blower motor. The total condenser fan motor power input is 0.36kW. Refer to SUPPLY AIR BLOWER PERFORMANCE Tables for the kW of the supply air blower motor.

NOMINAL RATING

TABLE 7: SUPPLY AIR BLOWER PERFORMANCE (3 TON BELT DRIVE) - SIDE DUCT APPLICATION

UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ²													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
3 ¹	2000	843	860	880	925	919	1005	956	1065	993	1145	1030	1195	1067	1235
	1900	817	775	854	850	893	920	930	995	970	1065	1008	1125	1046	1170
	1800	790	700	828	760	867	840	906	905	944	980	985	1040	1025	1100
	1700	-	-	802	670	840	745	881	815	920	900	961	970	1001	1030
	1600	-	-	-	-	818	665	858	740	898	820	940	890	980	950
	1500	-	-	-	-	-	-	842	695	882	755	922	835	962	895
	1400	-	-	-	-	-	-	833	650	867	705	904	765	942	820
	1300	-	-	-	-	-	-	-	-	858	665	893	725	932	785
	1200	-	-	-	-	-	-	-	-	847	640	880	680	916	730

UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ²													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
3 ¹	2000	1103	1270	-	-	-	-	-	-	-	-	-	-	-	-
	1900	1085	1210	-	-	-	-	-	-	-	-	-	-	-	-
	1800	1064	1145	1102	1180	-	-	-	-	-	-	-	-	-	-
	1700	1040	1075	1081	1115	1121	1140	-	-	-	-	-	-	-	-
	1600	1020	1005	1060	1050	1100	1085	-	-	-	-	-	-	-	-
	1500	1003	945	1044	995	1086	1035	-	-	-	-	-	-	-	-
	1400	982	880	1024	920	1067	965	1107	1000	-	-	-	-	-	-
	1300	970	835	1010	870	1053	920	1099	960	-	-	-	-	-	-
	1200	953	780	992	815	1034	855	1080	905	-	-	-	-	-	-

1. For 208 Volts multiply values by 0.95.

2. Includes allowances for a wet evaporator coil, 1" filters, and the heat exchangers. Refer to STATIC RESISTANCE Table for resistance values on applications other than gas / electric units with side duct airflows.

TABLE 8: SUPPLY AIR BLOWER PERFORMANCE (4 TON BELT DRIVE) - SIDE DUCT APPLICATION

UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ²													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
4 ¹	2000	843	860	880	925	919	1005	956	1065	993	1145	1030	1195	1067	1235
	1900	817	775	854	850	893	920	930	995	970	1065	1008	1125	1046	1170
	1800	790	700	828	760	867	840	906	905	944	980	985	1040	1025	1100
	1700	-	-	802	670	840	745	881	815	920	900	961	970	1001	1030
	1600	-	-	-	-	818	665	858	740	898	820	940	890	980	950
	1500	-	-	-	-	-	-	842	695	882	755	922	835	962	895
	1400	-	-	-	-	-	-	833	650	867	705	904	765	942	820
	1300	-	-	-	-	-	-	-	-	858	665	893	725	932	785
	1200	-	-	-	-	-	-	-	-	847	640	880	680	916	730

UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ²													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
4 ¹	2000	1103	1270	-	-	-	-	-	-	-	-	-	-	-	-
	1900	1085	1210	-	-	-	-	-	-	-	-	-	-	-	-
	1800	1064	1145	1102	1180	-	-	-	-	-	-	-	-	-	-
	1700	1040	1075	1081	1115	1121	1140	-	-	-	-	-	-	-	-
	1600	1020	1005	1060	1050	1100	1085	-	-	-	-	-	-	-	-
	1500	1003	945	1044	995	1086	1035	-	-	-	-	-	-	-	-
	1400	982	880	1024	920	1067	965	1107	1000	-	-	-	-	-	-
	1300	970	835	1010	870	1053	920	1099	960	-	-	-	-	-	-
	1200	953	780	992	815	1034	855	1080	905	-	-	-	-	-	-

1. Models shown at 230/460 Volts with side duct connections.

2. Includes allowances for a wet evaporator coil, 1" filters, and the heat exchangers. Refer to STATIC RESISTANCE Table for resistance values on applications other than gas / electric units with side duct airflows.

TABLE 9: SUPPLY AIR BLOWER PERFORMANCE (5 TON BELT DRIVE) - SIDE DUCT APPLICATION

UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ²													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
5 ¹	2500	1059	1560	1077	1590	1095	1630	1114	1650	1134	1660	1158	1685	1181	1720
	2400	1032	1405	1054	1470	1074	1525	1094	1560	1116	1595	1140	1620	1167	1640
	2300	1005	1260	1024	1275	1049	1370	1069	1440	1090	1475	1116	1505	1142	1535
	2200	980	1160	1002	1170	1022	1190	1044	1250	1066	1350	1090	1410	1117	1440
	2100	930	1060	957	1070	983	1080	1010	1100	1039	1160	1064	1260	1092	1340
	2000	877	950	908	975	941	1000	976	1020	1009	1050	1040	1100	1070	1225
	1900	-	-	-	-	894	885	940	940	980	980	1014	1020	1047	1095
	1800	-	-	-	-	855	815	903	860	950	905	988	940	1022	970
	1700	-	-	-	-	-	-	884	815	925	850	964	880	1001	910
	1600	-	-	-	-	-	-	864	770	908	805	948	835	987	870
	1500	-	-	-	-	-	-	-	-	882	740	926	780	965	830

UNIT TONNAGE	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE-IWG ²													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
5 ¹	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2400	1193	1665	-	-	-	-	-	-	-	-	-	-	-	-
	2300	1170	1580	1202	1620	-	-	-	-	-	-	-	-	-	-
	2200	1148	1480	1180	1530	-	-	-	-	-	-	-	-	-	-
	2100	1121	1385	1155	1425	1190	1475	-	-	-	-	-	-	-	-
	2000	1100	1285	1133	1340	1169	1385	1205	1445	-	-	-	-	-	-
	1900	1079	1180	1110	1240	1143	1280	1178	1330	1222	1375	-	-	-	-
	1800	1058	1060	1090	1135	1122	1190	1158	1240	1196	1295	-	-	-	-
	1700	1035	960	1071	1030	1103	1100	1134	1140	1164	1175	1197	1205	-	-
	1600	1020	900	1056	965	1088	1035	1118	1065	1145	1105	1170	1130	1198	1150
	1500	1004	860	1038	880	1070	925	1101	980	1130	1045	1158	1075	1184	1110

1. Models shown at 230/460 Volts with side duct connections.

2. Includes allowances for a wet evaporator coil, 1" filters, and the heat exchangers. Refer to STATIC RESISTANCE Table for resistance values on applications other than gas / electric units with side duct airflows.

TABLE 10: BELT DRIVE BLOWER MOTOR AND DRIVE DATA

MODEL SIZE	BLOWER RANGE (RPM)	MOTOR ¹		ADJUSTABLE MOTOR PULLEY				FIXED BLOWER PULLEY				BELT (NOTCHED)		
		HP	FRAME	DESIG- NATION	OUTSIDE DIA. (IN.)	PITCH DIA. (IN.)	BORE (IN.)	DESIG- NATION	OUTSIDE DIA. (IN.)	PITCH DIA. (IN.)	BORE (IN.)	DESIG- NATION	PITCH LENGTH (IN.)	QTY.
3 TON	790/1120	1 1/2	56	1VL40	2.7-3.7	2.4-3.4	5/8	AK61	5.9	5.7	1	A36	37.3	1
4 TON	790/1120	1 1/2	56	1VL40	2.7-3.7	2.4-3.4	5/8	AK61	5.9	5.7	1	A36	37.3	1
5 TON	850/1220	1 1/2	56	1VL40	2.7-3.7	2.4-3.4	5/8	AK56	5.4	5.2	1	A36	37.3	1

1. All motors have solid bases and are inherently protected. these motors can be selected to operate into their service factor because they are located in the moving air, upstream of any heating device.

TABLE 11: STATIC RESISTANCES

DESCRIPTION		RESISTANCE, IWG										
		CFM										
		1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
ECONOMIZER ^{1,3}		0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.20	0.23	0.26	0.30
ELECTRIC HEATERS ¹	7-15KW	0.04	0.05	0.06	0.07	0.08	0.10	0.12	0.14	0.16	0.19	0.22
	20-30KW	0.06	0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.20	0.23	0.26
BOTTOM DUCT CONNECTIONS ¹		0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.14	0.16	0.19	0.22
COOLING ONLY ²		0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.23	0.26	0.29	0.32

1. Deduct these resistance values from the available external static pressure shown in SUPPLY AIR BLOWER PERFORMANCE Tables.

2. Add these resistance values to the available static resistance values on SUPPLY AIR BLOWER PERFORMANCE Tables.

3. The pressure through the economizer is greater for 100% outdoor air than for 100% return air. If the resistance of the return air duct system is less than 0.25 IWG, the unit will deliver less CFM during full economizer operation.

TABLE 12: ELECTRIC HEATER CFM LIMITATIONS

UNIT MODEL SIZE NOMINAL TONS	VOLTAGE	MINIMUM SUPPLY AIR CFM					
		HEATER SIZE NOMINAL KW					
		5	7	10	15	20	30
3	208/230-3-60	1100	1100	1200	1200	1300	-
	460-3-60	-	1100	1200	1200	1300	-
	575-3-60	-	-	1200	1200	1300	-
4	208/230-3-60	1300	1300	1300	1300	1300	-
	460-3-60	-	1300	1300	1300	1300	-
	575-3-60	-	-	1300	1300	1400	-
5	208/230-3-60	1600	1600	1600	1600	1600	1600
	460-3-60	-	1600	1600	1600	1600	1600
	575-3-60	-	-	1600	1600	1600	1800

TABLE 13: ELECTRICAL DATA - D(HE, HG) 036-060 BELT DRIVE

MODEL TONNAGE	VOLTAGE	COMPRESSORS		OD FAN MOTOR FLA	ID BLOWER MOTOR FLA	ELECTRIC HEATER MODEL NO.	HEATER KW	HEATER AMPS	MIN. CIRCUIT AMPACITY (AMPS)	MAX. FUSE/ BRKR ¹ SIZE (AMPS)
		RLA EACH	LRA EACH							
D(HE, HG) 036 (3.0)	208-3-60	13.1	110.0	2.3	5.2	None	--	--	23.9	30
						2CE04510525 ²	4.0	11.1	23.9	30
						2CE04510725 ²	5.6	15.5	25.9	35
						2CE04511025	8.0	22.2	34.3	35
						2CE04511525	11.9	33.0	47.8	50
						2CE04512025	15.9	44.1	61.7	70
	230-3-60	13.1	110.0	2.3	5.2	None	--	--	23.9	30
						2CE04510525 ²	5.3	12.7	23.9	30
						2CE04510725 ²	7.5	18.0	29.1	35
						2CE04511025	10.6	25.5	38.4	40
						2CE04511525	15.9	38.2	54.3	60
						2CE04512025	21.2	51.0	70.2	80
	460-3-60	6.7	54.0	1.3	2.6	None	--	--	12.3	15
						2CE04510746 ²	6.8	8.2	13.5	15
						2CE04511046 ²	10.1	12.1	18.4	20
						2CE04511546 ²	13.6	16.4	23.7	25
						2CE04512046 ²	19.5	23.5	32.6	35
D(HE, HG) 048 (4.0)	208-3-60	13.1	110.0	2.3	5.2	None	--	--	23.9	30
						2CE04510525 ²	4.0	11.1	23.9	30
						2CE04510725 ²	5.6	15.5	25.9	35
						2CE04511025	8.0	22.2	34.3	35
						2CE04511525	11.9	33.0	47.8	50
						2CE04512025	15.9	44.1	61.7	70
	230-3-60	13.1	110.0	2.3	5.2	None	--	--	23.9	30
						2CE04510525 ²	5.3	12.7	23.9	30
						2CE04510725 ²	7.5	18.0	29.1	35
						2CE04511025	10.6	25.5	38.4	40
						2CE04511525	15.9	38.2	54.3	60
						2CE04512025	21.2	51.0	70.2	80
	460-3-60	6.7	54.0	1.3	2.6	None	--	--	12.3	15
						2CE04510746 ²	6.8	8.2	13.5	15
						2CE04511046 ²	10.1	12.1	18.4	20
						2CE04511546 ²	13.6	16.4	23.7	25
						2CE04512046 ²	19.5	23.5	32.6	35
	575-3-60	5.1	44.0	1.3	2.0	None	--	--	9.4	15
						2CE04511058	10.6	10.2	15.2	20
						2CE04511558	15.9	15.3	21.6	25
						2CE04512058	21.2	20.4	28.0	30

TABLE 13: ELECTRICAL DATA - D(HE, HG) 036-060 BELT DRIVE (CONTINUED)

MODEL TONNAGE	VOLTAGE	COMPRESSORS		OD FAN MOTOR FLA	ID BLOWER MOTOR FLA	ELECTRIC HEATER MODEL NO.	HEATER KW	HEATER AMPS	MIN. CIRCUIT AMPACITY (AMPS)	MAX. FUSE/ BRKR ¹ SIZE (AMPS)
		RLA EACH	LRA EACH							
D(HE, HG) 060 (5.0)	208-3-60	16.0	137.0	2.3	5.2	None	--	--	27.5	35
						2CE04510525 ²	4.0	11.1	27.5	35
						2CE04510725 ²	5.6	15.5	27.5	35
						2CE04511025	8.0	22.2	34.3	40
						2CE04511525	11.9	33.0	47.8	50
						2CE04512025	15.9	44.1	61.7	70
						2CE04513025	22.2	61.6	83.5	90
	230-3-60	16.0	137.0	2.3	5.2	None	--	--	27.5	35
						2CE04510525 ²	5.3	12.7	27.5	35
						2CE04510725 ²	7.5	18.0	29.1	40
						2CE04511025	10.6	25.5	38.4	40
						2CE04511525	15.9	38.2	54.3	60
						2CE04512025	21.2	51.0	70.2	80
						2CE04513025	29.6	71.2	95.5	100
	460-3-60	8.3	69.0	1.3	2.6	None	--	--	14.3	20
						2CE04510746 ²	6.8	8.2	14.3	20
						2CE04511046 ²	10.1	12.1	18.4	20
						2CE04511546 ²	13.6	16.4	23.7	25
						2CE04512046 ²	19.5	23.5	32.6	35
						2CE04513046 ²	28.8	34.6	46.6	50
	575-3-60	6.4	58.0	1.3	2.0	None	--	--	11.0	15
						2CE04511058	10.6	10.2	15.2	20
						2CE04511558	15.9	15.3	21.6	25
						2CE04512058	21.2	20.4	28.0	30
						2CE04513058	30.4	29.3	39.1	40

1. HACR Type per NEC.

2. These electric heaters do not include a fuse box. If a fuse box is required to meet a local code (i.e. Chicago), the fuse block accessories 2FB04700825 and 2FB04700846 are available for field installation.

TABLE 14: PHYSICAL DATA

MODELS		D(HE, HG)		
		036	048	060
EVAPORATOR BLOWER	Centrifugal Blower (Dia. x Wd. in.)	12 X 10	12 X 10	12 X 10
	Fan Motor HP (Belt Drive)	1 1/2	1 1/2	1 1/2
EVAPORATOR COIL	Rows Deep	4	4	4
	Fins Per Inch	13	13	13
	Face Area (Sq. Ft.)	4.3	5.1	5.1
CONDENSER FANS	Propeller Dia. (in.)	24	24	24
	Fan Motor Hp	1/2	1/2	1/2
	Nom. CFM	4500	4200	4200
CONDENSER COILS	Rows Deep	2	2	2
	Fins Per Inch	18	18	18
	Face Area (Sq. Ft.)	17.1	17.1	17.1
COMPRESSOR (Qty. Per Unit)	Recip. Type	1	1	1
AIR FILTERS	Quantity Per Unit (15" X 20" X 1" or 2")	2	2	2
	Quantity Per Unit (14" X 25" X 1" or 2")	1	1	1
	Total Face Area (sq. ft.)	6.3	6.3	6.3
CHARGE	Refrigerant 22 (lbs./oz.)	10/8	10/4	10/14

TABLE 15: ELECTRIC HEAT CORRECTION FACTORS

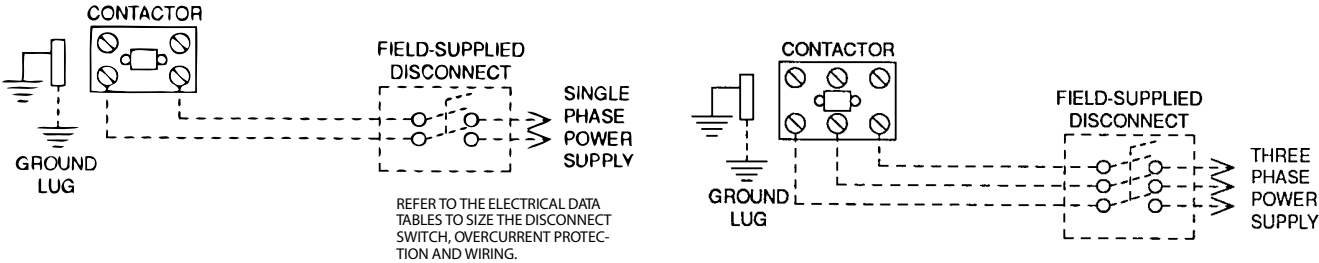
NOMINAL VOLTAGE	VOLTAGE	KW CAP. MULTI-PLIER
208	208	0.75
240	230	0.92
480	460	0.92
600	575	0.92

TABLE 16: VOLTAGE LIMITATIONS¹

POWER SUPPLY	VOLTAGE	
	MIN.	MAX.
208/230-3-60	187	253
460-3-60	414	506
575-3-60	540	630

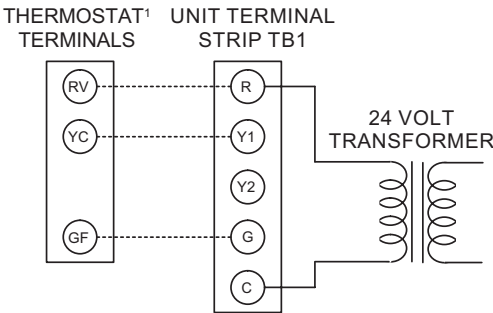
1. Utilization Range "A" in accordance with ARI Standard 110.

TYPICAL POWER WIRING



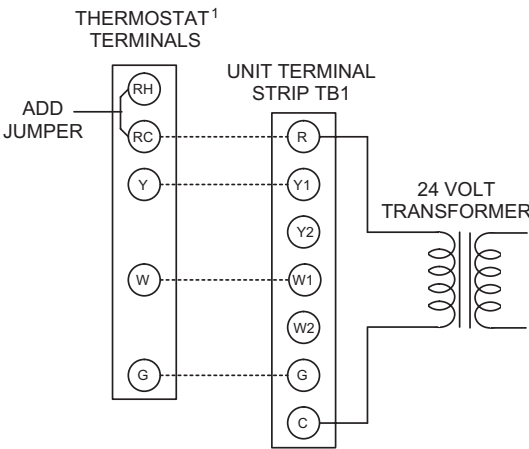
TYPICAL CONTROL WIRING

COOLING ONLY (24 VOLT THERMOSTAT)

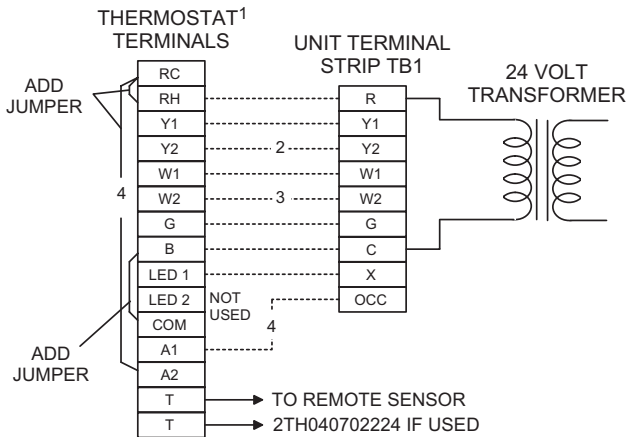


¹24 VOLT THERMOSTAT 2TH07701024. TO CONTROL THE ECONOMIZER ON SECOND STAGE COOLING, USE THE THERMOSTAT 2TH0401224.

COOLING / HEATING (24 VOLT THERMOSTAT)



COOLING / HEATING (ELECTRONIC THERMOSTAT) MULTI STAGE



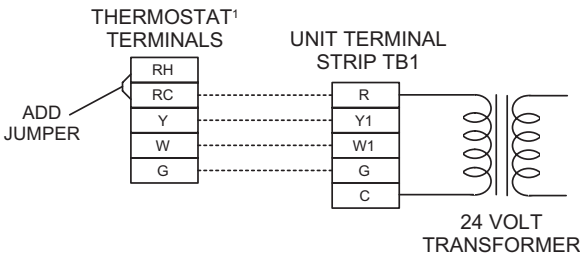
¹ ELECTRONIC PROGRAMMABLE THERMOSTAT 2ET04700224 (INCLUDES SUBBASE).

² SECOND STAGE COOLING IS NOT REQUIRED ON UNITS LESS ECONOMIZER.

³ SECOND STAGE HEATING IS ONLY REQUIRED ON UNITS WITH A TWO STAGE ELECTRIC HEATER.

⁴ REMOVE JUMPER J2 FROM TERMINALS 4 AND 9 ON JUMPER PLUG CONNECTOR P6 ON UNITS WITH ECONOMIZER. TERMINALS A1 AND A2 PROVIDE A RELAY OUT-PUT TO CLOSE THE OUTDOOR ECONOMIZER DAMPERS WHEN THE THERMOSTAT SWITCHES TO THE SET-BACK POSITION.

COOLING / HEATING (ELECTRONIC THERMOSTAT) SINGLE STAGE



¹ELECTRONIC PROGRAMMABLE THERMOSTAT 2ET07701024 (INCLUDES SUBBASE). TO CONTROL THE ECONOMIZER ON SECOND STAGE COOLING, USE THERMOSTAT 2TH04700224.

FIGURE 2 - TYPICAL FIELD POWER & CONTROL WIRING

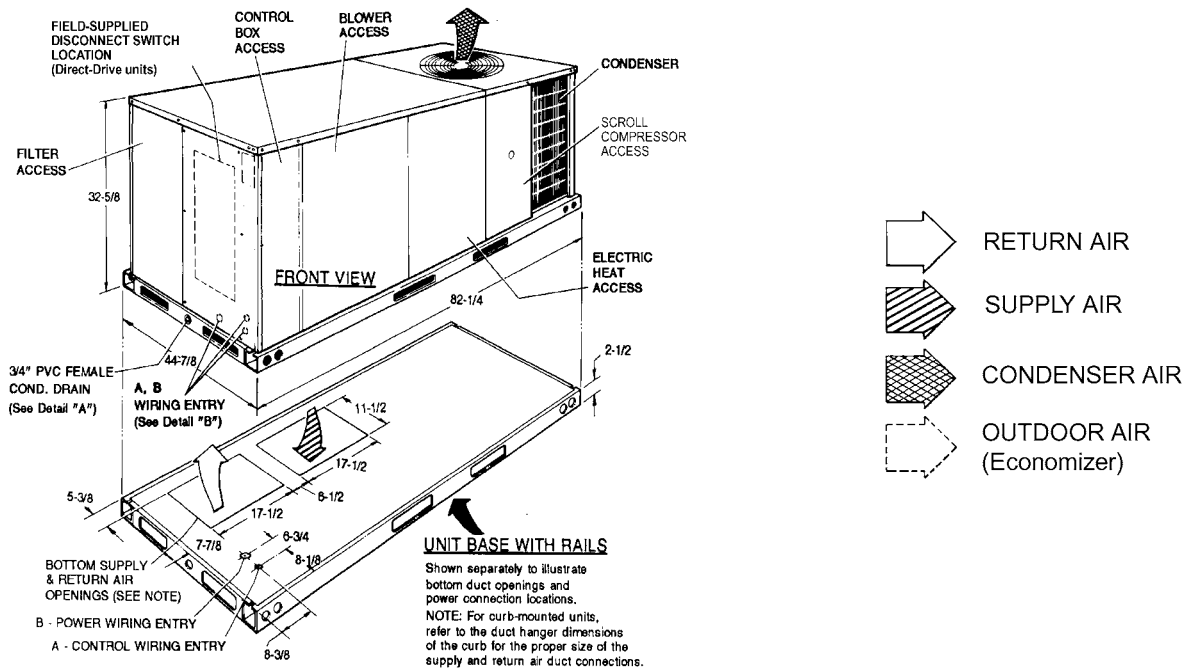


FIGURE 3 - UNIT DIMENSIONS (3 - 5 TON COOLING ONLY/ELECTRIC HEAT) FRONT VIEW

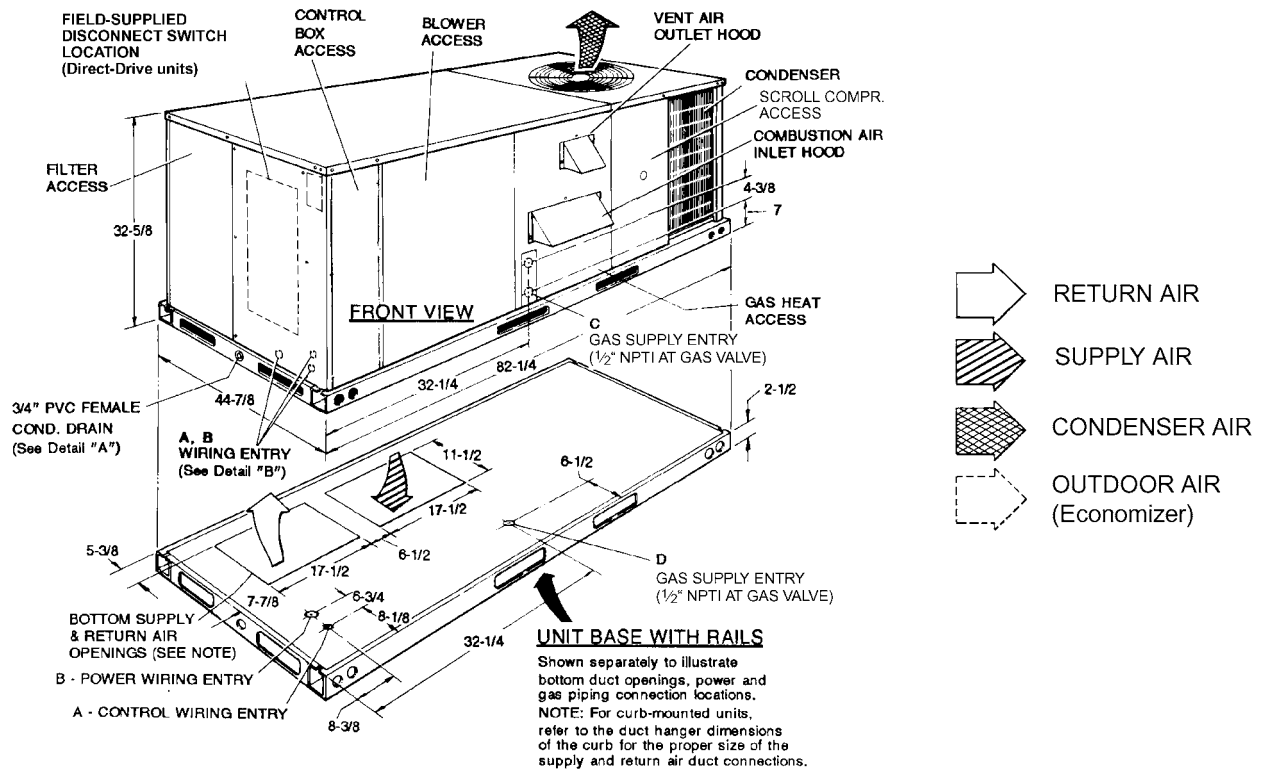


FIGURE 4 - UNIT DIMENSIONS (3 - 5 TON COOLING/GAS HEAT) FRONT VIEW

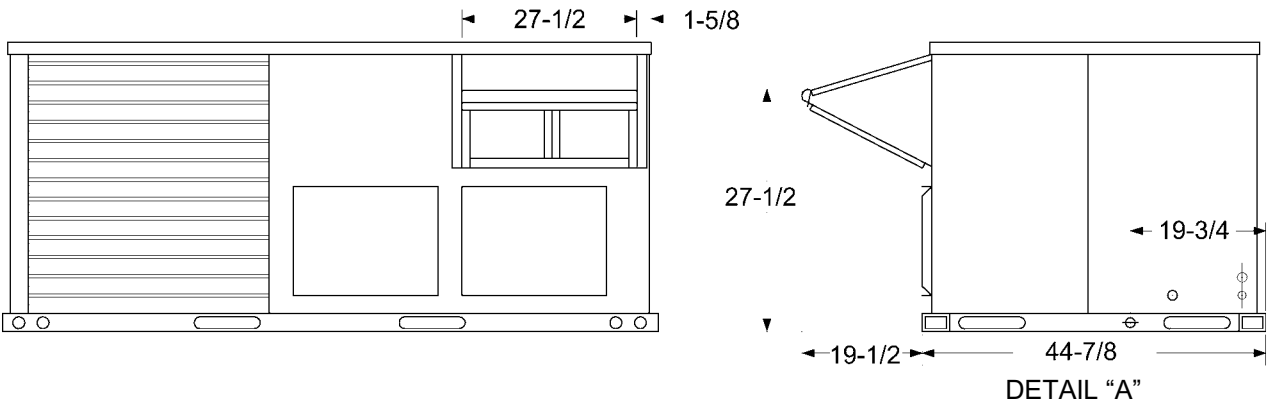


FIGURE 5 - UNIT WITH ECONOMIZER RAINHOOD

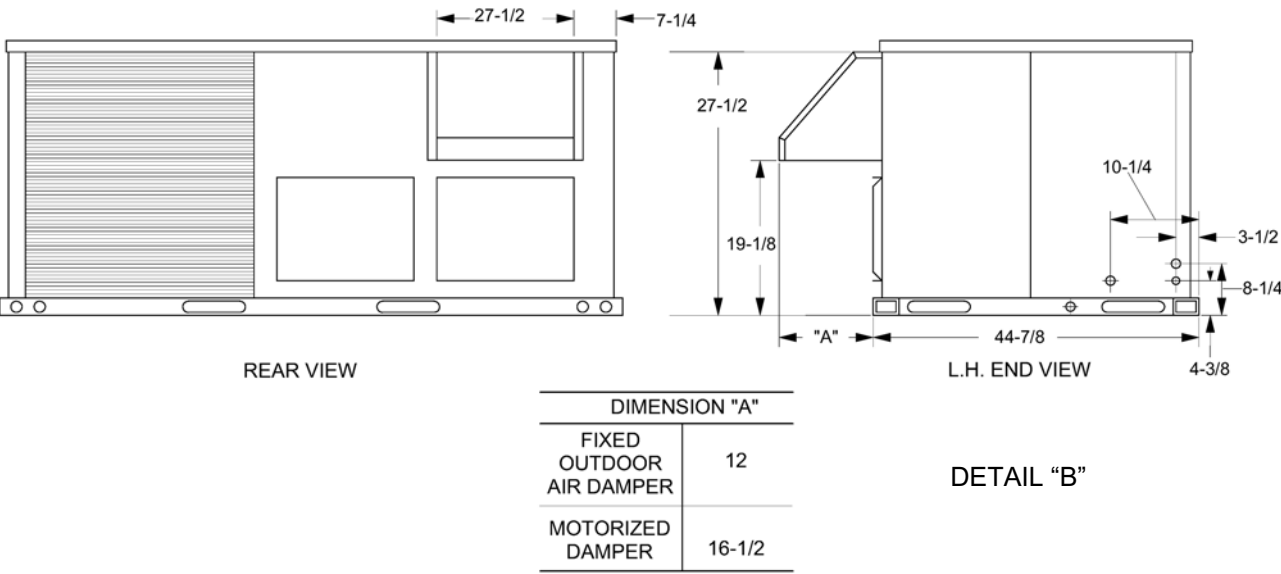


FIGURE 6 - UNIT WITH FIXED OUTDOOR AIR/MOTORIZED DAMPER RAINHOOD

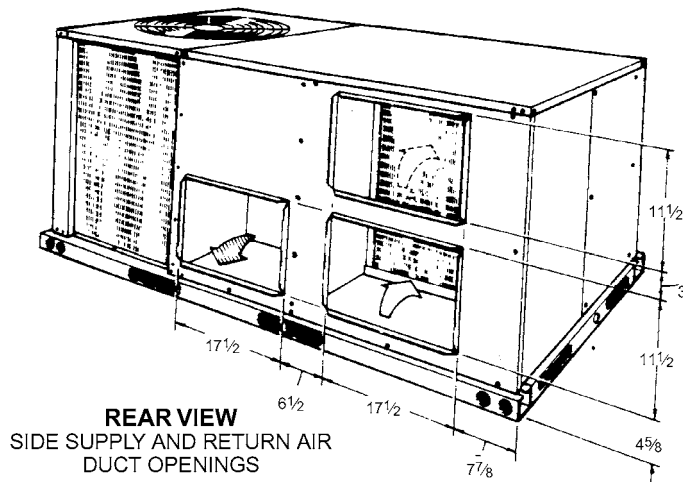


FIGURE 7 - UNIT DIMENSIONS (REAR VIEW)

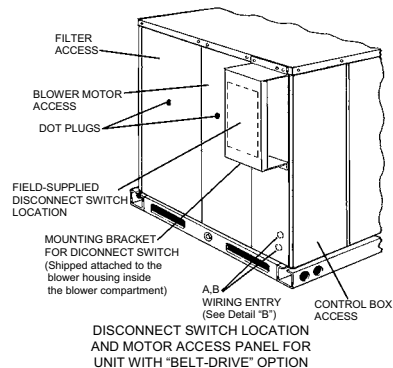


FIGURE 8 - DISCONNECT/BLOWER ACCESS LOCATION

DUCT COVERS - Units are shipped with all air duct openings covered.

For side duct applications;

1. Remove and discard the supply and return air duct covers.
2. Connect ductwork to duct flanges on the rear of the unit.

For bottom duct applications;

1. Remove the side supply air duct cover to gain access to the bottom supply air knockout panel.
2. Remove and discard the bottom knockout panel.
3. Replace the side duct cover.
4. With filter section access panel removed from the unit, remove and discard the bottom return air knockout panel.
5. Replace the filter access panel.

TABLE 18: MINIMUM CLEARANCES

LOCATION	CLEARANCE
Front	24" (Cooling/Electric Heat)
	32" (Gas Heat)
Rear	12" (Less Economizer)
	36" (With Economizer or Fixed Air/Motorized Damper)
Left Side (Filter Access)	24" (Less Economizer)
Right Side (Cond. Coil)	36" (With Economizer)
Below Unit ¹	0"
Above Unit ²	72" (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.

TABLE 17: UTILITIES ENTRY

HOLE	OPENING SIZE (DIA.)	USED FOR	
A	7/8" KO ¹	Control Wiring ²	Side
			Bottom
B	2" KO ¹	Power Wiring	Side
			Bottom
C	1-5/8" KO	Gas Piping (Front)	
D	1-1/2" KO	Gas Piping (Bottom)	

1. Opening in the bottom to the unit can be located by the side in the insulation.
2. Do not remove the 2" knockout ring.

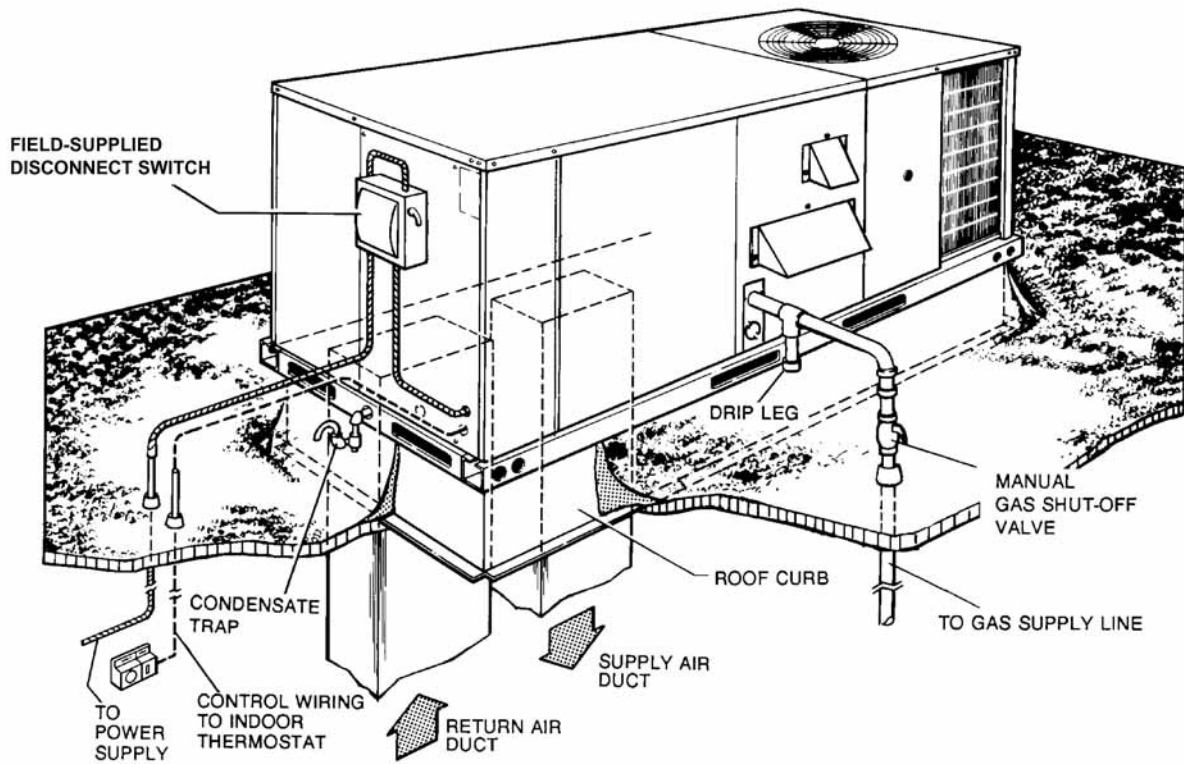
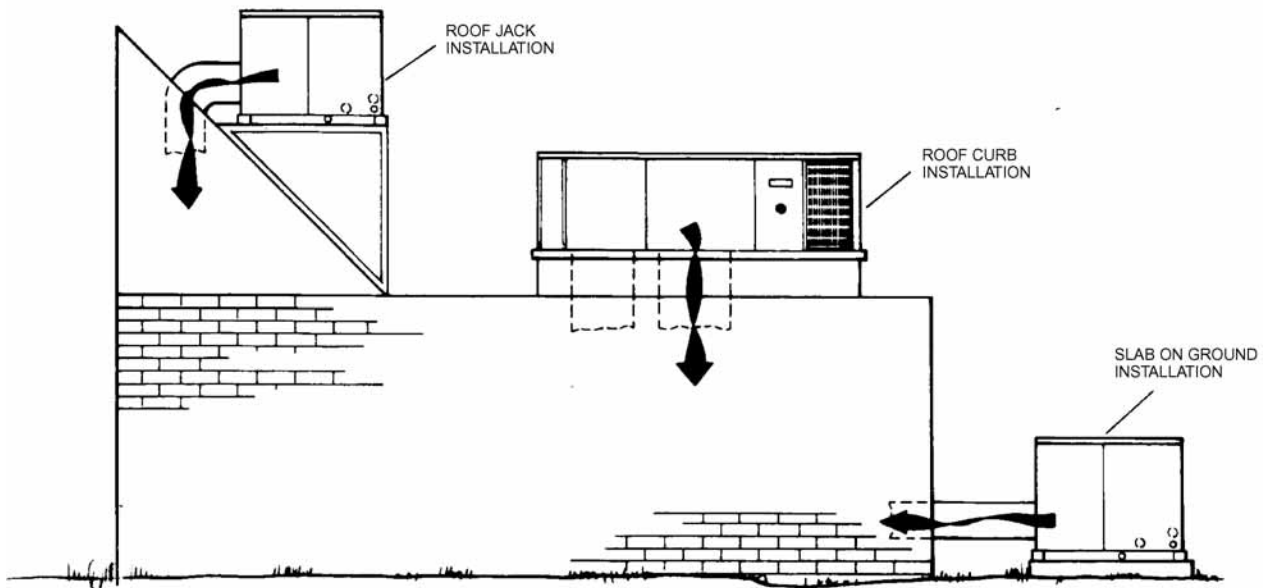


FIGURE 9 - TYPICAL APPLICATIONS

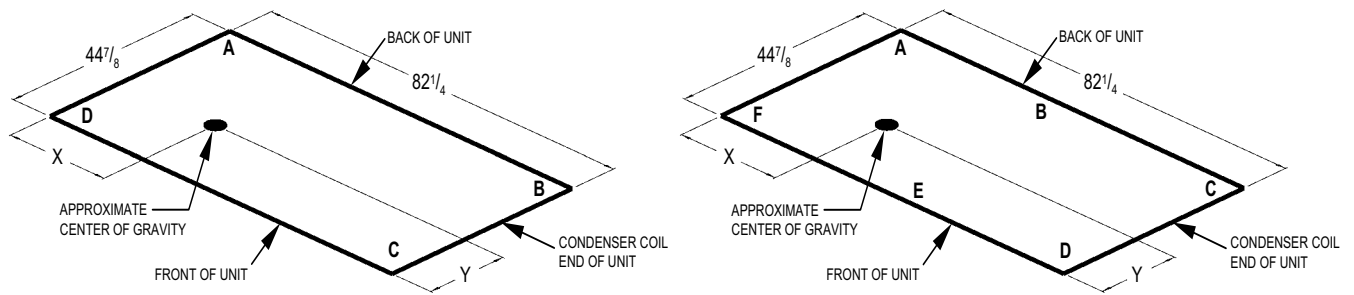


FIGURE 10 - FOUR AND SIX POINT LOADING

TABLE 19: D(HE, HG) 4 AND 6 POINT LOADS WEIGHT DISTRIBUTION

UNIT	TOTAL	4-Point Loading (lb)				6-Point Loading (lb)					
		A	B	C	D	A	B	C	D	E	F
DHE036 Cooling/ Electric	565	125	123	157	160	84	83	82	104	105	107
DHG036N040	605	134	132	168	171	90	89	88	112	113	114
DHG036N079	625	139	136	173	177	93	92	91	115	117	118
DHE048 Cooling/ Electric	610	135	133	169	172	91	89	88	112	114	115
DHG048N060	660	147	144	183	186	98	97	96	122	123	125
DHG048N099	680	151	148	189	192	101	100	99	125	127	128
DHE060 Cooling/ Electric	645	143	141	179	182	96	95	93	119	120	122
DHG060N079	705	157	154	196	199	105	103	102	130	132	133
DHG060N099	715	159	156	198	202	106	105	104	132	133	135

TABLE 20: CENTER OF GRAVITY

DIMENSION	3 - 5 TON
X	40-3/4"
Y	19-3/4"

TABLE 21: OPERATING WEIGHTS (LBS.)

MODEL SIZE			3 TON	4 TON	5 TON
BASIC UNIT	DHE (Cooling Only)		565	610	645
	DHG (Gas/Electric)	N040	605	-	-
		N060	-	660	-
		N079	625	-	705
		N099	-	680	715
OPTIONS OR ACCY.	Economizer		50		
	Motorized Damper		26		
	Electric Heater	5 - 7 kW	18		
		10 - 15 kW	23		
		20 - 30 kW	28		
	Roof Curb		92		
	Barometric Relief / Fixed Air Damper		10		
	Belt-Drive Blower		5		

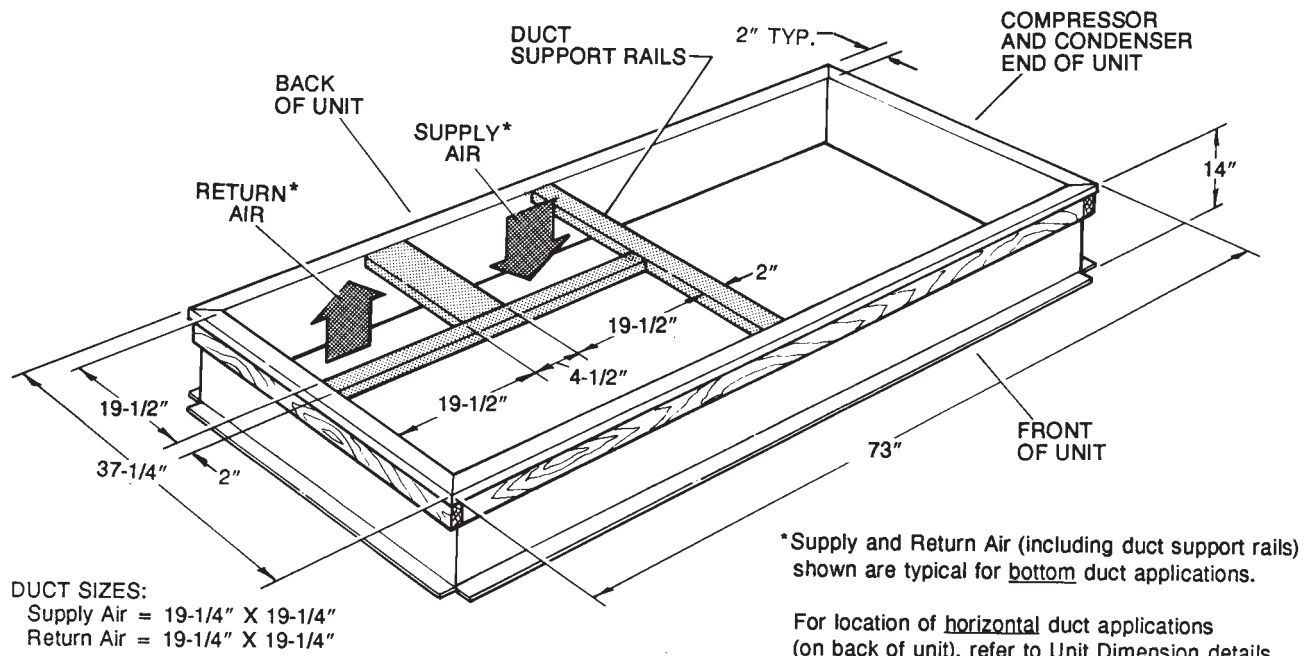


FIGURE 11 - ROOF CURB DIMENSIONS

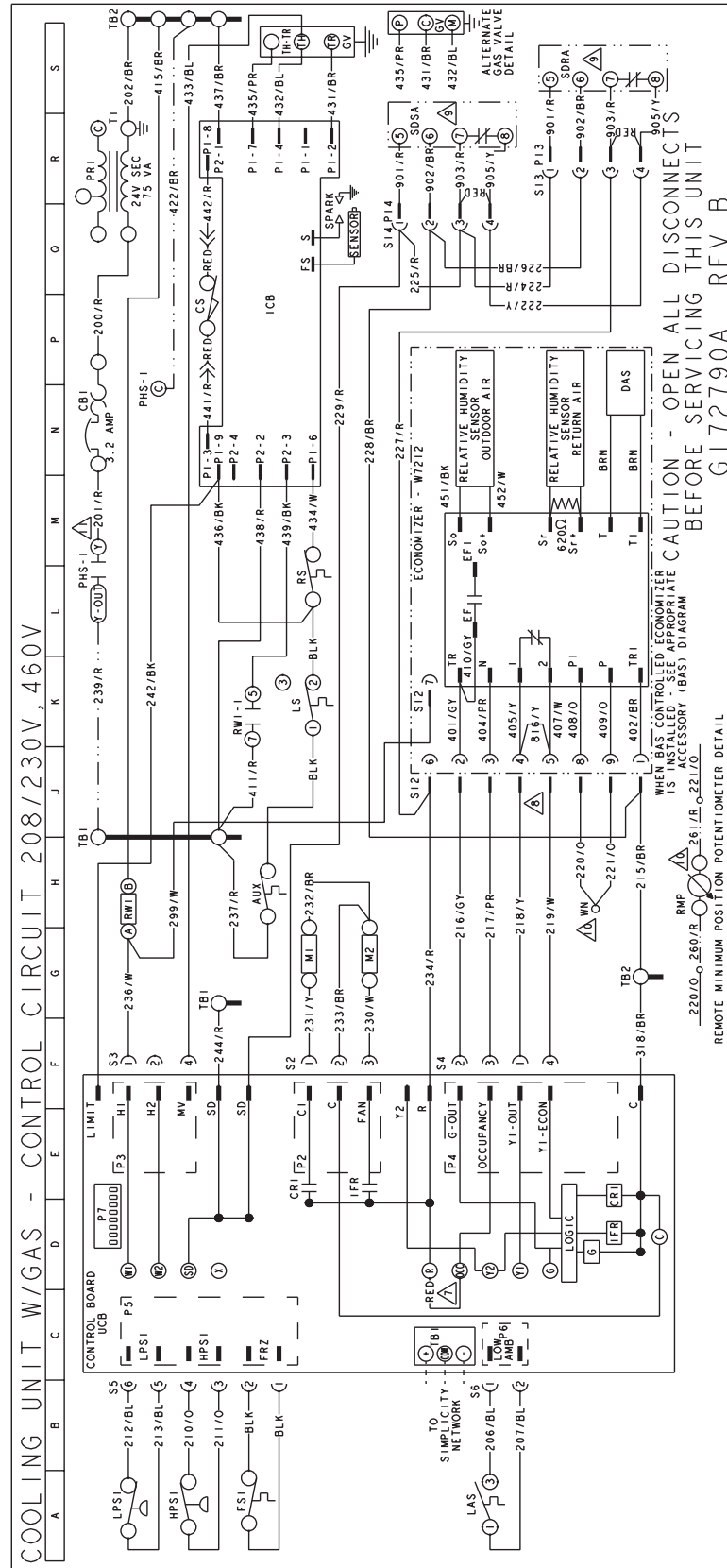
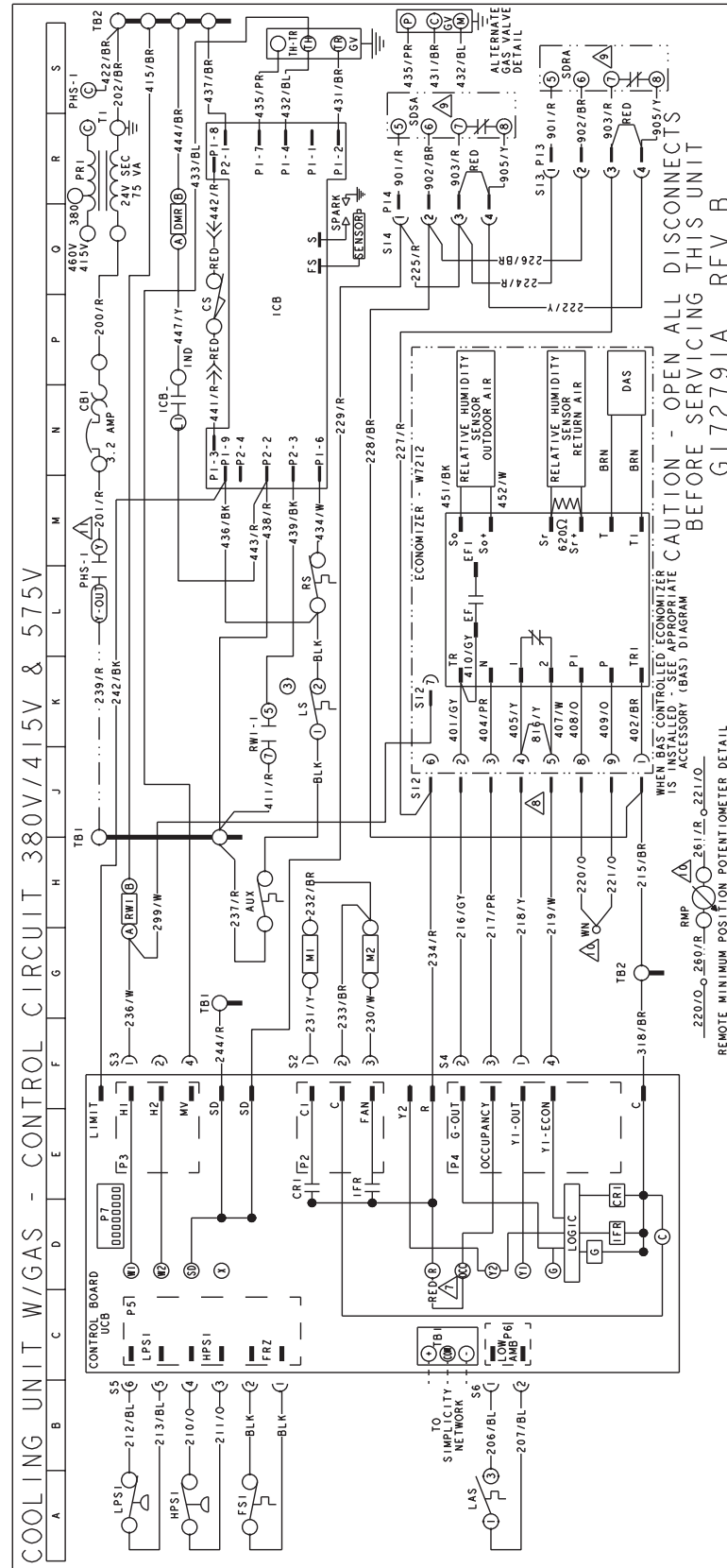


FIGURE 12 - COOLING UNIT WITH GAS HEAT CONTROL CIRCUIT 208/230V AND 460V DIAGRAM



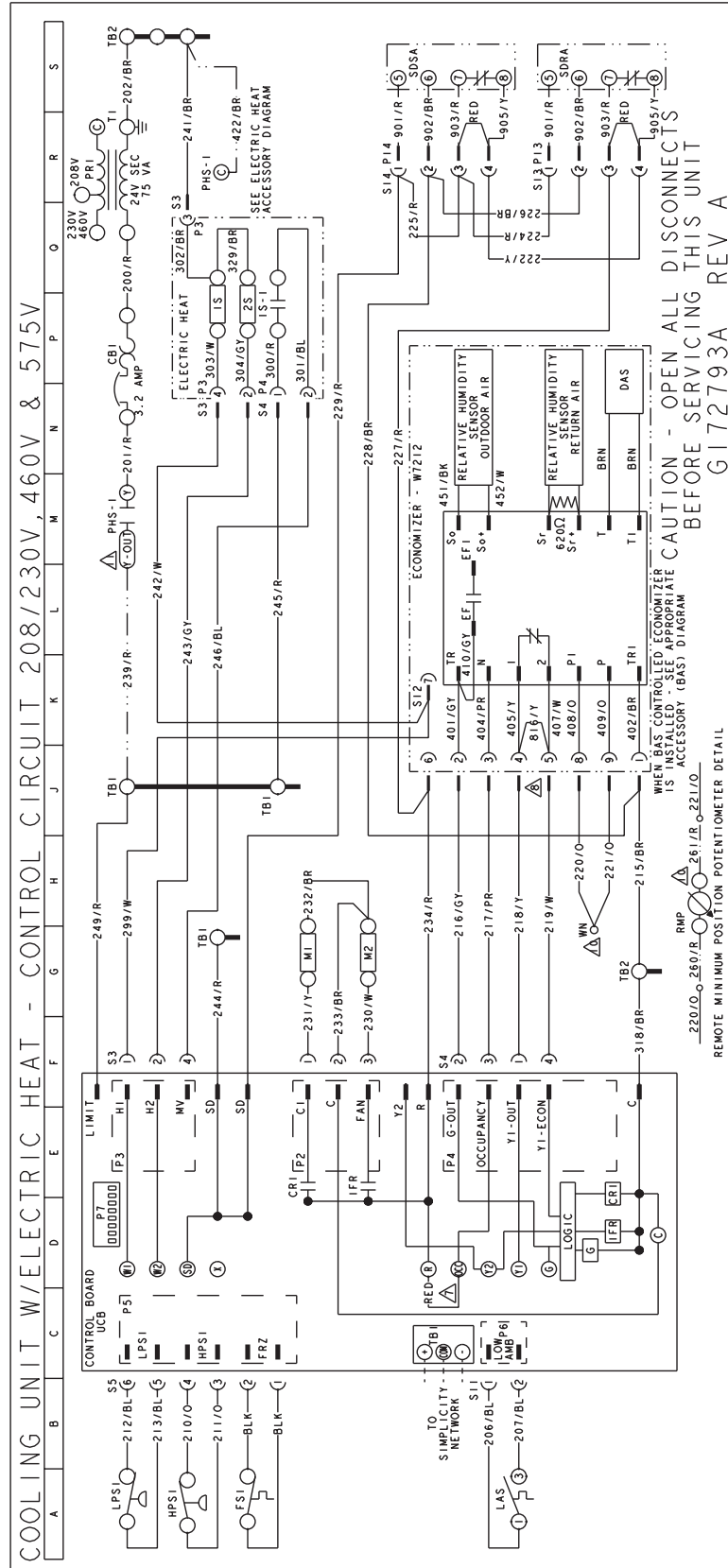
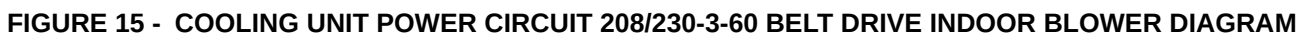


FIGURE 14 - COOLING UNIT WITH ELECTRIC HEAT CONTROL CIRCUIT 208/230V, 460V AND 575V DIAGRAM



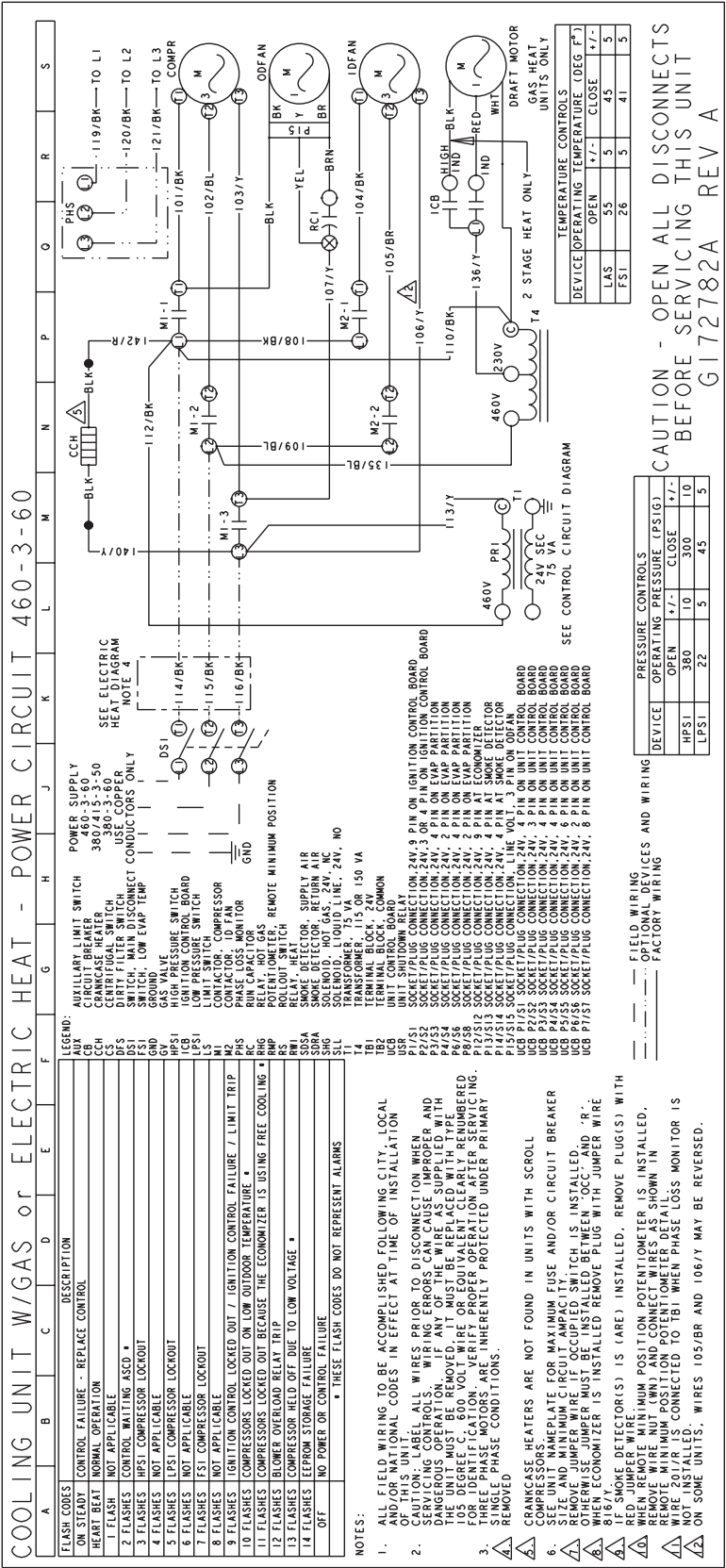


FIGURE 16 - COOLING UNIT W/GAS or ELECTRIC HEAT - POWER CIRCUIT 460-3-60 BELT DRIVE INDOOR BLOWER DIAGRAM



GUIDE SPECIFICATIONS

GENERAL

Units shall be manufactured by York International Unitary Products Group in an ISO 9001 certified facility.

York's Sunline Ultra® units are convertible single package units. 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. Cooling only and cooling with gas heat models are available with a wide variety of factory-mounted options and field-installed accessories to make them suitable for almost every application. All units are self-contained and assembled on full perimeter base rails with 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. All models (including those with an economizer) are suitable for either bottom or horizontal duct connections. Models with power exhaust are suitable for bottom duct connections only. For bottom duct, remove the sheet metal panels from the supply and return air openings through the base of the unit. For horizontal duct, remove the supply and return air panels on the rear of the unit.

All non-Scroll compressors include crankcase heaters and all compressors have internal pressure relief. Every refrigerant circuit includes 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. The unit control circuit includes a 75 VA transformer, a 24-volt circuit breaker and a relay board with a compressor lockout circuit, a terminal strip for thermostat wiring, plus an additional set of pin connectors to simplify the interface of additional field controls. All units have long lasting powder paint cabinets with 1000 hour salt spray test approval under ASTM B117 procedures. All models are CSA listed. All models include a 1-year limited warranty on the complete unit. Compressors and electric heater elements carry a 5-year warranty. Aluminized steel tubular heat exchangers carry a 10-year warranty.

DESCRIPTION

Units shall be factory-assembled, single packaged, Electric Cooling/Gas Heat, Electric Cooling/Optional Electric Heat and designed for outdoor mounted installation.

The 3 ton, 4 ton and 5 ton units shall have minimum SEER ratings of 12.2, 13.2 and 12.2 respectively. They shall have built-in field convertible duct connections for down discharge supply/return or horizontal discharge supply/return, and be available with factory installed options or field installed accessories. The units shall be factory wired, piped, charged with R-22 refrigerant and factory tested prior to shipment. All unit wiring shall be both numbered and color coded. All units the cooling performance shall be rated in accordance with DOE and ARI test procedures. Units shall be CSA listed, classified to ANSI Z21.47, UL 1995/CSA No. 236 standards.

UNIT CABINET

Unit cabinet shall be constructed of G90 galvanized steel, with exterior surfaces coated with a non-chalking, powdered paint finish, certified at 1000 hours salt spray test per ASTM B117 standards. Indoor blower section shall be insulated with a minimum 1/2" thick insulation, coated on the air-side. Aluminum foil faced insulation shall be used in the furnace compartment and be fastened with ridged fasteners to prevent insulation from entering the air stream. Cabinet panels shall be "large" size, easily removable for servicing and maintenance. Full perimeter base rails shall be provided to assure reliable transit of equipment, overhead rigging and proper sealing on roof curb applications. Disposable 1" filters shall be furnished and be accessible through a removable access door, sealed airtight. Units filter track shall be designed to accommodate either 1" or 2" filters. Fan performance measuring ports shall be provided on the outside of the cabinet to allow accurate air measurements of evaporator fan performance without removing panels or creating air bypass of the coils. Condensate pan shall be internally sloped and conform to ASHRAE 62-89 self-draining standards. Condensate connection shall be a minimum of 3/4" I.D. female and be a ridged mount connection.

INDOOR (EVAPORATOR) FAN ASSEMBLY

The indoor fan shall be a factory installed belt drive assembly that includes an adjustable pitch motor pulley. Job site selected brake horsepower (B.H.P.) shall not exceed the motors nameplate horsepower rating, plus the service factor. Units shall be designed not to operate above service factor. Fan wheel shall be double-inlet type with forward-curved blades, dynamically balanced to operate smoothly throughout the entire range of operation. Airflow design shall be constant air volume. Bearings shall be sealed and permanently lubricated for longer life and no maintenance.

OUTDOOR (CONDENSER) FAN ASSEMBLY

The outdoor fan shall be of the direct-driven propeller type, discharge air vertically, have aluminum blades riveted to a corrosion resistant steel spider bracket and shall be dynamically balanced for smooth operation. The outdoor fan motor shall be totally enclosed with permanently lubricated bearings, internally protected against overload conditions and staged independently.

REFRIGERANT COMPONENTS

Compressor:

- a. Shall be internally protected with internal high-pressure relief and over temperature protection.
- b. Shall have internal spring isolation and sound muffling to minimize vibration and noise, and be externally isolated on a dedicated, independent mounting.

Coils:

- a. Evaporator and condenser coils shall have aluminum plate fins mechanically bonded to seamless internally enhanced copper tubes with all joints brazed. Special Phenolic coating shall be available as a factory option.
- b. Evaporator and Condenser coils shall be of the direct expansion, draw-thru, design.

Refrigerant Circuit and Refrigerant Safety Components shall include:

- a. Thermal expansion devices (TXV's).
- b. Filter drier/strainer to eliminate any moisture or foreign matter.
- c. Accessible service gage connections on both suction and liquid lines to charge, evacuate, and measure refrigerant pressure during any necessary servicing or troubleshooting, without losing charge.
- d. The refrigeration system shall provide at least 15°F of sub-cooling at design conditions.

UNIT CONTROLS

- a. Unit shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-volt transformer side.
- b. Unit shall incorporate a lockout circuit which provides reset capability at the space thermostat or base unit, should any of the following standard safety devices trip and shut off compressor.
- c. Loss-of-charge/Low-pressure switch.
- d. High-pressure switch.
- e. Freeze-protection thermostat, evaporator coil.
- f. If any of the above safety devices trip, a LED (light-emitting diode) indicator shall flash a diagnostic code that indicates which safety switch has tripped.
- g. Unit shall incorporate "AUTO RESET" compressor over temperature, over current protection.
- h. Unit shall operate with conventional thermostat designs and have a low voltage terminal strip for easy hook-up.
- i. Unit control board shall have on-board diagnostics and fault code display.
- j. Standard controls shall include anti-short cycle and low voltage protection, and permit cooling operation down to 0°F.
- k. Control board shall monitor each refrigerant safety switch independently.
- l. Control board shall retain last 5 fault codes in non volatile memory which will not be lost in the event of a power loss.

GAS HEATING SECTION

Shall be designed with induced draft combustion with post purge logic, energy saving direct spark ignition, and redundant main gas valve. Venter wheel shall be constructed of stainless steel for corrosion resistance. The heat exchanger shall be of the tubular type, constructed of T1-40 aluminized steel for corrosion resistance and allowing minimum mixed air entering temperature of 25°F. Burners shall be of the inshot type, constructed of aluminum coated steel and contain air mixture adjustments. All gas piping shall enter the unit cabinet at a single location through either the side or curb without any field modifications. Integrated control boards shall provide timed control of evaporator fan functioning and burner ignition. Heating section shall be provided with the following minimum protection:

- a. Primary and auxiliary high-temperature limit switches.
- b. Induced draft motor speed sensor.
- c. Flame roll out switch.
- d. Flame proving controls.
- e. If any of the above safety devices trip, a LED (light-emitting diode) indicator shall flash a diagnostic code that indicates which safety switch has tripped.

ELECTRIC HEATING SECTION

An electric heating section, with nickel chromium elements, shall be provided in a range of 5 thru 30 KW, offering two stages of capacity - 16 KW and above on 208/230 volt heaters and 20 KW and above on 460 and 575 volt heaters. The heating section shall have a primary limit control(s) and automatic reset to prevent the heating element system from operating at an excessive temperature. The heating section assembly shall slide out of the unit for easy maintenance and service. Units with Electric Heating shall be wired for a single point power supply with branch circuit fusing (where required).

UNIT OPERATING CHARACTERISTICS

- a. Unit shall be capable of starting and running at 125°F outdoor temperature, exceeding maximum load criteria of ARI Standard 210/240.
- b. The compressor, with standard controls, shall be capable of operation down to 0°F outdoor temperature.
- c. Unit shall be provided with fan time delay to prevent cold air delivery before heat exchanger warms up (Gas heat only).

ELECTRICAL REQUIREMENTS

All unit power wiring shall enter unit cabinet at a single factory provided location and be capable of side or bottom entry, to minimize roof penetrations and avoid unit field modifications. Separate side and bottom openings shall be provided for the control wiring.

STANDARD LIMITED WARRANTIES

- Compressor 5 Years
- Heat Exchanger 10 Years
- Electric Heat Element 5 Years
- Other Parts 1 Year

OPTIONAL OUTDOOR AIR (Shall be made available by either/or):

- **ELECTRONIC ENTHALPY AUTOMATIC ECONOMIZER**- Outdoor and return air dampers that are interlocked and positioned by a fully-modulating, spring return damper actuator. The maximum leakage rate for the outdoor air intake dampers shall not exceed 2% when dampers are fully closed and operating against a pressure differential of 0.5 IWG. A unit-mounted potentiometer shall be provided to adjust the outdoor and return air damper assembly to take in CFM of outdoor air to meet the minimum ventilation requirement of the conditioned space during normal operation. During economizer operation, a mixed-air temperature control shall modulate the outdoor and return air damper assembly to prevent the supply air temperature from dropping below 55°F. Changeover from compressor to economizer operation shall be provided by an integral electronic enthalpy control that feeds input into the basic module. The outdoor intake opening shall be covered with a rain hood that matches the exterior of the unit. Water eliminator/filters shall be provided. Simultaneous economizer/compressor operation is also possible. Dampers shall fully close on power loss.

OTHER PRE-ENGINEERED ACCESSORIES AVAILABLE

- **ROOF CURB** - 14"and 8" high, full perimeter curb with wood nailer (shipped knocked-down).

- **BAROMETRIC RELIEF DAMPER** - Contains a rain hood, air inlet screen, exhaust damper and mounting hardware. Used to relieve internal air pressure through the unit.
- **PROPANE CONVERSION KIT** - Contains new orifices and gas valve parts to convert from natural to L.P. gas. One per unit required.
- **HIGH ALTITUDE - NATURAL GAS** - Contains orifices required for applications between 2000 and 6000 feet altitude.
- **HIGH ALTITUDE - PROPANE GAS** - Contains orifices required for applications between 2000 and 6000 feet altitude. Must be used with propane conversion kit.
- **LOW NOX** - Required to reduce the emission of nitrogen oxides below 40 nanograms per joule.
- **GAS PIPING** - Contains 1/2" pipe nipples, fittings and gas cock (including panel assess gaskets) required for bottom gas supply connection with external shut off.
- **POWER EXHAUST OPTION** - To work in conjunction with economizers.
- **ELECTRIC HEATERS**
- **ECONOMIZER/MOTORIZED DAMPER RAIN HOOD** - Contains all hood panels and the hardware for assembling.
- **MANUAL OUTDOOR AIR DAMPER**
- **COIL GUARD KIT** - Guard for condenser coil.
- **HAIL GUARD**
- **FLUE EXHAUST EXTENSION**
- **TECHNICOAT PHENOLIC COATED CONDENSER COIL**
- **ELECTRONIC SINGLE ENTHALPY ECONOMIZER**

