

Technical Sales Guide – 50 Hz

# DEH Stellar Medium Series

Air Cooled Packaged Air Conditioners  
13 TR (R-410a)



**Stellar Medium Series**

**“Include YORK Simplicity Controller”**

 **YORK**<sup>®</sup>  
INSTALL CONFIDENCE.

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PIN NUMBER GUIDELINES



**Series Name**

D = A/C, Single Package, R-410a

E = Energy Efficient (ESMA, ESTEDAMA & TRAKHEES Compliant)

**Product Identifier**

H = High Ambient Operation  
 HD = High Amb. Operation Double Skin

**Nominal Cooling Capacity**

160 = 13.0 Tons

**Mode**

C02 = Cooling -R-410a

**Motor Option**

A = Standard motor  
 B = Over size motor

**Power Supply**

4 = 380-415V /3Ph / 50Hz

**Product Generation**

1 = First generation

**Field Installed Options**

- 1 = No option installed
- 2 = 18 Kw electric heater
- 3 = 36 Kw electric heater
- 4 = Fresh air damper

**Factory Installed Options**

- A = No option installed
- B = Heresite coating on condenser coil
- C = Heresite Coating on Evaporator Coil
- D = 2" Aluminum Washable Filter
- E = Cu/Cu on Condenser Coil
- F = Cu/Cu on Evaporator Coil
- G = Disconnect Switch
- H = Phase Monitor
- I = BMS [Building Management System]
- J = High Speed Drive
- K = Low Speed Drive
- L = UV Lamp
- M = Dirty Filter Switch
- N = Low Ambient Kit
- P = Smoke Detector
- Q = 18 KW Heater
- R = 36 KW Heater
- S = Mixing Box [Double Skin]
- T = Temperature Economizer [Double Skin]
- U = Enthalpy Economizer [Double Skin]
- V = Bag Filter 85% Effcy.[Double Skin]
- W = Moisture Eliminator [Double Skin]
- X = VFC for comp.[Status on/off]
- Y = Pressure Guages

## DESCRIPTION

Model DEH 160 (13 Nominal Tons)

**YORK STELLAR** Units are single package energy efficient high ambient rooftops air conditioner. A Model have independent dual refrigerant circuits for efficient part load operation. **STELLAR** units are designed for roof top slab mounted at ground level or on steel platform installation above floor or roof. A wide range of factory mounted options and field installed accessories make the STELLAR units suitable for almost every application.

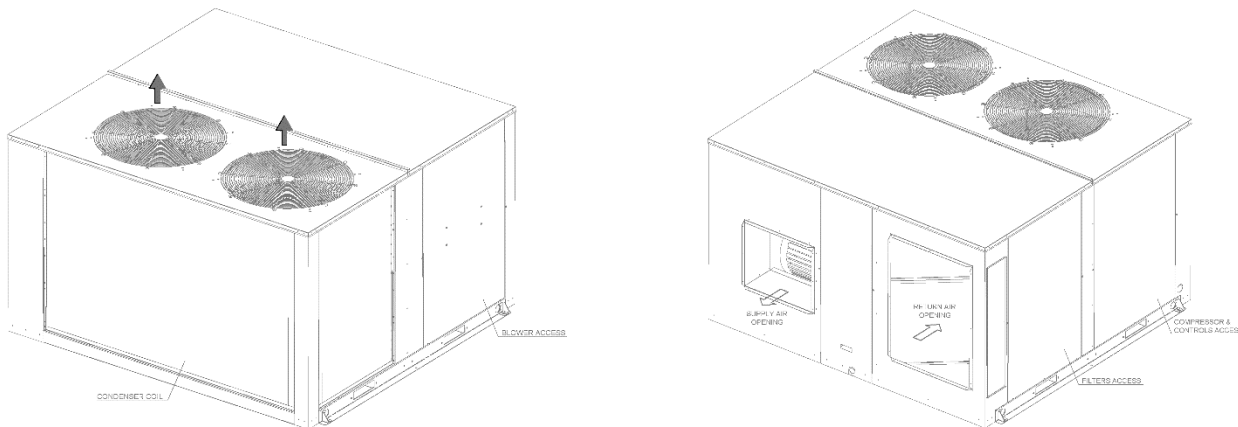
**YORK STELLAR** units are designed to operate satisfactorily in wide range of ambient temperatures from 131°F (55°C) down to 50°F (10°C) as standard.

**YORK STELLAR** packaged air conditioners are rated in accordance with AHRI 340/360

### All standard units include:

- Powder paint finish that meets ASTM B 117, 750 hour salt spray standard. For Double skin construction with Painted GI outer skin in attractive champagne color that meet ASTM B 117, 750 hour salt spray standard.
- Two-stage cooling provided by dual independent refrigeration circuits with expansion valves, filter drier, high and low pressure switches and freestats.
- High efficiency hermetic scroll compressors.
- Side air discharge configuration.
- Belt drive blower motor with variable pitch pulley.
- Totally Enclosed Fan Cooled (TEFC) IP55 Evaporator fan motors with Class F Insulation.
- Totally Enclosed Air over (TEAO) IP55 Condenser fan motors with Class F Insulation.
- Microprocessor based Simplicity TM control board.
- Fresh air intake panel.
- Copper tubes / Aluminum fins Evaporator coils.
- Copper Tubes / Aluminum fins Condenser coils.
- 2 inch disposable filter with easy access.
- Rigging holes in base rails for overhead lifting.
- Single point power connection.
- Complete factory package-tested, charged and wired.

### TYPICAL UNIT CONFIGURATION



## FEATURES

Stellar units are self-contained and assembled on full perimeter base rails with rigging 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 are suitable for horizontal duct connections. The power supply can be routed into the control box through a gland in the wiring panel on the front of the unit.

Compressors are Hermetic scroll type of an advanced design ensuring high Energy Efficiency Ratio, less noise, less vibration and outstanding endurance. Crankcase heaters, internal pressure relief valve, internal compressor motor protection. Every refrigerant circuit includes an expansion valve, liquid line filter-drier, a discharge line high pressure switch and suction line freeze stat and low pressure switch to protect all system components.

Each supply air blower is equipped with a belt drive that can be adjusted to meet the exact requirements of the application. A high or low static drive option is available for applications with a higher or lower airflow and / or static pressure requirement. All evaporator blower motors are weatherproof TEFC IP55 with Class F insulation.

A fixed outdoor air intake connection that is designed for 25% fresh air is available as standard. Fresh air dampers are optional for field / factory installation.

Condenser fans are propeller type of heavy duty construction, dynamically balanced and suitable for operate up to 80°C ambient. Fans are driven by TEAO IP55 motors with Class F insulation. The fan blade pitch Angle is designed for maximum airflow and minimum noise.

The evaporator and condenser coils are constructed of seamless internally enhanced copper tubes and aluminum tubes which are mechanically bonded to aluminum fins. Heat Exchangers are tested to a minimum pressure of 445/236 psig High/Low.

A SS painted drain pan with bottom condensate removal ensures zero water retention and no corrosion that ensures indoor air quality (IAQ).

All units have long lasting powder paint cabinets with a robust 40 microns thick paint coating that meets ASTM- B-117 standards and suitable for 750 hour salt spray test, ensuring excellent resistance to corrosion in the harshest conditions. The cabinet of all Stellar is internally lined by 13mm Elastomeric insulation that minimize heat gain and improves IAQ.

All Stellar units are equipped with a control panel that includes all the necessary operating and safety controls that are needed for reliable operation. Compressors are protected with internal thermal overload and fan motors with external overload. Transformers and control circuits are protected with fuses.

The Simplicity SE improve occupant comfort by providing reliable control of standard Rooftop Units (RTU), including both split system and heat pump equipment types. The innovative control algorithms provide superior temperature control of HVAC equipment.

The Simplicity SE advanced Direct Digital Control (DDC) controllers are bundled with Single Packaged Units (SPUs), actuators, sensors, and damper assemblies.

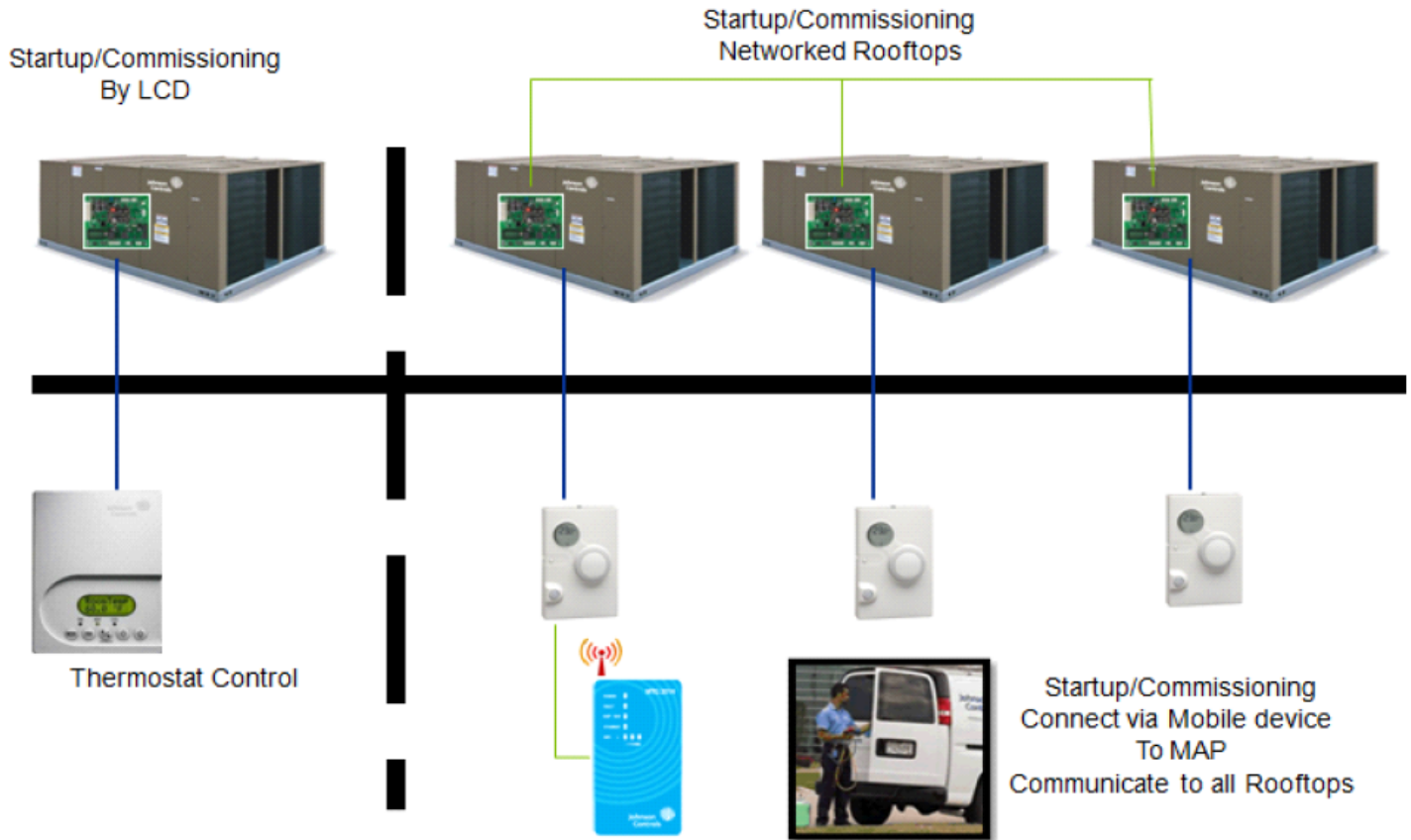
Advanced operating modes, such as Fault Detection Diagnostics, load shed, power exhaust, demand controlled ventilation (DCV), and occupancy sensing, ensure that Simplicity SE are the most advanced equipment offering within the light commercial market.

The operation of the package units is masterminded by the microprocessor based Simplicity™ control board which provides both intelligent monitoring and easy Diagnostics, as featured below

- **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.
- **Fan Delays:** Fan on and fan off delays are fully programmable. All units are programmed with default values based upon their configuration of cooling and heating
- **Safety Monitoring:** High flow pressure switches and suction line freeze stats are supplied on all units to protect against loss of charge and the occurrence of coil frosting. The control board monitors the high and low pressure switches and the freeze stats. The unit control board will alarm on compressor lockouts and repeated limit switch trips on electric heat units.
- **Nuisance Trip Protection:** To prevent nuisance Trouble calls. 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 associated compressor.
- **On Board Diagnostics:** Each alarm will energize an error on UCB LCD, Each high and low-pressure switch alarm as well as each freeze stat alarm has its own error code. The control board saves the five most recent alarms in memory, and these alarms can be reviewed at any time.

# Simplicity SE Network Architecture (Optional Features)

The following figures highlight the typical equipment setup for different application requirements.



## Typical Setup for Stand-alone Thermostat or Networked Equipment with Network Sensors



Communicating Equipment with Zone Sensors, Network Sensors, or Thermostat Control



**OPTIONS AVAILABLE**

- **Heresite Coated Evaporator and Condenser Coils (factory installed):** Coating is applied by spray for maximum corrosion protection.
- **Copper Tube and Copper Fin Condenser Coils (factory installed).**
- **Copper Tube and Copper Fin Evaporator Coils (factory installed)**
- **Filter Options:** Standard units are shipped, installed with 2" throw away filters. 2" washable aluminum filters and 4" pleated filter are offered as a factory installed option.
- **Bag Filters (factory installed):** Units can be supplied with standard size bag filters, depth 22" and efficiency 65%, 85% & 95%. For this option, add 800 mm in unit length.
- **High And Low Speed Drive (factory installed) :** Includes a belt and blower pulley to upgrade or downgrade the blower performance.
- **Fresh Air Dampers:** Manual or motorized
- **Electric Heaters:** All electric heat models (heater factory/field installed only) are wired for a single power source and include a bank of nickel chromium elements to be 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 high temperature thermal cut-out (HTIC).
- **Phase Monitors (factory installed):** Design to prevent unit damage, the phase monitor will shut the unit down in an out of phase condition.
- **Main Disconnect Switch (factory installed):** Suitably sized in accordance with the applicable electrical codes.
  - **Thermostat (field installed):** For 2 stage cooling only and a 2 stage heating.
- **BMS Controls: York's stellar series units offer factory mounted BMS controls-consult your local sales office for details.**
- **Low Ambient Kit (factory installed):** For unit to work satisfactorily down to 32°F (0°C)
  - **Smoke Detectors for supply air & return air (factory in- stalled):** The smoke detectors stop operation of the unit by interrupting power to the control board if smokes detected within the air compartment.
  - **Ultra violet Lamps: Factory Installed**
- **Economizer (factory installed):** Stellar units offer an optional factory installed economizer with low leak dampers, single enthalpy and double enthalpy controls. When selecting this option, add 1100 mm in unit length.

**SELECTION METHOD:**

The following steps illustrate the selection of a DEH Package Unit for a Total Capacity requirement of 60.5 MBh and an Airflow of 4,600 cfm. The unit operating Parameters are;

Entering Air Temperature: 80/67°F (DB/WB)  
 Ambient Temperature: 95°F Fan External  
 Static Pressure: 1.0 inch wg.

**Step 1** Select the unit model by referring to "Cooling Performance data" table for 95°F ambient on Page 9 Scroll down the "Total capacity" and "Entering Air WBT" columns until 60.5 MBH With (or a value close to it) is found at 67°F WB For an airflow close to 4,600 cfm. The selected model is DEH-160 giving total Capacity 161.8 MBH with the actual compressor power input being 11.3 Kw.

**Step 2** For the sensible capacity read the value at the Intersection of the same row (as the WB in step1)

and the 80° DB column on the right. The Sensible capacity for the unit in this example is 111.3 MBh.

- Step 3** Refer "Fan Performance Data" on page 13 to Check the motor size and fan rpm. Scroll down the "1.0 inch wg ESP" column to the 4,600 cfm row for DEH 160. The fan speed is 707 rpm and fan power input 1.37 Kw. The Yellow color of the box indicates that the Standard motor 3.0 Kw will be required.
- Step 4** To arrive at the correct drive set to be ordered the unit, refer "Drive & Pulley Data" on page 14 the fan rpm from step 3 to select the correct drive set. The package unit in this example will require a standard drive set.

**PRODUCT DATA**

Model				DEH 160	
(AHRI Condition) 95°F (35°C) Outdoor Ambient Temperature @ 80°F DB / 67°F WB (26.6°C DB /19.4°C WB) Indoor air Temperature	EER Gross		Btuh / W		11.6
	EER Net		Btuh / W		11.3
	Capacity Gross	MBh	Kw	162.1	(47.4)
	Capacity Net	MBh	Kw	158.02	(46.3)
	Total Power Input	Hp	kW	18.6	(13.9)
(T1 Condition) 95°F (35°C) Outdoor Ambient Temperature @ 80.6°F DB / 66.2°F WB (27°C DB /19°C WB) Indoor air Temperature	EER Gross		Btuh / W		11.4
	EER Net		Btuh / W		11.1
	Capacity Gross	MBh	Kw	159.3	(46.7)
	Capacity Net	MBh	Kw	155.2	(45.5)
	Total Power Input	Hp	kW	18.6	(13.9)
(T3 Condition) 115°F (46.1°C) Outdoor Ambient Temperature @ 84.2°F DB / 66.2°F WB (29°C DB /19°C WB) Indoor air Temperature	EER Gross		Btuh / W		8.2
	EER Net		Btuh / W		7.9
	Capacity Gross	MBh	Kw	139.9	(41.0)
	Capacity Net	MBh	Kw	134.8	(39.5)
	Total Power Input	Hp	kW	22.6	(17.0)
Heating Capacities	Option 1	MBh	kW	61	(18)
	Option 2	MBh	kW	123	(36)
Evaporator Coil	Tube / Fins			Enhanced Copper/Aluminum	
	Fins	fpi	mm	14	(1.8)
	Area	ft²	m²	15.3	(1.42)
Condenser Coil	Tube / Fins			Enhanced Copper/Aluminum	
	Fins	fpi	mm	16	(1.58)
	Area	ft²	m²	35.3	(3.27)
Blower Fan & Motor	Fan Type			Forward Curved Centrifugal - DIDW	
	Fan Qty			1	
	Motor Type			4 Pole, Class F insulation, Totally Enclosed Fan Cooled, IP55, 1425 rpm	
	Motor Size std	hp	kW	2	(1.5)
	Motor Size xtd			4	(3)
Condenser Fan & Motor	Type			4 Blades heavy duty Propeller Fan	
	Quantity		#	2	
	Motor Type			6 Pole, Class F insulation, Totally Enclosed Fan Cooled, IP55, 950 rpm	
	Motor size	hp	kW	0.75	(0.55)
	Quantity		#	2	
Compressor	Type			Hermetic Scroll	
	# of Compressor		#	2	
Refrigerant	Type			R410a	
	No of Circuits		#	2	
	Charge Circuit 1	lbs oz	kgs	14	(6.35)
	Charge Circuit 2	lbs oz	kgs	14	(6.35)
Dimensions	Height	inches	mm	51.9 (1319)	
	Width	inches	mm	91.7 (2328)	
	Length	inches	mm	83.6 (2123)	
Filters	24x24x2 Inches		Qty	4	
	Basic Unit	lbs	kgs	1583	(718)

Cooling Performance Data-50Hz

AMBIENT 85 °F 29.4°C

Model	Air Flow Rate		Entering Air WBT		Total Capacity		Power Input	Sensible Capacity											
								76.0 ( 24.4 )		78.0 ( 25.6 )		80.0 ( 26.7 )		82.0 ( 27.8 )		84.0 ( 28.9 )		86.0 (30°C )	
DEH	cfm	L/s	° F	° C	MBh	kW	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
160	3600	1699	62	16.7	152.0	44.5	10.1	102.8	30.1	111.0	32.5	118.6	34.8	125.6	36.8	131.9	38.7	137.4	40.3
			64.5	18.1	158.4	46.4	10.2	91.5	26.8	100.4	29.4	108.8	31.9	116.7	34.2	124.1	36.4	130.8	38.3
			67	19.4	165.1	48.4	10.2	79.9	23.4	89.3	26.2	98.2	28.8	106.7	31.3	114.8	33.6	122.3	35.9
			69.5	20.8	172.0	50.4	10.3	68.4	20.1	78.1	22.9	87.3	25.6	96.2	28.2	104.8	30.7	112.9	33.1
			72	22.2	179.2	52.5	10.3	57.2	16.8	67.1	19.7	76.6	22.4	85.8	25.1	94.6	27.7	103.1	30.2
	4100	1935	62	16.7	155.9	45.7	10.1	111.6	32.7	120.3	35.3	128.2	37.6	135.3	39.6	141.4	41.5	146.6	43.0
			64.5	18.1	162.4	47.6	10.2	99.4	29.1	109.1	32.0	118.1	34.6	126.4	37.1	134.0	39.3	140.9	41.3
			67	19.4	169.1	49.6	10.2	86.5	25.4	96.9	28.4	106.7	31.3	115.9	34.0	124.5	36.5	132.4	38.8
			69.5	20.8	176.1	51.6	10.3	73.6	21.6	84.4	24.7	94.6	27.7	104.4	30.6	113.7	33.3	122.5	35.9
			72	22.2	183.1	53.7	10.4	60.8	17.8	71.9	21.1	82.5	24.2	92.8	27.2	102.5	30.1	111.8	32.8
	4600	2171	62	16.7	158.9	46.6	10.2	119.7	35.1	128.7	37.7	136.7	40.1	143.6	42.1	149.4	43.8	154.0	45.1
			64.5	18.1	165.5	48.5	10.2	106.8	31.3	117.1	34.3	126.6	37.1	135.2	39.6	142.9	41.9	149.6	43.8
			67	19.4	172.3	50.5	10.3	92.8	27.2	104.1	30.5	114.6	33.6	124.3	36.4	133.4	39.1	141.6	41.5
			69.5	20.8	179.2	52.5	10.3	78.5	23.0	90.4	26.5	101.6	29.8	112.2	32.9	122.1	35.8	131.4	38.5
			72	22.2	186.5	54.7	10.4	64.3	18.8	76.6	22.4	88.3	25.9	99.5	29.2	110.1	32.3	120.2	35.2
	5100	2407	62	16.7	161.3	47.3	10.2	127.2	37.3	136.4	40.0	144.3	42.3	150.9	44.2	156.0	45.7	159.6	46.8
			64.5	18.1	168.0	49.2	10.2	113.8	33.4	124.7	36.5	134.5	39.4	143.2	42.0	150.8	44.2	157.1	46.0
			67	19.4	175.0	51.3	10.3	98.9	29.0	110.9	32.5	122.1	35.8	132.3	38.8	141.6	41.5	149.9	43.9
			69.5	20.8	182.1	53.4	10.4	83.4	24.4	96.2	28.2	108.3	31.7	119.6	35.1	130.1	38.1	139.8	41.0
			72	22.2	189.1	55.4	10.4	67.5	19.8	81.0	23.7	93.8	27.5	105.9	31.0	117.3	34.4	127.9	37.5

Note: These capacities are gross ratings. For net capacity deduct the heat of the supply air blower motor Brake Power x 3.415/Motor efficiency = MBH  
 Refer to the appropriate Blower Performance table for the Brake Power of the supply air blower. Power input includes compressor & condenser Motors.



Cooling Performance Data-50Hz

AMBIENT95 °F 35°C

Model	Air Flow Rate		Entering Air WBT		Total Capacity		Power Input	Sensible Capacity											
								76.0 ( 24.4 )		78.0 ( 25.6 )		80.0 ( 26.7 )		82.0 ( 27.8 )		84.0 ( 28.9 )		86.0 ( 30°C )	
DEH	cfm	L/s	° F	° C	MBh	kW	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
160	3600	1699	62	16.7	143.1	41.9	11.1	100.0	29.3	107.9	31.6	115.1	33.7	121.7	35.7	127.5	37.4	132.5	38.8
			64.5	18.1	149.1	43.7	11.2	89.0	26.1	97.7	28.6	105.9	31.0	113.5	33.3	120.4	35.3	126.7	37.1
			67	19.4	155.5	45.6	11.3	77.6	22.8	86.8	25.5	95.6	28.0	103.9	30.4	111.6	32.7	118.9	34.8
			69.5	20.8	161.8	47.4	11.3	66.2	19.4	75.7	22.2	84.9	24.9	93.6	27.4	101.9	29.9	109.8	32.2
	72	22.2	168.5	49.4	11.4	55.0	16.1	64.8	19.0	74.2	21.7	83.3	24.4	92.0	27.0	100.3	29.4		
	4100	1935	62	16.7	146.6	43.0	11.2	108.4	31.8	116.7	34.2	124.2	36.4	130.7	38.3	136.2	39.9	140.7	41.2
			64.5	18.1	152.6	44.7	11.2	96.6	28.3	106.0	31.1	114.7	33.6	122.6	35.9	129.7	38.0	136.0	39.9
			67	19.4	158.9	46.6	11.3	84.1	24.6	94.2	27.6	103.7	30.4	112.6	33.0	120.9	35.4	128.4	37.6
			69.5	20.8	165.4	48.5	11.4	71.3	20.9	81.9	24.0	92.0	27.0	101.5	29.8	110.6	32.4	119.0	34.9
	72	22.2	172.0	50.4	11.4	58.5	17.1	69.5	20.4	80.0	23.5	90.1	26.4	99.7	29.2	108.7	31.9		
	4600	2171	62	16.7	149.2	43.7	11.2	116.1	34.0	124.6	36.5	132.0	38.7	138.2	40.5	143.2	42.0	146.9	43.0
			64.5	18.1	155.4	45.5	11.3	103.8	30.4	113.8	33.3	122.8	36.0	130.9	38.4	137.9	40.4	143.9	42.2
67			19.4	161.8	47.4	11.3	90.2	26.4	101.2	29.6	111.3	32.6	120.7	35.4	129.3	37.9	137.0	40.2	
69.5			20.8	168.3	49.3	11.4	76.1	22.3	87.8	25.7	98.7	28.9	109.1	32.0	118.7	34.8	127.6	37.4	
72	22.2	175.0	51.3	11.5	61.8	18.1	74.0	21.7	85.6	25.1	96.6	28.3	107.0	31.4	116.7	34.2			
5100	2407	62	16.7	151.4	44.4	11.2	123.2	36.1	131.7	38.6	138.9	40.7	144.6	42.4	148.8	43.6	151.3	44.3	
		64.5	18.1	157.7	46.2	11.3	110.6	32.4	121.0	35.5	130.2	38.2	138.3	40.5	145.1	42.5	150.6	44.1	
		67	19.4	164.2	48.1	11.4	96.1	28.2	107.8	31.6	118.6	34.7	128.3	37.6	137.1	40.2	144.7	42.4	
		69.5	20.8	170.8	50.1	11.4	80.8	23.7	93.4	27.4	105.2	30.8	116.2	34.1	126.3	37.0	135.5	39.7	
72	22.2	177.3	52.0	11.5	65.1	19.1	78.4	23.0	91.0	26.7	102.8	30.1	113.9	33.4	124.2	36.4			

Note: These capacities are gross ratings. For net capacity deduct the heat of the supply air blower motor Brake Power x 3.415/Motor efficiency = MBH  
 Refer to the appropriate Blower Performance table for the Brake Power of the supply air blower. Power input includes compressor & condenser Motors.

Cooling Performance Data-50Hz

AMBIENT 105 °F 40.6°C

Model	Air Flow Rate		Entering Air WBT		Total Capacity		Power Input	Sensible Capacity											
								76.0 (24.4)		78.0 (25.6)		80.0 (26.7)		82.0 (27.8)		84.0 (28.9)		86.0 (30°C)	
DEH	cfm	L/s	° F	° C	MBh	kW	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
160	3600	1699	62	16.7	134.3	39.4	12.3	97.1	28.5	104.7	30.7	111.5	32.7	117.6	34.5	122.8	36.0	127.2	37.3
			64.5	18.1	139.9	41.0	12.3	86.5	25.4	95.0	27.8	102.8	30.1	110.0	32.2	116.6	34.2	122.4	35.9
			67	19.4	145.8	42.7	12.4	75.3	22.1	84.3	24.7	92.9	27.2	100.9	29.6	108.3	31.8	115.2	33.8
			69.5	20.8	152.0	44.5	12.5	64.1	18.8	73.5	21.5	82.5	24.2	91.0	26.7	99.1	29.0	106.7	31.3
			72	22.2	158.1	46.3	12.5	52.8	15.5	62.5	18.3	71.9	21.1	80.8	23.7	89.3	26.2	97.5	28.6
	4100	1935	62	16.7	137.4	40.3	12.3	105.1	30.8	113.0	33.1	119.9	35.1	125.7	36.9	130.6	38.3	134.2	39.3
			64.5	18.1	143.1	41.9	12.4	93.9	27.5	102.9	30.2	111.2	32.6	118.7	34.8	125.2	36.7	130.9	38.4
			67	19.4	149.1	43.7	12.4	81.6	23.9	91.5	26.8	100.8	29.5	109.3	32.0	117.2	34.3	124.3	36.4
			69.5	20.8	155.1	45.5	12.5	69.0	20.2	79.4	23.3	89.3	26.2	98.7	28.9	107.4	31.5	115.5	33.9
			72	22.2	161.3	47.3	12.6	56.2	16.5	67.2	19.7	77.6	22.7	87.5	25.6	96.8	28.4	105.6	31.0
	4600	2171	62	16.7	139.7	40.9	12.3	112.4	32.9	120.3	35.3	127.0	37.2	132.5	38.8	136.5	40.0	139.2	40.8
			64.5	18.1	145.6	42.7	12.4	100.8	29.5	110.3	32.3	118.9	34.8	126.4	37.0	132.8	38.9	138.0	40.4
			67	19.4	151.5	44.4	12.4	87.6	25.7	98.2	28.8	108.1	31.7	117.0	34.3	125.1	36.7	132.2	38.8
			69.5	20.8	157.7	46.2	12.5	73.7	21.6	85.1	25.0	95.9	28.1	105.9	31.0	115.1	33.7	123.6	36.2
			72	22.2	163.7	48.0	12.6	59.5	17.4	71.5	21.0	83.0	24.3	93.7	27.5	103.8	30.4	113.3	33.2
	5100	2407	62	16.7	141.7	41.5	12.3	119.1	34.9	126.9	37.2	133.2	39.0	138.0	40.4	141.0	41.3	141.7	41.5
			64.5	18.1	147.8	43.3	12.4	107.3	31.4	117.2	34.3	125.8	36.9	133.2	39.0	139.2	40.8	143.8	42.1
			67	19.4	153.7	45.1	12.5	93.3	27.3	104.6	30.7	115.0	33.7	124.2	36.4	132.3	38.8	139.3	40.8
			69.5	20.8	159.9	46.9	12.5	78.3	22.9	90.6	26.6	102.1	29.9	112.7	33.0	122.4	35.9	131.1	38.4
			72	22.2	165.8	48.6	12.6	62.6	18.4	75.8	22.2	88.2	25.9	99.8	29.2	110.6	32.4	120.5	35.3

Note: These capacities are gross ratings. For net capacity deduct the heat of the supply air blower motor Brake Power x 3.415/Motor efficiency = MBH  
 Refer to the appropriate Blower Performance table for the Brake Power of the supply air blower. Power input includes compressor & condenser Motors.

Cooling Performance Data-50Hz

AMBIENT 115 °F 46.1°C

Model	Air Flow Rate		Entering Air WBT		Total Capacity		Power Input	Sensible Capacity											
								76.0 ( 24.4 )		78.0 ( 25.6 )		80.0 ( 26.7 )		82.0 ( 27.8 )		84.0 ( 28.9 )		86.0 (30°C )	
DEH	cfm	L/s	° F	° C	MBh	kW	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
160	3600	1699	62	62	125.0	36.6	13.5	93.9	27.5	101.0	29.6	107.3	31.5	112.8	33.1	117.4	34.4	121.0	35.5
			64.5	64.5	130.5	38.2	13.5	83.9	24.6	92.0	27.0	99.5	29.1	106.2	31.1	112.3	32.9	117.6	34.5
			67	67	136.0	39.9	13.6	73.0	21.4	81.8	24.0	90.0	26.4	97.7	28.6	104.8	30.7	111.3	32.6
			69.5	69.5	141.7	41.5	13.7	61.8	18.1	71.1	20.8	79.9	23.4	88.2	25.9	96.0	28.1	103.3	30.3
			72	72	147.5	43.2	13.7	50.6	14.8	60.3	17.7	69.5	20.4	78.3	22.9	86.6	25.4	94.5	27.7
	4100	1935	62	62	127.6	37.4	13.5	101.4	29.7	108.7	31.9	114.9	33.7	120.0	35.2	123.9	36.3	126.6	37.1
			64.5	64.5	133.2	39.0	13.6	90.9	26.6	99.6	29.2	107.3	31.5	114.2	33.5	120.2	35.2	125.1	36.7
			67	67	138.8	40.7	13.6	79.0	23.2	88.6	26.0	97.5	28.6	105.7	31.0	113.1	33.1	119.6	35.1
			69.5	69.5	144.8	42.4	13.7	66.6	19.5	76.9	22.5	86.6	25.4	95.6	28.0	104.0	30.5	111.8	32.8
			72	72	150.4	44.1	13.8	54.0	15.8	64.8	19.0	75.0	22.0	84.7	24.8	93.8	27.5	102.4	30.0
	4600	2171	62	62	129.8	38.0	13.5	108.3	31.7	115.5	33.8	121.4	35.6	125.9	36.9	128.9	37.8	129.8	38.0
			64.5	64.5	135.4	39.7	13.6	97.5	28.6	106.5	31.2	114.4	33.5	121.3	35.5	126.8	37.2	131.2	38.4
			67	67	141.1	41.4	13.7	84.8	24.9	95.1	27.9	104.5	30.6	113.0	33.1	120.5	35.3	126.9	37.2
			69.5	69.5	146.9	43.1	13.7	71.2	20.9	82.4	24.2	92.9	27.2	102.5	30.1	111.4	32.6	119.3	35.0
			72	72	152.6	44.7	13.8	57.1	16.7	69.1	20.2	80.3	23.5	90.8	26.6	100.6	29.5	109.7	32.2
	5100	2407	62	62	131.7	38.6	13.5	114.4	33.5	121.4	35.6	126.8	37.2	130.4	38.2	131.7	38.6	131.7	38.6
			64.5	64.5	137.3	40.2	13.6	103.7	30.4	112.9	33.1	120.9	35.4	127.4	37.3	132.4	38.8	135.9	39.8
			67	67	143.1	42.0	13.7	90.3	26.5	101.3	29.7	111.1	32.6	119.7	35.1	127.1	37.3	133.3	39.1
			69.5	69.5	148.8	43.6	13.7	75.6	22.2	87.7	25.7	98.9	29.0	109.1	32.0	118.2	34.6	126.3	37.0
			72	72	154.4	45.3	13.8	60.2	17.6	73.2	21.5	85.4	25.0	96.6	28.3	107.0	31.4	116.5	34.1

Note: These capacities are gross ratings. For net capacity deduct the heat of the supply air blower motor Brake Power x 3.415/Motor efficiency = MBH  
 Refer to the appropriate Blower Performance table for the Brake Power of the supply air blower. Power input includes compressor & condenser Motors.

Cooling Performance Data-50Hz

AMBIENT 125 °F 51.7°C

Model	Air Flow Rate		Entering Air WBT		Total Capacity		Power Input	Sensible Capacity											
								76.0 ( 24.4 )		78.0 ( 25.6 )		80.0 ( 26.7 )		82.0 ( 27.8 )		84.0 ( 28.9 )		86.0 ( 30°C )	
DEH	cfm	L/s	° F	° C	MBh	kW	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
160	3600	1699	62	16.7	114.3	33.5	14.8	89.9	26.4	96.5	28.3	102.1	29.9	106.8	31.3	110.4	32.4	113.0	33.1
			64.5	18.1	119.8	35.1	15.0	80.7	23.6	88.4	25.9	95.4	28.0	101.6	29.8	107.0	31.4	111.6	32.7
			67	19.4	125.2	36.7	15.0	70.2	20.6	78.8	23.1	86.7	25.4	94.0	27.5	100.6	29.5	106.6	31.2
			69.5	20.8	130.7	38.3	15.1	59.3	17.4	68.4	20.1	77.0	22.6	85.0	24.9	92.5	27.1	99.4	29.1
			72	22.2	136.0	39.9	15.1	48.2	14.1	57.7	16.9	66.8	19.6	75.4	22.1	83.5	24.5	91.1	26.7
	4100	1935	62	16.7	116.8	34.2	14.9	96.9	28.4	103.5	30.3	108.8	31.9	112.9	33.1	115.7	33.9	116.8	34.2
			64.5	18.1	122.3	35.8	15.0	87.4	25.6	95.6	28.0	102.8	30.1	108.9	31.9	114.1	33.4	118.1	34.6
			67	19.4	127.7	37.4	15.0	76.1	22.3	85.4	25.0	93.8	27.5	101.5	29.7	108.3	31.7	114.1	33.5
			69.5	20.8	133.1	39.0	15.1	64.0	18.7	74.0	21.7	83.4	24.4	92.1	27.0	100.0	29.3	107.2	31.4
			72	22.2	138.7	40.6	15.2	51.5	15.1	62.2	18.2	72.2	21.2	81.7	23.9	90.5	26.5	98.6	28.9
	4600	2171	62	16.7	118.9	34.9	14.9	103.3	30.3	109.6	32.1	114.4	33.5	117.7	34.5	118.9	34.9	118.9	34.9
			64.5	18.1	124.2	36.4	15.0	93.6	27.4	102.0	29.9	109.2	32.0	115.1	33.7	119.7	35.1	122.8	36.0
			67	19.4	129.7	38.0	15.1	81.7	23.9	91.5	26.8	100.4	29.4	108.3	31.7	115.0	33.7	120.6	35.3
			69.5	20.8	135.1	39.6	15.1	68.4	20.1	79.4	23.3	89.5	26.2	98.6	28.9	106.9	31.3	114.3	33.5
			72	22.2	140.3	41.1	15.1	54.5	16.0	66.3	19.4	77.3	22.6	87.5	25.6	96.9	28.4	105.5	30.9
	5100	2407	62	16.7	121.9	35.7	15.0	109.5	32.1	115.6	33.9	119.8	35.1	121.9	35.7	121.9	35.7	121.9	35.7
			64.5	18.1	125.9	36.9	15.0	99.4	29.1	107.9	31.6	114.9	33.7	120.3	35.3	124.1	36.4	125.9	36.9
			67	19.4	131.4	38.5	15.1	87.0	25.5	97.4	28.5	106.5	31.2	114.4	33.5	120.9	35.4	126.0	36.9
			69.5	20.8	136.9	40.1	15.1	72.8	21.3	84.5	24.8	95.2	27.9	104.8	30.7	113.3	33.2	120.6	35.3
			72	22.2	142.1	41.6	15.2	57.5	16.9	70.3	20.6	82.2	24.1	93.1	27.3	103.0	30.2	111.9	32.8

Note: These capacities are gross ratings. For net capacity deduct the heat of the supply air blower motor Brake Power x 3.415/Motor efficiency = MBH  
 Refer to the appropriate Blower Performance table for the Brake Power of the supply air blower. Power input includes compressor & condenser Motors.

**Fan Performance Data**

**DEH 160**

Air Flow Rate cfm	External Static Pressure In Wg (Pa)															
	0.25(62.5)		0.5(125)		0.75(187.5)		1(250)		1.25(312.5)		1.5(375)		1.75(437.5)		2(500)	
	RPM	*kW	RPM	*kW	RPM	*kW	RPM	*kW	RPM	*kW	RPM	*kW	RPM	*kW	RPM	*kW
3,600	455	0.46	538	0.62	614	0.79	682	0.98	747	1.17	806	1.38	863	1.59	916	1.82
3,900	468	0.53	548	0.70	621	0.88	688	1.08	751	1.28	809	1.49	865	1.72	917	1.94
4,050	475	0.57	554	0.75	625	0.93	692	1.13	753	1.34	812	1.56	866	1.78	919	2.02
4,200	483	0.62	559	0.80	630	0.99	695	1.19	757	1.40	814	1.62	868	1.85	920	2.09
4,350	490	0.67	566	0.85	634	1.04	699	1.25	759	1.46	816	1.69	870	1.92	922	2.16
4,500	498	0.72	571	0.90	640	1.10	703	1.31	763	1.53	818	1.75	872	1.99	923	2.23
4,650	505	0.77	578	0.96	644	1.16	707	1.37	765	1.59	821	1.83	874	2.06	925	2.32
4,800	513	0.82	584	1.02	649	1.22	711	1.44	769	1.66	824	1.90	876	2.14	927	2.40
4,950	521	0.88	591	1.08	655	1.29	716	1.51	773	1.74	827	1.98	879	2.23	929	2.48
5,100	529	0.94	597	1.14	660	1.36	720	1.58	776	1.82	831	2.06	882	2.31	931	

Standard Motor 1.5 KW

Over Sized Motor 3 KW

\* KW Indoor blower brake power

**Drive and Pulley Data**

Low Static Drive Set											
Unit Model	Motor Drive Packaged		Pitch		Fan Drive Packaged		Pitch Dia mm	RPM Range		Belt	
	Pulley	Bush			Pulley	Bush		Min	Max	Center Dist.	Size
			MM	MM							
DEH 160	VAR 139 A1	1610 x 24	109	133	SPA315 A1	2012 x 25	315	494	603	604	1932

Standard Drive Set											
Unit Model	Motor Drive Packaged		Pitch		Fan Drive Packaged		Pitch Dia mm	RPM Range		Belt	
	Pulley	Bush			Pulley	Bush		Min	Max	Centre Dist.	Size
			mm	mm							
DEH 160	VAR 139 A1	1610 x 24	109	133	SPA236 A1	2012 x 25	236	660	805	604	1800

High Static Drive Set											
Unit Model	Motor Drive Packaged		Pitch		Fan Drive Packaged		Pitch Dia mm	RPM Range		Belt	
	Pulley	Bush			Pulley	Bush		Min	Max	Centre Dist.	Size
			mm	mm							
DEH 160	VAR 139 A1	1610 x 24	109	133	SPA190 A1	1610 x 25	190	819	1000	604	1700

**Sound Rating Data (Unit)**

DEH	Unit Sound dB (10-12) Watts									
	Sound Rating dB (A)	Octave Band Centerline Frequency (Hz)								
		63	125	250	500	1000	2000	4000	8000	
160	81.6	79.2	74.9	75.3	75.4	74.9	75.6	74.6	70.1	



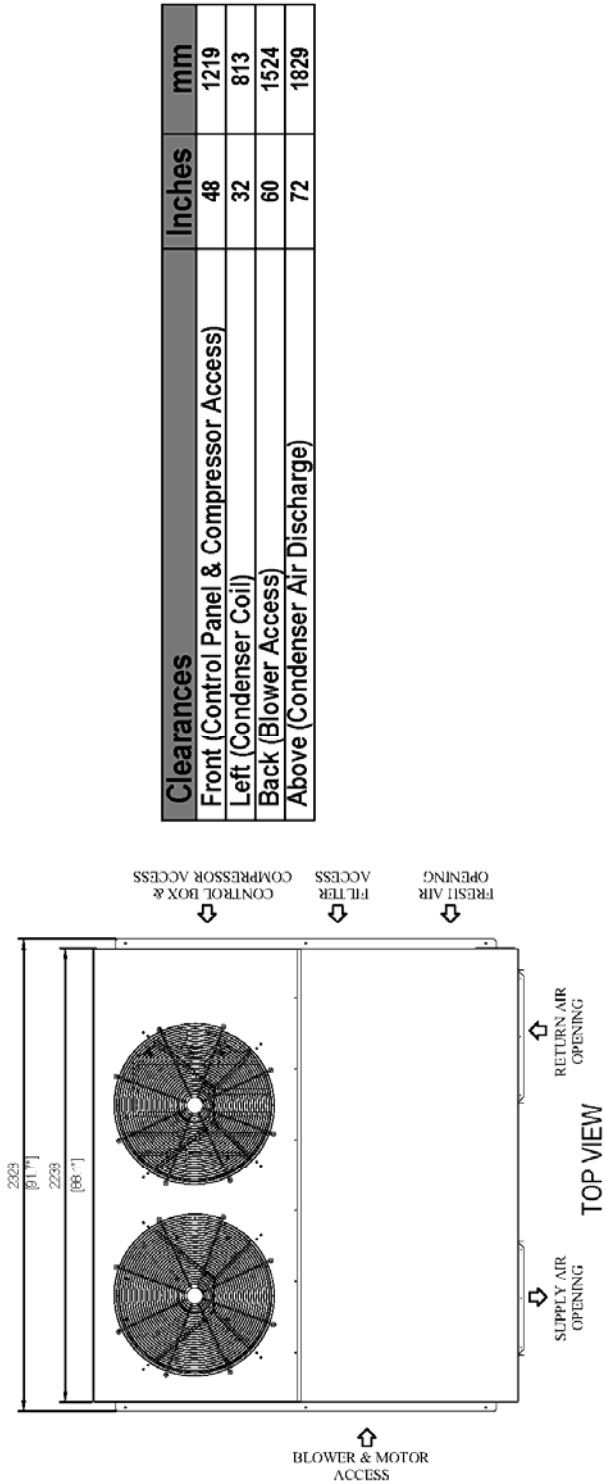
**Electrical Data**

Power Supply	380-415 V / 3 Ph / 50 Hz										
Model	Compressors		Condenser Fan Motors	Supply Blower Motor		Electric Heater		Minimum Circuit Amperes		Maximum Fuse Breaker Size Amperes	
	RLA Each	LRA Each	FLA Each	Standard	OSM	kW	Amperes	Standard	*OSR	Standard	*OSR
DEH 190	13.0	100	2.0	3.4	6.5	-	-	36.6	39.7	50	50
						18	26.0	36.6	39.7	50	50
						36	52.0	69.2	73.0	120	120

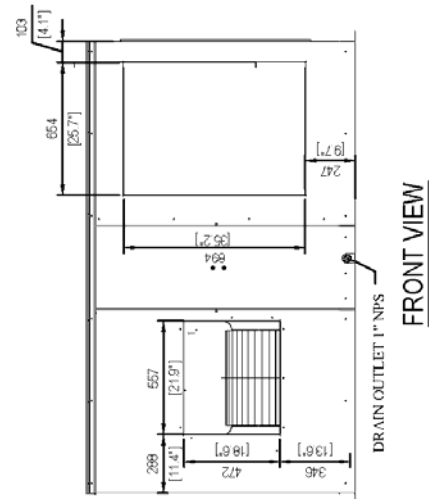
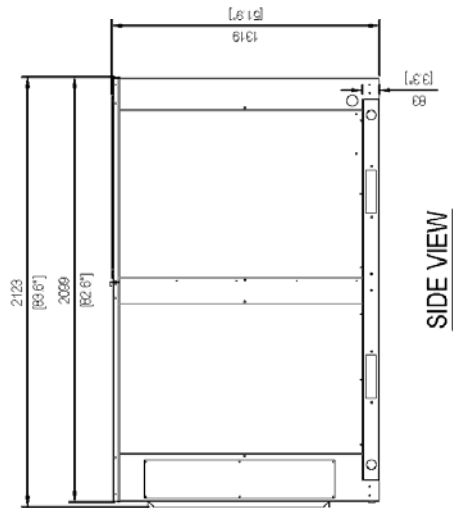
Notes:

\*Over Size Motor (OSR)

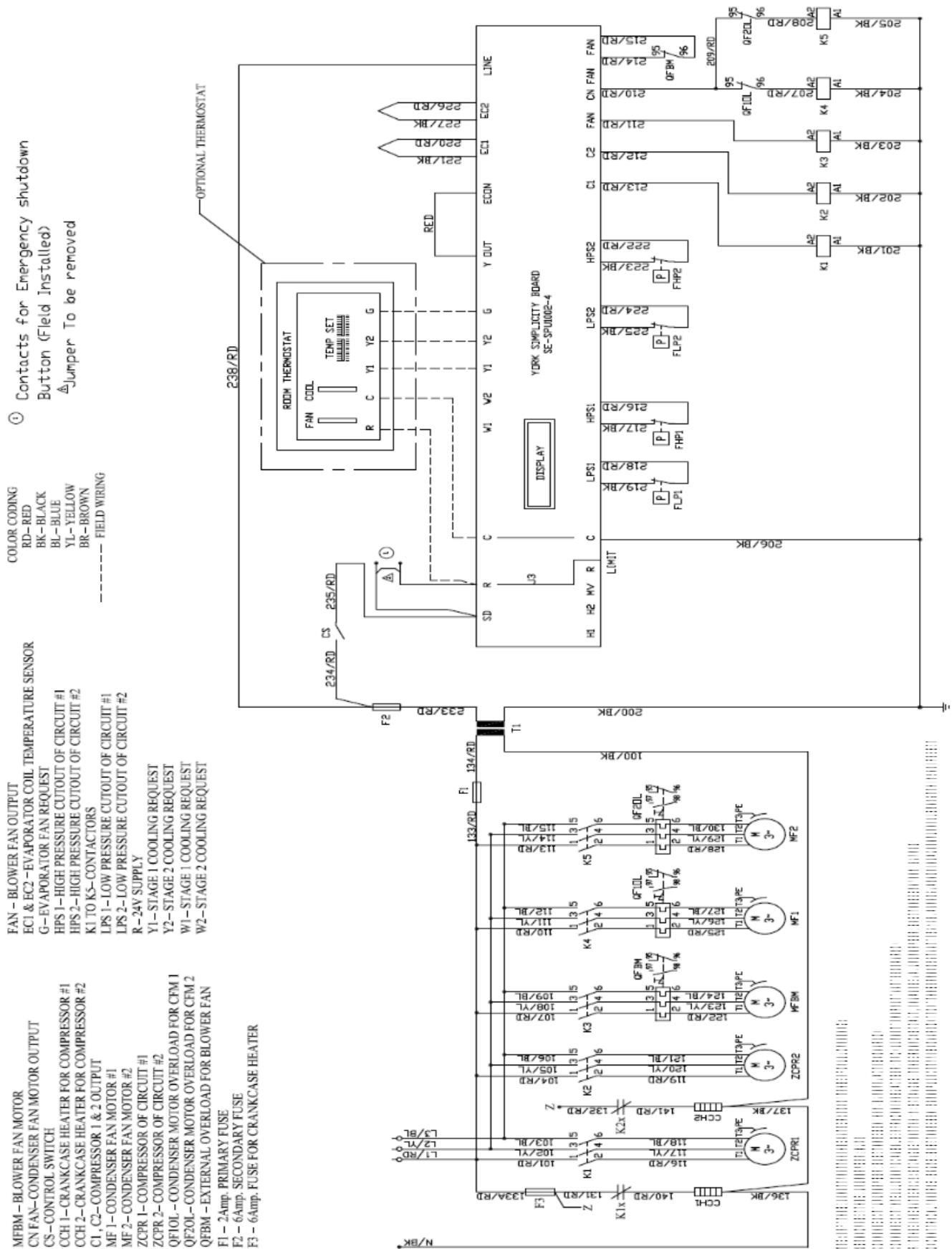
**Dimensional Data (DEH 160)**



Clearances	Inches	mm
Front (Control Panel & Compressor Access)	48	1219
Left (Condenser Coil)	32	813
Back (Blower Access)	60	1524
Above (Condenser Air Discharge)	72	1829



Typical Wiring Diagram



① Contacts for Emergency shutdown Button (Field Installed)  
 Δ Jumper To be removed

COLOR CODING  
 RD-RED  
 BK-BLACK  
 BL-BLUE  
 YL-YELLOW  
 BK-BROWN  
 ----- FIELD WIRING

FAN - BLOWER FAN OUTPUT  
 ECI & EC2 -EVAPORATOR COIL TEMPERATURE SENSOR  
 G -EVAPORATOR FAN REQUEST  
 HPS 1-HIGH PRESSURE CUTOFF OF CIRCUIT #1  
 HPS 2-HIGH PRESSURE CUTOFF OF CIRCUIT #2  
 K1 TO K5-CONTACTORS  
 LPS 1-LOW PRESSURE CUTOFF OF CIRCUIT #1  
 LPS 2-LOW PRESSURE CUTOFF OF CIRCUIT #2  
 R-24V SUPPLY  
 Y1-STAGE 1 COOLING REQUEST  
 Y2-STAGE 2 COOLING REQUEST  
 W1-STAGE 1 COOLING REQUEST  
 W2-STAGE 2 COOLING REQUEST

MF2M - BLOWER FAN MOTOR  
 CN FAN - CONDENSER FAN MOTOR OUTPUT  
 CS - CONTROL SWITCH  
 CCH 1 - CRANKCASE HEATER FOR COMPRESSOR #1  
 CCH 2 - CRANKCASE HEATER FOR COMPRESSOR #2  
 C1, C2 - COMPRESSOR 1 & 2 OUTPUT  
 MF1 - CONDENSER FAN MOTOR #1  
 MF2 - CONDENSER FAN MOTOR #2  
 ZCPR 1 - COMPRESSOR OF CIRCUIT #1  
 ZCPR 2 - COMPRESSOR OF CIRCUIT #2  
 QF1OL - CONDENSER MOTOR OVERLOAD FOR CFM 1  
 QF2OL - CONDENSER MOTOR OVERLOAD FOR CFM 2  
 QFBM - EXTERNAL OVERLOAD FOR BLOWER FAN  
 F1 - 2Amp. PRIMARY FUSE  
 F2 - 6Amp. SECONDARY FUSE  
 F3 - 6Amp. FUSE FOR CRANKCASE HEATER

NOT TO BE USED FOR THE FOLLOWING:  
 1. CONTACTS BETWEEN IN CONTACT BOARD  
 2. CONTACTS BETWEEN IN CONTACT BOARD  
 3. CONTACTS BETWEEN IN CONTACT BOARD  
 4. CONTACTS BETWEEN IN CONTACT BOARD  
 5. CONTACTS BETWEEN IN CONTACT BOARD

## Guide Specification:-

### DESCRIPTION

Standard Units shall be factory assembled, single packaged, cool only, and designed for outdoor mounted installation. They shall have built-in side duct connections for discharge supply and return. The units shall be factory wired, piped, charged with R-410a refrigerant and factory tested prior to shipment. All unit wiring shall be both numbered and colour coded.

### UNIT CABINET AND FRAME

Unit cabinet shall be constructed of G90 galvanized steel, with exterior surfaces coated with a non-chalking powdered paint finish, to meet ASTM B117 standard suitable for 750 hours salt spray test. The indoor blower and air supply section shall be insulated with 13mm Elastomeric insulation. Cabinet panels shall be easily removable for servicing and maintenance. Full perimeter base rails shall be provided to assure reliable transit of equipment, overhead rigging and fork lifting. Disposable 2" filters shall be furnished and be accessible through a removable access door, sealed airtight. Condensate connection shall be minimum of 1.0" FPT connection.

All the double skin construction provided by a "sandwich" type arrangement, 30mm thick comprising of 0.7mm thick galvanized steel inner & outer skin painted and Injected With polyurethane foam of 40 kg/m<sup>3</sup> density providing an Overall. The thermal coefficient of value K not less than 0.68 W/m<sup>2</sup>°K.

### INDOOR (EVAPORATOR) FAN ASSEMBLY

Fan shall be a belt drive assembly and include an adjustable pitch motor pulley. Fan wheel shall be DIDW type with forward curved High static blades, dynamically balanced to operate smoothly throughout the entire range of operation. Airflow design shall be constant air volume. Bearings shall be lubricated for life. The evaporator motor shall be TEFC IP55 class F insulation.

### OUTDOOR (CONDENSER) FAN ASSEMBLY

Each unit shall have two condenser fans / motors. The outdoor fans shall be of direct driven propeller type, discharge air vertically and shall be dynamically balanced for smooth operation. The outdoor fan motors shall be TEAO IP55 with class F insulation. Motors shall have permanently lubricated bearings and shall have external overload protection.

### REFRIGERANT COMPONENTS

#### Compressors

- a. Compressors for all models shall be Hermetic Scroll. All compressors shall be internally protected with internal high pressure relief and over temperature protection. The compressors shall be mounted on neoprene mounts to eliminate vibration from being transmitted to the unit structure and cabinet.

### Coils

- a. Evaporator and condenser coils shall have aluminum fins mechanically bonded to seamless internally enhanced copper tubes and aluminum tubes with all joints brazed. Condenser fin spacing shall be limited to 16 fpi for 13 Ton models to maximize heat transfer to minimize blockage and high pressure operating condition, special E-coating shall be available as factory options.
- b. Evaporator and Condenser coils shall be of the direct expansion, draw-thru, design. Coils shall be tested to a minimum pressure of 445/236 psig High/Low.

### Refrigerant Circuit and Refrigerant Safety components shall include

- a. Thermostatic expansion valve with external equalizing line.
- b. Filter drier to eliminate any moisture or foreign matter.
- c. Accessible service gauge connections on both suction and discharge 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 10°F of sub-cooling at design conditions.
- e. All models shall have 2 independent refrigerant circuits.
- f. Unit shall operate with conventional thermostat designs and have a low voltage terminal strip for easy hookup.
- g. Unit control board shall have on-board diagnostics and fault code display.
- h. Standard controls shall include anti-short cycle and low voltage protection, and permit cooling operation down to 50°F.
- i. Control board shall monitor each refrigerant safety switch independently.
- j. Control board shall retain last 5 fault codes in non-volatile memory, which will not be lost in the event of a power loss.

### ELECTRIC HEATING – OPTIONAL

Nickel chromium electric heating elements shall be provided as required by the application with 2 stage control for 18 kW or 36 kW capacities. 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. Units with Electric Heating shall be wired for a single point power supply.

### UNIT OPERATING CHARACTERISTICS

Unit shall be capable of starting and running at 131°F outdoor temperature. The compressor, with standard controls, shall be capable of operation down to 50°F outdoor temperature.

### ELECTRICAL REQUIREMENTS

All unit power wiring shall enter unit cabinet at a single factory provided gland be capable of side entry.

### MAINTENANCE

The Stellar Packaged Air Conditioners are premium quality machines with very low maintenance requirements.

Compressors used in Stellar Packaged Units are of Scroll type and are charged with the correct amount of refrigerant and lubricating oil. Unless there is a leak in the system, no topping up is generally required.

All bearings used in the fan shaft, fan motor and evaporator fan motor are permanently lubricated for life. Lubrication is therefore not a part of the periodic maintenance schedule.

### EVERY MONTH

Remove the filters and blow compressed air over them to get rid of loose dust. Visually inspect the filters Conditions, replace them with new ones of same sizes if required.

Stellar Packaged Air Conditioners are provided with a specially designed drain pan, for proper maintenance check and clean blockages at drain connections if any.

### EVERY 3 MONTHS

In addition to the monthly maintenance above, check the belt tension of evaporator fan. A correct tension is indicated when the belt has a relaxation of approximately 10 mm to 13 mm when pressed lightly with a finger.

### EVERY SIX MONTHS

In addition to the maintenance done every three months:

The condenser coils should be cleaned by spraying water over it at low pressure or with a brush while ensuring that the fins are not damaged.

Check all electrical connections and tighten them if required. Clean all accessible electrical panels of dirt and dust. Before cleaning the control panels, ENSURE that the electrical power to the unit is switched off.

### EVERY 12 MONTHS

In addition to the maintenance done every six months:

Use a proper cleaning cloth to clean fan blades and motors. Ensure that the unit is working properly by checking, current, voltages, pressures and temperatures. Check the earthing or grounding of the unit. Check the exterior of the unit for any signs of corrosion. Even though it is highly unlikely, if any corrosion that is seen, should be removed by proper sanding the surface. Repaint the unit with proper touch up paint, available from York. Check the unit for any unusual vibrations or noise, locate the cause and rectify it by changing mounts, base isolators etc as required.







## **Johnson Controls provides comfortable environments wherever you Live, Work or Travel**

Whether you're at home, in a car, or in an office or workplace, chances are there's a Johnson Controls product or service nearby, helping to make your environment more comfortable, safe and sustainable.

Johnson Controls creates smart environments that improve the places where people spend most of their time – their homes, workplaces and vehicles. We anticipate consumer needs, and then integrate technologies, products and services to make life better and easier.

For Johnson Controls, sustain ability matters at every level and through our products, service operations and community involvement, we promote the efficient use of resources to benefit all people and the world. Our triple bottom line of sustain ability that is, economic prosperity, environmental stewardship and social responsibility impacts each and every aspect of our business. York products are now a premier brand manufactured by Johnson Controls. The acquisition of York, gives us a unique insight into designing HVAC products that match your exact requirements. We provide solutions for today's most critical concerns - energy efficiency, refrigerant alternatives and indoor air quality.

Johnson Controls has a wide range of York products for residential, light commercial and commercial applications. Our offering includes package & split air conditioners and heat pumps. In addition, Johnson Controls offers chillers, air handling units, ventilation equipment and controls for larger projects.

Our advanced technology is leading the way in developing efficient and environment friendly solutions for your homes, offices and places of leisure.

### **Let us create the ideal environment for you**

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We reserve the right to change in part or in whole the specifications without prior notice.

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