

### COMMERCIAL SPLIT SYSTEMS CONDENSING UNITS R-410A, 6 to 20 TONS

#### BUILT TO LAST, EASY TO INSTALL AND SERVICE

- Single stage cooling capacity control on all 072–241 models  
Two stage cooling capacity control on 120 to 240 models
- Micro-channel (MCHX) aluminum/aluminum condenser coils on all 072–181 size models
- Round copper tube aluminum plate fin (RTPF) condenser coils on 240–241 size models
- Brass suction and liquid line service valves
- Full perimeter base rail with built-in rigging adapters and fork truck slots
- Galvanized steel cabinet with pre-painted exterior panels and primer-coated interior panels tested to 500 hours salt spray protection
- Fully hermetic scroll compressors with crankcase heater
- Compressors mounted on independent vibration isolators
- Comfort Alert™ Diagnostic Board  
LED Go–No–Go and fault code  
Built in time guard anti–short cycle  
Phase protection  
Fault code retention logic  
Low volt compressor contactor protector
- All units have high and low pressure switches
- Direct drive permanently lubricated condenser fan motors
- Newly designed terminal board facilitates simple safety circuit troubleshooting and simplified control box arrangement
- Outdoor temperature cooling operation range up to 125°F (52°C) and down to 35°F (2°C)
- Models with optional low ambient control provide cooling operation down to –20°F (–29°C)
- All units factory run tested



#### WARRANTY

- 5 Year compressor limited warranty
- 1 Year parts limited warranty



Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification of certification for individual products, go to [www.ahrirectory.org](http://www.ahrirectory.org).



UNIT PERFORMANCE DATA <sup>1</sup> – Single Circuit						
Model Number	COOLING			Total Power (KW)	Unit Dimensions H x W x L Inches [mm]	Ship Weight lb. / kg
	Nominal Capacity Ton	Net Capacity BTUH	E.E.R			
CAS072*AG0A00A	6	71,000	11.2	6.1	42-3/8 x 59-3/8 x 45-7/8 [1077 x 1508 x 1164]	350 / 159
CAS091*AG0A00A	7.5	92,000	11.2	8.2	42-3/8 x 59-3/8 x 45-7/8 [1077 x 1508 x 1164]	383 / 174
CAS121*AG0A00A	10	117,000	11.2	10.3	50-3/8 x 59-3/8 x 45-7/8 [1279 x 1507 x 1164]	450 / 204
CAS151*AG0A00A	12.5	148,000	11.0	13.5	50-3/8 x 59-3/8 x 45-7/8 [1279 x 1507 x 1164]	480 / 218
CAS181*AG0A00A	15	180,000	11.0	16.4	50-3/8 x 86-3/8 x 45-7/8 [1279 x 2193 x 1164]	633 / 287
CAS241*AA0A00A	20	240,000	11.0	21.6	50-3/8 x 86-1/8 x 67-1/8 [1279 x 2187 x 1704]	900 / 408
UNIT PERFORMANCE DATA <sup>1</sup> – Dual Circuit						
CAS120*DG0A00A	10	117,000	11.2	10.4	50-3/8 x 59-3/8 x 45-7/8 [1279 x 1507 x 1164]	450 / 204
CAS150*DG0A00A	12.5	147,000	11.0	13.3	50-3/8 x 59-3/8 x 45-7/8 [1279 x 1507 x 1164]	480 / 218
CAS180*DG0A00A	15	180,000	11.0	16.4	50-3/8 x 86-3/8 x 45-7/8 [1279 x 2193 x 1164]	633 / 287
CAS240*DA0A00A	20	240,000	11.0	21.6	50-3/8 x 86-1/8 x 67-1/8 [1279 x 2187 x 1704]	900 / 408

\* - Indicates Unit voltage: H = 208/230–3–60, L = 460–3–60, S = 575–3–60

<sup>1</sup> - Above ratings are with matching size air handling unit

# MODEL NOMENCLATURE

MODEL SERIES	C	A	S	0	9	1	H	A	G	0	A	0	0	A
Position Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
C = R-410A Condensing Unit														
A = Air Conditioning (Cooling Only)														
H = Heat Pump														
<b>Type</b>														
S = Standard ASHRAE 90.1-2010 Efficiency														
<b>Efficiency</b>														
072 = 71,000 BTUH = 6 Tons														
091 = 92,000 BTUH = 7.5 Tons (1 circuit)														
120 = 117,000 BTUH = 10 Tons (2 circuit)														
121 = 117,000 BTUH = 10 Tons (1 circuit)														
150 = 147,000 BTUH = 12.5 Tons (2 circuit)														
151 = 148,000 BTUH = 12.5 Tons (1 circuit)														
180 = 180,000 BTUH = 15 Tons (2 circuit)														
181 = 180,000 BTUH = 15 Tons (1 circuit)														
240 = 240,000 BTUH = 20 Tons (2 circuit)														
241 = 240,000 BTUH = 20 Tons (1 circuit)														
<b>Nominal Cooling Capacity</b>														
H = 208/230-3-60														
L = 460-3-60														
S = 575-3-60														
<b>Voltage</b>														
A = Single Circuit														
B = Single Circuit w/ Low Ambient Control														
D = Dual Circuit														
E = Dual Circuit w/ Low Ambient Control														
<b>Refrigerant System Options</b>														
G = Al/Al Standard Cond. Micro-Channel (072-181)														
K = E-Coat Al/Al Cond. Micro-Channel (072-181)														
A = Cu/Al Cond. RTPF (240-241)														
B = Precoat Al/Cu Cond. RTPF (240-241)														
C = E-Coat Al/Cu Cond. RTPF (240-241)														
<b>Outdoor Coil Options</b>														
0 = None														
1 = Non-powered 115v Convenience Outlet														
<b>Service Options</b>														
A = None														
C = Non-Fused Disconnect Switch														
<b>Electrical Options</b>														
0 = Standard Elec-Mechanical Control														
<b>Base Unit Controls</b>														
0 = No options, reserved for future Use														
<b>Future Use</b>														
A = Original Design														
<b>Sales Digit</b>														

**Table 1 – CAS FACTORY INSTALLED OPTIONS AND FIELD INSTALLED ACCESSORIES**

ITEM	FACTORY INSTALLED OPTION	FIELD INSTALLED ACCESSORY
Disconnect Switch (non-fused)	X	
E-coated Coil Protection (For MCHX models)	X	
Non-powered Convenience Outlet (115-v)	X	
Low Ambient temperature head pressure controller	X	X
Louvered Hail Guard		X
Wired Condenser Coil Grille		X

**CAS factory-installed options**

**E-coated aluminum-fin coils** have a flexible and durable epoxy coating uniformly applied to all coil surfaces. E-coating provides superior protection with unmatched flexibility, edge coverage, metal adhesion, thermal performance, and most importantly, corrosion resistance.

E-coated coils provide this protection since all coil surfaces are completely encapsulated from environmental contamination. This coating is especially suitable in industrial environments.

**-20°F low-ambient temperature kit option (Motormaster®)** controls outdoor-fan motor operation to maintain the correct head pressure at low outdoor ambient temperatures.

**115-v non-powered convenience outlet** is used to power electric drills, lights, and refrigerant recovery machines.

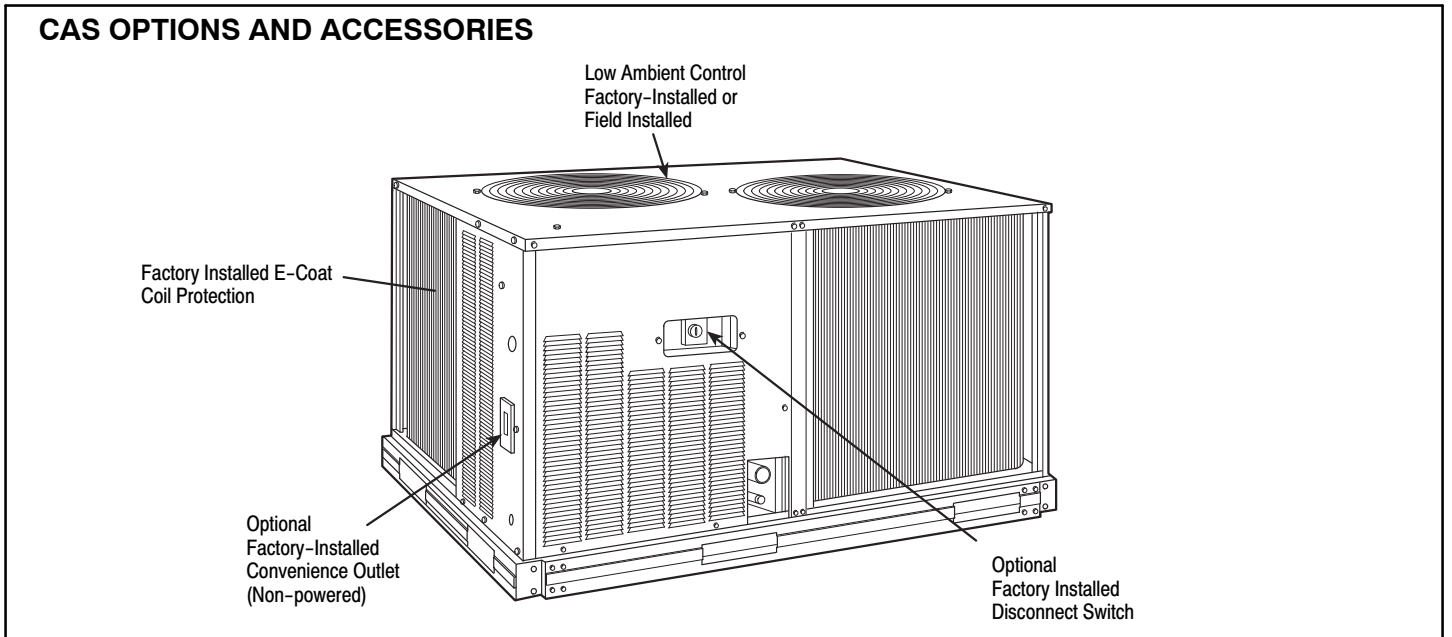
**Non-fused disconnect switch** is used to remove power locally at the condensing unit. This switch also includes a power lockout capability to protect the service person.

**CAS field-installed accessories**

**-20°F low-ambient temperature kit accessory (MotorMaster I)** controls outdoor-fan motor operation to maintain the correct head pressure at low outdoor ambient temperatures.

**Louvered hail guard package** protects coils against damage from flying debris and hail.

**Condenser coil grille** package protects condensing unit coil from impact by large objects and vandalism.



## ACCESSORIES – CAS

LOW AMBIENT CONTROLS		
Model Number	Description	Use With Model Size
DALOWAMB001A00	Low Ambient Temperature Head Pressure Controller, allows cooling operation down to -20°F by varying the speed on the condenser fan.*	072 – 151 (208/230-3-60v only)
DALOWAMB002A00		072 – 091 (460-3-60v only)
DALOWAMB008A00		121 – 151 (460-3-60v only)
DALOWAMB003A00		072 – 151 (575-3-60v only)
CALOWAMB012A00		181 (208/230-3-60v only)
CALOWAMB013A00		181 (460-3-60v only)
CALOWAMB014A00		181 (575-3-60v only)
CALOWAMB018A00		241 (208/230-3-60v only)
CALOWAMB019A00		241 (460-3-60v only)
CALOWAMB020A00		241 (575-3-60v only)
DALOWAMB010A00		120 – 150 (208/230-3-60v only)
DALOWAMB011A00		120 – 150 (460-3-60v only)
DALOWAMB007A00		120 – 150 (575-3-60v only)
CALOWAMB015A00		180 (208/230-3-60v only)
CALOWAMB016A00		180 (460-3-60v only)
CALOWAMB017A00		180 (575-3-60v only)
CALOWAMB021A00		240 (208/230-3-60v only)
CALOWAMB022A00		240 (460-3-60v only)
CALOWAMB023A00		240 (575-3-60v only)
DNWINSTR001A00		Winter Start Package – contains time delay relay for timed bypass of low pressure switch on startup.

\* Includes variable speed motor controller, outdoor motor, and bracket. Kits DALOWAMB010-11A00 and CALOWAMB12-23A00 include time delay relay for timed bypass of low pressure switch on start-up.

LOUVERED HAIL GUARDS – CONDENSER COIL		
Model Number	Description	Use With Model Size
CALVHLGD001A00	Louvered Condenser Coil Hail Guard – Includes louvered panel(s) to protect condenser coil from damage and vandalism	072
CALVHLGD002A00		091
CALVHLGD003A00		120, 121
CALVHLGD004A00		150, 151
CALVHLGD007A00		180, 181
CALVHLGD009A00		240, 241
<b>WIRED GUARDS – CONDENSER COIL</b>		
Model Number	Description	Use With Model Size
CAGRILLE006A00	Wired Grille Condenser Coil Guard – Includes panel(s) to protect condenser coil from larger objects	072
CAGRILLE007A00		091
CAGRILLE008A00		120, 121
CAGRILLE009A00		150, 151
CAGRILLE012A00		180, 181
CAGRILLE014A00		240, 241

## ACCESSORIES – CAS

LIQUID LINE SOLENOID VALVES (LLSV) †		
Model Number**	Description	Use With Model Size
1178274	Liquid Line Solenoid Valve	072 – 091 (3/8" L) ‡
1178275	Liquid Line Solenoid Valve	091 (1/2" L) (Qty 2) 150 with 1/2 in. L
1178276	Liquid Line Solenoid Valve	121 (1/2" L) (Qty 2) 120, (Qty 2) 180 & 240 with 1/2" in. L
1178277	Liquid Line Solenoid Valve	(Qty 2) 150, 151 (5/8" L) 181 and 241 with 5/8 in. L
1178273	Solenoid Coil	ALL
SIGHT GLASSES		
Model Number**	Description	Use With Model Size
1178270	Sight Glass	072, 091, (Qty 2) 120 (3/8" L)
1178271	Sight Glass	091, (Qty 2) 120, 121, (Qty 2) 150 – 1/2 in. L (Qty 2) 180 and 240 (1/2 in. L)
1178272	Sight Glass	151, 181, 241 – 5/8 in. L
SUCTION LINE ACCUMULATORS		
Model Number**	Description	Use With Model Size
1178265	Suction Line Accumulator	072 with 3/8 in. L ‡ , 091 with 3/8 in. & 1/2 in. ‡ (Qty 2) 150 with 1/2 in. L ‡
1178264	Suction Line Accumulator	121 1/2 in. L, 151 5/8 in. L (Qty 2) CAS180 and CAS240 with 1/2 in. L
1179084	Suction Line Accumulator	(Qty 2) 120 with 3/8 in L ‡
S7721HT	Suction Line Accumulator	181 and 241 with 5/8 in. L ‡

† LLSV must be installed at the INDOOR unit

‡ Bushing required

†† Bushings required on all except on CAS091 with 1/2" liquid line

L – Liquid line

S – Suction Line

\*\* Available from FAST Parts

**Table 2 – AHRI\* CAPACITY RATINGS**

PERFORMANCE DATA COOLING – Single Circuit						
UNIT	COOLING CIRCUITS	NOMINAL CAPACITY (TONS)	NET COOLING CAPACITY (BTUH)	TOTAL POWER (KW)	EER	IEER
CAS072	1	6	71,000	6.1	11.2	11.4
CAS091	1	7.5	92,000	8.2	11.2	11.4
CAS121	1	10	117,000	10.3	11.2	11.4
CAS151	1	12.5	148,000	13.5	11.0	11.2
CAS181	1	15	180,000	16.4	11.0	11.2
CAS241	1	20	240,000	21.6	11.0	11.2
PERFORMANCE DATA COOLING – Dual Circuit						
CAS120	2	10	117,000	10.3	11.2	11.4
CAS150	2	12.5	147,000	13.4	11.0	11.8
CAS180	2	15	180,000	16.4	11.0	11.2
CAS240	2	20	240,000	21.6	11.0	11.2

\* Above ratings are with matching size air handling unit.

**LEGEND**

- AHRI – Air-Conditioning, Heating and Refrigeration Institute
- ASHRAE – American Society of Heating, Refrigerating and Air Conditioning, Inc.
- EER – Energy Efficiency Ratio
- IEER – Integrated Energy Efficiency Ratio

**NOTES**

1. Rated in accordance with AHRI Standard 340/360–07, as appropriate.
2. Ratings are based on:  
**Cooling Standard:** 27°C (80°F) db, 19°C (67°F) wb indoor air temp and 35°C (95°F) db outdoor air temp.  
**IEER Standard:** 27°C (80°F) db, 19°C (67°F) wb indoor air temp and 4 various outdoor temperatures.
3. All units comply with ASHRAE 90.1 Energy Standard for minimum EER and IEER requirements.



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**Table 3 – SOUND LEVELS**

SOUND POWER LEVELS, dB									
Unit	OOUTDOOR SOUND (dB)								
	A-Weighted	63	125	250	500	1000	2000	4000	8000
CAS072	82	86.4	86.0	79.2	80.2	77.6	72.0	67.9	62.3
CAS091	82	86.8	85.7	80.3	80.3	77.7	72.3	70.2	65.4
CAS121	82	82.8	81.5	79.2	79.4	76.2	72.3	69.4	64.2
CAS151	82	82.9	78.5	77.0	77.0	75.6	75.9	72.3	70.9
CAS181	80	90.3	81.8	78.0	76.7	75.2	70.5	66.4	61.9
CAS241	85	91.0	85.0	80.0	86.0	79.0	73.0	68.0	63.0
CAS120	82	85.2	84.0	81.0	79.5	76.6	72.4	69.3	69.5
CAS150	82	84.7	79.8	78.8	77.6	77.0	72.5	70.3	67.3
CAS180	80	90.3	81.8	78.0	76.7	75.2	70.5	66.4	61.9
CAS240	85	91.0	85.0	80.0	86.0	79.0	73.0	68.0	63.0

**LEGEND**

dB = Decibel

**Table 4 – PHYSICAL DATA**

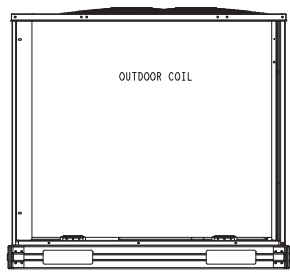
PHYSICAL DATA						
SINGLE CIRCUIT MODELS	CAS072	CAS091	CAS121	CAS151	CAS181	CAS241
<b>Refrigeration System</b>						
# Circuits / # Comp. / Type	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll	1 / 2 / Scroll	1 / 2 / Scroll
R-410A charge A/B (lbs)	4.4	4.9	6.3	7.3	12.2	38.0
System charge w/ fan coil	8.4	10.2	13.8	18.0	24.6	38.0
Metering device	TXV	TXV	TXV	TXV	TXV	TXV
High—press. Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505	630 / 505
Low—press. Trip / Reset (psig)	54 / 117	54 / 117	54 / 117	54 / 117	54 / 117	54 / 117
<b>Cond. Coil</b>						
Material (Fin/Tube)	Al/Al	Al/Al	Al/Al	Al/Al	Al/Al	Al/Cu
Coil type	MCHX	MCHX	MCHX	MCHX	MCHX	RTPF
Rows / FPI	1 / 20.3	1 / 20.3	1 / 20.3	1 / 20.3	1 / 20.3	2 / 17
total face area (ft2)	17.5	20.5	25.0	31.8	25.0 x 2	25.0 x 2
<b>Cond. fan / motor</b>						
Qty / Motor drive type	2 / direct	2 / direct	2 / direct	2 / direct	3 / direct	4 / direct
Motor HP / RPM	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
Nominal Airflow (cfm)	6,000	6,000	6,000	6,000	10,000	14,000
Watts (total)	610	610	610	610	970	1150

DUAL CIRCUIT MODELS	CAS120	CAS150	CAS180	CAS240
<b>Refrigeration System</b>				
# Circuits / # Comp. / Type	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll
R-410A charge A/B (lbs)	3.0 / 3.1	3.7 / 3.9	6.1 / 6.1	19.0 / 19.0
System charge w/ fan coil	7.4 / 7.4	10.8 / 10.8	12.0 / 12.0	19.0 / 19.0
Metering device	TXV	TXV	TXV	TXV
High—press. Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505
Low—press. Trip / Reset (psig)	54 / 117	54 / 117	54 / 117	54 / 117
<b>Cond. Coil</b>				
Material (Fin/Tube)	Al/Al	Al/Al	Al/Al	Al/Cu
Coil type	MCHX	MCHX	MCHX	RTPF
Rows / FPI	1 / 20.3	1 / 20.3	1 / 20.3	1 / 17
total face area (ft2)	25.0	31.8	25.0 x 2	25.0 x 2
<b>Cond. fan / motor</b>				
Qty / Motor drive type	2 / direct	2 / direct	3 / direct	4 / direct
Motor HP / RPM	1/4 / 1100	1/4 / 1100	1/4 / 1100	1/4 / 1100
Fan diameter (in)	22	22	22	22
Nominal Airflow (cfm)	6,000	6,000	10,000	14,000
Watts (total)	610	610	970	1150

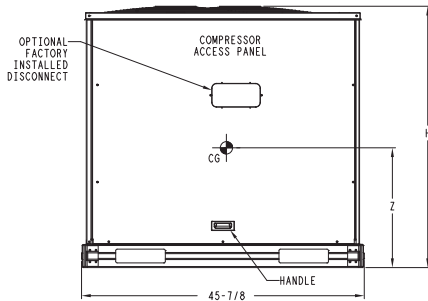
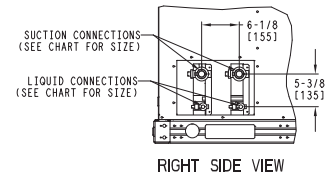
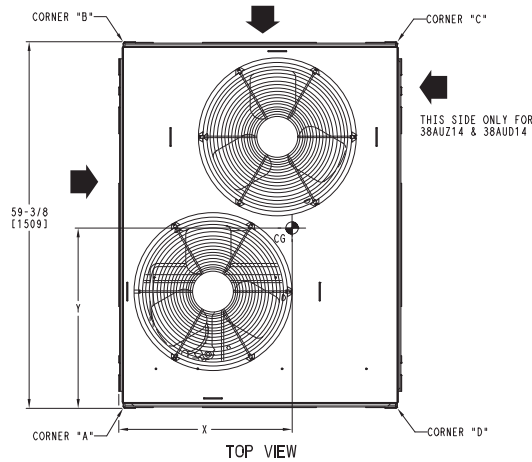
**Table 5 – DIMENSIONS AND WEIGHTS, 6 to 12.5 TON**

UNIT	BASE UNIT WEIGHT		Corner Weight A		Corner Weight B		Corner Weight C		Corner Weight D		Center of Gravity In [mm]			UNIT HEIGHT
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	X	Y	Z	
CAS072	328	149	128	58	68	31	62	28	70	32	21 [533.4]	19 [482.6]	13 [330.2]	42-3/8 [1076.0]
CAS091	353	160	138	63	72	33	65	29	78	35	19 [482.6]	23 [584.2]	13 [330.2]	42-3/8 [1076.0]
CAS121	418	190	165	75	85	39	78	35	90	41	23 [584.2]	20 [508.8]	15 [381.0]	50-3/8 [1279.2]
CAS151	431	196	162	73	82	37	92	42	95	43	19 [482.6]	23 [584.2]	15 [381.0]	50-3/8 [1279.2]
CAS120	499	226	193	88	111	50	72	38	123	56	20 [508.0]	23 [584.2]	15 [381.0]	50-3/8 [1279.2]
CAS150	505	229	190	86	88	40	76	34	151	68	20 [508.0]	24 [609.6]	15 [381.0]	50-3/8 [1279.2]

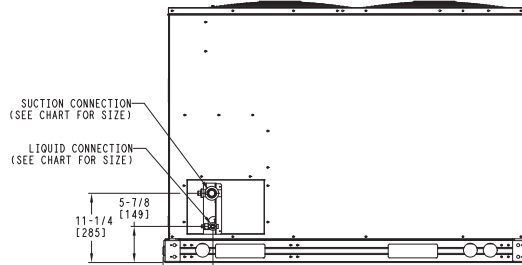
UNIT	SERVICE VALVE CONNECTIONS	
	SUCTION	LIQUID
CAS072	1-1/8 [28.6]	3/8 [9.5]
CAS091	1-1/8 [28.6]	1/2 [12.7]
CAS121	1-3/8 [34.9]	1/2 [12.7]
CAS151	1-3/8 [34.9]	5/8 [15.9]
CAS120	1-1/8 [28.6]	3/8 [9.5]
CAS150	1-3/8 [34.9]	1/2 [12.7]



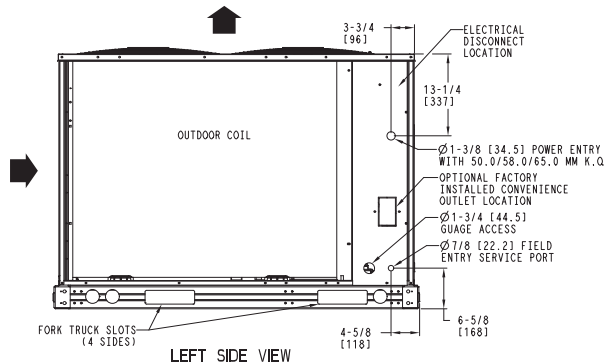
REAR VIEW



FRONT VIEW



RIGHT SIDE VIEW



LEFT SIDE VIEW

CG CENTER OF GRAVITY  
 DIRECTION OF AIR FLOW  
 DIMENSIONS IN ( ) ARE IN MM

- NOTES:
- MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
    - A. BOTTOM TO COMBUSTIBLE SURFACES: 0 INCHES.
    - B. OUTDOOR COIL, FOR PROPER AIR FLOW: 36 INCHES [914] ONE SIDE, 12 INCHES [305] THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
    - C. OVERHEAD: 60 INCHES [1524], TO ASSURE PROPER OUTDOOR FAN OPERATION.
    - D. BETWEEN UNITS: CONTROL BOX SIDE, 42 INCHES [1067] PER NEC.
    - E. BETWEEN UNIT AND UNGROUNDED SURFACES: CONTROL BOX SIDE, 36 INCHES [914] PER NEC.
    - F. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES: CONTROL BOX SIDE, 42 INCHES [1067] PER NEC.
  - WITH EXCEPTION OF THE CLEARANCE FOR THE OUTDOOR COIL AS STATED IN NOTE 1B, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
  - UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B OR C ROOF COVERING MATERIAL.



**Table 6 – DIMENSIONS AND WEIGHTS, 15 TON**

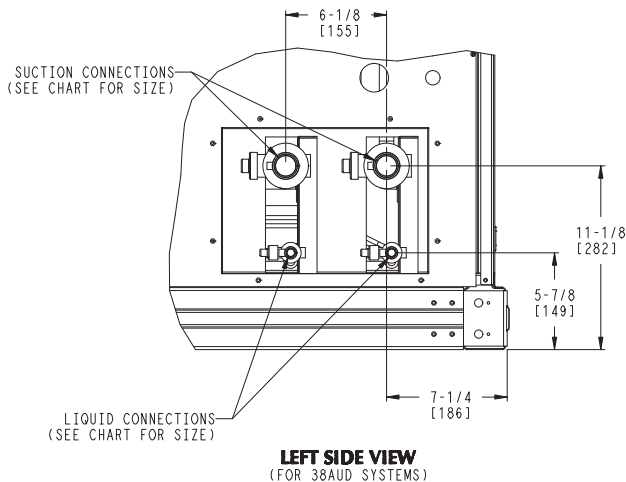
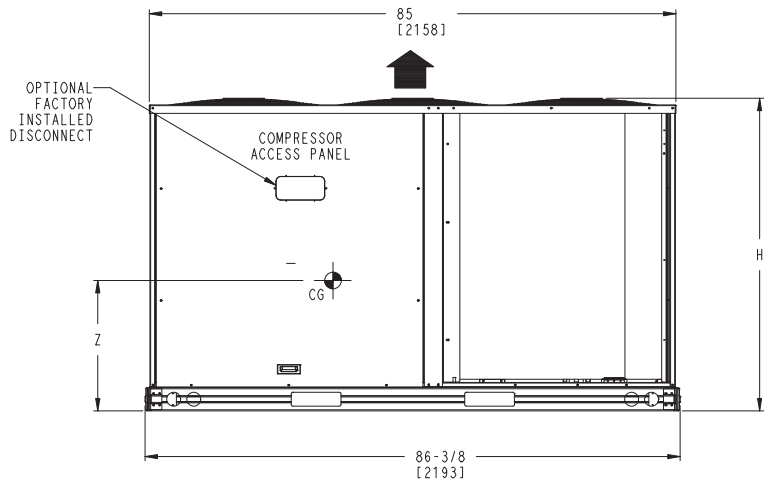
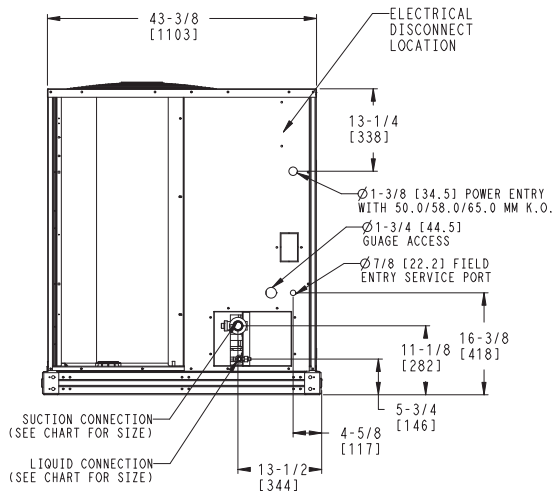
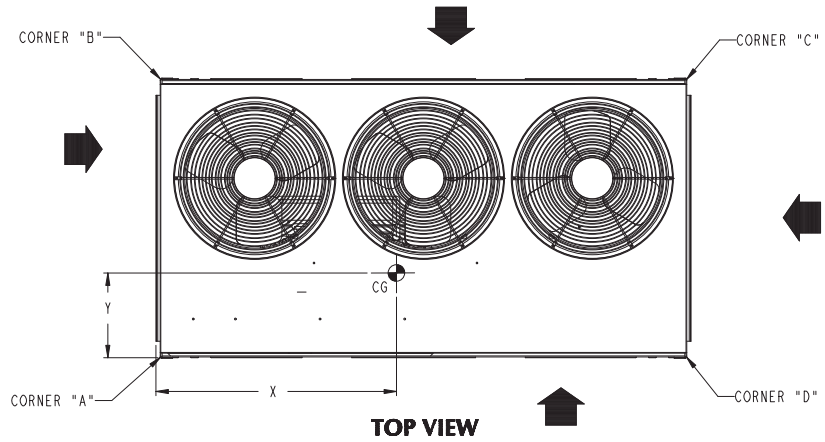
UNIT	BASE UNIT WEIGHT		Corner Weight A		Corner Weight B		Corner Weight C		Corner Weight D		Center of Gravity In [mm]			UNIT HEIGHT
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	X	Y	Z	
CAS180	633	288	220	100	134	61.5	135	62	144	66	38 [965]	19-1/2[495]	15-1/8 [384]	50-3/8 [1279]
CAS181	633	288	220	100	134	61.5	135	62	144	66	38 [965]	19-1/2[495]	15-1/8 [384]	50-3/8 [1279]

UNIT	SERVICE VALVE CONNECTIONS	
	SUCTION	LIQUID
CAS180	1-3/8 [34.9]	1/2 [12.7]
CAS181	1-3/8 [34.9]	5/8 [15.9]

CG CENTER OF GRAVITY

➔ DIRECTION OF AIR FLOW

DIMENSIONS IN [ ] ARE IN MM



**NOTES:**



- MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
  - BOTTOM TO COMBUSTIBLE SURFACES: 0 INCHES.
  - OUTDOOR COIL, FOR PROPER AIR FLOW: 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
  - OVERHEAD: 60 INCHES, TO ASSURE PROPER OUTDOOR FAN OPERATION.
  - BETWEEN UNITS: CONTROL BOX SIDE, 42 INCHES PER NEC.
  - BETWEEN UNIT AND UNGROUNDED SURFACES: CONTROL BOX SIDE, 36 INCHES PER NEC.
  - BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES: CONTROL BOX SIDE, 42 INCHES PER NEC.
- WITH EXCEPTION OF THE CLEARANCE FOR THE OUTDOOR COIL AS STATED IN NOTE 1B, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
- UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B OR C ROOF COVERING MATERIAL.

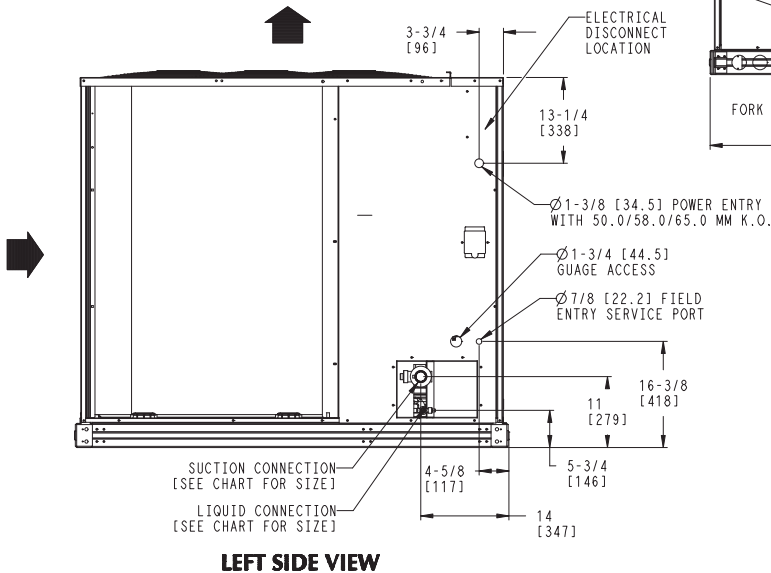
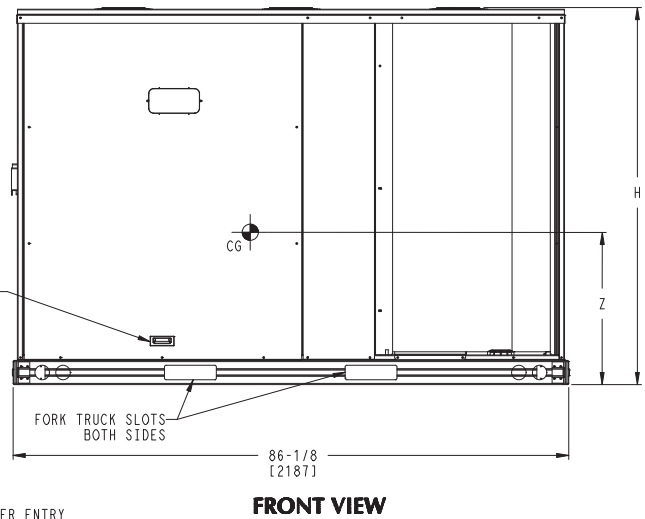
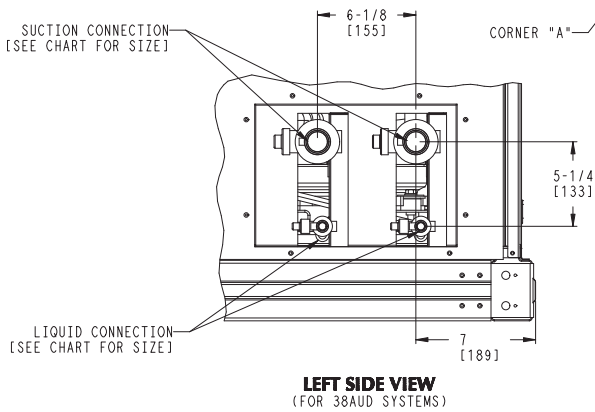
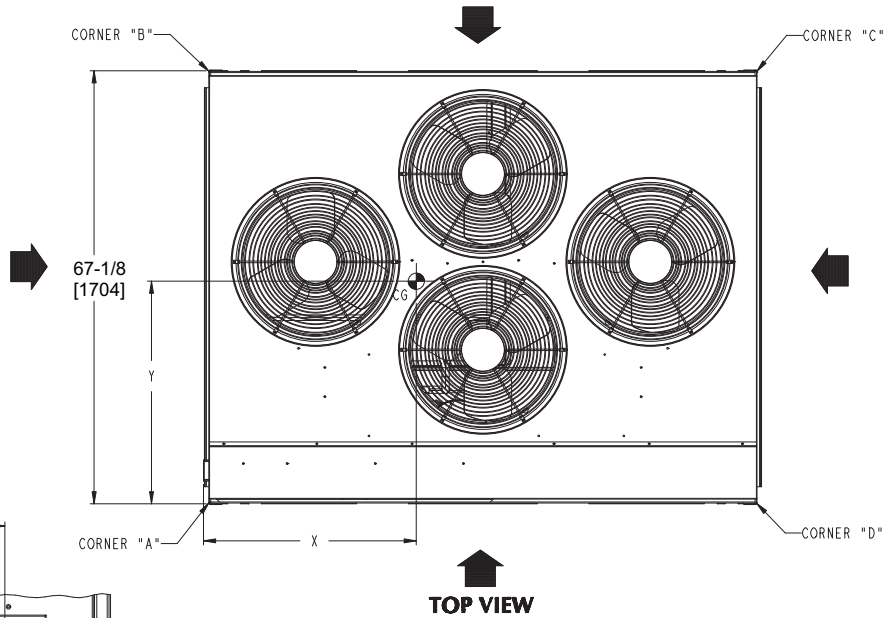
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

**Table 7 – DIMENSIONS AND WEIGHTS, 20 TON**

UNIT	BASE UNIT WEIGHT		Corner Weight A		Corner Weight B		Corner Weight C		Corner Weight D		Center of Gravity In [mm]			UNIT HEIGHT
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	X	Y	Z	
CAS240	900	409	475	216	58	26.5	242	110	125	57	37-1/4 [946]	23-1/4 [596]	15-1/8 [384]	50-3/8 [1279.2]
CAS241	900	409	475	216	58	26.5	242	110	125	57	37-1/4 [946]	23-1/4 [596]	15-1/8 [384]	50-3/8 [1279.2]

UNIT	SERVICE VALVE CONNECTIONS	
	SUCTION	LIQUID
CAS240	1-5/8 [41.3]	1/2 [12.7]
CAS241	1-5/8 [41.3]	5/8 [15.9]

 CENTER OF GRAVITY  
 DIRECTION OF AIR FLOW  
 DIMENSIONS IN [ ] ARE IN MM



- NOTES:**
- MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
    - BOTTOM TO COMBUSTIBLE SURFACES: 0 INCHES.
    - OUTDOOR COIL, FOR PROPER AIR FLOW: 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
    - OVERHEAD: 60 INCHES, TO ASSURE PROPER OUTDOOR FAN OPERATION.
    - BETWEEN UNITS: CONTROL BOX SIDE, 42 INCHES PER NEC.
    - BETWEEN UNIT AND UNGROUNDED SURFACES: CONTROL BOX SIDE, 36 INCHES PER NEC.
    - BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES: CONTROL BOX SIDE, 42 INCHES PER NEC.
  - WITH EXCEPTION OF THE CLEARANCE FOR THE OUTDOOR COIL AS STATED IN NOTE 1B, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
  - UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B OR C ROOF COVERING MATERIAL.

## SELECTION PROCEDURE

Combination ratings for CAS units matched with FAS Series air handlers are in this book.

### I. Determine cooling load, evaporator-air temperature, and quantity.

Given:

Total Cooling Capacity Required (TC) .....	121,000 Btuh
Sensible Heat Capacity Required (SHC) .....	95,000 Btuh
Compressor Type .....	Scroll
Temperature Air Entering Condenser (Edb) .....	95°F
Temperature Air Entering Evaporator (db/wb) .....	80°F db, 67°F wb
Evaporator Air Quantity .....	4,000 cfm
External Static Pressure .....	0.4 in. wg
Length of Interconnecting Refrigerant Piping .....	25 ft (Linear)
Power Supply (V-Ph-Hz) .....	208/230-3-60

### II. Select condensing unit air-handler combination.

For this example, select a CAS121 matched with a FAS120 coil. This CAS121/FAS120 condensing unit air-handler combination provides 122,000 Btuh of total cooling capacity and 97,200 Btuh of sensible capacity at the given conditions. If other temperatures or airflow values are required, interpolate the values from the combination ratings.

### III. Determine sizes of liquid and suction lines.

Enter Refrigerant Piping Sizes table. The sizes shown are based on an equivalent length of pipe. This equivalent length is equal to the linear length of pipe indicated at the top of each sizing column, plus a 50% allowance for fitting losses. (For a more accurate determination of actual equivalent length in place of using the estimated 50% value, refer to Carrier System Design Manual.) For this example, note in the linear length column that the proper pipe size is  $1/2$  in. for the liquid line and  $1^{3/8}$  in. for the suction line.

### IV. Determine fan rpm and bhp (brake horsepower).

Refer to the FAS Air Handler Catalog – Fan Performance table. Enter the Air Handler Fan Performance table at FAS120 at 4000 cfm and move to the External Static Pressure (ESP) column. Note that the conditions require 803 rpm at 1.77 bhp.

### V. Determine motor and drive.

Enter the Fan Motor Data tables and find the standard motor for FAS120 unit rated at 2.4 Hp. Since the bhp required is 1.77, a standard motor satisfies the requirement and should be used.

Next, find the type of drive that satisfies the 803 rpm requirement in the Drive Data tables. For the FAS120 unit, the Standard Drive table shows an rpm range of 666-863. Since the rpm required is 803, the standard drive satisfies the requirement and should be used.

## CONTROLS

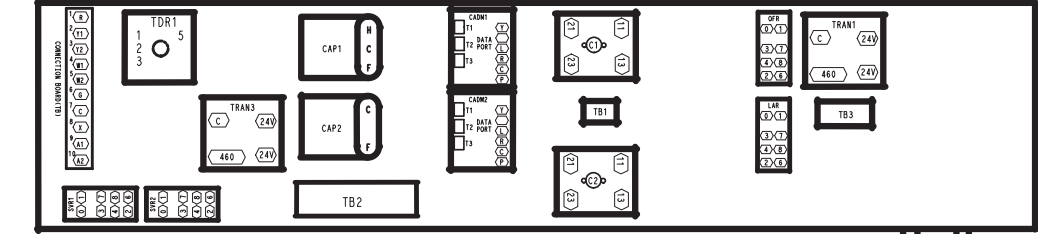
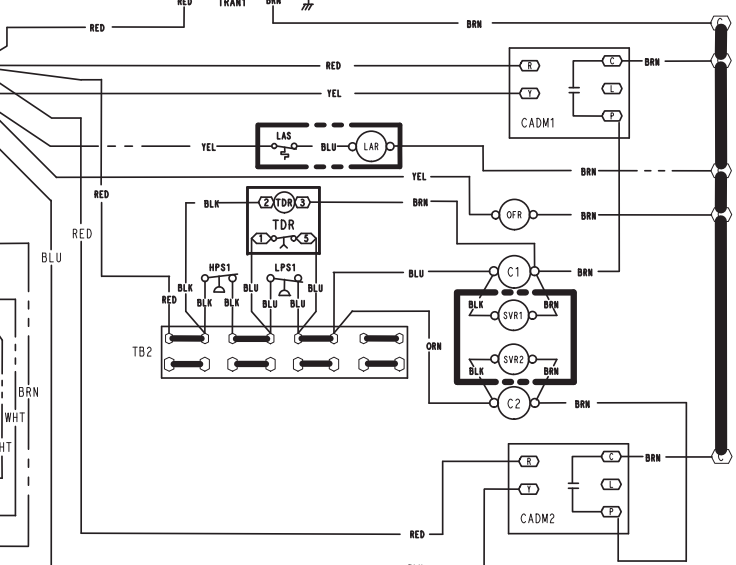
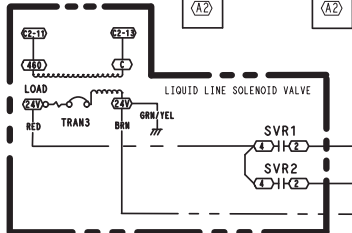
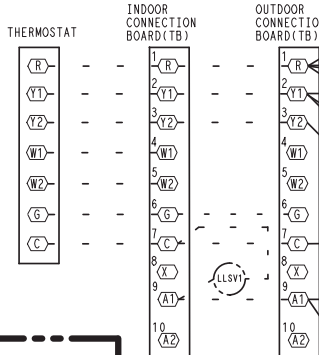
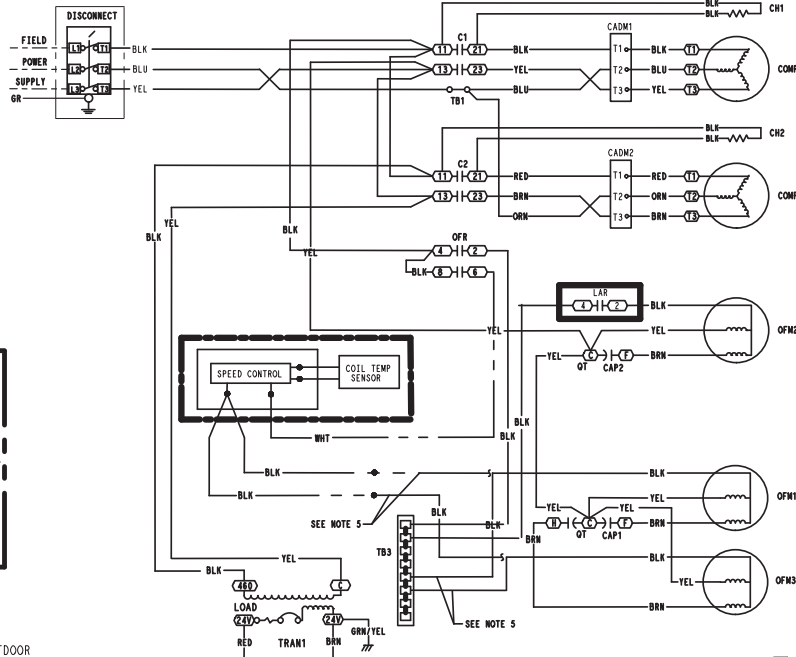
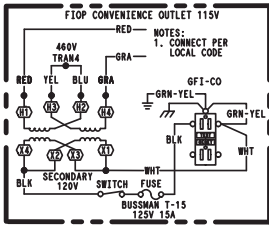
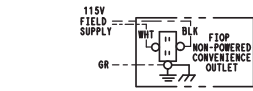
### Operating sequences

#### CAS (All Units)

At start-up, the thermostat calls for cooling. With all safety devices satisfied, the compressor contactor and fan contactor energize, causing the compressor and outdoor-fan motor to operate. Thermostat contacts energize, allowing the field-supplied and field-installed indoor-fan contactor to function. A field-supplied and field-installed liquid line valve also opens, allowing the system to function in Cooling mode. As cooling demand is satisfied, the thermostat contacts break, deenergizing the contactor and causing the system to shut off. The liquid line solenoid valve closes, minimizing the potential for refrigerant migration. The compressor does not restart until the thermostat again calls for cooling. The system is protected with a safety circuit so that the system will not start if a fault exists (i.e., high or low pressure fault). To reset the safety circuit, set the thermostat to eliminate the cooling demand, then return it to the original setpoint. This should be done only once, and if the system shuts down due to the same fault, determine the problem before attempting to restart the system.

# TYPICAL CONTROL WIRING - CAS181 SHOWN (460V. SINGLE CIRCUIT)

SCHEMATIC  
15T 460V TANDEM



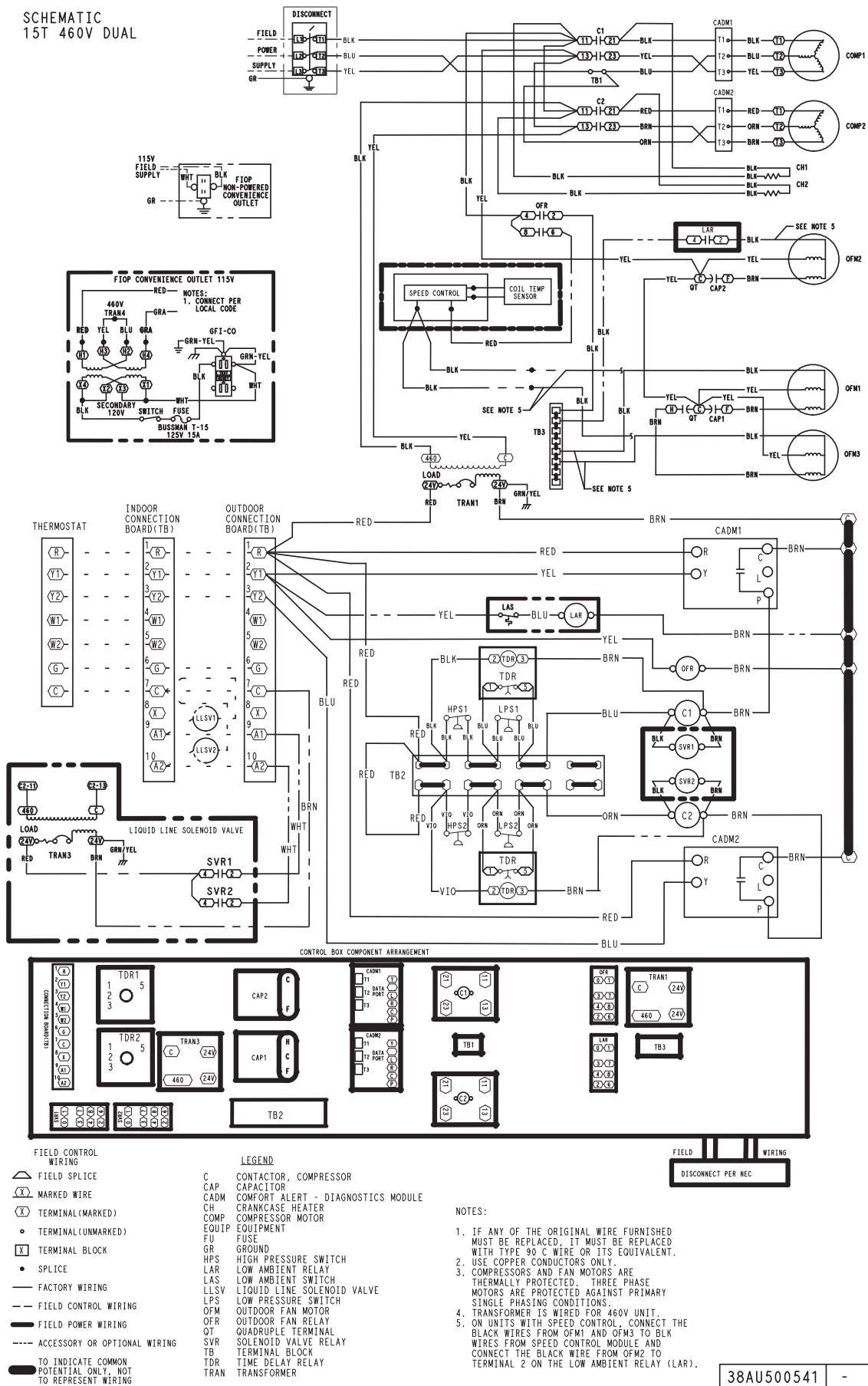
- |   |  |
|---|--|
| <p><b>FIELD CONTROL WIRING</b></p> <ul style="list-style-type: none"> <li>△ FIELD SPLICE</li> <li>(X) MARKED WIRE</li> <li>(X) TERMINAL (MARKED)</li> <li>• TERMINAL (UNMARKED)</li> <li>(X) TERMINAL BLOCK</li> <li>• SPLICE</li> <li>— FACTORY WIRING</li> <li>- - - FIELD CONTROL WIRING</li> <li>— FIELD POWER WIRING</li> <li>--- ACCESSORY OR OPTIONAL WIRING</li> <li>○ TO INDICATE COMMON</li> <li>○ POTENTIAL ONLY, NOT TO REPRESENT WIRING</li> </ul> | <p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li>C CONTACTOR, COMPRESSOR</li> <li>CAP CAPACITOR</li> <li>CADM COMFORT ALERT - DIAGNOSTICS MODULE</li> <li>CH CRANKCASE HEATER</li> <li>COMP COMPRESSOR MOTOR</li> <li>EQUIP EQUIPMENT</li> <li>FU FUSE</li> <li>GR GROUND</li> <li>HPS HIGH PRESSURE SWITCH</li> <li>LAR LOW AMBIENT RELAY</li> <li>LAS LOW AMBIENT SWITCH</li> <li>LLSV LIQUID LINE SOLENOID VALVE</li> <li>LPS LOW PRESSURE SWITCH</li> <li>OFM OUTDOOR FAN MOTOR</li> <li>OFR OUTDOOR FAN RELAY</li> <li>OT QUADRUPLE TERMINAL</li> <li>SVR1 SOLENOID VALVE RELAY</li> <li>SVR2 SOLENOID VALVE RELAY</li> <li>TB TERMINAL BLOCK</li> <li>TDR TIME DELAY RELAY</li> <li>TRAN TRANSFORMER</li> </ul> |
|---|--|

- NOTES:**
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
  2. USE COPPER CONDUCTORS ONLY.
  3. COMPRESSORS AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
  4. TRANSFORMER IS WIRED FOR 460V UNIT.
  5. ON UNITS WITH SPEED CONTROL, REMOVE OFM1 AND OFM3 BLK WIRES FROM TB3 AND CONNECT TO BLK WIRES FROM SPEED CONTROL.

38AU500538 -

# TYPICAL CONTROL WIRING - CAS180 SHOWN (460V, DUAL CIRCUIT)

SCHEMATIC  
15T 460V DUAL



## PERFORMANCE DATA

### CAS072, Single Circuit

### CONDENSER ONLY RATINGS

SST (F)		AIR TEMPERATURE ENTERING CONDENSER (F)					
		80	85	95	100	105	115
20	TC	46.7	45.1	41.7	39.8	37.9	33.9
	kW	4.04	4.27	4.77	5.04	5.32	5.93
	SDT	91.6	96.4	105.9	110.6	115.3	124.7
25	TC	51.8	50.2	46.5	44.6	42.6	38.4
	kW	4.06	4.29	4.79	5.05	5.33	5.95
	SDT	92.7	97.5	106.9	111.6	116.3	125.6
30	TC	57.0	55.2	51.4	49.4	47.3	42.9
	kW	4.07	4.30	4.80	5.07	5.35	5.96
	SDT	93.9	98.6	108.1	112.7	117.4	126.7
35	TC	62.7	60.8	56.8	54.6	52.4	47.8
	kW	4.09	4.32	4.81	5.08	5.36	5.98
	SDT	95.1	99.8	109.2	113.9	118.6	127.8
40	TC	68.7	66.7	62.5	60.2	57.9	53.0
	kW	4.11	4.34	4.83	5.10	5.38	5.99
	SDT	96.5	101.1	110.5	115.1	119.7	128.8
45	TC	75.2	73.1	68.5	66.2	63.7	58.6
	kW	4.13	4.36	4.84	5.10	5.38	5.99
	SDT	97.9	102.5	111.8	116.3	120.9	129.9
50	TC	82.2	79.9	75.1	72.5	69.9	64.4
	kW	4.15	4.37	4.85	5.12	5.39	6.00
	SDT	99.4	104.0	113.1	117.6	122.2	131.1

**NOTE:**

Condensing unit only ratings are at 45°F SST and 95°F entering—air temperature. EER = 13.1

### CAS091, Single Circuit

### CONDENSER ONLY RATINGS

SST (F)		AIR TEMPERATURE ENTERING CONDENSER (F)					
		80	85	95	100	105	115
20	TC	65.2	63.2	59.1	57.0	54.8	50.5
	kW	5.04	5.33	5.98	6.34	6.73	7.60
	SDT	95.3	100.2	109.8	114.7	119.5	129.2
25	TC	71.5	69.4	65.0	62.8	60.5	55.9
	kW	5.12	5.42	6.07	6.42	6.81	7.66
	SDT	96.4	101.2	110.8	115.6	120.4	129.9
30	TC	77.8	75.5	70.9	68.5	66.2	61.3
	kW	5.22	5.51	6.16	6.51	6.89	7.74
	SDT	97.6	102.4	111.9	116.6	121.3	130.7
35	TC	84.8	82.4	77.5	75.0	72.4	67.2
	kW	5.32	5.61	6.26	6.61	6.99	7.83
	SDT	98.8	103.5	112.9	117.6	122.3	131.6
40	TC	92.3	89.7	84.5	81.8	79.0	73.5
	kW	5.44	5.73	6.37	6.72	7.10	7.94
	SDT	100.1	104.8	114.2	118.8	123.5	132.7
45	TC	100.3	97.5	91.9	89.0	86.1	80.1
	kW	5.57	5.86	6.50	6.85	7.23	8.07
	SDT	101.6	106.2	115.5	120.2	124.8	133.9
50	TC	108.7	105.8	99.8	96.7	93.6	87.3
	kW	5.71	6.00	6.64	7.00	7.38	8.21
	SDT	103.1	107.8	117.0	121.6	126.2	135.3

**LEGEND:**

kW — Compressor Power  
 SDT — Saturated Discharge Temperature at Compressor (F)  
 SST — Saturated Suction Temperature (F)  
 TC — Gross Cooling Capacity (1000 Btuh)

**NOTE:**

Condensing unit only ratings are at 45°F SST and 95°F entering—air temperature. EER = 13.0

## PERFORMANCE DATA (cont.)

### CAS121, Single Circuit

### CONDENSER ONLY RATINGS

SST (F)		AIR TEMPERATURE ENTERING CONDENSER (F)					
		80	85	95	100	105	115
20	TC	78.0	75.4	70.1	67.3	64.6	58.9
	KW	6.03	6.44	7.31	7.76	8.23	9.21
	SDT	94.0	98.7	108.2	113.0	117.7	127.2
25	TC	86.4	83.6	77.9	74.9	72.0	66.0
	KW	6.11	6.53	7.41	7.87	8.36	9.36
	SDT	95.2	100.0	109.4	114.2	118.9	128.2
30	TC	94.7	91.8	85.6	82.5	79.4	73.0
	KW	6.20	6.62	7.51	7.98	8.47	9.49
	SDT	96.6	101.3	110.7	115.4	120.0	129.2
35	TC	104.0	100.8	94.3	90.9	87.6	80.7
	KW	6.30	6.71	7.61	8.09	8.58	9.62
	SDT	98.1	102.7	112.0	116.6	121.2	130.4
40	TC	113.9	110.4	103.4	99.9	96.2	88.9
	KW	6.39	6.81	7.71	8.20	8.70	9.75
	SDT	99.5	104.2	113.4	117.9	122.5	131.6
45	TC	124.3	120.6	113.1	109.2	105.4	97.5
	KW	6.49	6.92	7.83	8.32	8.82	9.89
	SDT	101.1	105.7	114.8	119.4	123.9	132.9
50	TC	135.4	131.4	123.3	119.2	115.0	106.5
	KW	6.61	7.04	7.96	8.45	8.96	10.03
	SDT	102.8	107.3	116.4	120.9	125.4	134.3

**NOTE:**

Condensing unit only ratings are at 45°F SST and 95°F entering—air temperature. EER = 13.5

### CAS120, Dual Circuit

### CONDENSER ONLY RATINGS

SST (°F)		AIR TEMP ENT CONDENSER (°F)					
		85	95	100	105	115	120
20	TC	75.29	69.95	67.18	64.32	58.42	55.21
	KW	6.88	7.89	8.43	8.96	10.04	10.53
	SDT	102.3	111.4	116.1	120.5	129.6	133.7
25	TC	83.12	77.31	74.32	71.28	64.99	61.76
	KW	6.97	7.98	8.53	9.07	10.18	10.73
	SDT	103.6	112.6	117.3	121.8	130.7	135.1
30	TC	91.41	85.21	81.99	78.76	72.08	68.58
	KW	7.06	8.08	8.63	9.18	10.31	10.87
	SDT	104.9	114.0	118.5	122.9	131.8	136.1
35	TC	100.35	93.69	90.26	86.76	85.11	75.65
	KW	7.15	8.18	8.73	9.29	10.42	10.99
	SDT	106.3	115.2	119.8	124.2	132.9	137.1
40	TC	109.90	102.58	98.84	95.06	87.13	83.07
	KW	7.25	8.29	8.83	9.39	10.54	11.12
	SDT	107.6	116.6	121.0	125.4	134.0	138.2
45	TC	119.86	111.84	107.74	103.56	95.02	90.54
	KW	7.36	8.39	8.93	9.49	10.64	11.22
	SDT	109.0	117.9	122.3	126.6	135.1	139.2
50	TC	130.20	121.39	116.90	112.33	103.07	98.17
	KW	7.48	8.51	9.04	9.60	10.75	11.33
	SDT	110.5	119.2	123.5	127.8	136.2	140.2

**NOTE:** Condensing unit only ratings are at 45°F SST and 95°F entering—air temperature. EER = 13.0

**LEGEND:**

- kW — Compressor Power
- SDT — Saturated Discharge Temperature at Compressor (°F)
- SST — Saturated Suction Temperature (°F)
- TC — Gross Cooling Capacity (1000 Btuh)

## PERFORMANCE DATA (cont.)

### CAS151, Single Circuit

### CONDENSER ONLY RATINGS

SST (F)		AIR TEMPERATURE ENTERING CONDENSER (F)					
		80	85	95	100	105	115
20	TC	100.8	97.4	90.3	86.6	83.0	75.5
	kW	8.48	8.97	10.00	10.53	11.07	12.19
	SDT	98.0	102.6	111.8	116.4	120.9	130.0
25	TC	111.8	108.1	100.5	96.6	92.7	84.7
	kW	8.66	9.15	10.20	10.75	11.31	12.47
	SDT	99.6	104.1	113.2	117.7	122.3	131.3
30	TC	122.9	118.9	110.7	106.6	102.4	93.9
	kW	8.84	9.35	10.41	10.97	11.55	12.75
	SDT	101.3	105.8	114.8	119.3	123.8	132.7
35	TC	134.9	130.6	121.9	117.4	113.0	103.8
	kW	9.05	9.55	10.64	11.21	11.80	13.03
	SDT	103.1	107.6	116.5	120.9	125.4	134.2
40	TC	147.7	143.0	133.7	128.9	124.1	114.3
	kW	9.27	9.78	10.88	11.47	12.07	13.32
	SDT	105.1	109.5	118.3	122.8	127.1	135.8
45	TC	161.1	156.2	146.1	141.0	135.8	125.4
	kW	9.51	10.03	11.15	11.73	12.34	13.61
	SDT	107.2	111.6	120.3	124.7	129.0	137.5
50	TC	175.4	170.1	159.3	153.8	148.3	137.1
	kW	9.78	10.30	11.42	12.02	12.63	13.92
	SDT	109.5	113.8	122.4	126.7	130.9	139.4

**NOTE:** Condensing unit only ratings are at 45 F SST and 95 F entering—air temperature. EER = 12.5

### CAS150, Dual Circuit

### CONDENSER ONLY RATINGS

SST (°F)		AIR TEMP ENT CONDENSER (°F)					
		85	95	100	105	115	120
20	TC	93.24	86.18	82.60	78.94	71.54	67.78
	kW	9.22	10.36	10.96	11.56	12.76	13.37
	SDT	104.4	113.3	117.8	122.2	130.9	135.2
25	TC	103.39	95.91	92.05	88.15	80.16	76.08
	kW	9.42	10.60	11.21	11.83	13.10	13.73
	SDT	106.1	114.9	119.3	123.7	132.3	136.6
30	TC	114.29	106.19	102.04	97.79	89.15	84.74
	kW	9.63	10.84	11.46	12.10	13.41	14.07
	SDT	107.8	116.6	120.9	125.3	133.8	138.0
35	TC	125.69	116.93	112.44	107.84	105.72	93.69
	kW	9.84	11.07	11.71	12.36	13.70	14.38
	SDT	109.5	118.2	122.6	126.8	135.2	139.4
40	TC	137.57	128.07	123.21	118.21	108.08	102.90
	kW	10.05	11.30	11.95	12.61	13.98	14.68
	SDT	111.3	119.9	124.2	128.4	136.7	140.8
45	TC	149.86	139.53	134.26	128.83	117.83	112.22
	kW	10.27	11.53	12.18	12.85	14.24	14.95
	SDT	113.1	121.6	125.8	130.0	138.1	142.1
50	TC	162.51	151.29	145.56	139.64	127.71	121.55
	kW	10.50	11.76	12.42	13.09	14.48	15.20
	SDT	114.9	123.3	127.5	131.6	139.6	143.5

**NOTE:** Condensing unit only ratings are at 45°F SST and 95°F entering—air temperature. EER = 11.5

**LEGEND:**

- kW — Compressor Power
- SDT — Saturated Discharge Temperature at Compressor (°F)
- SST — Saturated Suction Temperature (°F)
- TC — Gross Cooling Capacity (1000 Btuh)



## PERFORMANCE DATA (cont.)

### CAS181, Single Circuit

### CONDENSER ONLY RATINGS

SST (°F)		AIR TEMPERATURE ENTERING CONDENSER (°F)					
		80	85	95	105	115	125
20	TC	125.5	121.8	114.2	106.6	99.7	79.7
	kW	10.5	11.2	12.6	14.2	16.0	17.5
	SDT	98.6	103.4	113.0	122.7	134.9	136.0
25	TC	138.7	134.7	126.5	118.1	109.3	98.5
	kW	10.7	11.4	12.8	14.3	16.0	17.9
	SDT	100.0	104.7	114.2	123.6	132.9	140.5
30	TC	152.9	148.6	139.8	130.7	120.9	104.9
	kW	10.9	11.6	13.0	14.6	16.2	17.8
	SDT	101.4	106.2	115.5	125.0	133.6	139.4
35	TC	168.2	163.5	154.1	144.2	133.6	121.2
	kW	11.2	11.8	13.2	14.8	16.5	18.1
	SDT	102.9	107.5	117.0	126.2	134.8	142.1
40	TC	184.9	179.4	169.3	158.7	147.6	135.1
	kW	11.5	12.0	13.5	15.1	16.8	18.5
	SDT	105.2	108.9	118.5	127.7	136.7	144.5
45	TC	202.1	196.7	185.7	174.3	162.5	150.4
	kW	11.7	12.4	13.9	15.6	17.5	19.6
	SDT	106.4	111.2	120.9	130.7	140.4	150.2
50	TC	220.6	214.7	202.1	190.0	174.6	159.6
	kW	11.9	12.6	13.9	15.4	16.9	18.5
	SDT	107.2	111.7	120.4	129.4	136.9	144.9

NOTE: Condensing unit only ratings are at 45°F SST and 95°F entering—air temperature. EER = 12.7

### CAS180, Dual Circuit

### CONDENSER ONLY RATINGS

SST (°F)		AIR TEMPERATURE ENTERING CONDENSER (°F)					
		80	85	95	105	115	125
20	TC	127.6	123.7	116.0	108.1	99.7	90.2
	kW	10.0	10.6	11.9	13.4	14.9	16.6
	SDT	96.0	100.5	109.8	119.2	128.3	137.0
25	TC	140.9	136.7	128.3	119.5	110.4	101.2
	kW	10.0	10.6	11.9	13.4	14.9	16.6
	SDT	96.0	100.5	109.8	119.2	128.3	137.0
30	TC	155.0	150.5	141.3	132.0	122.3	111.4
	kW	10.4	11.0	12.3	13.7	15.3	17.0
	SDT	98.7	103.3	112.4	121.5	130.6	139.1
35	TC	170.1	165.3	155.4	145.2	134.4	123.3
	kW	10.6	11.2	12.5	14.0	15.5	17.2
	SDT	100.1	104.7	113.8	122.8	131.7	140.4
40	TC	186.3	181.0	170.3	159.0	147.3	134.9
	kW	10.8	11.4	12.8	14.2	15.8	17.4
	SDT	101.6	106.1	115.1	124.0	132.8	141.4
45	TC	203.4	197.6	185.7	173.5	160.6	147.2
	kW	11.1	11.7	13.0	14.4	16.0	17.6
	SDT	103.2	107.6	116.5	125.4	134.0	142.5
50	TC	221.4	214.9	202.0	188.6	174.5	159.7
	kW	11.4	12.0	13.3	14.7	16.2	17.9
	SDT	104.8	109.2	118.0	126.7	135.2	143.5

NOTE: Condensing unit only ratings are at 45°F SST and 95°F entering—air temperature. EER = 13.2

**LEGEND:**

- kW — Compressor Power
- SDT — Saturated Discharge Temperature at Compressor (°F)
- SST — Saturated Suction Temperature (°F)
- TC — Gross Cooling Capacity (1000 Btuh)

## PERFORMANCE DATA (cont.)

### CAS241, Single Circuit

### CONDENSER ONLY RATINGS

SST (°F)		AIR TEMPERATURE ENTERING CONDENSER (°F)					
		80	85	95	105	115	125
20	TC	159.2	154.5	144.5	133.9	122.5	110.2
	kW	13.0	13.7	15.3	17.1	19.2	21.5
	SDT	97.3	101.8	110.6	119.3	127.9	136.5
25	TC	176.1	171.0	160.2	148.8	136.5	123.2
	kW	13.2	14.0	15.6	17.4	19.5	21.8
	SDT	98.9	103.3	112.0	120.7	129.2	137.6
30	TC	194.2	188.6	176.9	164.5	151.3	136.9
	kW	13.5	14.3	15.9	17.7	19.7	22.0
	SDT	100.6	104.9	113.6	122.1	130.5	138.8
35	TC	213.5	207.4	194.7	181.2	166.8	151.2
	kW	13.8	14.6	16.2	18.0	20.0	22.3
	SDT	102.4	106.7	115.2	123.6	131.9	140.1
40	TC	234.1	227.4	213.5	198.8	183.1	166.1
	kW	14.2	14.9	16.5	18.3	20.3	22.6
	SDT	104.3	108.5	116.9	125.2	133.3	141.4
45	TC	255.9	248.6	233.3	217.3	200.1	181.7
	kW	14.6	15.3	16.9	18.7	20.7	22.9
	SDT	106.3	110.5	118.7	126.8	134.9	142.7
50	TC	279.0	270.9	254.2	236.7	218.1	197.8
	kW	15.1	15.8	17.3	19.1	21.1	23.2
	SDT	108.5	112.5	120.6	128.6	136.5	144.1

NOTE: Condensing unit only ratings are at 45°F SST and 95°F entering—air temperature. EER = 12.9

### CAS240, Dual Circuit

### CONDENSER ONLY RATINGS

SST (°F)		AIR TEMPERATURE ENTERING CONDENSER (°F)					
		80	85	95	105	115	125
20	TC	160.3	155.5	145.3	134.3	122.5	109.6
	kW	12.7	13.4	15.0	16.8	18.8	21.1
	SDT	97.0	101.5	110.3	119.1	127.7	136.3
25	TC	177.2	171.9	160.8	149.0	136.3	122.3
	kW	12.7	13.4	15.0	16.8	18.8	21.1
	SDT	97.0	101.5	110.3	119.1	127.7	136.3
30	TC	195.1	189.4	177.4	164.5	150.7	135.6
	kW	13.2	13.9	15.5	17.3	19.3	21.5
	SDT	100.3	104.6	113.3	121.8	130.3	138.6
35	TC	214.3	208.0	194.9	180.9	165.9	149.5
	kW	13.5	14.3	15.8	17.6	19.6	21.8
	SDT	102.1	106.3	114.9	123.3	131.7	139.8
40	TC	234.6	227.7	213.4	198.2	181.7	163.9
	kW	13.9	14.6	16.2	17.9	19.9	22.1
	SDT	104.0	108.2	116.6	124.9	133.1	141.1
45	TC	256.3	258.7	242.3	224.9	206.2	186.1
	kW	14.3	15.2	16.7	18.5	20.4	22.5
	SDT	106.0	111.1	119.2	127.4	135.4	143.1
50	TC	279.1	272.0	254.7	236.3	216.6	195.4
	kW	14.7	15.5	17.0	18.7	20.6	22.7
	SDT	108.1	112.3	120.4	128.4	136.4	143.9

NOTE: Condensing unit only ratings are at 45°F SST and 95°F entering—air temperature. EER = 13.0

**LEGEND:**

- kW — Compressor Power
- SDT — Saturated Discharge Temperature at Compressor (°F)
- SST — Saturated Suction Temperature (°F)
- TC — Gross Cooling Capacity (1000 Btuh)

# PERFORMANCE DATA (cont.)

## CAS072 & FAS072

## COMBINATION RATINGS

			AMBIENT TEMPERATURE																			
			85			95			105			115			125							
			EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)							
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85					
			1800 Cfm			EA (WB)			58	THC	65.8	65.8	74.1	63.4	63.4	71.4	60.7	60.7	68.3	58.3	58.3	65.7
SHC	57.4	65.8							74.1	55.3	63.4	71.4	53.0	60.7	68.3	50.9	58.3	65.7	47.8	54.7	61.6	
62	THC	68.1				68.1	70.7	65.2	65.2	69.2	62.0	62.0	67.6	58.1	58.1	65.7	54.6	54.6	55.4			
	SHC	51.9				61.3	70.7	50.4	59.8	69.2	48.9	58.3	67.6	47.1	56.4	65.7	36.3	45.9	55.4			
67	THC	74.0				74.0	74.0	70.9	70.9	70.9	67.3	67.3	67.3	63.4	63.4	63.4	56.7	56.7	56.7			
	SHC	42.3				51.8	61.3	41.0	50.5	59.9	39.5	49.0	58.4	37.9	47.3	56.8	35.3	44.9	54.4			
72	THC	80.7				80.7	80.7	77.3	77.3	77.3	73.6	73.6	73.6	69.4	69.4	69.4	63.2	63.2	63.2			
	SHC	32.7				42.2	51.8	31.4	40.9	50.4	30.0	39.5	49.0	28.4	37.9	47.4	26.2	35.7	45.3			
76	THC	–				86.2	86.2	–	82.6	82.6	–	78.6	78.6	–	74.3	74.3	–	70.7	70.7			
	SHC	–				34.5	44.3	–	33.2	43.0	–	31.8	41.6	–	30.3	40.0	–	29.0	38.7			
2100 Cfm			EA (WB)			58	THC	69.0	69.0	77.8	66.5	66.5	74.9	63.7	63.7	71.8	61.2	61.2	69.0	–	–	–
						SHC	60.3	69.0	77.8	58.0	66.5	74.9	55.6	63.7	71.8	53.5	61.2	69.0	–	–	–	
			62	THC	70.2	70.2	77.1	67.2	67.2	75.5	64.0	64.0	73.6	60.4	60.4	70.7	–	–	–			
				SHC	55.7	66.4	77.1	54.2	64.8	75.5	52.5	63.0	73.6	50.2	60.4	70.7	–	–	–			
			67	THC	75.9	75.9	75.9	72.6	72.6	72.6	68.9	68.9	68.9	64.8	64.8	64.8	59.1	59.1	59.9			
				SHC	44.8	55.7	66.5	43.4	54.3	65.1	41.9	52.8	63.6	40.3	51.1	62.0	38.1	49.0	59.9			
			72	THC	82.5	82.5	82.5	79.0	79.0	79.0	75.2	75.2	75.2	70.9	70.9	70.9	63.9	63.9	63.9			
				SHC	33.7	44.6	55.5	32.4	43.3	54.2	31.0	41.8	52.7	29.4	40.3	51.1	26.9	37.9	48.8			
			76	THC	–	88.1	88.1	–	84.3	84.3	–	80.2	80.2	–	75.5	75.5	–	71.8	71.8			
				SHC	–	35.8	47.0	–	34.5	45.6	–	33.0	44.2	–	31.4	42.5	–	30.2	41.2			
2400 Cfm			EA (WB)			58	THC	71.7	71.7	80.8	69.0	69.0	77.8	66.1	66.1	74.5	62.6	62.6	70.6	58.9	58.9	66.3
						SHC	62.6	71.7	80.8	60.3	69.0	77.8	57.7	66.1	74.5	54.7	62.6	70.6	51.4	58.9	66.3	
			62	THC	72.0	72.0	82.7	69.1	69.1	80.8	66.2	66.2	77.4	63.0	63.0	73.6	–	–	–			
				SHC	59.0	70.9	82.7	57.4	69.1	80.8	55.0	66.2	77.4	52.3	63.0	73.6	–	–	–			
			67	THC	77.3	77.3	77.3	74.0	74.0	74.0	70.2	70.2	70.2	66.1	66.1	66.9	62.5	62.5	65.0			
				SHC	47.1	59.3	71.5	45.7	57.9	70.1	44.2	56.4	68.6	42.6	54.7	66.9	41.0	53.0	65.0			
			72	THC	84.0	84.0	84.0	80.4	80.4	80.4	76.4	76.4	76.4	71.8	71.8	71.8	67.5	67.5	67.5			
				SHC	34.6	46.9	59.1	33.3	45.5	57.8	31.9	44.1	56.3	30.2	42.4	54.6	28.7	40.8	52.9			
			76	THC	–	89.5	89.5	–	85.7	85.7	–	81.4	81.4	–	76.7	76.7	–	–	–			
				SHC	–	36.9	49.4	–	35.6	48.1	–	34.2	46.6	–	32.6	45.0	–	–	–			
2700 Cfm			EA (WB)			58	THC	73.9	73.9	83.3	71.2	71.2	80.2	68.1	68.1	76.7	64.8	64.8	73.0	58.6	58.6	66.0
						SHC	64.6	73.9	83.3	62.2	71.2	80.2	59.5	68.1	76.7	56.5	64.8	73.0	51.2	58.6	66.0	
			62	THC	74.0	74.0	86.5	71.3	71.3	83.3	68.2	68.2	79.7	64.8	64.8	75.8	–	–	–			
				SHC	61.5	74.0	86.5	59.2	71.3	83.3	56.6	68.2	79.7	53.8	64.8	75.8	–	–	–			
			67	THC	78.5	78.5	78.5	75.1	75.1	75.1	71.2	71.2	73.2	67.0	67.0	71.5	63.2	63.2	69.4			
				SHC	49.3	62.7	76.2	47.9	61.3	74.8	46.4	59.8	73.2	44.7	58.1	71.5	43.0	56.2	69.4			
			72	THC	85.1	85.1	85.1	81.4	81.4	81.4	77.3	77.3	77.3	72.6	72.6	72.6	65.3	65.3	65.3			
				SHC	35.5	49.0	62.5	34.2	47.6	61.1	32.7	46.1	59.6	31.1	44.5	57.9	28.6	42.2	55.7			
			76	THC	–	90.7	90.7	–	86.7	86.7	–	82.3	82.3	–	–	–	–	–	–			
				SHC	–	38.1	51.8	–	36.7	50.4	–	35.3	48.9	–	–	–	–	–	–			
3000 Cfm			EA (WB)			58	THC	75.9	75.9	85.5	73.0	73.0	82.3	69.8	69.8	78.7	66.3	66.3	74.7	62.4	62.4	70.4
						SHC	66.3	75.9	85.5	63.8	73.0	82.3	61.0	69.8	78.7	57.9	66.3	74.7	54.5	62.4	70.4	
			62	THC	75.9	75.9	88.8	73.1	73.1	85.4	69.9	69.9	81.7	66.4	66.4	77.6	60.2	60.2	70.4			
				SHC	63.1	75.9	88.8	60.7	73.1	85.4	58.0	69.9	81.7	55.1	66.4	77.6	50.0	60.2	70.4			
			67	THC	79.5	79.5	80.7	76.0	76.0	79.3	72.1	72.1	77.6	67.9	67.9	75.7	63.7	63.7	73.5			
				SHC	51.4	66.0	80.7	49.9	64.6	79.3	48.4	63.0	77.6	46.7	61.2	75.7	44.8	59.2	73.5			
			72	THC	86.1	86.1	86.1	82.3	82.3	82.3	78.0	78.0	78.0	73.3	73.3	73.3	69.6	69.6	69.6			
				SHC	36.3	51.0	65.8	35.0	49.7	64.4	33.5	48.1	62.8	31.9	46.5	61.1	30.5	44.9	59.3			
			76	THC	–	91.6	91.6	–	87.6	87.6	–	–	–	–	–	–	–	–	–			
				SHC	–	39.1	54.0	–	37.8	52.7	–	–	–	–	–	–	–	–	–			

**PERFORMANCE DATA (cont.)**

**CAS072 & FAS091**

**COMBINATION RATINGS**

			AMBIENT TEMPERATURE															
			85			95			105			115			125			
			EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)			
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
2250 Cfm	EA (WB)	58	THC	71.6	71.6	80.7	69.1	69.1	77.9	66.2	66.2	74.6	63.2	63.2	72.2	—	—	—
			SHC	62.5	71.6	80.7	60.3	69.1	77.9	57.8	66.2	74.6	55.0	63.2	72.2	—	—	—
		62	THC	72.5	72.5	81.5	69.6	69.6	79.6	66.6	66.6	76.6	63.2	63.2	73.2	—	—	—
			SHC	58.5	70.0	81.5	56.9	68.2	79.6	54.6	65.6	76.6	52.1	62.7	73.2	—	—	—
		67	THC	78.1	78.1	78.1	74.8	74.8	74.8	71.2	71.2	71.2	67.0	67.0	67.7	60.9	60.9	64.5
72	THC	84.9	84.9	84.9	81.4	81.4	81.4	77.4	77.4	77.4	73.1	73.1	73.1	68.9	68.9	68.9		
2600 Cfm	EA (WB)	58	THC	74.8	74.8	84.2	72.1	72.1	81.3	69.0	69.0	77.8	65.7	65.7	74.0	62.2	62.2	70.0
			SHC	65.3	74.8	84.2	62.9	72.1	81.3	60.3	69.0	77.8	57.3	65.7	74.0	54.3	62.2	70.0
		62	THC	74.9	74.9	87.2	72.1	72.1	84.3	69.1	69.1	80.8	65.7	65.7	76.8	61.7	61.7	72.1
			SHC	62.0	74.6	87.2	60.0	72.1	84.3	57.4	69.1	80.8	54.6	65.7	76.8	51.2	61.7	72.1
		67	THC	79.8	79.8	79.8	76.3	76.3	76.4	72.6	72.6	74.2	68.4	68.4	71.9	63.9	63.9	69.8
72	THC	86.5	86.5	86.5	82.9	82.9	82.9	78.8	78.8	78.8	74.3	74.3	74.3	69.5	69.5	69.5		
3000 Cfm	EA (WB)	58	THC	77.6	77.6	87.4	74.8	74.8	84.2	71.5	71.5	80.6	67.9	67.9	76.5	64.9	64.9	73.1
			SHC	67.7	77.6	87.4	65.3	74.8	84.2	62.5	71.5	80.6	59.3	67.9	76.5	56.7	64.9	73.1
		62	THC	77.7	77.7	90.8	74.8	74.8	87.5	71.6	71.6	83.7	67.9	67.9	79.4	64.9	64.9	75.9
			SHC	64.5	77.7	90.8	62.1	74.8	87.5	59.5	71.6	83.7	56.4	67.9	79.4	53.9	64.9	75.9
		67	THC	81.2	81.2	83.0	77.7	77.7	81.6	73.9	73.9	80.0	69.6	69.6	78.0	65.3	65.3	74.4
72	THC	87.9	87.9	87.9	84.2	84.2	84.2	80.0	80.0	80.0	75.3	75.3	75.3	70.2	70.2	70.2		
3400 Cfm	EA (WB)	58	THC	79.7	79.7	89.8	76.8	76.8	86.4	73.4	73.4	82.7	69.6	69.6	78.4	64.8	64.8	73.0
			SHC	69.6	79.7	89.8	67.0	76.8	86.4	64.1	73.4	82.7	60.8	69.6	78.4	56.6	64.8	73.0
		62	THC	79.8	79.8	93.3	76.8	76.8	89.8	73.5	73.5	85.9	69.7	69.7	81.4	65.6	65.6	76.8
			SHC	66.3	79.8	93.3	63.8	76.8	89.8	61.0	73.5	85.9	57.8	69.7	81.4	54.5	65.6	76.8
		67	THC	82.3	82.3	88.8	78.8	78.8	87.3	74.9	74.9	85.5	70.6	70.6	83.2	—	—	—
72	THC	88.9	88.9	88.9	85.1	85.1	85.1	80.8	80.8	80.8	76.1	76.1	76.1	—	—	—		
3750 Cfm	EA (WB)	58	THC	81.5	81.5	91.9	78.5	78.5	88.4	75.0	75.0	84.5	71.1	71.1	80.1	64.7	64.7	72.9
			SHC	71.2	81.5	91.9	68.5	78.5	88.4	65.5	75.0	84.5	62.1	71.1	80.1	56.5	64.7	72.9
		62	THC	81.6	81.6	95.4	78.5	78.5	91.8	75.1	75.1	87.8	71.2	71.2	83.2	66.3	66.3	77.5
			SHC	67.8	81.6	95.4	65.2	78.5	91.8	62.4	75.1	87.8	59.1	71.2	83.2	55.1	66.3	77.5
		67	THC	83.2	83.2	93.9	79.7	79.7	92.2	75.8	75.8	90.3	71.5	71.5	87.7	—	—	—
72	THC	89.7	89.7	89.7	85.8	85.8	85.8	81.5	81.5	81.5	76.8	76.8	76.8	—	—	—		
76	THC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
	SHC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

# PERFORMANCE DATA (cont.)

## CAS091 & FAS091

## COMBINATION RATINGS

				AMBIENT TEMPERATURE														
				85			95			105			115			125		
				EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)		
Cfm	EA (wB)	Type	75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
			2250	58	THC	84.6	84.6	95.4	81.7	81.7	92.1	78.5	78.5	88.5	75.5	75.5	85.1	70.7
SHC	73.9	84.6			95.4	71.3	81.7	92.1	68.5	78.5	88.5	65.9	75.5	85.1	61.7	70.7	79.7	
THC	88.2	88.2			89.4	84.6	84.6	87.6	80.7	80.7	85.6	76.9	76.9	83.6	73.2	73.2	81.3	
SHC	66.1	77.7			89.4	64.3	75.9	87.6	62.4	74.0	85.6	60.5	72.0	83.6	58.5	69.9	81.3	
THC	95.5	95.5			95.5	91.5	91.5	91.5	87.3	87.3	87.3	82.7	82.7	82.7	76.1	76.1	76.1	
72	THC	103.4		103.4	103.4	99.2	99.2	99.2	94.6	94.6	94.6	89.6	89.6	89.6	82.3	82.3	82.3	
	SHC	41.8		53.7	65.5	40.2	52.0	63.8	38.4	50.2	62.0	36.6	48.3	60.1	33.8	45.6	57.4	
	THC	-		109.9	109.9	-	105.4	105.4	-	100.6	100.6	-	95.3	95.3	-	87.8	87.8	
	SHC	-		43.9	56.2	-	42.3	54.7	-	40.6	52.8	-	38.7	50.9	-	36.1	48.3	
	THC	88.7		88.7	99.9	85.6	85.6	96.4	82.1	82.1	92.5	78.7	78.7	88.7	75.4	75.4	85.0	
2625	58	SHC	77.4	88.7	99.9	74.7	85.6	96.4	71.7	82.1	92.5	68.8	78.7	88.7	65.8	75.4	85.0	
		THC	90.7	90.7	97.2	87.0	87.0	95.3	83.0	83.0	93.1	78.9	78.9	90.6	75.3	75.3	86.4	
		SHC	70.7	84.0	97.2	68.8	82.1	95.3	66.9	80.0	93.1	64.7	77.6	90.6	61.7	74.0	86.4	
		THC	97.8	97.8	97.8	93.7	93.7	93.7	89.2	89.2	89.2	84.4	84.4	84.4	76.7	76.7	76.7	
		SHC	57.0	70.4	83.8	55.3	68.7	82.1	53.4	66.8	80.2	51.5	64.8	78.2	48.6	62.0	75.5	
	72	THC	105.7	105.7	105.7	101.3	101.3	101.3	96.5	96.5	96.5	91.5	91.5	91.5	86.2	86.2	86.2	
		SHC	43.0	56.5	70.0	41.4	54.9	68.3	39.6	53.0	66.5	37.8	51.2	64.5	35.8	49.2	62.5	
		THC	-	112.2	112.2	-	107.6	107.6	-	102.5	102.5	-	97.0	97.0	-	-	-	
		SHC	-	45.4	59.5	-	43.8	57.8	-	42.0	55.9	-	40.2	54.0	-	-	-	
		THC	92.0	92.0	103.7	88.7	88.7	99.9	85.1	85.1	95.9	81.2	81.2	91.5	76.0	76.0	85.7	
3000	58	SHC	80.3	92.0	103.7	77.4	88.7	99.9	74.3	85.1	95.9	70.9	81.2	91.5	66.4	76.0	85.7	
		THC	92.9	92.9	104.3	89.2	89.2	102.0	85.1	85.1	99.5	81.4	81.4	95.1	-	-	-	
		SHC	74.9	89.6	104.3	72.9	87.4	102.0	70.7	85.1	99.5	67.6	81.4	95.1	-	-	-	
		THC	99.6	99.6	99.6	95.3	95.3	95.3	90.8	90.8	90.8	86.0	86.0	86.0	79.1	79.1	81.7	
		SHC	59.7	74.7	89.8	58.0	73.0	88.0	56.1	71.1	86.1	54.2	69.1	84.1	51.7	66.7	81.7	
	72	THC	107.5	107.5	107.5	103.0	103.0	103.0	98.0	98.0	98.0	92.9	92.9	92.9	88.0	88.0	88.0	
		SHC	44.1	59.2	74.3	42.5	57.5	72.6	40.7	55.7	70.7	38.8	53.8	68.7	37.0	51.8	66.7	
		THC	-	114.0	114.0	-	109.1	109.1	-	103.9	103.9	-	98.3	98.3	-	-	-	
		SHC	-	46.9	62.4	-	45.2	60.7	-	43.4	58.8	-	41.5	56.8	-	-	-	
		THC	94.8	94.8	106.8	91.3	91.3	102.9	87.5	87.5	98.6	83.4	83.4	94.0	77.9	77.9	87.8	
3375	58	SHC	82.8	94.8	106.8	79.7	91.3	102.9	76.4	87.5	98.6	72.9	83.4	94.0	68.0	77.9	87.8	
		THC	94.8	94.8	110.9	91.4	91.4	106.8	87.6	87.6	102.4	83.5	83.5	97.6	79.3	79.3	92.7	
		SHC	78.8	94.8	110.9	75.9	91.4	106.8	72.8	87.6	102.4	69.3	83.5	97.6	65.9	79.3	92.7	
		THC	101.0	101.0	101.0	96.6	96.6	96.6	92.0	92.0	92.0	87.0	87.0	89.6	82.8	82.8	87.3	
		SHC	62.3	78.9	95.4	60.6	77.1	93.7	58.7	75.2	91.7	56.7	73.2	89.6	54.8	71.0	87.3	
	72	THC	108.9	108.9	108.9	104.3	104.3	104.3	99.2	99.2	99.2	93.8	93.8	93.8	86.1	86.1	86.1	
		SHC	45.2	61.7	78.3	43.5	60.0	76.6	41.7	58.2	74.7	39.7	56.2	72.6	37.1	53.6	70.0	
		THC	-	115.4	115.4	-	110.4	110.4	-	105.1	105.1	-	99.3	99.3	-	92.2	92.2	
		SHC	-	48.2	65.2	-	46.5	63.4	-	44.7	61.6	-	42.7	59.5	-	40.4	57.1	
		THC	97.1	97.1	109.5	93.5	93.5	105.4	89.6	89.6	101.0	85.3	85.3	96.1	-	-	-	
3750	58	SHC	84.8	97.1	109.5	81.7	93.5	105.4	78.2	89.6	101.0	74.5	85.3	96.1	-	-	-	
		THC	97.2	97.2	113.7	93.6	93.6	109.5	89.7	89.7	104.8	85.5	85.5	100.0	78.2	78.2	91.4	
		SHC	80.8	97.2	113.7	77.8	93.6	109.5	74.5	89.7	104.8	71.1	85.5	100.0	64.9	78.2	91.4	
		THC	102.2	102.2	102.2	97.7	97.7	99.0	93.1	93.1	97.0	88.1	88.1	94.8	-	-	-	
		SHC	64.8	82.8	100.8	63.0	81.0	99.0	61.1	79.1	97.0	59.1	77.0	94.8	-	-	-	
	72	THC	110.1	110.1	110.1	105.3	105.3	105.3	100.2	100.2	100.2	94.7	94.7	94.7	90.0	90.0	90.0	
		SHC	46.1	64.2	82.2	44.4	62.4	80.4	42.6	60.5	78.4	40.7	58.5	76.4	38.9	56.6	74.2	
		THC	-	116.5	116.5	-	111.5	111.5	-	106.0	106.0	-	100.1	100.1	-	90.8	90.8	
		SHC	-	49.4	67.8	-	47.7	66.0	-	45.9	64.1	-	43.9	62.0	-	40.8	58.8	
		THC	97.1	97.1	109.5	93.5	93.5	105.4	89.6	89.6	101.0	85.3	85.3	96.1	-	-	-	

- Not operational











**PERFORMANCE DATA (cont.)**

**CAS120 & FAS150**

**COMBINATION RATINGS**

				AMBIENT TEMPERATURE														
				85			95			105			115			125		
				EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)		
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85
3750 Cfm	EA (WB)	58	THC	118.1	118.1	133.1	113.8	113.8	128.3	109.1	109.1	123.0	103.9	103.9	117.1	98.2	98.2	110.7
			SHC	103.1	118.1	133.1	99.4	113.8	128.3	95.3	109.1	123.0	90.7	103.9	117.1	85.8	98.2	110.7
		62	THC	120.1	120.1	133.8	115.0	115.0	130.9	109.5	109.5	127.1	104.1	104.1	121.7	98.3	98.3	115.0
			SHC	96.2	115.0	133.8	93.6	112.3	130.9	90.5	108.8	127.1	86.4	104.1	121.7	81.7	98.3	115.0
		67	THC	130.2	130.2	130.2	124.8	124.8	124.8	118.7	118.7	118.7	112.0	112.0	112.0	104.6	104.6	105.5
SHC	77.7	96.9	116.0	75.5	94.6	113.8	73.0	92.2	111.3	70.4	89.5	108.6	67.4	86.4	105.5			
4300 Cfm	EA (WB)	58	THC	122.7	122.7	138.2	118.2	118.2	133.2	113.3	113.3	127.7	107.9	107.9	121.5	101.8	101.8	114.7
			SHC	107.1	122.7	138.2	103.3	118.2	133.2	98.9	113.3	127.7	94.1	107.9	121.5	88.9	101.8	114.7
		62	THC	123.2	123.2	142.6	118.4	118.4	138.1	113.4	113.4	132.5	108.0	108.0	126.2	101.9	101.9	119.1
			SHC	101.5	122.0	142.6	98.2	118.1	138.1	94.1	113.3	132.5	89.7	108.0	126.2	84.6	101.9	119.1
		67	THC	132.3	132.3	132.3	126.8	126.8	126.8	120.6	120.6	121.3	113.8	113.8	118.1	106.3	106.3	114.4
SHC	81.8	103.6	125.2	79.6	101.3	123.0	77.1	98.8	120.5	74.4	96.0	117.7	71.4	92.9	114.4			
5000 Cfm	EA (WB)	58	THC	127.4	127.4	143.6	122.8	122.8	138.4	117.7	117.7	132.6	111.9	111.9	126.1	105.5	105.5	118.9
			SHC	111.3	127.4	143.6	107.2	122.8	138.4	102.7	117.7	132.6	97.7	111.9	126.1	92.1	105.5	118.9
		62	THC	127.5	127.5	149.1	122.9	122.9	143.7	117.7	117.7	137.7	112.0	112.0	131.0	105.6	105.6	123.5
			SHC	105.9	127.5	149.1	102.1	122.9	143.7	97.8	117.7	137.7	93.0	112.0	131.0	87.7	105.6	123.5
		67	THC	134.4	134.4	136.4	128.9	128.9	134.1	122.6	122.6	131.4	115.7	115.7	128.4	108.0	108.0	124.8
SHC	86.9	111.7	136.4	84.7	109.4	134.1	82.2	106.8	131.4	79.3	103.8	128.4	76.2	100.5	124.8			
6250 Cfm	EA (WB)	58	THC	131.2	131.2	147.9	126.4	126.4	142.4	121.1	121.1	136.4	115.1	115.1	129.8	108.5	108.5	122.4
			SHC	114.5	131.2	147.9	110.3	126.4	142.4	105.7	121.1	136.4	100.5	115.1	129.8	94.8	108.5	122.4
		62	THC	131.3	131.3	153.5	126.5	126.5	148.0	121.2	121.2	141.7	115.2	115.2	134.7	108.6	108.6	127.1
			SHC	109.0	131.3	153.5	105.1	126.5	148.0	100.6	121.2	141.7	95.7	115.2	134.7	90.3	108.6	127.1
		67	THC	136.1	136.1	146.9	130.5	130.5	144.4	124.2	124.2	141.6	117.2	117.2	138.0	109.6	109.6	133.8
SHC	91.6	119.3	146.9	89.3	116.9	144.4	86.7	114.2	141.6	83.8	111.0	138.0	80.2	107.0	133.8			
76	EA (WB)	58	THC	146.6	146.6	146.6	140.9	140.9	140.9	134.2	134.2	134.2	126.9	126.9	126.9	118.7	118.7	118.7
			SHC	63.5	91.5	119.6	61.5	89.5	117.5	59.3	87.2	115.2	56.7	84.6	112.6	54.0	81.8	109.7
		62	THC	133.5	133.5	150.5	128.7	128.7	145.0	123.3	123.3	138.9	117.2	117.2	132.1	110.5	110.5	124.5
			SHC	116.6	133.5	150.5	112.4	128.7	145.0	107.6	123.3	138.9	102.3	117.2	132.1	96.4	110.5	124.5
		67	THC	133.6	133.6	156.3	128.8	128.8	150.6	123.3	123.3	144.2	117.3	117.3	137.1	110.5	110.5	129.2
SHC	111.0	133.6	156.3	107.0	128.8	150.6	102.5	123.3	144.2	97.4	117.3	137.1	91.8	110.5	129.2			
76	EA (WB)	58	THC	137.1	137.1	154.6	131.5	131.5	151.9	125.1	125.1	148.6	118.2	118.2	144.5	110.8	110.8	138.2
			SHC	95.1	124.8	154.6	92.7	122.3	151.9	89.9	119.3	148.6	86.7	115.6	144.5	82.4	110.3	138.2
		62	THC	147.5	147.5	147.5	141.7	141.7	141.7	135.0	135.0	135.0	127.6	127.6	127.6	119.4	119.4	119.4
			SHC	65.0	95.3	125.6	63.0	93.3	123.6	60.7	91.0	121.2	58.2	88.4	118.6	55.4	85.6	115.8
		76	THC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SHC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

— Not operational

**PERFORMANCE DATA (cont.)**

**CAS151 & FAS150**

**COMBINATION RATINGS**

			AMBIENT TEMPERATURE															
			85			95			105			115			125			
			EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)			
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
3750 Cfm	EA (WB)	58	THC	138.4	138.4	152.4	133.2	133.2	147.0	127.6	127.6	141.2	121.6	121.6	135.0	113.3	113.3	126.5
		SHC	124.5	138.4	152.4	119.4	133.2	147.0	114.0	127.6	141.2	108.2	121.6	135.0	100.2	113.3	126.5	
	62	THC	144.5	144.5	144.5	137.9	137.9	138.9	131.0	131.0	135.4	123.7	123.7	131.6	–	–	–	
	SHC	114.9	128.6	142.3	111.8	125.4	138.9	108.6	122.0	135.4	105.0	118.3	131.6	–	–	–		
	67	THC	156.4	156.4	156.4	149.4	149.4	149.4	141.9	141.9	141.9	134.0	134.0	134.0	125.3	125.3	125.3	
SHC	95.6	108.7	121.7	92.7	105.7	118.6	89.7	102.5	115.3	86.5	99.2	111.9	83.1	95.7	108.2			
4375 Cfm	EA (WB)	58	THC	145.4	145.4	161.2	139.7	139.7	155.4	133.7	133.7	149.2	127.3	127.3	142.6	121.3	121.3	136.3
		SHC	129.5	145.4	161.2	124.0	139.7	155.4	118.3	133.7	149.2	112.1	127.3	142.6	106.3	121.3	136.3	
	62	THC	148.6	148.6	155.2	141.9	141.9	151.6	134.8	134.8	147.6	127.5	127.5	142.8	121.2	121.2	136.1	
	SHC	123.8	139.5	155.2	120.5	136.0	151.6	116.8	132.2	147.6	112.3	127.5	142.8	106.1	121.1	136.1		
	67	THC	160.2	160.2	160.2	152.9	152.9	152.9	145.2	145.2	145.2	136.9	136.9	136.9	127.9	127.9	127.9	
SHC	101.9	116.9	131.8	99.0	113.8	128.7	96.0	110.7	125.4	92.8	107.3	121.9	89.3	103.7	118.1			
5000 Cfm	EA (WB)	58	THC	151.0	151.0	168.8	145.0	145.0	162.6	138.7	138.7	156.0	131.9	131.9	149.0	124.6	124.6	141.4
		SHC	133.2	151.0	168.8	127.5	145.0	162.6	121.4	138.7	156.0	114.9	131.9	149.0	107.9	124.6	141.4	
	62	THC	152.2	152.2	166.8	145.3	145.3	162.8	138.9	138.9	156.2	132.0	132.0	149.1	124.7	124.7	141.5	
	SHC	131.5	149.1	166.8	127.8	145.3	162.8	121.5	138.9	156.2	115.0	132.0	149.1	107.9	124.7	141.5		
	67	THC	163.1	163.1	163.1	155.6	155.6	155.6	147.6	147.6	147.6	139.1	139.1	139.1	130.1	130.1	130.1	
SHC	107.9	124.8	141.6	105.0	121.7	138.5	101.9	118.5	135.1	98.6	115.1	131.5	95.1	111.4	127.7			
5625 Cfm	EA (WB)	58	THC	155.6	155.6	175.2	149.4	149.4	168.8	142.8	142.8	161.9	135.7	135.7	154.5	127.9	127.9	146.4
		SHC	136.0	155.6	175.2	130.0	149.4	168.8	123.7	142.8	161.9	116.8	135.7	154.5	109.4	127.9	146.4	
	62	THC	155.7	155.7	175.3	149.5	149.5	168.8	142.9	142.9	162.0	135.8	135.8	154.6	128.0	128.0	146.5	
	SHC	136.1	155.7	175.3	130.1	149.5	168.8	123.8	142.9	162.0	117.0	135.8	154.6	109.5	128.0	146.5		
	67	THC	165.3	165.3	165.3	157.8	157.8	157.8	149.6	149.6	149.6	140.9	140.9	140.9	131.7	131.7	136.8	
SHC	113.6	132.4	151.2	110.7	129.3	148.0	107.5	126.0	144.5	104.1	122.5	140.8	100.5	118.6	136.8			
6250 Cfm	EA (WB)	58	THC	159.5	159.5	180.9	153.1	153.1	174.3	146.2	146.2	167.1	138.9	138.9	159.5	131.0	131.0	151.2
		SHC	138.0	159.5	180.9	131.9	153.1	174.3	125.3	146.2	167.1	118.3	138.9	159.5	110.7	131.0	151.2	
	62	THC	159.6	159.6	181.0	153.2	153.2	174.4	146.3	146.3	167.2	139.0	139.0	159.5	131.0	131.0	151.2	
	SHC	138.2	159.6	181.0	132.0	153.2	174.4	125.5	146.3	167.2	118.4	139.0	159.5	110.7	131.0	151.2		
	67	THC	167.2	167.2	167.2	159.5	159.5	159.5	151.2	151.2	153.5	142.5	142.5	149.6	133.1	133.1	145.3	
SHC	119.0	139.7	160.4	116.0	136.6	157.1	112.8	133.1	153.5	109.2	129.4	149.6	105.3	125.3	145.3			
76	EA (WB)	72	THC	179.0	179.0	179.0	170.9	170.9	170.9	162.2	162.2	162.2	152.8	152.8	152.8	142.6	142.6	142.6
		SHC	87.9	107.4	126.8	85.1	104.5	123.8	82.2	101.4	120.6	79.1	98.2	117.2	75.9	94.7	113.5	
	76	THC	–	188.7	188.7	–	180.2	180.2	–	–	–	–	–	–	–	–	–	
	SHC	–	81.3	99.8	–	78.5	96.9	–	–	–	–	–	–	–	–	–		

– Not operational

**PERFORMANCE DATA (cont.)**

**CAS151 & FAS180**

**COMBINATION RATINGS**

			AMBIENT TEMPERATURE															
			85			95			105			115			125			
			EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)			
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
4500 Cfm	EA (wB)	58	THC	149.9	149.9	166.0	144.0	144.0	160.0	137.7	137.7	153.4	130.8	130.8	146.3	122.9	122.9	138.1
			SHC	133.8	149.9	166.0	128.1	144.0	160.0	122.0	137.7	153.4	115.3	130.8	146.3	107.8	122.9	138.1
		62	THC	152.8	152.8	160.5	145.8	145.8	156.7	138.6	138.6	152.1	131.1	131.1	146.5	122.0	122.0	137.1
			SHC	128.7	144.6	160.5	125.2	141.0	156.7	120.8	136.5	152.1	115.6	131.1	146.5	106.8	122.0	137.1
		67	THC	164.6	164.6	164.6	157.1	157.1	157.1	149.0	149.0	149.0	140.3	140.3	140.3	—	—	—
SHC	105.8		120.9	136.1	102.8	117.8	132.9	99.7	114.5	129.5	96.2	111.0	125.8	—	—	—		
72	THC	176.9	176.9	176.9	169.1	169.1	169.1	160.6	160.6	160.6	151.4	151.4	151.4	—	—	—		
	SHC	81.9	96.2	110.5	79.1	93.3	107.5	76.1	90.1	104.2	72.9	86.7	100.7	—	—	—		
76	THC	—	187.1	187.1	—	179.0	179.0	—	169.7	169.7	—	—	—	—	—	—		
	SHC	—	76.2	89.7	—	73.4	86.9	—	69.9	82.9	—	—	—	—	—	—		
5300 Cfm	EA (wB)	58	THC	156.6	156.6	175.0	150.4	150.4	168.6	143.7	143.7	161.7	136.4	136.4	154.1	124.7	124.7	141.2
			SHC	138.2	156.6	175.0	132.2	150.4	168.6	125.8	143.7	161.7	118.8	136.4	154.1	108.2	124.7	141.2
		62	THC	157.6	157.6	173.5	150.7	150.7	168.8	143.8	143.8	161.7	136.5	136.5	154.2	125.1	125.1	141.6
			SHC	136.9	155.2	173.5	132.5	150.7	168.8	125.9	143.8	161.7	118.9	136.5	154.2	108.6	125.1	141.6
		67	THC	167.9	167.9	167.9	160.2	160.2	160.2	151.8	151.8	152.2	142.9	142.9	144.4	—	—	—
SHC	113.4		131.0	148.5	110.5	127.9	145.3	107.3	124.5	141.7	103.8	120.9	138.0	—	—	—		
72	THC	180.2	180.2	180.2	172.1	172.1	172.1	163.4	163.4	163.4	153.9	153.9	153.9	—	—	—		
	SHC	85.9	102.4	118.8	83.1	99.5	115.8	80.1	96.3	112.5	76.9	92.9	109.0	—	—	—		
76	THC	—	189.4	189.4	—	181.2	181.2	—	—	—	—	—	—	—	—	—		
	SHC	—	78.2	93.1	—	75.5	90.3	—	—	—	—	—	—	—	—	—		
6000 Cfm	EA (wB)	58	THC	161.3	161.3	181.5	154.9	154.9	174.9	147.8	147.8	167.6	140.3	140.3	159.7	—	—	—
			SHC	141.1	161.3	181.5	134.9	154.9	174.9	128.1	147.8	167.6	120.9	140.3	159.7	—	—	—
		62	THC	161.7	161.7	181.1	155.0	155.0	175.0	148.0	148.0	167.7	140.4	140.4	159.8	—	—	—
			SHC	140.7	160.9	181.1	135.0	155.0	175.0	128.2	148.0	167.7	121.0	140.4	159.8	—	—	—
		67	THC	170.1	170.1	170.1	162.3	162.3	162.3	153.8	153.8	155.1	144.7	144.7	149.9	—	—	—
SHC	119.6		139.1	158.6	116.6	136.0	155.3	113.3	132.5	151.6	109.7	128.7	147.7	—	—	—		
72	THC	182.3	182.3	182.3	174.1	174.1	174.1	165.2	165.2	165.2	155.4	155.4	155.4	—	—	—		
	SHC	89.1	107.4	125.7	86.3	104.5	122.7	83.3	101.3	119.4	80.1	97.9	115.8	—	—	—		
76	THC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
	SHC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
6800 Cfm	EA (wB)	58	THC	166.2	166.2	188.7	159.5	159.5	181.8	152.2	152.2	174.2	144.3	144.3	165.9	—	—	—
			SHC	143.6	166.2	188.7	137.2	159.5	181.8	130.2	152.2	174.2	122.6	144.3	165.9	—	—	—
		62	THC	166.3	166.3	188.8	159.6	159.6	181.9	152.3	152.3	174.3	144.4	144.4	166.0	—	—	—
			SHC	143.8	166.3	188.8	137.4	159.6	181.9	130.3	152.3	174.3	122.7	144.4	166.0	—	—	—
		67	THC	172.4	172.4	175.3	164.5	164.5	169.2	155.9	155.9	163.4	146.7	146.7	159.1	—	—	—
SHC	126.9		148.8	170.7	123.8	145.5	167.3	120.3	141.9	163.4	116.3	137.6	159.1	—	—	—		
72	THC	184.4	184.4	184.4	176.1	176.1	176.1	167.0	167.0	167.0	157.1	157.1	157.1	—	—	—		
	SHC	93.0	113.5	134.1	90.2	110.6	131.1	87.2	107.5	127.8	84.0	104.1	124.2	—	—	—		
76	THC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
	SHC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
7500 Cfm	EA (wB)	58	THC	170.1	170.1	194.7	163.2	163.2	187.6	155.7	155.7	179.7	147.5	147.5	171.2	—	—	—
			SHC	145.4	170.1	194.7	138.8	163.2	187.6	131.6	155.7	179.7	123.8	147.5	171.2	—	—	—
		62	THC	170.2	170.2	194.8	163.3	163.3	187.7	155.8	155.8	179.8	147.6	147.6	171.3	—	—	—
			SHC	145.6	170.2	194.8	139.0	163.3	187.7	131.7	155.8	179.8	123.9	147.6	171.3	—	—	—
		67	THC	174.3	174.3	181.8	166.3	166.3	178.1	157.7	157.7	174.0	148.4	148.4	169.1	—	—	—
SHC	133.4		157.6	181.8	130.1	154.1	178.1	126.4	150.2	174.0	122.0	145.5	169.1	—	—	—		
72	THC	186.0	186.0	186.0	177.6	177.6	177.6	168.4	168.4	168.4	158.4	158.4	158.4	—	—	—		
	SHC	96.5	119.2	141.9	93.8	116.3	138.9	90.8	113.2	135.6	87.6	109.8	132.0	—	—	—		
76	THC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
	SHC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

— Not operational



**PERFORMANCE DATA (cont.)**

**CAS150 & FAS180**

**COMBINATION RATINGS**

				AMBIENT TEMPERATURE														
				85			95			105			115			125		
				EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)		
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85
4500 Cfm	EA (wB)	58	THC	145.6	145.6	164.1	140.4	140.4	158.2	134.6	134.6	151.7	128.4	128.4	144.6	121.6	121.6	137.0
			SHC	127.1	145.6	164.1	122.5	140.4	158.2	117.5	134.6	151.7	112.1	128.4	144.6	106.2	121.6	137.0
		62	THC	149.1	149.1	162.7	142.7	142.7	159.2	135.8	135.8	155.2	128.8	128.8	149.6	121.7	121.7	142.3
			SHC	117.6	140.1	162.7	114.5	136.8	159.2	110.9	133.1	155.2	106.4	128.0	149.6	101.1	121.7	142.3
		67	THC	161.2	161.2	161.2	154.4	154.4	154.4	147.0	147.0	147.0	138.8	138.8	138.8	130.1	130.1	130.1
	SHC		94.6	117.4	140.3	91.8	114.6	137.5	88.8	111.6	134.5	85.6	108.4	131.2	82.1	104.9	127.7	
	72	THC	174.0	174.0	174.0	167.0	167.0	167.0	159.1	159.1	159.1	150.6	150.6	150.6	141.2	141.2	141.2	
		SHC	70.0	93.0	116.1	67.4	90.4	113.4	64.6	87.6	110.6	61.6	84.5	107.5	58.3	81.2	104.1	
	76	THC	–	184.6	184.6	–	177.3	177.3	–	169.1	169.1	–	160.1	160.1	–	150.3	150.3	
		SHC	–	72.9	96.6	–	70.5	94.0	–	67.7	91.2	–	64.8	88.2	–	61.6	85.0	
5300 Cfm	EA (wB)	58	THC	152.7	152.7	172.0	147.0	147.0	165.7	140.9	140.9	158.8	134.3	134.3	151.3	127.0	127.0	143.1
			SHC	133.2	152.7	172.0	128.4	147.0	165.7	123.1	140.9	158.8	117.3	134.3	151.3	110.8	127.0	143.1
		62	THC	153.6	153.6	176.8	147.4	147.4	171.5	141.0	141.0	165.0	134.4	134.4	157.2	127.1	127.1	148.6
			SHC	126.2	151.5	176.8	122.0	146.8	171.5	117.2	141.0	165.0	111.6	134.4	157.2	105.6	127.1	148.6
		67	THC	164.9	164.9	164.9	157.8	157.8	157.9	150.2	150.2	150.6	141.7	141.7	144.5	132.6	132.6	140.7
	SHC		100.8	127.3	153.7	98.0	124.5	150.9	95.0	121.4	147.8	91.7	118.1	144.5	88.1	114.4	140.7	
	72	THC	177.6	177.6	177.6	170.3	170.3	170.3	162.2	162.2	162.2	153.3	153.3	153.3	143.7	143.7	143.7	
		SHC	72.4	99.1	125.7	69.9	96.5	123.1	67.0	93.7	120.2	64.0	90.6	117.1	60.6	87.2	113.7	
	76	THC	–	188.2	188.2	–	180.6	180.6	–	172.1	172.1	–	162.9	162.9	–	152.8	152.8	
		SHC	–	76.0	103.2	–	73.5	100.6	–	70.8	97.9	–	67.9	94.9	–	64.7	91.6	
6000 Cfm	EA (wB)	58	THC	157.7	157.7	177.7	151.8	151.8	171.1	145.5	145.5	163.9	138.5	138.5	156.1	130.9	130.9	147.5
			SHC	137.6	157.7	177.7	132.6	151.8	171.1	127.0	145.5	163.9	120.9	138.5	156.1	114.3	130.9	147.5
		62	THC	157.8	157.8	184.5	152.0	152.0	177.7	145.6	145.6	170.2	138.6	138.6	162.1	131.0	131.0	153.2
			SHC	131.1	157.8	184.5	126.2	152.0	177.7	120.9	145.6	170.2	115.1	138.6	162.1	108.8	131.0	153.2
		67	THC	167.2	167.2	167.2	160.1	160.1	162.1	152.3	152.3	158.9	143.7	143.7	155.3	134.6	134.6	151.3
	SHC		105.9	135.5	165.0	103.1	132.6	162.1	100.0	129.5	158.9	96.7	126.0	155.3	93.0	122.1	151.3	
	72	THC	180.0	180.0	180.0	172.6	172.6	172.6	164.3	164.3	164.3	155.3	155.3	155.3	145.4	145.4	145.4	
		SHC	74.5	104.3	134.0	72.0	101.6	131.3	69.1	98.8	128.4	66.1	95.7	125.3	62.7	92.3	121.9	
	76	THC	–	190.6	190.6	–	182.8	182.8	–	174.2	174.2	–	164.8	164.8	–	154.6	154.6	
		SHC	–	78.6	108.9	–	76.1	106.3	–	73.4	103.5	–	70.5	100.5	–	67.3	97.3	
6800 Cfm	EA (wB)	58	THC	162.2	162.2	182.9	156.2	156.2	176.1	149.6	149.6	168.6	142.4	142.4	160.4	134.5	134.5	151.5
			SHC	141.7	162.2	182.9	136.4	156.2	176.1	130.7	149.6	168.6	124.3	142.4	160.4	117.4	134.5	151.5
		62	THC	162.4	162.4	190.0	156.3	156.3	182.9	149.7	149.7	175.1	142.5	142.5	166.6	134.6	134.6	157.3
			SHC	134.9	162.4	190.0	129.9	156.3	182.9	124.4	149.7	175.1	118.4	142.5	166.6	111.8	134.6	157.3
		67	THC	169.5	169.5	177.2	162.2	162.2	174.2	154.3	154.3	170.7	145.7	145.7	166.7	136.4	136.4	162.1
	SHC		111.5	144.4	177.2	108.6	141.4	174.2	105.5	138.1	170.7	101.9	134.4	166.7	98.1	130.0	162.1	
	72	THC	182.2	182.2	182.2	174.6	174.6	174.6	166.2	166.2	166.2	157.0	157.0	157.0	146.9	146.9	146.9	
		SHC	76.8	109.9	143.1	74.2	107.3	140.5	71.4	104.4	137.6	68.3	101.3	134.5	65.0	97.9	131.0	
	76	THC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
		SHC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
7500 Cfm	EA (wB)	58	THC	165.7	165.7	186.8	159.6	159.6	179.8	152.7	152.7	172.1	145.2	145.2	163.7	137.1	137.1	154.5
			SHC	144.7	165.7	186.8	139.3	159.6	179.8	133.4	152.7	172.1	126.8	145.2	163.7	119.7	137.1	154.5
		62	THC	165.9	165.9	193.9	159.6	159.6	186.7	152.8	152.8	178.7	145.3	145.3	169.9	137.2	137.2	160.4
			SHC	137.8	165.9	193.9	132.6	159.6	186.7	126.9	152.8	178.7	120.7	145.3	169.9	113.9	137.2	160.4
		67	THC	171.2	171.2	187.4	163.9	163.9	184.1	155.9	155.9	180.3	147.2	147.2	175.8	137.9	137.9	170.1
	SHC		116.2	151.8	187.4	113.2	148.7	184.1	109.9	145.1	180.3	106.2	141.0	175.8	101.8	135.9	170.1	
	72	THC	183.8	183.8	183.8	176.0	176.0	176.0	167.5	167.5	167.5	158.2	158.2	158.2	148.0	148.0	148.0	
		SHC	78.7	114.8	150.9	76.1	112.2	148.3	73.3	109.3	145.4	70.2	106.2	142.2	66.9	102.8	138.7	
	76	THC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
		SHC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	

– Not operational

**PERFORMANCE DATA (cont.)**

**CAS181 & FAS180**

**COMBINATION RATINGS**

			AMBIENT TEMPERATURE															
			85			95			105			115			125			
			EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)			
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
4500 Cfm	EA (WB)	58	THC	169.9	169.9	190.5	164.1	164.1	184.2	157.5	157.5	176.8	151.4	151.4	170.0	—	—	—
			SHC	148.9	169.7	190.5	143.9	164.1	184.2	138.1	157.5	176.8	132.7	151.4	170.0	—	—	—
		62	THC	178.8	178.8	178.8	171.5	171.5	174.3	163.3	163.3	170.5	155.3	155.3	166.3	146.7	146.7	161.9
			SHC	133.1	155.4	177.8	129.5	151.9	174.3	125.7	148.1	170.5	121.7	144.0	166.3	117.4	139.7	161.9
		67	THC	193.8	193.8	193.8	186.0	186.0	186.0	177.5	177.5	177.5	168.6	168.6	168.6	—	—	—
	SHC		108.6	130.7	152.8	105.2	127.4	149.5	101.6	123.8	146.0	97.8	120.1	142.4	—	—	—	
	72	THC	210.1	210.1	210.1	201.7	201.7	201.7	192.6	192.6	192.6	182.7	182.7	182.7	—	—	—	
		SHC	85.0	106.1	127.1	81.6	103.0	124.3	77.9	99.5	121.1	74.0	95.9	117.7	—	—	—	
	76	THC	—	223.4	223.4	—	215.0	215.0	—	205.5	205.5	—	194.8	194.8	—	—	—	
		SHC	—	86.6	111.3	—	82.8	107.5	—	79.6	104.3	—	76.5	101.3	—	—	—	
5250 Cfm	EA (WB)	58	THC	178.2	178.2	200.2	172.0	172.0	193.3	164.8	164.8	185.2	158.4	158.4	178.0	150.6	150.6	169.3
			SHC	156.3	178.2	200.2	150.8	172.0	193.3	144.4	164.8	185.2	138.7	158.4	178.0	131.9	150.6	169.3
		62	THC	184.0	184.0	193.8	176.0	176.0	189.8	167.6	167.6	185.5	159.7	159.7	180.7	151.0	151.0	174.3
			SHC	142.4	168.1	193.8	138.5	164.1	189.8	134.4	160.0	185.5	130.1	155.4	180.7	124.8	149.6	174.3
		67	THC	199.0	199.0	199.0	190.8	190.8	190.8	181.6	181.6	181.6	172.6	172.6	172.6	—	—	—
	SHC		114.5	140.0	165.6	111.0	136.6	162.2	107.2	132.9	158.6	103.5	129.2	154.9	—	—	—	
	72	THC	215.3	215.3	215.3	206.5	206.5	206.5	196.9	196.9	196.9	186.7	186.7	186.7	—	—	—	
		SHC	87.1	111.9	136.7	83.7	108.7	133.7	80.0	105.2	130.3	76.2	101.4	126.7	—	—	—	
	76	THC	—	229.0	229.0	—	219.8	219.8	—	209.6	209.6	—	198.7	198.7	—	—	—	
		SHC	—	89.0	117.8	—	86.3	115.2	—	83.2	105.2	—	79.7	103.1	—	—	—	
6000 Cfm	EA (WB)	58	THC	185.2	185.2	208.1	178.7	178.7	200.8	170.9	170.9	192.2	164.2	164.2	184.6	156.1	156.1	175.6
			SHC	162.2	185.2	208.1	156.5	178.7	200.8	149.6	170.9	192.2	143.7	164.2	184.6	136.6	156.1	175.6
		62	THC	188.1	188.1	208.1	180.3	180.3	203.5	—	—	—	164.5	164.5	189.5	156.3	156.3	181.6
			SHC	150.7	179.4	208.1	146.6	175.1	203.5	—	—	—	135.6	162.5	189.5	129.7	155.6	181.6
		67	THC	203.1	203.1	203.1	194.6	194.6	194.6	185.6	185.6	185.6	175.8	175.8	175.8	—	—	—
	SHC		120.0	148.9	177.8	116.6	145.5	174.4	112.8	141.8	170.8	108.9	137.9	166.9	—	—	—	
	72	THC	219.3	219.3	219.3	210.2	210.2	210.2	200.2	200.2	200.2	189.8	189.8	189.8	—	—	—	
		SHC	89.2	117.4	145.7	85.8	114.2	142.6	82.0	110.6	139.1	78.2	106.8	135.5	—	—	—	
	76	THC	—	232.9	232.9	—	223.4	223.4	—	213.1	213.1	—	201.9	201.9	—	—	—	
		SHC	—	92.4	116.9	—	89.4	115.2	—	86.2	112.9	—	82.6	110.0	—	—	—	
6750 Cfm	EA (WB)	58	THC	191.0	191.0	214.8	184.2	184.2	207.2	176.6	176.6	198.6	169.0	169.0	190.1	160.6	160.6	180.7
			SHC	167.3	191.0	214.8	161.2	184.2	207.2	154.5	176.6	198.6	147.8	169.0	190.1	140.5	160.6	180.7
		62	THC	192.1	192.1	219.7	184.5	184.5	212.5	177.8	177.8	202.9	168.9	168.9	197.3	160.6	160.6	187.6
			SHC	157.7	188.7	219.7	152.1	182.3	212.5	145.5	174.2	202.9	140.6	168.9	197.3	133.6	160.6	187.6
		67	THC	206.4	206.4	206.4	197.7	197.7	197.7	188.2	188.2	188.2	178.4	178.4	178.5	—	—	—
	SHC		125.4	157.5	189.7	121.8	154.0	186.2	118.0	150.2	182.5	114.1	146.3	178.5	—	—	—	
	72	THC	222.5	222.5	222.5	213.1	213.1	213.1	203.1	203.1	203.1	192.4	192.4	192.4	—	—	—	
		SHC	91.1	122.7	154.3	87.7	119.4	151.1	84.0	115.8	147.5	80.2	112.1	144.0	—	—	—	
	76	THC	—	236.1	236.1	—	226.5	226.5	—	215.9	215.9	—	204.4	204.4	—	—	—	
		SHC	—	95.3	124.6	—	92.3	122.2	—	89.0	119.5	—	85.4	116.3	—	—	—	
7500 Cfm	EA (WB)	58	THC	196.0	196.0	220.5	189.0	189.0	212.6	181.2	181.2	204.0	173.1	173.1	194.8	—	—	—
			SHC	171.5	196.0	220.5	165.3	189.0	212.6	158.5	181.2	204.0	151.4	173.1	194.8	—	—	—
		62	THC	196.1	196.1	228.2	189.0	189.0	220.6	182.3	182.3	207.2	173.1	173.1	202.2	—	—	—
			SHC	162.9	195.5	228.2	157.3	189.0	220.6	148.6	177.9	207.2	144.0	173.1	202.2	—	—	—
		67	THC	209.1	209.1	209.1	200.2	200.2	200.2	190.5	190.5	193.8	180.5	180.5	189.7	—	—	—
	SHC		130.5	165.8	201.1	126.9	162.2	197.6	123.1	158.4	193.8	119.1	154.4	189.7	—	—	—	
	72	THC	225.2	225.2	225.2	215.6	215.6	215.6	205.4	205.4	205.4	194.4	194.4	194.4	—	—	—	
		SHC	93.0	127.9	162.7	89.6	124.5	159.4	85.9	120.9	155.9	82.0	117.1	152.2	—	—	—	
	76	THC	—	238.9	238.9	—	229.0	229.0	—	218.1	218.1	—	206.4	206.4	—	—	—	
		SHC	—	98.1	131.2	—	95.0	128.6	—	91.6	125.6	—	88.0	122.3	—	—	—	

— Not operational

















# ELECTRICAL DATA

## CAS072 COOLING WITHOUT POWERED CONVENIENCE OUTLET

V-Ph-Hz	VOLTAGE RANGE		COMP 1		OFM (ea)		POWER SUPPLY	
	MIN	MAX	RLA	LRA	WATTS	FLA	MCA	Fuse
230-3-60	187	253	19	123	325	1.5	26.7	40
460-3-60	414	506	9.7	62	325	0.8	13.7	20
575-3-60	518	633	7.4	50	325	0.6	10.4	15

## CAS091 COOLING WITHOUT POWERED CONVENIENCE OUTLET

V-Ph-Hz	VOLTAGE RANGE		COMP 1		OFM (ea)		POWER SUPPLY	
	MIN	MAX	RLA	LRA	WATTS	FLA	MCA	Fuse
230-3-60	187	253	25	164	325	1.5	34.2	50
460-3-60	414	506	12.2	100	325	0.8	16.8	25
575-3-60	518	633	9.0	78	325	0.6	12.4	20

## CAS121 COOLING WITHOUT POWERED CONVENIENCE OUTLET

V-Ph-Hz	VOLTAGE RANGE		COMP 1		OFM (ea)		POWER SUPPLY	
	MIN	MAX	RLA	LRA	WATTS	FLA	MCA	Fuse
230-3-60	187	253	30.1	225	325	1.5	40.6	60
460-3-60	414	506	16.7	114	325	0.8	22.5	40
575-3-60	518	633	12.2	80	325	0.6	16.4	30

## CAS120 COOLING WITHOUT POWERED CONVENIENCE OUTLET

V-Ph-Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		POWER SUPPLY	
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	MCA	Fuse
208/230-3-60	187	253	16	110	16	110	325	1.5	40.6	60
460-3-60	414	506	7.8	52	7.8	52	325	0.8	22.5	40
575-3-60	518	633	5.7	39	5.7	39	325	0.6	16.4	30

## CAS151 COOLING WITHOUT POWERED CONVENIENCE OUTLET

V-Ph-Hz	VOLTAGE RANGE		COMP 1		OFM (ea)		POWER SUPPLY	
	MIN	MAX	RLA	LRA	WATTS	FLA	MCA	Fuse
230-3-60	187	253	48.1	245	325	1.5	63.1	100
460-3-60	414	506	18.6	125	325	0.8	24.8	40
575-3-60	518	633	14.7	100	325	0.6	19.6	30

## CAS150 COOLING WITHOUT POWERED CONVENIENCE OUTLET

V-Ph-Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		POWER SUPPLY	
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	MCA	Fuse
208/230-3-60	187	253	22.40	149	22.40	149	325	1.5	53.4	60
460-3-60	414	506	10.6	75	10.6	75	325	0.8	25.4	30
575-3-60	518	633	7.7	54	7.7	54	325	0.6	18.5	25

## ELECTRICAL DATA (CONT.)

### CAS181 COOLING WITHOUT POWERED CONVENIENCE OUTLET

V-Ph-Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		POWER SUPPLY	
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	MCA	Fuse
208/230-3-60	187	253	25	164	25	164	325	1.5	60.7	80
460-3-60	414	506	12.2	100	12.2	100	325	0.8	29.8	40
575-3-60	518	633	9	78	9	78	325	0.6	22.0	30

### CAS180 COOLING WITHOUT POWERED CONVENIENCE OUTLET

V-Ph-Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		POWER SUPPLY	
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	MCA	Fuse
208/230-3-60	187	253	25	164	25	164	325	1.5	60.7	80
460-3-60	414	506	12.2	100	12.2	100	325	0.8	29.8	40
575-3-60	518	633	9	78	9	78	325	0.6	22.0	30

### CAS241 COOLING WITHOUT POWERED CONVENIENCE OUTLET

V-Ph-Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		POWER SUPPLY	
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	MCA	Fuse
208/230-3-60	187	253	30.1	225	30.1	225	325	1.5	73.7	100
460-3-60	414	506	16.7	114	16.7	114	325	0.8	40.8	50
575-3-60	518	633	12.2	80	12.2	80	325	0.6	29.8	40

### CAS240 COOLING WITHOUT POWERED CONVENIENCE OUTLET

V-Ph-Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		POWER SUPPLY	
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	MCA	Fuse
208/230-3-60	187	253	30.1	225	30.1	225	325	1.5	73.7	100
460-3-60	414	506	16.7	114	16.7	114	325	0.8	40.8	50
575-3-60	518	633	12.2	80	12.2	80	325	0.6	29.8	40



## APPLICATION DATA

### Operating limits

Maximum outdoor temperature	125°F
Minimum return-air temperature (FAS)	55°F
Maximum return-air temperature (FAS)	95°F
Range of acceptable saturation suction temperature	20°F to 50°F
Maximum discharge temperature	275F
Minimum discharge superheat	60°F

### NOTES:

- Select air handler at no less than 300 cfm/ton (nominal condensing unit capacity).
- Total combined draw of the field-supplied liquid line solenoid valve and air handler fan contactor must not exceed 22 va. If the specified va must be exceeded, use a remote relay to control the load.

### Liquid line

For applications with liquid lift greater than 20 ft, use 1/2-in. liquid line where 3/8 in. is shown; use 5/8-in. liquid line where 1/2 in. is shown. The maximum liquid lift is 60 ft.

### MINIMUM OUTDOOR-AIR OPERATING TEMPERATURE

UNIT	MINIMUM OUTDOOR TEMP (F)	
	Std	With Motormaster® Control†
CAS072	35	-20
CAS091	35	
CAS121	35	
CAS151	35	
CAS181	35	
CAS240	35	
CAS120	35	
CAS150	35	
CAS180	35	
CAS240	35	

† Wind baffles (field-supplied and field-installed) are recommended for all units with Motormaster control. Refer to Low Ambient Temperature Control Installation Instructions for additional information.

### Refrigerant Piping

Do not bury refrigerant piping underground.

It is recommended that the refrigerant piping for all commercial split systems include a liquid line solenoid valve, a liquid line filter drier and a sight glass.

For refrigerant lines longer than 75 lineal ft, a liquid line solenoid valve installed at the **indoor** unit and a suction accumulator are required. Refer to the Refrigerant Specialties Part Numbers table.

### REFRIGERANT SPECIALTIES PART NUMBERS

UNIT	LIQUID LINE SIZE (in.)	LIQUID LINE SOLENOID VALVE (LLSV)	LLSV COIL	SIGHT GLASS	FILTER DRIER	SUCTION LINE ACCUMULATOR
CAS072	3/8	1178274	1178273	HMI-1TT3	1178266	1178265*
CAS091	3/8	1178274	1178273	HMI-1TT3	1178266	1178265*
	1/2	1178275	1178273	HMI-1TT4	EK164S	1178265*
CAS121	1/2	1178276	1178273	HMI-1TT4	EK164S	1178264
CAS151	5/8	1178277	1178273	HMI-1TT5	1178267	1178264
CAS181	5/8	1178277	1178273	HMI-1TT5	1178267	1179084*
CAS241	5/8	1178277	1178273	HMI-1TT5	1178267	1179084*
CAS120	3/8	1178274 (Qty 2)	1178273	HMI-1TT3	1178266	1179084 (Qty 2)
CAS150	1/2	1178275 (Qty 2)	1178273	HMI-1TT4	1178267	1178265 (Qty 2)
CAS180	1/2	1178276 (Qty 2)	1178273	HMI-1TT4 (Qty 2)	EK164S (Qty 2)	1178265 (Qty 2)
CAS240	1/2	1178276 (Qty 2)	1178273	HMI-1TT4 (Qty 2)	EK304S (Qty 2)	1178265 (Qty 2)

\* Bushings required

**CAS072-151 PIPING RECOMMENDATIONS (SINGLE-CIRCUIT UNIT)**

R-410A	EQUIVALENT LENGTH										
	FT	0-38		38-75		75-113		113-150		150-188	
	M	0-12		12-23		23-34		34-46		46-57	
Model	Typ Linear ft	0-25		25-50		50-75		75-100		100-125	
CAS072	Liquid Line	3/8		3/8	1/2	1/2		1/2	5/8	1/2	5/8
	Max Lift	25		42	50	75		90	100	86	101
	Suction Line	7/8	1-1/8	7/8	1-1/8	1-1/8		1-1/8		1-1/8	
	Charge (lbs)	8.4		9.6	11.1	13.1		15.0	18.8	16.9	22.6
CAS091	Liquid Line	1/2		1/2		1/2		1/2		1/2	
	Max Lift	25		50		75		100		112	
	Suction Line	7/8	1-1/8	1-1/8		1-1/8		1-1/8		1-1/8	
	Charge (lbs)	11.8		9.6		12.9		16.8		18.7	
CAS121	Liquid Line	1/2		1/2	1/2	5/8	1/2	5/8	1/2	5/8	
	Max Lift	25		50		48	73	54	87	43	84
	Suction Line	1-1/8		1-1/8		1-1/8		1-1/8	1-3/8	1-1/8	1-3/8
	Charge (lbs)	13.9		15.4		17.3	20.1	20.0	23.7	22.1	26.8
CAS151	Liquid Line	1/2		1/2	5/8	1/2	5/8	5/8	3/4	5/8	3/4
	Max Lift	25		50	50	45	75	100	100	95	107
	Suction Line	1-1/8		1-1/8		1-3/8		1-3/8		1-3/8	
	Charge (lbs)	16.9		18.8	20.7	21.3	24.1	27.2	32.2	30.2	36.5
CAS181	Liquid Line	5/8		5/8		5/8		5/8		5/8	
	Max Lift	25		50		75		100		125	
	Suction Line	1-1/8		1-3/8		1-3/8		1-3/8		1-3/8	1-5/8
	Charge (lbs)	24.3		27.5		30.6		33.7		37.8	
CAS241	Liquid Line	5/8		5/8		5/8		5/8		5/8	
	Max Lift	25		50		71		77		63	
	Suction Line	1-1/8	1-3/8	1-3/8		1-3/8	1-5/8	1-5/8		1-5/8	
	Charge (lbs)	37.8		40.8		44.6		47.8		51.1	

**LEGEND**

- Length Equiv – Equivalent tubing length, including effects of refrigeration specialties devices
- Typ Linear – Typical linear tubing length, Feet (50% added to linear to define Equivalent Length for this table)
- Liquid Line – Tubing size, inches OD.
- Max Lift – Maximum liquid lift (indoor unit ABOVE outdoor unit only), at maximum permitted liquid line pressure drop —
  - Linear Length Less than 100 ft: Minimum 2.0°F subcooling entering TXV
  - Linear Length Greater than 100 ft: Minimum 0.5°F subcooling entering TXV
- Suction Line – Tube size, inches OD
- Charge – Charge Quantity, lbs. Calculated for both liquid line sizes (where applicable), but only with larger suction line size (where applicable)

**NOTE:** For applications with equivalent length greater than 188 ft (57 m) and/or linear length greater than 125 ft (38 m), contact your local dealer representative.

## CAS120–240 PIPING RECOMMENDATIONS (TWO-CIRCUIT UNIT)

**NOTES:** CAS120, CAS150, CAS180, CAS240 require TWO sets of refrigeration piping

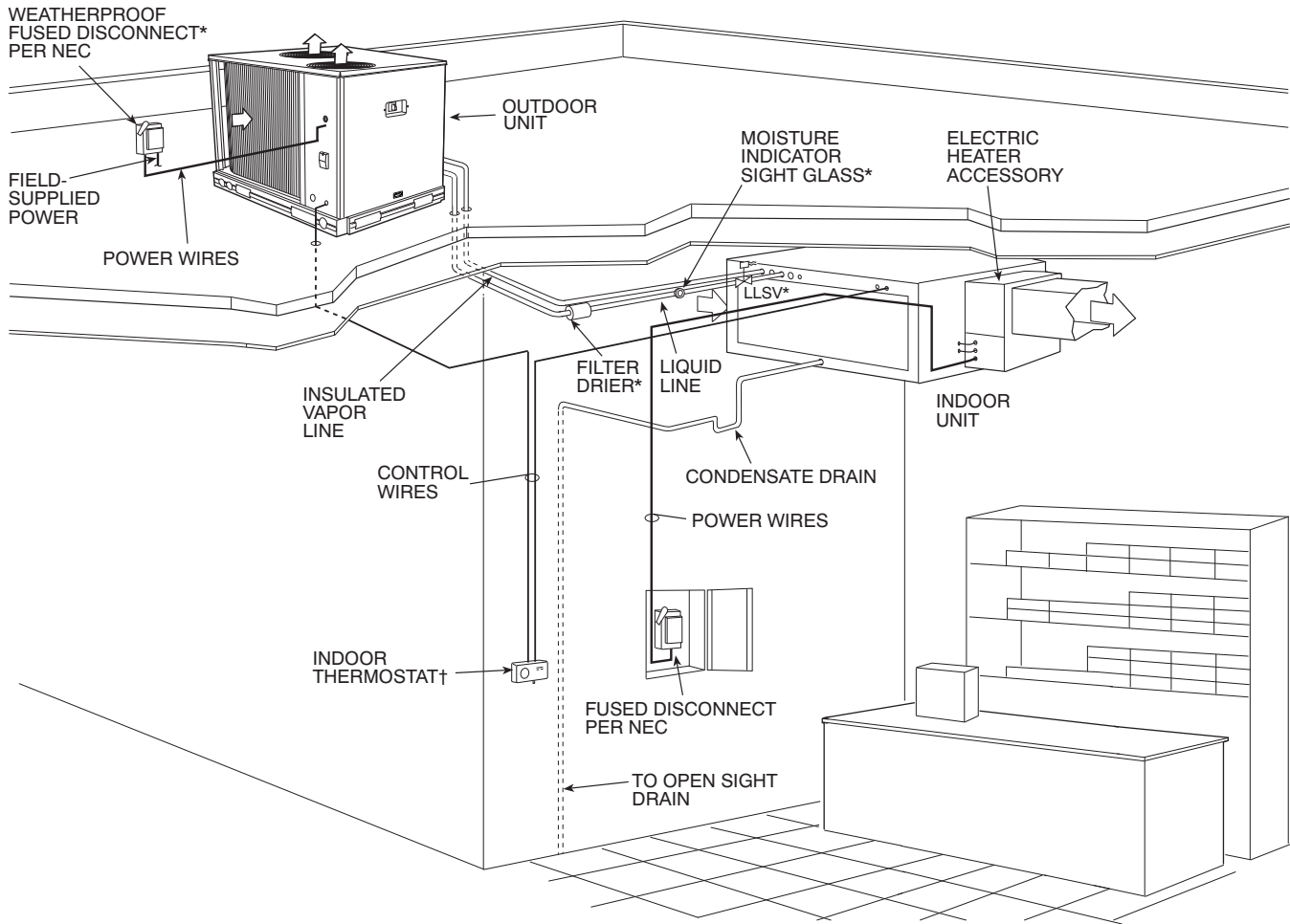
R-410A	EQUIVALENT LENGTH										
	FT	0-38		38-75		75-113		113-150		150-188	
	M	0-12		12-23		23-34		34-46		46-57	
Model	Typ Linear ft	0-25		25-50		50-75		75-100		100-125	
CAS120	Liquid Line	$\frac{3}{8}$		$\frac{3}{8}$		$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$		$\frac{1}{2}$	
	Max Lift	25		50		28	75	100		99	
	Suction Line	$\frac{7}{8}$		$\frac{7}{8}$		$1\frac{1}{8}$		$1\frac{1}{8}$		$1\frac{1}{8}$	
	Charge ea. (lbs)	7.1		8.1		9.6	11.9	13.8		15.8	
CAS150	Liquid Line	$\frac{3}{8}$		$\frac{3}{8}$		$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$		$\frac{1}{2}$	
	Max Lift	25		50		48	75	100		122	
	Suction Line	$\frac{7}{8}$		$\frac{7}{8}$		$1\frac{1}{8}$		$1\frac{1}{8}$		$1\frac{1}{8}$	
	Charge ea. (lbs)	9.7		10.7		12.2	14.5	16.4		18.4	
CAS180	Liquid Line	$\frac{1}{2}$		$\frac{1}{2}$		$\frac{1}{2}$		$\frac{1}{2}$		$\frac{1}{2}$	
	Max Lift	25		50		75		100		125	
	Suction Line	$\frac{7}{8}$		$1\frac{1}{8}$		$1\frac{1}{8}$		$1\frac{1}{8}$		$1\frac{1}{8}$	
	Charge ea. (lbs)	11.7		13.8		15.7		17.6		19.6	
CAS240	Liquid Line	$\frac{1}{2}$		$\frac{1}{2}$		$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{5}{8}$
	Max Lift	25		50		54	75	60	99	46	95
	Suction Line	$1\frac{1}{8}$		$1\frac{1}{8}$		$1\frac{1}{8}$		$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{3}{8}$	
	Charge (lbs)										
	A	19.3		21.0		23.0	26.0	25.9	29.7	28.0	32.7
B	18.3		20.3		22.0	25.0	24.9	28.7	27.0	31.7	

### LEGEND

- Length Equiv – Equivalent tubing length, including effects of refrigeration specialties devices
- Typ Linear – Typical linear tubing length, Feet (50% added to linear to define Equivalent Length for this table)
- Liquid Line – Tubing size, inches OD.
- Max Lift – Maximum liquid lift (indoor unit ABOVE outdoor unit only), at maximum permitted liquid line pressure drop —
  - Linear Length Less than 100 ft: Minimum 2.0°F subcooling entering TXV
  - Linear Length Greater than 100 ft: Minimum 0.5°F subcooling entering TXV
- Suction Line – Tube size, inches OD
- Charge – Charge Quantity, lbs. Calculated for both liquid line sizes (where applicable), but only with larger suction line size (where applicable)

**NOTE:** For applications with equivalent length greater than 188 ft (57 m) and/or linear length greater than 125 ft (38 m), contact your local dealer representative.

# TYPICAL PIPING AND WIRING



## LEGEND:

NEC – National Electrical Code

TXV – Thermostatic Expansion Valve

\* Field-supplied

† Double riser may be required. Consult condensing unit product data catalog for details.

## NOTES:

1. All piping must follow standard refrigerant piping techniques.

2. All wiring must comply with the applicable local and national codes.

3. Wiring and piping shown are general points-of-connection guides only and are not intended for, or to include all details for, a specific installation.

4. Liquid line solenoid valve (solenoid drop control) is recommended to prevent refrigerant migration to the compressor.

5. Internal factory-supplied TXVs not shown.

# GUIDE SPECIFICATIONS

## Commercial Air-Cooled Condensing Units

### HVAC Guide Specifications

Size Range: **CAS 6 to 20 Tons, Nominal**

#### Part 1 — General

##### 1.01 SYSTEM DESCRIPTION

Outdoor-mounted, air-cooled condensing unit suitable for on-the-ground or rooftop installation. Unit shall consist of a hermetic scroll air-conditioning compressor assembly, an air-cooled coil, propeller-type condenser fans, and a control box. Unit shall discharge supply air upward as shown on contract drawings. Unit shall be used in a refrigeration circuit matched with a packaged air-handling unit.

##### 1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with AHRI Standard 360.
- B. Unit construction shall comply with ANSI/ASHRAE 15 safety code latest revision and comply with NEC.
- C. Unit shall be constructed in accordance with UL 1995 standard and shall carry the UL and UL, Canada label.
- D. Unit cabinet shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
- E. Air-cooled condenser coils for hermetic compressor units (CAS) shall be leak tested at 150 psig, and pressure tested at 650 psig.
- F. Unit shall be manufactured in a facility registered to ISO 9001:2000 manufacturing quality standard.

##### 1.03 DELIVERY, STORAGE, AND HANDLING

Unit shall be shipped as single package only, and shall be stored and handled according to unit manufacturer's recommendations.

##### 1.04 WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER.)

#### Part 2 — Products

##### 2.01 EQUIPMENT

###### A. General:

Factory-assembled, single piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressor, holding charge, and special features required prior to field start-up.

###### B. Unit Cabinet:

- 1. Unit cabinet shall be constructed of G90 galvanized steel for CAS180 & 240, G60 galvanized steel for CAS072-150, bonderized and coated with a prepainted baked enamel finish.
- 2. A heavy-gauge roll-formed perimeter base rail with forklift slots and lifting holes shall be provided to facilitate rigging.

###### C. Condenser Fans:

- 1. Condenser fans shall be direct driven, propeller type, discharging air vertically upward.
- 2. Fan blades shall be balanced.
- 3. Condenser fan discharge openings shall be equipped with PVC-coated steel wire safety guards.
- 4. Condenser fan and motor shaft shall be corrosion resistant.

###### D. Compressor:

- 1. Compressor shall be of the hermetic scroll type .
- 2. Compressor shall be mounted on rubber grommets.
- 3. Compressors shall include overload protection.
- 4. Compressors shall be equipped with a crankcase heater.
- 5. Compressor shall be equipped with internal high pressure and high temperature protection.
- 6. CAS181 and CAS241 shall use two scroll compressors manifold together.

###### E. Condenser Coil:

- 1. Condenser coil shall be air-cooled and circuited for integral subcooler.
- 2. Standard condenser coils shall have all aluminum micro-channel (MCHX) Heat Exchanger Technology design consisting of aluminum multi-port flat tube design and aluminum fin. Coils shall be a furnace brazed design and contain epoxy lined shrink wrap on all aluminum to copper connections. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 199 burst test at 1980 psig.

###### F. Refrigeration Components:

Refrigeration circuit components shall include liquid line service valve, suction line service valve, a full charge of compressor oil, and a partial holding charge of refrigerant.

###### G. Controls and Safeties:

- 1. Minimum control functions shall include:
  - a. Control wire terminal blocks.
  - b. Compressor lockout on auto-reset safety until reset from thermostat.
  - c. Each unit shall utilize the Comfort Alert™ Diagnostic Board that provides:
    - 1.) System Pressure Trip fault code indication
    - 2.) Short Cycling fault code indication
    - 3.) Locked Rotor fault code indication
    - 4.) Open Circuit fault code indication
    - 5.) Reverse Phase 3 fault code indication
    - 6.) Welded Contactor fault code indication
    - 7.) Low Voltage fault code indication
    - 8.) Anti-short cycle protection
    - 9.) Phase reversal protection
- 2. Minimum safety devices which are equipped with automatic reset (after resetting first at thermostat), shall include:

- a. High discharge pressure cutout.
  - b. Low pressure cutout.
- H. Operating Characteristics:
1. The capacity of the condensing unit shall meet or exceed \_\_\_\_\_ Btuh at a suction temperature of \_\_\_\_\_ °F. The power consumption at full load shall not exceed \_\_\_\_\_ kW.
  2. The combination of the condensing unit and the evaporator or fan coil unit shall have a total net cooling capacity of \_\_\_\_\_ Btuh or greater at conditions of \_\_\_\_\_ cfm entering-air temperature at the evaporator at \_\_\_\_\_ °F wet bulb and \_\_\_\_\_ °F dry bulb, and air entering the condensing unit at \_\_\_\_\_ °F.
  3. The system shall have an EER of \_\_\_\_\_ Btuh/Watt or greater at standard ARI conditions.
- I. Electrical Requirements:
1. Nominal unit electrical characteristics shall be \_\_\_\_\_ v, 3-ph, 60 Hz. The unit shall be capable of satisfactory operation within voltage limits of \_\_\_\_\_ v to \_\_\_\_\_ v.
  2. Unit electrical power shall be single-point connection.
  3. Unit control circuit shall contain a 24-v transformer for unit control.
- J. Special Features:
1. Low-Ambient Temperature Control:  
A low-ambient temperature control shall be available as a factory-installed option or as a field-installed accessory. This low-ambient control shall regulate speed of the condenser-fan motors in response to the saturated condensing temperature of the unit. The control shall maintain correct condensing pressure at outdoor temperatures down to -20°F (-29°C).
  2. Optional Condenser Coil Materials:
    - a. Condenser Coil Protective Coating — E-Coated micro-channel (MCHX) coil:  
E-Coated aluminum micro-channel (MCHX) coils shall have a flexible epoxy polymer coating uniformly applied to all coil external surface areas without material bridging between fins or louvers. Coating process shall ensure complete coil encapsulation, including all exposed fin edges. 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. E-Coated coils shall have superior hardness characteristics of 2H per ASTM D3363-00 and cross-hatch adhesion of 4B-5B per ASTM D3359-02. E-coated products shall have superior impact resistance with no cracking, chipping or peeling per NSF/ANSI 51-2002 Method 10.2.
  3. Unit-Mounted, Non-Fused Disconnect Switch:  
Switch shall be factory-installed and internally mounted. NEC and UL-approved non-fused switch shall provide unit power shutoff. Switch shall be accessible from outside the unit and shall provide power off lockout capability.
  4. Non-Powered Convenience Outlet:  
Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle. Outlet shall include 15 amp GFI (ground fault interrupter) receptacle with independent fuse protection. Voltage required to operate convenience outlet shall be field supplied and separate from the unit power supply. Outlet shall be accessible from outside the unit.
  5. Thermostat Controls (field supplied):
    - a. Programmable multi-stage thermostat shall have 7-day clock, holiday scheduling, large backlit display, remote sensor capability, and Title 24 compliance.
    - b. Commercial Electronic Thermostat shall have 7-day timeclock, auto-changeover, multi-stage capability, and large LCD (liquid crystal display) temperature display.
  6. Louvered hail Guard Package:  
Louvered hail guard package shall protect coils against damage from hail and other flying debris.
  7. Condenser Coil Grille:  
Grille shall add decorative appearance to unit and protect condenser coil from large objects and vandalism.