

TECHNICAL GUIDE

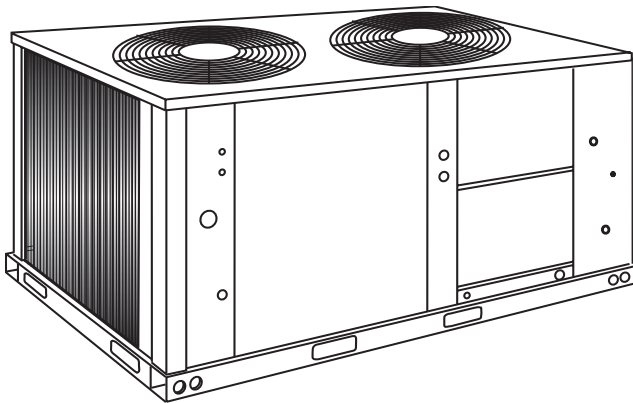
SPLIT SYSTEM

AIR COOLED

CONDENSING UNITS

HEHB180 & 240

15 AND 20 NOMINAL TONS



ISO 9001
Certified Quality
Management System



DESCRIPTION

These outdoor condensing units are completely assembled, piped and wired at the factory to provide one-piece shipment and rigging. Each unit is pressurized with a holding charge of Refrigerant-22 for storage and/or shipping.

The compact design, clean styling, and quiet operation make these condensing units suitable for almost any outdoor location. On rooftops . . . because they weigh much less than a single package unit of similar capacity and are much easier to rig and support.

All sheet metal parts are constructed of commercial grade galvanized steel. Before painting, each part is thoroughly cleaned to remove any grease or dirt from its surfaces. The external parts are then coated with powder paint to assure a quality finish for many years. This coating system has passed the 1000 hour, salt spray test per ASTM Standard B117.

All models include a 1-year limited warranty on the complete unit. The compressor carries an additional 4-year warranty.

A matching line of Evaporator Blower units is also offered to meet your precise capacity and air handling requirements.

FEATURES

- Simplicity® Controls
- Two stage single refrigerant circuit design
- Tandem scroll compressors
- Inherently protected fan motors
- High and Low Pressure Controls
- Exterior service port connections
- Weatherized Casing with powder paint (1000 hour salt spray hours)
- Five-minute compressor anti-short cycle delay
- Compressor operation to 45°F
- Field install Low Ambient control to 0°F
- Permanently attached base rails with fork lift slot and lifting holes allowing 3-way fork lift access and overhead rigging
- Factory installed service valves
- Factory installed crank case heaters
- Factory supplied filter-drier for field installation
- Optional Technicoat Coils
- Optional Pump Out Kit
- Optional Coil Guard
- Five year limited warranty
- One year limited warranty on all other parts

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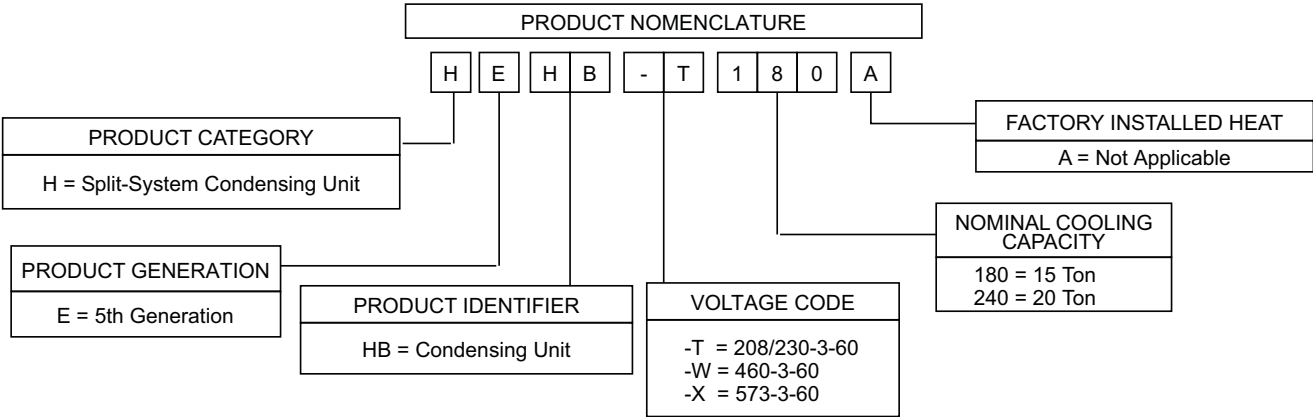


TABLE 1: ARI RATINGS

CONDENSING UNIT	AIR HANDLER	NET CAPACITY MBH (1)	EER (1)	IPLV (1)	COND. UNIT SOUND dB(2)	RATED AIR FLOW CFM	RATED EXT. STATIC PRESS IN WC
HEHB180	KCBC180	192	8.7	10.8	91.0	6000	0.35
HEHB240	LDBC240	234	8.8	11.0	89.0	8000	0.40

1. Rated in accordance with ARI 360.
2. Rated in accordance with ARI 370.
3. All ratings were determined with 25 feet of interconnecting tubing and with the air handler in the horizontal position.
For the 180, a 5/8" liquid line and an insulated 1-5/8" suction line were used.
For the 240, a 7/8" liquid line and an insulated 2-1/8" suction line were used.
4. For 208V operation, derate the 180 and 240 capacity 1% and add 2dB to HEHB240 sound rating.

TABLE 2: UNIT APPLICATION DATA

Voltage Variation ¹ Min. / Max.	208/230-3-60	187 / 252
	460-3-60	432 / 504
	575-3-60	540 / 630
Ambient Air on Condenser Coil Min. / Max.		35°F ² / 115°F
Ambient Air on Condenser Coil Min. / Max. with Head Pressure Control		0 - 115°F

1. Utilization range "A" in accordance with ARI Standard 110.
2. The minimum allowed ambient temperature for mechanical cooling without the head pressure control accessory installed must be raised if the indoor air flow is less than the minimum value given in the capacity tables.

TABLE 3: PART LOAD CAPACITY AND EFFICIENCY

CONDENSING UNIT	AIR HANDLER	SINGLE COMPRESSOR NET CAPACITY MBH	EVAPORATOR					
			IPLV	AIR FLOW CFM	ENTERING DRY BULB °F	ENTERING WET BULB °F	RATED EXT. STATIC PRESS IN WC	CONDENSER ENTERING DRY BULB °F
HEHB180	KCBC180	123.8	10.8	6000	80	67	0.35	80
HEHB240	LDBC240	133.7	11.0	800	80	67	0.4	80

TABLE 4: PHYSICAL DATA

MODEL SIZE (MBH)	COMPRESSOR ¹		Condenser									Unit Weight (lbs.)		Charge (Refrigerant-22 - lbs.oz.)	
			24" Fan (Propeller)			Fan Motor ²				Coil					
	Rating (Tons)	Cap. (Stg's.)	Qty.	Blades/Pitch (Deg.)	Nom. CFM	Qty.	HP	RPM	Rotation	Fins per inch	Rows Deep	Ship.	Oper.	Holding ³	Oper ⁴
180	15	2	2	3/34	10,800	2	1	1100	CCWLE	20	2	920	930	1-0	25-0
240	20	2	2	3/34	11,300	2	1	1100	CCWLE	20	2	970	990	1-0	37-0

1. Compressor set consists of two Copeland Scroll compressors manifolded into a single refrigerant circuit.
2. The ball bearing, 48 frame, single phase condenser fan motor have internal protection that is directly connected to the condenser fans. Motor rotation is counter-clockwise when viewing the lead end, which is opposite the shaft end.
3. Holding charge is the amount in the unit as shipped from the factory.
4. Operating refrigerant charge is for the condensing unit and the matching York air handler, but does not include the charge in the interconnecting piping.

TABLE 5: ELECTRICAL DATA

MODEL	UNIT POWER SUPPLY	COMPRESSOR ¹			CONDENSER FAN MOTOR			UNIT	
		QTY.	RLA	LRA	QTY.	HP	FLA	MINIMUM CIRCUIT AMPACITY (AMPS)	MAXIMUM FUSE ² /BREAKER ³ SIZE (AMPS)
HHB180A25	208/230/3/60	2	32.1	195	2	1	4.7	81.6	110
HHB180A46	460/3/60	2	16.4	95	2	1	2.5	41.9	50
HHB180A58	575/3/60	2	12.0	80	2	1	2.0	31.2	40
HHB240A25	208/230/3/60	2	42.0	239	2	1	4.7	103.9	125
HHB240A46	460/3/6/60	2	19.2	125	2	1	2.5	48.2	60
HHB240A58	575/3/60	2	13.8	80	2	1	2.0	35.0	45

1. The 208-230 V compressors and motors use a single tap for the entire range of voltages. The 208/230 V to 24 V transformers have different taps for 208 and 230 V.
2. Dual element, time delay type.
3. HACR Type per NEC.

FIELD INSTALLED ACCESSORIES

- **0°F LOW AMBIENT** - A single phase condenser fan motor and head pressure control to reduce its speed maintain stable system operation at ambient temperatures down to 0°F.
- **COIL GUARD** - A decorative coil guard provides an additional level of protection for the condenser coils.
- **PUMP OUT ACCESSORY** - Provides compressor protection upon start-up.

Low Ambient Cooling

The following accessories are available to provide low ambient operation to 0°F:

2LA04704225	208/230 VOLTS
2LA04704346	460 VOLTS
2LA04704458	575 VOLTS

All dimensions are in inches. They are subject to change without notice. Certified dimensions will be provided upon request.

Connection Entry	Connection Size	
	15 Ton	20 Ton
Suction Line	A 1-5/8 OD	2-1/8 OD
Liquid Line	B 5/8 OD	7/8 OD
Power Wiring	C 2-1/8 KO	2-1/8 KO
Control Wiring	D 7/8 KO	7/8 KO
Accessory Wiring	E 7/8 KO	7/8 KO
Accessory Wiring	F 1-3/8 KO	1-3/8 KO

CLEARANCES

Overhead (Top) ¹	120"
Front (Piping and Access Panels)	30"
Left Side	24"
Right Side	24"
Rear	24"
Bottom ²	0"

- Units must be installed outdoors. Overhanging structures or shrubs should not obstruct condenser air discharge.
- Adequate snow clearance must be provided if winter operation is expected.

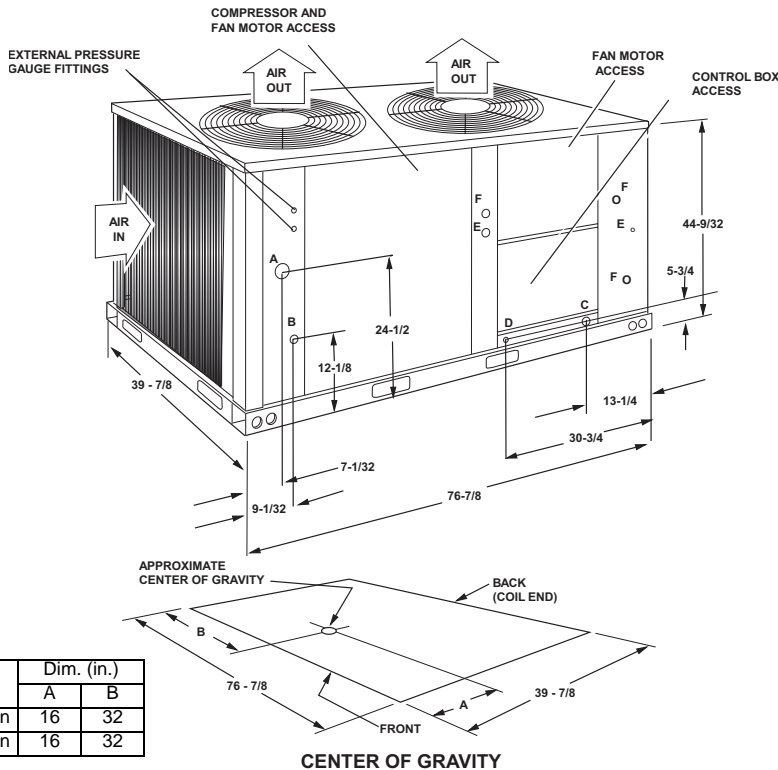


FIGURE 1 - UNIT DIMENSIONS AND CLEARANCES

TABLE 6: CONDENSING UNIT COOLING CAPACITIES AND POWER REQUIREMENTS

MODEL	COMPRESSOR SUCTION		AMBIENT TEMPERATURE ENTERING CONDENSER COIL (°F)											
	PRESSURE (PSIG)	SATURATED TEMP (°F)	65		75		85		95		105		115	
			MBH ¹	kW ²	MBH	kW	MBH	kW	MBH	kW	MBH	kW	MBH	kW
180	54.9	30	155	13.2	147	14.2	138	154	130	16.7	122	18.2	114	20.0
	61.6	35	169	13.561	161	14.5	152	15.7	144	17.0	135	18.5	126	20.3
	68.5	40	184	13.8	175	14.8	166	16.0	157	17.3	148	18.9	139	20.6
	76.0	45	200	14.1	191	15.2	181	16.3	172	17.7	162	19.2	153	21.0
	84.0	50	217	14.5	207	15.5	197	16.7	187	18.1	177	19.6	167	21.4
240	54.9	30	199	16.5	189	18.2	179	20.0	169	21.9	159	24.1	149	26.5
	61.6	35	218	16.8	207	18.5	196	20.3	186	22.3	175	24.5	164	26.9
	68.5	40	238	17.1	226	18.8	215	20.6	203	22.7	192	24.9	180	27.4
	76.0	45	258	17.5	246	19.1	234	21.0	221	23.1	209	25.4	196	27.9
	84.0	50	280	17.8	266	19.5	253	21.4	240	23.5	226	25.8	213	28.4

1. Capacities are net ratings.
 2. Power is for the condensing unit only.

TABLE 7: SYSTEM GROSS COOLING CAPACITIES AND POWER REQUIREMENTS HEHB180 W/KCBC180

AIR ENT. EVAPORATOR		AIR TEMPERATURE ENTERING EVAPORATOR, DRY BULB																	
CFM	WB	POWER INPUT KW	85°F AIR ENTERING CONDENSER								POWER INPUT KW	95°F AIR ENTERING CONDENSER							
			86		80		74		68			86		80		74		68	
			TOTAL	SENS	TOTAL	SENS	TOTAL	SENS	TOTAL	SENS		TOTAL	SENS	TOTAL	SENS	TOTAL	SENS	TOTAL	SENS
7200	72	15.6	205	154	204	115	201	77			17.2	198	151	196	112	193	74		
	67	15.4	197	188	191	149	188	110	185	71	16.9	191	185	183	145	182	108	179	68
	62	15.3	197	197	183	182	176	144	174	106	16.9	191	191	179	179	170	142	168	103
	57	15.3	197	197	182	182	172	172	163	140	16.9	191	191	179	179	167	167	157	136
6600	72	15.5	203	148	202	112	199	75			17.2	196	145	194	109	192	73		
	67	15.4	193	180	189	143	187	108	184	70	16.9	187	177	182	140	180	105	177	67
	62	15.2	193	193	181	174	174	139	172	103	16.8	187	187	175	172	168	136	166	100
	57	15.2	193	193	181	181	169	169	160	134	16.8	187	187	175	175	164	164	155	132
6000	72	15.5	201	142	200	108	197	74			17.1	194	139	192	106	190	71		
	67	15.3	189	172	187	137	185	105	182	69	16.9	184	170	180	134	178	102	175	66
	62	15.2	188	188	177	168	172	134	170	101	16.8	183	183	171	164	166	131	164	98
	57	15.2	188	188	177	177	164	162	158	129	16.8	183	183	171	171	159	158	152	126
5400	72	15.5	199	135	197	105	195	72			17.1	192	133	190	102	188	70		
	67	15.3	186	163	184	131	182	101	180	68	16.9	180	160	178	129	176	99	173	66
	62	15.1	183	183	173	160	170	128	168	98	16.7	178	178	167	156	163	125	162	95
	57	15.1	183	183	172	172	160	155	156	124	16.7	178	178	167	167	155	152	150	121
4800	72	15.4	196	129	194	101	192	71			17.0	189	126	187	98	185	68		
	67	15.2	183	154	181	125	179	98	177	67	16.8	177	151	175	122	173	95	170	65
	62	15.0	177	177	169	150	166	122	165	95	16.6	172	172	163	147	160	119	159	92
	57	15.0	177	177	166	166	156	147	153	118	16.6	172	172	161	161	151	143	147	115

AIR ENT. EVAPORATOR		AIR TEMPERATURE ENTERING EVAPORATOR, DRY BULB																	
CFM	WB	POWER INPUT KW	105°F AIR ENTERING CONDENSER								POWER INPUT KW	115°F AIR ENTERING CONDENSER							
			86		80		74		68			86		80		74		68	
			TOTAL	SENS	TOTAL	SENS	TOTAL	SENS	TOTAL	SENS		TOTAL	SENS	TOTAL	SENS	TOTAL	SENS	TOTAL	SENS
7200	72	19.0	190	148	188	109	185	72			21.0	182	146	180	106	177	69		
	67	18.7	184	181	176	142	174	104	171	65	20.8	177	177	169	140	166	101	163	63
	62	18.7	184	184	172	172	163	139	161	100	20.7	177	177	166	166	156	135	153	96
	57	18.7	184	184	172	172	161	161	151	133	20.7	177	177	166	166	155	155	144	129
6600	72	19.0	188	142	186	106	184	70			21.0	180	139	178	103	175	67		
	67	18.7	180	173	175	137	172	102	170	65	20.7	173	170	167	134	165	98	162	62
	62	18.6	180	181	169	167	161	133	159	97	20.6	173	173	163	163	155	130	152	94
	57	18.6	180	181	169	169	158	158	149	129	20.6	173	173	163	163	152	152	142	125
6000	72	18.9	186	136	184	102	182	69			21.0	178	133	176	99	174	66		
	67	18.7	177	166	173	131	171	99	168	64	20.7	170	162	165	128	163	95	161	61
	62	18.6	176	176	165	161	159	128	158	95	20.6	170	170	159	157	152	124	151	92
	57	18.6	176	176	165	166	155	155	146	123	20.6	170	170	159	159	149	149	141	120
5400	72	18.9	184	129	183	99	180	67			20.9	176	127	175	96	172	65		
	67	18.6	173	157	171	125	169	96	166	63	20.6	167	154	163	122	161	92	159	60
	62	18.5	172	172	161	153	157	122	155	92	20.5	166	166	155	149	150	119	149	89
	57	18.5	172	172	161	161	150	148	144	118	20.5	166	166	155	155	144	144	138	115
4800	72	18.9	181	123	180	96	177	66			20.9	174	120	172	92	170	63		
	67	18.6	170	148	168	119	166	92	164	62	20.6	163	145	161	116	159	89	157	59
	62	18.4	166	166	157	144	154	116	153	89	20.4	161	161	152	142	148	113	146	86
	57	18.4	166	166	156	156	146	140	142	112	20.4	161	161	151	151	140	138	136	109

Notes:

1. Capacities are gross MBH.
2. Temperatures are expressed in °F.
3. Power (kW) is for the condensing unit only and corresponds to 80°F dry bulb air temperature entering the evaporator.
4. Air handler power is not included.
5. Shaded areas represent dry coil operation.

All Sensible Capacity

3.415 MBH

Blower Motor KW x KW = Blower Motor Heat (MBH)

TABLE 8: SYSTEM GROSS COOLING CAPACITIES AND POWER REQUIREMENTS HEHB240 W/LDBC240

AIR ENT. EVAPORATOR		AIR TEMPERATURE ENTERING EVAPORATOR, DRY BULB																	
CFM	WB	POWER INPUT KW	85°F AIR ENTERING CONDENSER								POWER INPUT KW	95°F AIR ENTERING CONDENSER							
			86		80		74		68			86		80		74		68	
			TOTAL	SENS	TOTAL	SENS	TOTAL	SENS	TOTAL	SENS		TOTAL	SENS	TOTAL	SENS	TOTAL	SENS	TOTAL	SENS
9600	72	22.8	279	204	277	153	273	104			25.2	268	200	266	149	262	100		
	67	22.3	265	251	259	197	257	148	252	96	24.8	255	246	249	193	246	143	242	92
	62	22.2	265	265	248	245	240	192	237	142	24.7	255	255	244	244	230	187	227	137
	57	22.2	265	265	248	248	237	237	221	185	24.6	255	255	244	244	229	229	212	181
8800	72	22.7	277	196	274	149	270	102			25.1	266	192	264	145	259	98		
	67	22.3	261	240	257	190	254	144	250	95	24.7	252	237	247	186	244	140	240	91
	62	22.0	261	261	243	234	237	185	235	138	24.5	252	252	235	231	228	181	225	134
	57	22.0	261	261	243	243	232	232	218	179	24.5	252	252	235	235	224	224	210	174
8000	72	22.6	274	188	271	144	267	100			25.1	263	184	261	141	257	96		
	67	22.2	257	229	254	182	251	140	247	93	24.6	247	225	244	179	241	136	237	90
	62	21.9	257	257	239	224	234	178	232	135	24.4	247	247	230	220	225	174	223	130
	57	21.9	257	257	239	239	221	216	216	173	24.4	247	247	230	230	215	213	207	169
7200	72	22.5	270	180	268	140	264	98			25.0	260	176	257	136	254	94		
	67	22.1	253	218	250	175	247	136	244	92	24.5	243	214	241	171	238	132	234	89
	62	21.7	250	250	234	213	230	171	228	131	24.2	242	242	225	208	222	167	219	127
	57	21.7	250	250	234	234	217	207	212	166	24.2	242	242	225	225	209	203	204	162
6400	72	22.4	266	171	263	135	260	96			24.9	256	168	253	131	250	92		
	67	22.0	247	205	246	167	243	131	240	91	24.4	239	202	237	163	234	127	230	87
	62	21.6	242	242	229	202	226	163	224	127	24.0	234	234	220	197	218	160	215	123
	57	21.6	242	242	227	227	211	196	208	159	24.0	234	234	220	220	203	192	200	155

AIR ENT. EVAPORATOR		AIR TEMPERATURE ENTERING EVAPORATOR, DRY BULB																	
CFM	WB	POWER INPUT KW	105°F AIR ENTERING CONDENSER								POWER INPUT KW	115°F AIR ENTERING CONDENSER							
			86		80		74		68			86		80		74		68	
			TOTAL	SENS	TOTAL	SENS	TOTAL	SENS	TOTAL	SENS		TOTAL	SENS	TOTAL	SENS	TOTAL	SENS	TOTAL	SENS
9600	72	27.9	257	196	255	145	250	96			31.0	245	191	243	141	238	93		
	67	27.4	246	242	239	189	236	139	231	88	30.4	241	241	228	185	225	134	220	84
	62	27.4	246	246	235	235	220	183	218	132	30.4	241	241	226	226	210	179	207	128
	57	27.4	246	246	235	235	220	220	203	176	30.4	241	241	226	226	210	210	194	172
8800	72	27.9	255	188	252	141	248	94			30.9	243	184	241	136	237	91		
	67	27.4	242	232	237	182	234	135	229	87	30.3	232	227	226	178	223	131	219	83
	62	27.2	242	242	231	231	218	176	216	129	30.2	232	232	221	221	208	172	206	125
	57	27.2	242	242	231	231	216	216	201	170	30.2	232	232	221	221	207	207	192	166
8000	72	27.8	252	180	250	136	246	92			30.8	241	177	238	132	234	89		
	67	27.3	238	221	234	174	231	131	227	86	30.3	228	217	223	170	220	127	216	82
	62	27.1	238	238	221	214	215	169	213	126	30.1	228	228	217	217	206	165	203	122
	57	27.1	238	238	221	221	211	211	198	164	30.1	228	228	217	217	203	203	189	159
7200	72	27.7	249	172	247	132	243	90			30.7	238	168	235	128	232	87		
	67	27.2	234	210	231	166	228	127	224	85	30.2	223	205	220	162	218	123	214	81
	62	26.9	234	234	217	204	212	162	210	123	29.9	223	223	208	199	203	158	201	118
	57	26.9	234	234	217	217	202	199	195	157	29.9	223	223	211	211	198	198	187	152
6400	72	27.6	245	163	243	127	239	88			30.6	234	159	232	123	229	85		
	67	27.1	229	197	227	159	224	123	221	84	30.1	219	193	217	154	214	119	211	80
	62	26.7	226	226	211	192	209	155	207	119	29.7	218	218	202	187	199	150	197	114
	57	26.7	226	226	211	211	196	188	192	150	29.7	218	218	202	202	188	182	183	146

Notes:

1. Capacities are gross MBH.
2. Temperatures are expressed in °F.
3. Power (kW) is for the condensing unit only and corresponds to 80°F dry bulb air temperature entering the evaporator.
4. Air handler power is not included.
5. Shaded areas represent dry coil operation.

All Sensible Capacity

3.415 MBH

Blower Motor KW x KW = Blower Motor Heat (MBH)

GUIDE SPECIFICATIONS - H*HB 180 THRU 240

I. General

- a. Units shall be manufactured in a facility registered under the ISO 9002 manufacturing quality standard.
- b. Units shall be listed to US and Canadian safety standards.
- c. Unit shall be packaged to allow outdoor storage.
- d. Warranty shall be a full year limited parts warranty on the complete unit with an additional 4-year warranty on the compressor.
- e. Unit shall be rated in accordance with ARI 360.

II. Unit Cabinet

- a. Cabinet shall be constructed of 18 gauge, zinc-coated steel, finished with a powder paint process capable of withstanding a minimum of 1000 salt spray hours according to ASTM B117.
- b. Cabinet screws shall comply with the ASTM B117 salt spray test for a minimum of 1000 hours.
- c. Panels shall be removable for easy access to all internal components during maintenance and service.
- d. Cabinet shall feature a separate access panel for the controls so that unit airflow need not be disturbed during servicing.
- e. Permanently attached base rails shall have 3-way fork lift access and lifting holes for ease of installation.

III. Compressor

- a. Compressors shall be hermetic scroll.
- b. Compressor shall feature motor overload protection.
- c. A crankcase heater shall keep refrigerant from diluting the compressor oil in the sump. Crankcase heater shall be field replaceable without removal of the charge.
- d. Neoprene isolators shall be used to minimize the transmission of sound and vibration.
- e. Compressor sets shall have two stages, with unloading accomplished through turning off one compressor.

IV. Condenser and Fans

- a. Fan motors shall be direct-drive with propeller-type condenser fans which discharge air vertically upward.

- b. Fan motors shall have permanently lubricated ball-bearings for longer wear during start and stop cycles and shall have inherent overload protection.
- c. Coil shall be constructed of rifled copper tubing mechanically expanded and bonded to louvered aluminum fins. Coil shall include an integral subcooler.

V. Refrigeration Components - Refrigeration system shall contain the following:

- a. High and low pressure cut-outs
- b. Suction and liquid line service valves to ease installation and recovery of refrigerant
- c. External ports to accommodate gauge lines, allowing for easy servicing
- d. Filter drier shipped in unit for field installation
- e. Holding charge of Refrigerant-22

VI. Controls - Unit controls shall include:

- a. Unit shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-volt transformer side.
- b. Unit shall incorporate a lockout circuit which provides reset capability at the space thermostat or base unit, should any of the following standard safety devices trip and shut off compressor:
 - c. Loss-of-charge/Low-pressure switch. (1) High-pressure switch. If any of the above safety devices trip, a LED (light-emitting diode) indicator shall flash a diagnostic code that indicates which safety switch has tripped.
 - d. Unit shall incorporate "AUTO RESET" compressor over temperature, over current protection.
- e. Unit shall operate with conventional thermostat designs and have a low voltage terminal strip for easy hook-up.
- f. Unit control board shall have on-board diagnostics and fault code display.
- g. Standard controls shall include anti-short cycle and low voltage protection.
- h. Control board shall monitor each refrigerant safety switch independently.
- i. Control board shall retain last 5 fault codes in non volatile memory, which will not be lost in the event of a power loss.

VII. Electrical

- a. Units shall be _____ volts, 3 phase, with a single power point connection.

- b. Unit control circuit shall have a 24 volt transformer, sized sufficiently to operate the indoor fan.
- c. All condenser fan motors and the secondary of each transformer shall be grounded.

VIII. Accessories and Options

- a. **Head Pressure**
Control Shall include a condenser fan motor and a pressure controller, allowing operation of the condensing unit down to 0°F.

- b. **Coil Guard**
Field installed decorative grille shall be placed on the units to provide further coil protection.
- c. **Phenolic Coating on Condenser Coil**
Condenser coils shall be dipped in a four-coat phenolic coating process to provide longer life in corrosive conditions.
- d. **Pump out Accessory**
Field installed pump out accessory to provide compressor protection upon start-up.