CHS

Product Specifications

COMMERCIAL SPLIT SYSTEMS HEAT PUMP UNITS
R−410A, 6 − 10 TONS

BUILT TO LAST, EASY TO INSTALL AND SERVICE

- Single stage cooling capacity control on all models
- All models utilize round copper tube, aluminum plate fin condenser coils (RTPF)
- Brass suction and liquid line service valves
- Fully hermetic scroll compressors with crankcase heater and suction line accumulators
- 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
- Full perimeter base rail with built-in rigging adapters and fork truck slots
- Pre−painted exterior panels and primer−coated interior panels tested to 500 hours salt spray protection
- Direct drive permanently lubricated condenser fan motors
- Newly designed terminal board facilitates simple safety circuit troubleshooting and simplified control box arrangement
- All units have high pressure and loss of charge protection
- 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

AHRI CERTIFIED™ www.ahridirectory.org

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.ahridirectory.org .

ASHRAE 90.1 COMPLIANT

c UL us LISTED

UNIT PERFORMANCE DATA[1] − Single Ciruit

Model Number	Cooling Circuits	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			
CHS072*AA0A00A	1	6	70,000	11.0	6.4	42−3/8" x 59−3/8" x 45−7/8" [1077 x 1508 x 1164]	444 / 201
CHS091*AA0A00A	1	7.5	89,000	11.0	8.1	42−3/8" x 59−3/8" x 45−7/8" [1077 x 1508 x 1164]	483 / 219
CHS121*AA0A00A	1	10	112,000	11.0	10.2	50−3/8" x 59−3/8" x 45−7/8" [1279 x 1507 x 1164]	575 / 261

* − Indicates Unit voltage: H = 208/230−3−60, L = 460−3−60, S = 575−3−60
[1] − Above ratings are with matching size air handling unit

MODEL NOMENCLATURE

MODEL SERIES	C	H	S	0	9	1	H	A	A	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														
H = Heat Pump — **Type**														
S = Standard ASHRAE 90.1-2010 Efficiency — **Efficiency**														
072 = 6 Tons 091 = 7.5 Tons 121 = 10 Tons **Nominal Cooling Capacity**														
H = 208/230-3-60 L = 460-3-60 S = 575-3-60 — **Voltage**														
A = Single Circuit B = Single Circuit w/ Low Ambient Control **Refrigerant System Options**														
A = Standard Al Fin / Copper Tube B = Pre-Coated Al Fin / Copper Tube C = E-Coat Al Fin / Copper Tube — **Outdoor Coil Options**														
0 = None 1 = Non-powered 115v Convenience Outlet — **Service Options**														
A = None C = Non-Fused Disconnect — **Electrical Options**														
0 = Standard Electrical Mechanical — **Base Unit Controls**														
0 = No Options — **Future Use**														
A = Original Design														

Table 1 – CHS FACTORY INSTALLED OPTIONS AND FIELD INSTALLED ACCESSORIES

ITEM	FACTORY INSTALLED OPTION	FIELD INSTALLED ACCESSORY
Disconnect Switch (non−fused)	X	
Coil Protection Applications	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

CHS factory-installed options

Outdoor coil options are available to match coil protection to site conditions for optimum durability. See the table below and refer to the Application data for selection guidance.

Low ambient temperature Motormaster® head pressure control operates in Cooling mode at outdoor temperatures below 55° F. The Motormaster control varies the speed of outdoor−fan motors to maintain correct condensing temperature down to –20° F.

Non−powered convenience outlet requires the field installation of a general purpose 125−volt 15−A circuit powered from a source elsewhere in the building.

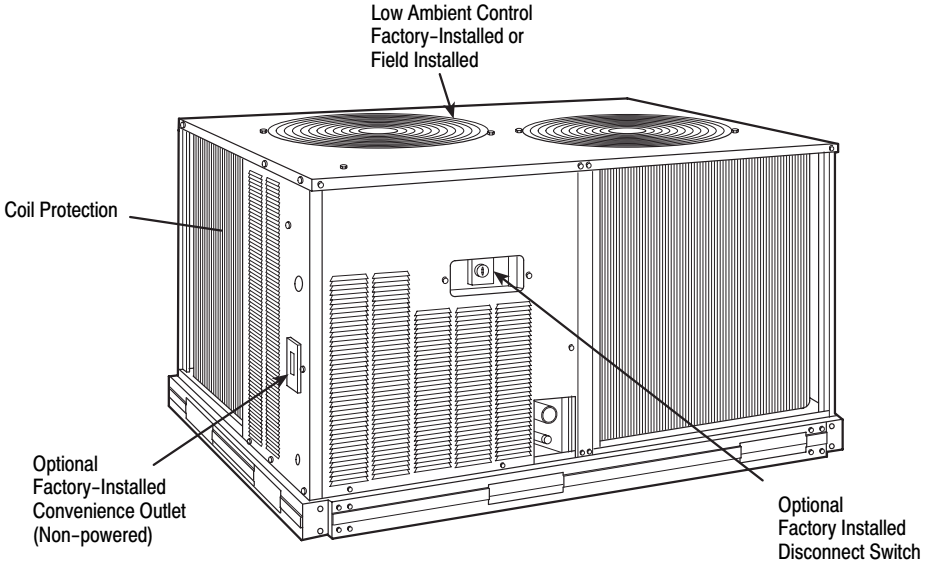
Non−fused disconnect switch removes power locally at the condensing unit. This switch also includes a power lockout capability to protect the service person. This lockout switch saves time and effort as the service person no longer needs to access a distant disconnect switch while servicing the unit.

Outdoor coil louvered hail guard protects outdoor units from hail and other flying debris.

Outdoor coil grille protects outdoor coil from large objects and vandalism.

DESCRIPTION	ENVIRONMENT					
	Standard Non−Corrosive	Mild Coastal	Moderate Coastal	Severe Coastal	Industrial	Combined Coastal and Industrial
Alum Fin / Copper Tube	X					
Pre-Coated Al/Copper		X				
E-Coated Al/Copper		X	X	X	X	X

CHS OPTIONS AND ACCESSORIES



ACCESSORIES − CHS

LOW AMBIENT CONTROLS		
Model Number	**Description**	**Use With Model Size**
DALOWAMB004A00	Low Ambient Temperature Head Pressure Contoller, allows cooling operation down to −20°F by varying the speed on the condenser fan.*	072 − 121 (208/230−3−60v only)
DALOWAMB005A00		072 − 091 (460−3−60v only)
DALOWAMB009A00		121 (460−3−60v only)
DALOWAMB006A00		072 − 121 (575−3−60v only)

* Includes variable speed motor controller, outdoor motor, and bracket.

LOUVERED HAIL GUARDS − CONDENSER COIL		
Model Number	**Description**	**Use With Model Size**
DALVHLGD005A00	Louvered Condenser Coil Hail Guard − Includes louvered panel(s) to protect condenser coil from damage and vandalism	072
DALVHLGD006A00		091
DALVHLGD010A00		121
WIRED GUARDS − CONDENSER COIL		
Model Number	**Description**	**Use With Model Size**
DAGRILLE010A00	Wired Grille Condenser Coil Guard − Includes panel(s) to protect condenser coil from larger objects	072
DAGRILLE011A00		091
DAGRILLE015A00		121

LIQUID LINE SOLENOID VALVES (LLSV)		
Model Number**	**Description**	**Use With Model Size**
1179871[1]	Liquid Line Solenoid Valve	072 (3/8” L)
1179872[1]	Liquid Line Solenoid Valve	072, 091 (1/2” L)
1179873[1]	Liquid Line Solenoid Valve	121 (5/8” L)
1178273	Solenoid Coil	All LLSVs listed
BI−FLOW FILTER DRIERS		
Model Number**	**Description**	**Use With Model Size**
1179875	Filter Drier	072 (3/8” L)
1179876	Filter Drier	072 (1/2“) 091 (1/2” L) 121 (1/2” L) 121 (5/8” L) ††
BI−FLOW SIGHT GLASSES		
Model Number**	**Description**	**Use With Model Size**
1178270	Sight Glass	072 (3/8” L)
1178271	Sight Glass	072, 091, 121 (1/2” L)
1178272	Sight Glass	121 (5/8“ L)

1 Bi−Flow kit 1183150 is also required
†† Bushings required on all except on CHS091 with 1/2” liquid line
L − Liquid line
S − Suction Line
** Available from FAST Parts

Table 2 – AHRI* CAPACITY RATINGS

PERFORMANCE DATA COOLING						
UNIT	COOLING CIRCUITS	NOMINAL CAPACITY (TONS)	NET COOLING CAPACITY (BTUH)	TOTAL POWER (KW)	EER	IEER
CHS072	1	6	70,000	6.4	11.0	11.8
CHS091	1	7.5	89,000	8.1	11.0	11.8
CHS121	1	10	112,000	10.2	11.0	11.8

PERFORMANCE DATA HEATING						
	HIGH HEAT AT 47°F (8°C)			LOW HEAT AT 17°F (−8°C)		
Unit	Net Heating Capacity (MBH)	Total Power (kW)	COP	Net Heating Capacity (MBH)	Total Power (kW)	COP
CHS072	66.0	5.9	3.30	39.0	5.2	2.20
CHS091	87.0	7.7	3.30	52.0	6.9	2.20
CHS121	106.0	9.4	3.30	70.0	9.3	2.20

* 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

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.ahridirectory.org .

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.

Table 3 – SOUND LEVELS

SOUND POWER LEVELS, dB									
	OUTDOOR SOUND (dB)								
Unit	A−Weighted	63	125	250	500	1000	2000	4000	8000
CHS072	82	86.4	86.0	79.2	80.2	77.6	72.0	67.9	62.3
CHS091	82	86.8	85.7	80.3	80.3	77.7	72.3	70.2	65.4
CHS121	82	82.8	81.5	79.2	79.4	76.2	72.3	69.4	64.2

LEGEND

dB = Decibel

Table 4 – PHYSICAL DATA

PHYSICAL DATA			
SINGLE CIRCUIT MODELS	**CHS072**	**CHS091**	**CHS121**
Refrigeration System			
# Circuits / # Comp. / Type	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll
Shipping charge A/B (lbs)	10.0 R−410A	13.0 R−410A	15.0 R−410A
System charge w/ fan coil * A/B (lbs)	18	21	27
High−press. Trip / Reset (psig)	630 / 505	630 / 505	630 / 505
Low−press. Trip / Reset (psig)	27 / 44	27 / 44	27 / 44
Outdoor Coil			
Material − Tube / Fin	Al/Cu	Al/Cu	Al/Cu
Round Tube Plate Fin Coil type	RTPF	RTPF	RTPF
Rows / FPI	2 / 17	2 / 17	2 / 17
total face area (ft2)	17.5	23.0	28.1
Outdoor fan / motor			
Qty / Motor drive type	2 / direct	2 / direct	2 / direct
Motor HP / RPM	1/4 / 1100	1/4 / 1100	1/4 / 1100
Fan diameter (in)	22	22	22
Watts (total)	610	610	610
Piping Connections			
Qty / Vapor (in. ODS)	1 / 1 1/8	1 / 1 1/8	2 / 1 3/8
Qty / Liquid (in. ODS)	1 / 3/8	1 / 1/2	1 / 1/2

* Approximate system charge with 25 ft. piping of sizes indicated with matched FHS

Table 5 – DIMENSIONS AND WEIGHTS, 6 − 10 TON

UNIT	ELECTRICAL CHARACTERISTICS	STD. UNIT WT.		CORNER A		CORNER B		CORNER C		CORNER D		CENTER OF GRAVITY			UNIT HEIGHT
		LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z	H
CHS072	208/230-3-60,460-3-60,575-3-60	444	201	134	61	97	44	90	41	123	56	22 [558.8]	25 [635.0]	13 [330.2]	42-3/8 [1076.0]
CHS091	208/230-3-60,460-3-60,575-3-60	483	219	162	74	110	50	85	39	125	57	20 [508.0]	24 [609.6]	21 [533.4]	42-3/8 [1076.0]
CHS121	208/230-3-60,460-3-60,575-3-60	575	261	186	84	126	57	106	48	157	71	21 [533.4]	24 [609.6]	23 [584.2]	50-3/8 [1279.2]

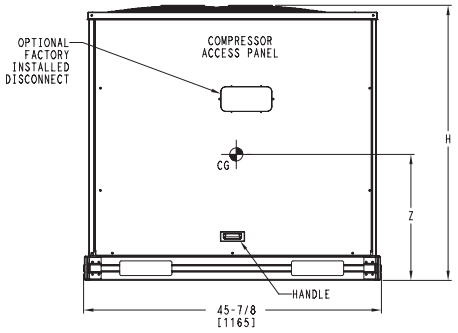
NOTES:
1. MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
   A. BOTTOM TO COMBUSTIBLE SURFACES: 0 INCHES.
   B. OUTDOOR COIL, FOR PROPER AIR FLOW: 36 INCHES [914] ONE SIDE, 12 INCHES [305] THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
   C. OVERHEAD: 60 INCHES [1524], TO 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.
2. WITH EXCEPTION OF THE CLEARANCE FOR THE OUTDOOR COIL AS STATED IN NOTE 1B, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
3. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B OR C ROOF COVERING MATERIAL.

SERVICE VALVE CONNECTIONS		
UNIT	SUCTION	LIQUID
CHS072	1-1/8 [28.6]	3/8 [9.5]
CHS091	1-1/8 [28.6]	1/2 [12.7]
CHS121	1-3/8 [34.9]	1/2 [12.7]

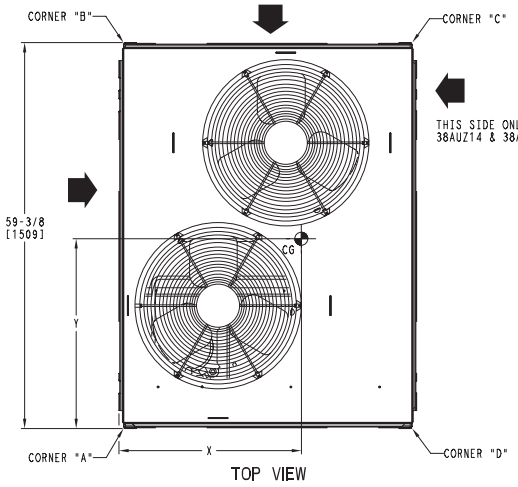
CG CENTER OF GRAVITY

DIRECTION OF AIR FLOW

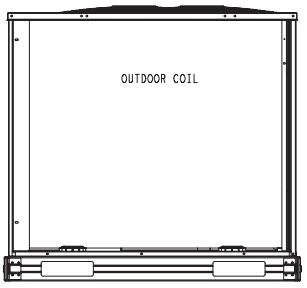
DIMENSIONS IN [ ] ARE IN MM



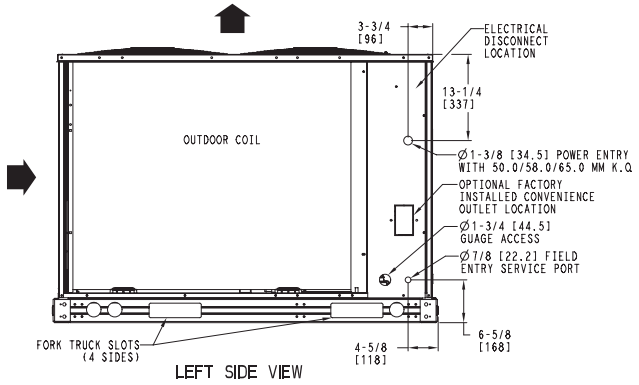
FRONT VIEW



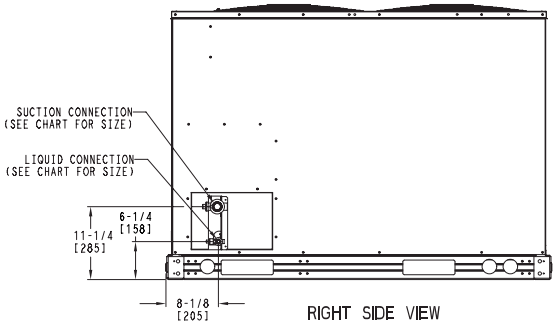
TOP VIEW



REAR VIEW



LEFT SIDE VIEW



RIGHT SIDE VIEW

PERFORMANCE DATA

CHS072, FHS072 RATINGS

COOLING COMBINATION

CHS072 / FHS072				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	63.5	63.5	71.3	61.2	61.2	68.8	58.8	58.8	66.1	56.3	56.3	63.3	53.5	53.5	60.2	
			SHC	55.7	63.5	71.3	53.7	61.2	68.8	51.6	58.8	66.1	49.3	56.3	63.3	46.9	53.5	60.2	
		62	THC	66.4	66.4	68.3	63.5	63.5	66.8	60.5	60.5	65.2	57.3	57.3	63.5	54.0	54.0	61.5	
			SHC	50.6	59.5	68.3	49.2	58.0	66.8	47.6	56.4	65.2	46.0	54.8	63.5	44.2	52.9	61.5	
		67	THC	72.8	72.8	72.8	69.6	69.6	69.6	66.3	66.3	66.3	62.7	62.7	62.7	59.0	59.0	59.0	
			SHC	41.6	50.5	59.4	40.2	49.1	58	38.7	47.6	56.6	37.2	46.1	55	35.6	44.5	53.4	
		72	THC	79.7	79.7	79.7	76.2	76.2	76.2	72.5	72.5	72.5	68.6	68.6	68.6	64.5	64.5	64.5	
			SHC	32.4	41.4	50.5	31.0	40.1	49.1	29.6	38.6	47.6	28.1	37.1	46.1	26.5	35.5	44.5	
		76	THC	–	85.5	85.5	–	81.7	81.7	–	77.7	77.7	–	73.5	73.5	–	69.1	69.1	
			SHC	–	34.2	44	–	32.8	42.5	–	31.4	41	–	29.9	39.4	–	28.4	37.8	
2100 Cfm	EA (wB)	58	THC	66.7	66.7	74.9	64.2	64.2	72.2	61.6	61.6	69.3	58.9	58.9	66.2	55.9	55.9	62.9	
			SHC	58.4	66.7	74.9	56.3	64.2	72.2	54.0	61.6	69.3	51.5	58.9	66.2	49.0	55.9	62.9	
		62	THC	68.4	68.4	74.3	65.4	65.4	72.6	62.3	62.3	70.7	59.0	59.0	68.8	55.9	55.9	65.3	
			SHC	54.1	64.2	74.3	52.5	62.6	72.6	50.8	60.8	70.7	49.1	59.0	68.8	46.6	55.9	65.3	
		67	THC	74.8	74.8	74.8	71.5	71.5	71.5	67.9	67.9	67.9	64.2	64.2	64.2	60.3	60.3	60.3	
			SHC	43.9	54.2	64.4	42.5	52.7	63	41.0	51.2	61.4	39.4	49.6	59.9	37.8	48.0	58.2	
		72	THC	81.8	81.8	81.8	78.2	78.2	78.2	74.3	74.3	74.3	70.2	70.2	70.2	65.9	65.9	65.9	
			SHC	33.4	43.8	54.1	32.0	42.3	52.7	30.5	40.9	51.2	29.0	39.3	49.6	27.4	37.7	47.9	
		76	THC	–	87.7	87.7	–	83.7	83.7	–	79.5	79.5	–	75.1	75.1	–	70.4	70.4	
			SHC	–	35.5	46.4	–	34.1	45	–	32.6	43.4	–	31.1	41.8	–	29.5	40.1	
2400 Cfm	EA (wB)	58	THC	69.3	69.3	78.0	66.7	66.7	75.1	64.0	64.0	72.0	61.0	61.0	68.7	57.9	57.9	65.2	
			SHC	60.7	69.3	78.0	58.4	66.7	75.1	56.0	64.0	72.0	53.4	61.0	68.7	50.6	57.9	65.2	
		62	THC	70.1	70.1	79.5	66.9	66.9	78.0	64.0	64.0	74.7	61.0	61.0	71.3	57.9	57.9	67.6	
			SHC	57.2	68.3	79.5	55.7	66.8	78.0	53.3	64.0	74.7	50.8	61.0	71.3	48.2	57.9	67.6	
		67	THC	76.4	76.4	76.4	72.9	72.9	72.9	69.2	69.2	69.2	65.3	65.3	65.3	61.2	61.2	62.7	
			SHC	46.1	57.6	69.1	44.6	56.1	67.6	43.1	54.6	66.1	41.5	52.9	64.4	39.8	51.2	62.7	
		72	THC	83.5	83.5	83.5	79.6	79.6	79.6	75.6	75.6	75.6	71.3	71.3	71.3	66.9	66.9	66.9	
			SHC	34.3	45.9	57.6	32.9	44.5	56.1	31.4	43.0	54.5	29.8	41.4	52.9	28.2	39.7	51.2	
		76	THC	–	89.4	89.4	–	85.2	85.2	–	80.8	80.8	–	76.2	76.2	–	71.5	71.5	
			SHC	–	36.7	48.8	–	35.2	47.3	–	33.7	45.7	–	32.2	44.1	–	30.5	42.4	
2700 Cfm	EA (wB)	58	THC	71.6	71.6	80.6	68.9	68.9	77.5	66.0	66.0	74.2	62.9	62.9	70.8	59.6	59.6	67.1	
			SHC	62.7	71.6	80.6	60.3	68.9	77.5	57.7	66.0	74.2	55.0	62.9	70.8	52.1	59.6	67.1	
		62	THC	71.7	71.7	83.7	68.9	68.9	80.4	66.0	66.0	77.0	62.8	62.8	73.4	59.6	59.6	69.6	
			SHC	59.7	71.7	83.7	57.3	68.9	80.4	54.9	66.0	77.0	52.3	62.8	73.4	49.5	59.6	69.6	
		67	THC	77.6	77.6	77.6	74.0	74.0	74.0	70.2	70.2	70.5	66.2	66.2	68.7	62.0	62.0	66.9	
			SHC	48.1	60.9	73.6	46.6	59.4	72.1	45.0	57.8	70.5	43.4	56.1	68.7	41.7	54.3	66.9	
		72	THC	84.8	84.8	84.8	80.8	80.8	80.8	76.6	76.6	76.6	72.3	72.3	72.3	67.7	67.7	67.7	
			SHC	35.1	48.0	60.8	33.7	46.5	59.3	32.2	44.9	57.7	30.6	43.3	56	28.9	41.6	54.3	
		76	THC	–	90.7	90.7	–	86.4	86.4	–	81.9	81.9	–	77.2	77.2	–	–	–	
			SHC	–	37.8	51.1	–	36.3	49.5	–	34.8	47.9	–	33.2	46.2	–	–	–	
3000 Cfm	EA (wB)	58	THC	73.6	73.6	82.8	70.7	70.7	79.6	67.7	67.7	76.2	64.4	64.4	72.5	61.0	61.0	68.7	
			SHC	64.4	73.6	82.8	61.9	70.7	79.6	59.2	67.7	76.2	56.3	64.4	72.5	53.3	61.0	68.7	
		62	THC	73.6	73.6	86	70.7	70.7	82.6	67.7	67.7	79.1	64.4	64.4	75.3	61.0	61.0	71.3	
			SHC	61.2	73.6	86	58.8	70.7	82.6	56.3	67.7	79.1	53.6	64.4	75.3	50.7	61.0	71.3	
		67	THC	78.6	78.6	78.6	74.9	74.9	76.3	71.0	71.0	74.6	66.9	66.9	72.8	62.7	62.7	70.8	
			SHC	50.0	64.0	77.9	48.5	62.4	76.3	46.9	60.8	74.6	45.2	59.0	72.8	43.4	57.1	70.8	
		72	THC	85.9	85.9	85.9	81.8	81.8	81.8	77.5	77.5	77.5	73.0	73.0	73.0	68.3	68.3	68.3	
			SHC	35.9	49.9	64	34.4	48.4	62.4	32.9	46.8	60.8	31.3	45.2	59.1	29.6	43.5	57.3	
		76	THC	–	91.8	91.8	–	87.4	87.4	–	82.8	82.8	–	–	–	–	–	–	
			SHC	–	38.8	53.2	–	37.3	51.7	–	35.7	50.0	–	–	–	–	–	–	

LEGEND:

THC – Total Cooling Capacity, Gross (1000 Btu/h)

SHC – Sensible Cooling Capacity, Gross (1000 Btu/h)

PERFORMANCE DATA

CHS091, FHS091 COOLING COMBINATION RATINGS

CHS091 / FHS091				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	78.7	78.7	87.1	76.0	76.0	84.1	73.1	73.1	80.9	70.0	70.0	77.4	66.6	66.6	73.7	
			SHC	70.4	78.7	87.1	68	76.0	84.1	65.4	73.1	80.9	62.6	70.0	77.4	59.5	66.6	73.7	
		62	THC	83.6	83.6	83.6	80.1	80.1	80.1	76.3	76.3	77.5	72.3	72.3	75.5	68.0	68.0	73.4	
			SHC	63.1	72.0	80.9	61.5	70.4	79.3	59.7	68.6	77.5	57.9	66.7	75.5	55.8	64.6	73.4	
		67	THC	91.4	91.4	91.4	87.6	87.6	87.6	83.5	83.5	83.5	79.1	79.1	79.1	74.3	74.3	74.3	
			SHC	51.8	60.8	69.7	50.3	59.2	68.2	48.6	57.5	66.5	46.8	55.8	64.7	45.0	53.9	62.8	
		72	THC	99.9	99.9	99.9	95.7	95.7	95.7	91.3	91.3	91.3	86.4	86.4	86.4	81.2	81.2	81.2	
			SHC	40.2	49.3	58.4	38.7	47.7	56.8	37.0	46.1	55.1	35.3	44.4	53.4	33.5	42.5	51.5	
		76	THC	–	107.1	107.1	–	102.6	102.6	–	97.8	97.8	–	92.6	92.6	–	87.0	87.0	
			SHC	–	39.9	49.7	–	38.4	48.1	–	36.8	46.4	–	35.1	44.6	–	33.3	42.7	
2625 Cfm	EA (wB)	58	THC	82.8	82.8	91.6	79.9	79.9	88.4	76.8	76.8	84.9	73.4	73.4	81.1	69.7	69.7	77.1	
			SHC	74.0	82.8	91.6	71.4	79.9	88.4	68.6	76.8	84.9	65.6	73.4	81.1	62.3	69.7	77.1	
		62	THC	86.1	86.1	88.2	82.4	82.4	86.3	78.5	78.5	84.3	74.3	74.3	82.1	69.9	69.9	79.8	
			SHC	67.8	78.0	88.2	66.1	76.2	86.3	64.2	74.3	84.3	62.1	72.1	82.1	60.0	69.9	79.8	
		67	THC	94.0	94.0	94.0	90.0	90.0	90.0	85.6	85.6	85.6	81.0	81.0	81.0	76.0	76.0	76.0	
			SHC	55.0	65.3	75.6	53.4	63.7	73.9	51.7	62.0	72.2	49.9	60.2	70.4	48.0	58.2	68.5	
		72	THC	102.6	102.6	102.6	98.2	98.2	98.2	93.5	93.5	93.5	88.4	88.4	88.4	83.0	83.0	83.0	
			SHC	41.8	52.1	62.5	40.2	50.6	60.9	38.5	48.9	59.2	36.8	47.1	57.4	34.9	45.2	55.5	
		76	THC	–	109.9	109.9	–	105.2	105.2	–	100.1	100.1	–	94.6	94.6	–	88.7	88.7	
			SHC	–	41.4	52.4	–	39.9	50.8	–	38.3	49.1	–	36.5	47.3	–	34.7	45.4	
3000 Cfm	EA (wB)	58	THC	86.2	86.2	95.4	83.1	83.1	91.9	79.8	79.8	88.2	76.2	76.2	84.2	72.2	72.2	79.9	
			SHC	77.1	86.2	95.4	74.3	83.1	91.9	71.3	79.8	88.2	68.1	76.2	84.2	64.6	72.2	79.9	
		62	THC	88.1	88.1	94.7	84.4	84.4	92.6	80.4	80.4	90.2	76.3	76.3	87.1	72.3	72.3	82.5	
			SHC	72.1	83.4	94.7	70.2	81.4	92.6	68.1	79.2	90.2	65.5	76.3	87.1	62.1	72.3	82.5	
		67	THC	96.0	96.0	96.0	91.8	91.8	91.8	87.3	87.3	87.3	82.4	82.4	82.4	77.3	77.3	77.3	
			SHC	58.1	69.6	81.1	56.4	68.0	79.5	54.7	66.2	77.7	52.9	64.4	75.9	50.9	62.4	73.9	
		72	THC	104.7	104.7	104.7	100.1	100.1	100.1	95.2	95.2	95.2	89.9	89.9	89.9	84.3	84.3	84.3	
			SHC	43.2	54.9	66.5	41.6	53.3	64.9	40.0	51.6	63.2	38.2	49.8	61.3	36.3	47.9	59.4	
		76	THC	–	112.1	112.1	–	107.1	107.1	–	101.8	101.8	–	96.2	96.2	–	90.1	90.1	
			SHC	–	42.9	55.0	–	41.3	53.4	–	39.7	51.7	–	37.9	49.9	–	36.1	48	
3375 Cfm	EA (wB)	58	THC	89.1	89.1	98.5	85.8	85.8	94.9	82.3	82.3	91.0	78.5	78.5	86.8	74.4	74.4	82.2	
			SHC	79.7	89.1	98.5	76.7	85.8	94.9	73.6	82.3	91.0	70.2	78.5	86.8	66.5	74.4	82.2	
		62	THC	90.0	90.0	100.4	86.1	86.1	98.3	82.4	82.4	94.0	78.5	78.5	89.7	74.4	74.4	84.9	
			SHC	75.9	88.1	100.4	73.9	86.1	98.3	70.7	82.4	94.0	67.4	78.5	89.7	63.9	74.4	84.9	
		67	THC	97.6	97.6	97.6	93.2	93.2	93.2	88.6	88.6	88.6	83.6	83.6	83.6	78.2	78.2	79.0	
			SHC	61.0	73.7	86.5	59.3	72.1	84.8	57.6	70.3	83	55.7	68.4	81.1	53.7	66.3	79.0	
		72	THC	106.4	106.4	106.4	101.6	101.6	101.6	96.6	96.6	96.6	91.1	91.1	91.1	85.3	85.3	85.3	
			SHC	44.6	57.5	70.3	43.0	55.8	68.7	41.3	54.1	66.9	39.5	52.3	65.1	37.6	50.4	63.1	
		76	THC	–	113.8	113.8	–	108.7	108.7	–	103.2	103.2	–	97.4	97.4	–	91.1	91.1	
			SHC	–	44.3	57.6	–	42.7	56	–	41.0	54.2	–	39.2	52.4	–	37.4	50.5	
3750 Cfm	EA (wB)	58	THC	91.6	91.6	101.3	88.1	88.1	97.5	84.5	84.5	93.4	80.5	80.5	89.0	76.1	76.1	84.2	
			SHC	81.9	91.6	101.3	78.8	88.1	97.5	75.5	84.5	93.4	71.9	80.5	89.0	68.1	76.1	84.2	
		62	THC	91.7	91.7	104.7	88.2	88.2	100.7	84.5	84.5	96.5	80.5	80.5	91.9	76.2	76.2	87.0	
			SHC	78.7	91.7	104.7	75.7	88.2	100.7	72.6	84.5	96.5	69.1	80.5	91.9	65.4	76.2	87.0	
		67	THC	98.9	98.9	98.9	94.4	94.4	94.4	89.6	89.6	89.6	84.5	84.5	86.1	79.1	79.1	83.8	
			SHC	63.8	77.8	91.7	62.1	76.1	90.0	60.3	74.2	88.1	58.3	72.2	86.1	56.2	70.0	83.8	
		72	THC	107.8	107.8	107.8	102.8	102.8	102.8	97.7	97.7	97.7	92.1	92.1	92.1	86.1	86.1	86.1	
			SHC	45.9	60.0	74.0	44.3	58.3	72.4	42.6	56.6	70.6	40.7	54.7	68.7	38.8	52.8	66.8	
		76	THC	–	115.2	115.2	–	110	110	–	104.3	104.3	–	98.4	98.4	–	92.0	92.0	
			SHC	–	45.6	60.1	–	44.0	58.4	–	42.3	56.7	–	40.5	54.9	–	38.6	52.9	

LEGEND:

THC – Total Cooling Capacity, Gross (1000 Btu/h)

SHC – Sensible Cooling Capacity, Gross (1000 Btu/h)

PERFORMANCE DATA

CHS121, FHS120 RATINGS

COOLING COMBINATION

CHS121 / FHS120				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	
3000 Cfm	EA (wB)	58	THC	103	103	116.2	99.5	99.5	112.2	95.6	95.6	108	91.2	91.2	102.9	86.4	86.4	97.4	
			SHC	89.9	103	116.2	86.8	99.5	112.2	83.4	95.6	108	79.6	91.2	102.9	75.4	86.4	97.4	
		62	THC	108.7	108.7	110	104.1	104.1	107.7	99.1	99.1	105	93.6	93.6	102.2	87.7	87.7	98.8	
			SHC	81.2	95.6	110	78.9	93.3	107.7	76.5	90.8	105	73.8	88.0	102.2	70.7	84.8	98.8	
		67	THC	118.8	118.8	118.8	113.6	113.6	113.6	108	108	108	101.9	101.9	101.9	95.2	95.2	95.2	
			SHC	66.9	81.4	95.9	64.7	79.2	93.7	62.4	76.8	91.3	59.8	74.2	88.7	57.0	71.4	85.9	
		72	THC	129.4	129.4	129.4	123.7	123.7	123.7	117.5	117.5	117.5	110.7	110.7	110.7	103.3	103.3	103.3	
			SHC	52.1	66.8	81.5	49.9	64.6	79.3	47.6	62.2	76.8	45.0	59.6	74.2	42.3	56.8	71.4	
		76	THC	–	138.3	138.3	–	132.1	132.1	–	125.3	125.3	–	117.9	117.9	–	110	110	
			SHC	–	54.9	70.8	–	52.7	68.4	–	50.3	65.8	–	47.7	63.1	–	45.0	60.2	
3500 Cfm	EA (wB)	58	THC	108.2	108.2	122	104.3	104.3	117.6	100.1	100.1	112.8	95.3	95.3	107.5	90.1	90.1	101.6	
			SHC	94.3	108.2	122	91.0	104.3	117.6	87.3	100.1	112.8	83.1	95.3	107.5	78.6	90.1	101.6	
		62	THC	111.8	111.8	119.4	107	107	116.8	101.8	101.8	113.9	96.1	96.1	110.3	90.2	90.2	105.6	
			SHC	86.7	103	119.4	84.3	100.6	116.8	81.7	97.8	113.9	78.6	94.5	110.3	74.8	90.2	105.6	
		67	THC	122	122	122	116	116	116	111	111	111	104	104	104	97.0	97.0	97.0	
			SHC	70.6	87.2	103.7	68.4	84.9	101.4	65.9	82.4	99	63.3	79.8	96.3	60.5	76.9	93.4	
		72	THC	132.6	132.6	132.6	126.6	126.6	126.6	120	120	120	112.8	112.8	112.8	105	105	105	
			SHC	53.7	70.5	87.2	51.5	68.2	84.9	49.0	65.7	82.4	46.4	63.1	79.7	43.7	60.3	76.9	
		76	THC	–	141.5	141.5	–	134.9	134.9	–	127.7	127.7	–	120	120	–	111.7	111.7	
			SHC	–	56.9	74.6	–	54.6	72.2	–	52.2	69.6	–	49.5	66.9	–	46.8	64.0	
4000 Cfm	EA (wB)	58	THC	112.3	112.3	126.7	108.2	108.2	122	103.7	103.7	116.9	98.6	98.6	111.2	93.0	93.0	104.9	
			SHC	98.0	112.3	126.7	94.4	108.2	122	90.4	103.7	116.9	86.0	98.6	111.2	81.1	93.0	104.9	
		62	THC	114.4	114.4	127.8	109.4	109.4	124.7	104	104	121.7	98.7	98.7	115.5	93.1	93.1	109	
			SHC	91.7	109.7	127.8	89.0	106.9	124.7	86.3	104	121.7	81.9	98.7	115.5	77.2	93.1	109	
		67	THC	124	124	124	118.6	118.6	118.6	112.4	112.4	112.4	105.6	105.6	105.6	98.3	98.3	100.5	
			SHC	74.1	92.6	111.2	71.8	90.3	108.8	69.3	87.8	106.3	66.6	85.1	103.5	63.7	82.1	100.5	
		72	THC	135	135	135	128.7	128.7	128.7	121.8	121.8	121.8	114.4	114.4	114.4	106.5	106.5	106.5	
			SHC	55.2	73.9	92.7	52.9	71.6	90.3	50.4	69.1	87.7	47.8	66.4	85	44.9	63.5	82.1	
		76	THC	–	144	144	–	137.1	137.1	–	129.6	129.6	–	121.6	121.6	–	113.1	113.1	
			SHC	–	58.8	78.3	–	56.4	75.9	–	53.9	73.3	–	51.3	70.5	–	48.5	67.6	
4500 Cfm	EA (wB)	58	THC	115.9	115.9	130.7	111.5	111.5	125.7	106.7	106.7	120.3	101.3	101.3	114.2	95.4	95.4	107.6	
			SHC	101.1	115.9	130.7	97.3	111.5	125.7	93.0	106.7	120.3	88.4	101.3	114.2	83.2	95.4	107.6	
		62	THC	116	116	136.3	111.7	111.7	130.7	106.7	106.7	124.9	101.4	101.4	118.6	95.5	95.5	112	
			SHC	96.6	116.4	136.3	92.7	111.7	130.7	88.6	106.7	124.9	84.1	101.4	118.6	79.2	95.5	112	
		67	THC	126.1	126.1	126.1	120.2	120.2	120.2	113.8	113.8	113.8	106.8	106.8	110	99.4	99.4	107.2	
			SHC	77.4	97.9	118.4	75.0	95.5	116	72.5	92.9	113.3	69.7	90.1	110	66.7	86.9	107.2	
		72	THC	137	137	137	130.4	130.4	130.4	123.3	123.3	123.3	115.7	115.7	115.7	107.5	107.5	107.5	
			SHC	56.6	77.2	97.9	54.2	74.8	95.5	51.7	72.3	92.9	49.0	69.5	90.1	46.2	66.6	87.1	
		76	THC	–	145.9	145.9	–	138.8	138.8	–	131.1	131.1	–	122.8	122.8	–	114.2	114.2	
			SHC	–	60.5	82.0	–	58.1	79.5	–	55.6	76.9	–	52.9	74.1	–	50.1	71.1	
5000 Cfm	EA (wB)	58	THC	118.9	118.9	134.1	114.3	114.3	128.9	109.2	109.2	123.1	103.6	103.6	117	97.4	97.4	109.9	
			SHC	103.7	118.9	134.1	99.7	114.3	128.9	95.3	109.2	123.1	90.4	103.6	117	85	97.4	109.9	
		62	THC	119	119	139.2	114.4	114.4	133.8	109.3	109.3	127.9	103.6	103.6	121	97.5	97.5	114.1	
			SHC	98.7	119	139.2	94.9	114.4	133.8	90.7	109.3	127.9	86.0	103.6	121	80.9	97.5	114.1	
		67	THC	127.6	127.6	127.6	121.6	121.6	122.8	115	115	120	107.8	107.8	116.8	100.3	100.3	113.3	
			SHC	80.6	102.9	125.3	78.1	100.5	122.8	75.5	97.7	120	72.6	94.7	116.8	69.4	91.4	113.3	
		72	THC	138.5	138.5	138.5	131.8	131.8	131.8	124.5	124.5	124.5	116.7	116.7	116.7	108.4	108.4	108.4	
			SHC	57.9	80.4	102.9	55.5	78.0	100.5	52.9	75.4	97.8	50.2	72.6	95	47.3	69.7	92.0	
		76	THC	–	147.5	147.5	–	140.1	140.1	–	132.3	132.3	–	123.8	123.8	–	–	–	
			SHC	–	62.2	85.5	–	59.8	83.0	–	57.2	80.3	–	54.5	77.5	–	–	–	

LEGEND:

THC – Total Cooling Capacity, Gross (1000 Btu/h)

SHC – Sensible Cooling Capacity, Gross (1000 Btu/h)

PERFORMANCE DATA

CHS072, FHS072 HEATING COMBINATION
RATINGS

CHS072 / FHS072										
Return Air (°F db)	CFM (Standard Air)		Temperature Air Entering Outdoor Coil (°F db at 70% rh)							
			−10	0	10	17	30	40	47	50	60
55	1800	TH	21.4	27.7	34.5	39.7	50.1	58.6	64.4	67.0	75.6
		THI	19.7	25.5	31.6	36.2	43.9	55.9	64.4	67.0	75.6
		kW	2.33	2.60	2.89	3.12	3.60	4.01	4.29	4.43	4.91
	2400	TH	22.0	28.5	35.5	40.9	51.6	60.0	65.6	68.0	76.3
		THI	27.6	27.6	27.5	27.4	26.3	28.7	30.0	30.0	30.0
		kW	2.27	2.51	2.77	2.96	3.37	3.70	3.93	4.04	4.41
	3000	TH	22.4	29.0	36.2	41.6	52.5	60.6	65.9	68.3	76.2
		THI	20.6	26.7	33.1	37.9	46.0	57.9	65.9	68.3	76.2
		kW	2.23	2.45	2.68	2.86	3.23	3.50	3.71	3.80	4.11
65	1800	TH	19.1	25.4	32.2	37.3	47.6	56.4	62.4	65.1	73.8
		THI	17.5	23.3	29.5	34.0	41.7	53.9	62.4	65.1	73.8
		kW	2.57	2.86	3.18	3.43	3.95	4.42	4.73	4.87	5.39
	2400	TH	19.6	26.1	33.2	38.5	49.2	58.0	64.0	66.5	75.0
		THI	18.1	24.0	30.4	35.1	43.1	55.4	64.0	66.5	75.0
		kW	2.51	2.78	3.06	3.28	3.73	4.11	4.36	4.48	4.90
	3000	TH	20.0	26.6	33.8	39.2	50.2	59.0	64.7	67.1	75.4
		THI	18.4	24.5	31.0	35.8	44.0	56.3	64.7	67.1	75.4
		kW	2.47	2.72	2.98	3.18	3.58	3.91	4.13	4.24	4.59
70	1800	TH	17.8	24.1	31.0	36.1	46.4	55.2	61.3	64.0	72.8
		THI	16.4	22.2	28.4	32.9	40.6	52.7	61.3	64.0	72.8
		kW	2.69	2.99	3.33	3.59	4.13	4.62	4.95	5.09	5.63
	2400	TH	18.4	24.9	32.0	37.3	48.0	57.0	63.0	65.6	74.2
		THI	16.9	22.9	29.3	34.0	42.0	54.4	63.0	65.6	74.2
		kW	2.64	2.91	3.21	3.44	3.91	4.32	4.58	4.70	5.14
	3000	TH	18.7	25.4	32.6	38.0	49.0	57.9	63.9	66.4	74.7
		THI	17.2	23.3	29.8	34.7	42.9	55.3	63.9	66.4	74.7
		kW	2.60	2.86	3.14	3.34	3.77	4.12	4.35	4.46	4.83
80	1800	TH	15.3	21.5	28.4	33.5	43.8	52.5	58.9	61.5	70.6
		THI	14.1	19.8	26.0	30.6	38.4	50.1	58.9	61.5	70.6
		kW	2.93	3.27	3.64	3.92	4.50	5.02	5.41	5.56	6.13
	2400	TH	15.8	22.3	29.4	34.7	45.3	54.4	60.8	63.5	72.4
		THI	14.5	20.5	26.9	31.6	39.7	52.0	60.8	63.5	72.4
		kW	2.89	3.19	3.52	3.77	4.28	4.73	5.03	5.16	5.65
	3000	TH	16.1	22.7	30.0	35.4	46.3	55.6	61.9	64.6	73.2
		THI	14.8	20.9	27.5	32.3	40.6	53.1	61.9	64.6	73.2
		kW	2.86	3.14	3.45	3.68	4.14	4.54	4.80	4.92	5.34

LEGEND:

TH – Total Heating Capacity, Gross (1000 Btu/h)

THI – Integrated Heating Capacity, Gross (1000 Btu/h)

kW – Total Compressor Power Motor Input

PERFORMANCE DATA

CHS091, FHS091 HEATING COMBINATION RATINGS

CHS091 / FHS091										
Return Air (°F db)	CFM (Standard Air)		Temperature Air Entering Outdoor Coil (°F db at 70% rh)							
			−10	0	10	17	30	40	47	50	60
55	2250	TH	31.6	39.6	47.8	53.8	66.9	78.2	86.1	89.6	101
		THI	29.1	36.4	43.8	49.0	58.6	74.7	86.1	89.6	101
		kW	3.83	4.14	4.45	4.67	5.18	5.65	5.96	6.08	6.53
	3000	TH	32.2	40.5	48.8	55.0	69.4	80.1	88.0	91.4	102
		THI	29.7	37.2	44.7	50.2	60.8	76.5	88.0	91.4	102
		kW	3.70	3.96	4.22	4.42	4.87	5.23	5.44	5.54	5.90
	3750	TH	32.6	40.9	49.4	55.8	70.3	81.2	88.8	92.1	103
		THI	30.0	37.6	45.3	50.9	61.6	77.5	88.8	92.1	103
		kW	3.62	3.86	4.09	4.26	4.67	4.97	5.15	5.23	5.54
65	2250	TH	29.5	37.4	45.6	51.4	63.7	75.8	83.8	87.4	98.6
		THI	27.1	34.4	41.8	46.9	55.8	72.4	83.8	87.4	98.6
		kW	4.24	4.56	4.90	5.14	5.65	6.19	6.55	6.67	7.15
	3000	TH	30.2	38.3	46.7	52.7	65.8	77.8	85.8	89.2	100
		THI	27.7	35.2	42.8	48.1	57.7	74.3	85.8	89.2	100
		kW	4.12	4.40	4.68	4.88	5.32	5.75	6.00	6.10	6.48
	3750	TH	30.6	38.8	47.3	53.5	67.3	78.9	86.7	90.0	101
		THI	28.1	35.7	43.4	48.8	59.0	75.4	86.7	90.0	101
		kW	4.04	4.29	4.54	4.72	5.12	5.50	5.68	5.77	6.10
70	2250	TH	28.3	36.2	44.4	50.3	62.3	73.7	82.5	86.2	97.4
		THI	26.0	33.3	40.6	45.9	54.6	70.3	82.5	86.2	97.4
		kW	4.45	4.79	5.14	5.39	5.91	6.43	6.87	6.99	7.48
	3000	TH	28.9	37.1	45.5	51.4	64.2	76.6	84.6	88.1	98.9
		THI	26.6	34.1	41.7	46.9	56.2	73.1	84.6	88.1	98.9
		kW	4.33	4.62	4.92	5.12	5.57	6.03	6.29	6.40	6.79
	3750	TH	29.4	37.6	46.2	52.2	65.5	77.8	85.6	89.0	99.6
		THI	27.0	34.6	42.3	47.6	57.4	74.3	85.6	89.0	99.6
		kW	4.26	4.52	4.78	4.97	5.37	5.77	5.97	6.06	6.40
80	2250	TH	25.6	33.6	41.8	47.7	59.5	70.2	79.4	83.6	95.1
		THI	23.6	30.9	38.3	43.5	52.1	67.0	79.4	83.6	95.1
		kW	4.89	5.26	5.64	5.92	6.47	6.99	7.49	7.67	8.19
	3000	TH	26.3	34.5	42.9	49.0	61.2	72.7	82.1	85.7	96.6
		THI	24.2	31.7	39.3	44.7	53.6	69.5	82.1	85.7	96.6
		kW	4.78	5.10	5.42	5.65	6.12	6.57	6.93	7.05	7.46
	3750	TH	26.7	35.0	43.6	49.8	62.3	74.7	83.3	86.7	97.3
		THI	24.5	32.2	39.9	45.4	54.6	71.3	83.3	86.7	97.3
		kW	4.71	5.00	5.29	5.50	5.90	6.33	6.59	6.69	7.04

LEGEND:

TH – Total Heating Capacity, Gross (1000 Btu/h)

THI – Integrated Heating Capacity, Gross (1000 Btu/h)

kW – Total Compressor Power Motor Input

PERFORMANCE DATA

CHS121, FHS120 RATINGS

HEATING COMBINATION

CHS121 / FHS120										
Return Air (°F db)	CFM (Standard Air)		Temperature Air Entering Outdoor Coil (°F db at 70% rh)							
			−10	0	10	17	30	40	47	50	60
55	3000	TH	35.9	46.0	56.1	64.2	81.1	96.6	106	110	123
		THI	33.1	42.3	51.4	58.5	71.0	92.3	106	110	123
		kW	4.46	4.83	5.18	5.45	6.03	6.59	6.83	6.95	7.37
	4000	TH	36.8	46.8	57.2	65.4	83.0	97.9	107	110	123
		THI	33.8	43.0	52.4	59.7	72.7	93.5	107	110	123
		kW	4.34	4.66	4.96	5.19	5.67	6.08	6.28	6.37	6.70
	5000	TH	37.2	47.4	57.9	66.2	84.8	98.3	107	110	123
		THI	34.2	43.5	53.0	60.3	74.3	93.9	107	110	123
		kW	4.26	4.55	4.82	5.03	5.50	5.79	5.96	6.04	6.31
65	3000	TH	32.5	43.0	53.3	61.2	77.9	92.9	104	108	120
		THI	29.9	39.5	48.8	55.9	68.2	88.7	104	108	120
		kW	4.94	5.36	5.75	6.05	6.66	7.24	7.58	7.71	8.15
	4000	TH	33.3	44.0	54.4	62.5	79.5	95.7	105	108	121
		THI	30.7	40.4	49.8	57.0	69.7	91.3	105	108	121
		kW	4.83	5.19	5.52	5.78	6.29	6.79	6.99	7.09	7.44
	5000	TH	33.8	44.6	55.0	63.3	80.7	96.3	105	109	121
		THI	31.1	41.0	50.4	57.7	70.7	92.0	105	109	121
		kW	4.76	5.09	5.39	5.61	6.07	6.47	6.65	6.74	7.03
70	3000	TH	30.7	41.4	51.9	59.7	76.3	90.9	102	107	119
		THI	28.3	38.0	47.5	54.4	66.8	86.8	102	107	119
		kW	5.20	5.64	6.06	6.36	7.00	7.57	7.98	8.11	8.57
	4000	TH	31.5	42.3	52.9	61.0	78.0	93.5	104	107	120
		THI	29.0	38.9	48.5	55.6	68.3	89.3	104	107	120
		kW	5.09	5.47	5.83	6.09	6.62	7.14	7.38	7.48	7.84
	5000	TH	32.0	42.9	53.5	61.8	79.0	95.2	104	108	120
		THI	29.4	39.4	49.1	56.3	69.2	90.9	104	108	120
		kW	5.02	5.37	5.69	5.93	6.39	6.85	7.03	7.11	7.41
80	3000	TH	26.9	37.8	49.0	56.6	73.0	86.9	98.3	103	117
		THI	24.8	34.8	44.9	51.6	63.9	83.0	98.3	103	117
		kW	5.75	6.23	6.72	7.04	7.73	8.32	8.85	8.98	9.46
	4000	TH	27.6	38.7	50.1	57.8	74.7	89.4	101	105	118
		THI	25.4	35.6	45.9	52.7	65.4	85.3	101	105	118
		kW	5.65	6.08	6.49	6.76	7.35	7.84	8.21	8.32	8.69
	5000	TH	28.0	39.3	50.6	58.5	75.7	90.8	102	106	118
		THI	25.8	36.1	46.3	53.4	66.3	86.8	102	106	118
		kW	5.59	5.98	6.35	6.60	7.11	7.57	7.84	7.93	8.24

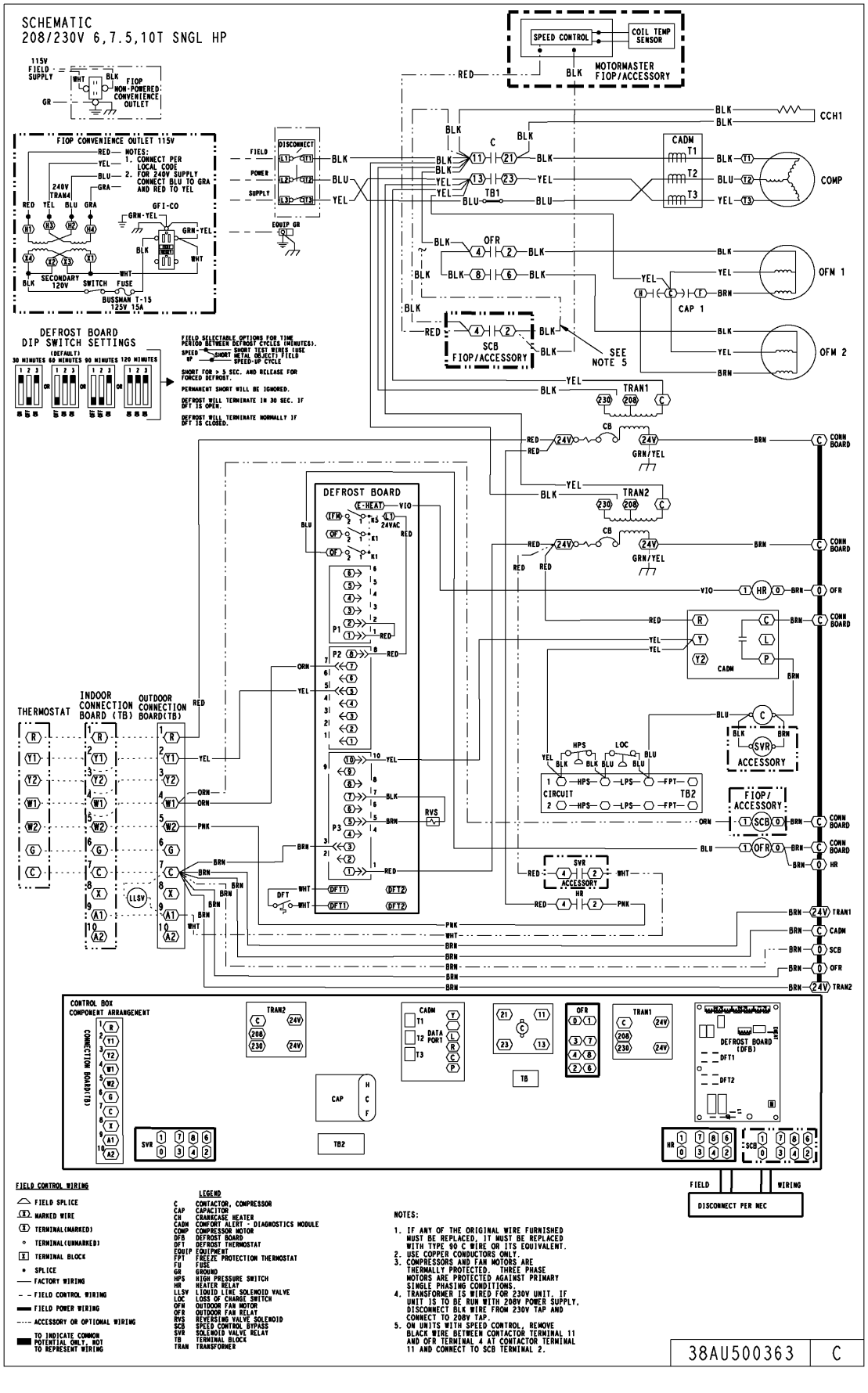
LEGEND:

TH – Total Heating Capacity, Gross (1000 Btu/h)

THI – Integrated Heating Capacity, Gross (1000 Btu/h)

kW – Total Compressor Power Motor Input

TYPICAL WIRING SCHEMATIC



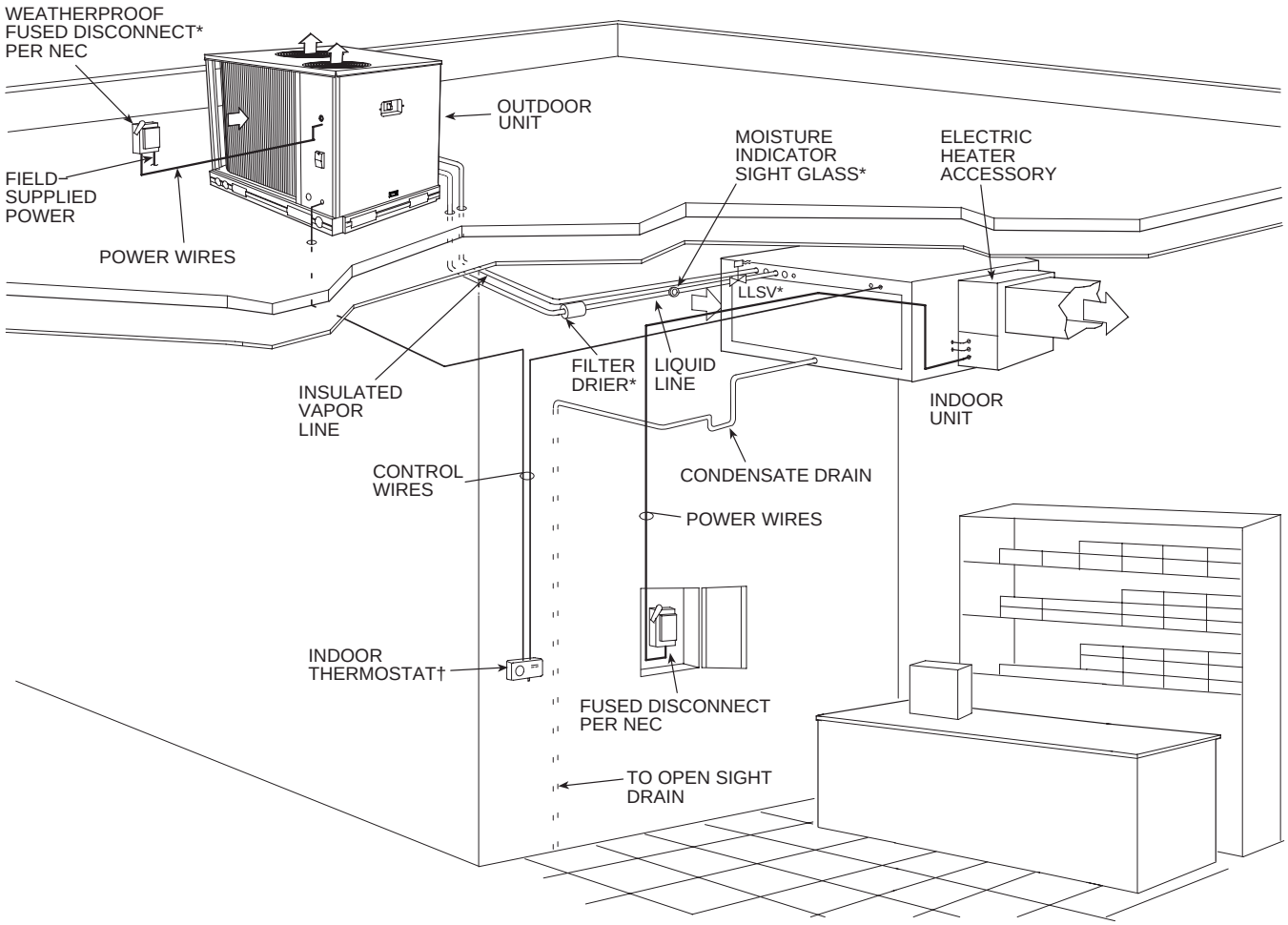
ELECTRICAL DATA

WITHOUT POWERED CONVENIENCE OUTLET

UNIT CHS	NOMINAL POWER SUPPLY	VOLTAGE RANGE		COMPRESSOR		OFM		POWER SUPPLY	
	V–Ph–Hz	Min	Max	RLA	LRA	Qty	FLA (ea)	MCA	MOCP
072	208/230–3–60	187	253	19.0	123	2	1.5	26.8/26.8	45/45
	460–3–60	414	506	9.7	62	2	0.9	13.9	20
	575–3–60	518	633	7.4	50	2	0.6	10.5	15
091	208/230–3–60	187	253	25.0	164	2	1.5	34.3/34.3	50/50
	460–3–60	414	506	12.2	100	2	0.9	17.1	25
	575–3–60	518	633	9.0	78	2	0.6	12.5	20
121	208/230–3–60	187	253	30.1	225	2	1.5	40.6/40.6	60/60
	460–3–60	414	506	16.7	114	2	0.8	22.5	30
	575–3–60	518	633	12.2	80	2	0.6	16.5	25

TYPICAL PIPING AND WIRING

HORIZONTAL INSTALLATION



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.

APPLICATION DATA

REFRIGERANT LINE SIZING — Consider the length of the piping required between the outdoor and indoor units. The maximum allowable line length is 100 ft (30.5 m). See Maximum Vertical Separation Table below. Refrigerant vapor piping should be insulated

IMPORTANT: A refrigerant receiver is not provided with the unit. Do not install a receiver.

Maximum Vertical Separation*

UNIT CHS	UNIT FHS	DISTANCE FT (M) Unit CHS Above Unit FHS
072	072	50 (15.2)
091	091	60 (18.3)
121	120	60 (18.3)

* Vertical distance between indoor and outdoor units.

INSTALL FILTER DRIER(S) AND MOISTURE INDICATOR(S) — Every unit MUST have a bi−directional filter drier in the liquid line. Locate the filter drier at the indoor unit, close to the evaporator coil thermal expansion valve (TXV) inlets.

CHS units include one R−410A−duty filter drier, shipped in cartons attached to the unit base pan. Remove the filter drier and prepare to install in the liquid line at the evaporator coil. Do not remove connection fitting plugs until ready to connect and braze the filter drier into the liquid line position.

R−410A−duty Filter Drier(s)

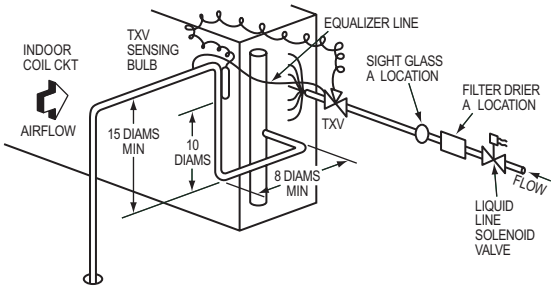
Model-Size	Qty	Liquid Line OD	Desiccant Volume	Part Number Ref
CHS072	1	$^3/_8$-in	8 cu. in.	1179875
CHS091	1	$^1/_2$-in	16 cu. in.	1179876
CHS121	1	$^1/_2$-in	16 cu. in.	1179876

Installation of liquid line moisture indicating sight glass in each circuit is recommended. Locate the sight glass(es) between the outlet of the filter drier and the TXV inlet.

Refer to Refrigerant Specialties Part Numbers Table for recommendations on refrigeration specialties.

Select the filter drier for maximum unit capacity and minimum pressure drop. Complete the refrigerant piping from the indoor unit to the outdoor unit before opening the liquid and suction lines at the outdoor unit.

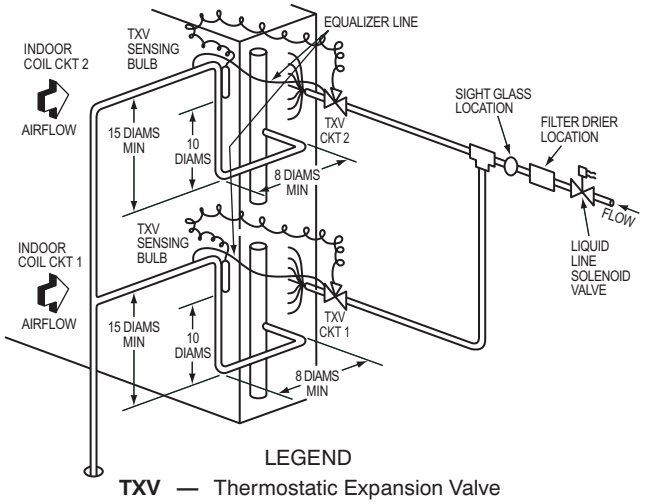
INSTALL LIQUID LINE SOLENOID VALVE — It is recommended that a bi−directional solenoid valve be placed in the main liquid line (see Figs. 1 & 2) between the outdoor unit and the indoor coil. Locate the solenoid valve at the end of the liquid line, near the outdoor unit connections, with flow direction arrow pointed at the outdoor unit. Refer to Refrigerant Specialties Part Numbers Table below. (A liquid line solenoid valve is required when the liquid line length exceeds 75 ft [23 m].) This valve prevents refrigerant migration (which causes oil dilution) to the compressor during the off cycle, at low outdoor ambient temperatures. Wire the solenoid according to the unit label



LEGEND

TXV — Thermostatic Expansion Valve

Fig. 1 − Location of Sight Glass(es) and Filter Driers (typical CHS/FHS 6 & 7.5 ton system)



LEGEND

TXV — Thermostatic Expansion Valve

Fig. 2 − Location of Sight Glass(es) and Filter Driers (typical CHS121 / FHS120 system)

Refrigerant Specialties Part Numbers

LIQUID LINE SIZE (in.)	LIQUID LINE SOLENOID VALVE (LLSV)	LLSV COIL	SIGHT GLASS	FILTER DRIER
$^3/_8$	1179871	1178273	1178270	Provided with unit.
$^1/_2$	1179872	1178273	1178271	
$^5/_8$	1179873	1178273	1178272	

GUIDE SPECIFICATIONS − CHS072−121

Split System Heat Pump Outdoor Unit with R−410A Refrigerant

HVAC Guide Specifications — Section 15678

Size Range: **66,000 to 106,000 Btuh Heating**
6 to 10 Nominal Tons Cooling

Part 1 — General

1.01 SYSTEM DESCRIPTION

A. Outdoor−mounted, electrically controlled, air−cooled split system heat pump suitable for on−the−ground or rooftop installation. Unit shall consist of a 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 function as the outdoor component of an air to air electric heat pump system.

B. Unit must be designed with a R−410A refrigerant circuit to match Packaged Heat Pump Air Handling Unit(s), FHS for matched systems approved by the manufacturer.

1.02 QUALITY ASSURANCE

A. Unit shall be rated in accordance with ARI Standard 340/360.

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 outdoor coils shall be leak tested at 150 psig and pressure tested at 650 psig and qualified to UL burst test at 1980 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 split system heat pump. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressor, holding charge R−410A, and special features required prior to field start−up.

B. Unit Cabinet:

1. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a pre−painted 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. 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. Compressor shall include overload protection.
4. Compressors shall be equipped with a crankcase heater.
5. Compressor shall be equipped with internal high discharge temperature protection.

E. Coil:

1. Coil shall be air−cooled and circuited for sub cooling during cooling mode of operation.
2. Coil shall be constructed of aluminum fins (copper fins optional) mechanically bonded to internally grooved seamless copper tubes which are then cleaned, dehydrated, and sealed.

F. Refrigeration Components and Operation:

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

2. Unit shall be capable of starting and running up to 125° F (52° C) and down to 35° F (2° C) ambient outdoor temperature.
3. Unit shall operate at +/− 10% from rated voltage

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 protection switch.
   b. Loss−of−charge protection switch.

H. Electrical Requirements:
1. Unit electrical power shall be single−point connection.
2. Unit control circuit shall contain a 75VA − 24−v transformer for unit control.

I. Special Features:
1. 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.
2. Convenience Outlet:
   c. Non−Powered convenience outlet.
      (1.) Outlet shall be powered from a separate 115/120v power source.
      (2.) A transformer shall not be included.
      (3.) Outlet shall be factory−installed and internally mounted with easily accessible 115−v female receptacle.
      (4.) Outlet shall include 15 amp GFI receptacles with independent fuse protection.
      (5.) Outlet shall be accessible from outside the unit.
      (6.) Outlet shall include a field−installed “Wet in Use” cover.
3. 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).
4. Optional Outdoor Coil Materials:
   a. Pre−Coated Aluminum−Fin Coils:
      Coils shall have a durable epoxy−phenolic coating to provide protection in mildly corrosive coastal environments. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube. Epoxy−phenolic barrier shall minimize galvanic action between dissimilar metals.
   b. E−Coated Aluminum−Fin Coils:
      Coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss requirements of 60° of 65 to 90% per ASTM D523−89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363−92A and cross hatch adhesion of 4B−5B per ASTM D3359−93. Impact resistance shall be up to 160 in./lb (ASTM D2794−93). Humidity and water immersion resistance shall be up to a minimum of 1000 and 250 hours respectively (ASTM D2247−92 and ASTM D870−92). Corrosion durability shall be confirmed through testing to no less than 1000 hours salt spray per ASTM B117−90. Coil construction shall be aluminum fins mechanically bonded to copper tubes.
5. Louvered hail Guard Package:
   Louvered hail guard package shall protect coils against damage from hail and other flying debris.
6. Outdoor Coil Grille:
   Grille shall add decorative appearance to unit and protect outdoor coil from large objects and vandalism.