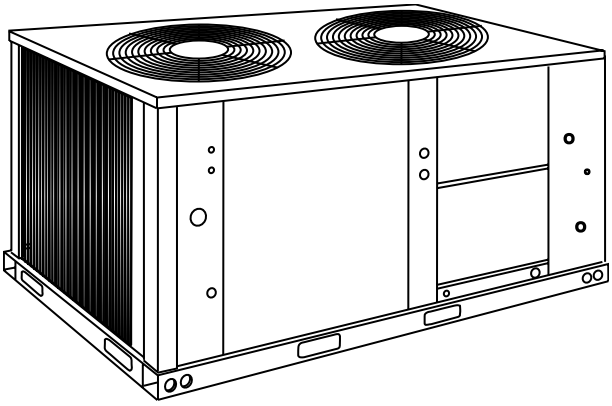
INSTALLATION MANUAL

SPLIT-SYSTEM CONDENSING UNITS AIR COOLED

MODELS: HEHB180 & 240

CONTENTS

See the following pages for a complete Table of Contents.



NOTES, CAUTIONS AND WARNINGS

The installer should pay particular attention to the words: *NOTE*, *CAUTION*, and *WARNING*. Notes are intended to clarify or make the installation easier. Cautions are given to prevent equipment damage. Warnings are given to alert installer that personal injury and/or equipment damage may result if installation procedure is not handled properly.

CAUTION: READ ALL SAFETY GUIDES BEFORE YOU BEGIN TO INSTALL YOUR UNIT.

SAVE THIS MANUAL

ISO 9001
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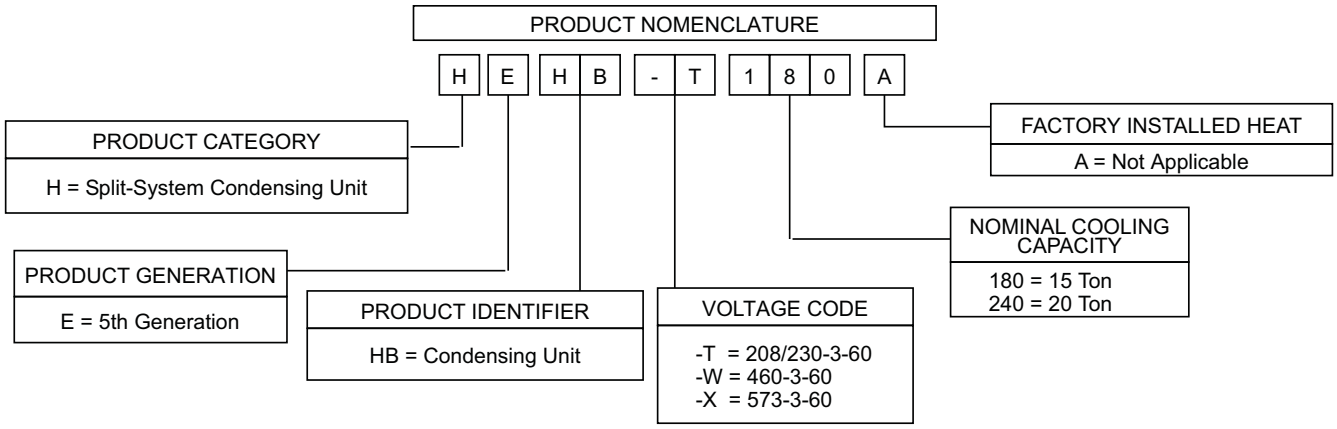
Management System

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES



GENERAL

These condensing units are designed for outdoor installation on a roof or at ground level. Every unit is completely piped and wired at the factory and is shipped ready for immediate installation. Only the liquid and suction lines to the evaporator coil, the filter drier, the control wiring and the main power wiring are required to complete the installation. Each unit is dehydrated, evacuated, leak tested and pressure tested at 450 psig before being pressurized with a holding charge of Refrigerant-22 for shipment and/or storage.

All controls are located in the front of the unit and are readily accessible for maintenance, adjustment and service. All wiring (power and control) can be made through the front of the unit.

REFERENCE

This instruction covers the installation and operation of the basic condensing unit. For refrigerant piping installation instructions refer to document 247077 “Application Data - General Piping Recommendations for Split System Air Conditioning and Heat Pumps”.

All accessories come with a separate Installation Manual.

RENEWAL PARTS

Contact your local UPG parts distribution center for replacement parts for this equipment.

INSPECTION

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

LIMITATIONS

These units must be installed in accordance with all national and local safety codes. If no local codes apply, installation must conform with the appropriate national codes. See Table 1 for Unit Application Data. Units are designed to meet National Safety Code Standards. If components are to be added to unit to meet local codes, they are to be installed at the dealer’s and/or the customer’s expense.

TABLE 1: UNIT APPLICATION DATA

MODEL		180 & 240 MBH
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.	Standard	45°F / 115°F
	With Head Pressure Control	0°F / 115°F

1. Rated in accordance with ARI Standard 100, utilizatio range “A”.

LOCATION

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

1. The condensing unit is designed for outdoor installation only. The condenser fans are the propeller type and are not suitable for use with duct work.

2. The condensing unit and the evaporator blower should be installed as close together as possible and with a minimum number of bends in the refrigerant piping. For refrigerant piping installation instructions refer to document 247077 “Application Data - General Piping Recommendations for Split System Air Conditioning and Heat Pumps”.

3. The condensing unit should not be installed where normal operating sounds may be objectionable. On either rooftop or ground level installations, rubber padding can be applied between the base rails and their supports to lessen any transmission of vibration.

ROOF-TOP LOCATIONS

Be careful not to damage the roof. Consult the building contractor or architect if the roof is bonded. Choose a location with adequate structural strength to support the unit.

The condensing unit must be mounted on solid level supports. The supports can be channel iron beams or wooden beams treated to reduce deterioration.

A minimum of two (2) beams are required to support each unit. The beams should: (1) Be positioned perpendicular to the roof joists. (2) Extend beyond the dimensions of the unit to distribute the load on the roof. (3) Be capable of adequately supporting the entire unit weight. Refer to Figure 1 and Table 2 for load distribution and weights.

These beams can usually be set directly on the roof. Flashing is not required.

⚠WARNING

On bonded roofs, check for special installation requirements.

GROUND LEVEL LOCATIONS

The units must be installed on a one-piece level concrete slab with a minimum thickness of 4 inches. The length and width should be at least 6 inches greater than the units overall base dimensions. Refer to Figure 4.

Footers under the slab that extend below the frost line are recommended. Any strain on the refrigerant lines may cause a refrigerant leak. The slab should not be tied to the building foundation because noise and vibration will telegraph into the building.

A unit can also be supported by concrete piers. These piers should (1) extend below the frost line, (2) be located under the unit's four corners, and (3) be sized to carry the entire unit weight. Refer to Figure 1 and Table 2 for the center of gravity and unit weight.

⚠ CAUTION

Care should be taken to protect the unit from tampering and unauthorized persons from injury. Screws on access panels will prevent casual tampering. Additional safety precautions such as fences around the unit or locking devices on the panels may be advisable. Check local authorities for safety regulations.

Unit	Dim. (in.)	
	A	B
180 Mbh	16	32
240 Mbh	16	32

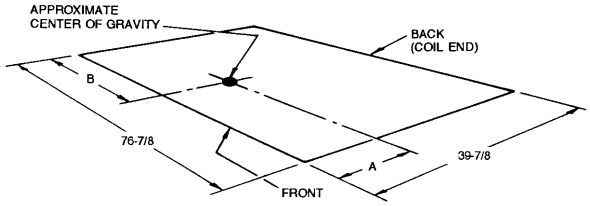


FIGURE 1 - CENTER OF GRAVITY

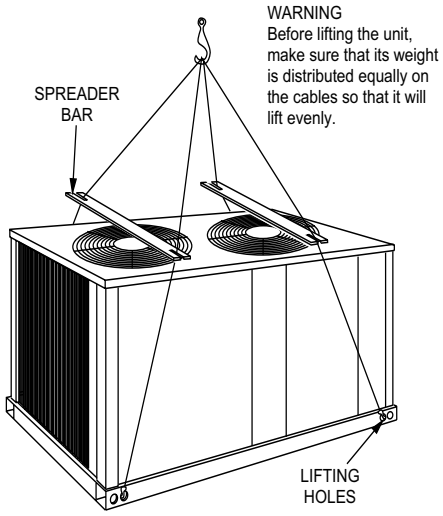


FIGURE 2 - TYPICAL RIGGING

RIGGING AND HANDLING

Exercise care when moving the unit. Do not remove any packaging until the unit is near the place of installation.

Rig the unit by attaching chain or cable slings with hooks to the round lifting holes provided in the base rails.

⚠ CAUTION

Spreaders, longer than the largest dimension across the unit, **must** be used across the top of the unit.

⚠WARNING

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

Units may also be moved or lifted with a fork-lift from the front, rear or the compressor end only through the slotted openings provided in the base rails.

⚠ CAUTION

Length of forks must be a minimum of 54” when lifting from the compressor end of the unit and a minimum of 42” when lifting from the front or rear of the unit.

Remove the nesting brackets from the four corners on top of the unit. All screws that are removed to take these brackets off must be replaced on the unit.

CLEARANCES

All units require certain minimum clearances for proper operation and service. Refer to Figure 4 for these clearances.

⚠WARNING

Do not permit overhanging structures or shrubs to obstruct condenser air discharge.

Additional height may be required for snow clearance if winter operation is expected.

POWER AND CONTROL WIRING

Install electrical wiring in accordance with the latest National Electrical Code (NFPA Standard No. 70) and/or local regulations. The unit should be grounded in accordance with these codes.

POWER WIRING

Check the voltage of the power supply against the data on the unit nameplate. Check the size of the power wire, the disconnect switch and the fuses against the data on Table 3.

NOTE: Copper conductors must be installed between the disconnect switch and the unit.

Refer to Figure 4 for the location of the power wire access opening through the front of the unit. This opening will require a field-supplied conduit fitting.

The field-supplied disconnect switch must be suitable for an outdoor location. Although it should be installed near the unit, do NOT secure it to the unit cabinet.

Refer to Figure 3 for typical field wiring.

CONTROL WIRING

Refer to Figure 4 for the location of the control wire access opening through the front of the unit.

Route the necessary low voltage control wires (18 AWG min.) from the TB1 terminal block inside of the unit control box through this access opening to the room thermostat and to the evaporator blower motor controller.

The room thermostat should be located on an inside wall approximately 56" above the floor where it will not be subject to drafts, sun exposure or heat from electrical fixtures or appliances. Follow manufacturer’s instructions enclosed with thermostat for general installation procedure.

Refer to Figure 3 for typical field wiring.

COMPRESSOR CRANKCASE HEATER

The compressor is equipped with a crankcase heater to prevent refrigerant from mixing with crankcase oil during the “OFF” cycle. The heater will be energized when the compressor is not running providing the unit disconnect switch is closed.

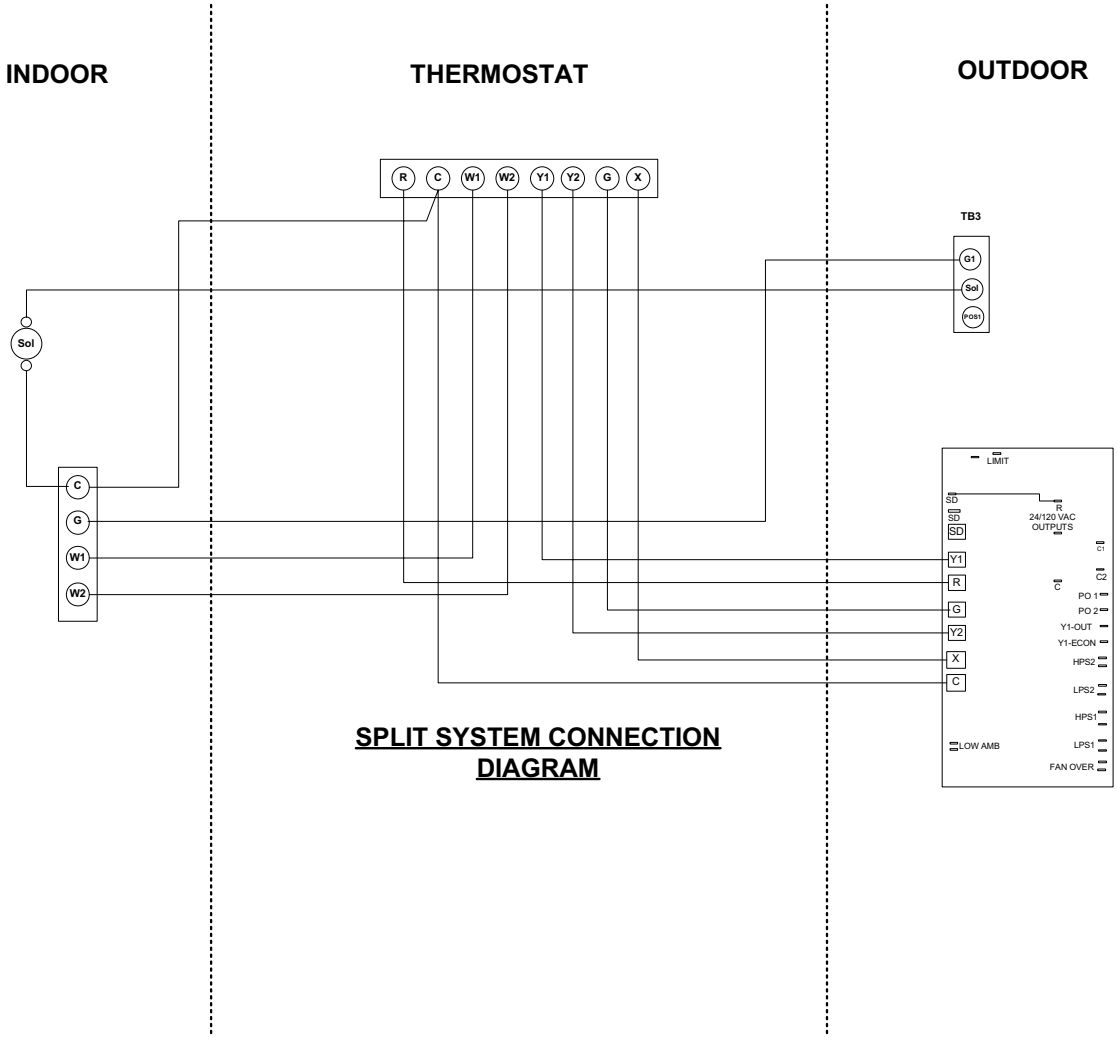
⚠ CAUTION

Do not attempt to start the compressor without at least eight hours of crankcase heat or compressor damage can occur.

TABLE 2: 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.



SPLIT SYSTEM CONNECTION DIAGRAM

FIGURE 3 - TYPICAL FIELD WIRING

TABLE 3: ELECTRICAL DATA

MODEL	UNIT POWER SUPPLY	COMPRESSOR*			CONDENSER FAN MOTOR			UNIT	
		QTY	RLA	LRA	QTY	HP	FLA	MINIMUM CIRCUIT AMPACITY (AMPS)	MAXIMUM FUSE[1]/BREAKER[2] 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. Dual element, time delay type.
2. HACR type per NEC.

* 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.

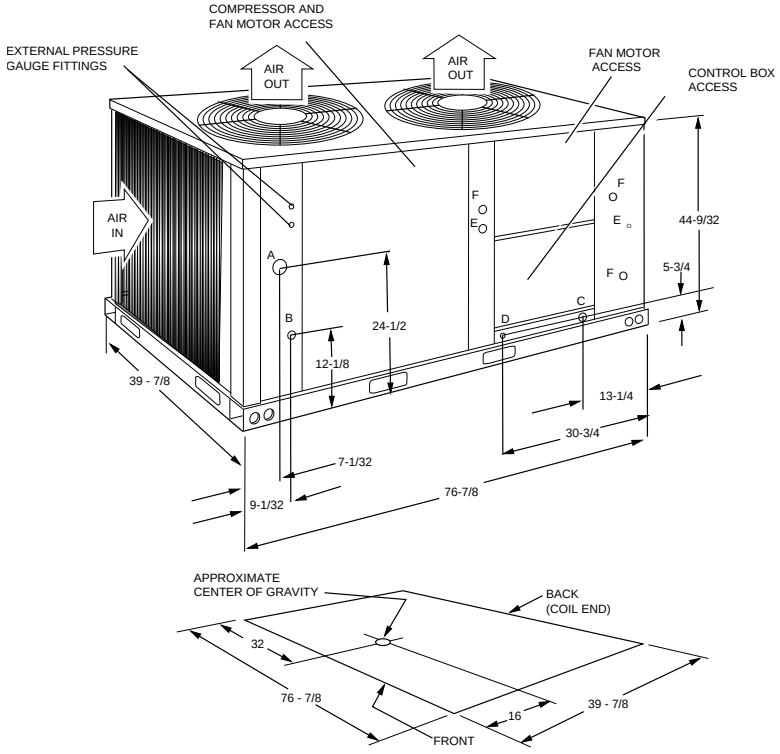


FIGURE 4 - UNIT DIMENSIONS AND CLEARANCES

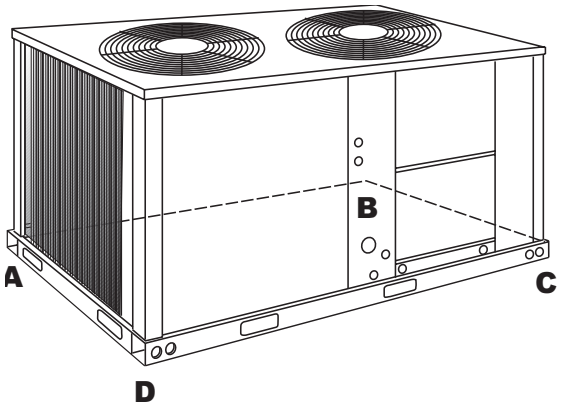
CONNECTION ENTRY		CONNECTION SIZE	
		15 Ton	20 Ton
Suction Line[1]	A	1/5/8 OD	2-1/8 OD
Liquid Line	B	5/8 OD	7/8 OD
Power Wiring	C	2-1/8 KO	2-1/8 KO
control Wiring	D	7/8 KO	7/8 KO
Accessory Wiring	E	7/8 KO	7/8 KO
Accessory Wiring	F	1-3/8KO	1-3/8 KO

1. Suction line is a belled fitting

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

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

1. Units must be installed outdoors. Overhanging structures or shrubs should not obstruct condenser air discharge.
2. Adequate snow clearance must be provided during winter operation.



UNIT	4-POINT LOAD (lbs)				
	TOTAL	A	B	C	D
180	930	325	218	155	232
240	990	346	232	165	247

FIGURE 5 - POINT LOADS

REFRIGERANT PIPING

GENERAL GUIDELINES

Many service problems can be avoided by taking adequate precautions to provide an internally clean and dry system and by using procedures and materials that conform with established standards.

Use hard drawn copper tubing where no appreciable amount of bending around pipes or other obstructions is necessary. Use long radius ells wherever possible with one exception—short radius ells for the traps in all suction risers. If soft copper is used, care should be taken to avoid sharp bends which may cause a restriction.

Pack fiberglass insulation and a sealing material such as permagum around refrigerant lines where they penetrate a wall to reduce vibrations and to retain some flexibility.

Support all refrigerant lines at minimum intervals with suitable hangers, brackets or clamps.

Braze all copper to copper joints with Silfos-5 or equivalent brazing material. Do not use soft solder.

Insulate all suction lines with a minimum of 1/2" ARMAFLEX or equal. Liquid lines exposed to direct sunlight and/or high temperatures must also be insulated.

Never solder suction and liquid lines together. They can be taped together for convenience and support purposes, but they must be completely insulated from each other.

A filter-drier MUST be installed in the liquid line of every system to prevent dirt and moisture from damaging the system. A properly-sized filter-drier is shipped with each condensing unit for field installation near the evaporator coil. The filter-drier is shipped inside the unit control box.

⚠WARNING

Installing a filter-drier does not eliminate the need for the proper evacuation of a system before it is charged.

A moisture indicating sight-glass may be field installed in liquid line(s) between the filter-drier and the evaporator coil. The moisture indicating sight-glass can be used to check for excess moisture in the system or used as visual means to verify refrigerant charge.

TABLE 4: 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

EXTENDING THE SERVICE PORT

1. Loosen the screws that secure the service ports in shipping position.
2. Push the service ports through the corner post.
3. Tighten the screws to secure the service ports for installation.

ALTERNATE CHARGING METHODS

If you are starting a unit when the ambient temperature is higher or lower than those shown in Figure 8, either of the following methods may be used.

Method 1: Determine the total weight of the refrigerant for the total system by adding the required charge for the outdoor unit, the indoor unit and the refrigerant lines using information in Table 2.

Using the charging procedures outlined above, weigh the required amount of refrigerant charge into the unit.

Method 2: Install a field supplied moisture indicating sight glass in the liquid line between the filter-drier and the evaporator coil.

Using the charging procedure outlined above, charge refrigerant until the moisture indicating sight glass is clear. Add approximately 2 extra pounds of refrigerant to assure a liquid refrigerant seal at the expansion valve under all operating conditions. Block the flow of the condenser air, if necessary, to assure a head pressure of 280 psig during the charging procedure.

NOTE: The installer should return to the job to verify the operating charge when the ambient temperature is within the conditions shown in Figures 7 or 8.

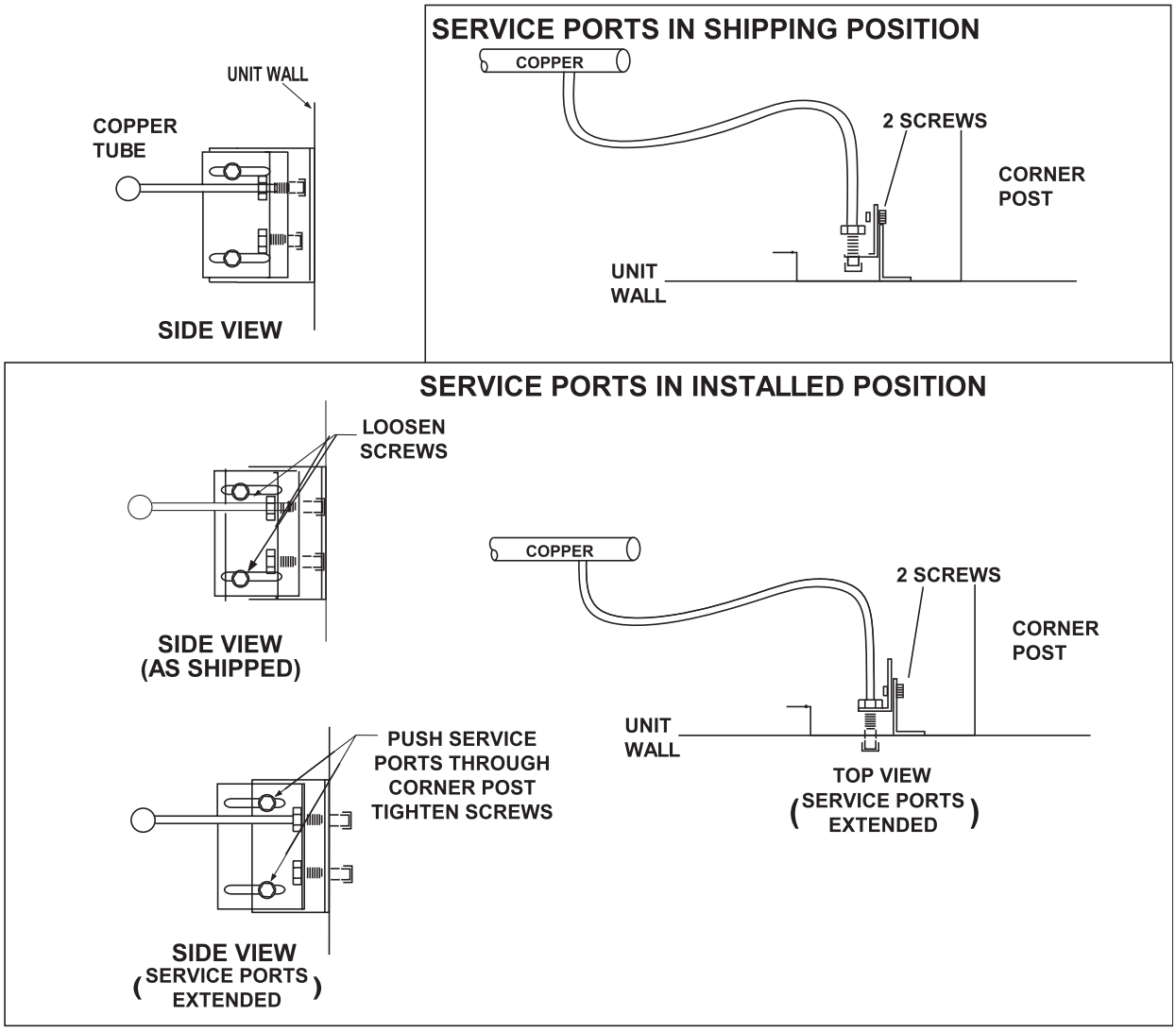


FIGURE 6 - EXTENDING THE SERVICE PORTS

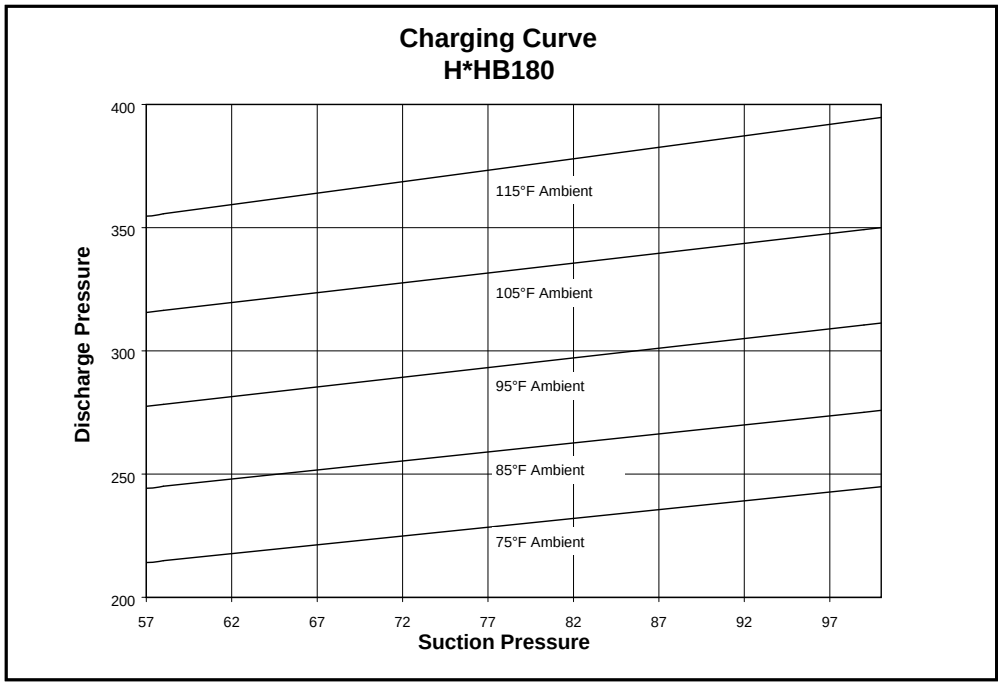


FIGURE 7 - CHARGING CURVE FOR HHB180

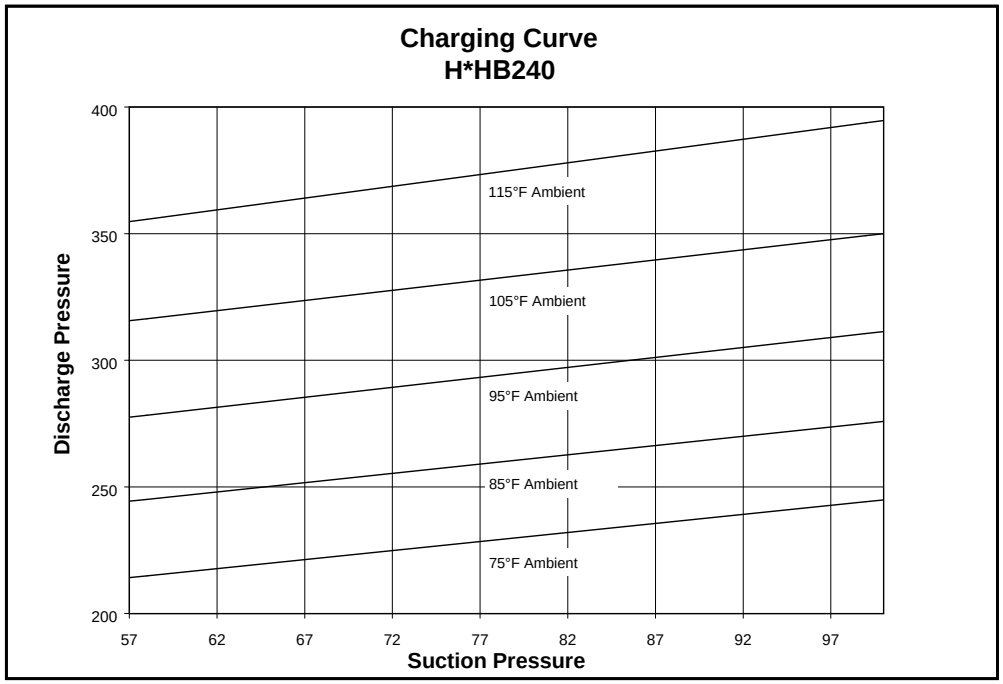


FIGURE 8 - CHARGING CURVE FOR HHB240

STARTUP

CRANKCASE HEATER

The crankcase heater must be energized at least 8 hours before starting the compressor. To energize the crankcase heater, the main disconnect switch must be closed. During this 8 hour period, the system switch on the room thermostat must be “OFF” to prevent the compressor from starting.

⚠ CAUTION

Do not attempt to start the compressor without at least 8 hours of crankcase heat or compressor damage can occur.

Make sure that the bottom of the compressor is warm to the touch to prove crankcase heater operation.

PRE-START CHECK

Before starting the unit, complete the following check list:

1. Have sufficient clearances been provided?
2. Has all foreign matter been removed from the interior of the unit (tools, construction or shipping materials, etc.)?
3. Have the condenser fans been rotated manually to check for free rotation?
4. Are all wiring connections tight?
5. Does the available power supply agree with the nameplate data on the unit?
6. Is the control circuit transformer set for the proper voltage?
7. Have the fuses, disconnect switch and power wire been sized properly?
8. Are all compressor hold-down nuts properly secured?
9. Are any refrigerant lines touching each other or any sheet metal surface? Rubbing due to vibration could cause a refrigerant leak.
10. Are there any visible signs of a refrigerant leak, such as oil residue?
11. Is any electrical wire laying against a hot refrigerant line?

INITIAL START-UP

1. Supply power to the unit through the disconnect switch at least 8 hours prior to starting the compressor.
2. Move the system switch on the thermostat to the AUTO or COOL position.
3. Reduce the setting of the room thermostat to energize the compressor.
4. Check the operation of the evaporator unit per the manufacturer’s recommendations.
5. With an ammeter, check the compressor amps against the unit data plate.
6. Check for refrigerant leaks.
7. Check for any abnormal noises and/or vibrations, and make the necessary adjustments to correct (e.g. fan blade(s) touching shroud, refrigerant lines hitting on sheet metal, etc.)
8. After the unit has been operating for several minutes, shut off the main power supply at the disconnect switch and inspect all factory wiring connections and bolted surfaces for tightness.

OPERATION

NOTE: The timing intervals described in the following procedures are nominal. Some variations will naturally occur due to differences in individual components, or due to variations in ambient temperature or line/control voltage. Refer to the wiring labels inside of the unit control access panel for additional information.

SEQUENCE OF OPERATION

OVERVIEW

These series of condensing units, come factory equipped with Simplicity™ controls to monitor all unit functionality and safety controls.

SAFETY CONTROLS

The Simplicity™ control board incorporates features to monitor safety circuits as well as minimize compressor wear and damage. An anti-short cycle delay (ASCD) is utilized to prevent operation of a compressor too soon after its previous run. Additionally, a minimum run time is imposed anytime a compressor is energized to allow proper oil return to the compressor. The ASCD is initiated on unit start-up and on any compressor reset or lockout.

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

- A high-pressure switch is factory installed to protect against excessive discharge pressure due to a blocked condenser coil or a condenser fan motor failure. During cooling operation, if a high-pressure limit switch opens, the Simplicity™ control board will de-energize the associated compressors and initiate the 5-minute ASCD. If the call for cool is still present at the end of the ASCD, the control board will re-energize the halted compressor.

- If a high-pressure switch opens three times within two hours of operation, the Simplicity™ control board will lockout the associated system compressors and will flash an error code (see Table 5).

- A low-pressure switch to protect the unit against excessively low suction pressure is standard on all condensing units.

If the low-pressure switch opens during normal operation, the Simplicity™ control board will de-energize the compressor, initiate the ASCD, and shut down the condenser fans.

On startup, if the low-pressure switch opens, the Simplicity™ control board will monitor the low-pressure switch to make sure it closes within one minute. If it fails to close, the unit will shut down the associated compressor and begin an ASCD. If the call for cool is still present at the end of the anti-short cycle time delay, the control board will re-energize the halted compressor.

If a low-pressure switch opens three times within one hour of operation, the Simplicity™ control board will lock-out the associated compressor and flash an error code (see Table 5).

An ambient air switch will lock out mechanical cooling at 45°F. In order to operate the unit in ambient temperatures below 45°F, the optional low ambient kit must be field installed which will allow the unit to operate during conditions down to 0°F.

PUMP OUT OPTION

The pump out option is field installed on 15 and 20 ton systems. The pump out circuit is activated each time the first and third compressor stage is called for by the thermostat. As such, it's a "Pump Out On Start Up" design. A normally closed solenoid valve (POS1) is placed in the liquid line, just prior to expansion valve.

When cooling is not being called for by the thermostat, the pump out solenoid (POS) is not energized, so it's in the closed position. When the Simplicity™ control receives a call for cooling, it energizes a compressor. With the POS being closed, it causes the pressure on the low side of the system to begin falling.

When the low pressure switch (LPS) opens, the control board energizes its on-board pump out relay, providing a 24vac output to an external relay used to energized the pump out solenoid. The refrigeration circuit being controlled is not in normal operating mode.

If the low pressure switch is already open on a call for cooling, the pump out relay is energized immediately. If the LPS does not open after 5 minutes, the pump out relay is energized.

CONTINUOUS BLOWER

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

INTERMITTENT BLOWER

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

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

COOLING SEQUENCE OF OPERATION

When the thermostat calls for the first stage of cooling, the low-voltage control circuit from the "R" to "Y1" and "G" is completed. The Simplicity™ control board activates the first stage of cooling by energizing compressor one and both condenser fans. After completing the specified fan on delay for cooling, the Simplicity™ control board will energize the indoor blower motor.

When the thermostat calls for the second stage of cooling, the low-voltage control circuit from "R" to "Y2" is completed. The control board will energize compressor two.

If there is an initial call for both stages of cooling, the Simplicity™ control board will delay energizing compressor two by 30 seconds in order to avoid an excessive power rush.

Once the thermostat has been satisfied, the Simplicity™ control board will de-energize Y1 and Y2. If the compressors have satisfied their minimum run times, the compressors and condenser fans are de-energized. Otherwise, the unit operates each cooling stage until the ASCD has elapsed. Upon the completion of first stage cooling, the blower is stopped following the completion of the fan off delay cycle.

FLASH CODES

Various flash codes are utilized by the unit control board (UCB) to aid in troubleshooting. Flash codes are distinguished by the short on and off cycle used (approximately

200ms on and 200ms off). To show normal operation, the control board flashes a 1 second on, 1 second off "heartbeat" during normal operation. This is to verify that the UCB is functioning correctly. Do not confuse this with an error flash code. To prevent confusion, a 1-flash, flash code is not used.

Alarm condition codes are flashed on the UCB lower left Red LED, See Figure 9. While the alarm code is being flashed, it will also be shown by the other LEDs: lit continuously while the alarm is being flashed. The total of the continuously lit LEDs equates to the number of flashes, and is shown in the table. Pressing and releasing the LAST ERROR button on the UCB can check the alarm history. The UCB will cycle through the last five (5) alarms, most recent to oldest, separating each alarm flash code by approximately 2 seconds. In all cases, a flashing Green LED will be used to indicate non-alarm condition.

In some cases, it may be necessary to "zero" the ASCD for the compressors in order to perform troubleshooting. To reset all ASCDs for one cycle, press and release the UCB TEST/ RESET button once.

Flash codes that do and do not represent alarms are listed in Table 5.

TABLE 5: UNIT CONTROL BOARD FLASH CODES

FLASH CODE	DESCRIPTION	GREEN LED 16	RED LED 8	RED LED 4	RED LED 2	RED LED 1
On Steady	This is a Control Failure	-	-	-	-	-
1 Flash	Not Applicable	-	-	-	-	-
2 Flashes	Control waiting ASCD[1]	Flashing	Off	Off	On	Off
3 Flashes	HPS1 Compressor Lockout	Off	Off	Off	On	On
4 Flashes	Not Applicable	Off	Off	On	Off	Off
5 Flashes	LPS1 Compressor Lockout	Off	Off	On	Off	On
6 Flashes	Not Applicable	Off	Off	On	On	Off
7 Flashes	FS1 Compressor Lockout	Off	Off	On	On	On
8 Flashes	Not Applicable	Off	On	Off	Off	Off
10 Flashes	Compressors Locked Out on Low Outdoor Air Temperature[1]	Flashing	On	Off	On	Off
12 Flashes	Unit Locked Out due to Fan Overload Switch Failure	Off	On	On	Off	Off
13 Flashes	Compressor Held Off due to Low Voltage[1]	Flashing	On	On	Off	On
14 Flashes	EEPROM Storage Failure	Off	On	On	On	Off
OFF	No Power or Control Failure	Off	Off	Off	Off	Off

1. Non-alarm condition.

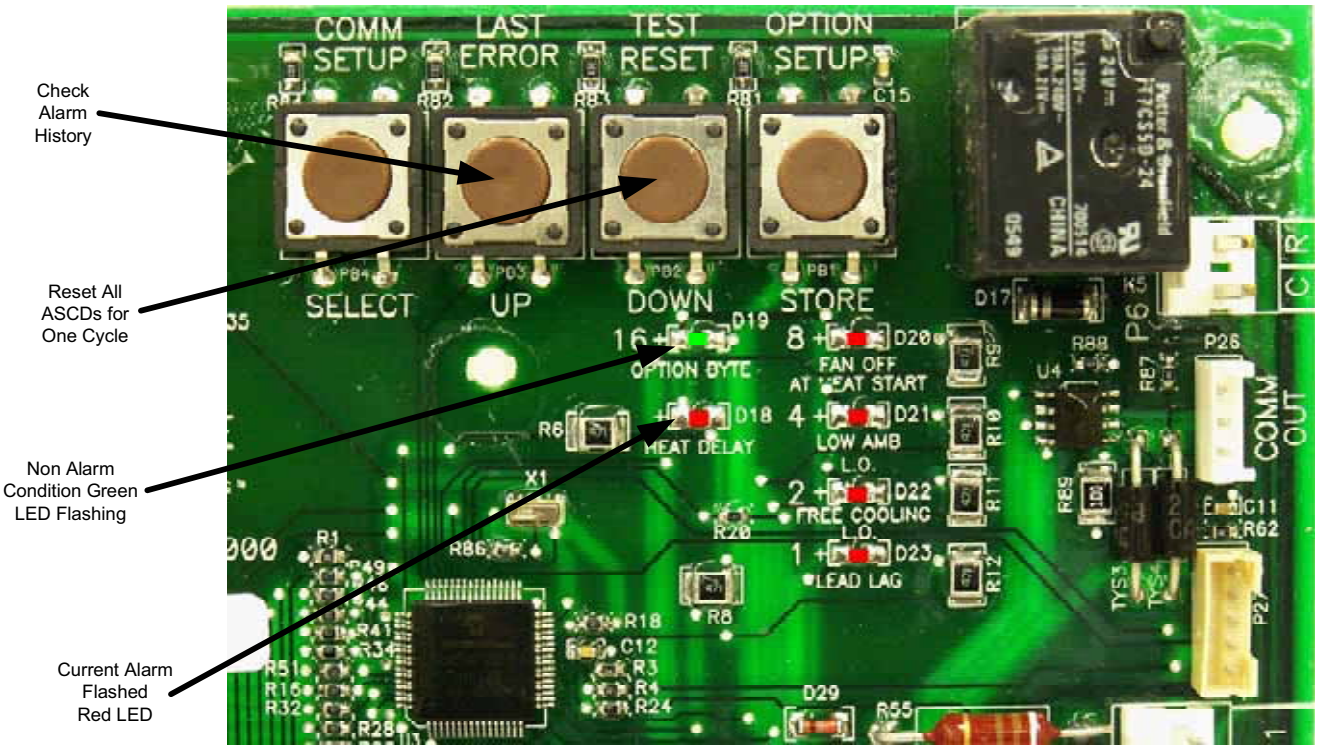


FIGURE 9 - UNIT CONTROL BOARD

CONDENSER FAN OPERATION

These condensing units are factory equipped with a fan cycling switch to regulate system head pressure. When outdoor ambient conditions are cool, the head pressure of any air conditioning system may drop too low for optimal performance. These condensing units maximize system performance in a variety of ambient conditions by incorporating a fan cycling switch to maintain proper system head pressure.

On these condensing units, the condenser fans are powered when compressor one is energized. Fan one will start immediately upon a call for first stage cooling. However, fan two is equipped with a fan cycling switch and will not start until the system head pressure reaches 320 psig. Condenser fan two will operate until the system head pressure drops below 180 psig where the fan cycling switch will shut the fan down. The unit will continue to operate condenser fan one until the system head pressure reaches 320 psig at which time condenser fan two will restart.

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

SAFETY FEATURES

1. The compressor is protected against over current and excessive temperature as described in the Sequence of Operation.

2. The compressor is equipped with a crankcase heater to discourage refrigerant migration into the compressor sump during the “OFF” cycle.

3. The condenser fan motors have auto-reset internal protection.

4. The secondary of every transformer is grounded.

5. Every unit is protected by high and low-pressure controls.

SECURE OWNER'S APPROVAL

When the system is functioning properly, secure the owner's approval. Show him the location of all disconnect switches and thermostat. Teach him how to start and stop the unit and how to adjust temperature settings within the limitations of the system.

MAINTENANCE

CLEANING CONDENSER SURFACE

Dirt should not be allowed to accumulate on the condenser coils or other parts in the condenser air circuit. Clean as often as necessary with a brush, vacuum cleaner attachment or other suitable means.

LUBRICATION

The fan motors for these condensing units are equipped with factory lubricated and sealed ball bearings. They do not require any maintenance.

COMPRESSOR REPLACEMENT

Contact your local Distribution Center for compressor or parts.

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Unitary Products Group
5005 York Drive
Norman OK 73069