

**Preferred™ Series
Gas Heat/Electric Cooling
Packaged Rooftop Units
15 to 25 Nominal Tons**



Product Data

Preferred™
SERIES



Unit shown with economizer and power exhaust.

581J Sizes 17 to 28
Packaged Rooftop Units with Gas Heat

Features/Benefits

The 15 to 25 Ton Preferred™ Series Bryant rooftop unit (RTU) was designed by customers for customers. With a newly designed cabinet that integrates “no-strip” screw collars, handled access panels, and more, we’ve made your unit easy to install, easy to maintain, easy to use and reliable.

Easy to install

These Preferred Series units are designed for dedicated factory-supplied vertical or horizontal air flow duct configurations. No special field kits are required. These units are designed to fit on pre-installed curbs by another manufacturer. This cabinet design also integrates a large control box that gives you room to work and room to mount Bryant accessory controls.

Easy to maintain

Easy access handles by Bryant provide quick and easy access to all normally serviced components. Our “no-strip” screw system has superior holding power and guides screws into position while preventing the screw from stripping the unit’s metal. Take accurate pressure readings by reading system pressures with panels in place as compressors are strategically located to eliminate any air bypass.

Easy to use

The central terminal board by Bryant puts all your connections and troubleshooting points in one convenient place, standard. Most low voltage connections are made to the same board and make it easy to find

what you’re looking for and easy to access it.

Reliable

Each unit comes with precision sized and tested scroll compressor that is internally protected from over temperature and pressures. In addition, each refrigerant circuit is further protected with a high-pressure and low-pressure switch as well as containing a liquid line filter drier. Each unit is factory tested prior to shipment to help ensure unit operation once properly installed.

Key features

- Two stage cooling capability with independent circuits and control.
- High performance copper tube / aluminum plate (RTPF) fin condenser and evaporator coils with optional coating.
- EERs up to 12.0
- IEERs up to 13.2 with single speed indoor fan motor and 13.8 with 2-Speed Indoor Fan Motor System/ VFD indoor fan motor.
- Gas heating efficiencies up to 81% thermal efficiency.
- Dedicated vertical and horizontal air flow duct configuration models. No field kits required.
- Utility connections through the side or bottom. Bottom connections are also in an enclosed environment to help prevent water entry. Field supplied couplings are required.
- Standardized components and layout. Standardized components and controls make service and stocking parts easier.
- Scroll compressors on all units. This makes service, stocking parts, replacement, and troubleshooting easier.

- Precision sized TXV metering device on each refrigerant circuit.
- Easy-adjust, belt-drive motor available. Motor assembly also contains a fan belt break protection system on all models and reliable pillow block bearing system that allows lubrication thru front of the unit.
- Single-point gas/electrical connection.
- Sloped, composite drain pan sheds water; and won’t rust.
- Standardized controls and control box layout. Standardized components and controls make stocking parts and service easier.
- Clean, large, easy to use control box.
- Color-coded wiring.
- Large, laminated wiring and power wiring drawings which are affixed to unit make troubleshooting easy.
- Single, central terminal board for test and wiring connections.
- Fast-access, handled, panels for easy access on normally accessed service panels.
- “No-strip” screw system guides screws into the panel and captures them tightly without stripping the screw, the panel, or the unit.
- Mechanical cooling (125°F to 35°F/ 52°C to –2°C) standard on all models. Low ambient controller allows operation down to –20°F/–29°C
- Redundant gas valve for 2-stage gas heating capacity control with induced-draft flue exhaust design to help ensure no flue gas can escape into the indoor air stream.
- Exclusive IGC solid state gas controller for on board diagnostics with LED error code designation, burner control logic and energy saving indoor fan motor delay.
- 2-in. (51 mm) disposable filters on all units, with 4-in. (102 mm) filter track field-installed.
- Refrigerant filter-drier on each circuit.
- High and low pressure switches. Added reliability with high-pressure switch and low-pressure switch.
- Many factory-installed options ranging from air management economizers, 2 position dampers, manual outdoor air dampers, plus convenience outlets, disconnect switch and smoke detectors.
- Factory-installed Perfect Humidity™ dehumidification system.
- Standard Parts Warranty: 10 year aluminumized heat exchanger, 5 year compressor, 1 year others.

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Features/Benefits (cont)

- Optional 2-Speed Indoor Fan Motor System utilizes a Variable Frequency Drive (VFD) to automatically adjust the indoor fan motor speed between cooling stages. Available on 2-stage cooling models 17-28 with electro-mechanical controls or RTU Open.

Model number nomenclature

581J MODEL NUMBER NOMENCLATURE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
5	8	1	J	E	1	7	D	3	1	0	A	1	A	0	A	A

Unit Type

581 = High Efficiency
Gas Heat RTU

Model

J = (Puron® Refrigerant)

Voltage

E = 460-3-60
P = 208/230-3-60
T = 575-3-60

Cooling Tons

17 = 15 ton
20 = 17.5 ton
24 = 20 ton
28 = 25 ton

Refrig. System/Gas Heat Options

D = Two stage compressor Model
F = Two stage compressor Model and Stainless steel
gas heat exchanger
K = Two stage cooling with aluminum gas heat
exchanger and Perfect Humidity
M = Two stage cooling with stainless steel gas heat
exchanger and Perfect Humidity

Heat Level Input

200 = 220,000
310 = 310,000
400 = 400,000

Coil Options (Outdoor — Indoor — Hail Guard)

A = Al/Cu - Al/Cu
B = Precoat Al/Cu - Al/Cu
C = E-coat Al/Cu - Al/Cu
D = E-coat Al/Cu - E-coat Al/Cu
E = Cu/Cu - Al/Cu
F = Cu/Cu - Cu/Cu
M = Al/Cu - Al/Cu - Louvered Hail Guard
N = Precoat Al/Cu - Al/Cu - Louvered Hail Guard
P = E-coat Al/Cu - Al/Cu - Louvered Hail Guard
Q = E-coat Al/Cu - E-coat Al/Cu - Louvered Hail Guard
R = Cu/Cu - Al/Cu - Louvered Hail Guard
S = Cu/Cu - Cu/Cu - Louvered Hail Guard

Indoor Fan Options

1 = Standard Static Option, Vertical
2 = Medium Static Option, Vertical
3 = High Static Option, Vertical
B = Medium Static, High Efficiency Motor, Vertical
C = High Static, High Efficiency Motor, Vertical

5 = Standard Static Option, Horizontal
6 = Medium Static Option, Horizontal
7 = High Static Option, Horizontal
F = Medium Static, High Efficiency Motor, Horizontal
G = High Static, High Efficiency Motor, Horizontal

Packaging, Controls & Indoor Fan Motor Speed Options

A = Standard Packaging, electro mech. controls that
require W7212 EconoMiSer IV
C = Standard Packaging, electro mech. controls that
require W7220 EconoMiSer X
D = Standard Packaging and 2-Speed Indoor Fan Motor
(VFD) Controller

Factory Installed Options

0A = None

Outdoor Air Options

If Position 17 is A

A = None
B = Temperature Economizer, Low Leak EconoMiSer IV
w/ Barometric Relief (W7212 controller)¹
D = Temperature Economizer, Low Leak EconoMiSer IV with
Centrifugal Power Exhaust (W7212 controller)²
E = Temperature Economizer, Low Leak EconoMiSer IV with
Barometric Relief and CO₂ (W7212 controller)¹
G = Temperature Economizer, Low Leak EconoMiSer IV with
Centrifugal Power Exhaust and CO₂ (W7212 controller)²
H = Enthalpy Economizer, Low Leak EconoMiSer IV with
Barometric Relief (W7212 controller)¹
K = Enthalpy Economizer, Low Leak EconoMiSer IV with
Centrifugal Power Exhaust (W7212 controller)²
L = Enthalpy Economizer, Low Leak EconoMiSer with
Barometric relief and CO₂ (W7212 controller)¹
N = Enthalpy Economizer, Low Leak EconoMiSer IV with
Centrifugal Power Exhaust CO₂ (W7212 controller)²
P = Manual Outdoor Air Damper¹
Q = Motorized 2-Position Damper¹

If Position 17 is C or D

A = None
B = Temperature Economizer, Low Leak EconoMiSer X with
Barometric Relief (W7220 controller)¹
D = Temperature Economizer, Low Leak EconoMiSer X with
Centrifugal Power Exhaust (W7220 controller)²
E = Temperature Economizer, Low Leak EconoMiSer X with
Barometric Relief and CO₂ (W7220 controller)¹
G = Temperature Economizer, Low Leak EconoMiSer X, with
Centrifugal Power Exhaust and CO₂ (W7220 controller)²
H = Enthalpy Economizer, Low Leak EconoMiSer X with
Barometric Relief (W7220 controller)¹
K = Enthalpy Economizer, Low Leak EconoMiSer X with
Centrifugal Power Exhaust (W7220 controller)²
L = Enthalpy Economizer, Low Leak EconoMiSer X with
Barometric Relief and CO₂ (W7220 controller)¹
N = Enthalpy Economizer, Low Leak with Centrifugal
Power Exhaust and CO₂ (W7220 controller)²
U = Ultra LOW LEAK Temperature EconoMiSer X with
Barometric Relief (W7220 controller)¹
V = Ultra LOW LEAK Temperature EconoMiSer X with
Centrifugal Power Exhaust (W7220 controller)²
W = Ultra LOW LEAK Enthalpy EconoMiSer X with
Barometric Relief (W7220 controller)¹
X = Ultra LOW LEAK Enthalpy EconoMiSer X with
Centrifugal Power Exhaust (W7220 controller)²

1. Vertical and Horizontal Air Flow
2. Vertical Air Flow Only



Capacity ratings

AHRI RATINGS (2-STAGE COOLING)

581J UNIT	CONFIGURATION	NOM. CAPACITY (TONS)	NET COOLING CAPACITY (MBH)	TOTAL POWER (kW)	EER	IEER (SINGLE SPEED)	IEER (2-SPEED)
17	Vertical	15.0	174	14.5	12.0	13.0	13.5
	Horizontal			15.1	11.5	12.2	13.0
20	Vertical	17.5	202	16.8	12.0	13.0	13.6
	Horizontal			17.9	11.3	11.5	13.2
24	Vertical	20.0	232	19.3	12.0	13.2	13.8
	Horizontal			20.4	11.4	12.0	13.0
28	Vertical	25.0	282	25.2	11.2	12.0	12.5
	Horizontal			26.9	10.5	N/A	12.2

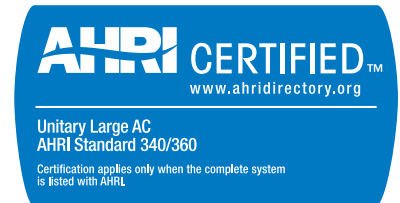
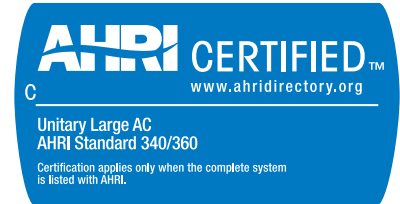
LEGEND

AHRI — Air-Conditioning, Heating and Refrigeration Institute

EER — Energy Efficiency Ratio

IEER — Integrated Energy Efficiency Ratio

NOTE: 581J*28 horizontal units are only available with a 2-speed option.



SOUND RATINGS TABLE

581J UNIT	COOLING STAGES	OUTDOOR SOUND (dB) AT 60 Hz											
		A-WEIGHTED	LINEAR	AHRI-370 RATING	31.5	63	125	250	500	1000	2000	4000	8000
17	2	84.1	96.2	84	92.6	92.0	84.0	80.0	82.0	78.7	76.5	72.2	65.4
20	2	84.1	96.2	84	92.6	92.0	84.0	80.0	82.0	78.7	76.5	72.2	65.4
24	2	86.5	99.6	87	96.2	95.6	87.5	84.2	84.2	81.7	77.9	73.2	66.3
28	2	85.9	103.0	86	101.0	97.0	88.0	84.0	83.0	80.7	77.4	73.4	67.3

LEGEND

dB — Decibel

NOTES:

1. Outdoor sound data is measured in accordance with AHRI 370.
2. Measurements are expressed in terms of sound power. Do not compare these values to sound pressure values because sound pressure depends on specific environmental factors which normally do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
3. A-weighted sound ratings filter out very high and very low frequencies, to better approximate the response of "average" human ear. A-weighted measurements for Bryant units are taken in accordance with AHRI 370.

Capacity ratings (cont)

MINIMUM - MAXIMUM AIRFLOW RATINGS (CFM) — NATURAL GAS AND PROPANE

581J UNIT	HEAT LEVEL	COOLING				ALUMINUM HEATING		STAINLESS STEEL HEATING	
		MINIMUM SINGLE SPEED FAN MOTOR	MINIMUM 2-SPEED FAN MOTOR (AT HIGH SPEED)	MINIMUM 2-SPEED FAN MOTOR (AT LOW SPEED)	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
17	LOW	4,500	5,070	3,380	7,500	3,000	8,250	3,000	8,250
	MED					3,880	7,750	3,880	7,750
	HIGH					4,620	8,570	4,620	8,570
20	LOW	5,250	5,915	3,943	9,000	3,000	11,000	3,000	11,000
	MED					3,880	9,300	3,880	9,300
	HIGH					4,620	10,000	4,620	10,000
24	LOW	6,000	7,500	5,000	10,000	3,000	11,000	3,000	11,000
	MED					3,880	11,630	3,880	11,630
	HIGH					4,620	10,000	4,620	10,000
28	LOW	7,500	8,450	5,633	12,500	3,000	16,500	3,000	16,500
	MED					3,880	15,500	3,880	15,500
	HIGH					4,620	15,000	4,620	15,000

HEAT RATING TABLE — NATURAL GAS AND PROPANE

581J UNIT	GAS HEAT	AL/SS HEAT EXCHANGER		TEMPERATURE RISE (°F)	THERMAL EFFICIENCY (%)
		INPUT/OUTPUT STAGE 1 (MBH)	INPUT/OUTPUT STAGE 2 (MBH)		
17	LOW	176/142	220/178	20-55	81%
	MED	248/200	310/251	30-60	
	HIGH	320/260	400/324	35-65	
20	LOW	176/142	220/178	15-55	81%
	MED	248/200	310/251	25-60	
	HIGH	320/260	400/324	30-65	
24	LOW	176/142	220/178	15-55	81%
	MED	248/200	310/251	20-60	
	HIGH	320/260	400/324	30-65	
28	LOW	176/142	220/178	10-55	81%
	MED	248/200	310/251	15-60	
	HIGH	320/260	400/324	20-65	

NOTES:

- Heat ratings are for natural gas heat exchangers operated at or below 2000 ft (610 m). For information on Propane or altitudes above 2000 ft (610 m), see the Application Data section of this book. Accessory Propane/High Altitude kits are also available.
- In the USA the input rating for altitudes above 2000 ft (610 m) must be derated by 4% for each 1000 ft (305 m) above sea level. In Canada, the input rating must be derated by 10% for altitudes of 2000 ft (610 m) to 4500 ft (1372 m) above sea level.

Physical data

581J 15 TO 25 TON PHYSICAL DATA

UNIT		581J*17D	581J*17E	581J*20D	581J*20E	581J*24D	581J*24E	581J*28D	581J*28E
BASE UNIT TONS		15	15	17.5	17.5	20	20	25	25
BASE UNIT WEIGHT - lb (kg)		1892 (858)		2102 (953)		2247 (1019)		2292 (1040)	
REFRIGERATION SYSTEM									
# Circuits / # Comp. / Type	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll
R-410A Charge A/B (lbs)	17/16.4	24.5/25.7	17.5/16.8	25.5/25.5	23.8/23.1	30.0/30.7	24.9/27.7	35.1/35.4	
Metering device	TXV	TXV	TXV	TXV	TXV	TXV	TXV	TXV	TXV
High-Pressure Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505
Low-Pressure Trip / Reset (psig)	54 / 117	27 / 44	54 / 117	27 / 44	54 / 117	27 / 44	54 / 117	27 / 44	
EVAPORATOR COIL									
Material	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al	Cu / Al
Tube Diameter (in.)	3/8 RTPF	3/8 RTPF	3/8 RTPF	3/8 RTPF	3/8 RTPF	3/8 RTPF	3/8 RTPF	3/8 RTPF	3/8 RTPF
Rows / FPI	4 / 15	4 / 15	4 / 15	4 / 15	4 / 15	4 / 15	4 / 15	4 / 15	4 / 15
Total Face Area (ft²)	22	22	22	22	26	26	26	26	26
Condensate Drain Connection Size (in.)	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
PERFECT HUMIDITY COIL									
Material	—	Cu / Al	—	Cu / Al	—	Cu / Al	—	Cu / Al	—
Tube Diameter		3/8 RTPF		3/8 RTPF		3/8 RTPF		3/8 RTPF	
Rows / FPI		1 / 17		1 / 17		1 / 17		1 / 17	
Total Face Area (ft²)		22		22		26		26	
EVAPORATOR FAN AND MOTOR VERTICAL SUPPLY									
STANDARD STATIC	Motor Qty / Belt Qty / Driver Type	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	N/A	N/A	1 / 1 /Belt	1 / 1 /Belt
	Nominal / Nameplate hp	2.9	2.9	3.7	3.7	N/A	N/A	5.25	5.25
	Max bhp	2.9	2.9	3.7	3.7	N/A	N/A	4.9	4.9
	Rpm Range	514-680	514-680	622-822	622-822	N/A	N/A	717-911	717-911
	Max Blower/Shaft rpm	1200	1200	1200	1200	N/A	N/A	1200	1200
	Motor Frame Size	56	56	56	56	N/A	N/A	56	56
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	N/A	N/A	2 / Centrifugal	2 / Centrifugal
MEDIUM STATIC	Fan Diameter (in.)	15 X 15	15 X 15	15 X 15	15 X 15	N/A	N/A	15 X 15	15 X 15
	Motor Qty / Belt Qty / Driver Type	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	N/A	N/A	N/A	N/A
	Nominal / Nameplate hp	3.7	3.7	5.25	5.25	N/A	N/A	N/A	N/A
	Max bhp	3.7	3.7	4.9	4.9	N/A	N/A	N/A	N/A
	Rpm Range	679-863	679-863	713-879	713-879	N/A	N/A	N/A	N/A
	Max Blower/Shaft rpm	1200	1200	1200	1200	N/A	N/A	N/A	N/A
	Motor Frame Size	56	56	56	56	N/A	N/A	N/A	N/A
HIGH STATIC	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	N/A	N/A	N/A	N/A
	Fan Diameter (in.)	15 X 15	15 X 15	15 X 15	15 X 15	N/A	N/A	N/A	N/A
	Motor Qty / Belt Qty / Driver Type	1 / 1 / BELT	1 / 1/ BELT	N/A	N/A	N/A	N/A	N/A	N/A
	Nominal / Nameplate hp	5.25	5.25	N/A	N/A	N/A	N/A	N/A	N/A
	Max bhp	4.9	4.9	N/A	N/A	N/A	N/A	N/A	N/A
	Rpm Range	826-1009	826-1009	N/A	N/A	N/A	N/A	N/A	N/A
	Max Blower/Shaft rpm	1200	1200	N/A	N/A	N/A	N/A	N/A	N/A
Motor Frame Size	56	56	N/A	N/A	N/A	N/A	N/A	N/A	
Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	N/A	N/A	N/A	N/A	N/A	N/A	
Fan Diameter (in.)	15 X 15	15 X 15	N/A	N/A	N/A	N/A	N/A	N/A	

Physical data (cont)

581J 15 TO 25 TON PHYSICAL DATA (CONT)

UNIT		581J*17D	581J*17E	581J*20D	581J*20E	581J*24D	581J*24E	581J*28D	581J*28E
EVAPORATOR FAN AND MOTOR VERTICAL SUPPLY (CONT)									
STANDARD STATIC - HIGH EFFCY	Motor Qty / Belt Qty / Driver Type	N/A	N/A	N/A	N/A	1 / 1 /Belt	1 / 1 /Belt	N/A	N/A
	Nominal / Nameplate hp	N/A	N/A	N/A	N/A	5.0	5.0	N/A	N/A
	Max bhp	N/A	N/A	N/A	N/A	6.5/ 6.9/ 7.0/ 8.3	6.5/ 6.9/ 7.0/ 8.3	N/A	N/A
	Rpm Range	N/A	N/A	N/A	N/A	690-863	690-863	N/A	N/A
	Max Blower/Shaft rpm	N/A	N/A	N/A	N/A	1200	1200	N/A	N/A
	Motor Frame Size	N/A	N/A	N/A	N/A	184T	184T	N/A	N/A
	Fan Qty / Type	N/A	N/A	N/A	N/A	2 / Centrifugal	2 / Centrifugal	N/A	N/A
	Fan Diameter (in.)	N/A	N/A	N/A	N/A	15 X 15	15 X 15	N/A	N/A
MEDIUM STATIC - HIGH EFFICIENCY	Motor Qty / Belt Qty / Driver Type	N/A	N/A	N/A	N/A	1 / 1 / Belt	1 / 1 / Belt	1 / 1 / Belt	1 / 1 / Belt
	Nominal / Nameplate hp	N/A	N/A	N/A	N/A	5.0	5.0	5.0	5.0
	Max bhp	N/A	N/A	N/A	N/A	6.5/ 6.9/ 7.0/ 8.3	6.5/ 6.9/ 7.0/ 8.3	6.5/ 6.9/ 7.0/ 8.3	6.5/ 6.9/ 7.0/ 8.3
	Rpm Range	N/A	N/A	N/A	N/A	835-1021	835-1021	913-1116	913-1116
	Max Blower/Shaft rpm	N/A	N/A	N/A	N/A	1200	1200	1200	1200
	Motor Frame Size	N/A	N/A	N/A	N/A	184T	184T	184T	184T
	Fan Qty / Type	N/A	N/A	N/A	N/A	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in.)	N/A	N/A	N/A	N/A	15 X 15	15 X 15	15 X 15	15 X 15
HIGH STATIC - HIGH EFFICIENCY	Motor Qty / Belt Qty / Driver Type	N/A	N/A	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt
	Nominal Nameplate hp	N/A	N/A	5.0	5.0	7.5	7.5	7.5	7.5
	Max Bhp (208/230/460/ 575v)	N/A	N/A	6.5/ 6.9/ 7.0/ 8.3	6.5/ 6.9/ 7.0/ 8.3	10.5/11.9/11.9/ 11	10.5/11.9/11.9/ 11	10.5/11.9/11.9/ 11	10.5/11.9/11.9/ 11
	Rpm Range	N/A	N/A	882-1078	882-1078	941-1176	941-1176	941-1176	941-1176
	Max Blower/Shaft Rpm	N/A	N/A	1200	1200	1200	1200	1200	1200
	Motor Frame Size	N/A	N/A	184T	184T	213T	213T	213T	213T
	Fan Qty / Type	N/A	N/A	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in.)	N/A	N/A	15 X 15	15 X 15	15 X 15	15 X 15	15 X 15	15 X 15
EVAPORATOR FAN AND MOTOR HORIZONTAL SUPPLY									
STANDARD STATIC	Motor Qty / Belt Qty / Driver Type	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	N/A	N/A	N/A	N/A
	Nominal / Nameplate hp	2.9	2.9	3.7	3.7	N/A	N/A	N/A	N/A
	Max bhp	2.9	2.9	3.7	3.7	N/A	N/A	N/A	N/A
	Rpm Range	514-680	514-680	622-822	622-822	N/A	N/A	N/A	N/A
	Max Blower/Shaft rpm	1100	1100	1100	1100	N/A	N/A	N/A	N/A
	Motor Frame Size	56	56	56	56	N/A	N/A	N/A	N/A
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	N/A	N/A	N/A	N/A
	Fan Diameter (in.)	18 x 15/15 X 11	18 x 15/15 X 11	18 x 15/15 X 11	18 x 15/15 X 11	N/A	N/A	N/A	N/A
MEDIUM STATIC	Motor Qty / Belt Qty / Driver Type	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	N/A	N/A	N/A	N/A
	Nominal / Nameplate hp	3.7	3.7	5.25	5.25	N/A	N/A	N/A	N/A
	Max bhp	3.7	3.7	4.9	4.9	N/A	N/A	N/A	N/A
	Rpm Range	614-780	614-780	713-879	713-879	N/A	N/A	N/A	N/A
	Max Blower/Shaft rpm	1100	1100	1100	1100	N/A	N/A	N/A	N/A
	Motor Frame Size	56	56	56	56	N/A	N/A	N/A	N/A
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	N/A	N/A	N/A	N/A
	Fan Diameter (in.)	18 x 15/15 X 11	18 x 15/15 X 11	18 x 15/15 X 11	18 x 15/15 X 11	N/A	N/A	N/A	N/A
HIGH STATIC	Motor Qty / Belt Qty / Driver Type	1 / 1 /Belt	1 / 1 /Belt	N/A	N/A	N/A	N/A	N/A	N/A
	Nominal / Nameplate hp	4.9	4.9	N/A	N/A	N/A	N/A	N/A	N/A
	Max bhp	4.9	4.9	N/A	N/A	N/A	N/A	N/A	N/A
	Rpm Range	746-912	746-912	N/A	N/A	N/A	N/A	N/A	N/A
	Max Blower/Shaft rpm	1100	1100	N/A	N/A	N/A	N/A	N/A	N/A
	Motor Frame Size	56	56	N/A	N/A	N/A	N/A	N/A	N/A
	Fan Qty / Type	2 / Centrifugal	2 / Centrifugal	N/A	N/A	N/A	N/A	N/A	N/A
	Fan Diameter (in.)	18 x 15/15 X 11	18 x 15/15 X 11	N/A	N/A	N/A	N/A	N/A	N/A

Physical data (cont)

581J 15 TO 25 TON PHYSICAL DATA (CONT)

UNIT		581J*17D	581J*17E	581J*20D	581J*20E	581J*24D	581J*24E	581J*28D	581J*28E
EVAPORATOR FAN AND MOTOR HORIZONTAL SUPPLY (CONT)									
STANDARD STATIC - HIGH EFFICIENCY	Motor Qty / Belt Qty / Driver Type	N/A	N/A	N/A	N/A	1 / 1 /Belt	1 / 1 /Belt	N/A	N/A
	Nominal / Nameplate hp	N/A	N/A	N/A	N/A	5.0	5.0	N/A	N/A
	Max bhp	N/A	N/A	N/A	N/A	6.5/ 6.9/ 7.0/ 8.3	6.5/ 6.9/ 7.0/ 8.3	N/A	N/A
	Rpm Range	N/A	N/A	N/A	N/A	690-863	690-863	N/A	N/A
	Max Blower/Shaft rpm	N/A	N/A	N/A	N/A	1200	1200	N/A	N/A
	Motor Frame Size	N/A	N/A	N/A	N/A	184T	184T	N/A	N/A
	Fan Qty / Type	N/A	N/A	N/A	N/A	2 / Centrifugal	2 / Centrifugal	N/A	N/A
MEDIUM STATIC - HIGH EFFICIENCY	Fan Diameter (in.)	N/A	N/A	N/A	N/A	18 x 15/15 X 11	18 x 15/15 X 11	N/A	N/A
	Motor Qty / Belt Qty / Driver Type	N/A	N/A	N/A	N/A	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt
	Nominal / Nameplate hp	N/A	N/A	N/A	N/A	5.0	5.0	5.0	5.0
	Max bhp	N/A	N/A	N/A	N/A	6.5/ 6.9/ 7.0/ 8.3	6.5/ 6.9/ 7.0/ 8.3	6.5/ 6.9/ 7.0/ 8.3	6.5/ 6.9/ 7.0/ 8.3
	Rpm Range	N/A	N/A	N/A	N/A	835-1021	835-1021	755-923	755-923
	Max Blower/Shaft rpm	N/A	N/A	N/A	N/A	1100	1100	1100	1100
	Motor Frame Size	N/A	N/A	N/A	N/A	184T	184T	184T	184T
HIGH STATIC- HIGH EFFICIENCY	Fan Qty / Type	N/A	N/A	N/A	N/A	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in.)	N/A	N/A	N/A	N/A	18 x 15/15 X 11	18 x 15/15 X 11	18 x 15/15 X 11	18 x 15/15 X 11
	Motor Qty / Belt Qty / Driver Type	N/A	N/A	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt	1 / 1 /Belt
	Nominal /Nameplate hp	N/A	N/A	5.0	5.0	7.5	7.5	7.5	7.5
	Max bhp	N/A	N/A	6.5/ 6.9/ 7.0/ 8.3	6.5/ 6.9/ 7.0/ 8.3	10.5/11.9/11.9/ 11	10.5/11.9/11.9/ 11	10.5/11.9/11.9/ 11	10.5/11.9/11.9/ 11
	Rpm Range	N/A	N/A	835-1021	835-1021	941-1100	941-1100	906-1100	906-1100
	Max Blower/Shaft rpm	N/A	N/A	1100	1100	1100	1100	1100	1100
COND. COIL (CIRCUIT A)	Motor Frame Size	N/A	N/A	184T	184T	213T	213T	213T	213T
	Fan Qty / Type	N/A	N/A	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal	2 / Centrifugal
	Fan Diameter (in.)	N/A	N/A	18 x 15/15 X 11	18 x 15/15 X 11	18 x 15/15 X 11	18 x 15/15 X 11	18 x 15/15 X 11	18 x 15/15 X 11
	Coil Type	RTPF	RTPF	RTPF	RTPF	RTPF	RTPF	RTPF	RTPF
	Coil Length (in.)	70	70	72	72	82	82	95	95
	Coil Height (in.)	44	44	44	44	52	52	52	52
	Rows / fpi	2 /17	2 /17	2 /17	2 /17	2 /17	2 /17	2 /17	2 /17
COND. COIL (CIRCUIT B)	Total Face Area (Ft²)	21.4	21.4	22.0	22.0	29.6	29.6	34.3	34.3
	Coil Type	RTPF	RTPF	RTPF	RTPF	RTPF	RTPF	RTPF	RTPF
	Coil Type	70	70	64	64	80	80	95	95
	Coil Length (in.)	44	44	44	44	52	52	52	52
	Coil Height (in.)	2 /17	2 /17	2 /17	2 /17	2 /17	2 /17	2 /17	2 /17
	Rows / fpi	21.4	21.4	19.5	19.5	29.6	29.6	34.3	34.3
	COND. FAN / MOTOR								
COND. FAN / MOTOR	Qty / Motor Drive Type	3 / direct	3 / direct	4 / direct	4 / direct	4/ direct	4/ direct	6 / direct	6 / direct
	Motor Hp / Rpm	1/4 / 1100	1/4 / 1100	1/4 / 1100	1/4 / 1100	1/4 / 1100	1/4 / 1100	1/4 / 1100	1/4 / 1100
	Fan Diameter (in.)	22	22	22	22	22	22	22	22
FILTERS									
FILTERS	RA Filter # / Size (in.)	6 / 20 x 25 x 2	6 / 20 x 25 x 2	6 / 20 x 25 x 2	6 / 20 x 25 x 2	9 / 16 x 25 x 2	9 / 16 x 25 x 2	9 / 16 x 25 x 2	9 / 16 x 25 x 2
	OA Inlet Screen # / Size (in.)	4 / 16 x 25 x 1	4 / 16 x 25 x 1	4 / 16 x 25 x 1	4 / 16 x 25 x 1	4 / 16 x 25 x 1	4 / 16 x 25 x 1	4 / 16 x 25 x 1	4 / 16 x 25 x 1

Physical data (cont)

581J 15 TO 25 TON PHYSICAL DATA (CONT)

UNIT		581J*17D	581J*17E	581J*20D	581J*20E	581J*24D	581J*24E	581J*28D	581J*28E
GAS CONNECTION									
Number of Gas Valves		1		1		1		1	
Nat. gas supply line press (in. wg) / (PSIG)		5 -13 / 0.18-0.47		5 -13 / 0.18-0.47		5 -13 / 0.18-0.47		5 -13 / 0.18-0.47	
LP supply line press (in. wg) / (PSIG)		11-13 / 0.40-0.47		11-13 / 0.40-0.47		11-13 / 0.40-0.47		11-13 / 0.40-0.47	
HEAT ANTICIPATOR SETTING (AMPS)									
First stage		0.14		0.14		0.14		0.14	
Second stage		0.14		0.14		0.14		0.14	
NATURAL GAS HEAT									
LOW	# of stages / # of burners (total)	2 / 5		2 / 5		2 / 5		2 / 5	
	Connection Size (in.)	3/4 NPT		3/4 NPT		3/4 NPT		3/4 NPT	
	Rollout switch opens / closes (°F)	195 / 115		195 / 115		195 / 115		195 / 115	
	Temperature Rise (°F)	25 - 55		25 - 55		25 - 55		25 - 55	
MED	# of stages / # of burners (total)	2 / 7		2 / 7		2 / 7		2 / 7	
	Connection Size (in.)	3/4 NPT		3/4 NPT		3/4 NPT		3/4 NPT	
	Rollout switch opens / closes (°F)	195 / 115		195 / 115		195 / 115		195 / 115	
	Temperature Rise (°F)	30 - 60		30 - 60		30 - 60		30 - 60	
HIGH	# of stages / # of burners (total)	2 / 10		2 / 10		2 / 10		2 / 10	
	Connection Size (in.)	3/4 NPT		3/4 NPT		3/4 NPT		3/4 NPT	
	Rollout switch opens / closes (°F)	195 / 115		195 / 115		195 / 115		195 / 115	
	Temperature Rise (°F)	35 - 65		35 - 65		35 - 65		35 - 65	
LIQUID PROPANE HEAT									
LOW	# of stages / # of burners (total)	2 / 5		2 / 5		2 / 5		2 / 5	
	Connection Size (in.)	3/4 NPT		3/4 NPT		3/4 NPT		3/4 NPT	
	Rollout switch opens / closes (°F)	195 / 115		195 / 115		195 / 115		195 / 115	
	Temperature Rise (°F)	25 - 55		25 - 55		25 - 55		25 - 55	
MED	# of stages / # of burners (total)	2 / 7		2 / 7		2 / 7		2 / 7	
	Connection Size (in.)	3/4 NPT		3/4 NPT		3/4 NPT		3/4 NPT	
	Rollout switch opens / closes (°F)	195 / 115		196 / 115		197 / 115		198 / 115	
	Temperature Rise (°F)	30 - 60		30 - 60		30 - 60		30 - 60	
HIGH	# of stages / # of burners (total)	2 / 10		2 / 10		2 / 10		2 / 10	
	Connection Size (in.)	3/4 NPT		3/4 NPT		3/4 NPT		3/4 NPT	
	Rollout switch opens / closes (°F)	195 / 115		195 / 115		195 / 115		195 / 115	
	Temperature Rise (°F)	35 - 65		35 - 65		35 - 65		35 - 65	

Options and accessories

ITEM	OPTION*	ACCESSORY†
CABINET		
Dedicated Vertical Air Flow Duct Configuration	X	
Dedicated Horizontal Air Flow Duct Configuration	X	
Hinged Access Panels	X	
Thru-the-Base Electrical or Gas-Line Connections	X	
COIL OPTIONS		
Cu/Cu (Indoor) Coils	X	
Premium, E-coated Outdoor Coils	X	
Pre-coated (outdoor and indoor) Coils	X	
HUMIDITY CONTROL		
Perfect Humidity™ Dehumidification System	X	
CONDENSER PROTECTION		
Condenser Coil Louvered Hail Guard	X	X
CONTROLS		
RTU Open Multi-Protocol Controller	X	
Thermostats, Temperature Sensors, and Subbase		X
Smoke Detector (Supply and/or Return Air)	X	X
Horn/Strobe Annunciator ¹		X
Time Guard II Compressor Delay Control Circuit		X
Phase Monitor		X
Condensate Overflow Switch	X	X
ECONOMIZERS AND OUTDOOR AIR DAMPERS		
EconoMi\$er® IV for Electro-Mechanical Controls — Non-FDD (Standard Air Leak Damper Models) ²	X	X
EconoMi\$er 2 for DDC controls (Standard and Ultra Low Leak Air Damper Models) ^{2, 3}	X	X
EconoMi\$er X For Electro-Mechanical Controls, Complies with FDD. (Standard and Ultra Low Leak air damper models) ²	X	X
Motorized 2 Position Outdoor-AirDamper ⁸	X	X
Manual Outdoor-AirDamper (25%) ⁸		X
Barometric Relief ⁴	X	X
Barometric Hood (Horizontal economizer)		X
Power Exhaust (Prop Design)	X	X
ECONOMIZER SENSORS AND IAQ DEVICES		
Single Dry Bulb Temperature Sensors ⁵	X	X
Differential Dry Bulb Temperature Sensors ⁵		X
Single Enthalpy Sensors ⁵	X	X
Differential Enthalpy Sensors ⁵		X
Wall or Duct Mounted CO ₂ Sensor ⁵		X
Unit Mounted CO ₂ Sensor ⁵	X	X
4-in. Filter Track Assembly		X

ITEM	OPTION*	ACCESSORY†
GAS HEAT		
Propane Conversion Kit		X
Stainless Steel Heat Exchanger	X	
High Altitude Conversion Kit		X
Flue Discharge Deflector		X
INDOOR MOTOR AND DRIVE		
Multiple Motor and Drive Packages	X	
2-Speed Indoor Fan Motor System with VFD Controller (2-Stage Cooling Models Only)	X	
Display Kit or 2-Speed Indoor Fan Motor System with VFD		X
LOW AMBIENT CONTROL		
Winter Start Kit ⁶		X
Motormaster® Head Pressure Controller to -20°F ⁶		X
POWER OPTIONS		
Cooling Low Ambient Controller to 0°F	X	
Powered Convenience Outlet	X	
Unpowered Convenience Outlet (125 amp Factory-Installed, 20 amp Field-Installed)	X	X
Non-Fused Disconnect ⁷	X	
ROOF CURBS		
Roof Curb 14-in. (356 mm)		X
Roof Curb 24-in. (610 mm)		X
Horizontal Curb Adapter (Vertical to Horizontal Airflow)		X

*Factory-installed option.

†Field-installed accessory.

NOTES:

1. Requires a field-supplied 24V transformer for each application. See price page for details.
2. FDD (Fault Detection and Diagnostics System) capability per ASHRAE 90.1-2016 and California Title 24-2015 Section 120.2.
3. Models with RTU Open comply with ASHRAE 90.1-2016 section 6.4.3.1.b and California Title 24-2015 section 120.2.
4. Included with economizer.
5. Sensors used to optimize economizer performance.
6. See application data for assistance.
7. Non-fused disconnect switch cannot be used when MOCP electrical rating exceeds 70 amps at 460/575 volt and 150 amps at 208/230 volt. Bryant Packaged RTUBuilder selects this automatically.
8. Not compatible with 2-Speed Indoor Fan Motor System.

Options and accessories (cont)

Factory Installed Options

Economizer (dry-bulb or enthalpy)

Economizers save money. They bring in fresh, outside air for ventilation; and provide cool, outside air to cool your building. This is the preferred method of low-ambient cooling. When coupled to CO₂ sensors, economizers can provide even more savings by coupling the ventilation air to only that amount required.

Economizers are available, installed and tested by the factory, with either enthalpy or dry-bulb temperature inputs. Additional sensors are available as accessories to optimize the economizers. Economizers include a powered exhaust system to help equalize building pressures.

Economizers include gravity controlled barometric relief that helps equalize building pressure and ambient air pressures. This can be a cost effective solution to prevent building pressurization. Economizers are available in Ultra Low Leak and standard low leak versions. Economizers can be factory-installed or easily field-installed.

Optional Perfect Humidity Dehumidification System

Bryant's Perfect Humidity dehumidification system is an all-inclusive factory-installed option that can be ordered with any Preferred™ Series 581J17-28 rooftop unit.

This system expands the envelope of operation of Bryant's Preferred Series rooftop products to provide unprecedented flexibility to meet year round comfort conditions.

The Perfect Humidity dehumidification system has a unique dual operational mode setting. The Perfect Humidity system includes two new modes of operation.

The Preferred Series 581J17-28 rooftop coupled with the Perfect Humidity system is capable of operating in normal design cooling mode, subcooling mode, and hot gas reheat mode. Normal design cooling mode is when the unit will operate under its normal sequence of operation by cycling compressors to maintain comfort conditions.

Subcooling mode will operate to satisfy part load type conditions when the space requires combined sensible and a higher proportion of latent load control. Hot Gas Reheat mode will operate when outdoor temperatures diminish and the need for latent capacity is required for sole humidity control. Hot Gas Reheat mode will provide neutral air for maximum dehumidification operation.

Thru-the-Base Connections

Thru-the-base provisions/connection points are available as standard with every unit. When bottom connections are required, field furnished couplings are required.

Hinged Access Panels

Allows access to unit's major components with specifically designed hinged access panels. Panels are filter, control box, indoor fan motor.

Cu/Cu (Indoor) Coils (3-Phase Models Only)

Copper fins and copper tubes are mechanically bonded to copper tubes and copper tube sheets. A polymer strip prevents coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.

E-coated (Outdoor and Indoor) Coils

A flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation of tubes, fins and headers.

Pre-Coated Outdoor Coils

A durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments. The coating minimizes galvanic action between dissimilar metals. Coating is applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube.

Condenser Coil Hail Guard

Sleek, louvered panels protect the condenser coil from hail damage, foreign objects, and incidental contact. This can be purchased as a factory installed option or as a field installed accessory.

Smoke Detectors

Trust the experts. Smoke detectors make your application safer and your job easier. Bryant smoke detectors immediately shut down the rooftop unit when smoke is detected. They are available, installed by the factory, for supply air, return air, or both.

Optional Stainless Steel Heat Exchanger

The stainless steel heat exchanger option provides the tubular heat exchanger be made out of a minimum 20 gauge type 409 stainless steel for applications where the mixed air to the heat exchanger is expected to drop below 45°F (7°C). Stainless steel may be specified on applications where the presence of airborne contaminants require its use (applications such as paper mills) or in area with very high outdoor humidity that may result in severe condensation in the heat exchanger during cooling operation.

Convenience Outlet (Powered or Un-powered)

Reduce service and/or installation costs by including a convenience outlet in your specification. Bryant will install this service feature at our factory. Provides a convenient, 15 amp, 115v GFCI receptacle with "Wet in Use" cover. The "powered" option allows the installer to power the outlet from the line side of the disconnect side as required by code. The "unpowered" option is to be powered from a separate 115/120v power source.

Non-Fused Disconnect

This OSHA-compliant, factory-installed, safety switch allows a service technician to locally secure power to the rooftop.

When selecting a factory-installed non-fused disconnect, note they are sized for unit as ordered from the factory. The sizing of these does not accommodate any power exhaust devices, etc.

RTU Open Protocol Controller

Connect the rooftop to an existing BAS without needing complicated translators or adapter modules using the RTU Open controller. This new controller speaks the 4 most common building automation system languages (BACnet¹, Modbus²,

1. BACnet is a trademark of ASHRAE.

2. Modbus is a registered trademark of Schneider Electric.

Options and accessories (cont)

N2, and LonWorks¹). Use this controller when you have an existing BAS.

Condensate Overflow Switch (Factory-Installed Option)

This sensor and related controller monitors the condensate level in the drain pan and shuts down compression operation when overflow conditions occur. It includes:

- Indicator light - solid red (more than 10 seconds on water contact - compressors disabled), blinking red (sensor disconnected)
- 10 second delay to break - eliminates nuisance trips from splashing or waves in pan (sensor needs 10 seconds of constant water contact before tripping)
- Disables the compressor(s) operation when condensate plug is detected, but still allows fans to run for Economizer.

Power Exhaust with Barometric Relief

Superior internal building pressure control. This field-installed accessory or factory-installed option may eliminate the need for costly, external pressure control fans.

Low Ambient Controller

The low ambient controller is a head pressure controller kit that is designed to maintain the unit's condenser head pressure during periods of low ambient cooling operation. This device should be used as an alternative to economizer free cooling not when economizer usage is either not appropriate or desired. The low ambient controller will either cycle the outdoor fan motors or operate them at reduced speed to maintain the unit operation, depending on the model. This controller allows cooling operation down to 0°F (−18°C) ambient conditions.

Manual OA Damper

Manual outdoor air dampers are an economical way to bring in ventilation air. The dampers are available in 25% versions.

2-Speed Indoor Fan Motor System

Bryant's 2-Speed Indoor Fan Motor System saves energy and installation time by utilizing a Variable Frequency Drive (VFD) to automatically adjust the indoor fan motor speed in sequence with the units cooling operation. Per ASHRAE 90.1-2016 standard, during the first stage of cooling operation the VFD will adjust the fan motor to provide 66% of the total cfm established for the unit. When a call for the second stage of cooling is required, the VFD will allow the total cfm for the unit established (100%). During the heating mode the VFD will allow total design cfm (100%) operation and during the ventilation mode the VFD will allow operation to 66% of total cfm. Compared to single speed indoor fan motor systems, Bryant's 2-Speed Indoor Fan Motor System can save substantial energy, 25%+, versus single speed indoor fan motor systems.

IMPORTANT: Data based on 0.10 (\$/kWh) in an office application utilizing Bryant's HAP 4.6 simulation software program.

The VFD used in Bryant's 2-Speed Indoor Fan Motor System has soft start capabilities to slowly ramp up the speeds, thus eliminating any high inrush air volume during initial start-up. It also has internal over current protection for the fan motor and a

field-installed display kit that allows adjustment and in depth diagnostics of the VFD.

This 2-Speed Indoor Fan Motor System is available on models with 2-stage cooling operation with electrical mechanical or RTU Open, Multi Protocol controls. Both space sensor and conventional thermostats controls can be used to provide accurate control in any application.

The 2-Speed Indoor Fan Motor System is very flexible for initial fan performance set up and adjustment. The standard factory shipped VFD is pre-programmed to automatically stage the fan speed between the first and second stage of cooling. The unit fan performance static pressure and cfm can be easily adjusted using the traditional means of pulley adjustments. The other means to adjust the unit static and cfm performance is to utilize the field-installed Display Kit and adjust the frequency and voltage in the VFD to required performance requirements. In either case, once set up, the VFD will automatically adjust the speed between the cooling stage operations.

Alternate Motors and Drives

Some applications need larger horsepower motors, some need more airflow, and some need both. Regardless of the case, your Bryant expert has a factory-installed combination to meet your application. A wide selection of motors and pulleys (drives) are available, factory-installed, to handle nearly any application.

Barometric Hood

For Horizontal Economizer applications where relief damper is installed in duct work. This kit provides the needed protection.

Field-Installed Accessories

Differential Enthalpy Sensor

The differential enthalpy sensor is comprised of an outdoor and return air enthalpy sensors to provide differential.

Wall or duct mounted CO₂ Sensor

The IAQ sensor shall be available in duct or wall mount. The sensor provides demand ventilation indoor air quality (IAQ) control.

Time Guard II Control Circuit

This accessory protects your compressor by preventing short-cycling in the event of some other failure, prevents the compressor from restarting for 30 seconds after stopping. Not required with RTU Open or authorized commercial thermostats.

Propane Conversion Kit

Convert your gas heat rooftop from standard natural gas operation to Propane using this field-installed kit.

High Altitude Heating

High altitudes have less oxygen, which affects the fuel/air mixture in heat exchangers. In order to maintain a proper fuel/air mixture, heat exchangers operating in altitudes above 2000 ft (610 m) require different orifices. To select the correct burner orifices or determine the heat capacity for a high altitude application, use either the selection software, or the unit's service manual. High altitudes have less oxygen, which means heat exchangers need less fuel. The new gas orifices in this field-installed kit make the necessary adjustment for high altitude applications. They restore the optimal fuel to air mixture and

1. LonWorks is a registered trademark of Echelon Corporation.

Options and accessories (cont)

maintain healthy combustion on altitudes above 2000 ft (610 m).

Typical natural gas heating value ranges from 975 to 1050 Btu/ft³ at sea level nationally. The heating value goes down approximately 1.7% per every thousand feet elevation. Standard factory orifices can typically be used up to 2000 ft (610 m) elevation without any operational issues.

Flue Discharge Deflector

The flue discharge deflector is a useful accessory when flue gas recirculation is a concern. By venting the flue discharge upwards, the deflector minimizes the chance for a neighboring unit to intake the flue exhaust.

Winter Start Kit

The winter start kit by Bryant extends the low ambient limit of your rooftop to 25°F (−4°C). The kit bypasses the low pressure switch, preventing nuisance tripping of the low pressure switch. Other low ambient precautions may still be prudent.

Motormaster Head Pressure Controller

The Motormaster motor controller is a low ambient, head pressure controller kit that is designed to maintain the unit's

condenser head pressure during periods of low ambient cooling operation. This device should be used as an alternative to economizer free cooling when economizer usage is either not appropriate or desired. The Motormaster controller will either cycle the outdoor-fan motors or operate them at reduced speed to maintain the unit operation, depending on the model.

Motormaster controller allows cooling operation down to −20°F (−29°C) ambient conditions.

Roof Curb (14-in./356 mm or 24-in./610 mm)

Full perimeter roof curb with exhaust capability provides separate air streams for energy recovery from the exhaust air without supply air contamination.

Horizontal Roof Curb Adapter (Vertical to Horizontal Air-flow) — Horizontal Roof Curb Adapters

Used when horizontal supply and/or return is desired. Motor Status Indicator Accessory – monitors wheel, supply and exhaust motors and provides indication if not operating. Filter status indicator accessory – monitors static pressure across supply and exhaust filters and provides indication when filters become clogged.

Options and accessories (cont)

OPTIONS AND ACCESSORY WEIGHTS

OPTION / ACCESSORY NAME	581J UNIT WEIGHT							
	17		20		24		28	
	lb	kg	lb	kg	lb	kg	lb	kg
Barometric Relief Damper	50	23	50	23	50	23	50	23
Perfect Humidity System*	110	50	120	55	120	55	120	55
Economizer	498	226	498	226	505	229	505	229
Power Exhaust	125	57	125	57	125	57	125	57
EconoMi\$er (IV, X, or 2)	170	77	170	77	170	77	195	88
Copper Tube/Fin Condenser Coil	28	13	30	14	34	15	34	15
Copper Tube/Fin Evaporator Coil	110	50	110	50	135	61	16	73
Copper Tube/Fin Condenser and Evaporator Coil	—	—	—	—	—	—	—	—
Low Gas Heat	85	39	85	39	85	39	85	39
Medium Gas Heat	90	41	90	41	90	41	90	41
High Gas Heat	113	51	113	51	113	51	113	51
Flue Discharge Deflector	7	3	7	3	7	3	7	3
Roof Curb 14-in. (356 mm)	240	109	240	109	240	109	255	116
Roof Curb 24-in. (610 mm)	340	154	340	154	340	154	355	161
Louvered Hail Guard	60	27	60	27	120	54	150	68
CO ₂ Sensor	5	2	5	2	5	2	5	2
Return Smoke Detector	5	2	5	2	5	2	5	2
Supply Smoke Detector	5	2	5	2	5	2	5	2
Fan/Filter Status Switch	2	1	2	1	2	1	2	1
Non-Fused Disconnect	15	7	15	7	15	7	15	7
Powered Convenience Outlet	35	16	35	16	35	16	35	16
Powered Exhaust	125	57	125	57	125	57	125	57
Non-Powered Convenience Outlet	5	2	5	2	5	2	5	2
Enthalpy Sensor	2	1	2	1	2	1	2	1
Differential Enthalpy Sensor	3	1	3	1	3	1	3	1
Two Position Motorized Damper	50	23	50	23	50	23	65	29
Manual Damper	35	16	35	16	35	16	40	18
Field Filter Track 4-in. (102mm)	12	5	12	5	12	5	12	5
Motormaster Controller	35	16	35	16	35	16	35	16
Medium Static Motor/Drive	5	2	6	3	6	3	6	3
High Static Motor/Drive	11	5	12	5	16	7	16	7
Barometric Relief Hood (Horizontal)	25	11	25	11	25	11	25	11
2-Speed Indoor Fan Motor System with VFD	20	9	20	9	20	9	20	9

LEGEND

—Not Available

*For Perfect Humidity system add Motormaster controller.

NOTE: Where multiple variations are available, the heaviest combination is listed.

581J*17 VERTICAL AIRFLOW

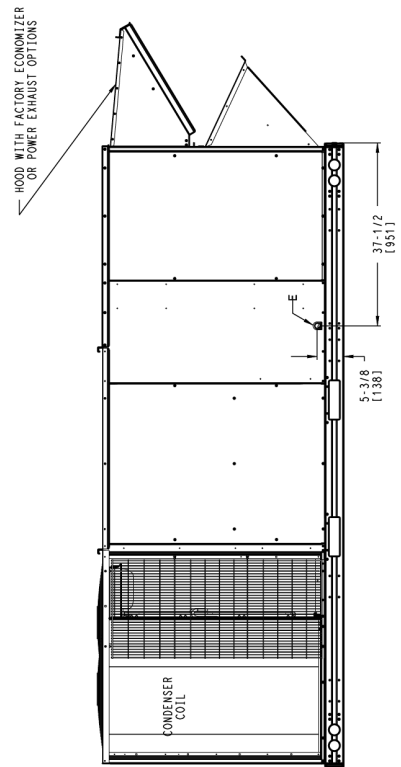


581J*17 HORIZONTAL AIRFLOW



18

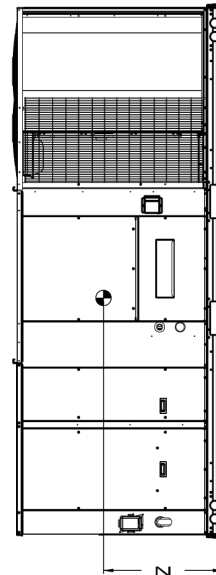
	CONNECTION SIZES		THIS DOCUMENT IS THE PROPERTY OF UTC CLIMATE CONTROLS. IT IS LOANED TO YOU FOR YOUR INFORMATION ONLY. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN CONSENT OF UTC CLIMATE CONTROLS. THIS DOCUMENT IS THE PROPERTY OF UTC CLIMATE CONTROLS. IT IS LOANED TO YOU FOR YOUR INFORMATION ONLY. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN CONSENT OF UTC CLIMATE CONTROLS.	SUBMISSION OF THESE DRAWINGS OR DOCUMENTS DOES NOT CONSTITUTE AN OFFER OF INSURANCE OR ACCEPTANCE OF CONTRACT.
E	3/4" - 1 1/4" WPT CONDENSATE DRAIN			



ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	REV
U.S. FCCM-NSR	3 OF 5	02/08/19	581 J 17 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	50HE502162

581J*17 CORNER WEIGHTS AND CLEARANCES

* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



1. CLEARANCE ABOVE THE UNIT TO BE 72"
2. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

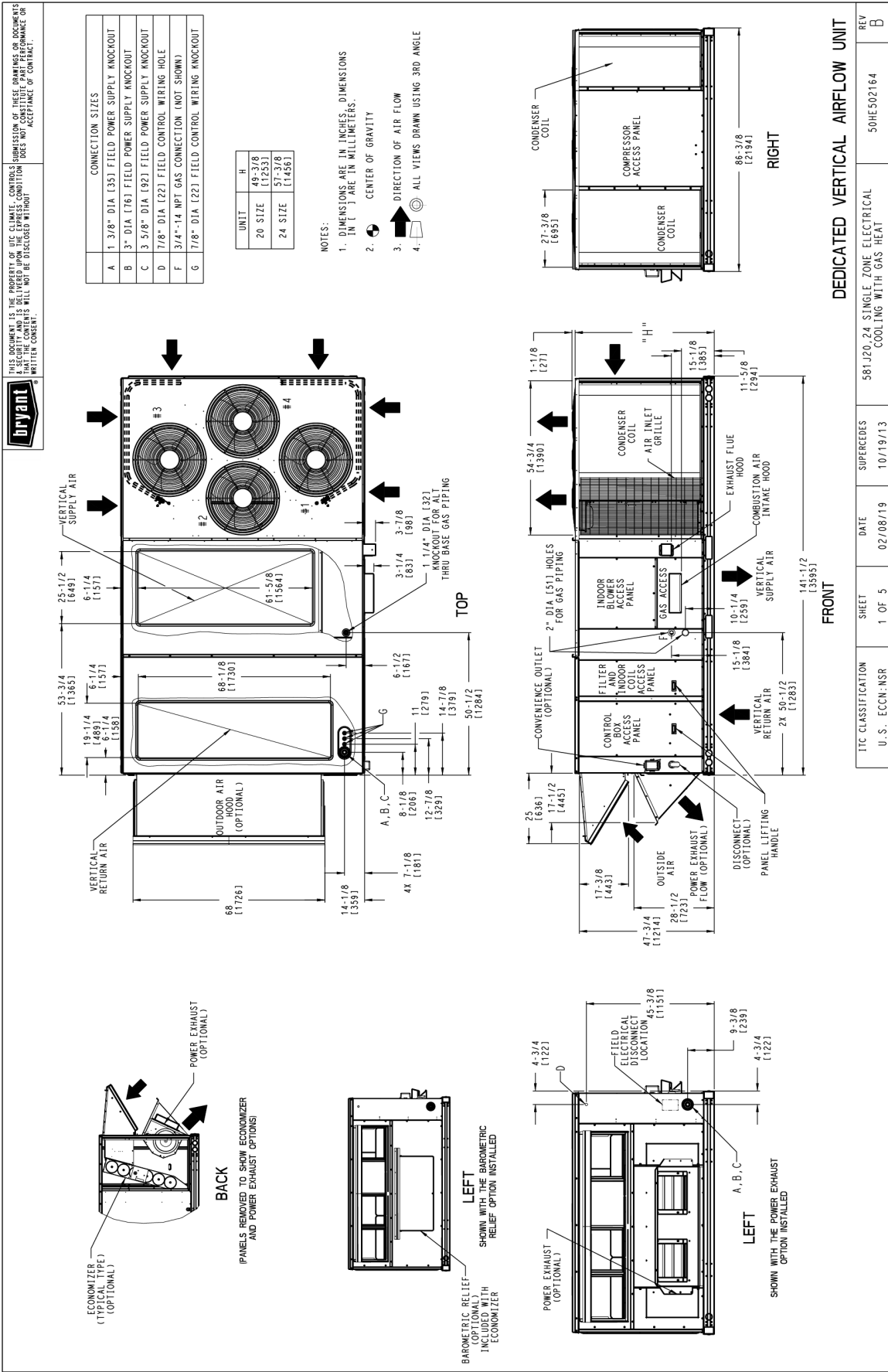
ITC CLASSIFICATION	SHEET	DATE	SUPERSEDES	REV
U.S. FCCN-NSR	4 OF 5	02/08/19	581 J 17 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	50HE502162 D

581J*17 BOTTOM VIEW

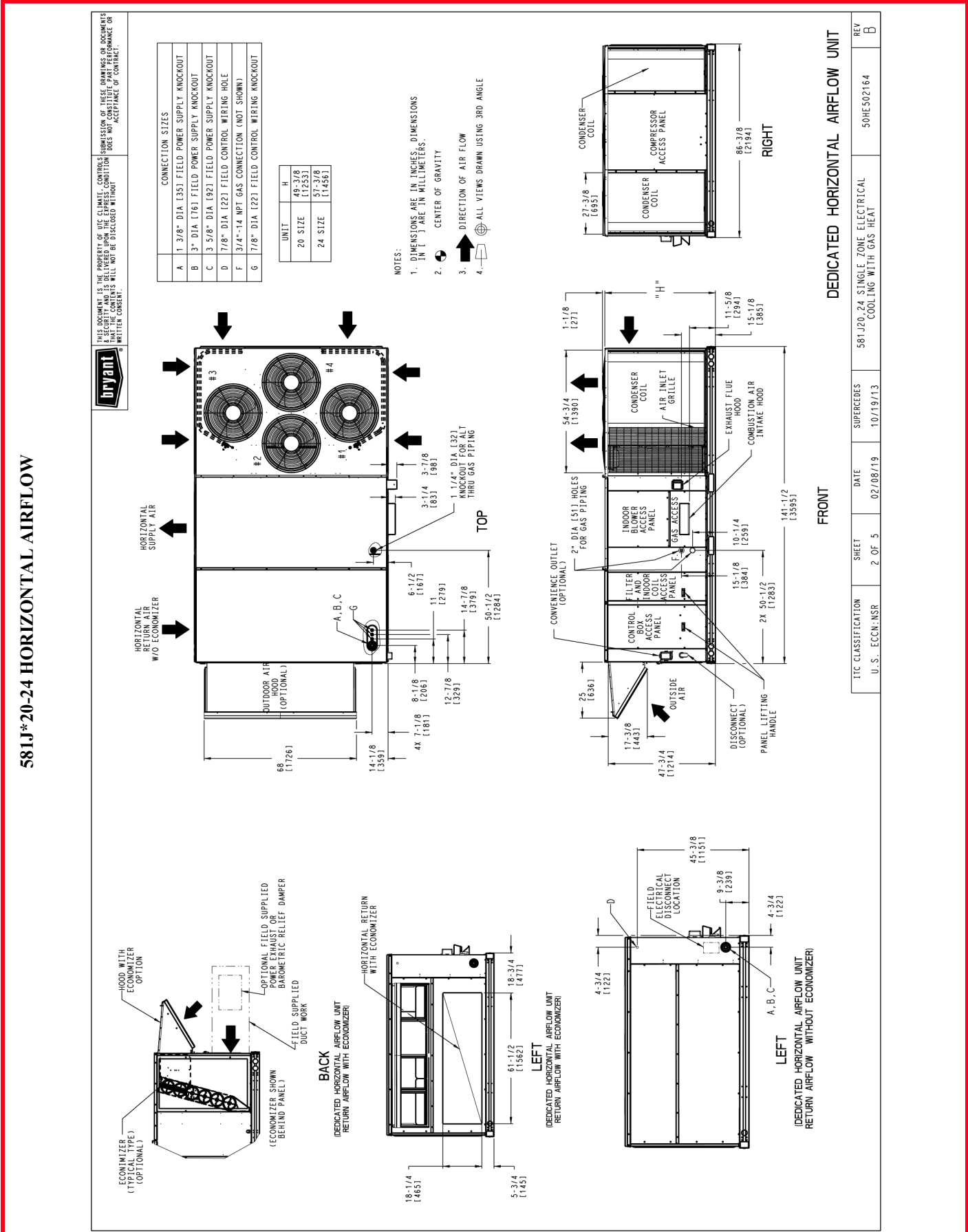


Base unit dimensions (cont)

581J*20-24 VERTICAL AIRFLOW



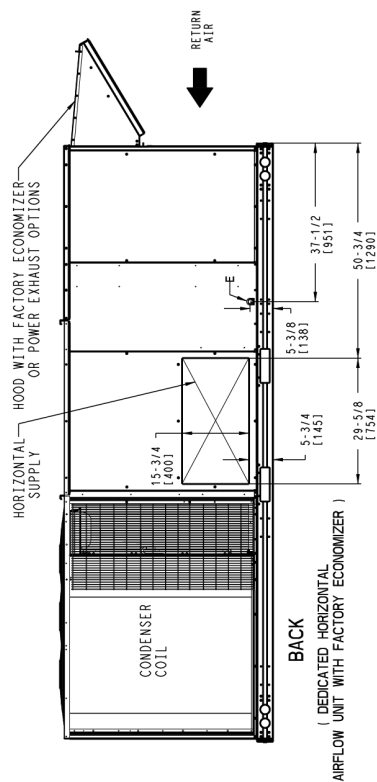
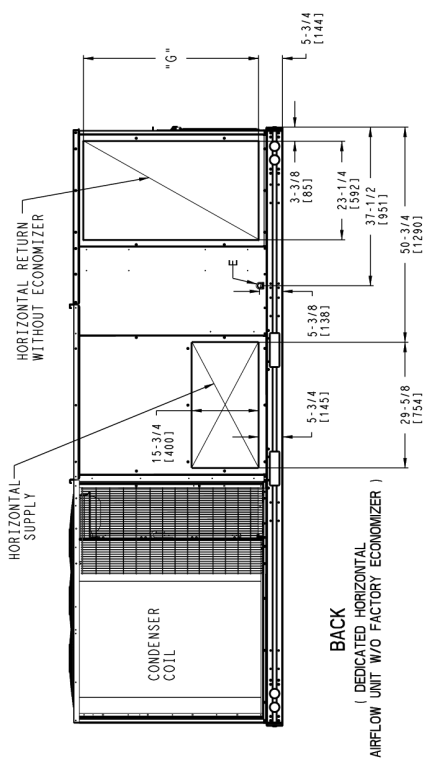
Base unit dimensions (cont)



581J*20-24 BACK VIEW AND CONDENSATE DRAIN LOCATION

	CONNECTION SIZES
E	3/4" - 14 NPT CONDENSATE DRAIN

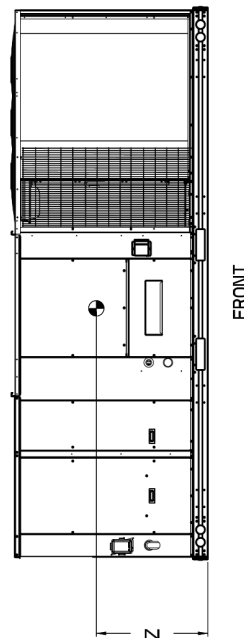
UNIT	G
20 SIZE	41-3/8 [1049]
24 SIZE	49-1/4 [1251]



ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	REV
11 S FCCM-NSR	3 OF 5	02/08/19	581J20.24 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	B
				50HE502164

581J*20-24 CORNER WEIGHTS AND CLEARANCES

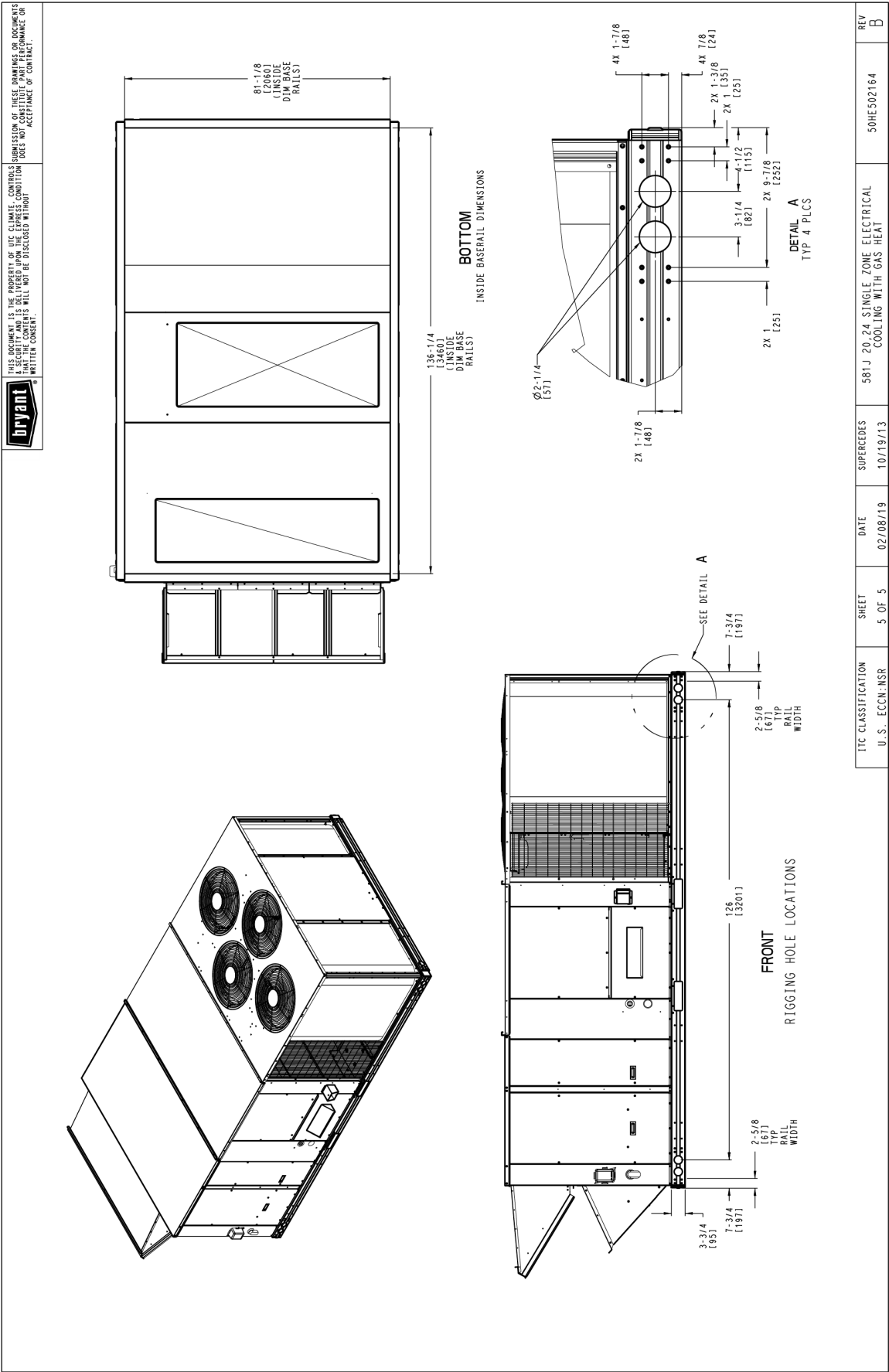
* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



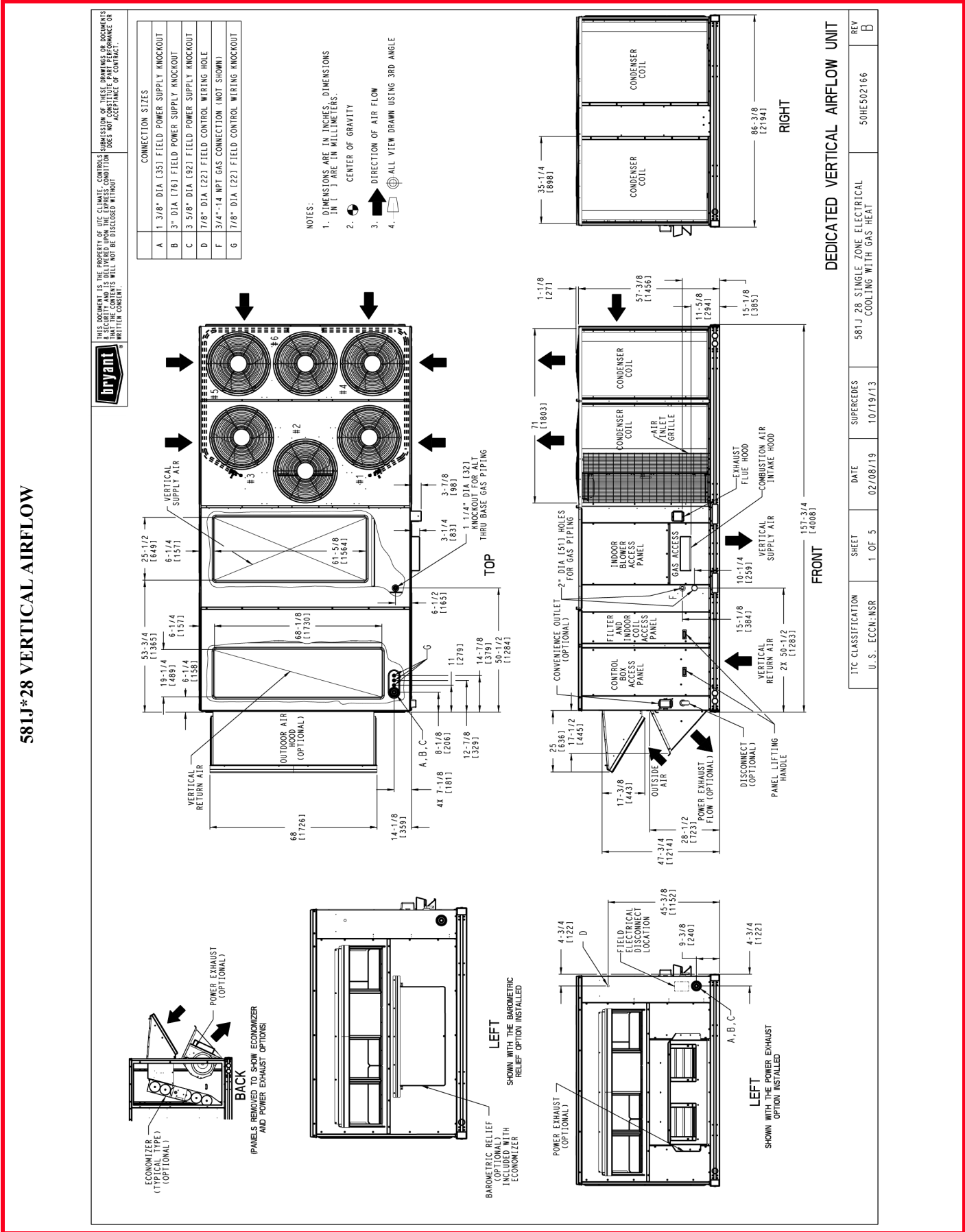
ITC CLASSIFICATION	SHEET	DATE	CLEARANCE				REV
			SURFACE	SERVICE WITH: CONDUCTIVE BARRIER	SERVICE WITH: NONCONDUCTIVE BARRIER	OPERATING CLEARANCE	
ILS ECCN: NSD 4 OF 5	02/08/10	10.150.1/2	FRONT	48 [121.9mm]	36 [91.4mm]	18 [45.7mm]	
			LEFT	48 [121.9mm]	42 [106.7mm]	18 [45.7mm]	
			BACK	42 [106.7mm]	36 [91.4mm]	18 [45.7mm]	
			LEFT WITH HOOD	36 [91.4mm]	36 [91.4mm]	18 [45.7mm]	
			RIGHT	36 [91.4mm]	36 [91.4mm]	18 [45.7mm]	
			TOP	72 [182.9mm]	72 [182.9mm]	72 [182.9mm]	
			SUPERDEDES	581.120.24 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	50NHE502164		

Base unit dimensions (cont)

581J*20-24 BOTTOM VIEW



Base unit dimensions (cont)

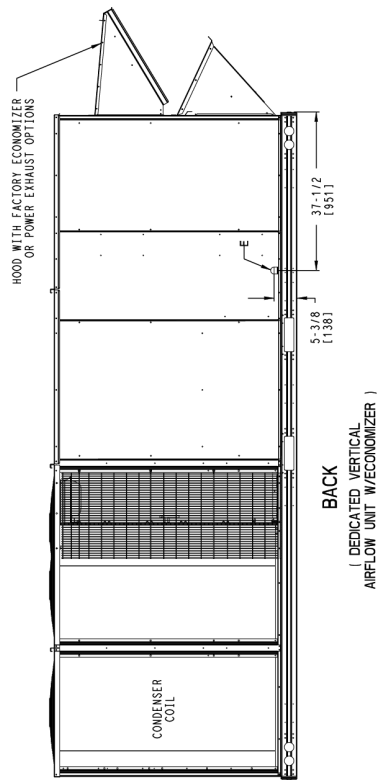


581J*28 HORIZONTAL AIRFLOW



28

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E	3/4" - 14 NPT CONDENSATE DRAIN		



Base unit dimensions (cont)

581J*28 CORNER WEIGHTS AND CLEARANCES

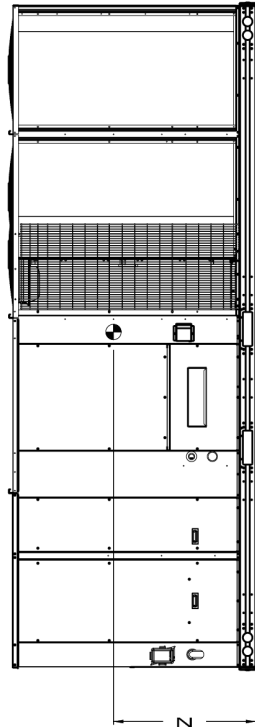
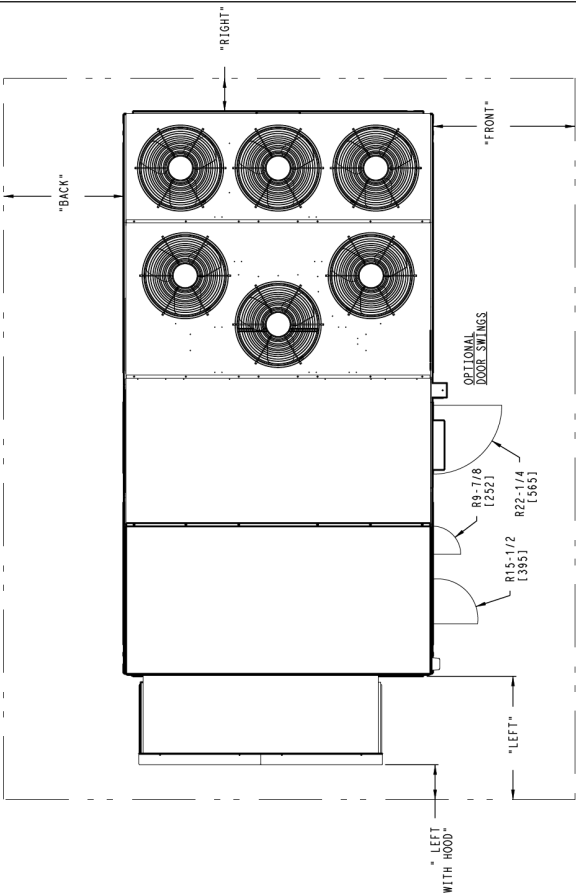
UNIT	STD UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C. G.			
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z	
581J-28	2292	1042	577	262	559	254	583	265	602	274	44	[1118]	77 1/2	[1969]
													19	[483]

■ STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.

FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



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FRONT

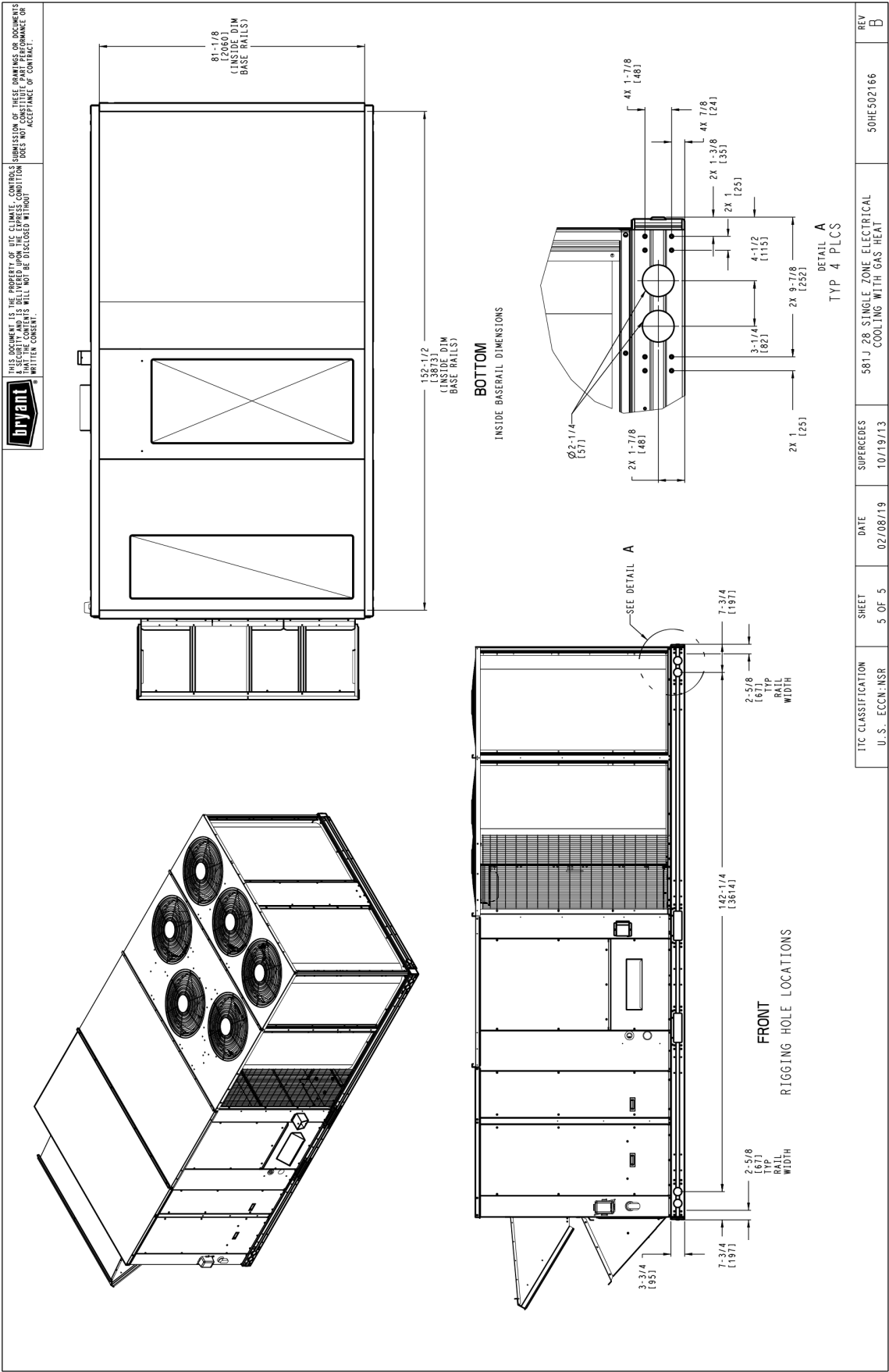
- NOTES:
1. CLEARANCE ABOVE THE UNIT TO BE 72"
 2. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

SURFACE	CLEARANCE		SERVICE WITH:		OPERATING	
	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER	CLEARANCE	CLEARANCE
FRONT	48 [1219mm]	42 [1067mm]	36 [914mm]	36 [914mm]	18 [457mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	36 [914mm]	36 [914mm]	18 [457mm]	18 [457mm]
BACK	42 [1067mm]	36 [914mm]	36 [914mm]	36 [914mm]	18 [457mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	36 [914mm]	36 [914mm]	18 [457mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]	72 [1829mm]	72 [1829mm]	72 [1829mm]

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	REV
U.S.: ECCN: NSR	4 OF 5	02/08/19	581J 28 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	50HE502166

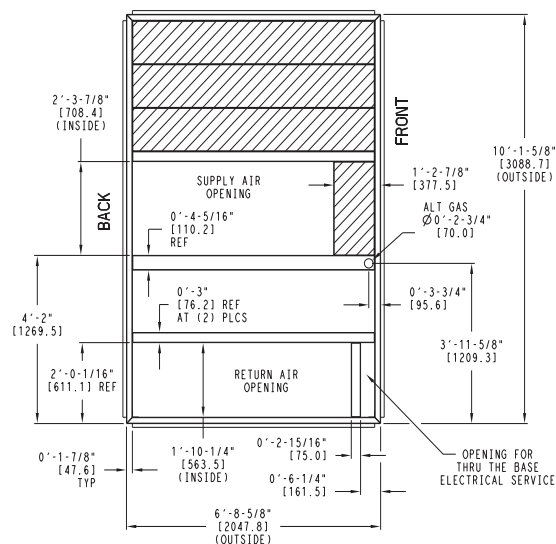
Base unit dimensions (cont)

581J*28 BOTTOM VIEW



Accessory dimensions

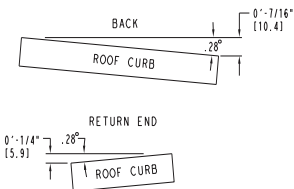
581J*17 — ROOF CURB DIMENSIONS



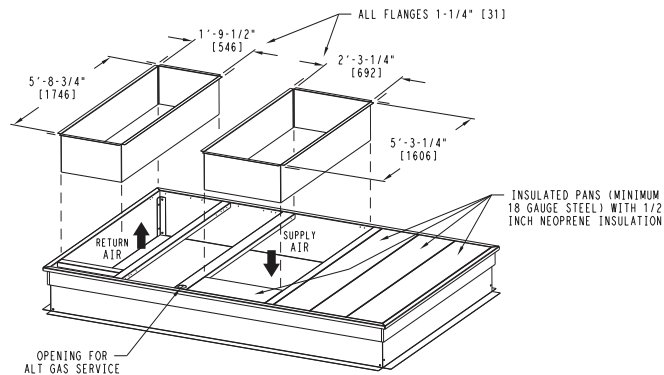
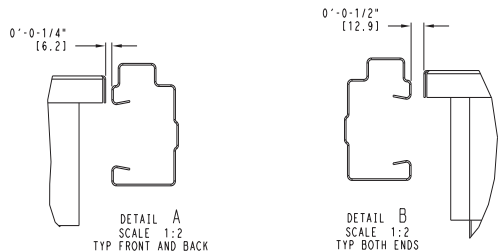
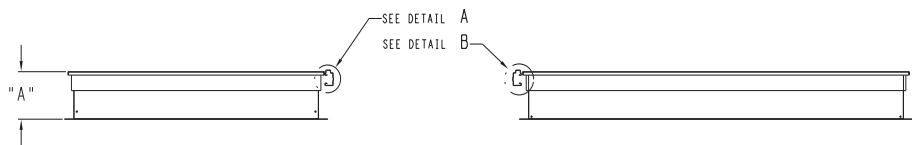
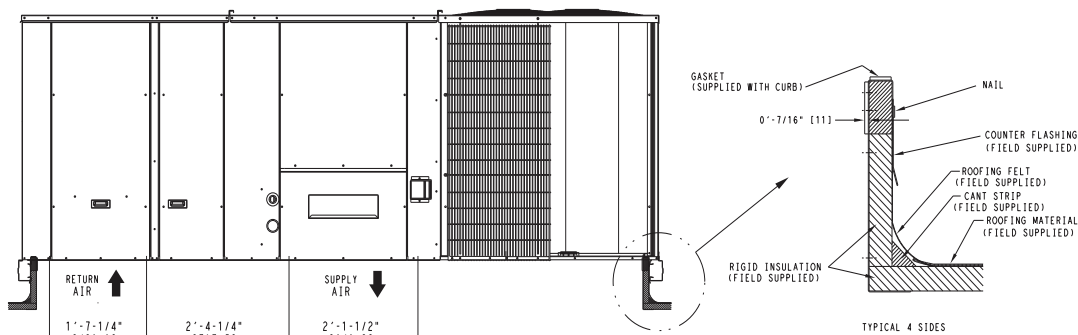
UNIT SIZE	"A"	ROOF CURB ACCESSORY
17	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB045A00 CRRFCURB046A00

- NOTES:
- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
 - 2 DIMENSIONS IN () ARE IN MILLIMETERS.
 - 3 ROOF CURB GALVANIZED STEEL.
 - 4 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
 - 5 SERVICE CLEARANCE 4 ft ON EACH SIDE

➡ DIRECTION OF AIR FLOW

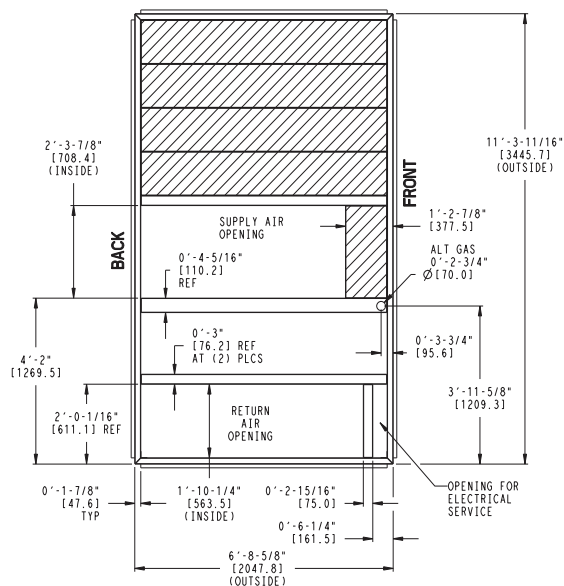


MAX CURB LEVELING TOLERANCES



Accessory dimensions (cont)

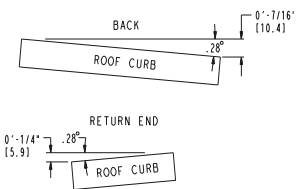
581J*20, 24 — ROOF CURB DIMENSIONS



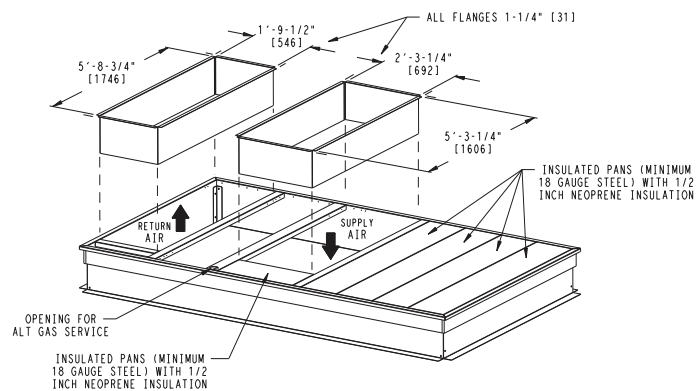
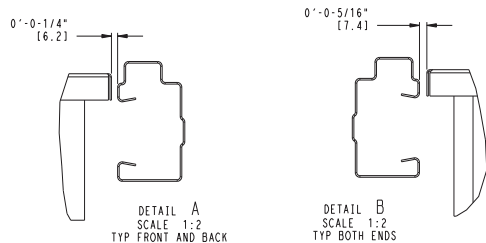
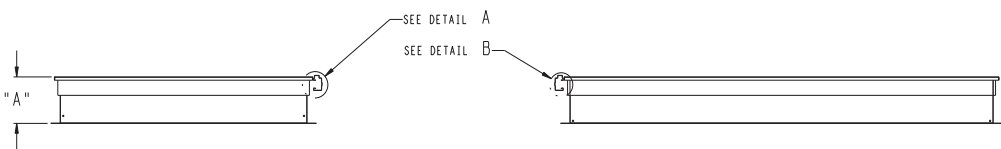
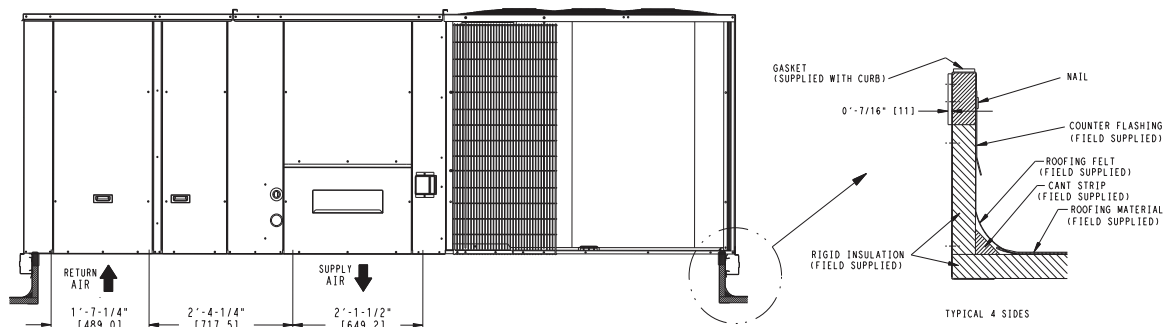
UNIT SIZE	"A"	ROOF CURB ACCESSORY
20, 24	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB047A00 CRRFCURB048A00

- NOTES:
- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
 - 2 DIMENSIONS IN [] ARE IN MILLIMETERS.
 - 3 ROOF CURB GALVANIZED STEEL.
 - 4 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
 - 5 SERVICE CLEARANCE 4 FT ON EACH SIDE

➡ DIRECTION OF AIR FLOW

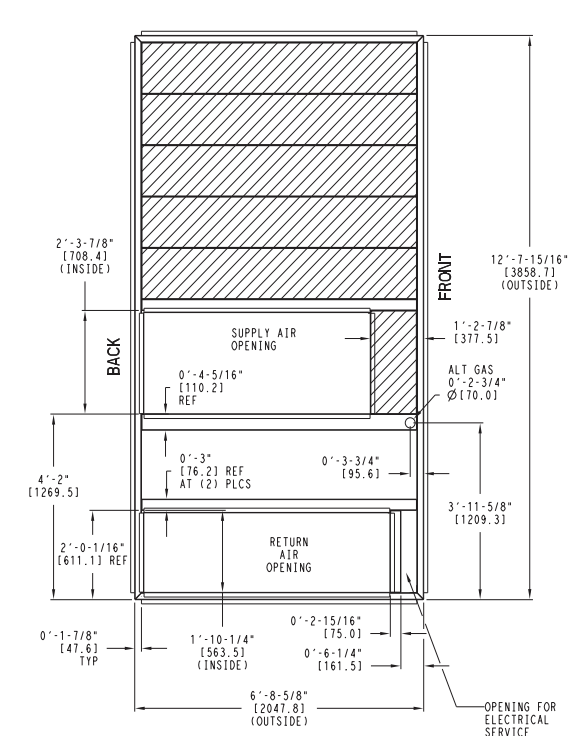


MAX CURB LEVELING TOLERANCES



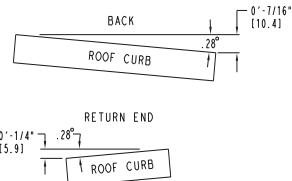
Accessory dimensions (cont)

581J*28 — ROOF CURB DIMENSIONS

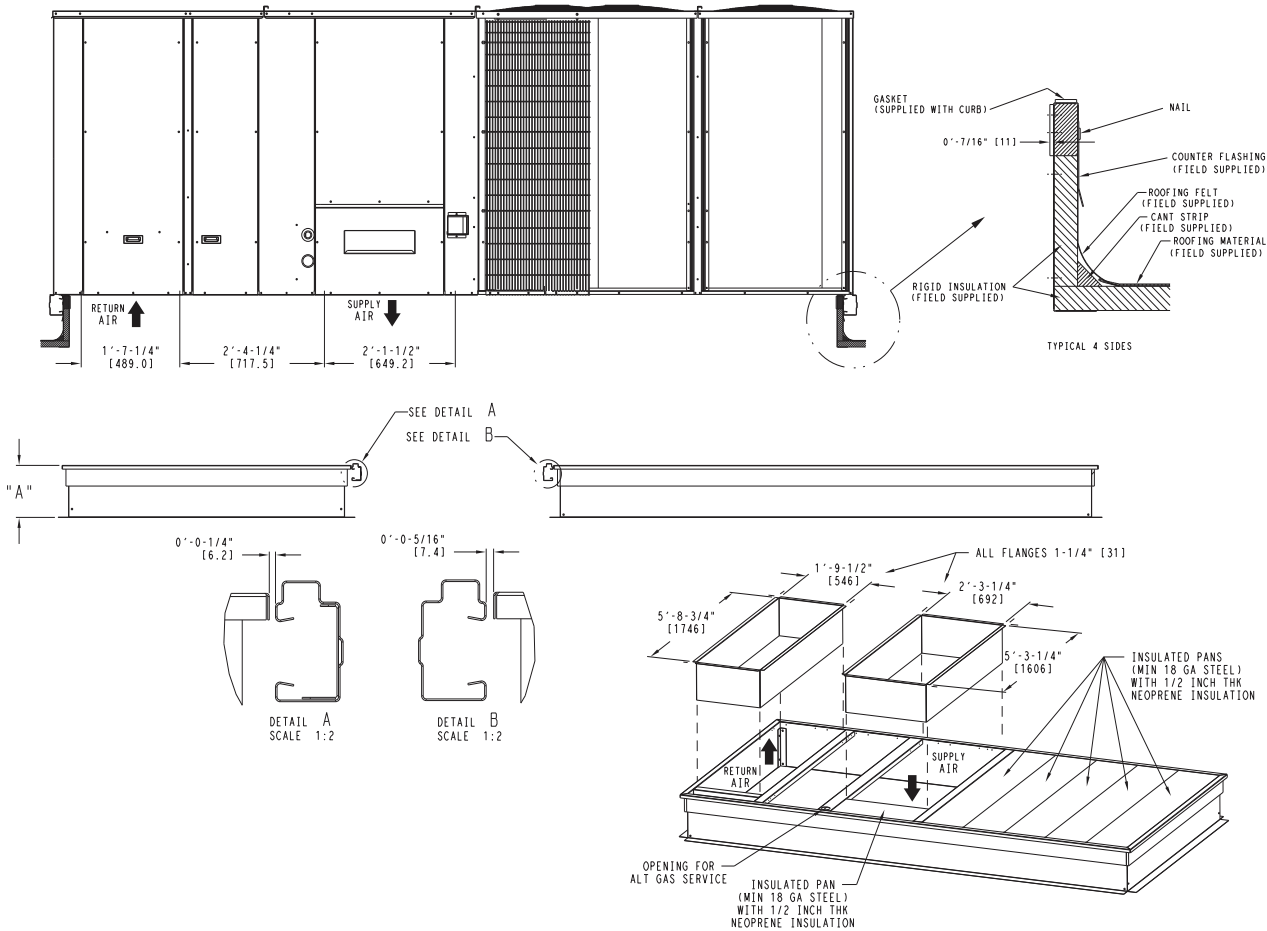


UNIT SIZE	"A"	ROOF CURB ACCESSORY
28	1'-2" [356.0] 2'-0" [610.0]	CRRFCURB049A00 CRRFCURB050A00

- NOTES:
- 1 ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
 - 2 BOLT HEADS TO BE ON INSIDE OF FLANGE. CLEARANCE IS [11] 0-0-7/16" TYP ALL CORNERS.
 - 3 DIMENSIONS IN [] ARE IN MILLIMETERS.
 - 4 ROOF CURB GALVANIZED STEEL.
 - 5 ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
 - 6 SERVICE CLEARANCE 4 ft ON EACH SIDE
 - 7 GAS SERVICE PLATE IS PART OF A SEPARATELY SHIPPED ACCESSORY PACKAGE.
 - 8 GAS SERVICE PLATE CAN BE USED WITH EITHER ACCESSORY ROOFCURB.
- ➡ DIRECTION OF AIR FLOW



MAX CURB LEVELING TOLERANCES



Performance data

581J*17D — 15 TON — COOLING CAPACITIES

581J17				AMBIENT TEMPERATURE (°F)														
				85			95			105			115			125		
				EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)		
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85
4500 Cfm	EAT (wb)	58	THC	158.3	158.3	179.2	152.6	152.6	172.9	146.6	146.6	166.1	140.2	140.2	158.8	133.2	133.2	150.8
			SHC	137.3	158.3	179.2	132.4	152.6	172.9	127.2	146.6	166.1	121.6	140.2	158.8	115.5	133.2	150.8
		62	THC	166.8	166.8	169.0	159.5	159.5	165.6	151.8	151.8	161.9	143.6	143.6	157.9	134.9	134.9	153.4
			SHC	123.1	146.1	169.0	119.7	142.6	165.6	116.1	139.0	161.9	112.3	135.1	157.9	108.2	130.8	153.4
		67	THC	182.9	182.9	182.9	174.9	174.9	174.9	166.3	166.3	166.3	157.2	157.2	157.2	147.6	147.6	147.6
			SHC	100.0	123.1	146.1	96.7	119.8	142.8	93.2	116.3	139.4	89.7	112.7	135.7	85.9	108.9	131.9
		72	THC	200.5	200.5	200.5	191.6	191.6	191.6	182.2	182.2	182.2	172.2	172.2	172.2	161.7	161.7	161.7
			SHC	76.1	99.5	122.8	72.9	96.2	119.5	69.5	92.8	116.1	66.0	89.3	112.5	62.4	85.6	108.8
		76	THC	—	215.4	215.4	—	205.8	205.8	—	195.6	195.6	—	184.8	184.8	—	173.6	173.6
			SHC	—	80.2	105.0	—	77.1	101.7	—	73.7	98.2	—	70.2	94.5	—	66.7	90.7
5250 Cfm	EAT (wb)	58	THC	166.7	166.7	188.8	160.6	160.6	181.9	154.0	154.0	174.4	147.0	147.0	166.5	139.5	139.5	157.9
			SHC	144.6	166.7	188.8	139.3	160.6	181.9	133.6	154.0	174.4	127.6	147.0	166.5	121.0	139.5	157.9
		62	THC	172.0	172.0	185.1	164.3	164.3	181.2	156.3	156.3	177.0	147.8	147.8	172.4	139.6	139.6	164.3
			SHC	132.5	158.8	185.1	128.9	155.1	181.2	125.0	151.0	177.0	120.9	146.6	172.4	114.9	139.6	164.3
		67	THC	188.3	188.3	188.3	179.7	179.7	179.7	170.7	170.7	170.7	161.0	161.0	161.0	150.9	150.9	150.9
			SHC	106.1	132.7	159.3	102.8	129.3	155.9	99.3	125.8	152.4	95.6	122.1	148.6	91.7	118.2	144.7
		72	THC	206.1	206.1	206.1	196.7	196.7	196.7	186.7	186.7	186.7	176.2	176.2	176.2	165.3	165.3	165.3
			SHC	78.8	105.6	132.5	75.5	102.3	129.1	72.1	98.8	125.6	68.5	95.2	121.9	64.8	91.4	118.0
		76	THC	—	221.2	221.2	—	211.0	211.0	—	200.3	200.3	—	189.0	189.0	—	177.2	177.2
			SHC	—	83.6	111.7	—	80.3	108.2	—	76.9	104.6	—	73.3	100.9	—	69.7	97.1
6000 Cfm	EAT (wb)	58	THC	173.8	173.8	196.8	167.2	167.2	189.4	160.2	160.2	181.4	152.7	152.7	173.0	144.7	144.7	163.8
			SHC	150.8	173.8	196.8	145.1	167.2	189.4	139.0	160.2	181.4	132.5	152.7	173.0	125.5	144.7	163.8
		62	THC	176.3	176.3	199.5	168.5	168.5	194.9	160.5	160.5	188.9	152.9	152.9	179.9	144.8	144.8	170.4
			SHC	140.9	170.2	199.5	136.9	165.9	194.9	132.1	160.5	188.9	125.8	152.9	179.9	119.2	144.8	170.4
		67	THC	192.3	192.3	192.3	183.4	183.4	183.4	173.9	173.9	173.9	164.0	164.0	164.0	153.4	153.4	156.9
			SHC	112.0	142.0	172.0	108.5	138.5	168.5	104.9	134.9	164.8	101.2	131.1	161.0	97.2	127.1	156.9
		72	THC	210.4	210.4	210.4	200.6	200.6	200.6	190.2	190.2	190.2	179.3	179.3	179.3	167.9	167.9	167.9
			SHC	81.2	111.4	141.7	77.9	108.0	138.2	74.4	104.5	134.6	70.7	100.8	130.8	67.0	96.9	126.9
		76	THC	—	225.6	225.6	—	215.0	215.0	—	203.8	203.8	—	192.1	192.1	—	180.0	180.0
			SHC	—	86.7	117.9	—	83.3	114.5	—	79.9	110.8	—	76.3	107.1	—	72.6	103.2
6750 Cfm	EAT (wb)	58	THC	179.8	179.8	203.7	172.9	172.9	195.8	165.5	165.5	187.4	157.5	157.5	178.4	149.0	149.0	168.8
			SHC	156.0	179.8	203.7	150.0	172.9	195.8	143.5	165.5	187.4	136.7	157.5	178.4	129.3	149.0	168.8
		62	THC	180.5	180.5	210.7	173.0	173.0	203.6	165.6	165.6	194.9	157.7	157.7	185.5	149.1	149.1	175.5
			SHC	147.6	179.2	210.7	142.4	173.0	203.6	136.3	165.6	194.9	129.8	157.7	185.5	122.8	149.1	175.5
		67	THC	195.6	195.6	195.6	186.2	186.2	186.2	176.5	176.5	176.8	166.2	166.2	172.7	155.4	155.4	168.4
			SHC	117.5	150.8	184.1	114.0	147.3	180.5	110.4	143.6	176.8	106.5	139.6	172.7	102.4	135.4	168.4
		72	THC	213.8	213.8	213.8	203.6	203.6	203.6	192.9	192.9	192.9	181.6	181.6	181.6	169.9	169.9	169.9
			SHC	83.5	117.0	150.5	80.1	113.5	147.0	76.5	109.9	143.3	72.8	106.1	139.4	69.1	102.3	135.5
		76	THC	—	229.1	229.1	—	218.1	218.1	—	206.6	206.6	—	194.6	194.6	—	182.1	182.1
			SHC	—	89.6	124.0	—	86.2	120.5	—	82.7	116.8	—	79.0	113.0	—	75.2	109.0
7500 Cfm	EAT (wb)	58	THC	185.1	185.1	209.6	177.7	177.7	201.3	170.0	170.0	192.5	161.6	161.6	183.0	152.8	152.8	173.0
			SHC	160.6	185.1	209.6	154.2	177.7	201.3	147.5	170.0	192.5	140.2	161.6	183.0	132.5	152.8	173.0
		62	THC	185.2	185.2	218.0	177.9	177.9	209.3	170.1	170.1	200.2	161.8	161.8	190.4	152.9	152.9	179.9
			SHC	152.5	185.2	218.0	146.4	177.9	209.3	140.0	170.1	200.2	133.2	161.8	190.4	125.8	152.9	179.9
		67	THC	198.1	198.1	198.1	188.6	188.6	192.1	178.6	178.6	188.1	168.1	168.1	183.8	157.2	157.2	179.1
			SHC	122.8	159.3	195.9	119.2	155.7	192.1	115.5	151.8	188.1	111.5	147.7	183.8	107.3	143.2	179.1
		72	THC	216.6	216.6	216.6	206.1	206.1	206.1	195.1	195.1	195.1	183.5	183.5	183.5	171.6	171.6	171.6
			SHC	85.6	122.3	159.0	82.2	118.8	155.5	78.6	115.2	151.7	74.9	111.3	147.8	71.1	107.4	143.8
		76	THC	—	231.9	231.9	—	220.7	220.7	—	208.9	208.9	—	196.5	196.5	—	183.8	183.8
			SHC	—	92.4	129.9	—	88.9	126.3	—	85.4	122.6	—	81.6	118.7	—	77.8	114.6

LEGEND

—	Do Not Operate
Cfm	Cubic Feet Per Minute (Supply Air)
EAT (db)	Entering Air Temperature (Wet Bulb)
EAT (wb)	Entering Air Temperature (Wet Bulb)
SHC	Sensible Heat Capacity (1000 Btuh) Gross
THC	Total Heat Capacity (1000 Btuh) Gross

Performance data (cont)

581J*20D — 17.5 TON — COOLING CAPACITIES

581J20				AMBIENT TEMPERATURE (°F)														
				85			95			105			115			125		
				EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)		
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85
5250 Cfm	EAT (wb)	58	THC	185.1	185.1	209.2	178.7	178.7	201.9	171.8	171.8	194.1	164.5	164.5	185.8	156.7	156.7	177.0
			SHC	161.1	185.1	209.2	155.4	178.7	201.9	149.4	171.8	194.1	143.1	164.5	185.8	136.3	156.7	177.0
		62	THC	193.8	193.8	199.5	185.6	185.6	195.4	176.9	176.9	191.1	167.7	167.7	186.4	158.2	158.2	181.1
			SHC	145.6	172.6	199.5	141.7	168.6	195.4	137.6	164.4	191.1	133.2	159.8	186.4	128.3	154.7	181.1
		67	THC	212.2	212.2	212.2	203.3	203.3	203.3	193.8	193.8	193.8	183.8	183.8	183.8	173.1	173.1	173.1
			SHC	119.0	146.0	173.1	115.3	142.3	169.4	111.4	138.4	165.4	107.3	134.3	161.3	103.0	130.0	157.0
		72	THC	232.3	232.3	232.3	222.7	222.7	222.7	212.4	212.4	212.4	201.6	201.6	201.6	190.1	190.1	190.1
			SHC	91.5	118.8	146.2	87.9	115.2	142.5	84.1	111.4	138.7	80.2	107.4	134.6	76.0	103.2	130.4
		76	THC	—	249.5	249.5	—	239.2	239.2	—	228.2	228.2	—	216.6	216.6	—	204.3	204.3
			SHC	—	96.7	125.3	—	93.2	121.7	—	89.5	117.9	—	85.6	113.8	—	81.5	109.5
6125 Cfm	EAT (wb)	58	THC	194.7	194.7	220.0	187.8	187.8	212.2	180.4	180.4	203.8	172.5	172.5	194.9	164.1	164.1	185.5
			SHC	169.4	194.7	220.0	163.3	187.8	212.2	156.9	180.4	203.8	150.1	172.5	194.9	142.8	164.1	185.5
		62	THC	199.6	199.6	218.0	191.1	191.1	213.5	182.1	182.1	208.4	173.0	173.0	201.2	164.3	164.3	192.8
			SHC	156.5	187.2	218.0	152.3	182.9	213.5	147.7	178.0	208.4	141.8	171.5	201.2	135.8	164.3	192.8
		67	THC	218.0	218.0	218.0	208.7	208.7	208.7	198.7	198.7	198.7	188.2	188.2	188.2	177.1	177.1	177.1
			SHC	126.2	157.4	188.6	122.4	153.6	184.7	118.4	149.6	180.7	114.3	145.4	176.5	109.9	141.0	172.1
		72	THC	238.5	238.5	238.5	228.4	228.4	228.4	217.7	217.7	217.7	206.3	206.3	206.3	194.3	194.3	194.3
			SHC	94.7	126.1	157.5	91.0	122.4	153.8	87.2	118.5	149.8	83.1	114.4	145.7	78.9	110.1	141.4
		76	THC	—	255.9	255.9	—	245.1	245.1	—	233.6	233.6	—	221.4	221.4	—	208.5	208.5
			SHC	—	100.7	133.3	—	97.1	129.6	—	93.3	125.6	—	89.3	121.5	—	85.1	117.1
7000 Cfm	EAT (wb)	58	THC	202.7	202.7	229.1	195.4	195.4	220.8	187.5	187.5	211.9	179.2	179.2	202.5	170.3	170.3	192.4
			SHC	176.4	202.7	229.1	170.0	195.4	220.8	163.1	187.5	211.9	155.9	179.2	202.5	148.1	170.3	192.4
		62	THC	204.6	204.6	234.4	196.0	196.0	228.0	187.7	187.7	220.3	179.3	179.3	210.5	170.4	170.4	200.0
			SHC	166.0	200.2	234.4	160.8	194.4	228.0	155.1	187.7	220.3	148.2	179.3	210.5	140.8	170.4	200.0
		67	THC	222.5	222.5	222.5	212.8	212.8	212.8	202.4	202.4	202.4	191.5	191.5	191.5	180.0	180.0	186.4
			SHC	133.0	168.2	203.4	129.2	164.3	199.5	125.1	160.3	195.4	120.9	156.0	191.0	116.4	151.4	186.4
		72	THC	243.3	243.3	243.3	232.7	232.7	232.7	221.6	221.6	221.6	209.9	209.9	209.9	197.4	197.4	197.4
			SHC	97.5	132.9	168.3	93.8	129.2	164.5	89.9	125.2	160.5	85.8	121.1	156.3	81.6	116.7	151.9
		76	THC	—	260.8	260.8	—	249.6	249.6	—	237.7	237.7	—	225.1	225.1	—	211.7	211.7
			SHC	—	104.4	140.8	—	100.7	137.0	—	96.9	133.0	—	92.8	128.8	—	88.5	124.4
7875 Cfm	EAT (wb)	58	THC	209.6	209.6	236.8	201.8	201.8	228.1	193.6	193.6	218.8	184.8	184.8	208.9	175.5	175.5	198.3
			SHC	182.3	209.6	236.8	175.6	201.8	228.1	168.4	193.6	218.8	160.8	184.8	208.9	152.7	175.5	198.3
		62	THC	209.8	209.8	246.2	202.0	202.0	237.1	193.8	193.8	227.4	185.0	185.0	217.1	175.6	175.6	206.1
			SHC	173.4	209.8	246.2	167.0	202.0	237.1	160.1	193.8	227.4	152.9	185.0	217.1	145.1	175.6	206.1
		67	THC	226.1	226.1	226.1	216.0	216.0	216.0	205.4	205.4	209.4	194.2	194.2	204.8	182.4	182.4	199.9
			SHC	139.6	178.6	217.7	135.6	174.7	213.7	131.5	170.5	209.4	127.1	166.0	204.8	122.5	161.2	199.9
		72	THC	247.0	247.0	247.0	236.2	236.2	236.2	224.7	224.7	224.7	212.7	212.7	212.7	199.9	199.9	199.9
			SHC	100.2	139.5	178.8	96.5	135.7	174.9	92.5	131.7	170.9	88.4	127.5	166.6	84.1	123.1	162.1
		76	THC	—	264.7	264.7	—	253.1	253.1	—	240.9	240.9	—	227.9	227.9	—	—	—
			SHC	—	107.9	148.1	—	104.2	144.3	—	100.2	140.2	—	96.1	135.9	—	—	—
8750 Cfm	EAT (wb)	58	THC	215.4	215.4	243.4	207.3	207.3	234.3	198.7	198.7	224.6	189.6	189.6	214.2	179.9	179.9	203.2
			SHC	187.4	215.4	243.4	180.3	207.3	234.3	172.9	198.7	224.6	164.9	189.6	214.2	156.5	179.9	203.2
		62	THC	215.5	215.5	253.0	207.5	207.5	243.5	198.9	198.9	233.4	189.7	189.7	222.7	180.0	180.0	211.2
			SHC	178.1	215.5	253.0	171.5	207.5	243.5	164.4	198.9	233.4	156.8	189.7	222.7	148.8	180.0	211.2
		67	THC	228.9	228.9	231.5	218.7	218.7	227.3	207.8	207.8	222.8	196.4	196.4	217.9	184.5	184.5	212.6
			SHC	145.8	188.6	231.5	141.8	184.5	227.3	137.5	180.1	222.8	133.0	175.5	217.9	128.2	170.4	212.6
		72	THC	250.1	250.1	250.1	239.0	239.0	239.0	227.3	227.3	227.3	214.9	214.9	214.9	201.8	201.8	201.8
			SHC	102.8	145.8	188.9	99.0	142.0	185.0	95.0	137.9	180.9	90.8	133.7	176.5	86.4	129.2	172.0
		76	THC	—	267.8	267.8	—	256.0	256.0	—	243.5	243.5	—	230.2	230.2	—	—	—
			SHC	—	111.2	155.2	—	107.4	151.3	—	103.5	147.1	—	99.3	142.8	—	—	—

LEGEND

—	Do Not Operate
Cfm	Cubic Feet Per Minute (Supply Air)
EAT (db)	Entering Air Temperature (Wet Bulb)
EAT (wb)	Entering Air Temperature (Wet Bulb)
SHC	Sensible Heat Capacity (1000 Btuh) Gross
THC	Total Heat Capacity (1000 Btuh) Gross

Performance data (cont)

581J*24D — 20 TON — COOLING CAPACITIES

581J24				AMBIENT TEMPERATURE (°F)														
				85			95			105			115			125		
				EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)		
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85
6000 Cfm	EAT (wb)	58	THC	214.4	214.4	242.5	207.0	207.0	234.2	199.0	199.0	225.1	190.2	190.2	215.2	180.6	180.6	204.3
			SHC	186.3	214.4	242.5	179.9	207.0	234.2	173.0	199.0	225.1	165.3	190.2	215.2	157.0	180.6	204.3
		62	THC	226.8	226.8	227.7	217.3	217.3	223.0	206.9	206.9	218.0	195.8	195.8	212.5	183.7	183.7	206.4
			SHC	167.0	197.3	227.7	162.4	192.7	223.0	157.6	187.8	218.0	152.3	182.4	212.5	146.6	176.5	206.4
		67	THC	248.4	248.4	248.4	237.9	237.9	237.9	226.6	226.6	226.6	214.3	214.3	214.3	201.0	201.0	201.0
			SHC	136.5	167.1	197.6	132.2	162.7	193.2	127.5	158.0	188.4	122.5	152.9	183.4	117.2	147.6	178.0
		72	THC	271.9	271.9	271.9	260.3	260.3	260.3	247.9	247.9	247.9	234.5	234.5	234.5	220.1	220.1	220.1
			SHC	105.1	136.0	167.0	100.8	131.7	162.5	96.3	127.1	157.9	91.4	122.1	152.9	86.3	116.9	147.6
		76	THC	—	291.7	291.7	—	279.2	279.2	—	265.7	265.7	—	251.3	251.3	—	235.8	235.8
			SHC	—	110.7	143.7	—	106.5	139.5	—	102.0	134.7	—	97.2	129.7	—	92.1	124.3
7000 Cfm	EAT (wb)	58	THC	225.8	225.8	255.3	217.8	217.8	246.3	209.1	209.1	236.5	199.6	199.6	225.7	189.2	189.2	214.0
			SHC	196.2	225.8	255.3	189.3	217.8	246.3	181.7	209.1	236.5	173.4	199.6	225.7	164.4	189.2	214.0
		62	THC	233.9	233.9	248.8	223.8	223.8	243.8	213.1	213.1	238.2	201.4	201.4	231.8	190.0	190.0	221.5
			SHC	179.4	214.1	248.8	174.6	209.2	243.8	169.4	203.8	238.2	163.7	197.8	231.8	155.9	188.7	221.5
		67	THC	255.7	255.7	255.7	244.6	244.6	244.6	232.6	232.6	232.6	219.6	219.6	219.6	205.7	205.7	205.7
			SHC	144.7	179.7	214.8	140.2	175.2	210.2	135.4	170.4	205.4	130.3	165.2	200.2	124.9	159.8	194.7
		72	THC	279.4	279.4	279.4	267.3	267.3	267.3	254.1	254.1	254.1	240.1	240.1	240.1	224.9	224.9	224.9
			SHC	108.7	144.1	179.6	104.3	139.7	175.1	99.6	135.0	170.3	94.7	129.9	165.1	89.5	124.6	159.7
		76	THC	—	299.4	299.4	—	286.2	286.2	—	272.1	272.1	—	256.9	256.9	—	240.7	240.7
			SHC	—	115.3	152.9	—	110.9	148.2	—	106.3	143.3	—	101.3	138.0	—	96.1	132.6
8000 Cfm	EAT (wb)	58	THC	235.3	235.3	266.2	226.8	226.8	256.5	217.5	217.5	246.0	207.4	207.4	234.5	196.3	196.3	222.0
			SHC	204.5	235.3	266.2	197.1	226.8	256.5	189.0	217.5	246.0	180.2	207.4	234.5	170.6	196.3	222.0
		62	THC	239.7	239.7	268.1	229.4	229.4	262.0	219.0	219.0	253.3	208.3	208.3	241.9	196.7	196.7	231.0
			SHC	190.7	229.4	268.1	185.4	223.7	262.0	178.6	215.9	253.3	170.4	206.2	241.9	162.3	196.7	231.0
		67	THC	261.3	261.3	261.3	249.6	249.6	249.6	237.1	237.1	237.1	223.6	223.6	223.6	209.2	209.2	210.6
			SHC	152.3	191.8	231.2	147.7	187.1	226.6	142.9	182.2	221.6	137.7	177.0	216.3	132.2	171.4	210.6
		72	THC	285.3	285.3	285.3	272.5	272.5	272.5	258.9	258.9	258.9	244.2	244.2	244.2	228.6	228.6	228.6
			SHC	111.9	151.7	191.5	107.5	147.2	186.9	102.7	142.4	182.0	97.7	137.2	176.7	92.4	131.8	171.2
		76	THC	—	305.4	305.4	—	291.6	291.6	—	276.8	276.8	—	261.2	261.2	—	244.4	244.4
			SHC	—	119.4	161.0	—	114.9	156.2	—	110.1	151.2	—	105.1	146.0	—	99.8	140.4
9000 Cfm	EAT (wb)	58	THC	243.5	243.5	275.4	234.5	234.5	265.2	224.6	224.6	254.0	213.9	213.9	241.9	202.3	202.3	228.8
			SHC	211.6	243.5	275.4	203.8	234.5	265.2	195.2	224.6	254.0	185.9	213.9	241.9	175.8	202.3	228.8
		62	THC	245.4	245.4	282.9	235.4	235.4	274.6	225.0	225.0	264.3	214.4	214.4	251.7	202.5	202.5	237.8
			SHC	199.7	241.3	282.9	193.2	233.9	274.6	185.6	224.9	264.3	176.8	214.3	251.7	167.1	202.5	237.8
		67	THC	265.6	265.6	265.6	253.6	253.6	253.6	240.7	240.7	240.7	226.8	226.8	231.8	212.0	212.0	225.8
			SHC	159.6	203.3	247.1	154.9	198.6	242.3	150.0	193.6	237.3	144.7	188.3	231.8	139.0	182.4	225.8
		72	THC	289.9	289.9	289.9	276.7	276.7	276.7	262.6	262.6	262.6	247.5	247.5	247.5	231.4	231.4	231.4
			SHC	114.9	159.0	203.0	110.4	154.4	198.3	105.6	149.5	193.3	100.5	144.2	188.0	95.2	138.7	182.3
		76	THC	—	310.1	310.1	—	295.8	295.8	—	280.6	280.6	—	264.4	264.4	—	247.3	247.3
			SHC	—	123.2	168.9	—	118.6	164.1	—	113.8	159.0	—	108.7	153.6	—	103.4	147.9
10000 Cfm	EAT (wb)	58	THC	250.4	250.4	283.2	240.9	240.9	272.5	230.7	230.7	260.9	219.5	219.5	248.2	207.3	207.3	234.5
			SHC	217.7	250.4	283.2	209.4	240.9	272.5	200.5	230.7	260.9	190.7	219.5	248.2	180.2	207.3	234.5
		62	THC	250.8	250.8	294.6	241.1	241.1	283.3	231.1	231.1	271.4	219.6	219.6	258.0	207.5	207.5	243.7
			SHC	207.0	250.8	294.6	199.0	241.1	283.3	190.7	231.1	271.4	181.2	219.6	258.0	171.2	207.5	243.7
		67	THC	269.2	269.2	269.2	256.8	256.8	257.6	243.5	243.5	252.3	229.4	229.4	246.4	214.3	214.3	240.0
			SHC	166.6	214.5	262.5	161.9	209.7	257.6	156.8	204.5	252.3	151.3	198.9	246.4	145.5	192.8	240.0
		72	THC	293.7	293.7	293.7	280.1	280.1	280.1	265.6	265.6	265.6	250.2	250.2	250.2	233.7	233.7	233.7
			SHC	117.8	166.0	214.2	113.2	161.3	209.3	108.3	156.3	204.3	103.2	151.0	198.8	97.8	145.4	193.1
		76	THC	—	313.9	313.9	—	299.3	299.3	—	283.7	283.7	—	267.1	267.1	—	249.6	249.6
			SHC	—	126.8	176.5	—	122.2	171.6	—	117.3	166.5	—	112.1	161.0	—	106.7	155.1

LEGEND

—	Do Not Operate
Cfm	Cubic Feet Per Minute (Supply Air)
EAT (db)	Entering Air Temperature (Wet Bulb)
EAT (wb)	Entering Air Temperature (Wet Bulb)
SHC	Sensible Heat Capacity (1000 Btuh) Gross
THC	Total Heat Capacity (1000 Btuh) Gross

Performance data (cont)

581J*28D — 25 TON — COOLING CAPACITIES

581J28				AMBIENT TEMPERATURE (°F)														
				85			95			105			115			125		
				EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)		
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85
7500 Cfm	EAT (wb)	58	THC	264.4	264.4	298.9	254.6	254.6	287.9	244.1	244.1	276.0	232.7	232.7	263.1	220.3	220.3	249.1
			SHC	229.9	264.4	298.9	221.4	254.6	287.9	212.2	244.1	276.0	202.3	232.7	263.1	191.5	220.3	249.1
		62	THC	278.7	278.7	282.4	266.3	266.3	276.4	252.8	252.8	269.8	238.5	238.5	262.4	223.9	223.9	251.3
			SHC	206.8	244.6	282.4	200.9	238.7	276.4	194.6	232.2	269.8	187.7	225.0	262.4	178.7	215.0	251.3
		67	THC	305.3	305.3	305.3	291.9	291.9	291.9	277.3	277.3	277.3	261.5	261.5	261.5	244.5	244.5	244.5
			SHC	169.0	207.0	245.0	163.4	201.4	239.4	157.4	195.3	233.3	151.0	188.9	226.8	144.2	182.1	219.9
		72	THC	334.0	334.0	334.0	319.4	319.4	319.4	303.6	303.6	303.6	286.5	286.5	286.5	268.1	268.1	268.1
			SHC	129.9	168.5	207.1	124.5	163.0	201.5	118.7	157.1	195.5	112.5	150.8	189.2	106.0	144.2	182.3
		76	THC	—	358.2	358.2	—	342.4	342.4	—	325.4	325.4	—	307.1	307.1	—	287.4	287.4
			SHC	—	137.0	178.2	—	131.7	172.9	—	126.0	166.9	—	119.9	160.4	—	113.4	153.4
8750 Cfm	EAT (wb)	58	THC	278.2	278.2	314.5	267.8	267.8	302.8	256.5	256.5	289.9	244.2	244.2	276.1	230.8	230.8	261.0
			SHC	241.9	278.2	314.5	232.8	267.8	302.8	223.0	256.5	289.9	212.3	244.2	276.1	200.7	230.8	261.0
		62	THC	287.2	287.2	308.3	274.3	274.3	301.5	260.8	260.8	291.7	247.0	247.0	280.9	232.0	232.0	269.1
			SHC	222.1	265.2	308.3	215.7	258.6	301.5	207.7	249.7	291.7	199.0	240.0	280.9	189.7	229.4	269.1
		67	THC	314.0	314.0	314.0	299.8	299.8	299.8	284.4	284.4	284.4	267.8	267.8	267.8	250.0	250.0	250.0
			SHC	179.1	222.7	266.4	173.3	216.9	260.6	167.2	210.8	254.3	160.7	204.2	247.7	153.7	197.2	240.6
		72	THC	343.0	343.0	343.0	327.7	327.7	327.7	311.1	311.1	311.1	293.1	293.1	293.1	273.8	273.8	273.8
			SHC	134.3	178.5	222.6	128.8	172.9	216.9	122.9	166.9	210.8	116.6	160.4	204.3	109.9	153.6	197.3
		76	THC	—	367.3	367.3	—	350.8	350.8	—	333.0	333.0	—	313.8	313.8	—	293.2	293.2
			SHC	—	142.6	189.4	—	137.1	183.5	—	131.2	177.3	—	125.0	170.7	—	118.4	163.7
10000 Cfm	EAT (wb)	58	THC	289.7	289.7	327.5	278.7	278.7	315.0	266.6	266.6	301.4	253.6	253.6	286.7	239.4	239.4	270.7
			SHC	251.9	289.7	327.5	242.3	278.7	315.0	231.8	266.6	301.4	220.5	253.6	286.7	208.2	239.4	270.7
		62	THC	294.6	294.6	329.6	282.2	282.2	319.7	268.7	268.7	309.1	254.1	254.1	298.4	239.7	239.7	281.4
			SHC	234.7	282.1	329.6	226.8	273.3	319.7	218.4	263.7	309.1	209.7	254.1	298.4	197.9	239.7	281.4
		67	THC	320.6	320.6	320.6	305.9	305.9	305.9	289.9	289.9	289.9	272.7	272.7	272.7	254.3	254.3	260.3
			SHC	188.6	237.7	286.8	182.7	231.8	280.9	176.5	225.5	274.5	169.8	218.8	267.7	162.8	211.5	260.3
		72	THC	350.0	350.0	350.0	334.0	334.0	334.0	316.8	316.8	316.8	298.2	298.2	298.2	278.3	278.3	278.3
			SHC	138.4	187.9	237.5	132.8	182.2	231.7	126.8	176.1	225.5	120.4	169.6	218.8	113.6	162.6	211.7
		76	THC	—	374.4	374.4	—	357.3	357.3	—	338.7	338.7	—	318.9	318.9	—	297.5	297.5
			SHC	—	147.7	199.5	—	142.1	193.7	—	136.1	187.4	—	129.7	180.6	—	123.0	173.5
11250 Cfm	EAT (wb)	58	THC	299.4	299.4	338.4	287.8	287.8	325.4	275.2	275.2	311.1	261.4	261.4	295.6	246.6	246.6	278.8
			SHC	260.3	299.4	338.4	250.2	287.8	325.4	239.2	275.2	311.1	227.3	261.4	295.6	214.4	246.6	278.8
		62	THC	302.2	302.2	346.0	289.3	289.3	335.7	275.5	275.5	323.5	262.1	262.1	307.7	246.8	246.8	289.8
			SHC	244.8	295.4	346.0	236.7	286.2	335.7	227.5	275.5	323.5	216.4	262.1	307.7	203.8	246.8	289.8
		67	THC	325.9	325.9	325.9	310.7	310.7	310.7	294.2	294.2	294.2	276.6	276.6	286.7	257.7	257.7	278.9
			SHC	197.6	252.1	306.5	191.7	246.1	300.4	185.3	239.6	293.9	178.5	232.6	286.7	171.2	225.1	278.9
		72	THC	355.5	355.5	355.5	339.1	339.1	339.1	321.3	321.3	321.3	302.2	302.2	302.2	281.8	281.8	281.8
			SHC	142.1	197.0	251.8	136.4	191.2	245.9	130.4	185.0	239.6	123.9	178.3	232.8	117.1	171.3	225.5
		76	THC	—	380.0	380.0	—	362.4	362.4	—	343.3	343.3	—	322.8	322.8	—	300.9	300.9
			SHC	—	152.4	209.4	—	146.8	203.4	—	140.7	197.0	—	134.2	190.2	—	127.3	182.8
12500 Cfm	EAT (wb)	58	THC	307.7	307.7	347.9	295.7	295.7	334.2	282.5	282.5	319.3	268.2	268.2	303.2	252.7	252.7	285.7
			SHC	267.6	307.7	347.9	257.1	295.7	334.2	245.6	282.5	319.3	233.2	268.2	303.2	219.7	252.7	285.7
		62	THC	308.4	308.4	362.2	295.9	295.9	347.4	283.1	283.1	332.4	268.4	268.4	315.2	252.8	252.8	296.9
			SHC	254.6	308.4	362.2	244.4	295.9	347.4	233.8	283.1	332.4	221.7	268.4	315.2	208.8	252.8	296.9
		67	THC	330.2	330.2	330.2	314.6	314.6	319.2	297.8	297.8	312.3	279.8	279.8	304.7	260.6	260.6	295.9
			SHC	206.3	265.9	325.5	200.3	259.7	319.2	193.8	253.1	312.3	186.7	245.7	304.7	179.0	237.4	295.9
		72	THC	360.1	360.1	360.1	343.2	343.2	343.2	325.0	325.0	325.0	305.4	305.4	305.4	284.6	284.6	284.6
			SHC	145.7	205.7	265.7	139.9	199.8	259.7	133.8	193.5	253.3	127.3	186.8	246.3	120.4	179.7	238.9
		76	THC	—	384.6	384.6	—	366.5	366.5	—	346.9	346.9	—	325.9	325.9	—	303.5	303.5
			SHC	—	157.0	218.9	—	151.2	212.9	—	145.1	206.3	—	138.5	199.3	—	131.5	191.7

LEGEND

—	Do Not Operate
Cfm	Cubic Feet Per Minute (Supply Air)
EAT (db)	Entering Air Temperature (Wet Bulb)
EAT (wb)	Entering Air Temperature (Wet Bulb)
SHC	Sensible Heat Capacity (1000 Btuh) Gross
THC	Total Heat Capacity (1000 Btuh) Gross

Performance data (cont)

581J*17E COOLING CAPACITIES, SUBCOOLING MODE

TEMP (°F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Cfm								
		4,500			6,000			7,500		
		AIR ENTERING EVAPORATOR - Ewb (°F)								
		72	67	62	72	67	62	72	67	62
75	TC	202.90	184.60	166.20	213.70	194.60	175.40	222.30	202.50	182.70
	SHC	91.90	112.40	132.90	106.10	126.40	146.80	117.50	137.70	158.00
	kW	10.19	10.12	9.78	10.51	10.19	9.95	10.61	10.36	10.12
85	TC	189.80	171.80	153.80	201.00	182.20	163.30	209.90	190.40	170.80
	SHC	75.90	101.00	126.20	91.20	116.30	141.30	103.40	128.40	153.50
	kW	11.57	11.49	11.15	11.88	11.56	11.32	11.98	11.73	11.49
95	TC	176.70	159.10	141.40	188.30	169.70	151.20	197.50	178.20	159.00
	SHC	59.80	89.70	119.60	76.20	106.10	135.90	89.40	119.20	149.00
	kW	12.87	12.81	12.47	13.20	12.88	12.64	13.30	13.05	12.81
105	TC	163.60	146.30	129.00	175.60	157.30	139.10	185.10	166.10	147.10
	SHC	43.80	78.40	112.90	61.30	95.90	130.40	75.30	109.90	144.40
	kW	14.05	14.00	13.65	14.39	14.07	13.82	14.40	14.24	14.00
115	TC	150.50	133.50	116.50	162.90	144.90	127.00	172.70	154.00	135.30
	SHC	27.70	67.00	106.30	46.40	85.70	125.00	61.30	100.60	133.40
	kW	15.44	15.36	15.02	15.75	15.43	15.19	15.85	15.60	15.36
125	TC	137.40	120.80	104.10	150.20	132.50	114.90	160.30	141.90	123.50
	SHC	11.70	55.70	99.60	31.40	75.50	112.90	47.30	91.30	123.00
	kW	16.77	16.71	16.37	17.10	16.78	16.54	17.20	16.95	16.71

581J*17E COOLING CAPACITIES, HOT GAS REHEAT MODE

TEMP (°F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Ewb (°F)								
		75 DRY BULB 62.5 WET BULB (50% RELATIVE)			75 DRY BULB 64 WET BULB (56% RELATIVE)			75 DRY BULB 65.3 WET BULB (60% RELATIVE)		
		AIR ENTERING EVAPORATOR - Cfm								
		4,500	6,000	7,500	4,500	6,000	7,500	4,500	6,000	7,500
80	TC	64.50	71.00	73.30	68.40	74.50	77.30	71.20	79.70	80.60
	SHC	12.60	24.90	36.80	6.80	13.70	23.90	-0.80	5.50	13.80
	kW	10.10	10.26	10.42	10.18	10.40	10.56	10.33	10.47	10.67
75	TC	66.60	73.10	75.60	70.50	76.60	79.50	73.20	80.80	82.90
	SHC	14.30	26.70	38.50	8.10	14.90	25.70	0.70	7.00	15.00
	kW	10.05	10.22	10.36	10.14	10.36	10.52	10.28	10.43	10.62
70	TC	68.70	75.10	77.40	72.50	78.60	81.40	75.20	82.80	84.90
	SHC	15.40	27.80	40.00	9.50	16.20	26.80	2.10	8.40	16.30
	kW	10.00	10.18	10.33	10.10	10.31	10.47	10.23	10.40	10.58
60	TC	72.80	79.30	81.60	76.70	82.80	85.70	79.40	86.90	88.80
	SHC	19.00	31.10	43.20	12.70	19.90	30.10	5.30	11.60	20.00
	kW	9.92	10.09	10.24	10.01	10.22	10.37	10.14	10.31	10.49
50	TC	76.80	83.40	85.70	80.80	86.90	89.70	83.50	90.90	92.80
	SHC	21.70	34.20	46.20	15.80	22.70	33.20	8.40	14.70	22.80
	kW	9.83	10.00	10.15	9.92	10.13	10.29	10.05	10.21	10.39
40	TC	80.90	87.30	89.60	84.90	90.80	93.60	87.40	94.80	96.70
	SHC	24.90	37.10	49.30	19.00	26.00	36.10	11.60	17.90	26.20
	kW	9.74	9.91	10.06	9.83	10.04	10.20	9.96	10.12	10.30

LEGEND

Edb — Entering Dry Bulb
Ewb — Entering Wet Bulb
kW — Kilowatts
SHC — Sensible Heat Capacity
TC — Total Capacity

Performance data (cont)

581J*20E COOLING CAPACITIES, SUBCOOLING MODE

TEMP (°F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Cfm								
		5250			7000			8750		
		AIR ENTERING EVAPORATOR - Ewb (°F)								
		72	67	62	72	67	62	72	67	62
75	TC	232.00	211.30	190.60	242.40	221.00	199.70	250.70	228.90	207.00
	SHC	110.90	133.70	156.40	127.60	150.30	173.00	141.10	163.70	186.40
	kW	12.45	12.16	11.81	12.74	12.41	12.02	12.93	12.51	12.18
85	TC	215.90	195.70	175.50	226.00	205.20	184.40	234.20	212.80	191.50
	SHC	90.60	118.80	147.00	108.40	136.60	164.90	122.70	151.00	179.20
	kW	13.48	13.20	12.88	13.77	13.47	13.07	13.96	13.58	13.23
95	TC	199.70	180.00	160.30	209.70	189.40	169.10	217.60	196.80	176.10
	SHC	70.30	104.00	137.70	89.20	123.00	156.70	104.40	138.20	172.10
	kW	14.60	14.25	13.94	14.89	14.51	14.15	15.08	14.63	14.31
105	TC	183.60	164.50	145.20	193.30	173.50	153.80	201.00	180.80	160.60
	SHC	50.00	89.10	128.30	70.00	109.30	148.60	86.00	125.50	158.60
	kW	15.64	15.36	15.01	15.93	15.60	15.21	16.12	15.72	15.37
115	TC	167.50	148.80	130.10	176.90	157.70	138.50	184.50	164.80	145.10
	SHC	29.70	74.30	118.90	50.70	95.60	138.10	67.70	112.70	145.10
	kW	16.70	16.38	15.82	16.98	16.63	16.03	17.17	16.75	16.19
125	TC	151.40	133.20	115.00	160.60	141.90	123.10	167.90	148.80	129.70
	SHC	9.40	59.50	109.60	31.50	81.90	123.00	49.30	100.00	129.70
	kW	17.71	17.39	17.09	18.01	17.65	17.30	18.20	17.76	17.46

581J*20E COOLING CAPACITIES, HOT GAS REHEAT MODE

TEMP (°F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Ewb (°F)								
		75 DRY BULB 62.5 WET BULB (50% RELATIVE)			75 DRY BULB 64 WET BULB (56% RELATIVE)			75 DRY BULB 65.3 WET BULB (60% RELATIVE)		
		AIR ENTERING EVAPORATOR - Cfm								
		5,250	7,000	8,750	5,250	7,000	8,750	5,250	7,000	8,750
80	TC	67.80	71.30	74.10	70.50	74.80	79.80	73.30	78.20	82.40
	SHC	9.00	26.50	41.70	2.20	13.20	26.90	-5.20	2.90	13.80
	kW	11.65	11.75	11.87	11.82	11.90	11.98	11.93	12.10	12.19
75	TC	72.50	76.00	78.80	75.00	79.20	84.30	78.00	83.00	86.90
	SHC	13.40	30.90	46.10	6.50	18.00	31.30	-2.10	7.20	17.90
	kW	11.44	11.54	11.66	11.61	11.68	11.75	11.70	11.86	11.95
70	TC	77.10	80.60	83.40	79.50	83.90	88.90	82.40	87.30	91.10
	SHC	17.60	34.70	49.90	10.80	22.20	35.10	3.20	11.50	22.20
	kW	11.22	11.33	11.45	11.40	11.46	11.54	11.49	11.64	11.75
60	TC	86.30	89.90	92.70	88.80	93.20	98.20	91.70	96.60	100.50
	SHC	26.20	43.20	58.40	19.40	30.80	43.60	11.60	20.10	30.70
	kW	10.76	10.86	10.98	10.93	11.00	11.07	11.03	11.18	11.28
50	TC	95.50	99.10	101.90	98.00	102.40	107.40	101.00	106.00	109.80
	SHC	34.80	51.80	67.00	28.00	39.40	52.20	20.10	28.70	39.40
	kW	10.33	10.43	10.55	10.50	10.52	10.63	10.59	10.74	10.85
40	TC	104.80	108.40	111.20	107.30	111.70	116.60	110.30	115.30	119.10
	SHC	43.40	60.40	75.60	36.60	48.00	60.80	28.80	37.30	47.90
	kW	9.87	9.97	10.09	10.04	10.11	10.18	10.14	10.28	10.40

LEGEND

Edb — Entering Dry Bulb
Ewb — Entering Wet Bulb
kW — Kilowatts
SHC — Sensible Heat Capacity
TC — Total Capacity

Performance data (cont)

581J*24E COOLING CAPACITIES, SUBCOOLING MODE

TEMP (°F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Cfm								
		6,000			8,000			10,000		
		AIR ENTERING EVAPORATOR - Ewb (°F)								
		72	67	62	72	67	62	72	67	62
75	TC	281.60	256.50	231.30	293.10	267.00	240.90	302.30	275.40	248.60
	SHC	114.70	141.00	167.40	140.60	166.60	192.60	161.60	187.30	212.90
	kW	13.52	13.25	12.95	13.82	13.46	13.21	13.97	13.60	13.31
85	TC	261.30	236.90	212.40	272.10	247.70	221.30	280.70	254.60	228.50
	SHC	90.90	123.50	156.10	118.80	151.10	183.30	141.40	173.40	205.40
	kW	14.95	14.68	14.48	15.25	14.89	14.64	15.40	15.03	14.74
95	TC	241.10	217.20	193.40	251.10	226.40	201.70	259.20	233.80	208.40
	SHC	67.20	106.00	144.80	97.10	120.10	174.10	121.20	159.50	197.80
	kW	16.52	16.25	15.95	16.82	16.46	16.21	16.97	16.60	16.31
105	TC	220.80	197.50	174.40	230.20	206.20	182.20	237.70	213.00	188.40
	SHC	43.40	88.40	133.50	75.30	120.10	164.90	101.00	145.70	178.90
	kW	18.09	17.82	17.52	18.39	18.03	17.78	18.54	18.17	17.88
115	TC	200.50	178.00	155.50	209.20	185.90	162.60	216.20	192.20	168.70
	SHC	19.70	70.90	122.20	53.50	104.60	155.70	80.90	131.80	161.20
	kW	19.65	19.38	19.08	19.95	19.59	19.34	20.10	19.73	19.44
125	TC	180.20	158.40	136.50	188.20	165.60	143.00	194.70	171.40	148.20
	SHC	-4.10	53.40	110.80	31.70	89.10	142.20	60.70	118.00	145.10
	kW	20.59	20.32	20.02	20.89	20.53	20.28	21.04	20.67	20.38

581J*24E COOLING CAPACITIES, HOT GAS REHEAT MODE

TEMP (°F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Ewb (°F)								
		75 DRY BULB 62.5 WET BULB (50% RELATIVE)			75 DRY BULB 64 WET BULB (56% RELATIVE)			75 DRY BULB 65.3 WET BULB (60% RELATIVE)		
		AIR ENTERING EVAPORATOR - Cfm								
		6,000	8,000	10,000	6,000	8,000	10,000	6,000	8,000	10,000
80	TC	115.20	123.30	130.60	120.40	129.30	138.20	122.80	135.00	143.70
	SHC	40.80	58.30	76.10	32.30	45.50	60.40	20.10	34.30	48.00
	kW	13.24	13.32	13.39	13.43	13.57	13.65	13.49	13.68	13.74
75	TC	119.80	128.60	135.90	125.50	135.30	143.20	128.00	139.50	148.40
	SHC	45.60	62.80	82.10	37.00	49.80	65.20	24.30	38.70	52.60
	kW	13.05	13.10	13.17	13.21	13.35	13.43	13.27	13.46	13.52
70	TC	122.50	133.10	140.20	129.80	140.70	147.60	132.40	144.40	153.20
	SHC	49.80	76.00	86.10	41.10	54.30	69.20	28.80	41.40	56.80
	kW	12.80	12.87	12.94	12.98	13.12	13.20	13.04	13.23	13.29
60	TC	133.80	142.50	149.60	139.30	150.40	157.40	141.50	154.20	163.00
	SHC	58.60	76.00	95.00	50.20	63.50	78.10	37.80	52.10	65.90
	kW	12.34	12.42	12.49	12.53	12.67	12.75	12.59	12.78	12.84
50	TC	143.50	151.80	159.30	149.00	160.00	167.00	151.30	163.60	172.50
	SHC	67.70	84.80	103.80	59.10	72.40	87.00	46.70	61.00	74.90
	kW	11.88	11.95	12.03	12.07	12.21	12.29	12.13	12.32	12.38
40	TC	153.20	161.30	168.70	158.60	169.20	176.60	160.80	173.10	182.00
	SHC	76.50	93.60	111.60	68.00	81.50	95.80	55.80	69.80	84.00
	kW	11.42	11.49	11.56	11.60	11.74	11.82	11.66	11.85	11.91

LEGEND

Edb — Entering Dry Bulb
Ewb — Entering Wet Bulb
kW — Kilowatts
SHC — Sensible Heat Capacity
TC — Total Capacity

Performance data (cont)

581J*28E COOLING CAPACITIES, SUBCOOLING MODE

TEMP (°F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Cfm								
		7,500			10,000			12,500		
		AIR ENTERING EVAPORATOR - Ewb (°F)								
		72	67	62	72	67	62	72	67	62
75	TC	351.30	319.50	287.80	370.40	337.30	304.10	385.80	351.50	317.20
	SHC	166.50	199.40	232.30	191.20	245.60	258.50	211.40	245.60	279.90
	kW	16.75	16.55	15.20	17.30	16.75	15.85	17.80	17.50	16.50
85	TC	327.50	296.40	265.30	346.10	313.60	281.20	361.10	327.50	294.00
	SHC	137.40	178.20	219.00	162.60	204.50	246.40	183.30	226.00	268.70
	kW	18.65	18.45	17.25	19.20	18.65	17.80	19.45	19.15	18.15
95	TC	303.70	273.30	242.90	321.80	290.00	258.30	336.40	303.50	270.70
	SHC	108.20	157.00	205.80	134.00	184.10	234.30	155.10	206.40	257.60
	kW	20.60	20.40	19.34	21.15	20.60	19.95	21.60	21.30	20.30
105	TC	279.90	250.20	220.40	297.50	266.40	235.30	311.70	279.50	247.40
	SHC	79.00	135.80	192.50	105.40	163.80	222.20	127.10	186.70	246.40
	kW	22.85	22.65	21.45	23.40	22.85	22.05	23.70	23.40	22.40
115	TC	256.20	227.10	198.00	273.20	242.80	212.40	287.00	255.50	224.10
	SHC	49.90	114.50	179.20	76.80	143.40	210.10	98.90	167.10	223.80
	kW	25.05	24.85	23.65	25.60	25.05	24.25	25.90	25.60	24.60
125	TC	232.40	203.90	175.50	248.90	219.20	189.50	262.30	231.50	200.80
	SHC	20.70	93.30	166.00	48.20	123.10	188.90	70.80	147.40	200.80
	kW	27.25	27.05	25.80	27.80	27.25	26.50	28.15	27.85	26.85

581J*28E COOLING CAPACITIES, HOT GAS REHEAT MODE

TEMP (°F) AIR ENT CONDENSER (Edb)		AIR ENTERING EVAPORATOR - Ewb (°F)								
		75 DRY BULB 62.5 WET BULB (50% RELATIVE)			75 DRY BULB 64 WET BULB (56% RELATIVE)			75 DRY BULB 65.3 WET BULB (60% RELATIVE)		
		AIR ENTERING EVAPORATOR - Cfm								
		7,500	10,000	12,500	7,500	10,000	12,500	7,500	10,000	12,500
80	TC	124.40	133.90	139.00	132.00	142.10	145.10	135.60	149.10	151.50
	SHC	37.60	60.70	82.20	27.80	45.40	65.80	17.50	34.20	50.10
	kW	15.83	15.90	16.00	15.97	16.13	16.16	16.11	16.31	16.38
75	TC	129.00	138.50	144.60	136.60	147.60	150.10	140.60	154.00	156.30
	SHC	47.10	70.60	92.10	37.30	55.30	75.70	27.00	43.70	60.00
	kW	15.77	15.83	15.94	15.91	16.07	16.10	16.05	16.25	16.32
70	TC	133.60	143.10	149.20	141.20	152.30	154.80	145.30	158.80	161.10
	SHC	57.30	80.70	102.20	47.50	65.40	85.80	37.20	53.90	70.10
	kW	15.68	15.75	15.86	15.83	16.00	16.04	15.88	16.08	16.15
60	TC	142.80	158.40	158.40	150.40	161.40	163.90	153.90	167.40	169.70
	SHC	76.50	121.40	121.40	66.70	84.60	105.00	56.40	73.10	89.30
	kW	15.54	15.60	15.71	15.68	15.84	15.87	15.82	16.02	16.09
50	TC	151.80	161.30	167.40	159.40	170.50	173.20	162.80	176.20	178.80
	SHC	94.10	117.50	139.00	84.30	102.20	122.60	74.00	90.70	106.90
	kW	15.40	15.47	15.58	15.54	15.68	15.71	15.66	15.86	15.93
40	TC	161.20	170.70	176.80	168.80	179.80	182.50	172.20	185.70	188.20
	SHC	114.10	137.60	159.10	104.30	122.30	142.70	94.00	110.70	127.00
	kW	15.24	15.31	15.42	15.39	15.55	15.58	15.53	15.73	15.80

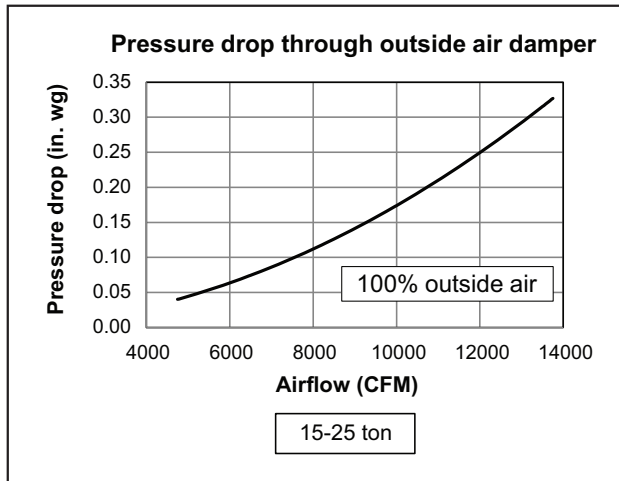
LEGEND

Edb — Entering Dry Bulb
Ewb — Entering Wet Bulb
kW — Kilowatts
SHC — Sensible Heat Capacity
TC — Total Capacity

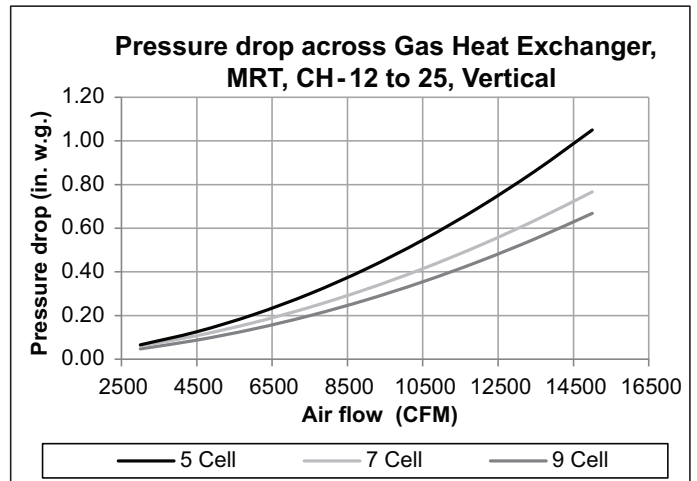
Performance data (cont)

ACCESSORY PRESSURE DROPS, BAROMETRIC RELIEF AND POWER EXHAUST PERFORMANCE

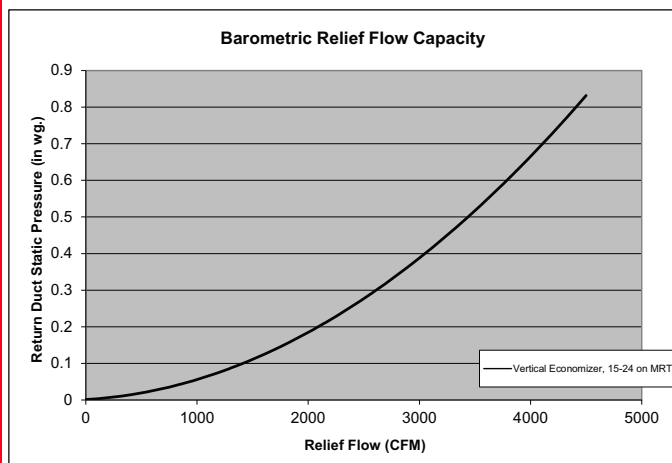
OUTSIDE AIR PRESSURE DROP



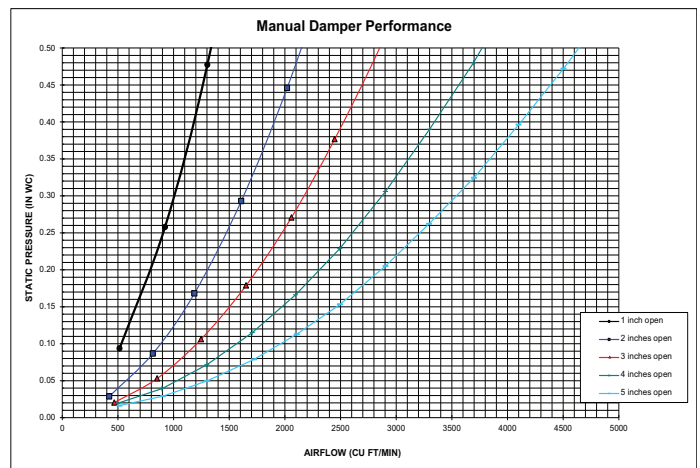
GAS HEAT EXCHANGER, CH-12 TO 25, VERTICAL SUPPLY PRESSURE DROP



BAROMETRIC RELIEF FLOW CAPACITY



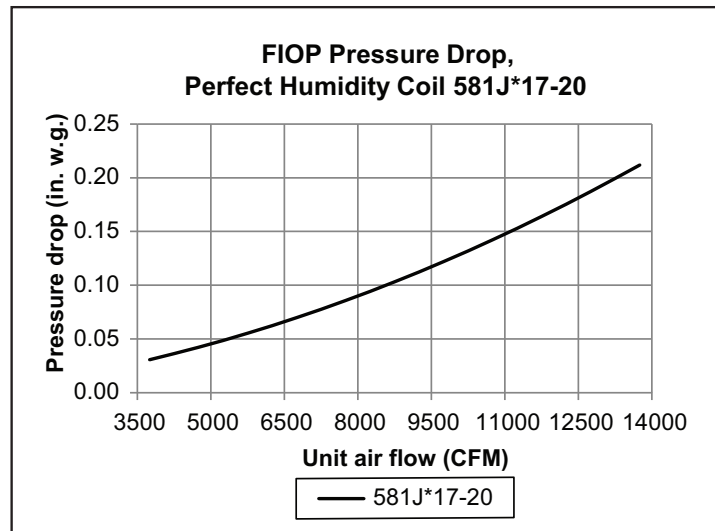
MANUAL DAMPER PERFORMANCE



Performance data (cont)

ACCESSORY PRESSURE DROPS, BAROMETRIC RELIEF AND POWER EXHAUST PERFORMANCE (cont)

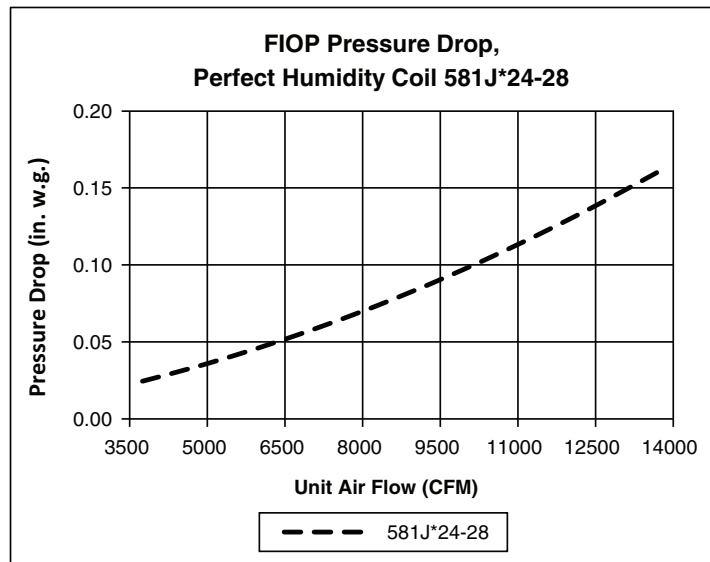
PRESSURE DROP FOR PERFECT HUMIDITY COIL, SIZES 17, 20



15, 17.5 TONS

Cfm	3750	4750	5750	6750	7750	8750	9750	10750	11750	12750	13750
PRESSURE DROP (in. wg)	0.03	0.04	0.06	0.07	0.08	0.10	0.12	0.14	0.16	0.19	0.21

PRESSURE DROP FOR PERFECT HUMIDITY COIL, SIZES 24, 28



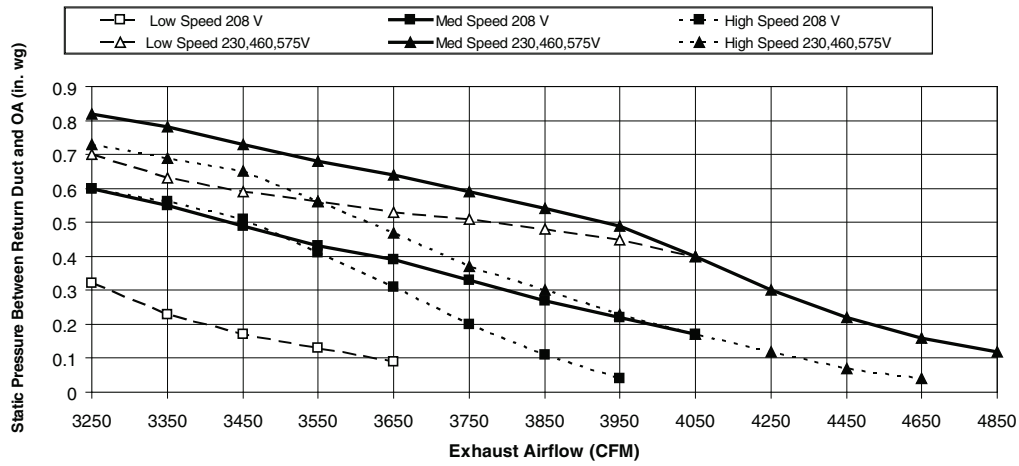
20, 25 TONS

Cfm	3750	4750	5750	6750	7750	8750	9750	10750	11750	12750	13750
PRESSURE DROP (in. wg)	0.02	0.03	0.04	0.05	0.07	0.08	0.09	0.11	0.13	0.14	0.16

Performance data (cont)

ACCESSORY PRESSURE DROPS, BAROMETRIC RELIEF AND POWER EXHAUST PERFORMANCE (cont)

POWER EXHAUST FAN PERFORMANCE



FAN PERFORMANCE — POWER EXHAUST

AIRFLOW	208V		230V/460V/575V	
	ESP	BHP	ESP	BHP
3850	0.600	1845	0.730	1.99
3950	0.560	1870	0.690	2.01
4050	0.510	1890	0.650	2.04
4250	0.410	1915	0.560	2.06
4450	0.310	1965	0.470	2.12
4650	0.200	2035	0.370	2.19
4850	0.110	2085	0.300	2.24
5050	0.040	2125	0.230	2.28
5250	—	—	0.170	2.33
5450	—	—	0.120	2.38
5650	—	—	0.070	2.40
5850	—	—	0.040	2.42

Fan data

GENERAL FAN PERFORMANCE NOTES:

1. Interpolation is permissible. Do not extrapolate.
2. External static pressure is the static pressure difference between the return duct and the supply duct plus the static pressure caused by any FIOPs or accessories.
3. Tabular data accounts for pressure loss due to clean filters, unit casing, and wet coils. Factory options and accessories may add static pressure losses. Selection software is available, through your salesperson, to help you select the best motor/drive combination for your application.
4. The Fan Performance tables offer motor/drive recommendations. In cases when two motor/drive combinations would work, Bryant recommended the lower horsepower option.
5. For information on the electrical properties of Bryant motors, please see the Electrical information section of this book.
6. For more information on the performance limits of Bryant motors, see the application data section of this book.
7. The EPACT (Energy Policy Act of 1992) regulates energy requirements for specific types of indoor fan motors. Motors regulated by EPACT include any general purpose, T-frame (three-digit, 143 and larger), single-speed, foot mounted, polyphase, squirrel cage induction motors of NEMA (National Electrical Manufacturers Association) design A and B, manufactured for use in the United States. Ranging from 1 to 200 Hp, these continuous-duty motors operate on 230 and 460 volt, 60 Hz power. If a motor does not fit into these specifications, the motor does not have to be replaced by an EPACT compliant energy-efficient motor. Variable-speed motors are exempt from EPACT compliance requirements.

581J*17, 15 TON, VERTICAL SUPPLY/RETURN — FAN PERFORMANCE

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	494	0.77	583	1.09	662	1.43	732	1.80	796	2.19
4900	522	0.93	605	1.27	681	1.64	750	2.03	813	2.44
5250	547	1.10	626	1.45	700	1.84	766	2.24	828	2.67
5650	577	1.32	651	1.68	721	2.09	786	2.51	846	2.96
6000	603	1.53	674	1.91	741	2.33	804	2.78	863	3.24
6400	634	1.81	701	2.20	765	2.64	826	3.10	883	3.59
6750	662	2.07	725	2.49	787	2.94	846	3.42	902	3.92
7150	694	2.42	754	2.85	813	3.31	869	3.81	923	4.33
7500	722	2.74	779	3.19	836	3.67	890	4.19	943	4.72

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	856	2.60	911	3.02	963	3.46	<i>1012</i>	3.92	<i>1059</i>	4.39
4900	871	2.86	926	3.30	977	3.76	<i>1026</i>	4.23	<i>1072</i>	4.72
5250	885	3.11	939	3.57	990	4.05	<i>1038</i>	4.54	—	—
5650	903	3.43	956	3.91	1006	4.40	—	—	—	—
6000	918	3.72	971	4.22	<i>1020</i>	4.73	—	—	—	—
6400	937	4.09	988	4.61	—	—	—	—	—	—
6750	954	4.44	—	—	—	—	—	—	—	—
7150	975	4.87	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—

	Standard static 514-680 RPM, 2.9 BHP, max
	Medium static 679-863 RPM, 3.7 BHP max
	High static 826-1009 RPM, 4.9 BHP max
Boldface	Indicates that a field-supplied drive is required.
<i>Italics</i>	Indicates that a high static drive package with different motor pulley is required.

Fan data (cont)

581J*17, 15 TON, HORIZONTAL SUPPLY/RETURN — FAN PERFORMANCE

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	508	1.25	582	1.76	647	2.31	705	2.89	758	3.51
4900	540	1.51	610	2.05	672	2.64	729	3.26	781	3.91
5250	568	1.78	635	2.35	695	2.96	750	3.61	801	4.29
5650	600	2.13	664	2.73	723	3.37	776	4.05	825	4.76
6000	629	2.47	691	3.10	747	3.77	799	4.48	—	—
6400	663	2.91	721	3.57	776	4.28	—	—	—	—
6750	693	3.34	749	4.03	801	4.76	—	—	—	—
7150	727	3.88	781	4.61	—	—	—	—	—	—
7500	757	4.40	—	—	—	—	—	—	—	—

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4500	807	4.16	852	4.83	—	—	—	—	—	—
4900	829	4.58	—	—	—	—	—	—	—	—
5250	—	—	—	—	—	—	—	—	—	—
5650	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—
6400	—	—	—	—	—	—	—	—	—	—
6750	—	—	—	—	—	—	—	—	—	—
7150	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—

Standard static 514-680 RPM, 2.9 BHP, max

Medium static 614-780 RPM, 3.7 BHP max

High static 746-912 RPM, 4.9 BHP max

Fan data (cont)

581J*20, 17.5 TON, VERTICAL SUPPLY/RETURN — FAN PERFORMANCE

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5250	547	1.10	626	1.45	700	1.84	766	2.24	828	2.67
5700	581	1.35	655	1.72	724	2.12	789	2.55	849	3.00
6150	615	1.63	684	2.02	750	2.44	812	2.90	871	3.37
6550	646	1.92	711	2.32	774	2.77	834	3.24	891	3.73
7000	682	2.28	743	2.71	803	3.17	860	3.66	915	4.17
7450	718	2.70	775	3.14	832	3.62	887	4.13	940	4.67
7900	755	3.16	809	3.62	863	4.12	915	4.65	966	5.21
8300	787	3.62	839	4.09	891	4.61	941	5.16	990	5.73
8750	825	4.18	874	4.68	923	5.22	971	5.78	1018	6.38

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5250	885	3.11	939	3.57	990	4.05	1038	4.54	1084	5.04
5700	905	3.47	958	3.95	1008	4.45	1055	4.96	1100	5.48
6150	925	3.86	977	4.36	1026	4.88	1073	5.42	1118	5.96
6550	945	4.24	995	4.76	1043	5.30	1090	5.86	1134	6.42
7000	967	4.71	1017	5.26	1064	5.82	1109	6.39	—	—
7450	991	5.22	1039	5.79	1085	6.38	—	—	—	—
7900	1015	5.78	1062	6.38	—	—	—	—	—	—
8300	1038	6.33	—	—	—	—	—	—	—	—
8750	—	—	—	—	—	—	—	—	—	—

Standard static 622-822 RPM, 3.7 BHP, max

Medium static 713-879 RPM, 4.9 BHP max

High static 882-1078 RPM, 208V (6.5 Max BHP) /
230V (6.9 Max BHP) / 460V (7.0 Max BHP) /
575V (8.3 Max BHP)

Operation point covered by high static drive. Confirm Max
BHP coverage based on unit voltage selected.

Boldface Indicates that a field-supplied drive is required.

Fan data (cont)

581J*20, 17.5 TON, HORIZONTAL SUPPLY/RETURN — FAN PERFORMANCE

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5250	568	1.78	635	2.35	695	2.96	750	3.61	801	4.29
5700	604	2.17	668	2.78	726	3.43	779	4.11	829	4.82
6150	642	2.63	702	3.27	758	3.95	809	4.67	857	5.42
6550	676	3.09	733	3.76	786	4.48	836	5.23	883	6.01
7000	714	3.67	769	4.38	820	5.14	868	5.92	913	6.74
7450	753	4.33	805	5.08	854	5.87	900	6.69	944	7.54
7900	792	5.06	841	5.85	888	6.68	933	7.54	—	—
8300	827	5.78	874	6.61	920	7.47	—	—	—	—
8750	867	6.69	912	7.55	—	—	—	—	—	—

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5250	848	4.99	893	5.72	934	6.47	974	7.25	1012	8.05
5700	875	5.56	918	6.33	959	7.12	998	7.93	—	—
6150	902	6.20	944	7.00	985	7.83	—	—	—	—
6550	927	6.82	968	7.65	—	—	—	—	—	—
7000	955	7.58	—	—	—	—	—	—	—	—
7450	—	—	—	—	—	—	—	—	—	—
7900	—	—	—	—	—	—	—	—	—	—
8300	—	—	—	—	—	—	—	—	—	—
8750	—	—	—	—	—	—	—	—	—	—

Standard static 622-822 RPM, 3.7 BHP, max

Medium static 713-879 RPM, 4.9 BHP max

High static 835-1021 RPM, 208V (6.5 Max BHP) /
230V (6.9 Max BHP) / 460V (7.0 Max BHP) /
575V (8.3 Max BHP)

Operation point covered by high static drive. Confirm
Max BHP coverage based on unit voltage selected.

Fan data (cont)

581J*24, 20 TON, VERTICAL SUPPLY/RETURN — FAN PERFORMANCE

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6,000	615	1.25	690	1.56	757	1.89	819	2.22	875	2.57
6,500	653	1.52	725	1.87	789	2.21	848	2.57	903	2.94
7,000	692	1.85	760	2.21	822	2.58	879	2.96	932	3.35
7,500	731	2.21	796	2.60	856	3.00	911	3.40	963	3.81
8,000	771	2.63	833	3.04	890	3.47	944	3.89	994	4.33
8,500	812	3.10	871	3.54	926	3.98	977	4.43	1026	4.89
9,000	852	3.62	909	4.09	961	4.55	1011	5.03	1059	5.51
9,500	893	4.20	947	4.69	998	5.19	1046	5.69	1092	6.19
10,000	934	4.85	986	5.36	1035	5.88	1082	6.40	1126	6.93

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6,000	928	2.92	978	3.28	1025	3.65	1071	4.03	1114	4.42
6,500	955	3.31	1003	3.69	1050	4.09	1094	4.49	1137	4.89
7,000	983	3.75	1030	4.15	1075	4.56	1119	4.98	1161	5.41
7,500	1011	4.23	1058	4.66	1102	5.09	1145	5.53	<i>1186</i>	<i>5.98</i>
8,000	1041	4.77	1087	5.21	1130	5.67	1171	6.13	—	—
8,500	1072	5.35	1116	5.82	1158	6.30	—	—	—	—
9,000	1104	6.00	1147	6.49	<i>1188</i>	<i>6.99</i>	—	—	—	—
9,500	1136	6.70	<i>1178</i>	<i>7.22</i>	—	—	—	—	—	—
10,000	1169	7.47	—	—	—	—	—	—	—	—

Standard static 690-863 RPM; 208V (6.5 Max BHP) /
230V (6.9 Max BHP) / 460V (7.0 Max BHP) /
575V (8.3 Max BHP)

Medium static 835-1021 RPM; 208V (6.5 Max BHP) /
230V (6.9 Max BHP) / 460V (7.0 Max BHP) /
575V (8.3 Max BHP)

High static 941-1176 RPM; 208V (10.5 Max BHP) /
230V (11.9 Max BHP) / 460V (11.9 Max BHP) /
575V (11.0 Max BHP)

Boldface Indicates that a field-supplied drive is required.

Italics Indicates that a high static drive package with different motor pulley is required.

Fan data (cont)

581J*24, 20 TON, HORIZONTAL SUPPLY/RETURN — FAN PERFORMANCE

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6,000	633	1.92	700	2.44	759	2.98	812	3.53	861	4.10
6,500	674	2.34	738	2.90	795	3.48	847	4.07	894	4.67
7,000	715	2.83	776	3.43	831	4.05	882	4.67	928	5.31
7,500	757	3.39	816	4.03	869	4.68	917	5.35	963	6.03
8,000	800	4.02	856	4.70	907	5.39	954	6.10	<u>998</u>	<u>6.81</u>
8,500	843	4.73	896	5.45	945	6.18	<u>991</u>	<u>6.93</u>	1034	7.68
9,000	886	5.52	937	6.28	<u>984</u>	<u>7.06</u>	1029	7.84	1071	8.63
9,500	929	6.40	<u>978</u>	<u>7.21</u>	1024	8.02	1067	8.84	—	—
10,000	<u>973</u>	<u>7.38</u>	<u>1020</u>	<u>8.22</u>	1064	9.08	—	—	—	—

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6,000	907	4.68	949	5.27	990	5.88	1028	6.50	1064	7.13
6,500	939	5.29	981	5.92	<u>1020</u>	<u>6.56</u>	1058	7.21	1094	7.88
7,000	972	5.97	<u>1013</u>	<u>6.63</u>	1052	7.31	1089	8.00	—	—
7,500	<u>1005</u>	<u>6.72</u>	1046	7.42	1084	8.13	—	—	—	—
8,000	1040	7.54	1079	8.28	—	—	—	—	—	—
8,500	1075	8.45	—	—	—	—	—	—	—	—
9,000	—	—	—	—	—	—	—	—	—	—
9,500	—	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—	—

Standard static 690-863 RPM; 208V (6.5 Max BHP) / 230V (6.9 Max BHP) / 460V (7.0 Max BHP) / 575V (8.3 Max BHP)

Medium static 835-1021 RPM; 208V (6.5 Max BHP) / 230V (6.9 Max BHP) / 460V (7.0 Max BHP) / 575V (8.3 Max BHP)

High static 941-1100 RPM; 208V (10.5 Max BHP) / 230V (11.9 Max BHP) / 460V (11.9 Max BHP) / 575V (11.0 Max BHP)

Boldface Indicates that a field-supplied drive is required.

Underscore Indicates that operation point covered by mid static drive; confirm Max BHP coverage based on the unit voltage selected.

Fan data (cont)

581J*28, 25 TON, VERTICAL SUPPLY/RETURN — FAN PERFORMANCE

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7,500	731	2.21	796	2.60	856	3.00	911	3.40	963	3.81
8,150	783	2.76	844	3.19	901	3.61	954	4.05	1003	4.49
8,750	832	3.35	890	3.80	943	4.26	994	4.73	1042	5.19
9,400	885	4.08	940	4.57	991	5.06	1039	5.55	1085	6.05
10,000	934	4.85	986	5.36	1035	5.88	1082	6.40	1126	6.93
10,650	988	5.78	1038	6.33	<u>1084</u>	<u>6.88</u>	1129	7.44	1172	8.00
11,250	<u>1038</u>	<u>6.74</u>	<u>1086</u>	<u>7.32</u>	1130	7.91	1173	8.49	—	—
11,900	<u>1093</u>	<u>7.91</u>	1138	8.52	1181	9.14	—	—	—	—
12,500	1144	9.10	1187	9.74	—	—	—	—	—	—

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7,500	1011	4.23	1058	4.66	1102	5.09	1145	5.53	<i>1186</i>	<i>5.98</i>
8,150	1050	4.94	1095	5.39	1138	5.85	<i>1180</i>	<i>6.32</i>	—	—
8,750	1088	5.67	1131	6.15	1173	6.64	—	—	—	—
9,400	1129	6.56	1172	7.07	—	—	—	—	—	—
10,000	1169	7.47	—	—	—	—	—	—	—	—
10,650	—	—	—	—	—	—	—	—	—	—
11,250	—	—	—	—	—	—	—	—	—	—
11,900	—	—	—	—	—	—	—	—	—	—
12,500	—	—	—	—	—	—	—	—	—	—

Standard static 717-911 RPM, 4.9 BHP, max

Medium static 913-1116 RPM, 208V (6.5 Max BHP) /
230V (6.9 Max BHP) / 460V (7.0 Max BHP) /
575V (8.3 Max BHP)

High static 941-1176 RPM, 208V (10.5 Max BHP) /
230V (11.9 Max BHP) / 460V (11.9 Max BHP) /
575V (11.0 Max BHP)

Italics Indicates that a high static drive package with different motor pulley is required.

Underscore Indicates that operation point covered by mid static drive; confirm Max BHP coverage based on the unit voltage selected.

Fan data (cont)

581J*28, 25 TON, HORIZONTAL SUPPLY/RETURN — FAN PERFORMANCE

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7,500	757	3.39	816	4.03	869	4.68	917	5.35	963	6.03
8,000	800	4.02	856	4.70	907	5.39	954	6.10	998	6.81
8,500	843	4.73	896	5.45	945	6.18	991	6.93	1034	7.68
9,000	886	5.52	937	6.28	984	7.06	1029	7.84	1071	8.63
9,500	929	6.40	978	7.21	1024	8.02	1067	8.84	—	—
10,000	973	7.38	1020	8.22	1064	9.08	—	—	—	—
10,500	1017	8.45	1062	9.33	—	—	—	—	—	—
11,000	1061	9.63	—	—	—	—	—	—	—	—
11,500	—	—	—	—	—	—	—	—	—	—

Cfm	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7,500	1005	6.72	1046	7.42	1084	8.13	—	—	—	—
8,000	1040	7.54	1079	8.28	—	—	—	—	—	—
8,500	1075	8.45	—	—	—	—	—	—	—	—
9,000	—	—	—	—	—	—	—	—	—	—
9,500	—	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—	—
10,500	—	—	—	—	—	—	—	—	—	—
11,000	—	—	—	—	—	—	—	—	—	—
11,500	—	—	—	—	—	—	—	—	—	—

Standard static 717-911 RPM, 4.9 BHP, max

Medium static 913-1116 RPM, 208V (6.5 Max BHP) /
230V (6.9 Max BHP) / 460V (7.0 Max BHP) /
575V (8.3 Max BHP)

High static 941-1176 RPM, 208V (10.5 Max BHP) /
230V (11.9 Max BHP) / 460V (11.9 Max BHP) /
575V (11.0 Max BHP)

Boldface Indicates that a field-supplied drive is required.

Fan data (cont)

PULLEY ADJUSTMENT, VERTICAL

581J UNIT		MOTOR/DRIVE COMBO	MOTOR PULLEY TURNS OPEN										
			0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
17	3 phase	Standard Static	680	663	647	630	614	597	580	564	547	531	514
		Medium Static	863	845	826	808	789	771	753	734	716	697	679
		High Static	1009	991	972	954	936	918	899	881	863	844	826
20	3 phase	Standard Static	822	802	782	762	742	722	702	682	662	642	622
		Medium Static	879	862	846	829	813	796	779	763	746	730	713
		High Static	1078	1058	1039	1019	1000	980	960	941	921	902	882
24	3 phase	Standard Static	863	846	828	811	794	777	759	742	725	707	690
		Medium Static	1021	1002	984	965	947	928	909	891	872	854	835
		High Static	1176	1153	1129	1106	1082	1059	1035	1012	988	965	941
28	3 phase	Standard Static	911	892	872	853	833	814	795	775	756	736	717
		Medium Static	1116	1096	1075	1055	1035	1015	994	974	954	933	913
		High Static	1176	1153	1129	1106	1082	1059	1035	1012	988	965	941

Factory setting

PULLEY ADJUSTMENT, HORIZONTAL

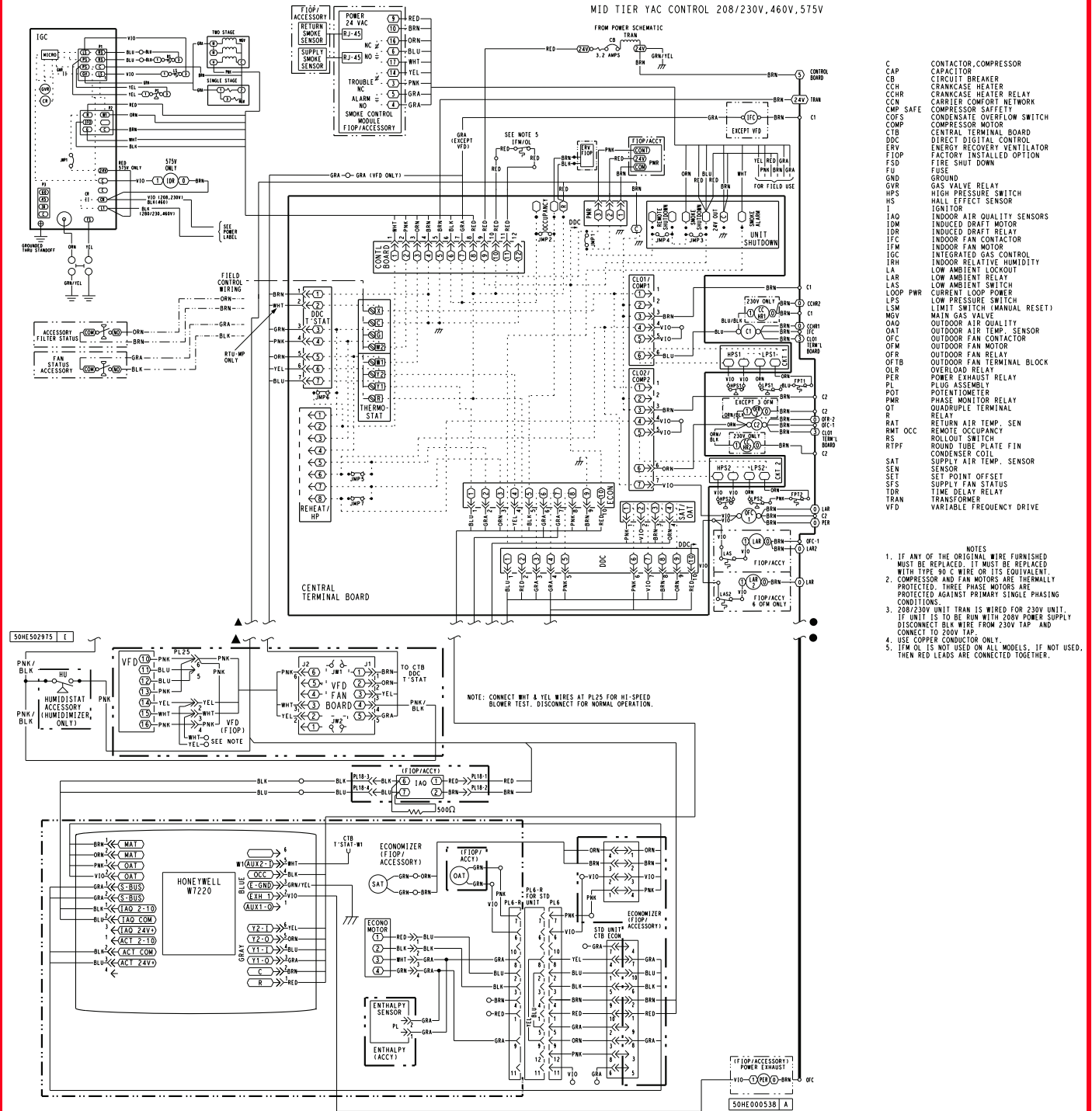
581J UNIT		MOTOR/DRIVE COMBO	MOTOR PULLEY TURNS OPEN										
			0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
17	3 phase	Standard Static	680	663	647	630	614	597	580	564	547	531	514
		Medium Static	780	763	747	730	714	697	680	664	647	631	614
		High Static	912	895	879	862	846	829	812	796	779	763	746
20	3 phase	Standard Static	822	802	782	762	742	722	702	682	662	642	622
		Medium Static	879	862	846	829	813	796	779	763	746	730	713
		High Static	1021	1002	984	965	947	928	909	891	872	854	835
24	3 phase	Standard Static	863	846	828	811	794	777	759	742	725	707	690
		Medium Static	1021	1002	984	965	947	928	909	891	872	854	835
		High Static	1176	1153	1129	1106	1082	1059	1035	1012	988	965	941
28	3 phase	*Standard Static	791	777	762	748	733	719	705	690	676	661	647
		Medium Static	923	906	889	873	856	839	822	805	789	772	755
		High Static	1107	1087	1067	1047	1027	1007	986	966	946	926	906

* Standard Static drive is for units with available electric heat. For gas units (581J), use a field-supplied drive.

Factory setting

Typical wiring diagrams

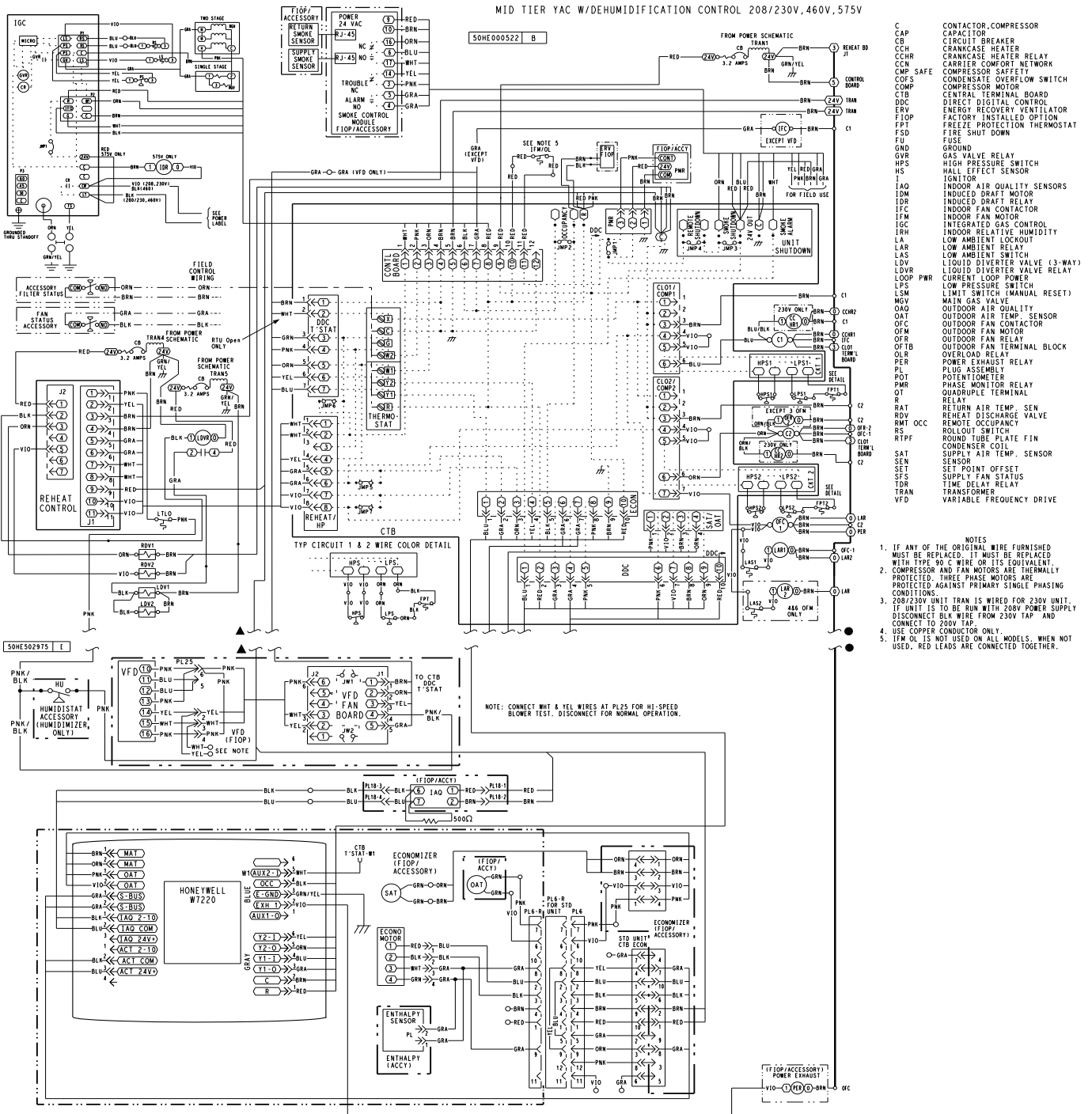
581J 17-24 ELECTRO-MECHANICAL CONTROL WIRING DIAGRAMS



Typical wiring diagrams (cont)

581J 17-24 ELECTRO-MECHANICAL CONTROL WIRING DIAGRAM WITH OPTIONAL PERFECT HUMIDITY SYSTEM

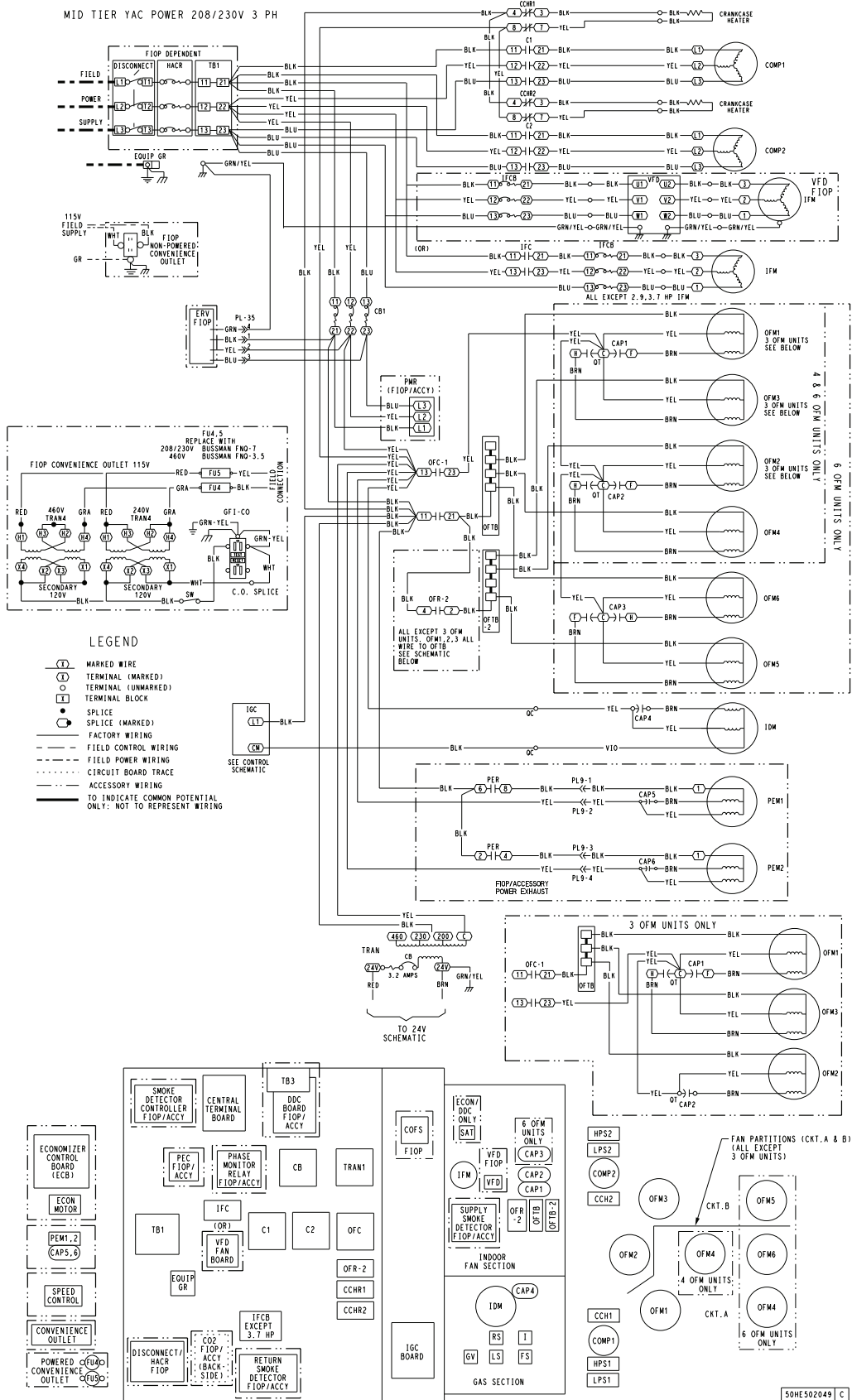
MID TIER YAC W/DEHUMIDIFICATION CONTROL 208/230V, 460V, 575V



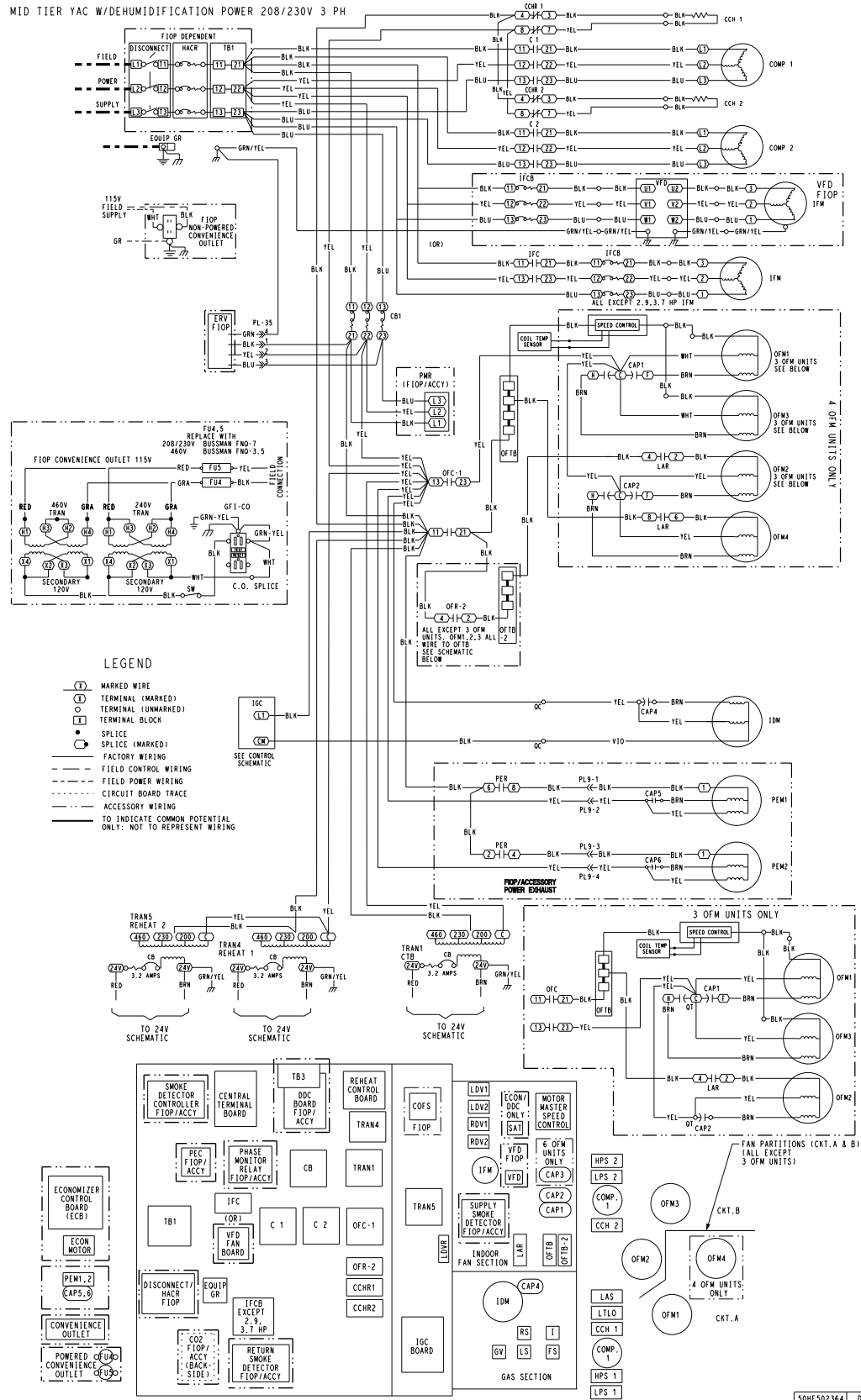
Typical wiring diagrams (cont)

581J 17-24 TYPICAL POWER WIRING DIAGRAM, 208/230V SHOWN

MID TIER YAC POWER 208/230V 3 PH



581J 17-24 TYPICAL POWER WIRING DIAGRAM WITH OPTIONAL PERFECT HUMIDITY SYSTEM, 208/230V SHOWN



Electrical data

581J*17-28 COOLING ELECTRICAL DATA

581J UNIT SIZE	V-Ph-Hz	VOLTAGE		COMP 1		COMP 2		OFM (ea)		IFM			COMBUSTION FAN MOTOR	POWER EXHAUST	
		RANGE		RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFFCY AT FULL LOAD	FLA	FLA	KIT QTY	FLA (EA KIT)
		MIN	MAX												
17	208-3-60	187	253	25.0	164	25.0	164	350	1.5	STD	81.3%	7.5	0.52	2	5.9
										MED	87.0%	10.6			
										HIGH	82.9%	13.6			
	230-3-60	187	253	25.0	164	25.0	164	350	1.5	STD	81.3%	7.5	0.52	2	5.9
										MED	87.0%	10.6			
										HIGH	82.9%	12.7			
	460-3-60	414	506	12.8	100	12.8	100	277	0.9	STD	81.3%	3.4	0.3	2	3.1
										MED	87.0%	5.3			
										HIGH	82.9%	6.4			
	575-3-60	518	633	9.6	78	9.6	48	397	0.6	STD	81.1%	2.8	0.24	2	2.4
										MED	81.1%	2.8			
										HIGH	83.6%	5.6			
20	208-3-60	187	253	27.6	191	25.0	164	350	1.5	STD	83.8%	10.2	0.52	2	5.9
										MED	82.9%	13.6			
										HIGH-HE	89.5%	17.1			
	230-3-60	187	253	27.6	191	25.0	164	350	1.5	STD	83.8%	10.2	0.52	2	5.9
										MED	82.9%	12.7			
										HIGH-HE	89.5%	17.1			
	460-3-60	414	506	12.8	100	12.2	100	277	0.9	STD	83.8%	4.8	0.3	2	3.1
										MED	82.9%	6.4			
										HIGH-HE	89.5%	8.6			
	575-3-60	518	633	9.6	78	9.0	78	397	0.6	STD	81.1%	2.8	0.24	2	2.4
										MED	83.6%	5.6			
										HIGH-HE	89.5%	7.6			
24	208-3-60	187	253	28.2	239	28.2	239	350	1.5	STD	89.5%	17.1	0.52	2	5.9
										MED-HE	89.5%	17.1			
										HIGH-HE	91.7%	28.5			
	230-3-60	187	253	28.2	239	28.2	239	350	1.5	STD	89.5%	17.1	0.52	2	5.9
										MED-HE	89.5%	17.1			
										HIGH-HE	91.7%	28.5			
	460-3-60	414	506	14.7	130	14.7	130	277	0.9	STD	89.5%	8.6	0.3	2	3.1
										MED-HE	89.5%	8.6			
										HIGH-HE	91.7%	14.3			
	575-3-60	518	633	11.3	94	11.3	94	397	0.6	STD	83.6%	5.6	0.24	2	2.4
										MED-HE	89.5%	7.6			
										HIGH-HE	91.7%	9.5			
28	208-3-60	187	253	48.1	245	33.9	240	350	1.5	STD	82.9%	13.6	0.52	2	5.9
										MED-HE	89.5%	17.1			
										HIGH-HE	91.7%	28.5			
	230-3-60	187	253	48.1	245	33.9	240	350	1.5	STD	82.9%	12.7	0.52	2	5.9
										MED-HE	89.5%	17.1			
										HIGH-HE	91.7%	28.5			
	460-3-60	414	506	18.6	125	16.0	140	277	0.9	STD	82.9%	6.4	0.3	2	3.1
										MED-HE	89.5%	8.6			
										HIGH-HE	91.7%	14.3			
	575-3-60	518	633	14.7	100	12.9	108	397	0.6	STD	83.6%	5.6	0.24	2	2.4
										MED-HE	89.5%	7.6			
										HIGH-HE	91.7%	9.5			

See Legend and Notes on page 64.

Electrical data (cont)

581J*17-28 WITH TWO-SPEED BLOWER COOLING ELECTRICAL DATA

581J UNIT SIZE	V-Ph-Hz	VOLTAGE		COMP 1		COMP 2		OFM (ea)		IFM			COMBUSTION FAN MOTOR	POWER EXHAUST	
		RANGE		RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFFCY AT FULL LOAD	FLA	FLA	KIT QTY	FLA (EA KIT)
		MIN	MAX												
17	208-3-60	187	253	25.0	164	25.0	164	350	1.5	STD	85.0%	8.6	0.52	2	5.9
										MED	81.5%	10.8			
										HIGH	83.6%	13.6			
	230-3-60	187	253	25.0	164	25.0	164	350	1.5	STD	85.0%	7.8	0.52	2	5.9
										MED	81.5%	9.8			
										HIGH	83.6%	12.7			
	460-3-60	414	506	12.8	100	12.8	100	277	0.9	STD	85.0%	3.8	0.3	2	3.1
										MED	81.5%	4.9			
										HIGH	83.6%	6.4			
	575-3-60	518	633	9.6	78	9.6	78	397	0.6	STD	81.1%	4.5	0.24	2	2.4
										MED	81.1%	4.5			
										HIGH	83.6%	6.2			
20	208-3-60	187	253	27.6	191	25.0	164	350	1.5	STD	81.5%	10.8	0.52	2	5.9
										MED	83.6%	13.6			
										HIGH	89.5%	17.1			
	230-3-60	187	253	27.6	191	25.0	164	350	1.5	STD	81.5%	9.8	0.52	2	5.9
										MED	83.6%	12.7			
										HIGH	89.5%	17.1			
	460-3-60	414	506	12.8	100	12.2	100	277	0.9	STD	81.5%	4.9	0.3	2	3.1
										MED	83.6%	6.4			
										HIGH	89.5%	8.6			
	575-3-60	518	633	9.6	78	9.0	78	397	0.6	STD	81.1%	4.5	0.24	2	2.4
										MED	83.6%	6.2			
										HIGH	89.5%	7.6			
24	208-3-60	187	253	28.2	239	28.2	239	350	1.5	STD	83.6%	13.6	0.52	2	5.9
										MED	89.5%	17.1			
										HIGH	91.7%	28.5			
	230-3-60	187	253	28.2	239	28.2	239	350	1.5	STD	83.6%	12.7	0.52	2	5.9
										MED	89.5%	17.1			
										HIGH	91.7%	28.5			
	460-3-60	414	506	14.7	130	14.7	130	277	0.9	STD	83.6%	6.4	0.3	2	3.1
										MED	89.5%	8.6			
										HIGH	91.7%	14.3			
	575-3-60	518	633	11.3	94	11.3	94	397	0.6	STD	83.6%	6.2	0.24	2	2.4
										MED	89.5%	7.6			
										HIGH	91.7%	9.5			
28	208-3-60	187	253	48.1	245	33.9	240	350	1.5	STD	83.6%	13.6	0.52	2	5.9
										MED	89.5%	17.1			
										HIGH	91.7%	28.5			
	230-3-60	187	253	48.1	245	33.9	240	350	1.5	STD	83.6%	12.7	0.52	2	5.9
										MED	89.5%	17.1			
										HIGH	91.7%	28.5			
	460-3-60	414	506	18.6	125	16.0	140	277	0.9	STD	83.6%	6.4	0.3	2	3.1
										MED	89.5%	8.6			
										HIGH	91.7%	14.3			
	575-3-60	518	633	14.7	100	12.9	108	397	0.6	STD	83.6%	6.2	0.24	2	2.4
										MED	89.5%	7.6			
										HIGH	91.7%	9.5			

See Legend and Notes on page 64.

Electrical data (cont)

581J*17-28 MCA MOCP ELECTRICAL DATA — WITHOUT CONVENIENCE OUTLET OR UNPOWERED CONVENIENCE OUTLET

581J UNIT TYPE	NOM. V-Ph-Hz	IFM TYPE	NO CONVENIENCE OUTLET OR UNPOWERED CONVENIENCE OUTLET					
			NO POWERED EXHAUST			WITH POWERED EXHAUST (POWERED FROM UNIT)		
			MCA	DISC. SIZE		MCA	DISC. SIZE	
				FLA	LRA		FLA	LRA
17	208/230-3-60	STD	68.3	71	393	80.1	85	413
		MED	71.4	75	423	83.2	88	443
		HIGH	74.4	78/77	425	86.2	92/91	445
	460-3-60	STD	34.9	36	234	41.1	44	246
		MED	36.8	39	249	43.0	46	261
		HIGH	37.9	40	250	44.1	47	262
	575-3-60	STD	26.2	27	184	31.0	33	192
		MED	26.2	27	184	31.0	33	192
		HIGH	29.0	31	198	33.8	36	206
20	208/230-3-60	STD	75.7	79	440	87.5	93	460
		MED	79.1	83/82	455	90.9	97/96	475
		HIGH-HE	82.6	87	451	94.4	101	471
	460-3-60	STD	36.6	38	245	42.8	46	257
		MED	38.2	40	252	44.4	47	264
		HIGH-HE	40.4	43	250	46.6	50	262
	575-3-60	STD	26.2	27	186	31.0	33	194
		MED	29.0	31	200	33.8	36	208
		HIGH-HE	31.0	33	198	35.8	38	206
24	208/230-3-60	STD	86.6	91	574	98.4	105	594
		MED-HE	86.6	91	574	98.4	105	594
		HIGH-HE	98.0	105	653	109.8	118	673
	460-3-60	STD	45.3	48	310	51.5	55	322
		MED-HE	45.3	48	310	51.5	55	322
		HIGH-HE	51.0	54	350	57.2	62	362
	575-3-60	STD	33.4	35	232	38.2	41	240
		MED-HE	35.4	37	230	40.2	43	238
		HIGH-HE	37.3	40	257	42.1	45	265
28	208/230-3-60	STD	116.6	120/119	591	128.4	134/133	611
		MED-HE	120.1	124	587	131.9	138	607
		HIGH-HE	131.5	137	666	143.3	151	686
	460-3-60	STD	51.1	53	321	57.3	60	333
		MED-HE	53.3	56	319	59.5	63	331
		HIGH-HE	59.0	62	359	65.2	70	371
	575-3-60	STD	40.5	42	256	45.3	48	264
		MED-HE	42.5	45	254	47.3	50	262
		HIGH-HE	44.4	47	281	49.2	52	289

See Legend and Notes on page 64.

Electrical data (cont)

581J*17-28 MCA MOCP ELECTRICAL DATA — WITH POWERED CONVENIENCE OUTLET

581J UNIT TYPE	NOM. V-Ph-Hz	IFM TYPE	WITH POWERED CONVENIENCE OUTLET					
			NO POWERED EXHAUST			WITH POWERED EXHAUST (POWERED FROM UNIT)		
			MCA	DISC. SIZE		MCA	DISC. SIZE	
				FLA	LRA		FLA	LRA
17	208/230-3-60	STD	73.1	77	398	84.9	90	68.3
		MED	76.2	80	428	88.0	94	71.4
		HIGH	79.2	84/83	430	91.0	97/96	74.4
	460-3-60	STD	37.1	39	236	43.3	46	34.9
		MED	39.0	41	251	45.2	48	36.8
		HIGH	40.1	42	252	46.3	50	37.9
	575-3-60	STD	27.9	29	186	32.7	35	26.2
		MED	27.9	29	186	32.7	35	26.2
		HIGH	30.7	33	200	35.5	38	29.0
20	208/230-3-60	STD	80.5	85	445	92.3	98	75.7
		MED	83.9	89/88	460	95.7	102/101	79.1
		HIGH-HE	87.4	93	456	99.2	106	82.6
	460-3-60	STD	38.8	41	247	45.0	48	36.6
		MED	40.4	43	254	46.6	50	38.2
		HIGH-HE	42.6	45	252	48.8	52	40.4
	575-3-60	STD	27.9	29	188	32.7	35	26.2
		MED	30.7	33	202	35.5	38	29.0
		HIGH-HE	32.7	35	200	37.5	40	31.0
24	208/230-3-60	STD	91.4	97	579	103.2	111	86.6
		MED-HE	91.4	97	579	103.2	111	86.6
		HIGH-HE	102.8	110	658	114.6	124	98.0
	460-3-60	STD	47.5	50	312	53.7	58	45.3
		MED-HE	47.5	50	312	53.7	58	45.3
		HIGH-HE	53.2	57	352	59.4	64	51.0
	575-3-60	STD	35.1	37	234	39.9	43	33.4
		MED-HE	37.1	39	232	41.9	45	35.4
		HIGH-HE	39.0	42	259	43.8	47	37.3
28	208/230-3-60	STD	121.4	126/125	596	133.2	139/138	116.6
		MED-HE	124.9	130	592	136.7	143	120.1
		HIGH-HE	136.3	143	671	148.1	157	131.5
	460-3-60	STD	53.3	56	323	59.5	63	51.1
		MED-HE	55.5	58	321	61.7	66	53.3
		HIGH-HE	61.2	65	361	67.4	72	59.0
	575-3-60	STD	42.2	44	258	47.0	50	40.5
		MED-HE	44.2	47	256	49.0	52	42.5
		HIGH-HE	46.1	49	283	50.9	54	44.4

See Legend and Notes on page 64.

Electrical data (cont)

2-STAGE COOLING WITH TWO-SPEED INDOOR FAN MOTOR, SIZES 17-28 (15-25 TONS) — HIGH SCCR

581J* UNIT	V-Ph-Hz	VOLTAGE RANGE		HIGH SCCR KA	COMP 1		COMP 2		OFM (ea)		IFM		
		MIN	MAX		RLA	LRA	RLA	LRA	WATTS	FLA	TYPE*	EFF AT FULL LOAD	FLA
17	208-3-60	253	187	60	25.0	164	25.0	164	350	1.5	STD	85.0%	8.6
											MED	81.5%	10.8
											HIGH	83.6%	13.6
	230-3-60	253	187	60	25.0	164	25.0	164	350	1.5	STD	85.0%	7.8
											MED	81.5%	9.8
											HIGH	83.6%	12.7
	460-3-60	506	414	65	12.8	100	12.8	100	277	0.9	STD	85.0%	3.8
											MED	81.5%	4.9
											HIGH	83.6%	6.4
20	208-3-60	253	187	60	27.6	191	25.0	164	350	1.5	STD	81.5%	10.8
											MED	83.6%	13.6
											HIGH	89.5%	17.1
	230-3-60	253	187	60	27.6	191	25.0	164	350	1.5	STD	81.5%	9.8
											MED	83.6%	12.7
											HIGH	89.5%	17.1
	460-3-60	506	414	65	12.8	100	12.2	100	277	0.9	STD	81.5%	4.9
											MED	83.6%	6.4
											HIGH	89.5%	8.6
24	208-3-60	253	187	60	28.2	239	28.2	239	350	1.5	STD	83.6%	13.6
											MED	89.5%	17.1
											HIGH	91.7%	28.5
	230-3-60	253	187	60	28.2	239	28.2	239	350	1.5	STD	83.6%	12.7
											MED	89.5%	17.1
											HIGH	91.7%	28.5
	460-3-60	506	414	65	14.7	130	14.7	130	277	0.9	STD	83.6%	6.4
											MED	89.5%	8.6
											HIGH	91.7%	14.3
28	208-3-60	253	187	60	48.1	245	33.9	240	350	1.5	STD	83.6%	13.6
											MED	89.5%	17.1
											HIGH	91.7%	28.5
	230-3-60	253	187	60	48.1	245	33.9	240	350	1.5	STD	83.6%	12.7
											MED	89.5%	17.1
											HIGH	91.7%	28.5
	460-3-60	506	414	65	18.6	125	16.0	140	277	0.9	STD	83.6%	6.4
											MED	89.5%	8.6
											HIGH	91.7%	14.3

* The 2 speed motors are the same efficiency level as the single speed motors.

See Legend and Notes on page 64.

NOTE: High SCCR is not available for units with 575v.

Electrical data (cont)

UNIT WIRE/FUSE SIZING DATA, TWO-SPEED INDOOR FAN MOTOR, SIZES 17-28 (15-25 TONS) — HIGH SCCR

581J* UNIT	NOM. V-Ph-Hz	IFM TYPE	HIGH SCCR kA	NO C.O. OR UNPWR C.O.							
				NO P.E.				W/ P.E. (PWRD FR/UNIT)			
				MCA	FUSE	DISC. SIZE		MCA	FUSE	DISC. SIZE	
						FLA	LRA			FLA	LRA
17	208/230-3-60	STD	60	69.4/68.6	90/90	73/72	390	81.2/80.4	100/100	86/85	410
		MED	60	71.6/70.6	90/90	75/74	414	83.4/82.4	100/100	89/88	434
		HIGH	60	74.4/73.5	90/90	78/77	425	86.2/85.3	100/100	92/91	445
	460-3-60	STD	65	35.3	45	37	233	41.5	50	44	245
		MED	65	36.4	45	38	245	42.6	50	45	257
		HIGH	65	37.9	50	40	250	44.1	50	47	262
20	208/230-3-60	STD	60	76.3/75.3	100/100	80/79	444	88.1/87.1	100/100	93/92	464
		MED	60	79.1/78.2	100/100	83/82	455	90.9/90.0	100/100	97/96	475
		HIGH	60	82.6	100	87	451	94.4	110	101	471
	460-3-60	STD	65	36.7	45	39	247	42.9	50	46	259
		MED	65	38.2	50	40	252	44.4	50	47	264
		HIGH	65	40.4	50	43	250	46.6	50	50	262
24	208/230-3-60	STD	60	83.1/82.2	100/100	87/86	578	94.9/94.0	110/110	101/100	598
		MED	60	86.6	100	91	574	98.4	125	105	594
		HIGH	60	98.0	125	105	653	109.8	125	118	673
	460-3-60	STD	65	43.1	50	45	312	49.3	60	52	324
		MED	65	45.3	50	48	310	51.5	60	55	322
		HIGH	65	51.0	60	54	350	57.2	70	62	362
28	208/230-3-60	STD	60	116.6/115.7	150/150	120/119	591	128.4/127.5	175/175	134/133	611
		MED	60	120.1	150	124	587	131.9	175	138	607
		HIGH	60	131.5	175	137	666	143.3	175	151	686
	460-3-60	STD	65	51.1	60	53	321	57.3	70	60	333
		MED	65	53.3	60	56	319	59.5	70	63	331
		HIGH	65	59.0	70	62	359	65.2	80	70	371

See Legend and Notes on page 64.

NOTE: High SCCR is not available for units with 575v.

Electrical data (cont)

LEGEND AND NOTES

Applicable for Electrical Data Tables on pages 58-63

LEGEND

BRKR	— Circuit Breaker
DISC	— Disconnect
EA	— Each
FLA	— Full Load Amps
HIGH-HE	— High-High Efficiency
IFM	— Indoor Fan Motor
LRA	— Locked Rotor Amps
MCA	— Minimum Circuit Amps
MED-HE	— Medium-High Efficiency
OFM	— Outdoor Fan Motor
RLA	— Rated Load Amps
SCCR	— Short Circuit Current Rating

NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the over-current protective device for the unit shall be fuse. Canadian units may be fuse or circuit breaker.
2. For 208/230 v units, where one value is shown it is the same for either 208 or 230 volts.
3. Unbalanced 3-Phase Supply Voltage
Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 230-3-60



$$AB = 224 \text{ v}$$

$$BC = 231 \text{ v}$$

$$AC = 226 \text{ v}$$

$$\text{Average Voltage} = \frac{(224 + 231 + 226)}{3} = \frac{681}{3} = 227$$

Determine maximum deviation from average voltage.

$$(AB) 227 - 224 = 3 \text{ v}$$

$$(BC) 231 - 227 = 4 \text{ v}$$

$$(AC) 227 - 226 = 1 \text{ v}$$

Maximum deviation is 4 v.

Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{227} = 1.78\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

Sequence of operation

General

The sequence below describes the sequence of operation for an electro-mechanical unit with and without a factory-installed EconoMi\$er IV and X (called “economizer” in this sequence). For information regarding a direct digital controller, see the start-up, operations, and troubleshooting manual for the applicable controller.

Electro-Mechanical Units with No Economizer Cooling (Single Speed Indoor Fan Motor)

When the thermostat calls for cooling, terminals G and Y1 are energized. As a result, the indoor-fan contactor (IFC) and the compressor contactor (C1) are energized, causing the indoor-fan motor (IFM), compressor #1, and outdoor fan to start. If the unit has 2 stages of cooling, the thermostat will additionally energize Y2. The Y2 signal will energize compressor contactor #2 (C2), causing compressor #2 to start. Regardless of the number of stages, the outdoor-fan motor runs continuously while unit is cooling.

Cooling (2-speed indoor fan motor)

Per ASHRAE 90.1-2016 standards during the first stage of cooling operation the VFD will adjust the fan motor to provide 66% of the total cfm established for the unit. When a call for the second stage of cooling is required, the VFD will allow the total cfm established for the unit (100%).

Heating

Preferred Series units have either 1 or 2 stages of gas heat.

When the thermostat calls for heating, power is sent to W on the Integrated Gas Controller (IGC) board. An LED (light-emitting diode) on the IGC board turns on and remains on during normal operation. A check is made to ensure that the roll-out switch and limit switch are closed. If the check was successful, the induced-draft motor is energized, and when its speed is satisfactory, as proven by the flue gas pressure switch, the ignition activation period begins. The burners will ignite within 5 seconds. If the burners do not light, there is a 22-second delay before another 5-second attempt. This sequence is repeated for 15 minutes or until the burners light. If, after the 15 minutes, the burners still have not lit, heating is locked out. To reset the control, break 24 V power to the thermostat.

When ignition occurs, the IGC board will continue to monitor the condition of the roll-out switch, the limit switches, the flue gas pressure switch, as well as the flame sensor. 45 seconds after ignition occurs, assuming the unit is controlled through a room thermostat set for fan auto, the indoor-fan motor will energize (and the outdoor-air dampers will open to their minimum position). If, for some reason, the over-temperature limit opens prior to the start of the indoor fan blower, the unit will shorten the 45-second delay to 5 seconds less than the time from initiation of heat to when the limit tripped. Gas will not be interrupted to the burners and heating will continue. Once the fan-on delay has been modified, it will not change back to 45 seconds until power is reset to the control. On units with 2 stages of heat, when additional heat is required, W2 closes and initiates power to the second stage of the main gas valve. When the thermostat is satisfied, W1 and W2 open and the gas valve closes, interrupting the flow of gas to the main burners. If the call for W1 lasted less than 1 minute, the heating cycle will not terminate until 1 minute after W1 became active. If the unit

is controlled through a room thermostat set for fan auto, the indoor-fan motor will continue to operate for an additional 45 seconds then stop. If the over-temperature limit opens after the indoor motor is stopped, but within 10 minutes of W1 becoming inactive, on the next cycle the time will be extended by 15 seconds. The maximum delay is 3 minutes. Once modified, the fan off delay will not change back to 45 seconds unless power is reset to the control. An LED indicator is provided on the IGC to monitor operation.

Electro-Mechanical Units with Factory-Installed EconoMi\$er Cooling (Single Speed Indoor Fan Motor)

Cooling

When free cooling is not available, the compressors will be controlled by the zone thermostat. When free cooling is available, the outdoor-air damper is modulated by the EconoMi\$er IV and X control to provide a 50°F (10°C) to 55°F (13°C) mixed-air temperature into the zone. As the mixed air temperature fluctuates above 55°F (13°C) or below 50°F (10°C) dampers will be modulated (open or close) to bring the mixed-air temperature back within control. If mechanical cooling is utilized with free cooling, the outdoor-air damper will maintain its current position at the time the compressor is started. If the increase in cooling capacity causes the mixed-air temperature to drop below 45°F (7°C), then the outdoor-air damper position will be decreased to the minimum position. If the mixed-air temperature continues to fall, the outdoor-air damper will close. Control returns to normal once the mixed-air temperature rises above 48°F (9°C). The power exhaust fans will be energized and de-energized, if installed, as the outdoor-air damper opens and closes.

If field-installed accessory CO₂ sensors are connected to the EconoMi\$er IV and X control, a demand controlled ventilation strategy will begin to operate. As the CO₂ level in the zone increases above the CO₂ set-point, the minimum position of the damper will be increased proportionally. As the CO₂ level decreases because of the increase in fresh air, the outdoor-air damper will be proportionally closed. For EconoMi\$er IV and X operation, there must be a thermostat call for the fan (G). If the unit is occupied and the fan is on, the damper will operate at minimum position. Otherwise, the damper will be closed.

When the EconoMi\$er IV and X control is in the occupied mode and a call for cooling exists (Y1 on the thermostat), the control will first check for indoor fan operation. If the fan is not on, then cooling will not be activated. If the fan is on, then the control will open the EconoMi\$er IV and X damper to the minimum position.

On the initial power to the EconoMi\$er IV and X control, it will take the damper up to 2-1/2 minutes before it begins to position itself. After the initial power-up, further changes in damper position can take up to 30 seconds to initiate. Damper movement from full closed to full open (or vice versa) will take between 1-1/2 and 2-1/2 minutes. If free cooling can be used as determined from the appropriate changeover command (switch, dry bulb, enthalpy curve, differential dry bulb, or differential enthalpy), then the control will modulate the dampers open to maintain the mixed-air temperature set-point at 50°F (10°C) to 55°F (13°C). If there is a further demand for cooling (cooling second stage - Y2 is energized), then the control will bring on compressor stage 1 to maintain the mixed-air

Sequence of operation (cont)

temperature set-point. The EconoMiSer IV and X damper will be open at maximum position.

2-Speed Note: When operating in ventilation mode only, the indoor fan motor will automatically adjust to 66% of the total cfm established.

Heating

The sequence of operation for the heating is the same as an electro-mechanical unit with no economizer. The only difference is how the economizer acts. The economizer will stay at the Economizer Minimum Position while the evaporator fan is operating. The outdoor-air damper is closed when the indoor fan is not operating. Refer to Service and Maintenance Manual for further details.

Optional Perfect Humidity Dehumidification System

Units with the factory equipped Perfect Humidity system option are capable of providing multiple modes of improved dehumidification as a variation of the normal cooling cycle. The Perfect Humidity system option includes additional valves in the liquid line and discharge line of each refrigerant circuit, a small reheat condenser coil downstream of the evaporator, and Motormaster variable-speed control of some or all outdoor fans. Operation of the revised refrigerant circuit for each mode is described below.

The Perfect Humidity system provides three sub-modes of operation: Cool, Reheat1, and Reheat2.

Cool mode — Provides a normal ratio of Sensible and Latent Cooling effect from the evaporator coil.

Reheat1 — Provides increased Latent Cooling while slightly reducing the Sensible Cooling effect.

Reheat2 — Provides normal Latent Cooling but with null or minimum Sensible Cooling effect delivered to the space.

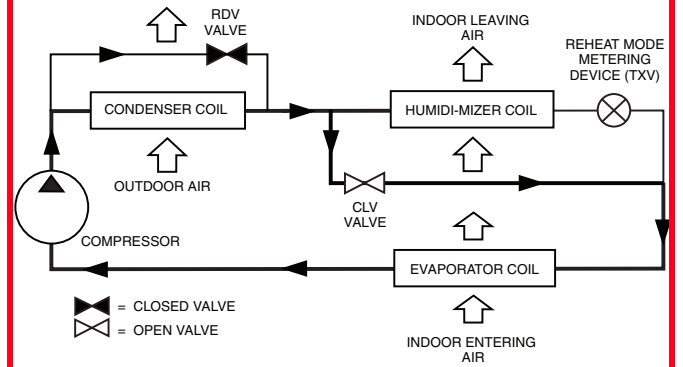
The Reheat1 and Reheat2 modes are available when the unit is not in a Heating mode and when the Low Ambient Lockout switch is closed.

The figures on this page depict piping for single stage cooling units.

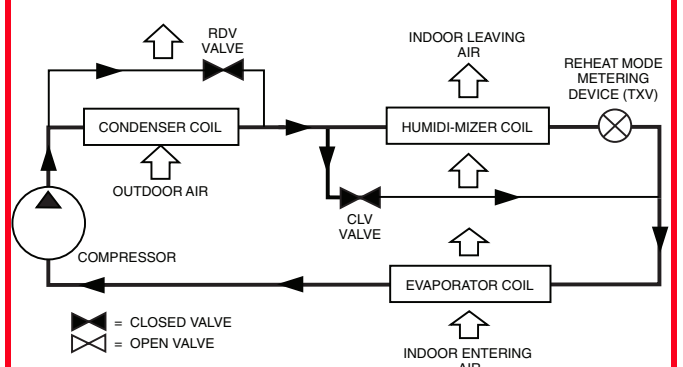
RTU Open Controller (Factory Option)

For details on operating 581J units equipped with the factory-installed RTU Open controller option refer to Factory Installed RTU Open Multi-Protocol Controller Controls, Start-Up, Operation and Troubleshooting manual.

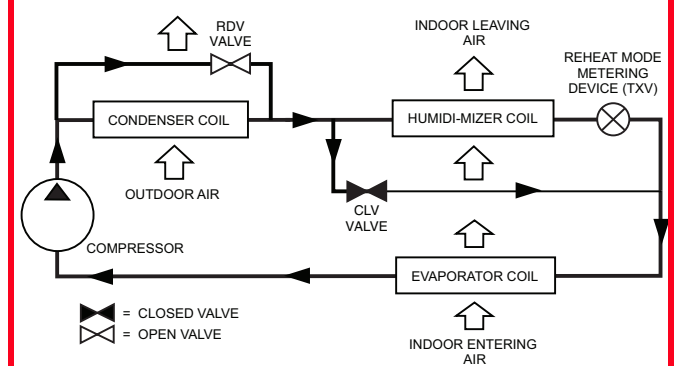
NORMAL COOLING MODE — PERFECT HUMIDITY SYSTEM WITH SINGLE STAGE COOLING



SUBCOOLING MODE (REHEAT 1) — PERFECT HUMIDITY



HOT GAS REHEAT MODE (REHEAT2) — PERFECT HUMIDITY SYSTEM WITH SINGLE STAGE COOLING



Application data

Minimum Operating Ambient Temperature (Cooling)

In mechanical cooling mode, your Bryant rooftop unit can safely operate down to an outdoor ambient temperature of 35°F (2°C). It is possible to provide cooling at lower outdoor ambient temperatures by using less outside air, economizers, and/or accessory low ambient kits.

Maximum Operating Ambient Temperature (Cooling)

The maximum operating ambient temperature for cooling mode is 125°F (52°C). While cooling operation above 125°F (52°C) may be possible, it could cause either a reduction in performance, reliability, or a protective action by the unit's internal safety devices.

Minimum Mixed Air Temperature (Heating)

Using the factory settings, the minimum temperatures for the mixed air (the combined temperature of the warm return air and the cold outdoor air) entering the dimpled, gas heat exchangers are shown in the table below.

MINIMUM MIXED AIR TEMPERATURE

ALUMINIZED	STAINLESS STEEL
50°F (10°C) Continuous	40°F (4°C) Continuous
45°F (7°C) Intermittent	35°F (2°C) Intermittent

Operating at lower mixed-air temperatures may be possible, if a field-supplied, outdoor air thermostat initiates both heat stages when the temperature is less than the minimum temperatures listed above. Please contact your local Bryant representative for assistance.

Minimum and Maximum Airflow (Heating and Cooling)

To maintain safe and reliable operation of your rooftop, operate within the heating airflow limits during heating mode and cooling airflow limits during cooling mode. Operating above the max may cause blow-off, undesired airflow noise, or airflow related problems with the rooftop unit. Operating below the min may cause problems with coil freeze-up and unsafe heating operation. Heating and cooling limitations differ when evaluating operating CFM, the minimum value is the HIGHER of the cooling and heating minimum CFM values published on page 6 and the maximum value is the LOWER of the cooling and heating minimum values published on page 6.

Heating-To-Cooling Changeover

Your unit will automatically change from heating to cooling mode when using a thermostat with an auto-changeover feature.

Airflow

All units are draw-through in cooling mode and blow-through in heating mode.

Outdoor Air Application Strategies

Economizers reduce operating expenses and compressor run time by providing a free source of cooling and a means of ventilation to match application changing needs. In fact, they should be considered for most applications. Also, consider the various economizer control methods and their benefits, as well as sensors required to accomplish your application goals. Please contact your local Bryant representative for assistance.

Motor Limits, Break Horsepower (BHP)

Due to internal design of Bryant units, the air path, and specially designed motors, the full horsepower (maximum continuous BHP) band, as listed in the Fan Performance tables, can be used with the utmost confidence. There is no need for extra safety factors, as Bryant motors are designed and rigorously tested to use the entire, listed BHP range without either nuisance tripping or premature motor failure.

Propane Heating

Propane has different physical qualities than natural gas. As a result, propane requires different fuel to air mixture. To optimize the fuel/air mixture for propane, Bryant sells different burner orifices in an easy to install accessory kit. To select the correct burner orifices or determine the heat capacity for a propane application, use either the selection software, or the unit's service manual.

High Altitude Heating

High altitudes have less oxygen, which affects the fuel/air mixture in heat exchangers. In order to maintain a proper fuel/air mixture, heat exchangers operating in altitudes above 2000 ft (610 m) require different orifices. To select the correct burner orifices or determine the heat capacity for a high altitude application, use either the selection software, or the unit's service manual.

High altitudes have less oxygen, which means heat exchangers need less fuel. The new gas orifices in this field-installed kit make the necessary adjustment for high altitude applications. They restore the optimal fuel to air mixture and maintain healthy combustion on altitudes above 2000 ft (610 m).

Typical natural gas heating value ranges from 975 to 1050 Btu/ft³ at sea level nationally. The heating value goes down approximately 1.7% per every thousand feet elevation. Standard factory orifices can typically be used up to 2000 ft (610 m) elevation without any operational issues.

The optional Bryant economizer can adequately cool your space by bringing in fresh, cool outside air. In fact, when so equipped, accessory low-ambient kit may not be necessary. In low ambient conditions, unless the outdoor air is excessively humid or contaminated, economizer-based "free cooling" is the preferred less costly and energy conscious method. In low ambient applications where outside air might not be desired (such as contaminated or excessively humid outdoor environments), your Bryant rooftop can operate to ambient temperatures down to -20°F (-29°C) using the recommended accessory Motormaster low ambient controller.

Sizing a Rooftop

Bigger isn't necessarily better. While an air conditioner needs to have enough capacity to meet the design loads, it doesn't need excess capacity. In fact, excess capacity typically results in very poor part load performance and humidity control.

Using higher design temperatures than ASHRAE recommends for your location, adding "safety factors" to the calculated load, are all signs of oversizing air conditioners. Oversizing the air conditioner leads to poor humidity control, reduced efficiency, higher utility bills, larger indoor temperature swings, excessive noise, and increased wear and tear on the air conditioner.

Rather than oversizing an air conditioner, engineers should "right-size" or even slightly undersize air conditioners.

Application data (cont)

Correctly sizing an air conditioner controls humidity better; promotes efficiency; reduces utility bills; extends equipment life, and maintains even, comfortable temperatures. Please contact your local Bryant representative for assistance.

Low Ambient Applications

The optional Bryant economizer can adequately cool your space by bringing in fresh, cool outside air. In fact, when so equipped, accessory low-ambient kit may not be necessary. In low ambient conditions, unless the outdoor air is excessively humid or contaminated, economizer-based “free cooling” is the preferred less costly and energy conscious method. In low ambient applications where outside air might not be desired (such as contaminated or excessively humid outdoor environments), your Bryant rooftop can operate to ambient temperatures down to -20°F (-29°C) using the recommended accessory Motormaster low ambient controller.

2-Speed Indoor Fan Motor System with VFD Controller (2-Stage Cooling Models Only)

Bryant’s 2-Speed Indoor Fan Motor System saves energy and installation time by utilizing a variable frequency drive (VFD) to automatically adjust the indoor fan motor speed in sequence with the units cooling operation. Per ASHRAE 90.1-2016 and IECC-2015, during the first stage of cooling operation the VFD will adjust the fan motor to provide two-thirds of the total cfm established for the unit. When a call for the second stage of cooling is required, the VFD will allow the total cfm for the unit established (100%). During the heating mode the VFD will allow total design cfm (100%) operation and during the ventilation mode the VFD will allow operation to two-thirds of total cfm.

Compared to single speed indoor fan motor systems, Bryant’s 2-Speed Indoor Fan Motor System can save substantial energy, 25%+, versus single speed indoor fan motor systems.

IMPORTANT: Data based on .10 (\$/kWh) in an office application utilizing Bryant’s HAP 4.6 simulation software program.

The VFD used in Bryant’s 2-Speed Indoor Fan Motor System has soft start capabilities to slowly ramp up the speeds, thus eliminating any high inrush air volume during initial start-up. It also has internal over current protection for the fan motor and a field installed display kit that allows adjustment and in depth diagnostics of the VFD.

This 2-Speed Indoor Fan Motor System is available on models with 2-stage cooling operation. The 2-Speed Indoor Fan Motor System is very flexible for initial fan performance set up and adjustment. The standard factory shipped VFD is pre-programmed to automatically stage the fan speed between the first and second stage of cooling. The unit fan performance static pressure and cfm can be easily adjusted using the traditional means of pulley adjustments. The other means to adjust the unit static and cfm performance is to utilize the field-installed display kit and adjust the frequency and voltage in the VFD to required performance requirements. In either case, once set up, the VFD will automatically adjust the speed between the cooling stage operations.

581J 2-SPEED INDOOR FAN MOTOR SYSTEM — VARIABLE FREQUENCY DRIVE (VFD) HP RATING

UNIT SIZE	STATIC OPTION	VOLTAGE	VFD HP
17	STD	208/230	3.0
		460	3.0
		575	5.0
	MED	208/230	3.0
		460	5.0
		575	5.0
	HIGH	208/230	7.5
		460	
		575	
20	STD	208/230	3.0
		460	5.0
		575	5.0
	MED	208/230	7.5
		460	
		575	
	HIGH	208/230	7.5
		460	
		575	
24	STD	208/230/460/575	7.5
	MED	208/230/460/575	7.5
	HIGH	208/230/460/575	7.5
28	STD	208/230/460/575	7.5
	MED	208/230/460/575	7.5
	HIGH	208/230/460/575	7.5

Application/Selection Option

Selection software by Bryant saves time by performing many of the steps above. Contact your Bryant sales representative for assistance.

Guide specifications

"Masterformat" as published by the Construction Specification Institute. Please feel free to copy this specification directly into your building spec.



Preferred™ Series Gas Heat/Electric Cooling Packaged Rooftop

HVAC guide specifications

Size range: **15 to 25 Nominal Tons**

Bryant Model Number: **581J*17-28**

Part 1 — (23 06 80) Schedules for decentralized HVAC equipment

1.01 (23 06 80.13) Decentralized Unitary HVAC Equipment Schedule

- A. (23 06 80.13.A.) Rooftop unit (RTU) schedule
Schedule is per the project specification requirements.

Part 2 — (23 07 16) HVAC equipment insulation

2.01 (23 07 16.13) Decentralized, Rooftop Units:

- A. (23 07 16.13.A.) Evaporator fan compartment:
 - 1. Interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, minimum 1-1/2-lb density, flexible fiberglass insulation bonded with a phenolic binder, neoprene coated on the air side.
 - 2. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
 - 3. Unit internal insulation linings shall be resistant to mold growth in accordance with "mold growth and humidity" test in ASTM C1338, G21, and UL 181 or comparable test method. Air stream surfaces shall be evaluated in accordance with the "Erosion Test" in UL 181, as part of ASTM C1071.
- B. (23 07 16.13.B.) Gas heat compartment:
 - 1. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

Part 3 — (23 09 13) Instrumentation and control devices for HVAC

3.01 (23 09 13.23) Sensors and Transmitters

- A. (23 09 13.23.A.) Thermostats
 - 1. Thermostat must
 - a. energize both "W" and "G" when calling for heat.
 - b. have capability to energize 2 different stages of cooling, and 2 different stages of heating.
 - c. include capability for occupancy scheduling.

Part 4 — (23 09 23) Direct-digital control system for HVAC

4.01 (23 09 23.13) Decentralized, Rooftop Units:

- A. (23 09 23.13.A.) RTU Open protocol, direct digital controller:
 - 1. Shall be ASHRAE 62 compliant.

- 2. Shall accept 18-30VAC, 50-60Hz, and consume 15VA or less power.
- 3. Shall have an operating temperature range from –40°F (–40°C) to 130°F (54°C), 10% to 90% RH (non-condensing).
- 4. Shall include built-in protocol for BACnet¹ (MS/TP and PTP modes), Modbus² (RTU and ASCII), Johnson N2 and LonWorks. LonWorks Echelon processor required for all Lon applications shall be contained in separate communication board.
- 5. Shall allow access of up to 62 network variables (SNVT). Shall be compatible with all open controllers.
- 6. Baud rate Controller shall be selectable using a dip switch.
- 7. Shall have an LED display independently showing the status of serial communication, running, errors, power, all digital outputs, and all analog inputs.
- 8. Shall accept the following inputs: space temperature, setpoint adjustment, outdoor air temperature, indoor air quality, outdoor air quality, compressor lock-out, fire shutdown, enthalpy switch, and fan status / filter status / humidity / remote occupancy.
- 9. Shall provide the following outputs: economizer, variable frequency drive, fan, cooling stage 1, cooling stage 2, heat stage 1, heat stage 2, exhaust reversing valve/high fan speed.
- 10. Shall have built-in surge protection circuitry through solid-state polyswitches. Polyswitches shall be used on incoming power and network connections. Polyswitches will return to normal when the "trip" condition clears.
- 11. Shall have a battery backup capable of a minimum of 10,000 hours of data and time clock retention during power outages.
- 12. Shall have built-in support for Bryant technician tool.
- 13. Shall include an RS-485 protocol communication port, an access port for connection of either a computer or a Bryant technician tool, an RS-485 port for network communication to intelligent space sensors and displays, and a port to connect an optional LonWorks communications card.
- 14. Software upgrades will be accomplished by either local or remote download. No software upgrades through chip replacements are allowed.

Part 5 — (23 09 33) Electric and electronic control system for HVAC

5.01 (23 09 33.13) Decentralized, rooftop units

- A. (23 09 33.13.A) General:

1. BACnet is a trademark of ASHRAE.
2. Modbus is a registered trademark of Schneider Electric.

Guide specifications (cont)

1. Shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-v transformer side. Transformer shall have 75VA capability.
2. Shall utilize color-coded wiring.
3. Shall include a central control terminal board to conveniently and safely provide connection points for vital control functions such as: smoke detectors, phase monitor, economizer, thermostat, DDC control options, loss of charge, freeze switch, high pressure switches.
4. The heat exchanger shall be controlled by an integrated gas controller (IGC) microprocessor. See heat exchanger section of this specification.
5. Unit shall include a minimum of one 8-pin screw terminal connection board for connection of control wiring.

B. (23 09 33.13.B) Safeties:

1. Compressor over-temperature, over-current.
2. Low-pressure switch.
 - a. Units with 2 compressors shall have different sized connectors for the circuit 1 and circuit 2 loss of charge switches. They shall physically prevent the cross-wiring of the safety switches between circuits 1 and 2.
 - b. Loss of charge switch shall use different color wire than the high pressure switch. The purpose is to assist the installer and service technician to correctly wire and/or troubleshoot the rooftop unit.
3. High-pressure switch.
 - a. Units with 2 compressors shall have different sized connectors for the circuit 1 and circuit 2 high pressure switches. They shall physically prevent the cross-wiring of the safety switches between circuits 1 and 2.
 - b. High-pressure switch shall use different color wire than the low-pressure switch. The purpose is to assist the installer and service technician to correctly wire and/or troubleshoot the rooftop unit.
4. Automatic reset, motor thermal overload protector.
5. Heating section shall be provided with the following minimum protections.
 - a. High-temperature limit switches.
 - b. Induced draft motor speed sensor.
 - c. Flame rollout switch.
 - d. Flame proving controls.

Part 6 — (23 09 93) Sequence of operations for HVAC controls

6.01 (23 09 93.13) Decentralized, Rooftop Units:

A. (23 09 93.13.A) INSERT SEQUENCE OF OPERATION

Part 7 — (23 40 13) Panel air filters

7.01 (23 40 13 13) Decentralized rooftop units:

A. (23 40 13 13.A) Standard filter section

1. Shall consist of factory-installed, low velocity, throwaway 2-in. thick fiberglass filters of commercially available sizes.
2. Unit shall use only one filter size. Multiple sizes are not acceptable.
3. Filters shall be accessible through a dedicated, weather tight access panel.
4. 4-in. filter capabilities shall be capable with pre-engineered and approved Bryant filter track field-installed accessory. This kit requires field furnished filters.

Part 8 — (23 81 19) Self-contained air conditioners

8.01 (23 81 19.13) Medium-Capacity Self-Contained Air Conditioners

A. (23 81 19.13.A) General

1. Outdoor, rooftop mounted, electrically controlled, heating and cooling unit utilizing hermetic scroll compressor(s) for cooling duty and gas combustion for heating duty.
2. Factory assembled, single piece heating and cooling rooftop unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, and special features required prior to field start-up.
3. Unit shall use Puron® (R-410A) refrigerant.
4. Unit shall be installed in accordance with the manufacturer's instructions.
5. Unit must be selected and installed in compliance with local, state, and federal codes.

B. (23 81 19.13.B.) Quality Assurance

1. Unit meets ASHRAE 90.1-2016 and IECC¹-2015 minimum efficiency requirements.
2. Units are ENERGY STAR² certified where sizes are required.
3. Unit shall be rated in accordance with AHRI Standard 340/360.
4. Unit shall be designed to conform to ASHRAE 15.
5. Unit shall be ETL-tested and certified in accordance with ANSI Z21.47 Standards and ETL-listed and certified under Canadian standards as a total package for safety requirements.
6. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
7. Unit internal insulation linings shall be resistant to mold growth in accordance with "mold growth and humidity" test in ASTM C1338, G21, and UL 181 or comparable test method. Air stream surfaces

1. IECC is a registered trademark of the International Code Council, Inc.

2. Energy Star is registered trademark of the United States Department of Energy.

Guide specifications (cont)

shall be evaluated in accordance with the “Erosion Test” in UL 181, as part of ASTM C1071.

8. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
 9. Roof curb shall be designed to conform to NRCA Standards.
 10. Unit shall be subjected to a completely automated run test on the assembly line. The data for each unit will be stored at the factory, and must be available upon request.
 11. Unit shall be designed in accordance with UL Standard 1995, ETL listed including tested to withstand rain.
 12. Unit shall be constructed to prevent intrusion of snow and tested to prevent snow intrusion into the control box up to 40 mph.
 13. Unit shake tested to assurance level 1, ASTM D4169 to ensure shipping reliability.
 14. High-Efficiency Motors listed shall meet section 313 of the Energy Independence and Security Act of 2007 (EISA 2007).
- C. (23 81 19.13.C) Delivery, storage, and handling
1. Unit shall be stored and handled per manufacturer’s recommendations.
 2. Lifted by crane requires either shipping top panel or spreader bars.
 3. Unit shall only be stored or positioned in the upright position.
- D. (23 81 19.13.D) Project conditions
- As specified in the contract.
- E. (23 81 19.13.E) Operating characteristics
1. Unit shall be capable of starting and running at 125°F (52°C) ambient outdoor temperature, meeting maximum load criteria of AHRI Standard 340/360 at ± 10% voltage.
 2. Compressor with standard controls shall be capable of operation from 35°F (2°C), ambient outdoor temperatures. Accessory kits are necessary if mechanically cooling at ambient temperatures below 35°F (2°C).
 3. Unit shall discharge supply air vertically as shown on contract drawings.
 4. Unit shall be factory configured and ordered for vertical supply and return configurations.
 5. Unit shall be factory furnished for either vertical or horizontal configuration without the use of special conversion kits. No field conversion is possible.
- F. (23 81 19.13.F) Electrical Requirements
- Main power supply voltage, phase, and frequency must match those required by the manufacturer.
- G. (23 81 19.13.G) Unit Cabinet
1. Unit cabinet shall be constructed of galvanized steel, and shall be bonderized and coated with a pre-painted baked enamel finish on all externally exposed surfaces.
2. Unit cabinet exterior paint shall be: film thickness, (dry) 0.003 inches minimum, gloss (per ASTM D523, 60°F): 60, Hardness: H-2H Pencil hardness.
 3. Evaporator fan compartment interior cabinet insulation shall conform to AHRI Standards 340/360 minimum exterior sweat criteria. Interior surfaces shall be insulated with a minimum 1/2-in. thick, 1 lb density, flexible fiberglass insulation, neoprene coated on the air side.
 4. Unit internal insulation linings shall be resistant to mold growth in accordance with “mold growth and humidity” test in ASTM C1338, G21, and UL 181 or comparable test method. Air stream surfaces shall be evaluated in accordance with the “Erosion Test” in UL 181, as part of ASTM C1071.
 5. Base of unit shall have a minimum of four locations for factory thru-the-base gas and electrical connections (factory-installed or field-installed) standard. Connections shall be internal to the cabinet to protect from environmental issues.
 6. Base Rail:
 - a. Unit shall have base rails on a minimum of 2 sides.
 - b. Holes shall be provided in the base rails for rigging shackles to facilitate maneuvering and overhead rigging.
 - c. Holes shall be provided in the base rail for moving the rooftop by fork truck.
 - d. Base rail shall be a minimum of 16 gauge thickness.
 7. Condensate pan and connections:
 - a. Shall be a sloped condensate drain pan made of a non-corrosive material.
 - b. Shall comply with ASHRAE Standard 62.
 - c. Shall use a 3/4-in. 14 NPT drain connection at the end of the drain pan. Connection shall be made per manufacturer’s recommendations.
 8. Top panel:

Shall be a multi-piece top panel linked with water tight flanges and interlocking systems.
 9. Gas Connections:
 - a. All gas piping connecting to unit gas valve shall enter the unit cabinet at a single location on side of unit (horizontal plane).
 - b. Thru-the-base capability
 - 1) Standard unit shall have a thru-the-base gas-line location using a raised, embossed portion of the unit basepan.
 - 2) Optional, factory-approved, water-tight connection method must be used for thru-the-base gas connections.
 - 3) No basepan penetration, other than those authorized by the manufacturer, is permitted.

Guide specifications (cont)

10. Electrical Connections:

- a. All unit power wiring shall enter unit cabinet at a single, factory-prepared, knockout location.
- b. Thru-the-base capability
 - 1) Thru-the-base provisions/connections are available as standard with every unit. When bottom connections are required, field furnished couplings are required.
 - 2) No basepan penetration, other than those authorized by the manufacturer, is permitted.

11. Component Access Panels (standard):

- a. Cabinet panels shall be easily removable for servicing.
- b. Unit shall have one factory installed, tool-less, removable, filter access panel.
- c. Panels covering control box and filters shall have molded composite handles while the blower access door shall have an integrated flange for easy removal.
- d. Handles shall be UV modified, composite, permanently attached, and recessed into the panel.
- e. Screws on the vertical portion of all removable access panel shall engage into heat resistant, molded composite collars.
- f. Collars shall be removable and easily replaceable using manufacturer recommended parts.

H. (23 81 19.13.H.) Gas Heat

1. General:

- a. Heat exchanger shall be an induced draft design. Positive pressure heat exchanger designs shall not be allowed.
- b. Shall incorporate a direct-spark ignition system and redundant main gas valve.
- c. Gas supply pressure at the inlet to the rooftop unit gas valve must match that required by the manufacturer.

2. The heat exchanger shall be controlled by an integrated gas controller (IGC) microprocessor.

- a. IGC board shall notify users of fault using an LED (light-emitting diode).
- b. IGC board shall contain algorithms that modify evaporator-fan operation to prevent future cycling on high temperature limit switch.
- c. Unit shall be equipped with anti-cycle protection with one short cycle on unit flame rollout switch or 4 continuous short cycles on the high temperature limit switch. Fault indication shall be made using an LED.

3. Standard Heat Exchanger Construction:

- a. Heat exchanger shall be of the tubular-section type constructed of a minimum of 20-gauge steel coated with a nominal 1.2 mil aluminum-silicone alloy for corrosion resistance.

- b. Burners shall be of the in-shot type constructed of aluminum-coated steel.

- c. Burners shall incorporate orifices for rated heat output up to 2000 ft (610 m) elevation. Additional accessory kits may be required for applications above 2000 ft (610 m) elevation, depending on local gas supply conditions.

- d. Each heat exchanger tube shall contain multiple dimples for increased heating effectiveness.

4. Optional Stainless Steel Heat Exchanger Construction:

- a. Use energy saving, direct-spark ignition system.
- b. Use a redundant main gas valve.
- c. Burners shall be of the in-shot type constructed of aluminum-coated steel.
- d. All gas piping shall enter the unit cabinet at a single location on side of unit (horizontal plane).
- e. The optional stainless steel heat exchanger shall be of the tubular-section type, constructed of a minimum of 20-gauge type 409 stainless steel.
- f. Type 409 stainless steel shall be used in heat exchanger tubes and vestibule plate.
- g. Complete stainless steel heat exchanger allows for greater application flexibility.

5. Induced Draft Combustion Motor and Blower:

- a. Shall be a direct-drive, single inlet, forward-curved centrifugal type.
- b. Shall be made from steel with a corrosion-resistant finish.
- c. Shall have permanently lubricated sealed bearings.
- d. Shall have inherent thermal overload protection.
- e. Shall have an automatic reset feature.

I. (23 81 19.13.I.) Coils

1. Standard Aluminum Fin/Copper Tube Coils:

- a. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
- b. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
- c. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.

2. Optional Pre-coated aluminum-fin condenser coils:

- a. Shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments.
- b. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube.

Guide specifications (cont)

- c. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.
 - d. Corrosion durability of fin stock shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90.
 - e. Corrosion durability of fin stock shall be confirmed through testing to have no visible corrosion after 48 hour immersion in a room temperature solution of 5% salt, 1% acetic acid.
 - f. Fin stock coating shall pass 2000 hours of the following: one week exposure in the prohesion chamber followed by one week of accelerated ultraviolet light testing. Prohesion chamber: the solution shall contain 3.5% sodium chloride and 0.35% ammonium sulfate. The exposure cycle is one hour of salt fog application at ambient followed by one hour drying at 95°F (35°C).
3. Optional Copper-fin evaporator and condenser coils:
- a. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
 - b. Galvanized steel tube sheets shall not be acceptable.
 - c. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.
4. Optional E-coated aluminum-fin evaporator and condenser coils:
- a. Shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins.
 - b. Coating process shall ensure complete coil encapsulation of tubes, fins and headers.
 - c. Color shall be high gloss black with gloss per ASTM D523-89.
 - d. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges.
 - e. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93.
 - f. Impact resistance shall be up to 160 in.-lb (ASTM D2794-93).
 - g. Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D224-92 and ASTM D870-92).
 - h. Corrosion durability shall be confirmed through testing to be no less than 6000 hours salt spray per ASTM B117-90.
5. Optional E-coated aluminum-fin, aluminum tube condenser coils:
- a. Shall have a flexible epoxy polymer coating uniformly applied to all coil external surface areas without material bridging between fins or louvers.
 - b. Coating process shall ensure complete coil encapsulation, including all exposed fin edges.
 - c. E-coat thickness of 0.8 to 1.2 mil with top coat having a uniform dry film thickness from 1.0 to 2.0 mil on all external coil surface areas, including fin edges, shall be provided.
 - d. Shall have superior hardness characteristics of 2H per ASTM D3363-00 and cross-hatch adhesion of 4B-5B per ASTM D3359-02.
 - e. Shall have superior impact resistance with no cracking, chipping or peeling per NSF/ANSI 51-2002 Method 10.2.
- J. (23 81 19.13.J) Refrigerant components
- 1. Refrigerant circuit shall include the following control, safety, and maintenance features:
 - a. Thermostatic Expansion Valve (TXV) shall help provide optimum performance across the entire operating range. Shall contain removable power element to allow change out of power element and bulb without removing the valve body.
 - b. Refrigerant filter drier.
 - c. Service gauge connections on suction and discharge lines.
 - d. Pressure gauge access through a specially designed access screen on the side of the unit.
 - 2. Compressors:
 - a. Unit shall use fully hermetic, scroll compressor for each independent refrigeration circuit.
 - b. Models shall be available with 2 compressor/2-stage cooling.
 - c. Compressor motors shall be cooled by refrigerant gas passing through motor windings.
 - d. Compressors shall be internally protected from high discharge temperature conditions.
 - e. Compressors shall be protected from an over-temperature and over-ampereage conditions by an internal, motor overload device.
 - f. Compressor shall be factory mounted on rubber grommets.
 - g. Compressor motors shall have internal line break thermal, current overload and high pressure differential protection.
 - h. Crankcase heaters shall not be required for normal operating range, unless provided by the factory.
- K. (23 81 19.13.K) Filter section
- 1. Filters access is specified in the unit cabinet section of this specification.
 - 2. Filters shall be held in place by a preformed slide out filter tray, facilitating easy removal and installation.
 - 3. Shall consist of factory-installed, low velocity, throw-away 2-in. thick fiberglass filters.

Guide specifications (cont)

4. Filters shall be standard, commercially available sizes.
5. Only one size filter per unit is allowed.
6. 4-in. filter capability is possible with a field-installed pre-engineered slide out filter track accessory. 4-in. filters are field furnished.
- L. (23 81 19.13.L) Evaporator fan and motor
 1. Evaporator fan motor:
 - a. Shall have inherent automatic-reset thermal overload protection or circuit breaker.
 - b. Shall have a maximum continuous bhp rating for continuous duty operation; no safety factors above that rating shall be required.
 2. Belt-driven evaporator fan:
 - a. Belt drive shall include an adjustable-pitch motor pulley and belt break protection system.
 - b. Shall use rigid pillow block bearing system with lubricate fittings at are accessible or lubrication line.
 - c. Blower fan shall be double-inlet type with forward-curved blades.
 - d. Shall be constructed from steel with a corrosion resistant finish and dynamically balanced.
- M. (23 81 19.13.M) Condenser Fans and Motors
 1. Condenser fan motors:
 - a. Shall be a totally enclosed motor.
 - b. Shall use permanently lubricated bearings.
 - c. Shall have inherent thermal overload protection with an automatic reset feature.
 - d. Shall use a shaft down design on all sizes.
 2. Condenser fans:
 - a. Shall be a direct driven propeller type fan.
 - b. Shall have aluminum blades riveted to corrosion resistant steel spiders and shall be dynamically balanced.
- N. (23 81 19.13.N) Special Features Options and Accessories
 1. 2-Speed Indoor Fan Motor System for 2-stage cooling models only:
 - a. Evaporator Fan Motor:
 - 1) Shall have permanently lubricated bearings.
 - 2) Shall have a maximum continuous bhp rating for continuous duty operation; no safety factors above that rating.
 - 3) Shall be Variable Frequency duty and 2-speed control.
 - 4) Shall contain motor shaft grounding ring to prevent electrical bearing fluting damage by safely diverting harmful shaft voltages and bearing currents to ground.
 2. Variable Frequency Drive (VFD). Only available on 2-Speed Indoor Fan Motor System:
 - a. Factory-supplied VFDs qualify, through ABB for a 12-month warranty from date of commissioning or 18 months from date of sale, whichever occurs first.
 - b. Shall be installed inside the unit cabinet, mounted, wired and tested.
 - c. Shall contain Electromagnetic Interference (EMI) frequency protection.
 - d. Insulated Gate Bi-Polar Transistors (IGBT) used to produce the output pulse width modulated (PWM) waveform, allowing for quiet motor operation.
 - e. Self diagnostics with fault and power code LED indicator. Field accessory Display Kit available for further diagnostics and special setup applications.
 - f. RS485 capability standard.
 - g. Electronic thermal overload protection.
 - h. 5% swinging chokes for harmonic reduction and improved power factor.
 - i. All printed circuit boards shall be conformal coated.
 3. Integrated EconoMiSer® IV, EconoMiSer 2, and EconoMiSer X low leak rate models. (Factory-installed on 3-phase models only. Field installed on all 3 and 1-phase models):
 - a. Integrated, gear driven opposing modulating blade design type capable of simultaneous economizer and compressor operation.
 - b. Independent modules for vertical or horizontal return configuration shall be available. Vertical return modules shall be available as a factory-installed option.
 - c. Damper blades shall be galvanized steel with composite gears. Plastic or composite blades on intake or return shall not be acceptable.
 - d. Shall include all hardware and controls to provide free cooling with outdoor air when temperature and/or humidity are below setpoints.
 - e. Shall be equipped with gear driven dampers for both the outdoor ventilation air and the return air for positive air stream control.
 - f. Low leak rate models shall be equipped with dampers not to exceed 2% leakage at 1 in. wg pressure differential.
 - g. Economizer controller on EconoMiSer IV models shall be Honeywell W7212 that provides:
 - 1) Combined minimum and DCV maximum damper position potentiometers with compressor staging relay.
 - 2) Functions with solid state analog enthalpy or dry bulb changeover control sensing.
 - 3) LED indicators for: when free cooling is available, when module is in DCV mode, when exhaust fan contact is closed.

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- h. Economizer controller on EconoMiSer® X models shall be the Honeywell W7220 that provides:
 - 1) 2-line LCD interface screen for setup, configuration and troubleshooting.
 - 2) On-board Fault Detection and Diagnostics (FDD) that senses and alerts when the economizer is not operating properly, per California Title 24.
 - 3) Sensor failure loss of communication identification.
 - 4) Automatic sensor detection.
 - 5) Capabilities for use with multiple-speed indoor fan systems.
 - 6) Utilize digital sensors: Dry bulb and Enthalpy.
 - i. Economizer controller on EconoMiSer 2 models with RTU Open controller shall be a 4-20mA design controlled directly by the RTU Open controller. RTU Open controller meets California Title 24 Fault Detection and Diagnostic (FDD) requirements.
 - j. Shall be capable of introducing up to 100% outdoor air.
 - k. Shall be equipped with a barometric relief damper capable of relieving up to 100% return air and contain seals that meet ASHRAE 90.1-2016 and IECC-2015 requirements.
 - l. Shall be designed to close damper(s) during loss-of-power situations with spring return built into motor.
 - m. Dry bulb outdoor air temperature sensor shall be provided as standard. Enthalpy sensor is also available on factory-installed only. Outdoor air sensor setpoint shall be adjustable and shall range from 40 to 100°F (4 to 38°C). Additional sensor options shall be available as accessories.
 - n. The economizer controller shall also provide control of an accessory power exhaust unit function. Factory set at 100%, with a range of 0% to 100%.
 - o. The economizer shall maintain minimum airflow into the building during occupied period and provide design ventilation rate for full occupancy.
 - p. Dampers shall be completely closed when the unit is in the unoccupied mode.
 - q. Economizer controller shall accept a 2-10 Vdc CO₂ sensor input for IAQ/DCV control. In this mode, dampers shall modulate the outdoor air damper to provide ventilation based on the sensor input.
 - r. Compressor lockout temperature on W7220 is adjustable from -45°F to 80°F, set at a factory default of 32°F. Others shall open at 35°F (2°C) and close at 50°F (10°C).
 - s. Actuator shall be direct coupled to economizer gear. No linkage arms or control rods shall be acceptable.
 - t. Economizer controller shall provide indications when in free cooling mode, in the DCV mode, or the exhaust fan contact is closed.
4. Integrated EconoMiSer2 and EconoMiSer X Ultra Low Leak rate models. (Factory-installed on 3-phase models only. Field-installed on all 3 and 1-phase models):
- a. Integrated, gear driven opposing modulating blade design type capable of simultaneous economizer and compressor operation.
 - b. Independent modules for vertical or horizontal return configuration shall be available. Vertical return modules shall be available as a factory-installed option.
 - c. Damper blades shall be galvanized steel with composite gears. Plastic or composite blades on intake or return shall not be acceptable.
 - d. Shall include all hardware and controls to provide free cooling with outdoor air when temperature and/or humidity are below setpoints.
 - e. Shall be equipped with gear driven dampers for both the outdoor ventilation air and the return air for positive air stream control.
 - f. Ultra Low Leak design meets California Title 24 section 140.4 and, ASHRAE 90.1-2016 and IECC-2015 requirements for 4 cfm per sq. ft. on the outside air dampers and 10 cfm per sq. ft. on the return dampers.
 - g. Economizer controller on EconoMiSer X models shall be the Honeywell W7220 that provides:
 - 1) 2-line LCD interface screen for setup, configuration and troubleshooting.
 - 2) On-board Fault Detection and Diagnostics (FDD) that senses and alerts when the economizer is not operating properly, per California Title 24.
 - 3) Sensor failure loss of communication identification.
 - 4) Automatic sensor detection.
 - 5) Capabilities for use with multiple-speed indoor fan systems.
 - 6) Utilize digital sensors: Dry bulb and Enthalpy.
 - h. Economizer controller on EconoMiSer® 2 models with RTU Open controller shall be a 4-20mA design controlled directly by the RTU Open controller. RTU Open controller meets California Title 24 Fault Detection and Diagnostic (FDD) requirements.
 - i. Shall be capable of introducing up to 100% outdoor air.
 - j. Shall be equipped with a barometric relief damper capable of relieving up to 100% return

Guide specifications (cont)

- air and contain seals that meet ASHRAE 90.1-2016 and IECC-2015 requirements.
- k. Shall be designed to close damper(s) during loss-of-power situations with spring return built into motor.
 - l. Dry bulb outdoor air temperature sensor shall be provided as standard. Enthalpy sensor is also available on factory-installed only. Outdoor air sensor setpoint shall be adjustable and shall range from 40 to 100°F (4 to 38°C). Additional sensor options shall be available as accessories.
 - m. The economizer controller shall also provide control of an accessory power exhaust unit function. Factory set at 100%, with a range of 0% to 100%.
 - n. The economizer shall maintain minimum air-flow into the building during occupied period and provide design ventilation rate for full occupancy.
 - o. Dampers shall be completely closed when the unit is in the unoccupied mode.
 - p. Economizer controller shall accept a 2-10 Vdc CO₂ sensor input for IAQ/DCV control. In this mode, dampers shall modulate the outdoor air damper to provide ventilation based on the sensor input.
 - q. Compressor lockout temperature on W7220 is adjustable from -45°F to 80°F, set at a factory default of 32°F. Others shall open at 35°F (2°C) and closes at 50°F (10°C).
 - r. Actuator shall be direct coupled to economizer gear. No linkage arms or control rods shall be acceptable.
 - s. Economizer controller shall provide indications when in free cooling mode, in the DCV mode, or the exhaust fan contact is closed.
5. Two-Position Damper:
- a. Damper shall be a Two-Position Damper. Damper travel shall be from the full closed position to the field adjustable %-open setpoint.
 - b. Damper shall include adjustable damper travel from 25% to 100% (full open).
 - c. Damper shall include single or dual blade, gear driven dampers and actuator motor.
 - d. Actuator shall be direct coupled to damper gear. No linkage arms or control rods shall be acceptable.
 - e. Damper will admit up to 100% outdoor air for applicable rooftop units.
 - f. Damper shall close upon indoor (evaporator) fan shutoff and/or loss of power.
 - g. The damper actuator shall plug into the rooftop unit's wiring harness plug. No hard wiring shall be required.
 - h. Outside air hood shall include aluminum water entrainment filter.
 - i. Not available with 2-Speed Indoor Fan Motor System models.
6. Manual Damper:
- a. Manual damper package shall consist of damper, air inlet screen, and rain hood which can be preset to admit up to 25% outdoor air for year round ventilation.
 - b. Not available with 2-Speed Indoor Fan Motor System models.
7. Perfect Humidity™ Dehumidification System:
- a. The Perfect Humidity Dehumidification System shall be factory-installed and shall provide greater dehumidification of the occupied space by two modes of dehumidification operations in addition to its normal design cooling mode:
 - 1) Subcooling mode further sub cools the hot liquid refrigerant leaving the condenser coil when both temperature and humidity in the space are not satisfied.
 - 2) Hot gas reheat mode shall mix a portion of the hot gas from the discharge of the compressor with the hot liquid refrigerant leaving the condenser coil to create a two-phase heat transfer in the system, resulting in a neutral leaving air temperature when only humidity in the space is not satisfied.
 - 3) Includes head pressure controller.
8. Head Pressure Control Package (Motormaster®):
- a. Controller shall control coil head pressure by condenser-fan speed modulation or condenser-fan cycling and wind baffles.
 - b. Shall consist of solid-state control and condenser-coil temperature sensor to maintain condensing temperature at outdoor ambient temperatures between 90°F (32°C) and 110°F (43°C) at outdoor ambient temperatures down to 0°F (-18°C).
9. Low Ambient Controller (Factory-installed only):
- a. Controller shall control coil head pressure by condenser-fan speed modulation or condenser-fan cycling and wind baffles.
 - b. Shall consist of solid-state control and condenser-coil temperature sensor to maintain condensing temperature between 90°F (32°C) and 110°F (43°C) at outdoor ambient temperatures down to 0°F (-18°C).
10. Propane Conversion Kit:
- Package shall contain all the necessary hardware and instructions to convert a standard natural gas unit for use with liquefied propane. Kits shall be available for elevations from 0 up to 14,000 ft (4,276 m).
11. Condenser Coil Hail Guard Assembly:
- a. Shall protect against damage from hail.
 - b. Shall be of louvered style.

Guide specifications (cont)

12. Unit-Mounted, Non-Fused Disconnect Switch:
 - a. Switch shall be factory-installed, internally mounted.
 - b. National Electric Code (NEC) and UL or ETL approved non-fused switch shall provide unit power shutoff.
 - c. Shall be accessible from outside the unit.
 - d. Shall provide local shutdown and lockout capability.
 - e. Sized only for the unit as ordered from the factory. Does not accommodate field-installed devices.
13. Convenience Outlet:
 - a. Powered convenience outlet. (Not available on single phase models):
 - 1) Outlet shall be powered from main line power to the rooftop unit.
 - 2) Outlet shall be powered from line side or load side of disconnect by installing contractor, as required by code. If outlet is powered from load side of disconnect, unit electrical ratings shall be UL certified and rated for additional outlet amperage.
 - 3) Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle.
 - 4) Outlet shall include 15 amp GFI receptacles with independent fuse protection.
 - 5) Voltage required to operate convenience outlet shall be provided by a factory-installed step down transformer.
 - 6) Outlet shall be accessible from outside the unit.
 - 7) Outlet shall include a field-installed “Wet in Use” cover.
 - b. Non-powered convenience outlet.
 - 1) Outlet shall be powered from a separate 115-120v power source.
 - 2) A transformer shall not be included.
 - 3) Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle.
 - 4) Outlet shall include 15 amp GFI receptacles.
 - 5) Outlet shall be accessible from outside the unit.
 - 6) Outlet shall include a field-installed “Wet in Use” cover.
14. Flue Discharge Deflector:
 - a. Flue discharge deflector shall direct unit exhaust vertically instead of horizontally.
 - b. Deflector shall be defined as a “natural draft” device by the National Fuel and Gas (NFG) code.
15. Fan/Filter Status Switch:
 - a. Switch shall provide status of indoor evaporator fan (ON/OFF) or filter (CLEAN/DIRTY).
 - b. Status shall be displayed either over communication bus (when used with direct digital controls) or with an indicator light at the thermostat.
16. Centrifugal Propeller Power Exhaust:
 - a. Power exhaust shall be used in conjunction with an integrated economizer.
 - b. Independent modules for vertical or horizontal return configurations shall be available.
 - c. Horizontal power exhaust is shall be mounted in return ductwork.
 - d. Power exhaust shall be controlled by economizer controller operation. Exhaust fans shall be energized when dampers open past the 0-100% adjustable setpoint on the economizer control.
17. Roof Curbs (Vertical):
 - a. Full perimeter roof curb with exhaust capability providing separate air streams for energy recovery from the exhaust air without supply air contamination.
 - b. Formed galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.
 - c. Permits installation and securing of ductwork to curb prior to mounting unit on the curb.
18. High Altitude Gas Conversion Kit:

Package shall contain all the necessary hardware and instructions to convert a standard natural gas unit to operate from 3,000 to 10,000 ft (914 to 3048 m) elevation and 10,001 to 14,000 ft (3049 to 4267 m) elevation.
19. Outdoor Air Enthalpy Sensor:

The outdoor air enthalpy sensor shall be used to provide single enthalpy control. When used in conjunction with a return air enthalpy sensor, the unit will provide differential enthalpy control. The sensor allows the unit to determine if outside air is suitable for free cooling.
20. Return Air Enthalpy Sensor:

The return air enthalpy sensor shall be used in conjunction with an outdoor air enthalpy sensor to provide differential enthalpy control.
21. Indoor Air Quality (CO₂) Sensor:
 - a. Shall be able to provide demand ventilation indoor air quality (IAQ) control.
 - b. The IAQ sensor shall be available in duct mount, wall mount, or wall mount with LED display. The setpoint shall have adjustment capability.
22. Smoke Detectors:
 - a. Shall be a Four-Wire Controller and Detector.
 - b. Shall be environmental compensated with differential sensing for reliable, stable, and drift-free sensitivity.

Guide specifications (cont)

- c. Shall use magnet-activated test/reset sensor switches.
 - d. Shall have tool-less connection terminal access.
 - e. Shall have a recessed momentary switch for testing and resetting the detector.
 - f. Controller shall include:
 - 1) One set of normally open alarm initiation contacts for connection to an initiating device circuit on a fire alarm control panel.
 - 2) Two Form-C auxiliary alarm relays for interface with rooftop unit or other equipment.
 - 3) One Form-C supervision (trouble) relay to control the operation of the Trouble LED on a remote test/reset station.
 - 4) Capable of direct connection to two individual detector modules.
 - 5) Can be wired to up to 14 other duct smoke detectors for multiple fan shutdown applications
23. Horn/Strobe Annunciator:
- a. Provides an audible/visual signaling device for use with factory-installed option or field-installed accessory smoke detectors.
 - b. Requires installation of a field-supplied 24-v transformer suitable for 4.2 VA (AC) or 3.0 VA (DC) per horn/strobe accessory.
 - c. Requires field-supplied electrical box, North American 1-gang box, 2-in (51 mm) x 4-in (102 mm).
 - d. Shall have a clear colored lens.
24. Winter Start Kit:
- a. Shall contain a bypass device around the low pressure switch.
 - b. Shall be required when mechanical cooling is required down to 25°F (−4°C).
 - c. Shall not be required to operate on an economizer when below an outdoor ambient of 40°F (4°C).
25. Time Guard:
- a. Shall prevent compressor short cycling by providing a 5-minute delay (±2 minutes) before restarting a compressor after shutdown for any reason.
 - b. One device shall be required per compressor.
26. Barometric Hood (Horizontal Economizer Applications):
- Shall be required when a horizontal economizer and barometric relief are required. Barometric relief damper must be installed in the return air (horizontal) duct work. This hood provides weather protection.
27. Display Kit for Variable Frequency Drive:
- a. Kit allows the ability to access the VFD controller programs to provide special setup capabilities and diagnostics.
 - b. Kit contains display module and communication cable.
 - c. Display Kit can be permanently installed in the unit or used on any 2-Speed Indoor Fan Motor System VFD controller as needed.
28. Condensate Overflow Switch:
- a. This sensor and related controller monitors the condensate level in the drain pan and shuts down compression operation when overflow conditions occur. It includes:
 - 1) Indicator light - solid red (more than 10 seconds on water contact - compressors disabled), blinking red (sensor disconnected).
 - 2) 10 second delay to break - eliminates nuisance trips from splashing or waves in pan (sensor needs 10 seconds of constant water contact before tripping).
 - 3) Disables the compressor(s) operation when condensate plug is detected, but still allows fans to run for Economizer.
29. Hinged Access Panels:
- a. Shall provide easy access through integrated quarter turn latches.
 - b. Shall be on major panels of – filter, control box, fan motor and compressor.
30. High Short Circuit Current Rating (SCCR):
- a. An optional SCCR of 65kA shall be provided for 460 volt and 60kA for 208/230 volt units.

