INSTALLATION MANUAL

R-410A
XY SERIES

3 - 5 Ton

60 Hertz

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General

XY units are single package heat pumps designed for outdoor installation on a rooftop or slab and for non-residential use.

These units are completely assembled on rigid, permanently attached base rails. All piping, refrigerant charge, and electrical wiring is factory installed and tested. The units require electric power and duct connections.

Safety Considerations

⚠ This is a safety alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.

Understand and pay particular attention the signal words **DANGER**, **WARNING** or **CAUTION**.

DANGER indicates an **imminently** hazardous situation, which, if not avoided, **will result in death or serious injury.**

WARNING indicates a **potentially** hazardous situation, which, if not avoided, **could result in death or serious injury.**

CAUTION indicates a potentially hazardous situation, which, if not avoided **may result in minor or moderate injury.** It is also used to alert against unsafe practices and hazards involving only property damage.

⚠WARNING

Improper installation may create a condition where the operation of the product could cause personal injury or property damage. Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual for assistance or for additional information, consult a qualified contractor, installer or service agency.

⚠ CAUTION

This product must be installed in strict compliance with the installation instructions and any applicable local, state and national codes including, but not limited to building, electrical, and mechanical codes.

⚠WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury. Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer or service agency.

⚠ CAUTION

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system. Gauge sets, hoses, refrigerant containers and recovery systems must be designed to handle R-410A. If you are unsure, consult the equipment manufacturer. Failure to use R-410A compatible servicing equipment may result in property damage or injury.

⚠WARNING

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death or property damage.

Improper servicing could result in dangerous operation, serious injury, death or property damage.

- Before servicing, disconnect all electrical power to furnace.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- Verify proper operation after servicing.

Due to system pressure, moving parts, and electrical components, installation and servicing of air conditioning equipment can be hazardous. Only qualified, trained service personnel should install, repair, or service this equipment. Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters.

Observe all precautions in the literature, labels, and tags accompanying the equipment whenever working on air conditioning equipment. Be sure to follow all other applicable safety precautions and codes that apply.

Wear safety glasses and work gloves. Use quenching cloth and have a fire extinguisher available during brazing operations.

Inspection

As soon as a unit is received, it should be inspected for possible damage during transit. If damage is evident, the extent of the damage should be noted on the carrier's freight bill. A separate request for inspection by the carrier's agent should be made in writing.

Reference

Additional information is available in the following reference forms:

- Technical Guide - XYE04-06 5147362
- General Installation - XYE04-06 5146977

- Economizer Option or Accessory -
  Vertical Flow Dry Bulb Economizer Factory installed Option or Field Installed accessory

  Horizontal Flow Dry Bulb Economizer Field Installed accessory
- Power Exhaust Accessory -
  Vertical or Horizontal Flow Field Installed

Renewal Parts

Contact your local UP parts distribution center for authorized replacement parts.

Approvals

Design certified by CSA as follows:

1. For use as a heat pump unit.
2. For outdoor installation only.
3. For installation on combustible material.

⚠ CAUTION

This product must be installed in strict compliance with the enclosed installation instructions and any applicable local, state, and national codes including, but not limited to, building, electrical, and mechanical codes.

⚠WARNING

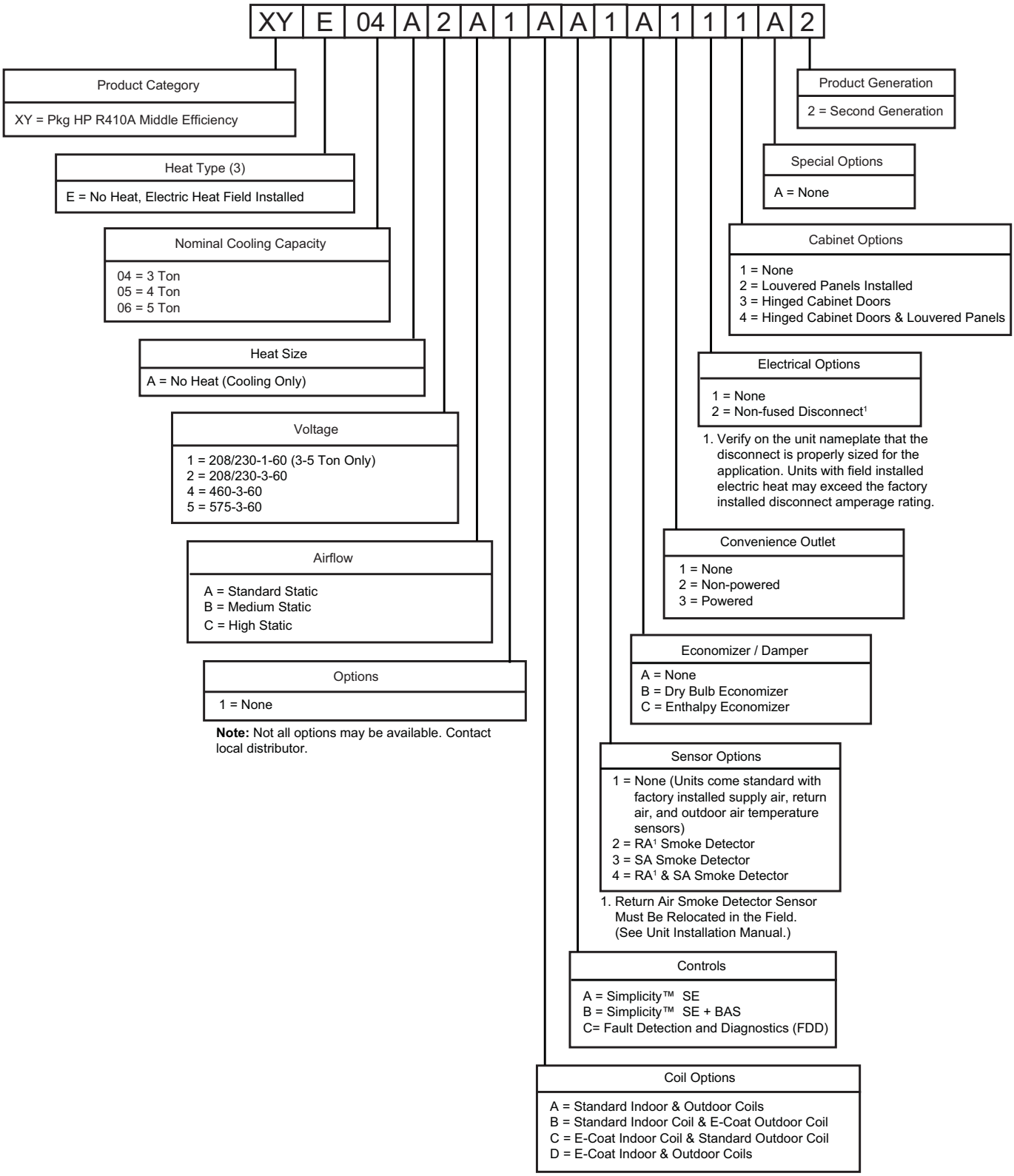
Improper installation may create a condition where the operation of the product could cause personal injury or property damage.

⚠ CAUTION

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system.

Nomenclature

3-8.5 Ton Model Number Nomenclature



Installation

Installation Safety Information

Read these instructions before continuing this appliance installation. This is an outdoor combination heating and cooling unit. The installer must assure that these instructions are made available to the consumer and with instructions to retain them for future reference.

1. Install this unit only in a location and position as specified on Page 6 of these instructions.
2. This equipment is not to be used for temporary heating of buildings or structures under construction.

Preceding Installation

1. Remove the two screws holding the brackets in the side fork-lift slots.

Figure 1: Unit Shipping Bracket

2. Turn each bracket toward the ground and the protective plywood covering will drop to the ground.
3. Remove the condenser coil external protective covering prior to operation.

Figure 2: Condenser Covering

4. If a factory option convenience outlet is installed, the weatherproof outlet cover must be field installed. The cover shall be located behind the filter access panel. To install the cover, remove the shipping label covering the convenience outlet, follow the instructions on the back of the weatherproof cover box, and attach the cover to the unit using the (4) screws provided.

⚠ CAUTION

208/230-3-60 and units with factory installed Powered Convenience Outlet Option are wired for 230v power supply. Change tap on transformer for 208-3-60 operation. See unit wiring diagram.

5. If a factory option return air smoke detector is installed, the return air sensor must be moved from a factory shipped (upside down) position to the (right side up) working position and the flex conduit sampler tube connected.

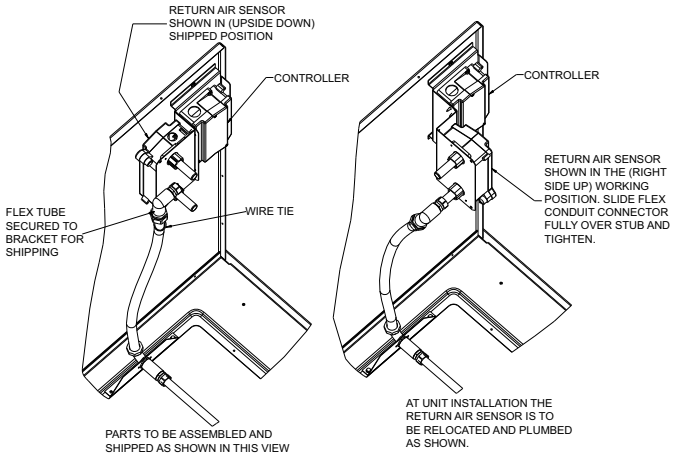


Figure 3: Return Air Smoke Detector Field Location

Limitations

These units must be installed in accordance with the following:

In U.S.A.:

1. National Electrical Code, ANSI/NFPA No. 70 - Latest Edition
2. Local building codes, and
3. Local utility requirements

In Canada:

1. Canadian Electrical Code, CSA C22.1
2. Local plumbing and waste water codes, and
3. Other applicable local codes.

Refer to unit application data found in this document.

If components are to be added to a unit to meet local codes, they are to be installed at the dealer's and/or customer's expense.

Size of unit for proposed installation should be based on heat loss/heat gain calculation made according to the methods of Air Conditioning Contractors of America (ACCA).

This unit is not to be used for temporary heating of buildings or structures under construction.

Table 1: XYE04-06 Unit Limitations

Model	Size (Tons)	Unit Voltage	Unit Limitations		
			Applied Voltage		Outdoor DB Temp
			Min	Max	Max (°F)
XYE	04 (3)	208/230-1-60	187	252	125
		208/230-3-60	187	252	125
		460-3-60	432	504	125
		575-3-60	540	630	125
XYE	05 (4)	208/230-1-60	187	252	125
		208/230-3-60	187	252	125
		460-3-60	432	504	125
		575-3-60	540	630	125
XYE	06 (5)	208/230-1-60	187	252	125
		208/230-3-60	187	252	125
		460-3-60	432	504	125
		575-3-60	540	630	125

Location

Use the following guidelines to select a suitable location for these units:

1. Unit is designed for *outdoor installation only*.
2. Condenser coils must have an unlimited supply of air. Where a choice of location is possible, position the unit on either north or east side of building.
3. Suitable for mounting on roof curb.
4. For ground level installation, use a level concrete slab with a minimum thickness of 4 inches. The length and width should be at least 6 inches greater than the unit base rails. Do not tie slab to the building foundation.
5. Roof structures must be able to support the weight of the unit and its options/accessories. Unit must be installed on a solid, level roof curb or appropriate angle iron frame.
6. Maintain level tolerance to 1/2" across the entire width and length of unit.

Clearances

All units require particular clearances for proper operation and service. Installer must make provisions for adequate ventilation air. Refer to Table 4 for clearances required for servicing and proper unit operation.

⚠WARNING

Do not permit overhanging structures or shrubs to obstruct condenser air discharge outlet, outdoor coil face or combustion air inlet or vent outlets.

Rigging And Handling

Exercise care when moving the unit. Do not remove any packaging until the unit is near the place of installation. Rig the unit by attaching chain or cable slings to the lifting holes provided in the base rails. Spreader bars, whose length exceeds the largest dimension across the unit, **MUST** be used across the top of the unit.

⚠ CAUTION

If a unit is to be installed on a roof curb other than a UP roof curb, gasketing must be applied to all surfaces that come in contact with the unit underside.

⚠ CAUTION

Before lifting, make sure the unit weight is distributed equally on the rigging cables so it will lift evenly.

Units may be moved or lifted with a forklift. Slotted openings in the base rails are provided for this purpose.

LENGTH OF FORKS MUST BE A MINIMUM OF 60 INCHES.

⚠ CAUTION

All panels must be secured in place when the unit is lifted.

The condenser coils should be protected from rigging cable damage with plywood or other suitable material.

XYE04-06 Unit Weights

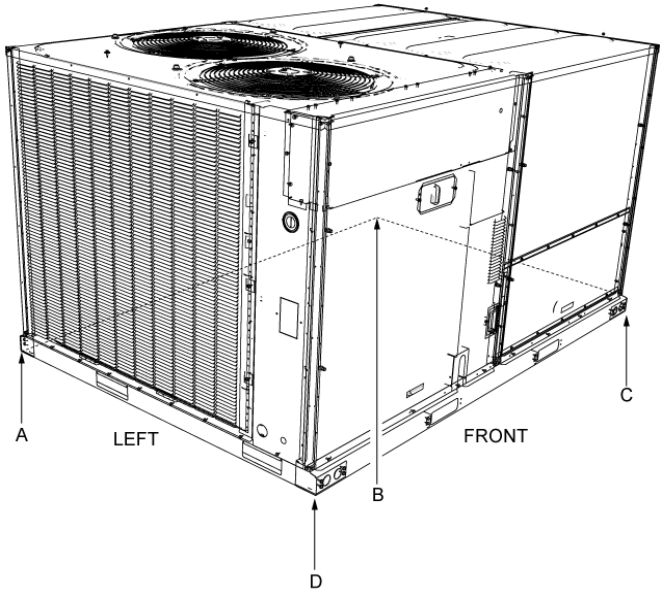


Figure 4: Unit 4 Point Load Weight

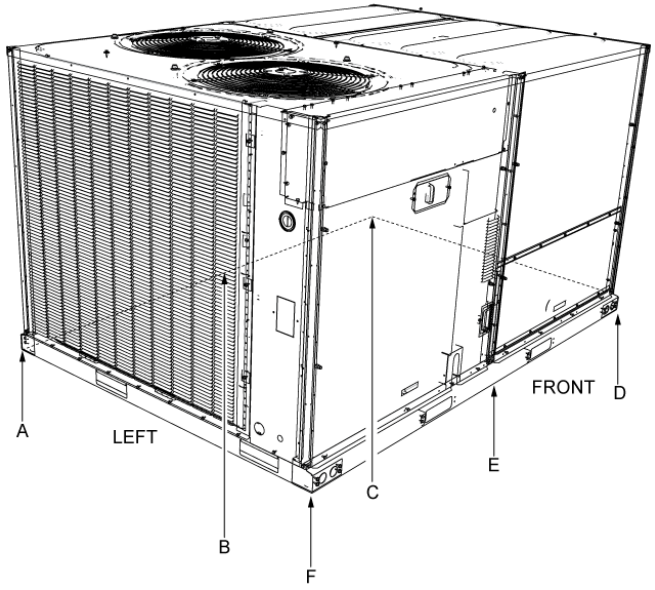


Figure 5: Unit 6 Point Load Weight

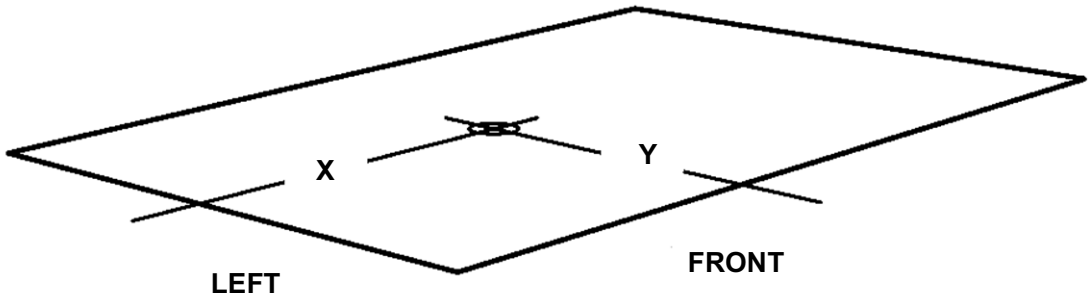


Figure 6: Center of Gravity

Table 2: XYE04-06 Corner Weights

Model	Size (Tons)	Weight (lbs.)		Center of Gravity		4 Point Load Location (lbs.)				6 Point Load Location (lbs.)					
		Shipping	Operating	X	Y	A	B	C	D	A	B	C	D	E	F
XYE	04 (3)	563	535	36.5	25.1	138	135	130	133	92	91	89	86	88	89
XYE	05 (4)	643	614	35.8	24.2	155	146	151	161	105	100	96	100	104	109
XYE	06 (5)	682	653	36.5	26.2	176	171	151	155	118	116	114	100	102	104

Table 3: XYE04-06 Unit Accessory Weights

Unit Accessory	Weights (lbs.)
Vertical Flow Dry Bulb Economizer Small Footprint	55
Horizontal Flow Dry Bulb Economizer Small Footprint Short	74
Horizontal Flow Dry Bulb Economizer Small Footprint Tall	76
Power Exhaust Vert Flow Small Footprint	55
Power Exhaust Horiz Flow Small Footprint	40
Hail Guard Kit Small Short Factory Installed	18
Hail Guard Kit Small Tall Factory Installed	23
Curb Rigid 14" Small Footprint	94
Curb Rigid 24" Small Footprint	148

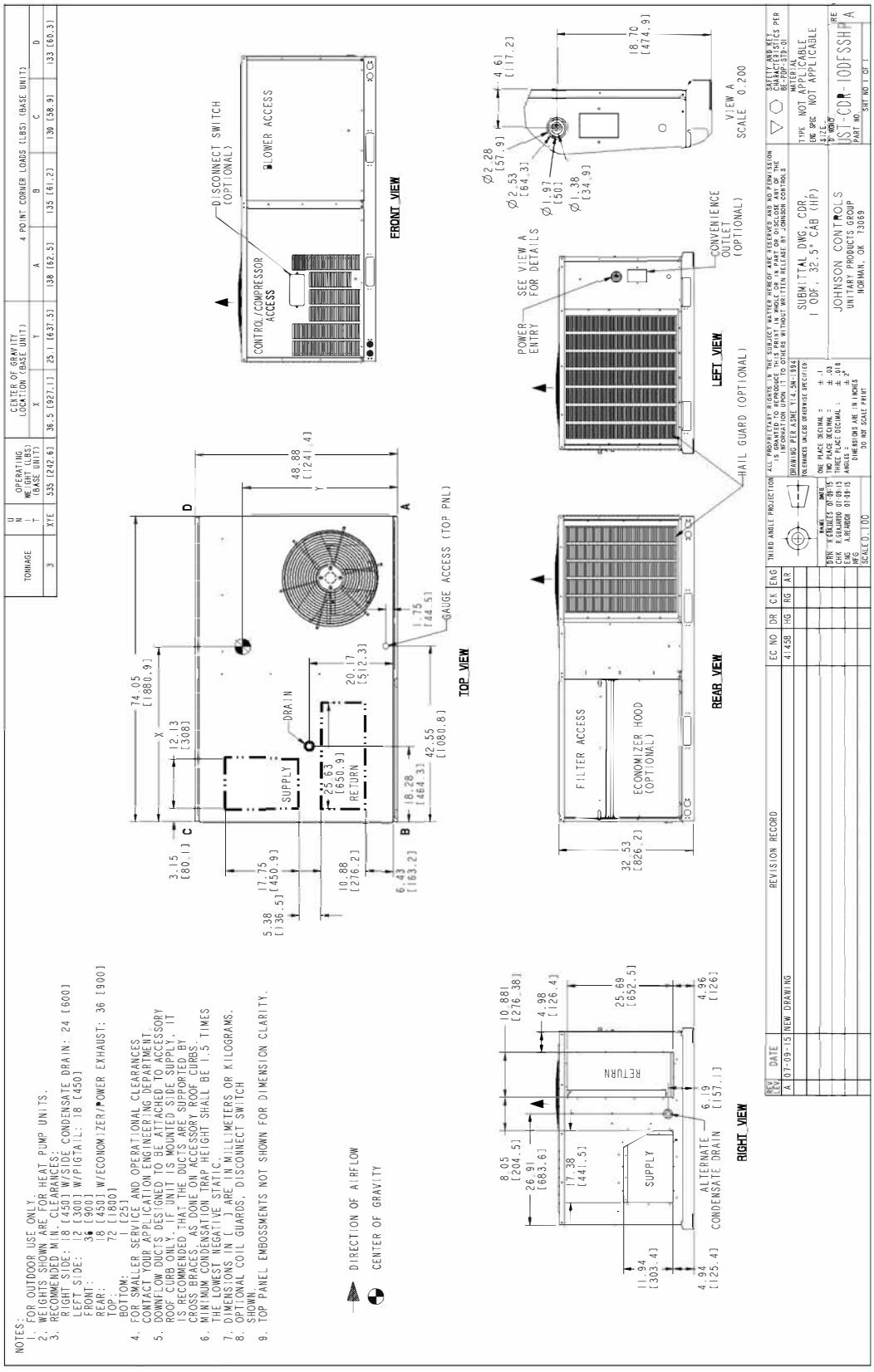


Figure 7: XYE04 Unit Dimensions

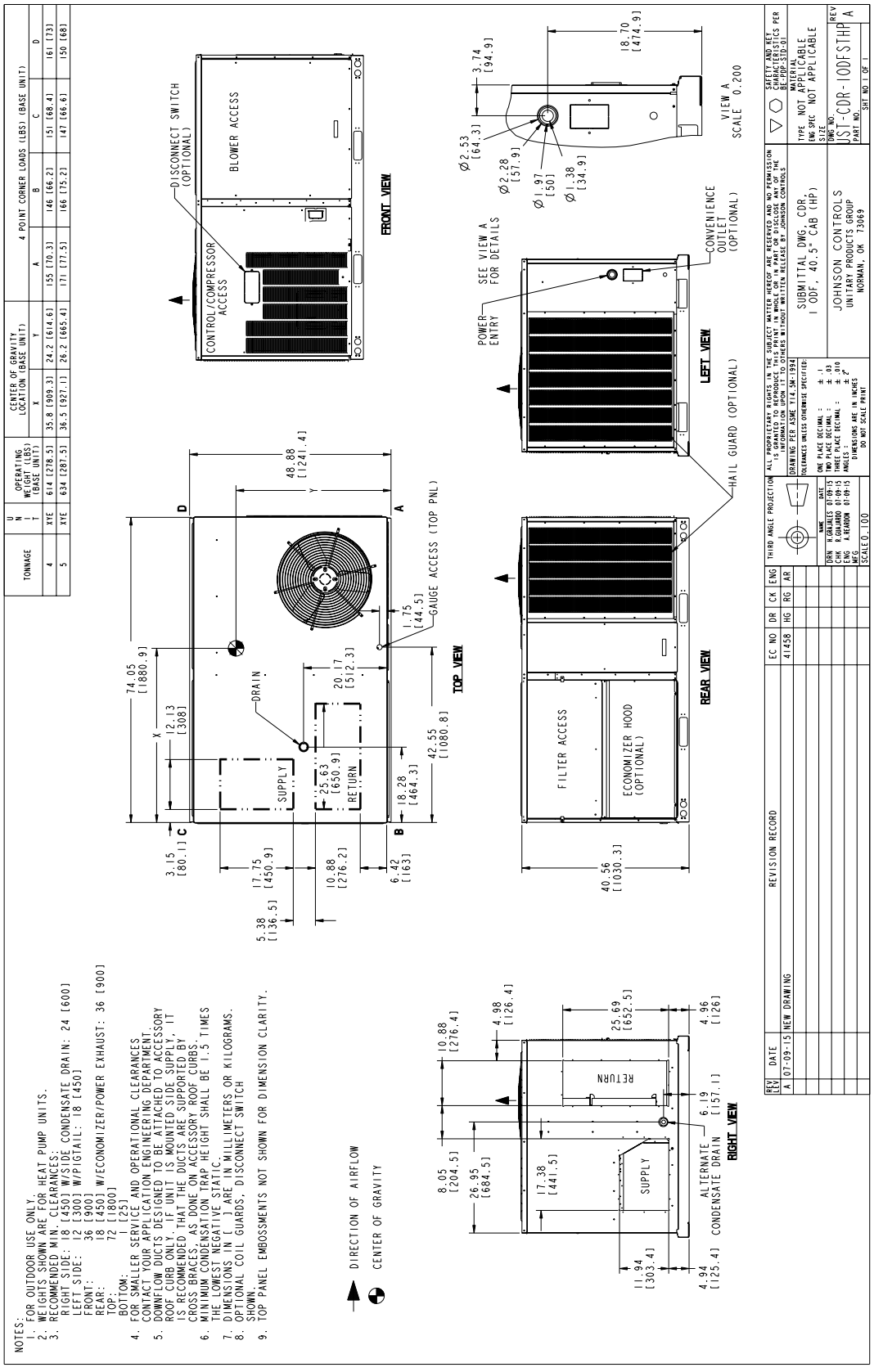
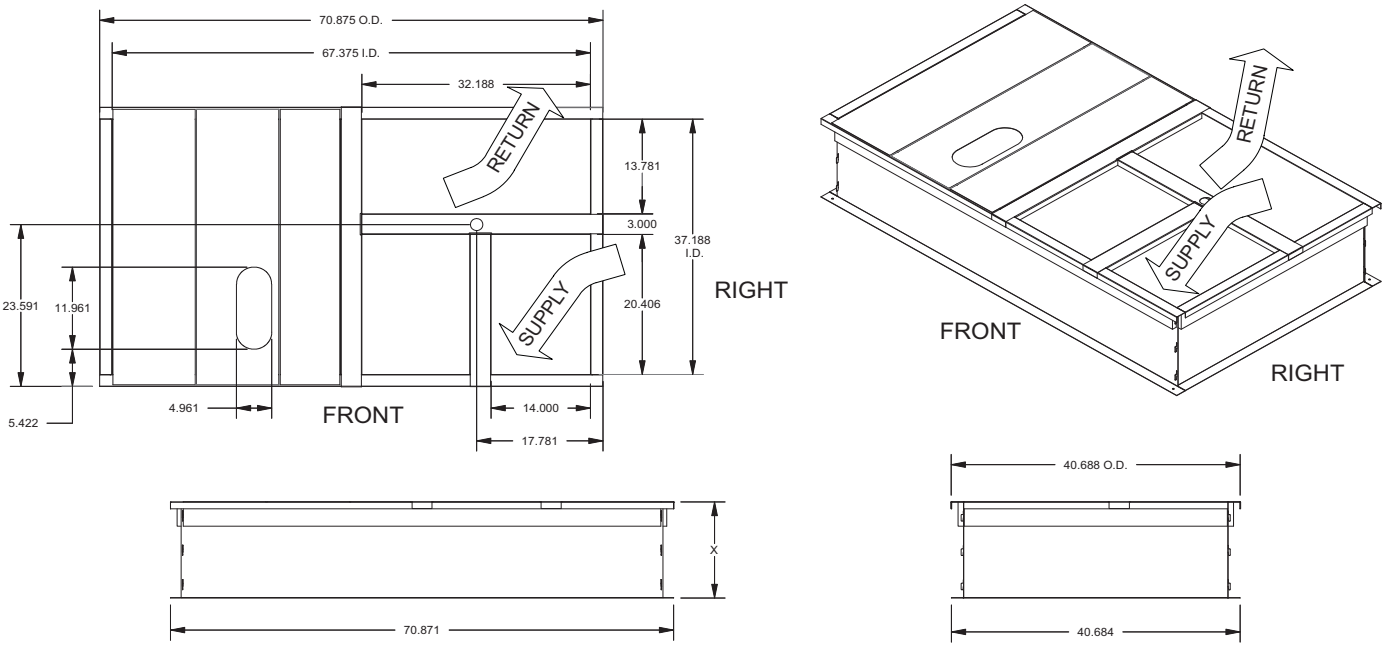


Figure 8: XYE05-06 Unit Dimensions

Table 4: XYE04-06 Unit Clearances

Direction	Distance (in.)	Direction	Distance (in.)
Top[1]	72	Right	18
Front	36	Left	12
Rear	18[2]/36[3]	Bottom[4]	1

1. Units must be installed outdoors. Over hanging structure or shrubs should not obscure condenser air discharge outlet, outdoor coil face.
2. Units without economizer or power exhaust.
3. Units equipped with an Economizer or Power Exhaust. Flue products must not be discharged within 10 Feet of the rear of the unit.
4. Units may be installed on combustible floors made from wood or class A, B or C roof covering materials.



1RC0456 X= 14" Height
1RC0458 X= 24" Height

Notes:
1. Sides, ends and cross support are 18-G90. Deck pans, R/A & S/A supports are 20-G90.
2. Full perimeter wood nailer.
3. Insulated deck pans.

Figure 9: 1RC0456, 1RC0458 Roof Curb Dimensions

Table 5: Unit Models used with 1RC0456, 1RC0458 Roof Curb

XYE04
XYE05
XYE06

NOTE: If utilities are required thru the base of the unit or thru the roof curb the following field installed accessories can be purchased thru your dealer or contractor:

1TB0403 - Thru the base electrical

Ductwork

Ductwork should be designed and sized according to the methods in Manual D or Manual Q of the Air Conditioning Contractors of America (ACCA) or as recommended by any other recognized authority such as ASHRAE or SMACNA.

A closed return duct system should be used. This will not preclude use of economizers or outdoor fresh air intake. The supply and return air duct connections at the unit should be made with flexible joints to minimize noise.

The supply and return air duct systems should be designed for the CFM and static pressure requirements of the job. They should NOT be sized to match the dimensions of the duct connections on the unit.

Refer to Figures 6 and 7 for bottom and side air duct openings.

Duct Covers

Units are shipped with the side duct openings covered and a covering over the bottom of the unit. For side duct application, remove the side duct covers and install over the bottom duct openings. The panels removed from the side duct connections are designed to be reused by securing each panel to its respective bottom duct opening. But keep in mind that the supply and return panels are installed with the painted surface DOWN, facing the bottom duct opening. The gasket must be removed from the insulation side of the duct cover so it is not directly exposed to the heating elements.The panels are secured by sliding them into slots in the back of the duct openings and screwing them to the base of the unit with screws (Use screws removed from original panel location.). Seals around duct openings must be tight.

⚠ CAUTION

When fastening ductwork to side duct flanges on unit, insert screws through duct flanges only. DO NOT insert screws through casing. Outdoor ductwork must be insulated and water-proofed.

Figure 10: Side Duct Cover Panels

NOTE: Shown with duct connection cover panel as shipped.

Figure 11: Bottom Return Opening For Side Duct Conversion

Figure 12: Bottom Supply Opening For Side Duct Conversion

Condensate Drain

A side condensate drain is provided to facilitate condensate piping. A condensate drain connection is available through the base pan for piping inside the roof curb. Trap the connection per Figure 13. The trap and drain lines should be protected from freezing.

Plumbing must conform to local codes. Use a sealing compound on male pipe threads. Install condensate drain line from the 3/4 inch NPT female connection on the unit to an open drain.

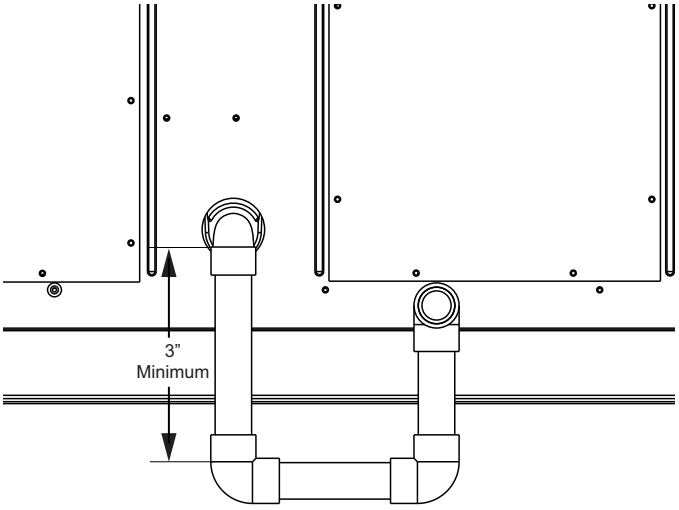


Figure 13: Condensate Drain

Compressors

The compressor used in this product is specifically designed to operate with R-410A Refrigerant and cannot be interchanged.

⚠ CAUTION

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system.

The compressor also uses a refrigerant oil that is extremely hygroscopic, meaning it absorbs water readily. They can absorb 15 times as much water as other oils designed for HCFC and CFC refrigerants. Take all necessary precautions to avoid exposure of the oil to the atmosphere.

⚠ CAUTION

Do not leave the system open to the atmosphere. Unit damage could occur due to moisture being absorbed by the **refrigerant** in the system. This type of oil is highly susceptible to moisture absorption.

R-410A compressor lubricants are known to cause long term damage to some synthetic roofing materials.

⚠ CAUTION

Exposure, even if immediately cleaned up, may cause embrittlement (leading to cracking) to occur in one year or more. When performing any service that may risk exposure of compressor oil to the roof, take precautions to protect roofing.

Procedures which risk oil leakage include, but are not limited to, compressor replacement, repairing refrigerant leaks, replacing refrigerant components such as filter drier, pressure switch, metering device or coil.

Units are shipped with compressor mountings which are factory-adjusted and ready for operation.

⚠ CAUTION

Do not loosen compressor mounting bolts.

Filters

Two-inch filters are supplied with each unit. Four-inch filters may be used with no modification to the filter racks. Filters must always be installed ahead of evaporator coil and must be kept clean or replaced with same size and type. Dirty filters reduce the capacity of the unit and result in frosted coils or safety shutdown. Refer to physical data tables, for the number and size of filters needed for the unit. The unit should not be operated without filters properly installed.

Power And Control Wiring

Field wiring to the unit, fuses, and disconnects must conform to provisions of National Electrical Code (NEC), ANSI/NFPA No. 70 – Latest Edition (in U.S.A.), current Canadian Electrical Code C221, and/or local ordinances. The unit must be electrically grounded in accordance with NEC and CEC as specified above and/or local codes.

Voltage tolerances which must be maintained at the compressor terminals during starting and running conditions are indicated on the unit Rating Plate and Table 1.

⚠ CAUTION

208/230-3-60 and 208/230-1-60 units control transformers are factory wired for 230v. Change tap on transformer for 208v operation. See unit wiring diagram.

The internal wiring harnesses furnished with this unit are an integral part of the design certified unit. Field alteration to comply with electrical codes should not be required. If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram and the same minimum gauge as the replaced wire.

A disconnect must be utilized for these units. Factory installed disconnects are available. If installing a disconnect (field supplied or UP supplied accessory), refer to Figures 6 and 7 for the recommended mounting location.

⚠ CAUTION

Avoid damage to internal components if drilling holes for disconnect mounting.

NOTE: Since not all local codes allow the mounting of a disconnect on the unit, please confirm compliance with local code before mounting a disconnect on the unit.

Electrical line must be sized properly to carry the load. USE COPPER CONDUCTORS ONLY. Each unit must be wired with a separate branch circuit fed directly from the meter panel and properly fused.

⚠ CAUTION

When connecting electrical power and control wiring to the unit, water-proof connectors must be used so that water or moisture cannot be drawn into the unit during normal operation. The above water-proofing conditions will also apply when installing a field supplied disconnect switch.

⚠ CAUTION

When installing equipment in a facility with a 3 phase high-leg delta power supply, care must be taken to ensure that the high-leg conductor is not attached to either of the two legs of the (single phase, direct drive) X13 or ECM motors. Failure to do so can result in the motor acting erratically or not running at all.

Check for the high leg conductor by checking voltage of each phase to ground.

Example: A or L1 phase to ground, voltage reading is 120V. B or L2 phase to ground, voltage reading is 195 to 208V. C or L3 phase to ground, voltage reading is 120V. Therefore B or L2 phase is the high Leg. The high should always be wired to the center or B or L2 tap.

Note: Check all three phase motors and compressors for proper rotation after making a change. If it is necessary to change 3 phase motor rotation, swap A or L1 and C or L3 only.

Thermostat Wiring

A two stage thermostat must be used and should be located on an inside wall approximately 56 inch above the floor where it will not be subject to drafts, sun exposure or heat from electrical fixtures or appliances. Follow the manufacturer's instructions enclosed with thermostat for general installation procedure. Seven (7) color-coded, insulated wires should be used to connect the thermostat to the unit. Refer to Table 6 for control wire sizing and maximum length.

Table 6: Control Wire Sizes

Wire Size	Maximum Length[1]
18 AWG	150 Feet

1. From the unit to the thermostat and back to the unit.

Table 7: Electrical Data

XYE04-06 Standard Static Indoor Blower - Without Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA[1] (Amps)	Min Fuse[2]/ Breaker[3] Size (Amps)	Max Fuse[2]/ Breaker[3] Size (Amps)	Min Discon-nect Rating		MCA[1] w/Pwr Exh (Amps)	Min Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Max Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Min Discon-nect Rating/ Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
04 (3)	208-1-60	15.4	83.9	24				2.3	6.6	1.5		None	-	-	-	28.2	30	40	28	91	29.7	30	45	30	94
												10625	4.9	1	23.6	57.7	60	60	55	114	59.2	60	60	57	118
												11125	7.9	1	38	75.7	80	80	72	129	77.2	80	80	73	132
	230-1-60	15.4	83.9	24				2.3	6	1.3		None	-	-	-	27.6	30	40	27	91	28.9	30	40	29	94
												10625	6.5	1	27.1	61.5	70	70	58	118	62.8	70	70	60	121
												11125	10.5	1	43.8	82.4	90	90	78	135	83.7	90	90	79	138
	208-3-60	10.4	73	16				2.3	6.6	1.1		None	-	-	-	21.9	25	30	22	80	23	25	30	23	82
												10625	4.9	1	13.6	38.9	40	45	38	93	40	40	45	39	96
												11125	7.9	1	21.9	49.3	50	50	47	102	50.4	60	60	49	104
												11625	12	1	33.3	63.5	70	70	60	113	64.6	70	70	62	116
	230-3-60	10.4	73	16				2.3	6	1		None	-	-	-	21.3	25	30	22	80	22.3	25	30	23	82
												10625	6.5	1	15.6	40.8	45	45	39	96	41.8	45	45	41	98
												11125	10.5	1	25.3	52.9	60	60	51	105	53.9	60	60	52	108
												11625	16	1	38.5	69.4	70	70	66	119	70.4	80	80	67	121
	460-3-60	5.8	38	9				1.3	3.2	0.5		None	-	-	-	11.8	15	15	12	43	12.3	15	15	12	44
												10646	6	1	7.2	20.8	25	25	20	50	21.3	25	20	21	51
												11146	11.5	1	13.8	29.1	30	30	28	57	29.6	30	28	28	58
												11446	14	1	16.8	32.8	35	35	31	60	33.3	35	31	32	61
	575-3-60	3.8	36.5	6				1.1	6	0.4		None	-	-	-	8.3	15	15	8	40	8.7	15	15	9	41
05 (4)	208-1-60	19.6	130	31				2.3	8.4	1.5		None	-	-	-	35.2	40	50	35	137	36.7	40	50	37	140
												10625	4.9	1	23.6	64.7	70	70	62	160	66.2	70	70	64	164
												11125	7.9	1	38	82.7	90	90	79	175	84.2	90	90	80	178
	230-1-60	19.6	130	31				2.3	7.6	1.3		None	-	-	-	34.4	35	50	34	137	35.7	40	50	35	140
												10625	6.5	1	27.1	68.3	70	80	65	164	69.6	70	80	67	167
												11125	10.5	1	43.8	89.2	90	90	84	181	90.5	100	100	86	184
	208-3-60	13.7	83.1	21				2.3	8.4	1.1		None	-	-	-	27.8	30	40	28	90	28.9	30	40	29	92
												10625	4.9	1	13.6	44.8	45	50	44	104	45.9	50	50	45	106
												11125	7.9	1	21.9	55.2	60	60	53	112	56.3	60	60	55	114
												11625	12	1	33.3	69.4	70	70	66	123	70.5	80	80	68	126
	230-3-60	13.7	83.1	21				2.3	7.6	1		None	-	-	-	27	30	40	27	90	28	30	40	28	92
												10625	6.5	1	15.6	46.5	50	50	45	106	47.5	50	50	46	108
												11125	10.5	1	25.3	58.6	60	60	56	115	59.6	60	60	57	118
												11625	16	1	38.5	75.1	80	80	71	129	76.1	80	80	73	131
	460-3-60	6.2	41	10				1.3	4	0.5		None	-	-	-	13.1	15	15	13	46	13.6	15	15	14	47
												10646	6	1	7.2	22.1	25	25	22	53	22.6	25	22	22	54
												11146	11.5	1	13.8	30.4	35	35	29	60	30.9	35	29	30	61
												11446	14	1	16.8	34.1	35	35	33	63	34.6	35	33	33	64
	575-3-60	4.8	33	8				1.1	7.6	0.4		None	-	-	-	10.1	15	15	10	36	10.5	15	15	11	37

XYE04-06 Standard Static Indoor Blower - Without Powered Convenience Outlet (Continued)

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA[1] (Amps)	Min Fuse[2]/ Breaker[3] Size (Amps)	Max Fuse[2]/ Breaker[3] Size (Amps)	Min Discon-nect Rating		MCA[1] w/Pwr Exh (Amps)	Min Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Max Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Min Discon-nect Rating/ Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
06 (5)	208-1-60	24.4	144	38				2.3	8.4	1.5		None	-	-	-	41.2	45	60	40	151	42.7	45	60	42	154
												10625	4.9	1	23.6	70.7	80	80	68	175	72.2	80	90	69	178
												11125	7.9	1	38	88.7	90	100	84	189	90.2	100	100	86	192
	230-1-60	24.4	144	38				2.3	7.6	1.3		None	-	-	-	40.4	45	60	39	151	41.7	45	60	41	154
												10625	6.5	1	27.1	74.3	80	90	71	178	75.6	80	90	72	181
												11125	10.5	1	43.8	95.2	100	100	90	195	96.5	100	100	91	198
	208-3-60	16	110	25				2.3	8.4	1.1		None	-	-	-	30.7	35	45	31	117	31.8	35	45	32	119
												10625	4.9	1	13.6	47.7	50	60	46	130	48.8	50	60	48	133
												11125	7.9	1	21.9	58.1	60	60	56	139	59.2	60	60	57	141
												11625	12	1	33.3	72.3	80	80	69	150	73.4	80	80	70	153
	230-3-60	16	110	25				2.3	7.6	1		None	-	-	-	29.9	30	45	30	117	30.9	35	45	31	119
												10625	6.5	1	15.6	49.4	50	60	48	133	50.4	60	60	49	135
												11125	10.5	1	25.3	61.5	70	70	59	142	62.5	70	70	60	145
												11625	16	1	38.5	78	80	80	74	156	79	80	80	75	158
	460-3-60	7.8	52	12				1.3	4	0.5		None	-	-	-	15.1	20	20	15	57	15.6	20	20	16	58
												10646	6	1	7.2	24.1	25	30	23	64	24.6	25	23	24	65
												11146	11.5	1	13.8	32.4	35	35	31	71	32.9	35	31	32	72
												11446	14	1	16.8	36.1	40	40	34	74	36.6	40	34	35	75
	575-3-60	5.7	38.9	9				1.1	7.6	0.4		None	-	-	-	11.2	15	15	11	42	11.6	15	15	12	43

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.

XYE04-06 Standard Static Indoor Blower - With Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA[1] (Amps)	Min Fuse[2]/ Breaker[3] Size (Amps)	Max Fuse[2]/ Breaker[3] Size (Amps)	Min Discon-nect Rating		MCA[1] w/Pwr Exh (Amps)	Min Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Max Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Min Discon-nect Rating/ Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
04 (3)	208-1-60	15.4	83.9	24				2.3	6.6	1.5	8.6	None	-	-	-	32.5	35	45	33	95	34	35	45	35	98
												10625	4.9	1	23.6	62	70	70	60	119	63.5	70	70	62	122
												11125	7.9	1	38	80	80	80	77	133	81.5	90	90	78	136
	230-1-60	15.4	83.9	24				2.3	6	1.3	8.6	None	-	-	-	31.9	35	45	32	95	33.2	35	45	34	98
												10625	6.5	1	27.1	65.8	70	70	63	122	67.1	70	70	65	125
												11125	10.5	1	43.8	86.7	90	90	83	139	88	90	90	84	142
	208-3-60	10.4	73	16				2.3	6.6	1.1	8.6	None	-	-	-	26.2	30	35	27	84	27.3	30	35	28	87
												10625	4.9	1	13.6	43.2	45	50	43	98	44.3	45	50	44	100
												11125	7.9	1	21.9	53.6	60	60	52	106	54.7	60	60	54	109
												11625	12	1	33.3	67.8	70	70	65	117	68.9	70	70	67	120
	230-3-60	10.4	73	16				2.3	6	1	8.6	None	-	-	-	25.6	30	35	26	84	26.6	30	35	28	87
												10625	6.5	1	15.6	45.1	50	50	44	100	46.1	50	50	46	102
												11125	10.5	1	25.3	57.2	60	60	56	110	58.2	60	60	57	112
												11625	16	1	38.5	73.7	80	80	71	123	74.7	80	80	72	125
	460-3-60	5.8	38	9				1.3	3.2	0.5	8.6	None	-	-	-	14	15	15	14	45	14.5	15	15	15	46
												10646	6	1	7.2	23	25	25	23	52	23.5	25	23	23	53
												11146	11.5	1	13.8	31.3	35	35	30	59	31.8	35	30	31	60
												11446	14	1	16.8	35	35	35	34	62	35.5	40	34	34	63
	575-3-60	3.8	36.5	6				1.1	6	0.4	8.6	None	-	-	-	10	15	15	10	41	10.4	15	15	11	42
05 (4)	208-1-60	19.6	130	31				2.3	8.4	1.5	8.6	None	-	-	-	39.5	40	50	40	141	41	45	60	42	145
												10625	4.9	1	23.6	69	70	80	67	165	70.5	80	80	69	168
												11125	7.9	1	38	87	90	90	83	179	88.5	90	90	85	183
	230-1-60	19.6	130	31				2.3	7.6	1.3	8.6	None	-	-	-	38.7	40	50	39	141	40	40	50	40	144
												10625	6.5	1	27.1	72.6	80	80	70	168	73.9	80	80	72	171
												11125	10.5	1	43.8	93.5	100	100	89	185	94.8	100	100	91	188
	208-3-60	13.7	83.1	21				2.3	8.4	1.1	8.6	None	-	-	-	32.1	35	45	33	94	33.2	35	45	34	97
												10625	4.9	1	13.6	49.1	50	50	49	108	50.2	60	60	50	110
												11125	7.9	1	21.9	59.5	60	60	58	116	60.6	70	70	59	119
												11625	12	1	33.3	73.7	80	80	71	128	74.8	80	80	73	130
	230-3-60	13.7	83.1	21				2.3	7.6	1	8.6	None	-	-	-	31.3	35	45	32	94	32.3	35	45	33	97
												10625	6.5	1	15.6	50.8	60	60	50	110	51.8	60	60	51	112
												11125	10.5	1	25.3	62.9	70	70	61	120	63.9	70	70	62	122
												11625	16	1	38.5	79.4	80	80	76	133	80.4	90	90	78	135
	460-3-60	6.2	41	10				1.3	4	0.5	8.6	None	-	-	-	15.3	20	20	16	48	15.8	20	20	16	49
												10646	6	1	7.2	24.3	25	25	24	55	24.8	25	24	25	56
												11146	11.5	1	13.8	32.6	35	35	32	62	33.1	35	32	32	63
												11446	14	1	16.8	36.3	40	40	35	65	36.8	40	35	36	66
	575-3-60	4.8	33	8				1.1	7.6	0.4	8.6	None	-	-	-	11.9	15	15	12	38	12.3	15	15	13	39
06 (5)	208-1-60	24.4	144	38				2.3	8.4	1.5	8.6	None	-	-	-	45.5	50	60	45	155	47	50	70	47	159
												10625	4.9	1	23.6	75	80	90	72	179	76.5	80	90	74	182
												11125	7.9	1	38	93	100	100	89	193	94.5	100	100	91	197
	230-1-60	24.4	144	38				2.3	7.6	1.3	8.6	None	-	-	-	44.7	45	60	44	156	46	50	70	46	158
												10625	6.5	1	27.1	78.6	80	90	76	183	79.9	80	90	77	186
												11125	10.5	1	43.8	99.5	100	110	95	199	100.8	110	110	96	202
	208-3-60	16	110	25				2.3	8.4	1.1	8.6	None	-	-	-	35	35	50	36	121	36.1	40	50	37	124
												10625	4.9	1	13.6	52	60	60	51	135	53.1	60	60	53	137
												11125	7.9	1	21.9	62.4	70	70	61	143	63.5	70	70	62	146
												11625	12	1	33.3	76.6	80	80	74	154	77.7	80	80	75	157
	230-3-60	16	110	25				2.3	7.6	1	8.6	None	-	-	-	34.2	35	50	35	121	35.2	40	50	36	124
												10625	6.5	1	15.6	53.7	60	60	53	137	54.7	60	60	54	139
												11125	10.5	1	25.3	65.8	70	70	64	147	66.8	70	70	65	149
												11625	16	1	38.5	82.3	90	90	79	160	83.3	90	90	80	162
	460-3-60	7.8	52	12				1.3	4	0.5	8.6	None	-	-	-	17.3	20	25	18	59	17.8	20	25	18	60
												10646	6	1	7.2	26.3	30	30	26	66	26.8	30	26	26	67
												11146	11.5	1	13.8	34.6	35	35	33	73	35.1	40	33	34	74
												11446	14	1	16.8	38.3	40	40	37	76	38.8	40	37	37	77
	575-3-60	5.7	38.9	9				1.1	7.6	0.4	8.6	None	-	-	-	13	15	15	13	44	13.4	15	15	14	45

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.

XYE04-06 Medium Static Indoor Blower - Without Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA[1] (Amps)	Min Fuse[2]/ Breaker[3] Size (Amps)	Max Fuse[2]/ Breaker[3] Size (Amps)	Min Discon-nect Rating		MCA[1] w/Pwr Exh (Amps)	Min Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Max Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Min Discon-nect Rating/ Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
04 (3)	208-1-60	15.4	83.9	24				2.3	7.6	1.5		None	-	-	-	29.2	30	40	29	122	30.7	35	45	31	125
												10625	4.9	1	23.6	58.7	60	60	56	145	60.2	70	70	58	149
												11125	7.9	1	38	76.7	80	80	73	160	78.2	80	80	75	163
	230-1-60	15.4	83.9	24				2.3	7	1.3		None	-	-	-	28.6	30	40	28	124	29.9	30	45	30	127
												10625	6.5	1	27.1	62.5	70	70	60	152	63.8	70	70	61	154
												11125	10.5	1	43.8	83.4	90	90	79	168	84.7	90	90	80	171
	208-3-60	10.4	73	16				2.3	5.2	1.1		None	-	-	-	20.5	25	30	21	100	21.6	25	30	22	103
												10625	4.9	1	13.6	37.5	40	40	36	114	38.6	40	45	37	116
												11125	7.9	1	21.9	47.9	50	50	46	122	49	50	50	47	125
												11625	12	1	33.3	62.1	70	70	59	134	63.2	70	70	60	136
	230-3-60	10.4	73	16				2.3	5.2	1		None	-	-	-	20.5	25	30	21	103	21.5	25	30	22	105
												10625	6.5	1	15.6	40	40	45	39	119	41	45	45	40	121
												11125	10.5	1	25.3	52.1	60	60	50	128	53.1	60	60	51	131
												11625	16	1	38.5	68.6	70	70	65	142	69.6	70	70	66	144
	460-3-60	5.8	38	9				1.3	2.6	0.5		None	-	-	-	11.2	15	15	11	53	11.7	15	15	12	55
												10646	6	1	7.2	20.2	25	25	19	61	20.7	25	19	20	62
												11146	11.5	1	13.8	28.5	30	30	27	67	29	30	27	28	68
												11446	14	1	16.8	32.2	35	35	30	70	32.7	35	30	31	71
	575-3-60	3.8	36.5	6				1.1	2	0.4		None	-	-	-	7.9	15	15	8	49	8.3	15	15	8	50
05 (4)	208-1-60	19.6	130	31				2.3	7.6	1.5		None	-	-	-	34.4	35	50	34	168	35.9	40	50	36	171
												10625	4.9	1	23.6	63.9	70	70	61	191	65.4	70	70	63	195
												11125	7.9	1	38	81.9	90	90	78	206	83.4	90	90	79	209
	230-1-60	19.6	130	31				2.3	7	1.3		None	-	-	-	33.8	35	50	33	171	35.1	40	50	35	173
												10625	6.5	1	27.1	67.7	70	80	64	198	69	70	80	66	201
												11125	10.5	1	43.8	88.6	90	90	84	214	89.9	90	90	85	217
	208-3-60	13.7	83.1	21				2.3	5.2	1.1		None	-	-	-	24.6	25	35	24	110	25.7	30	35	26	113
												10625	4.9	1	13.6	41.6	45	50	40	124	42.7	45	50	41	126
												11125	7.9	1	21.9	52	60	60	50	132	53.1	60	60	51	135
												11625	12	1	33.3	66.2	70	70	63	144	67.3	70	70	64	146
	230-3-60	13.7	83.1	21				2.3	5.2	1		None	-	-	-	24.6	25	35	24	113	25.6	30	35	26	115
												10625	6.5	1	15.6	44.1	45	50	42	129	45.1	50	50	43	131
												11125	10.5	1	25.3	56.2	60	60	53	138	57.2	60	60	55	141
												11625	16	1	38.5	72.7	80	80	69	152	73.7	80	80	70	154
	460-3-60	6.2	41	10				1.3	2.6	0.5		None	-	-	-	11.7	15	15	12	56	12.2	15	15	12	58
												10646	6	1	7.2	20.7	25	25	20	64	21.2	25	20	20	65
												11146	11.5	1	13.8	29	30	30	27	70	29.5	30	27	28	71
												11446	14	1	16.8	32.7	35	35	31	73	33.2	35	31	32	74
	575-3-60	4.8	33	8				1.1	2	0.4		None	-	-	-	9.1	15	15	9	45	9.5	15	15	10	46
06 (5)	208-1-60	24.4	144	38				2.3	6.8	1.5		None	-	-	-	39.6	40	60	39	182	41.1	45	60	40	185
												10625	4.9	1	23.6	69.1	70	80	66	205	70.6	80	80	67	209
												11125	7.9	1	38	87.1	90	100	82	220	88.6	90	100	84	223
	230-1-60	24.4	144	38				2.3	6.2	1.3		None	-	-	-	39	40	60	38	182	40.3	45	60	39	185
												10625	6.5	1	27.1	72.9	80	90	69	209	74.2	80	90	70	212
												11125	10.5	1	43.8	93.8	100	100	88	226	95.1	100	100	90	229
	208-3-60	16	110	25				2.3	7	1.1		None	-	-	-	29.3	30	45	29	175	30.4	35	45	30	177
												10625	4.9	1	13.6	46.3	50	50	45	189	47.4	50	60	46	191
												11125	7.9	1	21.9	56.7	60	60	54	197	57.8	60	60	56	199
												11625	12	1	33.3	70.9	80	80	67	208	72	80	80	69	211
	230-3-60	16	110	25				2.3	7.2	1		None	-	-	-	29.5	30	45	29	177	30.5	35	45	30	179
												10625	6.5	1	15.6	49	50	60	47	192	50	50	60	48	195
												11125	10.5	1	25.3	61.1	70	70	58	202	62.1	70	70	60	204
												11625	16	1	38.5	77.6	80	80	74	215	78.6	80	80	75	218
	460-3-60	7.8	52	12				1.3	3.6	0.5		None	-	-	-	14.7	15	20	15	86	15.2	20	20	15	87
												10646	6	1	7.2	23.7	25	25	23	93	24.2	25	23	23	94
												11146	11.5	1	13.8	32	35	35	30	100	32.5	35	30	31	101
												11446	14	1	16.8	35.7	40	40	34	103	36.2	40	34	35	104
	575-3-60	5.7	38.9	9				1.1	2.5	0.4		None	-	-	-	10.7	15	15	11	59	11.1	15	15	11	60

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.

XYE04-06 Medium Static Indoor Blower - With Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA[1] (Amps)	Min Fuse[2]/ Breaker[3] Size (Amps)	Max Fuse[2]/ Breaker[3] Size (Amps)	Min Discon-nect Rating		MCA[1] w/Pwr Exh (Amps)	Min Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Max Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Min Discon-nect Rating/ Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
04 (3)	208-1-60	15.4	83.9	24				2.3	7.6	1.5	8.6	None	-	-	-	33.5	35	45	34	126	35	35	50	36	129
												10625	4.9	1	23.6	63	70	70	61	150	64.5	70	70	63	153
												11125	7.9	1	38	81	90	90	78	164	82.5	90	90	79	167
	230-1-60	15.4	83.9	24				2.3	7	1.3	8.6	None	-	-	-	32.9	35	45	33	129	34.2	35	45	35	132
												10625	6.5	1	27.1	66.8	70	70	65	156	68.1	70	70	66	159
												11125	10.5	1	43.8	87.7	90	90	84	173	89	90	90	85	175
	208-3-60	10.4	73	16				2.3	5.2	1.1	8.6	None	-	-	-	24.8	25	35	26	105	25.9	30	35	27	107
												10625	4.9	1	13.6	41.8	45	45	41	118	42.9	45	45	42	121
												11125	7.9	1	21.9	52.2	60	60	51	126	53.3	60	60	52	129
												11625	12	1	33.3	66.4	70	70	64	138	67.5	70	70	65	140
	230-3-60	10.4	73	16				2.3	5.2	1	8.6	None	-	-	-	24.8	25	35	26	107	25.8	30	35	27	110
												10625	6.5	1	15.6	44.3	45	50	43	123	45.3	50	50	45	125
												11125	10.5	1	25.3	56.4	60	60	55	133	57.4	60	60	56	135
												11625	16	1	38.5	72.9	80	80	70	146	73.9	80	80	71	148
	460-3-60	5.8	38	9				1.3	2.6	0.5	8.6	None	-	-	-	13.4	15	15	14	56	13.9	15	15	14	57
												10646	6	1	7.2	22.4	25	25	22	63	22.9	25	22	23	64
												11146	11.5	1	13.8	30.7	35	35	30	69	31.2	35	30	30	70
												11446	14	1	16.8	34.4	35	35	33	72	34.9	35	33	34	73
	575-3-60	3.8	36.5	6				1.1	2	0.4	8.6	None	-	-	-	9.6	15	15	10	51	10	15	15	10	51
05 (4)	208-1-60	19.6	130	31				2.3	7.6	1.5	8.6	None	-	-	-	38.7	40	50	39	172	40.2	45	50	41	176
												10625	4.9	1	23.6	68.2	70	80	66	196	69.7	70	80	68	199
												11125	7.9	1	38	86.2	90	90	83	210	87.7	90	90	84	214
	230-1-60	19.6	130	31				2.3	7	1.3	8.6	None	-	-	-	38.1	40	50	38	175	39.4	40	50	40	178
												10625	6.5	1	27.1	72	80	80	69	202	73.3	80	80	71	205
												11125	10.5	1	43.8	92.9	100	100	89	219	94.2	100	100	90	222
	208-3-60	13.7	83.1	21				2.3	5.2	1.1	8.6	None	-	-	-	28.9	30	40	29	115	30	30	40	31	117
												10625	4.9	1	13.6	45.9	50	50	45	128	47	50	50	46	131
												11125	7.9	1	21.9	56.3	60	60	55	137	57.4	60	60	56	139
												11625	12	1	33.3	70.5	80	80	68	148	71.6	80	80	69	150
	230-3-60	13.7	83.1	21				2.3	5.2	1	8.6	None	-	-	-	28.9	30	40	29	117	29.9	30	40	30	120
												10625	6.5	1	15.6	48.4	50	50	47	133	49.4	50	50	48	135
												11125	10.5	1	25.3	60.5	70	70	58	143	61.5	70	70	60	145
												11625	16	1	38.5	77	80	80	74	156	78	80	80	75	158
	460-3-60	6.2	41	10				1.3	2.6	0.5	8.6	None	-	-	-	13.9	15	20	14	59	14.4	15	20	15	60
												10646	6	1	7.2	22.9	25	25	22	66	23.4	25	22	23	67
												11146	11.5	1	13.8	31.2	35	35	30	72	31.7	35	30	31	73
												11446	14	1	16.8	34.9	35	35	33	75	35.4	40	33	34	76
	575-3-60	4.8	33	8				1.1	2	0.4	8.6	None	-	-	-	10.8	15	15	11	47	11.2	15	15	12	48
06 (5)	208-1-60	24.4	144	38				2.3	6.8	1.5	8.6	None	-	-	-	43.9	45	60	43	186	45.4	50	60	45	189
												10625	4.9	1	23.6	73.4	80	90	71	209	74.9	80	90	72	213
												11125	7.9	1	38	91.4	100	100	87	224	92.9	100	100	89	227
	230-1-60	24.4	144	38				2.3	6.2	1.3	8.6	None	-	-	-	43.3	45	60	43	187	44.6	45	60	44	189
												10625	6.5	1	27.1	77.2	80	90	74	214	78.5	80	90	75	217
												11125	10.5	1	43.8	98.1	100	110	93	230	99.4	100	110	95	233
	208-3-60	16	110	25				2.3	7	1.1	8.6	None	-	-	-	33.6	35	45	34	179	34.7	35	50	35	182
												10625	4.9	1	13.6	50.6	60	60	50	193	51.7	60	60	51	195
												11125	7.9	1	21.9	61	70	70	59	201	62.1	70	70	60	204
												11625	12	1	33.3	75.2	80	80	72	213	76.3	80	80	74	215
	230-3-60	16	110	25				2.3	7.2	1	8.6	None	-	-	-	33.8	35	45	34	181	34.8	35	50	35	183
												10625	6.5	1	15.6	53.3	60	60	52	197	54.3	60	60	53	199
												11125	10.5	1	25.3	65.4	70	70	63	206	66.4	70	70	65	209
												11625	16	1	38.5	81.9	90	90	79	220	82.9	90	90	80	222
	460-3-60	7.8	52	12				1.3	3.6	0.5	8.6	None	-	-	-	16.9	20	20	17	88	17.4	20	20	18	89
												10646	6	1	7.2	25.9	30	30	25	95	26.4	30	25	26	96
												11146	11.5	1	13.8	34.2	35	35	33	102	34.7	35	33	34	103
												11446	14	1	16.8	37.9	40	40	36	105	38.4	40	36	37	106
	575-3-60	5.7	38.9	9				1.1	2.5	0.4	8.6	None	-	-	-	12.4	15	15	13	61	12.8	15	15	13	62

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.

XYE04-06 Hi Static Indoor Blower - Without Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA[1] (Amps)	Min Fuse[2]/ Breaker[3] Size (Amps)	Max Fuse[2]/ Breaker[3] Size (Amps)	Min Discon-nect Rating		MCA[1] w/Pwr Exh (Amps)	Min Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Max Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Min Discon-nect Rating/ Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
04 (3)	208-3-60	10.4	73	16				2.3	5.2	1.1		None	-	-	-	20.5	25	30	21	100	21.6	25	30	22	103
												10625	4.9	1	13.6	37.5	40	40	36	114	38.6	40	45	37	116
												11125	7.9	1	21.9	47.9	50	50	46	122	49	50	50	47	125
												11625	12	1	33.3	62.1	70	70	59	134	63.2	70	70	60	136
	230-3-60	10.4	73	16				2.3	5.2	1		None	-	-	-	20.5	25	30	21	103	21.5	25	30	22	105
												10625	6.5	1	15.6	40	40	45	39	119	41	45	45	40	121
												11125	10.5	1	25.3	52.1	60	60	50	128	53.1	60	60	51	131
												11625	16	1	38.5	68.6	70	70	65	142	69.6	70	70	66	144
	460-3-60	5.8	38	9				1.3	2.6	0.5		None	-	-	-	11.2	15	15	11	53	11.7	15	15	12	55
												10646	6	1	7.2	20.2	25	25	19	61	20.7	25	19	20	62
												11146	11.5	1	13.8	28.5	30	30	27	67	29	30	27	28	68
												11446	14	1	16.8	32.2	35	35	30	70	32.7	35	30	31	71
	575-3-60	3.8	36.5	6				1.1	2	0.4		None	-	-	-	7.9	15	15	8	49	8.3	15	15	8	50
05 (4)	208-3-60	13.7	83.1	21				2.3	7.5	1.1		None	-	-	-	26.9	30	40	27	137	28	30	40	28	139
												10625	4.9	1	13.6	43.9	45	50	43	150	45	45	50	44	153
												11125	7.9	1	21.9	54.3	60	60	52	158	55.4	60	60	53	161
												11625	12	1	33.3	68.5	70	70	65	170	69.6	70	70	67	172
	230-3-60	13.7	83.1	21				2.3	7.5	1		None	-	-	-	26.9	30	40	27	143	27.9	30	40	28	145
												10625	6.5	1	15.6	46.4	50	50	45	159	47.4	50	50	46	161
												11125	10.5	1	25.3	58.5	60	60	56	168	59.5	60	60	57	171
												11625	16	1	38.5	75	80	80	71	182	76	80	80	72	184
	460-3-60	6.2	41	10				1.3	3.4	0.5		None	-	-	-	12.5	15	15	13	71	13	15	15	13	73
												10646	6	1	7.2	21.5	25	25	21	79	22	25	21	21	80
												11146	11.5	1	13.8	29.8	30	30	28	85	30.3	35	28	29	86
												11446	14	1	16.8	33.5	35	35	32	88	34	35	32	32	89
	575-3-60	4.8	33	8				1.1	2.8	0.4		None	-	-	-	9.9	15	15	10	57	10.3	15	15	10	58
06 (5)	208-3-60	16	110	25				2.3	8.9	1.1		None	-	-	-	31.2	35	45	31	192	32.3	35	45	33	194
												10625	4.9	1	13.6	48.2	50	60	47	205	49.3	50	60	48	208
												11125	7.9	1	21.9	58.6	60	60	56	214	59.7	60	70	58	216
												11625	12	1	33.3	72.8	80	80	70	225	73.9	80	80	71	227
	230-3-60	16	110	25				2.3	8.2	1		None	-	-	-	30.5	35	45	30	194	31.5	35	45	32	196
												10625	6.5	1	15.6	50	50	60	48	210	51	60	60	50	212
												11125	10.5	1	25.3	62.1	70	70	60	219	63.1	70	70	61	222
												11625	16	1	38.5	78.6	80	80	75	233	79.6	80	80	76	235
	460-3-60	7.8	52	12				1.3	4.1	0.5		None	-	-	-	15.2	20	20	15	89	15.7	20	20	16	91
												10646	6	1	7.2	24.2	25	30	23	97	24.7	25	23	24	98
												11146	11.5	1	13.8	32.5	35	35	31	103	33	35	31	32	104
												11446	14	1	16.8	36.2	40	40	35	106	36.7	40	35	35	107
	575-3-60	5.7	38.9	9				1.1	3.2	0.4		None	-	-	-	11.4	15	15	12	67	11.8	15	15	12	68

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.

XYE04-06 Hi Static Indoor Blower - With Powered Convenience Outlet

Size (Tons)	Nominal Unit Voltage	Compressor 1			Compressor 2			OD Fan Motors (each)	Supply Blower Motor	Pwr Exh Motor	Pwr Conv Outlet	Electric Heat Field Installed Kit 2EK045*				MCA[1] (Amps)	Min Fuse[2]/ Breaker[3] Size (Amps)	Max Fuse[2]/ Breaker[3] Size (Amps)	Min Discon-nect Rating		MCA[1] w/Pwr Exh (Amps)	Min Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Max Fuse[2]/ Breaker[3] Size w/ Pwr Exh (Amps)	Min Discon-nect Rating/ Pwr Exh	
		RLA	LRA	MCC	RLA	LRA	MCC					Model	kW	Stages	Amps				FLA	LRA				FLA	LRA
04 (3)	208-3-60	10.4	73	16				2.3	5.2	1.1	8.6	None	-	-	-	24.8	25	35	26	105	25.9	30	35	27	107
												10625	4.9	1	13.6	41.8	45	45	41	118	42.9	45	45	42	121
												11125	7.9	1	21.9	52.2	60	60	51	126	53.3	60	60	52	129
												11625	12	1	33.3	66.4	70	70	64	138	67.5	70	70	65	140
	230-3-60	10.4	73	16				2.3	5.2	1	8.6	None	-	-	-	24.8	25	35	26	107	25.8	30	35	27	110
												10625	6.5	1	15.6	44.3	45	50	43	123	45.3	50	50	45	125
												11125	10.5	1	25.3	56.4	60	60	55	133	57.4	60	60	56	135
												11625	16	1	38.5	72.9	80	80	70	146	73.9	80	80	71	148
	460-3-60	5.8	38	9				1.3	2.6	0.5	8.6	None	-	-	-	13.4	15	15	14	56	13.9	15	15	14	57
												10646	6	1	7.2	22.4	25	25	22	63	22.9	25	22	23	64
												11146	11.5	1	13.8	30.7	35	35	30	69	31.2	35	30	30	70
												11446	14	1	16.8	34.4	35	35	33	72	34.9	35	33	34	73
	575-3-60	3.8	36.5	6				1.1	2	0.4	8.6	None	-	-	-	9.6	15	15	10	51	10	15	15	10	51
05 (4)	208-3-60	13.7	83.1	21				2.3	7.5	1.1	8.6	None	-	-	-	31.2	35	40	32	141	32.3	35	45	33	143
												10625	4.9	1	13.6	48.2	50	50	48	154	49.3	50	50	49	157
												11125	7.9	1	21.9	58.6	60	60	57	163	59.7	60	60	58	165
												11625	12	1	33.3	72.8	80	80	70	174	73.9	80	80	72	177
	230-3-60	13.7	83.1	21				2.3	7.5	1	8.6	None	-	-	-	31.2	35	40	32	147	32.2	35	45	33	150
												10625	6.5	1	15.6	50.7	60	60	50	163	51.7	60	60	51	165
												11125	10.5	1	25.3	62.8	70	70	61	173	63.8	70	70	62	175
												11625	16	1	38.5	79.3	80	80	76	186	80.3	90	90	77	188
	460-3-60	6.2	41	10				1.3	3.4	0.5	8.6	None	-	-	-	14.7	15	20	15	74	15.2	20	20	16	75
												10646	6	1	7.2	23.7	25	25	23	81	24.2	25	23	24	82
												11146	11.5	1	13.8	32	35	35	31	87	32.5	35	31	32	88
												11446	14	1	16.8	35.7	40	40	34	90	36.2	40	34	35	91
	575-3-60	4.8	33	8				1.1	2.8	0.4	8.6	None	-	-	-	11.6	15	15	12	59	12	15	15	12	60
06 (5)	208-3-60	16	110	25				2.3	8.9	1.1	8.6	None	-	-	-	35.5	40	50	36	196	36.6	40	50	37	198
												10625	4.9	1	13.6	52.5	60	60	52	210	53.6	60	60	53	212
												11125	7.9	1	21.9	62.9	70	70	61	218	64	70	70	63	220
												11625	12	1	33.3	77.1	80	80	75	229	78.2	80	80	76	232
	230-3-60	16	110	25				2.3	8.2	1	8.6	None	-	-	-	34.8	35	50	35	198	35.8	40	50	37	201
												10625	6.5	1	15.6	54.3	60	60	53	214	55.3	60	60	55	216
												11125	10.5	1	25.3	66.4	70	70	65	224	67.4	70	70	66	226
												11625	16	1	38.5	82.9	90	90	80	237	83.9	90	90	81	239
	460-3-60	7.8	52	12				1.3	4.1	0.5	8.6	None	-	-	-	17.4	20	25	18	92	17.9	20	25	18	93
												10646	6	1	7.2	26.4	30	30	26	99	26.9	30	26	27	100
												11146	11.5	1	13.8	34.7	35	35	34	105	35.2	40	34	34	106
												11446	14	1	16.8	38.4	40	40	37	108	38.9	40	37	38	109
	575-3-60	5.7	38.9	9				1.1	3.2	0.4	8.6	None	-	-	-	13.1	15	15	13	69	13.5	15	15	14	70

1. Minimum Circuit Ampacity.
2. Dual Element, Time Delay Type.
3. HACR type per NEC.

Table 8: Physical Data

XYE04 thru 06

Component	Models		
	XYE04	XYE05	XYE06
Nominal Tonnage	**3**	**4**	**5**
AHRI COOLING PERFORMANCE			
Gross Capacity @ AHRI A point (Btu)	37,300	48,600	60,000
AHRI net capacity (MBH)	36,400	47,000	58,500
EER	12.5	12.5	12.5
SEER	15.0	15.0	15.0
CFM	1,250	1,490	1,682
System power (KW)	2.9	3.8	4.7
Refrigerant type	R410A	R410A	R410A
Refrigerant charge (lb-oz)	12-0	14-0	16-0
ARI HEATING PERFORMANCE			
47ºF capacity rating (MBH)	34,000	46,000	55,000
System power (KW) / COP	3.0 / 3.3	3.8 / 3.6	4.4 / 3.6
17ºF capacity rating (MBH)	18,400	26,000	30,000
System power (KW) / COP	2.7 / 2.0	3.3 / 2.3	3.9 / 2.3
HSPF (Btu/Watts-hr)	8.0	8.2	8.2
DIMENSIONS (inches)			
Length	74.1	74.1	74.1
Width	48.9	48.9	48.9
Height	32.5	40.6	40.6
OPERATING WT. (lbs.)	535	614	653
COMPRESSORS			
Type	SCROLL	SCROLL	SCROLL
Quantity	1	1	1
OUTDOOR COIL DATA			
Face area (Sq. Ft.)	15.1	19.4	19.4
Rows	2	2	2
Fins per inch	17	17	17
Tube diameter	0.375	0.375	0.375
Circuitry Type	Split-face	Split-face	Split-face
Refrigerant control	TXV	TXV	TXV
INDOOR COIL DATA			
Face area (Sq. Ft.)	5.5	7.3	7.3
Rows	3	3	4
Fins per inch	15	15	15
Tube diameter	0.375	0.375	0.375
Circuitry Type	Intertwined	Intertwined	Intertwined
Refrigerant control	TXV	TXV	TXV
OUTDOOR FAN DATA			
Quantity	1	1	1
Fan diameter (Inch)	22	22	22
Type	Prop	Prop	Prop
Drive type	DIRECT DRIVE	DIRECT DRIVE	DIRECT DRIVE
No. speeds	1	1	1
Number of motors	1	1	1
Motor HP each	1/2	1/2	1/2
RPM	1100	1100	1100
Total CFM	3600	4000	4300

XYE04 thru 06 (Continued)

Component	Models					
	XYE04		XYE05		XYE06	
Nominal Tonnage	**3**		**4**		**5**	
BELT DRIVE INDOOR FAN DATA						
Quantity	1		1		1	
Fan diameter (Inch)	10 x 10		10 x 10		11 x 10	
Type	Centrifugal		Centrifugal		Centrifugal	
Motor Sheave	1VL34	1VL44	1VL34	1VL44	1VL34	1VL44
Blower Sheave	AK46	AK46	AK46	AK46	AK46	AK46
Belt	A39	A40	A39	A40	A37	A39
Motor HP, nominal, each	1.5	1.5	1.5	2	1.5	2
RPM	1725		1725		1750	
Frame size	56Y		56Y		56HZ	
DIRECT DRIVE INDOOR FAN DATA						
Quantity	1		1		1	
Fan Size (Inch)	10 x 10		10 x 10		11 x 10	
Type	Centrifugal		Centrifugal		Centrifugal	
Motor HP each	3/4		1		1	
RPM	1050		1050		1050	
FILTERS						
Quantity - Size	2 - (16 x 25 x 2)[1]		4 - (16 x 16 x 2)[1]		4 - (16 x 16 x 2)[1]	

1. 2-inch Throwaway, Standard, MERV 4 (Minimum Efficiency Reporting Value)

Operation

Sequence Of Operation

For XYE units, a "Y1" call for the first stage of cooling is passed to the Unit Control Board (UCB) which then determines whether the requested operation is available and if so, which components to energize. With an "Y1" call for first stage cooling the UCB will determine if a first stage cooling output is valid as long as all safeties and time-delays allow a C1 output for cooling. The C1 relay on the UCB will close and send 24 volts to the compressor relay starting the first stage compressor and also energizing a relay starting the associated condenser fans. During any call for fan or cooling the FAN output on the UCB will energize the appropriate relay starting the supply fan.

If at any time a call for both heating and cooling are present, the heating operation will be performed. If operating, the cooling system is halted as with a completion of a call for cooling. Heating always takes priority.

Continuous Blower

By setting the room thermostat fan switch to "ON," the supply air blower will operate continuously.

Intermittent Blower

With the room thermostat fan switch set to "AUTO" and the system switch set to either the "AUTO" or "HEAT" settings, the blower is energized whenever a cooling or heating operation is requested. The blower is energized after any specified delay associated with the operation.

When energized, the indoor blower has a minimum run time of 30 seconds. Additionally, the indoor blower has a minimum off delay of 10 seconds.

No Outdoor Air Options

When the thermostat calls for cooling, the low-voltage control circuit from “R” to “Y1” and “G” is completed. The compressor and condenser fan motor are energized. After completing the specified fan on delay for cooling, the UCB will energize the blower motor.

Once the thermostat has been satisfied, it will de-energize Y1. If the compressor has satisfied its minimum run time, the compressor and condenser fan de-energize. Otherwise, the unit operates the cooling system until the minimum run time for the compressor has been completed. After the compressor de-energizes, the blower is stopped following the elapse of the fan off delay for cooling.

To be available, a compressor must not be locked-out due to a high or low-pressure switch or Evaporator Low Limit sensor **(EC1)** detecting a temperature below 26° F and the anti-short cycle delay (ASCD) must have elapsed.

Economizer With Single Enthalpy Sensor

When the room thermostat calls for cooling, the low voltage control circuit from “R” to “G” and “Y1” is completed. The UCB energizes the blower motor (if the fan switch on the room thermostat is set in the “AUTO” position) and drives the economizer dampers from fully closed to their minimum position. If the enthalpy of the outdoor air is below the setpoint of the enthalpy controller (previously determined), “Y1” energizes the economizer. The dampers will modulate to maintain a constant supply air temperature as monitored by the discharge air sensor. If the outdoor air enthalpy is above the setpoint, “Y1” energizes the compressor and condenser fan motor only.

Once the thermostat has been satisfied, it will de-energize “Y1”. If the compressor has satisfied its minimum run time, the compressor and condenser fan are de-energized. Otherwise, the unit operates the cooling system until the minimum run times for the compressor has been completed. After the compressor de-energizes, the blower is stopped following the elapse of the fan off delay for cooling, and the economizer damper goes to the closed position. If the unit is in continuous fan operation the economizer damper goes to the min. position.

Economizer With Dual Enthalpy Sensors

The operation with the dual enthalpy sensors is identical to the single sensor except that a second enthalpy sensor is mounted in the return air. This return air sensor allows the economizer to choose between outdoor air and return air, whichever has the lowest enthalpy value, to provide maximum operating efficiency.

Economizer With Power Exhaust

A unit equipped with an economizer (single or dual enthalpy) and a power exhaust operates as specified above with one addition. The power exhaust motor is energized 45 seconds after the actuator position exceeds the exhaust fan set point on the economizer control. As always, the "R" to "G" connection provides minimum position but does not provide power exhaust operation.

Motorized Outdoor Air Dampers

This system operation is the same as the units with no outdoor air options with one exception. When the “R” to “G” circuit is complete, the motorized damper drives open to a position set by the thumbwheel on the damper motor. When the “R” to “G” circuit is opened, the damper spring returns fully closed.

Cooling Operation Errors

Each cooling system is monitored for operation outside of the intended parameters. Errors are handled as described below. All system errors override minimum run times for compressors.

High-Pressure Limit Switch

During cooling operation, if a high-pressure limit switch opens, the UCB will de-energize the compressor, initiate the ASCD (Anti-short cycle delay), and stop the condenser fan. If the call for cooling is still present at the conclusion of the ASCD, the UCB will re-energize the compressor.

Should a high-pressure switch open three times within two hours of operation, the UCB will lock-out the associated compressor and sends an error message.

Low-Pressure Limit Switch

The low-pressure limit switch is not monitored during the initial 30 seconds of a cooling system's operation. For the following

30 seconds, the UCB will monitor the low-pressure switch to ensure it closes. If the low-pressure switch fails to close after the 30-second monitoring phase, the UCB will de-energize the compressor, initiate the ASCD, and stop the condenser fan.

Once the low-pressure switch has been proven (closed during the 30-second monitor period described above), the UCB will monitor the low-pressure limit switch for any openings. If the low-pressure switch opens for greater than 5 seconds, the UCB will de-energize the compressor, initiate the ASCD, and stop the condenser fan.

If the call for cooling is still present at the conclusion of the ASCD, the UCB will re-energize the compressor.

Should a low-pressure switch open three times within one hour of operation, the UCB will lock-out the compressor and sends an error message.

Evaporator Low Limit

During cooling operation, if the **Evaporator Low Limit Sensor (EC1)** (Located on the Suction Line at the Evaporator Coil.) detects a temperature below 26 Deg. F (default), the UCB will de-energize the compressor, initiate the ASCD, and stop the condenser fan. If the call for cooling is still present at the conclusion of the ASCD and the evaporator temperature (EC1) is above 39ºF, the UCB will re-energize the halted compressor.

Should the evaporator low limit sensor **(EC1)** detect a temperature below 26°F three times within two hours of operation, the UCB will lock-out the associated compressor and flash an error message.

Low Ambient Cooling

To determine when to operate in low ambient mode, the UCB has an **Outdoor Air Temperature Sensor (OAT)** with a low ambient setpoint at 45ºF (default). When the **OAT Sensor** senses a temperature below the low ambient setpoint and the thermostat is calling for cooling, the UCB will operate in the low ambient mode.

Low ambient mode operates the compressors in this manner:

10 minutes on, 5 minutes off. The indoor blower is operated throughout the cycle. The 5-minute off period is necessary to defrost the indoor coil.

Low ambient mode always begins with compressor operation. Compressor minimum run time may extend the minutes of compressor operation. The off cycle will begin immediately following the elapse of the minimum run time.

When operating in low ambient mode, an **Evaporator Low Limit Sensor (EC1)** temperature below 26ºF will de-energize the compressor. If the call for cooling is still present at the end of the ASCD and the evaporator temperature **(EC1)** is above 39ºF, the unit will resume operation.

Safety Controls

The unit control board monitors the following inputs for each cooling system:

1. An evaporator low limit sensor **(EC1)** (Located on the Suction Line at the Evaporator Coil.) to protect against low evaporator temperatures due to a low airflow or a low return air temperature, set at 26°F.
2. A high-pressure switch to protect against excessive discharge pressures due to a blocked condenser coil or a condenser motor failure, (opens at 650 ± 25 psig).
3. A low-pressure switch to protect against loss of refrigerant charge, (opens at 7 ± 3 psig).

The above pressure switches are hard-soldered to the unit. The refrigeration systems are independently monitored and controlled. On any fault, only the associated system will be affected by any safety/preventive action.

The unit control board monitors the temperature limit switch of electric heat units.

Compressor Protection

In addition to the external pressure switches, the compressor also has inherent (internal) protection. If there is an abnormal temperature rise in a compressor, the protector will open to shut down the compressor. The UCB incorporates features to minimize compressor wear and damage. An **Anti-Short Cycle Delay (ASCD)** is utilized to prevent operation of a compressor too soon after its previous run. Additionally, a minimum run time is imposed any time a compressor is energized.

The ASCD is initiated on unit start-up and on any compressor reset or lock-out.

Error Message

The UCB will initiate a error message associated with errors within the system.

Reset

Remove the call for cooling, by raising thermostat setting higher than the conditioned space temperature. This resets any pressure or evaporator low limit error messages.

Heating Sequence Of Operations

With or Without Electric Heat

When the thermostat calls for the first stage of heating, the low voltage control circuit is completed between "R" and "W1". The 24vac signal is passed through the UCB to the Fan, C1 and CN-Fan output Terminals and withholds a 24vac output to the H1 terminal assuring the reversing valve cannot be energized, except during defrost. If the ASCD timer is satisfied the UCB will energize compressor contactor M1.

If the compressor alone cannot satisfy the heating requirements, a second stage call from the thermostat completes the circuit between "R" and "W2". This 24vac signal is passed through the UCB H2 output terminal to the electric heat section (if available). The total available kW of electric heat will be energized on a call for "W2".

Defrost Initiation

Defrost control implements a temperature differential, demand defrost algorithm. The heat pump is allowed to operate in the heating mode until the combination of outdoor ambient temperature and outdoor coil temperature indicate that defrosting is necessary. When the coil temperature is maintained below the initiate point for a given ambient temperature, continuously for 4-1/2 minutes, the heat pump is put into a defrost cycle. This 4-1/2 minute timer eliminates unnecessary defrost cycles caused by refrigeration surges such as those that occur at the start of a heating cycle.

For defrost, the UCB will signal the energizing of the reversing valve and de-energizing the systems condenser fan motor(s).The unit's optional electric first-stage heater is also energized via a 24-volt VAC output terminal labeled "H2".

Defrost Termination

The UCB terminates the defrost mode when either of the following two conditions are met;

1. The outdoor coil temperature sensor reaches 40°F, or
2. The maximum allowable defrost run time of 8 minutes.

Interval between Defrosts

A timed inhibit feature prevents the system from responding to a call for defrost less than 40 minutes after the initiation of the previous defrost. After this inhibit time has expired, temperature conditions must call for defrost continuously for 4- 1/2 minutes before another defrost cycle is initiated. A temperature inhibit feature prohibits defrost if the coil temperature is above 40°F. All defrost timing occurs only while the compressor is on.

Forced Defrost

A forced-defrost feature puts the system into a defrost cycle every 6 hours and 4 minutes to recirculate lubricants, unless the coil temperature is above 40°F. All defrost timing occurs only while the compressor is on.

For trouble shooting purposes, the defrost cycle can be manually initiated by selecting "Test Defrost" in the UCB menu.

Options/Accessories

Economizer

The Economizer can be a factory installed option or a field installed accessory. If factory installed, refer to the instructions included with the outdoor air hood to complete the assembly. Field installed Economizer accessories include complete instructions for installation.

There are two Economizer options. Each is specific to footprint:

1. Vertical Flow application with barometric relief standard.
2. Horizontal Flow application with barometric relief standard.

Power Exhaust

The Power Exhaust is a field installed accessory. Field installed Power Exhaust accessories include complete instructions for installation.

The Power Exhaust factory installed option is for Down Flow application only.

There are two field installed Power Exhaust accessories. Each is specific to footprint and unit voltage:

1. Down Flow application.
2. Horizontal Flow application that requires the purchase of a barometric relief hood.

Rain Hood

All of the hood components, including the mist eliminators, the gasketing and the hardware for assembling, are packaged and located between the condenser coil section and the main unit cabinet, if the unit has factory installed options. If field installed accessories are being installed all parts necessary for the installation comes in the accessory.

Standard Economizer and Power Exhaust Set Point Adjustments

Remove the filter access (from Figures 6 and 7) panel from the unit. Locate the economizer control module, where the following adjustments will be made.

⚠ CAUTION

Extreme care must be exercised in turning all set point, maximum and minimum damper positioning adjustment screws to prevent twisting them off.

Minimum Position Adjustment

- Check that the damper blades move smoothly without binding; carefully turn the Minimum Position Adjust screw (found on the damper control module) fully clockwise and then set the thermostat indoor fan switch to the ON position and then OFF or energize and de-energize terminals “R” to “G”.
- With the thermostat set to the indoor fan ON position or terminals “R” to “G” energized, turn the Minimum Position Adjusting screw (located on the damper control module) counterclockwise until the desired minimum damper position has been attained.

Power Exhaust Damper Set Point

- With power exhaust option, each building pressurization requirement will be different. The point at which the power exhaust comes on is determined by the economizer damper position (Percent Open). The Exhaust Air Adjustment Screw should be set at the Percent Open of the economizer damper at which the power exhaust is needed. It can be set from 0 to 100% damper open.

Indoor Air Quality AQ

Indoor Air Quality (indoor sensor input): Terminal AQ accepts a +2 to +10 VDC signal with respect to the (AQ1) terminal. When the signal is below it's set point, the actuator is allowed to modulate normally in accordance with the enthalpy and mixed air sensor inputs. When the AQ signal exceeds it's set point setting and there is no call for free cooling, the actuator is proportionately modulated from the 2 to 10 VDC signal, with 2 VDC corresponding to full closed and 10 VDC corresponding to full open. When there is no call for free cooling, the damper position is limited by the IAQ Max damper position setting. When the signal exceeds it's set point (Demand Control Ventilation Set Point) setting and there is a call for free cooling, the actuator modulates from the minimum position to the full open position based on the highest call from either the mixed air sensor input or the AQ voltage input.

- Optional CO_2 Space Sensor Kit Part # 2AQ04700524B
- Optional CO_2 Sensor Kit Part # 2AQ04700624C

Blower Phasing

XYE units are properly phased at the factory. Check for proper blower rotation. If the blower rotates in the wrong direction at start-up, the electrical connection to the unit is misphased. Change the phasing of the **Field Line Connection at the factory or field supplied disconnect** to obtain proper rotation.

⚠ CAUTION

When installing equipment in a facility with a 3 phase high-leg delta power supply, care must be taken to ensure that the high-leg conductor is not attached to either of the two legs of the (single phase, direct drive) X13 or ECM motors. Failure to do so can result in the motor acting erratically or not running at all.

Check for the high leg conductor by checking voltage of each phase to ground.

Example: A or L1 phase to ground, voltage reading is 120V. B or L2 phase to ground, voltage reading is 195 to 208V. C or L3 phase to ground, voltage reading is 120V. Therefore B or L2 phase is the high Leg. The high should always be wired to the center or B or L2 tap.

Note: Check all three phase motors and compressors for proper rotation after making a change. If it is necessary to change 3 phase motor rotation, swap A or L1 and C or L3 only.

Blower Rotation

Check for proper supply air blower rotation. If the blower is rotating backwards, the line voltage at the unit point of power connection is misphased (See 'BLOWER PHASING').

Table 9: Supply Air Limitations

Model (Size)	Supply Air (CFM)	
	Minimum	Maximum
XYE04 (3)	900	1500
XYE05 (4)	1200	2000
XYE06 (5)	1500	2500

Belt Tension

The tension on the belt should be adjusted as shown in Figure 20.

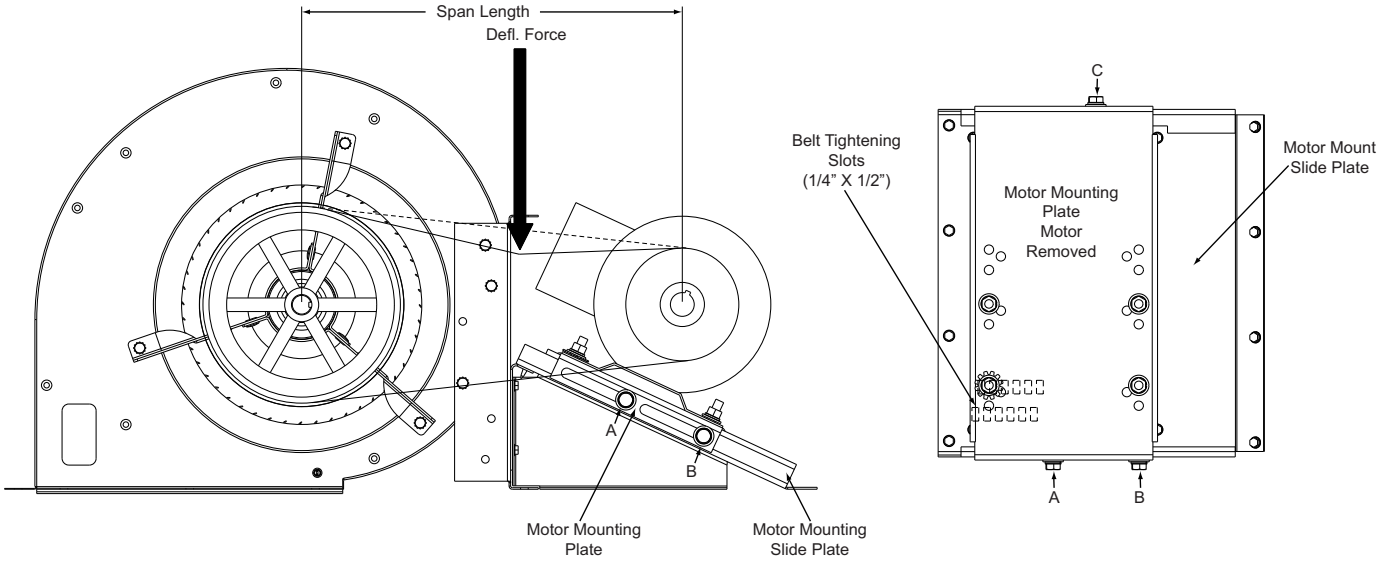


Figure 14: Belt Adjustment

⚠ CAUTION

Procedure for adjusting belt tension:

1. Loosen the three nuts (A and B on side and C on back) of motor mount slide plate.
2. Adjust tension by placing a flat heat screwdriver into the belt tightening slots (1/4" X 1/2") in the motor mount slide plate and applying pressure against the motor mounting plate. See Figure 22.
3. Tighten the three loosened nuts (A, B and C).
4. Determine the deflection distance from normal position, use a straight edge from sheave to sheave as reference line. Use belt tension checker to apply a perpendicular force to the belt at the midpoint of the span as shown. Deflection distance of 4mm (5/32") is obtained.
5. After adjustments are completed re-tighten nuts (A, B and C).

Altitude and Temperature Correction for CFM, Static Pressure and Power.

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

The air flow rates listed in the standard blower performance tables are based on standard air at sea level. As the altitude or temperature increases, the density of air decreases. In order to use the indoor blower tables for high altitude applications, certain corrections are necessary.

A centrifugal fan is a "constant volume" device. This means that, if the rpm remains constant, the CFM delivered is the same regardless of the density of the air. However, since the air at high altitude is less dense, less static pressure will be generated and less power will be required than a similar application at sea level. Air density correction factors are shown in Table 10 and Figure 15.

Table 10: Altitude/Temperature Correction Factors

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

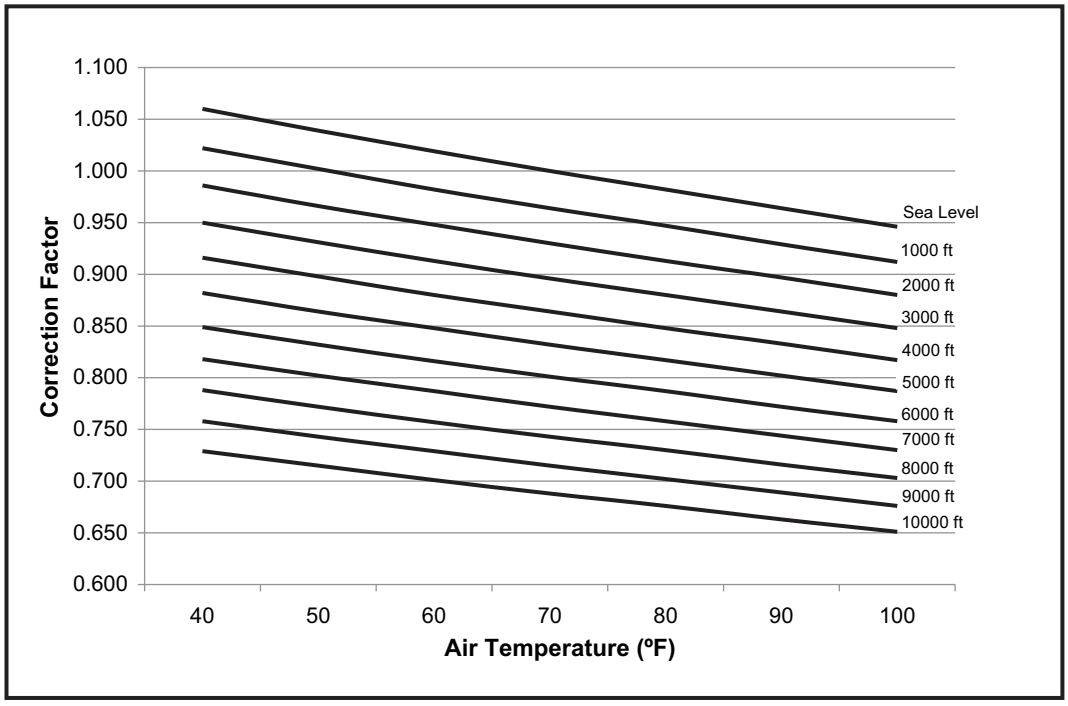


Figure 15: Altitude/Temperature Correction Factors

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

Example 1: What are the corrected CFM, static pressure, and BHP at an elevation of 5,000 ft. if the airflow performance data is 3,000 CFM, 1.4 IWC and 2.0 BHP?

Solution: At an elevation of 5,000 ft. the indoor blower will still deliver 3,000 CFM if the rpm is unchanged. However, the Altitude correction must be used to determine the static pressure and BHP. Since no temperature data is given, we will assume an Air Temperature of 70°F. The Altitude/Temperature Factors show the correction factor to be 0.832.

Corrected static pressure = 1.4 x 0.832 = 1.16 IWC

Corrected BHP = 2.0 x 0.832 = 1.66

Example 2: A system, located at 5,000 feet of elevation, is to deliver 3,000 CFM at a static pressure of 1.4". Use the unit blower tables to select the blower speed and the BHP requirement.

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

The 1.4" static pressure given is at an elevation of 5,000 ft. The first step is to convert this static pressure to equivalent sea level conditions.

Sea level static pressure = 1.4" / .832 = 1.68"

Enter the Supply Air Blower Performance Table at 3,000 CFM and static pressure of 1.68". The rpm listed will be the same rpm needed at 5,000 ft.

Suppose that the corresponding BHP listed in the table is 2.0. This value must be corrected for elevation.

BHP at 5,000 ft. = 2.0 x .832 = 1.66

Drive Selection

1. Determine side or bottom supply duct Application.
2. Determine desired airflow.
3. Calculate or measure the amount of external static pressure.
   - Add or deduct any additional static resistance from “Additional Static Resistance Table”.
4. Using the operating point determined from steps 1, 2 & 3, locate this point on the appropriate supply air blower performance table. (Linear interpolation may be necessary.)
5. Noting the RPM and BHP from step 4, locate the appropriate motor and, or drive.
6. Review the BHP compared to the motor options available. Select the appropriate motor and, or drive.
7. Review the RPM range for the motor options available. Select the appropriate drive if multiple drives are available for the chosen motor.
8. Determine turns open to obtain the desired operation point.

Example

1. 2000 CFM
2. 1.4 iwg
3. Using the airflow performance table below, the following data point was located: 1565 RPM & 1.65 BHP.
4. Using the RPM selection table below, Model XYE and Size 05 (Tons) 4.0 is found.
5. 1.65 BHP exceeds the maximum continuous BHP rating of the 1.5 HP motor. The 2 HP motor is required.
6. 1565 RPM is within the range of the 2 HP drives.
7. Using the 2 HP motor and drive, Zero turns open will achieve 1565 RPM.

Airflow Performance

Example Supply Air Blower Performance
XYE05 (4.0 Ton) Bottom Duct

CFM	Available External Static																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	840	0.37	929	0.46	1016	0.56	1101	0.68	1184	0.80	1265	0.93	1345	1.04	1423	1.14	1500	1.22	1576	1.28
1300	858	0.43	947	0.52	1035	0.62	1120	0.74	1203	0.86	1284	0.99	1364	1.10	1442	1.20	1519	1.28	1593	1.34
1400	879	0.49	968	0.58	1055	0.69	1140	0.81	1224	0.93	1305	1.05	1385	1.17	1463	1.27	1540	1.35	--	--
1500	903	0.56	992	0.65	1079	0.76	1164	0.88	1247	1.00	1328	1.12	1408	1.24	1486	1.34	1563	1.42	--	--
1600	929	0.64	1018	0.73	1105	0.83	1190	0.95	1273	1.07	1354	1.20	1434	1.31	1512	1.41	1589	1.49	--	---
1700	957	0.72	1047	0.81	1134	0.91	1219	1.03	1302	1.15	1383	1.28	1463	1.39	1541	1.49	--	--	--	--
1800	989	0.80	1078	0.89	1165	1.00	1250	1.12	1333	1.24	1415	1.36	1494	1.47	1572	1.58	--	--	--	--
1900	1023	0.89	1112	0.98	1199	1.08	1284	1.20	1367	1.33	1449	1.45	1528	1.56	--	--	--	--	--	--
2000	1059	0.98	1149	1.07	1236	1.18	1321	1.29	1404	1.42	1485	1.54	1565	1.65	--	--	--	--	--	--

kW = 0.929 x BHP

Medium Static Option with Motor rated at 2.4-hp
High Static Option with Motor rated at 2.9-hp
-- Exceeds recommended blower speed

Example RPM Selection

Model	Size (Tons)	Airflow Option	HP	Max BHP	Blower Sheave	Motor Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turns Open	Fully Closed
XYE	05 (4)	Std.						Direct Drive					
		Med.	1.5	2.4	AK46	1VL34	N/A	792	875	958	1042	1125	1208
		H. Static	2.0	2.9	AK46	1VL44	N/A	1167	1250	1333	1417	1500	1593

Example Additional Static Resistance

Model	Size (Tons)	CFM	Cooling Only	Economizer	2” Filter	Electric Heat kW				
						---	---	---	---	---
XYE	05 (4.0)	1200	0.06	0.24	---	0.01	0.01	0.02	---	---
		1300	0.06	0.28	---	0.01	0.01	0.03	---	---
		1400	0.06	0.33	---	0.02	0.02	0.03	---	---
		1500	0.07	0.44	---	0.02	0.02	0.04	---	---
		1600	0.08	0.52	---	0.02	0.02	0.04	---	---
		1700	0.11	0.59	---	0.03	0.03	0.05	---	---
		1800	0.13	0.66	---	0.03	0.03	0.05	---	---
		1900	0.16	0.74	---	0.04	0.04	0.06	---	---
		2000	0.20	0.81	---	0.04	0.04	0.07	---	---

Table 11: XYE04-06 Side Duct Application (Belt Drive)

XYE04 (3.0 Ton) Side Duct

CFM	Available External Static																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900			874	0.31	972	0.40	1065	0.50	1153	0.60	1236	0.70	1315	0.80	1390	0.89	1460	0.97	1526	1.05
1000			887	0.36	985	0.45	1078	0.55	1165	0.65	1249	0.75	1328	0.85	1402	0.94	1472	1.03	1539	1.10
1100	797	0.33	900	0.42	998	0.51	1091	0.61	1179	0.71	1263	0.81	1341	0.91	1416	1.00	1486	1.08	1553	1.16
1200	813	0.40	916	0.48	1014	0.57	1107	0.67	1195	0.77	1279	0.87	1357	0.97	1432	1.06	1502	1.15	1569	1.22
1300	831	0.46	935	0.55	1033	0.64	1126	0.74	1214	0.84	1297	0.94	1376	1.03	1450	1.13	1520	1.21	1583	1.28
1400	852	0.53	956	0.61	1054	0.71	1146	0.80	1234	0.90	1318	1.00	1396	1.10	1471	1.19	1541	1.28	--	--
1500	876	0.59	979	0.68	1077	0.77	1170	0.87	1258	0.97	1341	1.07	1420	1.17	1494	1.26	1565	1.34	--	--

kW = 0.929 x BHP

Medium Static Option with Motor rated at 2.4-hp
High Static Option with Motor rated at 2.4-hp
-- Exceeds recommended blower speed

XYE05 (4.0 Ton) Side Duct

CFM	Available External Static																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	840	0.30	927	0.41	1012	0.53	1096	0.65	1177	0.77	1257	0.89	1334	1.01	1411	1.12	1485	1.22	1558	1.31
1300	857	0.35	944	0.47	1029	0.59	1112	0.71	1194	0.83	1273	0.95	1351	1.07	1427	1.18	1502	1.28	1574	1.37
1400	875	0.42	962	0.53	1048	0.65	1131	0.77	1212	0.89	1292	1.01	1370	1.13	1446	1.24	1520	1.34	1593	1.43
1500	897	0.49	984	0.60	1069	0.72	1152	0.84	1233	0.96	1313	1.08	1391	1.20	1467	1.31	1542	1.41	--	--
1600	921	0.56	1008	0.67	1093	0.79	1176	0.91	1258	1.04	1337	1.16	1415	1.27	1491	1.38	1566	1.49	--	--
1700	948	0.64	1035	0.76	1120	0.87	1204	1.00	1285	1.12	1365	1.24	1442	1.36	1518	1.47	1593	1.57	--	--
1800	979	0.73	1066	0.85	1151	0.96	1234	1.08	1315	1.21	1395	1.33	1473	1.44	1549	1.56	--	--	--	--
1900	1012	0.83	1099	0.94	1185	1.06	1268	1.18	1349	1.30	1429	1.42	1507	1.54	1583	1.65	--	--	--	--
2000	1049	0.93	1136	1.04	1222	1.16	1305	1.28	1386	1.40	1466	1.52	1544	1.64	--	--	--	--	--	--

kW = 0.929 x BHP

Medium Static Option with Motor rated at 2.4-hp
High Static Option with Motor rated at 2.9-hp
-- Exceeds recommended blower speed

XYE06 (5.0 Ton) Side Duct

CFM	Available External Static																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	810	0.49	883	0.60	954	0.70	1023	0.80	1089	0.91	1152	1.02	1213	1.14	1269	1.26	1323	1.40	1373	1.55
1600	831	0.58	904	0.68	975	0.79	1044	0.89	1110	1.00	1173	1.11	1233	1.22	1290	1.35	1344	1.49	1394	1.64
1700	854	0.66	927	0.77	998	0.87	1067	0.98	1133	1.08	1196	1.19	1256	1.31	1313	1.44	1367	1.57	1417	1.72
1800	878	0.75	952	0.86	1023	0.96	1091	1.07	1157	1.17	1221	1.28	1281	1.40	1338	1.52	1391	1.66	1441	1.81
1900	904	0.84	977	0.95	1048	1.05	1117	1.16	1183	1.26	1246	1.37	1306	1.49	1363	1.61	1417	1.75	1467	1.90
2000	931	0.93	1004	1.04	1075	1.15	1144	1.25	1210	1.36	1273	1.47	1333	1.58	1390	1.71	1444	1.84	1494	1.99
2100	959	1.03	1032	1.14	1103	1.24	1172	1.35	1238	1.45	1301	1.56	1361	1.68	1418	1.81	1472	1.94	1522	2.09
2200	988	1.13	1061	1.24	1132	1.35	1201	1.45	1267	1.56	1330	1.67	1390	1.78	1447	1.91	1501	2.04	1550	2.19
2300	1017	1.24	1091	1.35	1162	1.45	1230	1.56	1296	1.66	1359	1.77	1420	1.89	1477	2.02	1530	2.15	1580	2.30
2400	1047	1.36	1121	1.46	1192	1.57	1260	1.67	1326	1.78	1390	1.89	1450	2.01	1507	2.13	1560	2.27	--	--
2500	1078	1.48	1151	1.58	1222	1.69	1291	1.79	1357	1.90	1420	2.01	1480	2.13	1537	2.25	1591	2.39	--	--

Medium Static Option with Motor rated at 2.4-hp
High Static Option with Motor rated at 2.9-hp
-- Exceeds recommended blower speed

Table 12: XYE04-06 Side Duct Application (Direct Drive)

XYE04-06 Side Duct

Unit (Ton)	Motor Speed	Available External Static														
		0.2			0.4			0.6			0.8			1.0		
		CFM	WATTS	RPM	CFM	WATTS	RPM	CFM	WATTS	RPM	CFM	WATTS	RPM	CFM	WATTS	RPM
XYE04 (3)	1 (LOW)	987	120	651	813	145	774	698	162	864	541	180	959	383	201	1047
	2 (MED/LOW)	1079	144	677	936	171	795	793	190	886	692	214	975	521	232	1063
	3 (MED)	1153	166	701	1037	195	812	875	221	913	786	239	986	654	263	1076
	4 (MED/HI)	1191	178	712	1086	206	815	927	233	916	837	257	998	711	278	1083
	5 (HI)	1326	229	757	1235	261	856	1124	291	951	973	319	1035	896	336	1099
XYE05 (4)	1 (LOW)	1302	207	727	1188	240	841	1037	266	933	941	296	1022	882	318	1098
	2 (MED/LOW)	1421	247	757	1323	282	861	1209	315	958	1064	346	1043	993	368	1116
	3 (MED)	1538	297	795	1453	332	888	1343	367	982	1216	396	1058	1093	427	1146
	4 (MED/HI)	1571	315	809	1496	352	898	1385	389	996	1288	420	1072	1135	444	1147
	5 (HI)	1779	432	878	1707	470	960	1615	511	1042	1516	544	1123	1165	468	1160
XYE06 (5)	1 (LOW)	1588	298	695	1517	330	761	1409	358	835	1273	393	913	1167	418	973
	2 (MED/LOW)	1624	321	713	1557	352	777	1464	383	845	1315	418	924	1224	446	983
	3 (MED)	1942	504	792	1881	536	852	1800	565	908	1714	605	969	1611	644	1038
	4 (MED/HI)	2146	631	840	2064	692	908	2001	713	954	1932	757	1007	1843	794	1065
	5 (HI)	2316	812	892	2240	861	954	2181	894	1000	2113	938	1045	2003	946	1093

Table 13: XYE04-06 Bottom Duct Application (Belt Drive)

XYE04 (3.0 Ton) Bottom Duct

CFM	Available External Static																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900			878	0.26	976	0.37	1070	0.47	1161	0.58	1247	0.67	1329	0.76	1405	0.85	1477	0.93	1543	1.00
1000	792	0.20	894	0.31	992	0.42	1087	0.52	1177	0.62	1263	0.72	1345	0.81	1422	0.90	1493	0.98	1560	1.05
1100	810	0.26	912	0.37	1010	0.47	1104	0.58	1195	0.68	1281	0.77	1363	0.87	1439	0.95	1511	1.03	1577	1.11
1200	829	0.32	931	0.43	1029	0.54	1124	0.64	1214	0.74	1300	0.84	1382	0.93	1459	1.02	1530	1.10	1593	1.17
1300	850	0.39	952	0.50	1050	0.61	1145	0.71	1235	0.81	1321	0.91	1403	1.00	1480	1.09	1552	1.17	--	--
1400	874	0.47	975	0.58	1073	0.69	1168	0.79	1258	0.89	1344	0.99	1426	1.08	1503	1.17	1575	1.25	--	--
1500	899	0.56	1000	0.67	1098	0.77	1193	0.88	1283	0.98	1370	1.07	1451	1.17	1528	1.25	1600	1.33	--	--

kW = 0.929 x BHP

Medium Static Option with Motor rated at 2.4-hp
High Static Option with Motor rated at 2.4-hp
-- Exceeds recommended blower speed

XYE05 (4.0 Ton) Bottom Duct

CFM	Available External Static																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	840	0.37	929	0.46	1016	0.56	1101	0.68	1184	0.80	1265	0.93	1345	1.04	1423	1.14	1500	1.22	1576	1.28
1300	858	0.43	947	0.52	1035	0.62	1120	0.74	1203	0.86	1284	0.99	1364	1.10	1442	1.20	1519	1.28	1593	1.34
1400	879	0.49	968	0.58	1055	0.69	1140	0.81	1224	0.93	1305	1.05	1385	1.17	1463	1.27	1540	1.35	--	--
1500	903	0.56	992	0.65	1079	0.76	1164	0.88	1247	1.00	1328	1.12	1408	1.24	1486	1.34	1563	1.42	--	--
1600	929	0.64	1018	0.73	1105	0.83	1190	0.95	1273	1.07	1354	1.20	1434	1.31	1512	1.41	1589	1.49	--	---
1700	957	0.72	1047	0.81	1134	0.91	1219	1.03	1302	1.15	1383	1.28	1463	1.39	1541	1.49	--	--	--	--
1800	989	0.80	1078	0.89	1165	1.00	1250	1.12	1333	1.24	1415	1.36	1494	1.47	1572	1.58	--	--	--	--
1900	1023	0.89	1112	0.98	1199	1.08	1284	1.20	1367	1.33	1449	1.45	1528	1.56	--	--	--	--	--	--
2000	1059	0.98	1149	1.07	1236	1.18	1321	1.29	1404	1.42	1485	1.54	1565	1.65	--	--	--	--	--	--

kW = 0.929 x BHP

Medium Static Option with Motor rated at 2.4-hp
High Static Option with Motor rated at 2.9-hp
-- Exceeds recommended blower speed

XYE06 (5.0 Ton) Bottom Duct

CFM	Available External Static																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	840	0.48	910	0.58	977	0.67	1042	0.77	1106	0.87	1166	0.98	1225	1.08	1280	1.19	1334	1.30	1384	1.41
1600	866	0.55	935	0.65	1003	0.74	1068	0.84	1131	0.94	1192	1.04	1250	1.15	1306	1.26	1359	1.37	1410	1.48
1700	892	0.63	961	0.72	1029	0.82	1094	0.92	1157	1.02	1218	1.12	1276	1.23	1332	1.33	1385	1.44	1436	1.56
1800	918	0.71	987	0.81	1055	0.90	1120	1.00	1183	1.10	1244	1.21	1302	1.31	1358	1.42	1411	1.53	1462	1.64
1900	944	0.80	1014	0.90	1081	1.00	1146	1.09	1209	1.19	1270	1.30	1329	1.40	1384	1.51	1438	1.62	1488	1.73
2000	971	0.90	1041	1.00	1108	1.09	1174	1.19	1237	1.29	1297	1.39	1356	1.50	1412	1.61	1465	1.72	1516	1.83
2100	999	1.01	1069	1.10	1136	1.20	1202	1.30	1265	1.40	1326	1.50	1384	1.60	1440	1.71	1493	1.82	1544	1.93
2200	1028	1.12	1098	1.21	1165	1.31	1231	1.41	1294	1.51	1355	1.61	1413	1.72	1469	1.82	1522	1.93	1573	2.05
2300	1058	1.24	1128	1.33	1195	1.43	1261	1.53	1324	1.63	1385	1.73	1443	1.83	1499	1.94	1552	2.05	--	--
2400	1090	1.36	1159	1.46	1227	1.55	1292	1.65	1355	1.75	1416	1.85	1474	1.96	1530	2.07	1583	2.18	--	--
2500	1122	1.49	1191	1.59	1259	1.68	1324	1.78	1387	1.88	1448	1.98	1506	2.09	1562	2.20	1615	2.31	--	--

Medium Static Option with Motor rated at 2.4-hp
High Static Option with Motor rated at 2.9-hp
-- Exceeds recommended blower speed

Table 14: XYE04-06 Bottom Duct Application (Direct Drive)

XYE04-06 Bottom Duct

Unit (Ton)	Motor Speed	Available External Static														
		0.2			0.4			0.6			0.8			1.0		
		CFM	WATTS	RPM	CFM	WATTS	RPM	CFM	WATTS	RPM	CFM	WATTS	RPM	CFM	WATTS	RPM
XYE04 (3)	1 (LOW)	929	128	699	782	148	794	663	164	880	514	187	976	377	202	1053
	2 (MED/LOW)	1036	157	732	870	177	827	803	198	905	649	217	996	508	236	1074
	3 (MED)	1106	181	760	956	204	849	878	225	928	755	245	1010	616	266	1092
	4 (MED/HI)	1147	197	776	1042	218	860	916	243	944	820	262	1017	671	286	1103
	5 (HI)	1272	252	830	1177	277	909	1037	304	986	975	323	1053	872	347	1125
XYE05 (4)	1 (LOW)	1256	220	776	1170	242	851	1077	266	931	988	298	1025	872	321	1113
	2 (MED/LOW)	1350	272	828	1279	292	893	1196	320	966	1105	347	1048	1003	372	1131
	3 (MED)	1449	323	866	1380	350	937	1303	370	996	1223	402	1071	1133	428	1149
	4 (MED/HI)	1488	345	882	1418	374	954	1357	394	1006	1264	424	1083	1160	442	1155
	5 (HI)	1677	471	966	1602	507	1034	1543	525	1083	1475	545	1131	1209	465	1162
XYE06 (5)	1 (LOW)	1548	310	720	1441	336	792	1337	370	864	1213	397	928	1097	421	988
	2 (MED/LOW)	1593	337	738	1488	363	805	1381	394	875	1271	425	937	1150	451	997
	3 (MED)	1880	532	827	1792	563	890	1719	588	944	1632	629	1006	1527	652	1061
	4 (MED/HI)	2066	689	895	1999	712	942	1907	761	999	1830	773	1048	1734	809	1100
	5 (HI)	2237	862	949	2163	882	996	2097	929	1036	1998	946	1085	1815	883	1115

Table 15: RPM Selection

Model	Size (Tons)	Airflow Option	HP	Max BHP	Blower Sheave	Motor Sheave	6 Turns Open	5 Turns Open	4 Turns Open	3 Turns Open	2 Turns Open	1 Turns Open	Fully Closed
XYE	04 (3)	Std.						Direct Drive					
		Med.	1.5	2.4	AK46	1VL34	N/A	792	875	958	1042	1125	1208
		H. Static	1.5	2.4	AK46	1VL44	N/A	1167	1250	1333	1417	1500	1593
XYE	05 (4)	Std.						Direct Drive					
		Med.	1.5	2.4	AK46	1VL34	N/A	792	875	958	1042	1125	1208
		H. Static	2.0	2.9	AK46	1VL44	N/A	1167	1250	1333	1417	1500	1593
XYE	06 (5)	Std.						Direct Drive					
		Med.	1.5	2.4	AK46	1VL34	N/A	792	875	958	1042	1125	1208
		H. Static	2.0	2.9	AK46	1VL44	N/A	1167	1250	1333	1417	1500	1593

Table 16: Indoor Blower Specifications

Model	Size (Tons)	Airflow Option	Motor						Motor Sheave			Blower Sheave			Belt
			phase	HP	RPM	Eff.	SF	Frame	Datum Dia. (in.)	Bore (in.)	Model	Datum Dia. (in.)	Bore (in.)	Model	
XYE	04 (3)	Std.	Direct Drive												
		Med.	1	1.5	1725	0.79	1.15	56HZ	1.9 - 2.9	5/8	1VL34	4.2	3/4	AK46	A39
		Med.	3	1.5	1725	0.80	1.15	56Y	1.9 - 2.9	5/8	1VL34	4.2	3/4	AK46	A39
		H. Static	3	1.5	1725	0.80	1.15	56Y	2.8 - 3.8	5/8	1VL44	4.2	3/4	AK46	A40
XYE	05 (4)	Std.	Direct Drive												
		Med.	1	1.5	1725	0.79	1.15	56HZ	1.9 - 2.9	5/8	1VL34	4.2	3/4	AK46	A39
		Med.	3	1.5	1725	0.80	1.15	56Y	1.9 - 2.9	5/8	1VL34	4.2	3/4	AK46	A39
		H. Static	3	2.0	1725	0.81	1.15	56Y	2.8 - 3.8	7/8	1VL44	4.2	3/4	AK46	A40
XYE	06 (5)	Std.	Direct Drive												
		Med.	1	1.5	1750	0.83	1.15	56H	1.9 - 2.9	5/8	1VL34	4.2	3/4	AK46	A37
		Med.	3	2.4	1750	0.87	1.15	56HZ	1.9 - 2.9	5/8	1VL34	4.2	3/4	AK46	A37
		H. Static	3	2.9	1750	0.87	1.15	56Z	2.8 - 3.8	7/8	1VL44	4.2	3/4	AK46	A39

Supply Air Drive Adjustment

⚠ CAUTION

Before making any blower speed changes review the installation for any installation errors, leaks or undesirable systems effects that can result in loss of airflow.

Even small changes in blower speed can result in substantial changes in static pressure and BHP. BHP and AMP draw of the blower motor will increase by the cube of the blower speed. Static pressure will increase by the square of the blower speed. Only qualified personnel should make blower speed changes, strictly adhering to the fan laws.

At unit start-up, the measured CFM may be higher or lower than the required CFM. To achieve the required CFM, the speed of the drive may have adjusted by changing the datum diameter (DD) of the variable pitch motor sheave as described below:

$$\left(\frac{1{,}700\ \text{CFM}}{1{,}400\ \text{CFM}}\right) \bullet 1.88\ \text{in.} = 2.28\ \text{in.}$$

Use the following tables and the DD calculated per the above equation to adjust the motor variable pitch sheave.

EXAMPLE NEW DATUM DIAMETER

A 4 ton unit was selected to deliver 1,700 CFM with a 1.5 HP motor, but the unit is delivering 1,400 CFM. The variable pitch motor sheave is set at 3 turns open.

Use the equation to determine the required DD for the new motor sheave,

$$\left(\frac{\text{Required CFM}}{\text{Measured CFM}}\right) \bullet \text{Existing DD} = \text{New DD}$$

Use Table 19 to locate the DD nearest to 2.28 in. Close the sheave to 2 turn open.

EXAMPLE NEW BHP

= (Speed increase)^3 • BHP at 1,400 CFM

= (Speed increase)^3 • Original BHP

= New BHP

EXAMPLE NEW MOTOR AMPS

= (Speed increase)^3 • Amps at 1,400 CFM

= (Speed increase)^3 • Original Amps

= New Amps

Table 17: Motor Sheave Datum Diameters

1VL34x5/8 (1 1/2 HP Motor)		1VL44x7/8 (2 HP Motor)		1VP50x7/8 (3 HP Motor)		1VP56x7/8 (5 HP Motor)	
Turns Open	Datum Diameter	Turns Open	Datum Diameter	Turns Open	Datum Diameter	Turns Open	Datum Diameter
0	2.9	0	4.0	0	4.4	0	-
1/2	2.73	1/2	3.9	1/2	4.3	1/2	-
1	2.56	1	3.8	1	4.2	1	5.3
1-1/2	2.39	1-1/2	3.7	1-1/2	4.1	1-1/2	5.2
2	2.22	2	3.6	2	4.0	2	5.1
2-1/2	2.05	2-1/2	3.5	2-1/2	3.9	2-1/2	5.0
3	1.88	3	3.4	3	3.8	3	4.9
3-1/2	1.71	3-1/2	3.3	3-1/2	3.7	3-1/2	4.8
4	1.54	4	3.2	4	3.6	4	4.7
4-1/2	1.37	4-1/2	3.1	4-1/2	3.5	4-1/2	4.6
5	1.2	5	3.0	5	3.4	5	4.5
5-1/2	-	5-1/2	-	5-1/2	-	5-1/2	4.4
6	-	6	-	6	-	6	4.3

⚠ CAUTION

Belt drive blower systems MUST be adjusted to the specific static and CFM requirements for the application. The Belt drive blowers are NOT set at the factory for any specific static or CFM. Adjustments of the blower speed and belt tension are REQUIRED. Verify proper sheave alignment; tighten blower pulley and motor sheave set screws after these adjustments. Re-checking set screws and belt tension after 10-12 hrs. run time is recommended.

Table 18: Additional Static Resistance - XYE04-06

Model	Size (Tons)	CFM	Cooling Only[1]	Economizer[2 3]	4" Filter[2]	Electric Heat kW[2]				
						6	10.5	16	---	---
XYE	04 (3.0)	900	0.04	0.15	---	0.00	0.00	0.01	---	---
		1000	0.05	0.18	---	0.00	0.00	0.02	---	---
		1100	0.06	0.21	---	0.01	0.01	0.02	---	---
		1200	0.07	0.24	---	0.01	0.01	0.02	---	---
		1300	0.10	0.28	---	0.01	0.01	0.03	---	---
		1400	0.12	0.33	---	0.02	0.02	0.03	---	---
		1500	0.14	0.44	---	0.02	0.02	0.04	---	---
XYE	05 (4.0)	1200	0.06	0.24	---	0.01	0.01	0.02	---	---
		1300	0.06	0.28	---	0.01	0.01	0.03	---	---
		1400	0.06	0.33	---	0.02	0.02	0.03	---	---
		1500	0.07	0.44	---	0.02	0.02	0.04	---	---
		1600	0.08	0.52	---	0.02	0.02	0.04	---	---
		1700	0.11	0.59	---	0.03	0.03	0.05	---	---
		1800	0.13	0.66	---	0.03	0.03	0.05	---	---
		1900	0.16	0.74	---	0.04	0.04	0.06	---	---
		2000	0.20	0.81	---	0.04	0.04	0.07	---	---
XYE	06 (5.0)	1800	0.23	0.66	---	0.03	0.03	0.05	---	---
		2000	0.28	0.81	---	0.04	0.04	0.07	---	---
		2200	0.32	0.95	---	0.06	0.06	0.08	---	---
		2400	0.37	1.10	---	0.07	0.07	0.10	---	---
		2500	0.50	1.17	---	0.08	0.08	0.11	---	---

1. Add these values to the available static resistance in the respective Blower Performance Tables.
2. Deduct these values from the available external static pressure shown in the respective Blower Performance Tables.
3. The pressure drop through the economizer is greater for 100% outdoor air than for 100% return air. If the resistance of the return air duct is less than 0.25 IWG, the unit will deliver less CFM during full economizer operation.

Figure 16: Unit Control Board

Table 19: Simplicity SE UCB Details

Description		Function & Comments
Terminal Directional orientation: viewed with silkscreen labels upright		
Limit, 24 VAC power and shutdown connections from unit wiring harness at left on upper edge of UCB		
LIMIT	Monitored 24 VAC input through heat section limit switch(es)	If voltage is absent, indicating the heat section is over-temperature, the UCB will bring on the indoor blower
C	24 VAC, 75 VA transformer Common referenced to cabinet ground	Connects through circuit traces to thermostat connection strip C and indoor blower VFD pin C
24V	24 VAC, 75 VA transformer hot	Powers the UCB microprocessor, connects through circuit trace to the SD 24 terminal
SD 24	24 VAC hot out for factory accessory smoke detector, condensate overflow and/or user shutdown relay switching in series	Connects through circuit trace to thermostat connection strip SD-24. A wiring harness jumper plug connecting SD 24 to SD R is in place if factory accessories for unit shutdown are not used - this jumper plug must be removed if the switching of field-added external accessories for unit shutdown are wired between thermostat connection strip SD-24 and R
SD R	24 VAC hot return from factory accessory smoke detector, condensate overflow and user shutdown relay switching in series	Connects through circuit trace to the R terminal on the upper left of the board

Table 19: Simplicity SE UCB Details (Continued)

Description		Function & Comments
R	24 VAC hot for switched inputs to the UCB	Connects through circuit trace to the thermostat connection strip R terminal, right FAN OVR pin, right HPS1 pin, right HPS2 pin, lower DFS pin and lower APS pin
Terminal Thermostat connection strip on left edge of UCB		
W1	1st stage heating request, 24 VAC input switched from R	Not effective for cooling-only units
W2	2nd stage heating request, 24 VAC input switched from R	Not effective for cooling-only units or units with single-stage heat sections
Y1	1st stage cooling request, 24 VAC input switched from R	
Y2	2nd stage cooling request, 24 VAC input switched from R	Visible in the display menu when the #ClgStgs parameter is set for 2 or more, also effective for economizer free cooling supply air temperature reset when the #ClgStgs parameter is set for 1 or more
G	Continuous indoor blower request, 24 VAC input switched from R	
OCC	Occupancy request, 24 VAC input switched from R	Must have the OccMode parameter set for External to be effective
X	Hard lockout indicator, 24 volt output to a light thermostat LED	
R	24 VAC hot for thermostat switching and power	If field-added external accessories for unit shutdown are used, 24 VAC hot return from smoke detector, condensate overflow and/or user shutdown relay switching in series
SD-24	If field-added external accessories for unit shutdown are used, 24 VAC hot out for smoke detector, condensate over- flow and/or user shutdown relay switching in series	Unit wiring harness jumper plug for factory shutdown accessories must be removed if the switching of field-added external accessories for unit shutdown are wired between thermo- stat connection strip SD-24 and R
C	24 VAC common for thermostat power	
LEDs on left edge of UCB		
POWER	Green UCB power indicator	Lit indicates 24 VAC is present at C and 24V terminals
FAULT	Red hard lockout, networking error and firmware error indicator	1/2 second on/off flashing indicates one or more alarm is currently active, 1/10th second on/off flashing indicates a networking error (polarity, addressing, etc.) or a firmware error (likely correctable with re-loading from USB flash drive)
SA BUS	Green UCB SA bus communication transmission indicator	Lit/flickering indicates UCB SA bus communication is currently active, off indicates the UCB is awaiting SA bus communication
Terminal Space temperature sensor connections at center on upper edge of UCB		
ST	Space Temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Positive of VDC circuit (3.625 VDC reading to COM with open circuit), effective if “Thermo- stat-only Control” parameter is set OFF, space sensor override momentary shorts ST to COM to initiate/terminate temporary occupancy
COM	Common for ST and SSO inputs	Negative of VDC circuit for ST and SSO inputs
SSO	Space Sensor Offset input from 0 to 20KΩ potentiometer	Positive of VDC circuit (3.625 VDC reading to COM with open circuit), 10KΩ/2.5 VDC is 0°F offset, 0Ω/0 VDC is maximum above offset and 20KΩ/3.4 VDC is maximum below offset from active space temperature setpoint

Table 19: Simplicity SE UCB Details (Continued)

Description		Function & Comments
Pin Temperature sensor connections at right on upper edge of UCB		
SAT+	Supply Air Temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for operation; 3.625 VDC reading SAT+ to SAT– with open circuit. Used in heat/cool staging cutouts, free cooling operation, demand ventilation operation, comfort ventilation operation, economizer loading operation, VAV cooling operation, hydronic heat operation.
RAT+	Return Air Temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for operation; 3.625 VDC reading RAT+ to RAT– with open circuit. Used in return air enthalpy calculation. Substitutes for space temperature if no other space temperature input is present.
OAT+	Outside Air Temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for operation but may be a communicated value; 3.625 VDC reading OAT+ to OAT– with open circuit. Used in heat/cool cutouts, low ambient cooling determination, dry bulb free cooling changeover, outside air enthalpy calculation, economizer loading operation, heat pump demand defrost calculation.
CC1+	#1 refrigerant circuit Condenser Coil temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for heat pump units, not required for A/C units; 3.625 VDC reading CC1+ to CC1– with open circuit. Used in heat pump demand defrost calculation.
EC1+	#1 refrigerant circuit Evaporator Coil temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for operation; 3.625 VDC reading EC1+ to EC1– with open circuit. Used in suction line temperature safety.
CC2+	#2 refrigerant circuit Condenser Coil temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for 2-compressor heat pump units, not required for 2-compressor A/C units, not active for 1-compressor units; 3.625 VDC reading CC2+ to CC2– with open circuit. Used in heat pump demand defrost calculation.
EC2+	#2 refrigerant circuit Evaporator Coil temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	Input required for operation of 2-compressor units, not active for 1-compressor units; 3.625 VDC reading EC2+ to EC2– with open circuit. Used in suction line temperature safety.
Pinned connections on right edge of UCB		
RAH+	Return Air Humidity input from 0-10 VDC @ 0-100% RH sensor	Input required for reheat units, optional in all other units, may be a communicated value. Used in return air enthalpy calculation, temperature/humidity setpoint reset, reheat operation.
DCT PRS+	Supply Duct Pressure input from 0-10 VDC @ 0-5” w.c. sensor	Input required for variable air volume units. Used in VAV indoor blower operation.
DFS (upper pin)	24 VAC hot return from Dirty Filter Switch	Optional input; switch closure for greater than 15 seconds during indoor blower operation initiates a notification alarm
DFS (lower pin)	24 VAC hot out for Dirty Filter Switch	Connects through circuit trace to the R terminal
APS (upper pin)	24 VAC hot return from Air Proving Switch	When this optional input is enabled: the air proving switch must close within 30 seconds of initiation of indoor blower operation and not open for greater than 10 seconds during in- door blower operation to allow heat/cool operation and prevent an “APS open” alarm; the air proving switch must open within 30 seconds of termination of indoor blower operation to prevent an “APS stuck closed” notification alarm
APS (lower pin)	24 VAC hot out for Air Proving Switch	Connects through circuit trace to the R terminal
C	Common for the VFD output	Negative of the VDC circuit for the VFD output

Table 19: Simplicity SE UCB Details (Continued)

Description		Function & Comments
VFD	2-10 VDC (0-100%) output for the indoor blower Variable Frequency Drive	Output is active with indoor blower operation. For CV units: this output provides stepped IntelliSpeed control of the indoor blower VFD based on fan-only, cooling stage and heating stage outputs. For VAV units: this output provides control of the indoor blower VFD based on supply duct static pressure input and setpoint.
VFDFLT	24 VAC hot input from the normally open VFD alarm contact	The VFD alarm contact switches from R within the unit wiring harness. 24 VAC input results in unit shutdown and a “VFD fault” alarm
Terminal at lower right corner of UCB		
24V FOR OUTPUTS	24 VAC hot for H1, H2, CN-FAN, AUX HGR, FAN C1 and C2 output relay contact switching	Output relay circuitry is isolated from other UCB components and the 24 VAC hot source may be from a second transformer in the unit
Pin Heat section connections at right on lower edge of UCB		
H1	24 VAC hot output for heat section stage 1	Not effective for cooling-only units. Output if demand is present and permissions allow one stage or two stages of heat section operation
H2	24 VAC hot output for heat section stage 2	Not effective for cooling-only units or units with single-stage heat sections. Output if demand is present and permissions allow two stages of heat section operation
MV	24 VAC hot input confirming heat section operation	Sourced from gas valve in gas heat units or first stage heat contactor in electric heat units. Input within 5 minutes from initiation of H1 output initiates the “Heat On Fan Delay” timer, loss of input following the termination of H1 output initiates the “Heat On Fan Delay” timer, no input within 5 minutes from initiation of H1 output initiates an “Ignition Failure” alarm, input for longer than 5 minutes without H1 output initiates a “Gas Valve Mis-wire” alarm
Pin Cooling and fan output connections at right on lower edge of UCB		
CN-FAN	24 VAC hot output for the condenser fan contactor coil	Output with either C1 or C2 output; interrupted during defrost cycle for heat pump units
AUX HGR	24 VAC hot output for hot gas reheat components	Effective only for reheat units, output with reheat operation
FAN	24 VAC hot output for indoor blower contactor coil/ indoor blower VFD enable relay coil	Output with heat/cool operation, G input or schedule demand
C1	24 VAC hot output for compressor 1	If demand is present and permissions allow compressor 1 operation; output with compressor cooling, comfort ventilation cooling, reheat or heat pump heating demands
C2	24 VAC hot output for compressor 2	Not effective for one stage compressor UCBs. If demand is present and permissions allow compressor 2 operation; output with compressor cooling, comfort ventilation cooling or heat pump heating demands
Pin Refrigerant circuit safety switch and indoor blower overload connections at center on lower edge of UCB		
HPS1 (right pin)	24 VAC hot out for refrigerant circuit 1 High Pressure Switch	Connects through circuit trace to the R terminal
HPS1 (left pin)	24 VAC hot return from refrigerant circuit 1 High Pressure Switch	Input is only considered if C1 output is needed; input must be present to allow C1 output. Three HPS1 trips in a two hour period cause a “High Pressure Switch 1 Lockout” and C1 output is then prevented until alarm reset. Connects through circuit trace to the right LPS1 pin.
LPS1 (right pin)	24 VAC hot out for refrigerant circuit 1 Low Pressure Switch	Connects through circuit trace to the left HSP1 pin

Table 19: Simplicity SE UCB Details (Continued)

Description		Function & Comments
LPS1 (left pin)	24 VAC hot return from refrigerant circuit 1 Low Pressure Switch	Input is only considered after 30 seconds of C1 output; afterwards, input must be present to allow C1 output. Three LPS1 trips in a one hour period cause a “Low Pressure Switch 1 Lockout” and C1 output is then prevented until alarm reset.
HPS2 (right pin)	24 VAC hot out for refrigerant circuit 2 High Pressure Switch	Not effective for one stage compressor UCBs. Connects through circuit trace to the R terminal
HPS2 (left pin)	24 VAC hot return from refrigerant circuit 2 High Pressure Switch	Not effective for one stage compressor UCBs. Input is only considered if C2 output is needed; input must be present to allow C1 output. Three HPS2 trips in a two hour period cause a “High Pressure Switch 1 Lockout” and C2 output is then prevented until alarm reset. Connects through circuit trace to the right LPS2 pin.
LPS2 (right pin)	24 VAC hot out for refrigerant circuit 2 Low Pressure Switch	Not effective for one stage compressor UCBs. Connects through circuit trace to the left HSP2 pin
LPS2 (left pin)	24 VAC hot return from refrigerant circuit 2 Low Pressure Switch	Not effective for one stage compressor UCBs. Input is only considered after 30 seconds of C2 output; afterwards, input must be present to allow C2 output. Three LPS2 trips in a one hour period cause a “Low Pressure Switch 2 Lockout” and C2 output is then prevented until alarm reset.
FAN OVR (right pin)	24 VAC hot out for indoor blower FAN Overload relay contact/motor protector switch	Connects through circuit trace to the R terminal
FAN OVR (left pin)	24 VAC hot return from indoor blower FAN Overload relay contact/motor protector switch	Input is only considered if FAN output is needed; input must be present to allow FAN output and unit operation. One FAN OVR trip lasting longer than 5 minutes or three FAN OVR trips in a two hour period cause a “Fan Overload Lockout” and unit operation is then prevented until alarm reset.
Terminal SA BUS connections on at left on lower edge and center of UCB		
PWR	Power for SA (“Sensor-Actuator”) BUS devices	Also incorporated in the J8 6-pin phone jack connector at the left-center of the board. Positive of the 15 VDC (reading to C) circuit for powering an optional netstat and/or Multi Touch gateway
C	Common for SA BUS power and communication circuits	Also incorporated in the J8 6-pin phone jack connector at the left-center of the board. Negative of the SA BUS circuits
–	Communication for SA BUS devices	Also incorporated in the J8 6-pin phone jack connector at the left-center of the board. Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to C; at least 0.25 volts lower than +) SA BUS communication circuit to optional economizer board, 4-stage board, fault detection & diagnostics board, netstat and/or Multi Touch gateway
+	Communication for SA BUS devices	Also incorporated in the J8 6-pin phone jack connector at the left-center of the board. Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to C; at least 0.25 volts higher than –) SA BUS communication circuit to optional economizer board, 4-stage board, fault detection & diagnostics board, netstat and/or Multi Touch gateway
J8	6-pin phone jack connector	Incorporates the SA BUS terminals for convenience/alternate connection of SA BUS devices, primarily used for temporary service connection of the Multi Touch gateway
Item Integrated user interface at lower left corner of UCB		
Display	On-board, 2-line x 8-character back-lit display	On-board display, buttons and joystick allow access to UCB, economizer, 4-stage and FDD board parameters

Table 19: Simplicity SE UCB Details (Continued)

Description		Function & Comments
ENTER	Button for display menu acknowledgment and navigation	
CANCEL	Button for display menu navigation and zeroing of active compressor ASCD timer	
JOY	4-way Joystick for display menu navigation	
Item USB connector at right of UCB		
J10	Type A female Universal Serial Bus connector	Used for backup, restoration, & copying of board parameters as well as board software updating through a flash drive
J15	Factory wired SA Bus connector	
Optional communication sub-board at center of UCB		
Terminal FC BUS connections on left edge of the communication board		
FC+	FC (“Field Connected”) BUS BACnet MSTP communication	Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to COM; at least 0.25 volts higher than –) FC bus BACnet MSTP communication circuit
FC–	FC (“Field Connected”) BUS BACnet MSTP communication	Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to COM; at least 0.25 volts lower than +) FC bus BACnet MSTP communication circuit
COM	Common for the FC (“Field Connected”) BUS BACnet MSTP communication circuit	Negative of the VDC FC bus BACnet MSTP communication circuit
SHLD	Shield for the FC (“Field Connected”) BUS BACnet MSTP communication circuit	Earth ground reference of the cable to prevent interference on the FC bus BACnet MSTP communication circuit
Item Selector in red housing at left on top edge of the communication board		
EOL switch	End Of Line selector switch for the FC BUS BACnet MSTP communication circuit	ON selected only for the UCB that is the terminus of the FC bus BACnet MSTP communication cable to prevent signal “bounce-back”
LEDs on the communication board		
EOL	Green End Of Line indicator	Lit indicates the EOL switch is selected ON
FC BUS	Green FC bus communication transmission indicator	Lit/flickering indicates outgoing UCB FC bus communication is currently active, off indicates the UCB is awaiting incoming FC bus communication
ISO PWR	Green communication board Isolated Power indicator	Lit indicates the UCB is supplying power to the communication sub-board

Operation

Compressor Operation

Compressor Operation details include:

a. Compressors are controlled by the Y1 through Y2 thermostat inputs. If the Lead/Lag function is turned OFF, a Y1 input energizes the C1 output when the compressor number 1 anti-short cycle delay is at 0 and all refrigerant safety devices are closed (Default 5 minutes).

b. The FAN output for indoor fan operation energizes with any cooling output after the Indoor Fan Cool On Delay expires.

c. When the thermostat cooling inputs are lost **and** the minimum runtime expires, the compressor outputs stage off (Default 3 minutes).

d. A 30 second interstage delay occurs when multiple stages are requested.

NOTE: A Y2 input without a Y1 input energizes a C1 first and then C2 30 seconds later.

Economizer Sequences

Several functions can drive the economizer, including: minimum position, free cooling, economizer loading, and minimum outdoor air supply.

Economizer Minimum Position

The economizer minimum position is set during occupied mode when outside air is not suitable for free cooling. The position of the damper is set proportionally between the "Economizer Minimum Position and the Economizer Minimum Position Low Speed Fan" set points. On a constant volume single speed

supply fan system both set-points should be set to the same value.

Free Cooling

Four types of free cooling options are available: dry bulb changeover, single enthalpy, dual enthalpy changeover, and Auto.

Dry Bulb Changeover

For dry bulb economizer operation, the outside air is suitable for free cooling if the outside air temperature is 1°F below the Economizer OAT Enable Setpoint **and** 1°F below the Return Air Temperature.

Free cooling is no longer available if the outside air temperature rises above **either** the Economizer OAT Enable setpoint **or** the return air temperature.

Single Enthalpy Changeover

For single enthalpy economizer operation, the outside air is suitable for free cooling if the outside air enthalpy is at least 1 BTU/lb below the Economizer Outside Air Enthalpy Setpoint **and** the outside air temperature is no greater than the RAT plus 9°F.

If the outside air temperature rises above the RAT plus 10°F, free cooling is no longer available. The outside air temperature must drop to no greater than RAT plus 9°F to enter free cooling again.

Free cooling is no longer available if the outside air enthalpy rises above the Economizer Outside Air Enthalpy Setpoint.

Dual Enthalpy Changeover

For dual enthalpy economizer operation, the outside air enthalpy must be lower than the return air enthalpy by 1 btu/lb AND the outside air temperature is no greater than the RAT plus 9°F.

Auto

The control determines the type of free cooling changeover based on which sensors are present and reliable. Conditions include:

- Return and outside air dry bulb = dry bulb changeover
- Return and outside air dry bulb and outside air humidity = single enthalpy
- Return and outside air dry bulb and return and outside air humidity = dual enthalpy
- If either the return or outside air dry bulb sensors are unreliable, free cooling is not available

Free Cooling Operation

When the control determines that the outside air is suitable, the first stage of cooling will always be free cooling.

Thermostat

In free cooling, with a thermostat input to Y1, the dampers modulate to control the supply air temperature to the Economizer Setpoint +/- 1°F (default 55°F).

If the thermostat provides an input to Y2 **and** the parameter Compressors Off in Free Cooling is turned OFF a compressor output energizes. The economizer dampers continue to modulate to control the supply air temperature to the Economizer Setpoint.

If the supply air temperature cannot be maintained within 5°F of the economizer setpoint, the first stage compressor (C1) will be turned on.

Sensor

In free cooling, with a demand from the zone/return sensor for the first stage of cooling, the dampers modulate to control the supply air temperature to the Economizer Setpoint +/- 1°F.

If the economizer output is at 100% **and** the SAT is greater than the Economizer setpoint + 1°F, the control starts a 12-minute timer to energize a compressor output.

If at any time the economizer output drops below 100% the timer stops and resets when the economizer output returns to 100%.

Once a compressor output is turned ON, the economizer dampers continue to modulate to control the supply air temperature to the Economizer Setpoint.

At no time will a compressor output be turned ON if the economizer output is less than 100%, even if the differential between zone (or return) temperature and the current cooling setpoint is great enough to demand more than one stage of cooling.

If the economizer output goes to minimum position **and** the SAT is less than Economizer Setpoint -1°F, the control starts a 12-minute timer to de-energize a compressor output.

If at any time the economizer output goes above the minimum position the timer stops and resets when the economizer output returns to minimum position.

If the demand for cooling from the space/return is satisfied, the economizer output will modulate to minimum position and the compressor outputs will be de-energized as long as their minimum run timers have expired.

Economizer Loading

Power Exhaust

Setpoints

a.	Economizer Enable	ON
b.	Power Exhaust Enable	ON
c.	Modulating Power Exhaust	OFF
d.	Exhaust VFD Installed	OFF

e. Building Pressure Sensor Enabled OFF

f. Econo Damper Position For Exh Fan ON Percent

g. Econo Damper Position For Exh Fan OFF Percent

Inputs

No inputs are present for non-modulating power exhaust.

Outputs

a. 2-10 VDC from ECON on Economizer Expansion module

b. 24 VAC from EX-FAN to energize exhaust fan on Economizer Expansion module

Operation

Operation details include:

a. Compares economizer output to the Economizer Damper Position For Exhaust Fan On and OFF.

b. Energizes exhaust fan when economizer output is above Economizer Damper Position For Exhaust Fan On.

c. De-energizes exhaust fan when economizer output is below the Economizer Damper Position for Exhaust Fan OFF

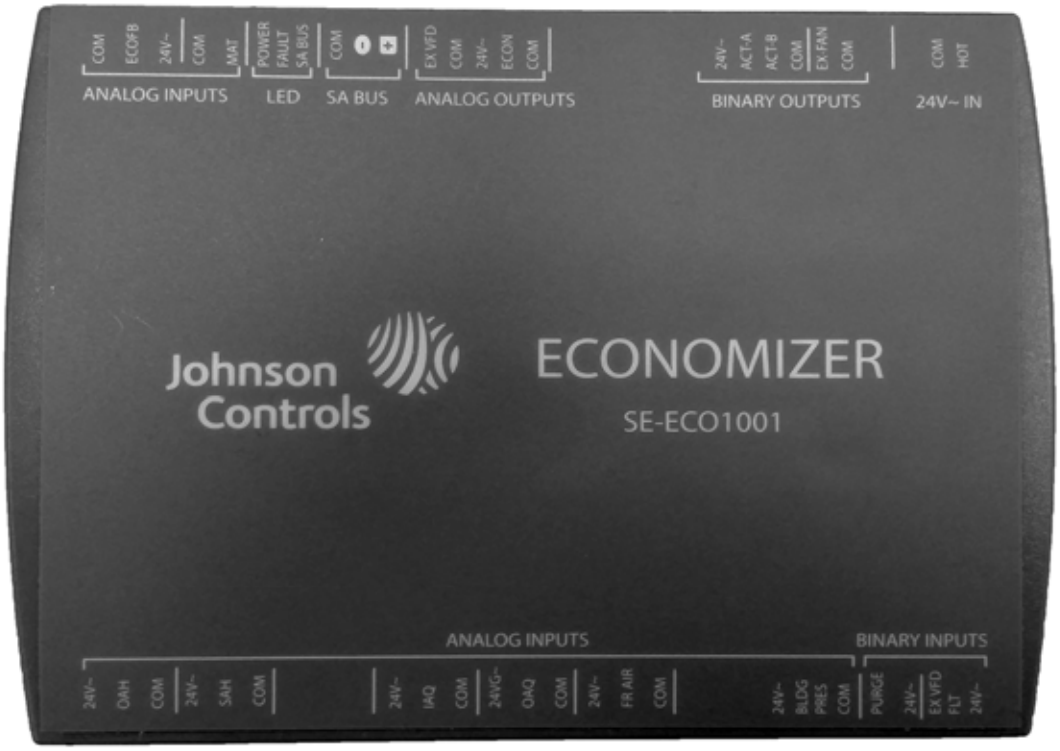


Figure 17: SE-ECO1001-1 Economizer Controller

Table 20: Simplicity SE Economizer Board Details

Board Label	Cover Label	Description	Function & Comments
		Directional orientation: viewed with the center text of the cover label upright	
		ANALOG INPUTS Terminal at left on upper edge of economizer board	
C	COM	24 VAC common/0-10 VDC negative for economizer actuator position feedback	Connects through circuit trace to 24V~ IN pin COM
IN2	ECOFB	0-10 VDC positive input from Economizer actuator position Feedback	EconDampPos parameter reports input status (0-100%). Used to meet Cali. Title 24 requirements for economizer actuator position feedback
R	24V~	24 VAC hot supplied for economizer actuator position feedback	Connects through circuit trace to 24V~ IN pin HOT
C	COM	Mixed Air Temperature sensor input from 10KΩ @ 77°F, Type III negative temperature coefficient thermistor	MAT parameter reports input status (°F/°C), 3.65 VDC reading MAT (+) to COM (−) with open circuit. Read-only use in current control revision.
IN1	MAT		
		LEDs at left on upper edge of economizer board	
POWER	POWER	Green UCB power indicator	Lit indicates 24 VAC is present at 24V~ IN COM and HOT pins
FAULT	FAULT	Red networking error and firmware error indicator	1/10th second on/off flashing indicates a networking error (polarity, addressing, etc.) or a firmware error (likely correctable with re-loading from USB flash drive)
SA BUS	SA BUS	Green UCB SA bus communication transmission indicator	Lit/flickering indicates UCB-to-economizer board SA bus communication is currently active, off indicates the economizer board is awaiting SA bus communication

Table 20: Simplicity SE Economizer Board Details (Continued)

Board Label	Cover Label	Description	Function & Comments
		SA BUS Pin connections at left on upper edge of economizer board	
C	COM	Common for SA BUS power and communication circuits	EconCtrlr parameter reports UCB-to-economizer board SA bus communication status. Negative of the SA BUS communication circuit to the UCB. Through the unit wiring harness, may continue on to the 4-stage board and/or fault detection & diagnostics board
–	–	Communication for SA BUS devices	EconCtrlr parameter reports UCB-to-economizer board SA BUS communication status. Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to C; at least 0.25 volts lower than +) SA BUS communication circuit to the UCB. Through the unit wiring harness, may continue on to the 4-stage board and/or fault detection & diagnostics board
+	+	Communication for SA BUS devices	EconCtrlr parameter reports UCB-to-economizer board SA BUS communication status. Positive of the VDC (typically, a fluctuating 1.5 to 3.5 volts reading to C; at least 0.25 volts higher than –) SA BUS communication circuit to the UCB. Through the unit wiring harness, may continue on to the 4-stage board and/or fault detection & diagnostics board
		ANALOG OUTPUTS Pin at center on upper edge of economizer board	
J4	EX VFD	2-10 VDC positive output for the modulating power Exhaust fan Variable Frequency Drive/ discharge damper modulating power exhaust actuator	ExFanVFD parameter reports output status (0-100%) when ExFType selection is Variable Frequency Fan; EAD-O parameter reports output status (0-100%) when ExFType selection is Modulating Damper. Used to ramp the power exhaust fan VFD/ position the discharge damper actuator.
	COM	24 VAC common/0-10 VDC negative for the power exhaust variable frequency drive/ discharge damper modulating power exhaust actuator	Connects through circuit trace to 24V~ IN pin COM
	24V~	24 VAC hot supplied for the discharge damper modulating power exhaust actuator and economizer actuator	Connects through circuit trace to 24V~ IN pin HOT
	ECON	2-10 VDC output for the Economizer actuator	Econ parameter reports output status (0-100%). Used to position the economizer actuator for minimum position, free cooling, demand ventilation, cooling economizer loading and purge functions
	COM	24 VAC common/0-10 VDC negative for economizer actuator	Connects through circuit trace to 24V~ IN pin COM
		BINARY OUTPUTS Pin at right on upper edge of economizer board	
J3	24V~	24 VAC hot supplied for an incremental (floating control) economizer actuator	Connects through circuit trace to 24V~ IN pin HOT
	ACT-A	24 VAC hot outputs to position an incremental (floating control) economizer actuator	Unused in current control revision
	ACT-B	24 VAC return	Unused in current control revision
	COM	24 VAC common for an incremental (floating control) economizer actuator	Connects through circuit trace to 24V~ IN pin COM
	EX-FAN	24 VAC hot output to energize power exhaust fan contactor coil/VFD enable relay coil	ExFan parameter reports output status (Off-On) when ExFType selection is Non-Modulating, Modulating Damper or Variable Frequency Fan. Used to turn on/enable the power exhaust fan motor.
	COM	24 VAC common/0-10 VDC negative for economizer actuator	Connects through circuit trace to 24V~ IN pin COM

Table 20: Simplicity SE Economizer Board Details (Continued)

Board Label	Cover Label	Description	Function & Comments
		24V~ IN Pin connections at right on upper edge of economizer board	
C	COM	24 VAC transformer Common referenced to cabinet ground	24 VAC common connection to power the economizer board. Connects through circuit traces to C/COM terminals and pins distributed on the economizer board.
R	HOT	24 VAC transformer HOT	24 VAC hot connection to power the economizer board. Connects through circuit traces to R/24V~ terminals and pins distributed on the economizer board.
		ANALOG INPUTS Terminal on lower edge of economizer board	
R	24V~	24 VAC hot supplied for the outdoor air humidity sensor	Connects through circuit trace to 24V~ IN pin HOT
IN3	OAH	0-10 VDC positive input from the Outdoor Air Humidity sensor	OAH parameter reports input status (0-100%H). Used in outdoor air enthalpy calculation for dual enthalpy economizer free cooling changeover.
C	COM	24 VAC common/0-10 VDC negative for the outdoor air humidity sensor	Connects through circuit trace to 24V~ IN pin COM
R	24V~	24 VAC hot supplied for the supply air humidity sensor	Connects through circuit trace to 24V~ IN pin HOT
IN4	SAH	0-10 VDC positive input from the Supply Air Humidity sensor	SAH parameter reports input status (0-100%H). Unused in current control revision.
C	COM	24 VAC common/0-10 VDC negative for the supply air humidity sensor	Connects through circuit trace to 24V~ IN pin COM
R	24V~	24 VAC hot supplied for the indoor air quality sensor	Connects through circuit trace to 24V~ IN pin HOT
IN5	IAQ	0-10 VDC positive input from the Indoor Air Quality sensor	IAQRange parameter sets the CO2 parts per million measured by the indoor air quality sensor when it outputs 10 VDC; IAQ parameter reports input status (0-5000ppm). Used for demand ventilation functions if the NetIAQ parameter indicates ?Unrel.
C	COM	24 VAC common/0-10 VDC negative for the indoor air quality sensor	Connects through circuit trace to 24V~ IN pin COM
R	24V~	24 VAC hot supplied for the outdoor air quality sensor	Connects through circuit trace to 24V~ IN pin HOT
IN6	OAQ	0-10 VDC positive input from the Outdoor Air Quality sensor	OAQRange parameter sets the CO2 parts per million measured by the outdoor air quality sensor when it outputs 10 VDC; OAQ parameter reports input status (0-5000ppm). Used for demand ventilation function when DVent-Mode selection is Diff between IAQ and OAQ and the NetOAQ parameter indicates ?Unrel.
C	COM	24 VAC common/0-10 VDC negative for the outdoor air quality sensor	Connects through circuit trace to 24V~ IN pin COM
R	24V~	24 VAC hot supplied for the air monitoring station sensor	Connects through circuit trace to 24V~ IN pin HOT
IN7	FR AIR	0-10 VDC positive input from the air monitoring station sensor	MOA-Range parameter sets the cubic feet per minute/liters per second measured by the air monitoring station sensor when it outputs 10 VDC; Fr Air parameter reports input status (0-50000CFM/23595lps). Used for economizer minimum position reset in speed-controlled indoor blower applications.
C	COM	24 VAC common/0-10 VDC negative for the air monitoring station sensor	Connects through circuit trace to 24V~ IN pin COM
R	24V~	24 VAC hot supplied for the building pressure sensor	Connects through circuit trace to 24V~ IN pin HOT

Table 20: Simplicity SE Economizer Board Details (Continued)

Board Label	Cover Label	Description	Function & Comments
IN8	BLDG PRES	0-5 VDC positive input from the Building Pressure sensor	BldgPres parameter reports input status (-.250-.250"/w/-.062-.062kPa). Used for modulating power exhaust functions when ExFType selection is Modulating Damper or Variable Frequency Fan.
C	COM	24 VAC common/0-5 VDC negative for the building pressure sensor	Connects through circuit trace to 24V~ IN pin COM
		BINARY INPUTS at right on lower edge of economizer board	
IN9	PURGE	24 VAC hot input from the PURGE dry contact	Purge parameter reports input status (False with 0 VAC input-True with 24 VAC input). When Purge status is True, heating and cooling operation is prevented, the indoor blower and power exhaust fan operate, the economizer actuator is positioned to 100%.
	24V~	24 VAC hot supplied for the purge dry contact	Connects through circuit trace to 24V~ IN pin HOT
IN10	EX VFD FLT	24 VAC hot input from the power Exhaust Variable Frequency Drive Fault contact	ExFanVFDFlt parameter reports input status (Normal with 0 VAC input-Alarm with 24 VAC input) when ExFType selection is Variable Frequency Fan. When ExFanVFDFlt status is Alarm, EX-FAN fan output is prevented.
	24V~	24 VAC hot supplied for the power exhaust variable frequency drive fault contact	Connects through circuit trace to 24V~ IN pin HOT

Start-Up

Prestart Check List

After installation has been completed:

1. Check the electrical supply voltage being supplied. Be sure that it is the same as listed on the unit nameplate.
2. Set the room thermostat to the off position.
3. Turn unit electrical power on.
4. Set the room thermostat fan switch to on.
5. Check indoor blower rotation.
   - If blower rotation is in the wrong direction. Refer to Phasing Section in general information section.

   Check blower drive belt tension.
6. Check the unit supply air (CFM).
7. Measure evaporator fan motor's amp draw.
8. Set the room thermostat fan switch to off.
9. Turn unit electrical power off.

Operating Instructions

1. Turn unit electrical power on.

NOTE: Prior to each cooling season, the crankcase heaters must be energized at least 10 hours before the system is put into operation.

2. Set the room thermostat setting to lower than the room temperature.
3. First stage compressors will energize after the built-in time delay (five minutes).

Post Start Check List

1. Verify proper system pressures.
2. Measure the temperature drop across the evaporator coil.

Troubleshooting

⚠WARNING

Troubleshooting of components may require opening the electrical control box with the power connected to the unit. **Use extreme care when working with live circuits!** Check the unit nameplate for the correct line voltage and set the voltmeter to the correct range before making any connections with line terminals.

When not necessary, shut off all electric power to the unit prior to any of the following maintenance procedures so as to prevent personal injury.

⚠ CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation, which could cause injury to person and/or damage unit components. Verify proper operation after servicing.

Table 21: XYE04 Charging Table

Air Flow Indoor Db/Wb	Outdoor DB (F)	Suction P (psig)	Suction Temp. (F)	Liquid P (psig)	Liquid Temp. (F)	Delta T Db (F)	Compr. amps
300 Cfm/Ton 80/62	75	137	62	273	81	-25	8.0
	85	136	63	318	90	-26	9.1
	95	136	63	362	99	-26	10.2
300 Cfm/Ton 80/67	75	136	62	274	81	-25	8.0
	85	140	64	320	90	-24	9.2
	95	143	65	366	100	-23	10.3
300 Cfm/Ton 80/72	75	136	62	274	81	-25	8.0
	85	142	65	321	91	-23	9.2
	95	149	67	369	101	-20	10.4
300 Cfm/Ton 75/62	75	131	60	272	80	-23	8.0
	85	132	61	316	90	-22	9.1
	95	133	62	361	99	-22	10.2
400 Cfm/Ton 80/62	75	142	64	275	81	-23	8.0
	85	143	65	319	91	-23	9.1
	95	145	66	364	100	-23	10.2
400 Cfm/Ton 80/67	75	143	64	275	81	-23	8.0
	85	146	66	321	91	-22	9.1
	95	148	67	367	101	-21	10.3
400 Cfm/Ton 80/72	75	144	64	275	81	-22	8.0
	85	148	66	322	91	-21	9.1
	95	152	68	370	101	-19	10.3
400 Cfm/Ton 75/62	75	136	62	273	81	-21	8.0
	85	138	63	318	90	-20	9.1
	95	140	64	363	100	-19	10.2

Table 22: XYE05 Charging Table

Air Flow Indoor Db/Wb	Outdoor DB (F)	Suction P (psig)	Suction Temp. (F)	Liquid P (psig)	Liquid Temp. (F)	Delta T Db (F)	Compr. amps
300 Cfm/Ton 80/62	75	135	60	274	79	-25	10.6
	85	135	60	319	89	-26	12.1
	95	136	61	363	99	-26	13.7
300 Cfm/Ton 80/67	75	135	60	274	79	-25	10.7
	85	139	61	320	89	-24	12.2
	95	143	62	366	99	-23	13.7
300 Cfm/Ton 80/72	75	134	60	275	79	-26	10.7
	85	142	62	322	89	-23	12.2
	95	150	64	369	99	-20	13.8
300 Cfm/Ton 75/62	75	129	58	273	79	-23	10.6
	85	131	59	317	89	-22	12.1
	95	133	60	362	99	-22	13.6
400 Cfm/Ton 80/62	75	139	63	274	79	-23	10.6
	85	142	63	320	89	-23	12.1
	95	144	63	365	99	-22	13.7
400 Cfm/Ton 80/67	75	140	64	275	79	-22	10.7
	85	145	64	321	89	-22	12.2
	95	149	64	367	99	-21	13.7
400 Cfm/Ton 80/72	75	142	65	276	80	-22	10.8
	85	148	65	323	90	-20	12.2
	95	154	65	369	100	-19	13.7
400 Cfm/Ton 75/62	75	134	60	273	79	-20	10.6
	85	137	61	318	89	-20	12.1
	95	140	61	364	99	-19	13.6

Table 23: XYE06 Charging Table

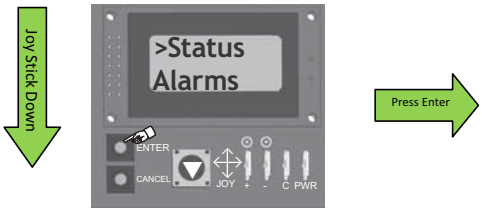
Air Flow Indoor Db/Wb	Outdoor DB (F)	Suction P (psig)	Suction Temp. (F)	Liquid P (psig)	Liquid Temp. (F)	Delta T Db (F)	Compr. amps
300 Cfm/Ton 80/62	75	138	62	283	78	-26	13.7
	85	138	62	328	88	-26	15.6
	95	139	61	374	98	-26	17.4
300 Cfm/Ton 80/67	75	138	61	282	78	-26	13.7
	85	142	62	331	88	-25	15.7
	95	145	64	379	98	-24	17.6
300 Cfm/Ton 80/72	75	138	61	281	78	-26	13.7
	85	145	63	333	88	-23	15.7
	95	152	66	384	99	-21	17.8
300 Cfm/Ton 75/62	75	132	59	281	78	-23	13.6
	85	134	60	328	88	-23	15.5
	95	136	61	375	98	-22	17.5
400 Cfm/Ton 80/62	75	143	64	284	79	-23	13.8
	85	145	64	331	89	-23	15.7
	95	148	65	379	98	-22	17.6
400 Cfm/Ton 80/67	75	144	64	283	79	-23	13.8
	85	147	65	333	89	-22	15.7
	95	151	66	382	99	-21	17.7
400 Cfm/Ton 80/72	75	144	64	283	78	-22	13.7
	85	149	65	334	89	-21	15.8
	95	154	66	386	99	-19	17.8
400 Cfm/Ton 75/62	75	137	61	283	78	-21	13.7
	85	140	62	330	88	-20	15.6
	95	143	63	378	98	-19	17.6

SIMPLICITY™ SE (SMART EQUIPMENT) FIRMWARE VERSION 3. BASIC UNIT CONTROL BOARD NAVIGATION EXAMPLES:

The following document details the navigation and viewing of the LCD display screen equipped as a standard item on the Simplicity SE control installed within various commercial UPG packaged and split system equipment. The following information provides a step-by-step demonstration on how to navigate the basic status menu and how to change basic configuration settings. The basic navigation steps outlined in this short demonstration applies to most menus within the Simplicity SE control.

Understanding the Local LCD
After you apply power to your Rooftop Unit (RTU), a start-up countdown begins on the Unit Control Board (UCB) LCD. When the controller is ready, the screen is blank because no faults are present. Use the joystick and the two push buttons below the LCD, to navigate through the menus.

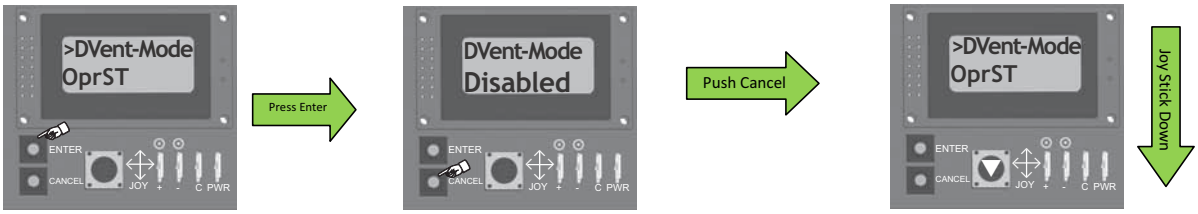
Step 1 - After the start-up countdown is complete the first screen displayed is the "Status & Alarms" screen. When the cursor is on the top "Status" line hit the ""ENTER"" button. This action steps the LCD display into the status mode. Hit ""ENTER" to view the status menu.



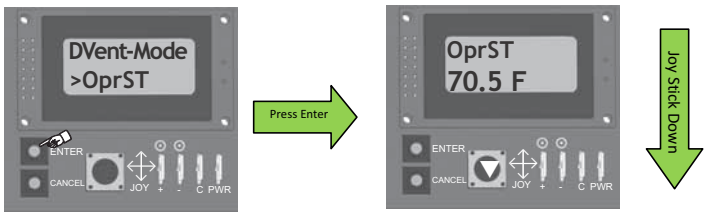
Step 2 - The first item under the status menu is "DVent-Mode". This is the demand ventilation mode.

Step 3 - When the cursor is on the "DVent-Mode" hit "ENTER" to view the status of this mode. In this case a CO2 sensor is not installed, thus Demand Ventilation or DVent is disabled.

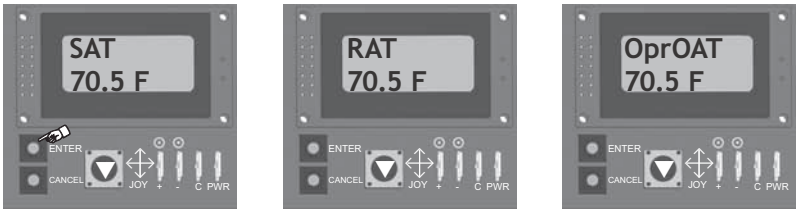
Step 4 - To exit out of the "DVent-Mode status screen push "Cancel". The screen returns to that shown below.



Step 5- By pushing the joystick down, the cursor toggles to OprST (Operating Space Temp).



Step 6- By pushing "ENTER" the actual OprST (Operating Space Temp) appears. Pushing the joystick down scrolls through SAT, RAT, OAT and other available sensor readings.

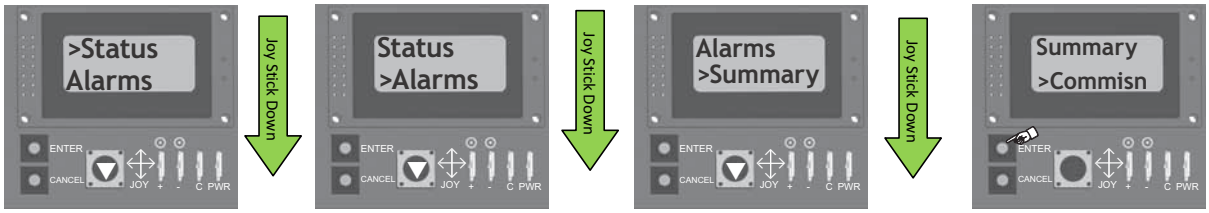


Press the "Cancel" button to exit each menu level. Repeatedly pressing "Cancel" returns the menu to the first "Status, Alarms" screen.

When the "Cancel" button is pressed multiple times to exit each menu level and the screen returns to the first "Status, Alarms" display the next demonstration can begin. In this demonstration the information below steps through the "Commissioning" menu.

Step 1- Beginning at the status/alarm screen toggle the joystick down three times. This accesses the “Commissioning “ screen. In this menu section various settings can be changed. Please see the Unit Control Board menu for a list of parameters that can be modified.

Step 2- Once commission appears next to the cursor, press “ENTER” to begin viewing parameters.



Step 3- After “ENTER” is pressed the various parameter sections appear, such as: HVAC zone, Indoor Fan, Clg, Htg, Econ and others.

Step 4- After toggling the joystick down two times “Clg” appears. This allows items, such as lead-lag and OCC/UNOCC cooling set points, to be changed.

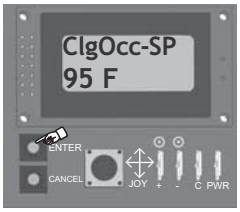
Step 5- At the “Clg” screen once “ENTER” is pushed the status indicates if cooling is engaged/disengaged and lead-lag is engaged/ disengaged.

Step 6- By toggling down twice the screen reaches the “ClgOcc-SP” screen or “Cooling Occupied Set Point”.

Step 7- After pressing “ENTER” at the “ClgOCC-SP” screen the space temperature set point appears. NOTE: Only applies to units controlled by a space sensor.

Step 8- In order to change set points push the toggle switch left or right. Note: The screen flashes. Left decreases the value, right increases. In this demonstration the ClgOCC setpoint is changed from 72F to 95F.

Step 9- The joystick was toggled right to increase the set point temperature. The screen flashes when in the change mode. Once the desired set point/value is reached press the ““ENTER”” button to save the value.



These few pages provide a simple demonstration how to navigate the menu’s of the Simplicity SE control containing Version 3 firmware. Please utilize this document along with the additional information in the Users Guide and detailed navigation menu to adjust the control to customer preferences or job specifications.

NOTE: IF OPERATING THE EQUIPMENT WITH A THERMOSTAT, THE UCB SETPOINTS AND PARAMETERS SHOULD NOT REQUIRE ALTERATION; HOWEVER, THERE MAY BE THE CASE WHERE MINIMUM OUTSIDE AIR, LEAD-LAG OR OTHER CUSTOM SETTINGS ARE REQUIRED. PLEASE READ THIS DOCUMENT IN DETAIL TO UNDERSTAND THE IMPLICATIONS OF MAKING CHANGES BEFORE PROCEEDING. IT IS STRONGLY RECOMMENDED THAT A BACKUP OF PARAMETER SETTINGS BE SAVED ON A USB DRIVE BEFORE MAKING ANY MAJOR CHANGES TO THE CONTROL!

Start-Up Sheet

START-UP & SERVICE DATA INSTRUCTION

COMMERCIAL PACKAGE UNITS

3.0 To 40.0 TONS

START-UP CHECKLIST

Date: _____

Job Name: _____

Customer Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Model Number: _____ Serial Number:_____

Qualified Start-up Technician: _____ Signature: _____

HVAC Contractor: _____ Phone: _____

Address: _____

Contractor's E-mail Address: _____

Electrical Contractor: _____ Phone: _____

Distributor Name: _____ Phone: _____

WARRANTY STATEMENT

Johnson Controls/UPG is confident that this equipment will operate to the owner's satisfaction if the proper procedures are followed and checks are made at initial start-up. This confidence is supported by the 30 day dealer protection coverage portion of our standard warranty policy which states that Johnson Controls/UPG will cover parts and labor on new equipment start-up failures that are caused by a defect in factory workmanship or material, for a period of 30 days from installation. Refer to current standard warranty policy and warranty manual found on UPGnet for details.

In the event that communication with Johnson Controls/UPG is required regarding technical and/or warranty concerns, all parties to the discussion should have a copy of the equipment start-up sheet for reference. A copy of the original start-up sheet should be filed with the Technical Services Department.

The packaged unit is available in constant or variable air volume versions with a large variety of custom options and accessories available. Therefore, some variation in the startup procedure will exist depending upon the products capacity, control system, options and accessories installed.

This start-up sheet covers all startup check points common to all package equipment. In addition it covers essential startup check points for a number of common installation options. Depending upon the particular unit being started not all sections of this startup sheet will apply. Complete those sections applicable and use the notes section to record any additional information pertinent to your particular installation.

Warranty claims are to be made through the distributor from whom the equipment was purchased.

EQUIPMENT STARTUP

Use the local LCD or Mobile Access Portal (MAP) Gateway to complete the start-up.

A copy of the completed start-up sheet should be kept on file by the distributor providing the equipment and a copy sent to:

Johnson Controls/UPG
Technical Services Department
5005 York Drive
Norman, OK 73069

1034349-UCL-C-0315

SAFETY WARNINGS

The inspections and recording of data outlined in this procedure are required for start-up of Johnson Controls/UPG's packaged products. Industry recognized safety standards and practices must be observed at all times. General industry knowledge and experience are required to assure technician safety. It is the responsibility of the technician to assess all potential dangers and take all steps warranted to perform the work in a safe manner. By addressing those potential dangers, prior to beginning any work, the technician can perform the work in a safe manner with minimal risk of injury.

⚠WARNING

Lethal voltages are present during some start-up checks. Extreme caution must be used at all times.

⚠WARNING

Moving parts may be exposed during some startup checks. Extreme caution must be used at all times.

NOTE: Read and review this entire document before beginning any of the startup procedures.

DESIGN APPLICATION INFORMATION

This information will be available from the specifying engineer who selected the equipment. If the system is a VAV system the CFM will be the airflow when the remote VAV boxes are in the full open position and the frequency drive is operating at 60 HZ. **Do not proceed with the equipment start-up without the design CFM information.**

Design Supply Air CFM: _____ Design Return Air CFM:_____

Design Outdoor Air CFM At Minimum Position: _____

Total External Static Pressure: _____

Supply Static Pressure: _____

Return Static Pressure: _____

Design Building Static Pressure: _____

Outside Air Dilution: Economizer Position Percentage: _____ CFM: _____

Supply Gas Pressure After Regulator W/o Heat Active _____ Inches_____

ADDITIONAL APPLICATION NOTES FROM SPECIFYING ENGINEER:

REFERENCE

General Inspection	Completed	See Notes
Unit inspected for shipping, storage, or rigging damage	☐	☐
Unit installed with proper clearances	☐	☐
Unit installed within slope limitations	☐	☐
Refrigeration system checked for gross leaks (presence of oil)	☐	☐
Terminal screws and wiring connections checked for tightness	☐	☐
Filters installed correctly and clean	☐	☐
Economizer hoods installed in operating position	☐	☐
Condensate drain trapped properly, refer to Installation Manual	☐	☐
Economizer damper linkage tight	☐	☐
Gas Heat vent hood installed	☐	☐
All field wiring (power and control) complete	☐	☐

Air Moving Inspection	Completed	See Notes
Alignment of drive components	☐	☐
Belt tension adjusted properly	☐	☐
Blower pulleys tight on shaft, bearing set screws tight, wheel tight to shaft	☐	☐
Pressure switch or transducer tubing installed properly	☐	☐

Exhaust Inspection Powered ☐ Barometric Relief ☐	Completed	See Notes
Check hub for tightness	☐	☐
Check fan blade for clearance	☐	☐
Check for proper rotation	☐	☐
Check for proper mounting (screen faces towards unit)	☐	☐
Prove operation by increasing minimum setting on economizer	☐	☐

Economizer Inspection Standard ☐ BAS ☐	Completed	See Notes
CO_2 sensor installed Yes ☐ No ☐	☐	☐
Check economizer setting (Reference SSE Control Board LCD menu location)	☐	☐
Prove economizer open/close through SSE Board Setting	☐	☐

Reheat Mode Normal ☐ or Alternate ☐ Not Applicable ☐
Humidity Sensor (2SH0401) _____

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Operating Measurements - Air Flow

Fan operates with proper rotation	ID Fans ☐	Exh. Fans ☐	Cond. Fans ☐
Pressure drop across dry evaporator coil (At maximum design CFM) [1]			IWC
External Static Pressure			IWC
Return Static Pressure			IWC
Supply Static Pressure			IWC
Supply Air CFM Using Dry Coil Chart			CFM
Final Adjusted Supply Air CFM[2]			CFM

1. Consult the proper airflow to pressure drop table to obtain the actual airflow at the measured pressure differential.
2. Was a motor pulley adjustment or change required to obtain the correct airflow?
   Was it necessary to increase of decrease the airflow to meet the design conditions?
   If the motor pulley size was changed, measure the outside diameters of the motor and blower pulleys and record those diameters here;

Blower Motor HP _____ FLA_____ RPM_____

Pulley Pitch Diameter _____Turns Out_____ Final Turns Out_____

Blower Pulley Pitch Diameter _____ Fixed Sheave_____

ELECTRICAL DATA

T1 - T2 _____ Volts T2 - T3 _____ Volts

Control Voltage _____ Volts T1 - T3 _____ Volts

Device	Nameplate	Measured List All Three Amperages
Supply Fan Motor[1, 2]	AMPS	AMPS
Exhaust Motor (Dampers 100%)	AMPS	AMPS
Condenser Fan #1	AMPS	AMPS
Condenser Fan #2 (if equipped)	AMPS	AMPS
Condenser Fan #3 (if equipped)	AMPS	AMPS
Condenser Fan #4 (if equipped)	AMPS	AMPS
Compressor #1	AMPS	AMPS
Compressor #2 (if equipped)	AMPS	AMPS
Compressor #3 (if equipped)	AMPS	AMPS
Compressor #4 (if equipped)	AMPS	AMPS

1. VAV units with heat section - simulate heat call to drive VAV boxes and VFD/IGV to maximum design airflow position.
2. VAV units without heat section - VAV boxes must be set to maximum design airflow position.

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OPERATING MEASUREMENTS - COOLING

Stage	Discharge Pressure	Discharge Temp.	Liquid Line Temp.[1]	Subcooling[2]	Suction Pressure	Suction Temp.	Superheat
First	#	°	°	°	#	°	°
Second (if equipped)	#	°	°	°	#	°	°
Third (if equipped)	#	°	°	°	#	°	°
Fourth (if equipped)	#	°	°	°	#	°	°
Reheat 1st Stage	#	°	°	°	#	°	°

1. Liquid temperature should be taken before filter/drier.
2. Subtract 10 psi from discharge pressure for estimated liquid line pressure

Outside air temperature	_____	°F db	_____	°F wb	_____ %RH
Return Air Temperature	_____	°F db	_____	°F wb	_____ %RH
Mixed Air Temperature	_____	°F db	_____	°F wb	_____ %RH
Supply Air Temperature	_____	°F db	_____	°F wb	_____ %RH

REFRIGERANT SAFETIES

Action	Completed	See Notes
Prove Compressor Rotation (3 phase only) by gauge pressure	☐	☐
Prove High Pressure Safety, All Systems	☐	☐
Prove Low Pressure Safety, All Systems	☐	☐

OPERATING MEASUREMENTS - GAS HEATING

Fuel Type: ☐ Natural Gas ☐ LP Gas

Action		Completed	See Notes
Check for gas leaks		☐	☐
Prove Ventor Motor Operation		☐	☐
Prove Primary Safety Operation		☐	☐
Prove Auxiliary Safety Operation		☐	☐
Prove Rollout Switch Operation		☐	☐
Prove Smoke Detector Operation		☐	☐
Manifold Pressure	Stage 1	IWC	☐
	Stage 2 (If Equipped)	IWC	☐
	Stage 3 (If Equipped)	IWC	☐
Supply gas pressure at full fire		IWC	☐
Check temperature rise[1]	☐ measured at full fire	°F	☐

1. $\frac{\text{Input X Eff. (BTU output)}}{\text{1.08 X Temp. Rise}}$

OPERATIONAL MEASUREMENTS - STAGING CONTROLS

Verify Proper Operation of Heating/Cooling Staging Controls	
Create a cooling demand at the Thermostat, BAS System or Simplicity SE Verify that cooling/economizer stages are energized.	☐
Create a heating demand at the Thermostat, BAS System or Simplicity SE Verify that heating stages are energized.	☐
Verify Proper Operation of the Variable Frequency Drive (If Required)	
Verify that motor speed modulates with duct pressure change.	☐

FINAL - INSPECTION

Verify that all operational control set points have been set to desired value Scroll through all setpoints and change as may be necessary to suit the occupant requirements.	☐
Verify that all option parameters are correct Scroll through all option parameters and ensure that all installed options are enabled in the software and all others are disabled in the software. (Factory software settings should match the installed options)	☐
Verify that all access panels have been closed and secured	☐

OBSERVED PRODUCT DIFFICIENCIES & CONCERNS:

5146977-UIM-D-1015
Supersedes: 5146977-UIM-C-1015

York International Corporation
5005 York Drive
Norman, OK 73069