

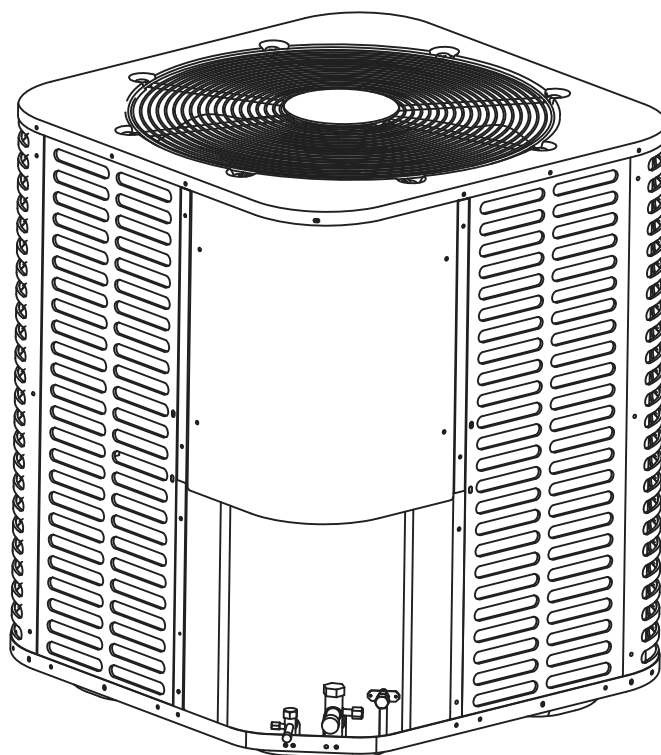
INSTALLATION INSTRUCTIONS

14 SEER

Split System Air Conditioner & Heat Pump

1.5-5 Tons

R410A



NOTE: Appearance of unit may vary.



RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION

WARNING

These instructions are intended as an aid to qualified licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.



DO NOT DESTROY THIS MANUAL

Please read carefully and keep in a safe place for future reference by a serviceman.

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All phases of this installation must comply with NATIONAL, STATE, AND LOCAL CODES.

1. Key to symbols and safety instructions

1.1 Key to symbols



Warnings in this document are identified by a warning triangle. Keywords at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.



This symbol indicates important information where there is no risk to people or property.

The following keywords are defined and can be used in this document:

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION indicates a hazardous situation which, if not avoided, could result in minor to moderate injury.

NOTICE is used to address practices not related to personal injury.

1.2 Safety



CAUTION:

- This document is customer property and is to remain with this unit. Please return to service information pack upon completion of work.
- These instructions do not cover all variations in systems or provide for every possible contingency to be met in connection with the installation.
- Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to your installing dealer or local distributor.



This document contains a wiring diagram and service information.



CAUTION:

This information is intended for use by individuals possessing adequate backgrounds of electrical and mechanical experience. Any attempt to repair a central air conditioning product may result in personal injury and/or property damage.



WARNING: HAZARDOUS VOLTAGE

- Failure to follow this warning could result in property damage, severe personal injury or death.
- Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized.



WARNING: REFRIGERANT OIL

These units use R-410A refrigerant which operates at 50% to 70% higher pressures than R-22. Use only R-410A approved service equipments. Refrigerant cylinders are painted a "Rose" color to indicate the type of refrigerant and may contain a "dip" tube to allow for charging of liquid refrigerant into the system. All R-410A systems use a POE oil that readily absorbs moisture from the atmosphere. To limit this "hygroscopic" action, the system should remain sealed whenever possible. If a system has been opening to the atmosphere for more than 4 hours, the compressor oil must be replaced. Never break a vacuum with air and always change the driers when opening the system for component replacement.



CAUTION: HOT SURFACE

May cause minor to severe burning. Failure to follow this Caution could result in property damage or personal injury. Do not touch the top of compressor.



CAUTION: CONTAINS REFRIGERANT

Failure to follow proper procedures can result in personal illness or injury or severe equipment damage. System contains oil and refrigerant under high pressure. Recover refrigerant to relieve pressure before opening system.



CAUTION: GROUNDING REQUIRED

Failure to inspect or use proper service tools may result in equipment damage or personal injury. Reconnect all grounding devices. All parts of this product that are capable of conducting electrical current are grounded. If grounding wires, screws, straps, clips, nuts or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.



WARNING: SERVICE VALVES

Failure to follow this warning will result in abrupt release of system charge and may result in personal injury and/or property damage. Extreme caution should be exercised when opening the Liquid Line Service Valve. Turn valve stem counterclockwise only until the stem contacts the rolled edge. No torque is required.



WARNING: BRAZING REQUIRED

Failure to inspect lines or use proper service tools may result in equipment damage or personal injury. All outdoor unit and evaporator coil connections are copper-to-copper and should be brazed with a phosphorous-copper alloy material such as Silfos-5 or equivalent. Do not use soft solder.

⚠ WARNING: HIGH CURRENT LEAKAGE

Failure to follow this warning could result in property damage, severe personal injury or death. Grounding is essential before connecting electrical supply.

2. Unit location considerations

2.1 Unit dimensions

Unit Dimensions				
Model		H(Inches)	W(Inches)	L(Inches)
AC	HP			
18	/	24-15/16	21-7/8	21-7/8
24	18/24	24-15/16	23-5/8	23-5/8
30	30	24-15/16	28	28
36	36	24-15/16	29-1/8	29-1/8
42	42	33-3/16	28	28
48	48	33-3/16	28	28
60	60	33-3/16	29-1/8	29-1/8

Table 1

The unit's weight value is on the cardboard box.

When mounting the outdoor unit on a roof, be sure the roof will support the unit's weight. Properly selected isolation is recommended to prevent sound or vibration transmission to the building structure.

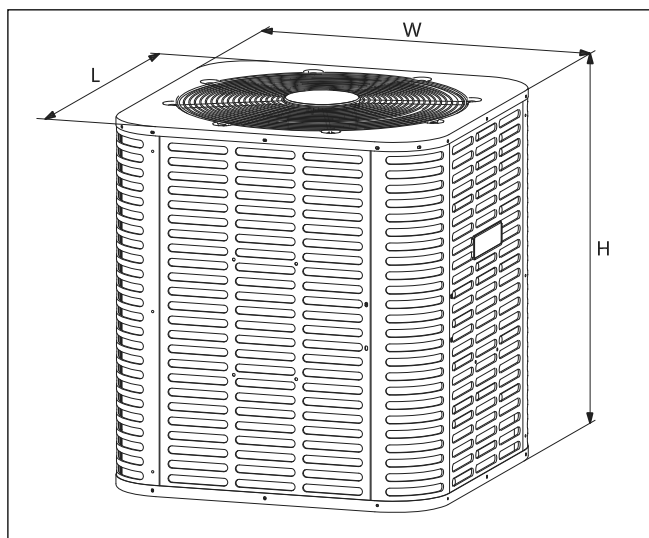


Figure 1

2.2 Location restrictions

Ensure the top discharge area is unrestricted for at least 60 inches above the unit.

Do not locate outdoor unit near bedrooms since normal operational sounds may be objectionable.

Position unit to allow adequate space for unobstructed airflow, wiring, refrigerant lines, and serviceability.

Maintain a distance of 24 inches between units.

24 inches clearance must be provided in front of the control box (access panels) and any other side requiring service.

Position unit where water, snow or ice from roof or overhang cannot fall directly on unit.

Position the outdoor unit a minimum of 12" from any wall or surrounding shrubbery to ensure adequate airflow.

See Figure 2 and Figure 3.

Cold climate considerations (heat pump only)



Precautions must be taken for units being installed in areas where snow accumulation and prolonged below-freezing temperatures occur.

- Units should be elevated 3-12 inches above the pad or rooftop, depending on local weather. This additional height will allow drainage of snow and ice melted during defrost cycle prior to its refreezing. Ensure that drain holes in unit base pan are not obstructed, preventing drainage of defrost water (Figure 4).
- If possible, avoid locations that are likely to accumulate snow drifts. If not possible, a snow drift barrier should be installed around the unit to prevent a build-up of snow on the sides of the unit.

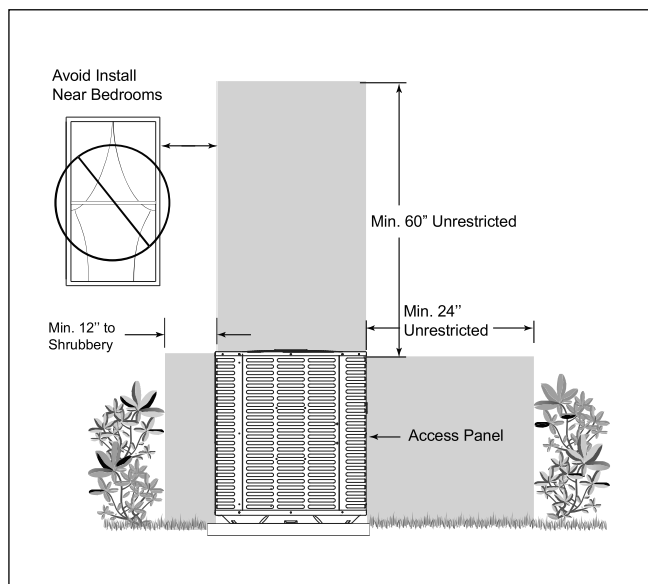


Figure 2

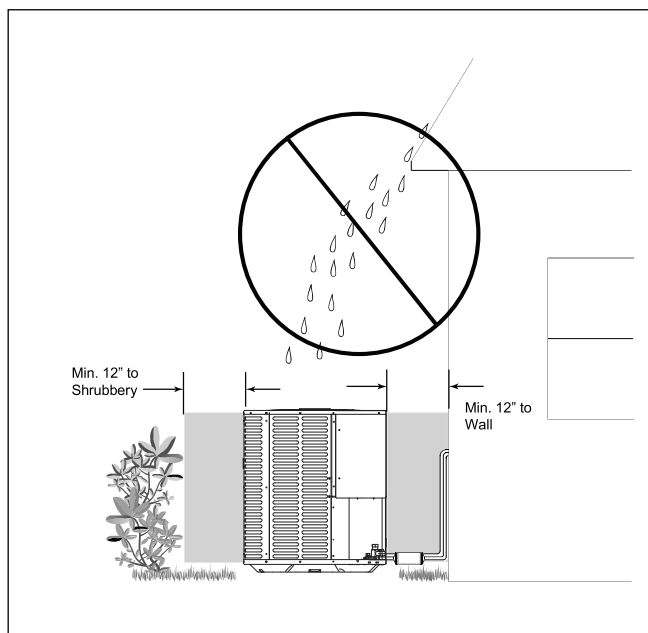


Figure 3

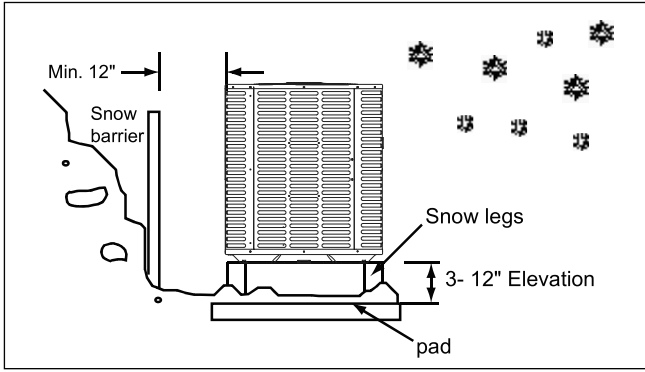


Figure 4

3. Unit preparation

3.1 Pre-installation

STEP 1 - Check for damage and report promptly to the carrier any damage found to the unit (Figure 5).

STEP 2 - Instruments must be designed to install/serve R410A equipments.

- Gauge sets, hoses, refrigerant containers and recovery system must be designed to handle the POE type oils.
- Manifold sets should be 800 PSIG high side and 250 PSIG low side.
- All hoses must have a 700 PSIG service pressure rating.
- Leak detectors should be designed to detect R410A.
- Recovery equipments (including refrigerant recovery containers) must be specifically designed to handle R410A.
- Do not use an R22 TXV.

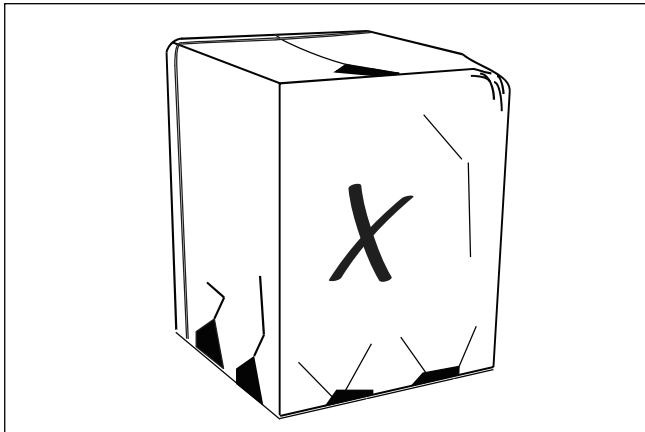


Figure 5

4. Setting up the unit

4.1 Pad installation

When installing the unit on a support pad, such as a concrete slab, consider the following:

- The pad must be at least 1-2" larger than the unit on all sides.
- The pad must be separate from any structure.
- The pad must be level.

- The pad must be high enough above grade to allow for drainage.
- The pad location must comply with National, State and Local codes.

These instructions are intended to provide a method to tie-down system to concrete slab as a securing procedure for high wind areas. Check Local Codes for tie-down methods and protocols.

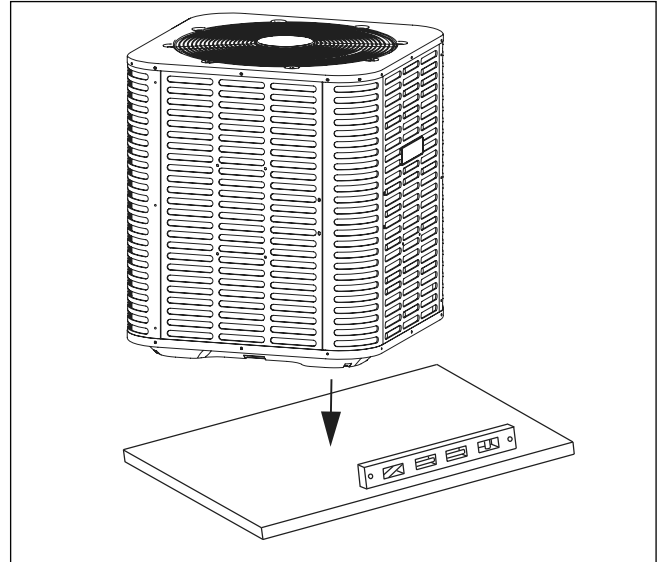


Figure 6

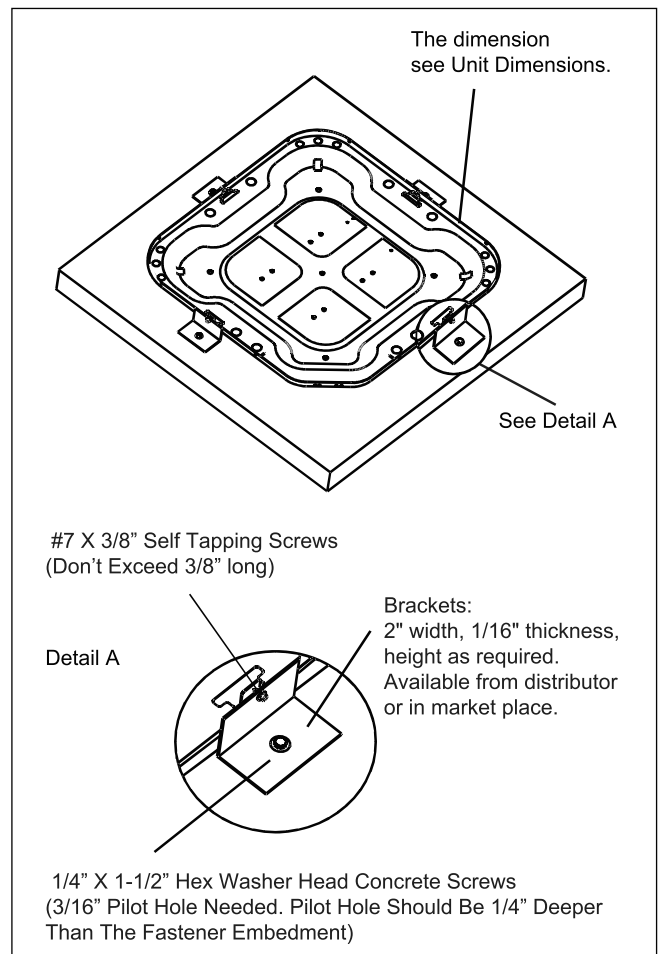


Figure 7

5. Refrigerant line considerations

5.1 Service valve connection sizes

Model	Suction line connection	Liquid line connection
18	3/4	3/8
24	3/4	3/8
30	3/4	3/8
36	3/4	3/8
42	3/4	3/8
48	7/8	3/8
60	7/8	3/8

Table 2

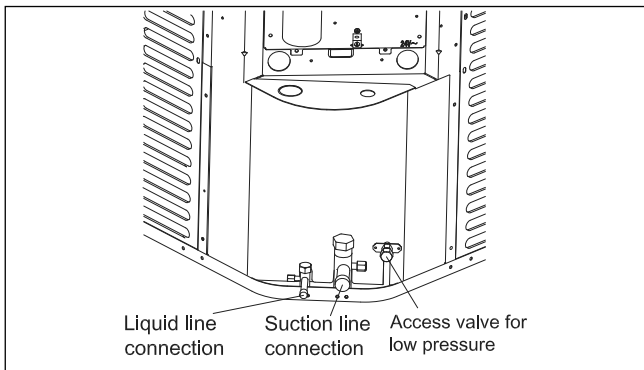


Figure 8

5.2 Refrigerant line sizes

Model	Suction line		Liquid line	
	optional	standard	optional	standard
18	5/8	3/4	5/16	3/8
24	5/8	3/4	5/16	3/8
30	5/8	3/4	5/16	3/8
36	5/8	3/4	5/16	3/8
42	5/8	3/4	5/16	3/8
48	3/4	7/8	1/2	3/8
60	7/8	1-1/8	1/2	3/8

Table 3


5.3 Refrigerant piping limits and required refrigerant line length

Model	Liquid line (Inches)	Total equivalent length(Feet)					
		25	50	75	100	125	150
		Maximum vertical length(Feet)					
18	5/16	25	50	60	58	40	30
	3/8	25	50	60	60	40	30
24	5/16	25	36	29	23	16	9
	3/8	25	50	60	60	40	30
30	5/16	25	49	38	27	17	6
	3/8	25	50	60	60	40	30
36	5/16	25	50	37	22	7	N/A
	3/8	25	50	60	60	40	30
42	5/16	25	23	4	N/A	N/A	N/A
	3/8	25	50	43	36	30	24
48	1/2	25	50	56	55	40	30
	3/8	25	46	38	30	22	15
60	1/2	25	50	60	60	40	30
	3/8	25	50	56	44	32	20

Table 4

Model	Suction line (Inches)	Total suction line length(Feet)			
		25	50	100	150
		Coefficient			
18	5/8	1.00	0.97	0.94	0.90
	3/4	1.00	0.98	0.95	0.92
24	5/8	1.00	0.97	0.94	0.90
	3/4	1.00	0.98	0.95	0.92
30	5/8	1.00	0.97	0.94	0.90
	3/4	1.00	0.98	0.96	0.93
36	5/8	1.00	0.97	0.94	0.90
	3/4	1.00	0.99	0.97	0.96
42	5/8	1.00	0.98	0.95	0.91
	3/4	1.00	0.98	0.97	0.96
48	3/4	1.00	0.98	0.95	0.92
	7/8	1.00	0.98	0.97	0.96
60	7/8	0.99	0.98	0.94	0.90
	1-1/8	1.00	0.99	0.98	0.97

Table 5 Suction line length/size VS capacity multiplier

 Using suction line larger than shown in chart will result in poor oil return and is not recommended.

For example: the system capacity published in AHRI is 17800 Btu/h. This data is based on the AHRI test condition and 25 feet line set with standard suction tube size (3/4" tube). If you need to add the line set more than 25 feet or use the optional suction tube size, you need to recalculate the capacity with the coefficient in the table. For 50 feet line and 5/8" suction tube, the capacity will be $17800 \times 0.97 = 17266$ Btu/h.

Determine required line length and lift. You will need this later in Section 14.

Total Line Length = _____ Feet.

Total vertical Change(Lift) = _____ Feet.

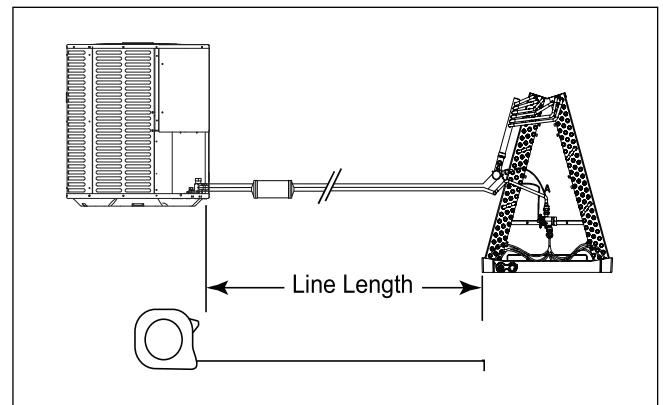



Figure 9

5.4 Refrigerant line insulation

 The suction line must always be insulated. DO NOT allow the Liquid Line and Suction Line to come in direct (metal to metal) contact.

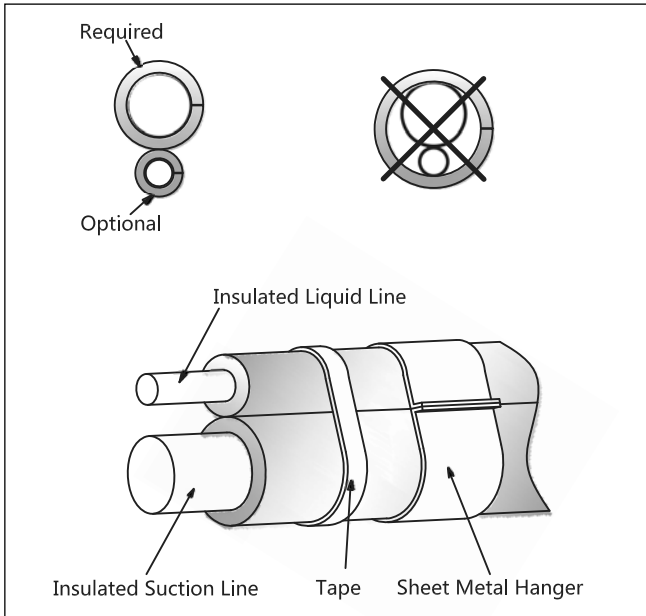


Figure 10

5.5 Reuse existing refrigerant lines

CAUTION:

If using existing refrigerant lines make certain that all joints are brazed, not soldered.

For retrofit applications, where the existing refrigerant lines will be used, the following precautions should be taken:

- Ensure that the refrigerant lines are the correct size. Refer to Section 5.1 listed and Table 3.
- Ensure that the refrigerant lines are free of leaks, acid, and oil.

The manufacturer recommends installing only approved matched indoor and outdoor systems. All of the manufacturer's split systems are AHRI certified. Some of the benefits of installing approved matched indoor and outdoor split systems are maximum efficiency, optimum performance and the best overall system reliability.

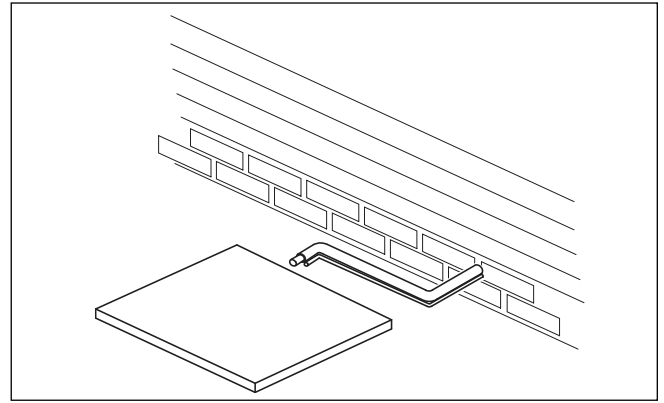


Figure 11

6. Refrigerant line routing

6.1 Precautions

Take precautions to prevent noise within the building structure due to vibration transmission from the refrigerant lines. For example:

- When the refrigerant lines have to be fastened to floor joists or other framing in a structure, use isolation type hangers.
- Isolation hangers should also be used when refrigerant lines are run in stud spaces or enclosed ceilings.
- Where the refrigerant lines run through a wall or sill, they should be insulated and isolated.
- Isolate the lines from all ductwork.
- Minimize the number of 90° turns.
- Use PVC piping as a conduit for all underground installations as shown in Figure 15. Buried lines should be kept as short as possible.
- The lines should not obstruct service access to the coil, air handling system or filter.
- Care must also be taken to isolate the refrigerant lines to minimize noise transmission from the equipment to the structure.

Comply with National, State, and Local Codes when isolating line sets from joists, rafters, walls or other structural elements.

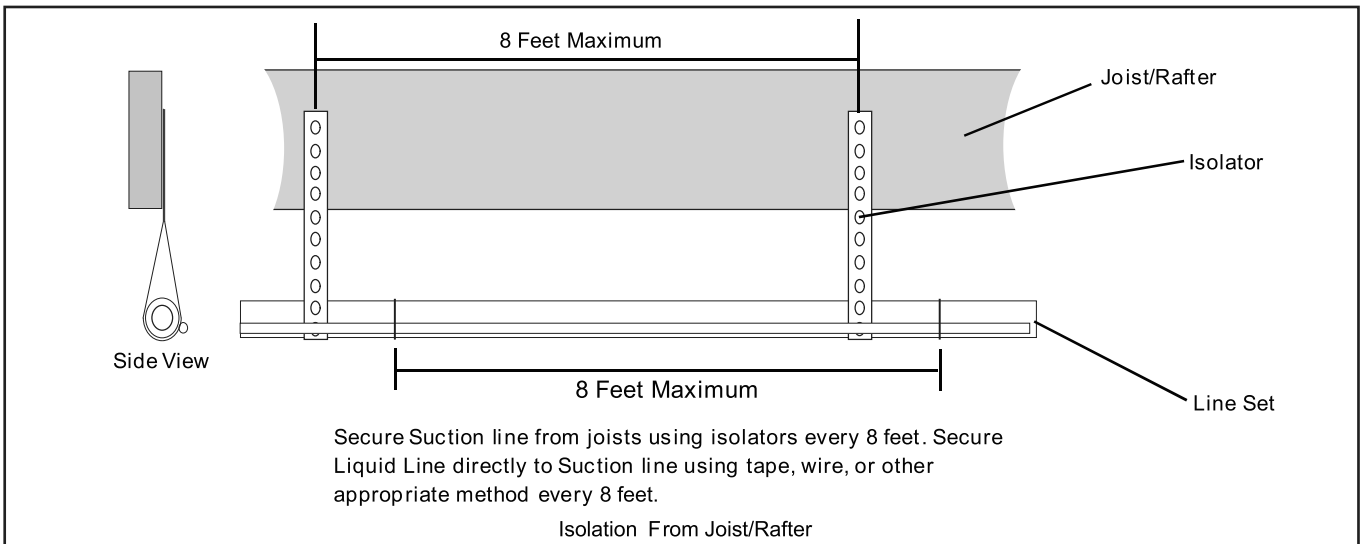


Figure 12

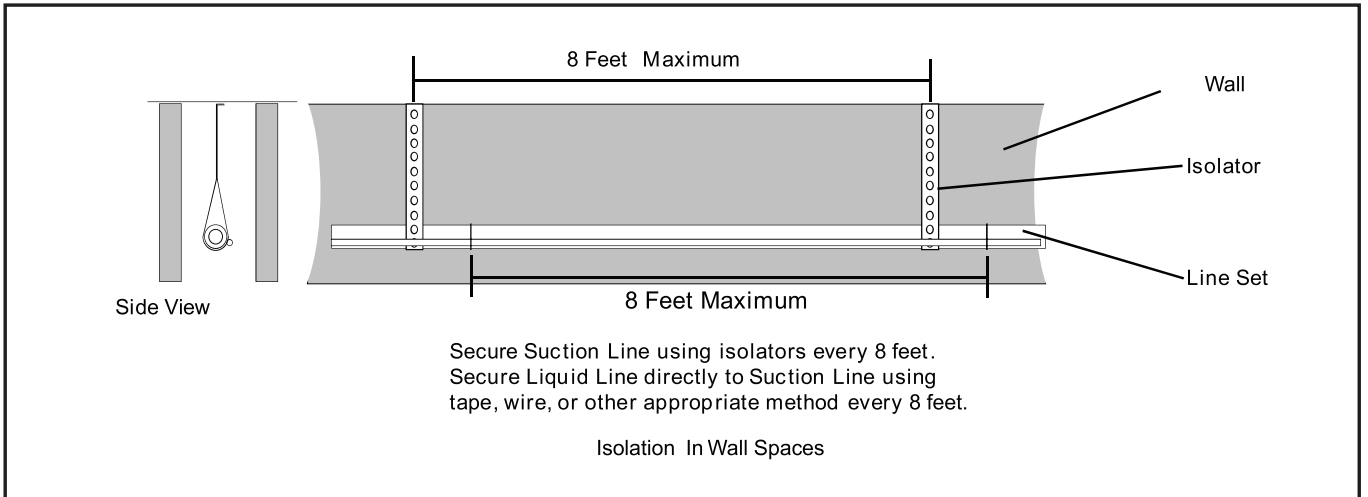


Figure 13

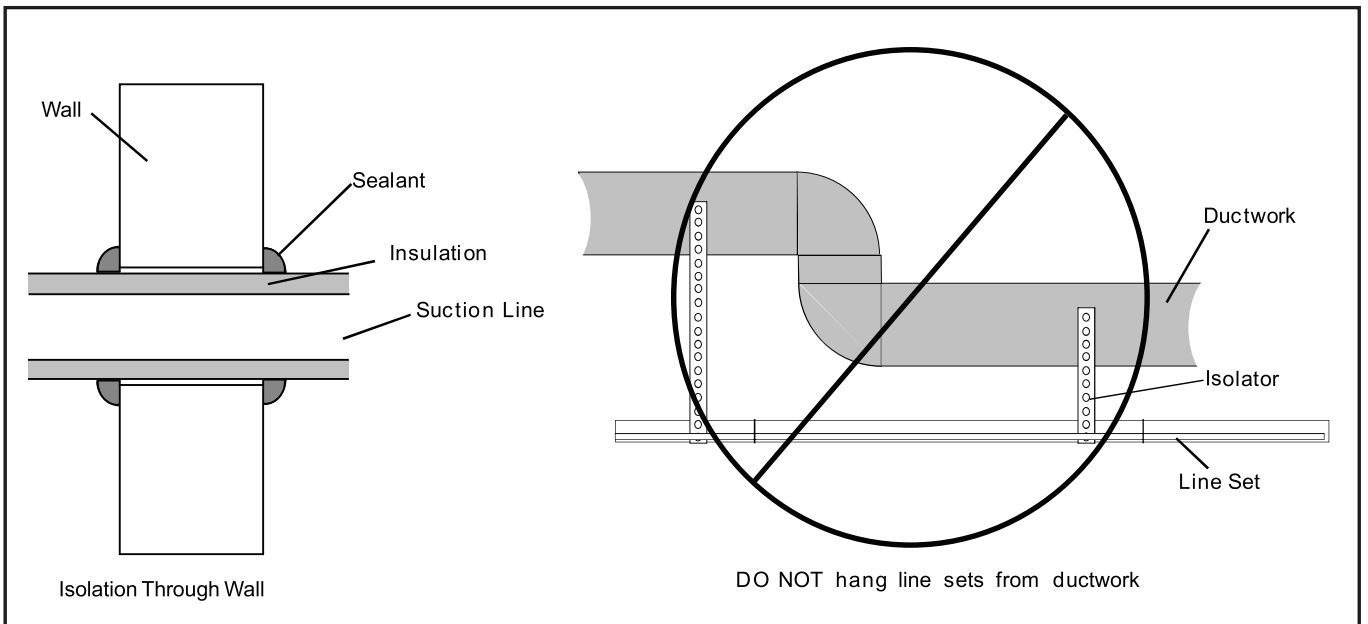


Figure 14

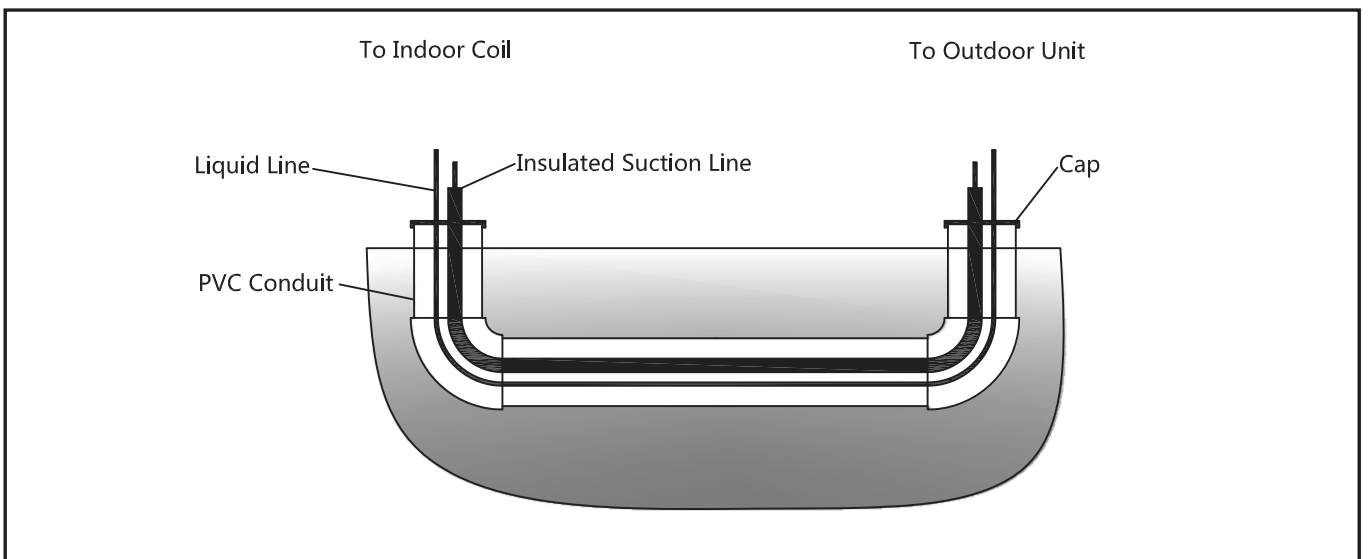


Figure 15

7. Refrigerant line brazing

7.1 Braze the refrigerant lines

1. Remove caps or plugs. Use a deburring tool to deburr the pipe ends. Clean both internal and external surfaces of the tubing using an emery cloth.

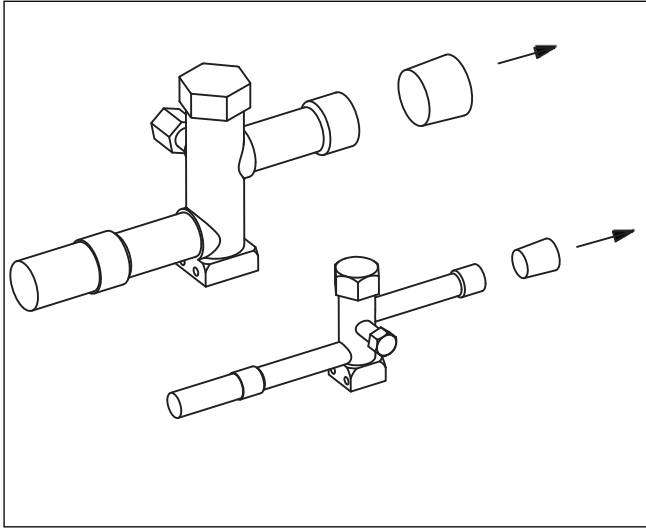


Figure 16

2. Remove the pressure tap cap from both service valves.

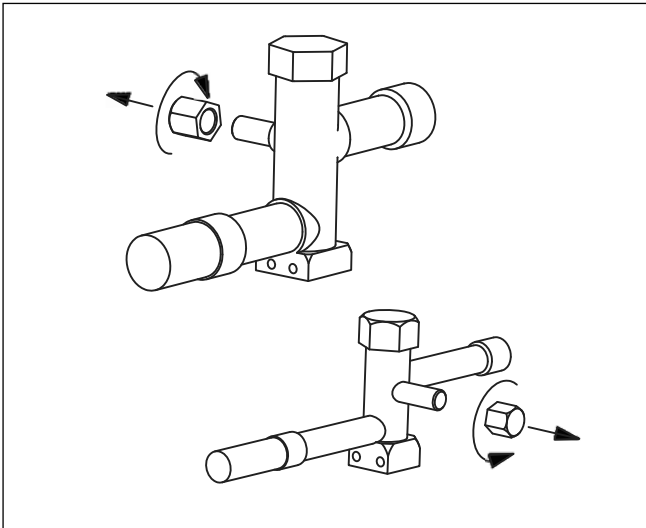


Figure 17

3. Purge the refrigerant lines and indoor coil with dry nitrogen.

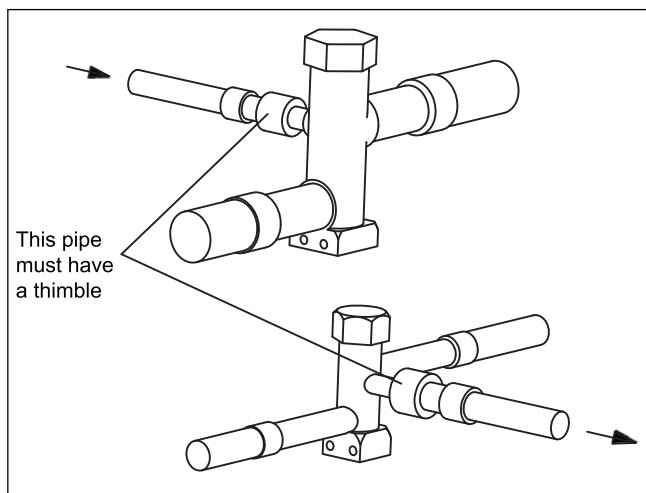


Figure 18

4. Wrap a wet rag around the valve body to avoid heat damage and continue the dry nitrogen purge (Figure 19).

Braze the refrigerant lines to the service valves.

Check liquid line filter drier's directional flow arrow to confirm correct direction of refrigeration flow (away from outdoor unit and toward evaporator coil) as illustrated. Brazing the filter drier to the Liquid Line.

Continue the dry nitrogen purge. Do not remove the wet rag until all brazing is completed.

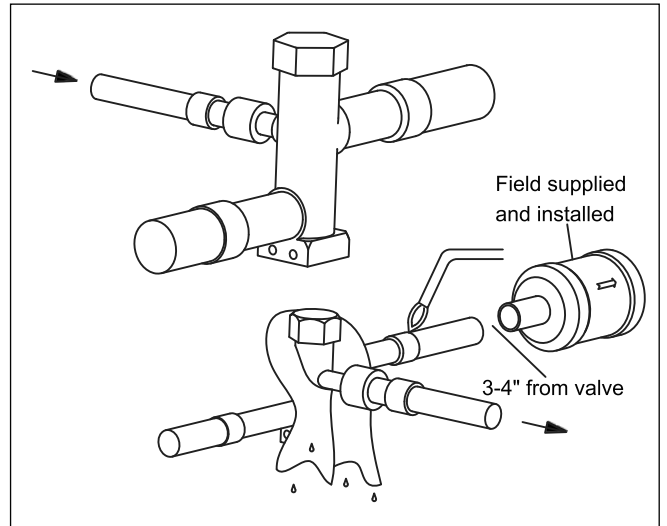
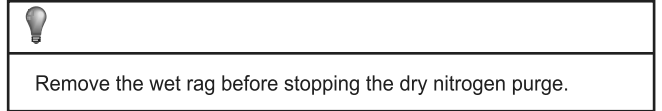


Figure 19

5. Replace the pressure tap caps after the service valves have cooled.

Note: Do not over tighten (between 40 and 60 inch-lbs. maximum).

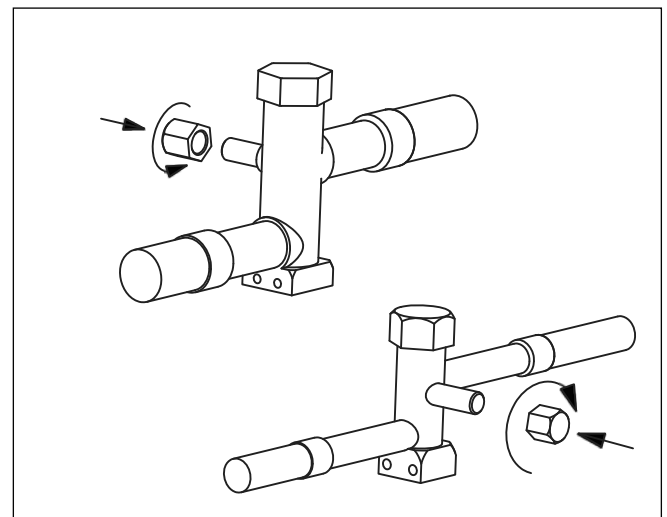


Figure 20

8. Refrigerant line leak check

8.1 Check for leaks

1. Pressurize the refrigerant lines and evaporator coil to 150 PSIG using dry nitrogen.

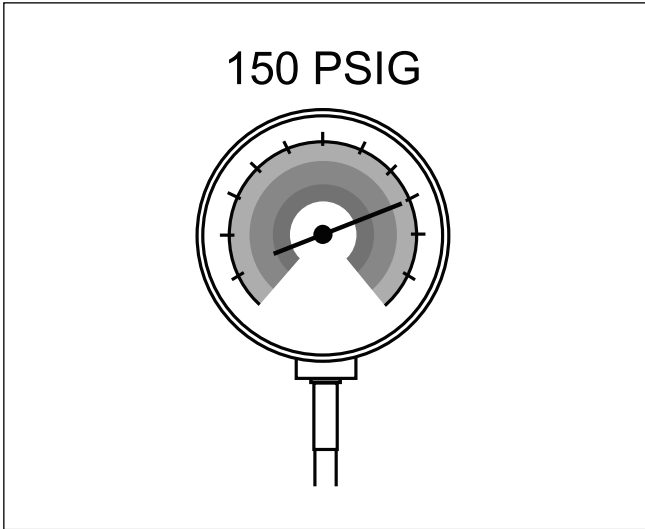


Figure 21

2. Check for leaks by using a soapy solution or bubbles at each brazed location.

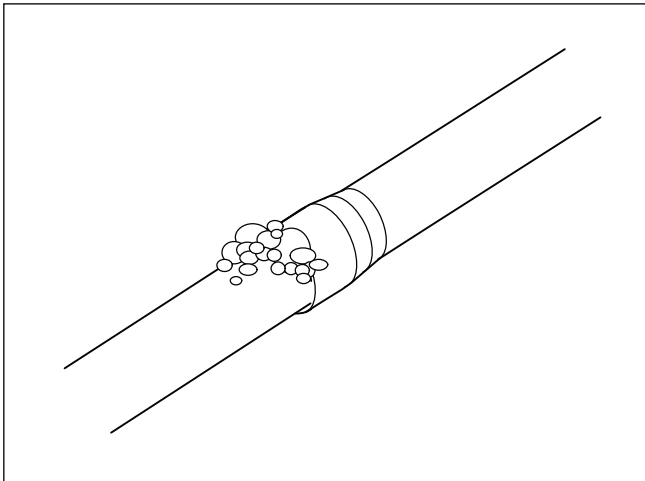


Figure 22

Remove nitrogen pressure and repair any leaks before continuing.

9. Evacuation

9.1 Evacuate the refrigerant lines and indoor coil



Do not open the service valves until the refrigerant lines and indoor coil leak check and evacuation are complete.

1. Evacuate until the micron gauge reads no higher than 350 microns, then close off the valve to the vacuum pump.

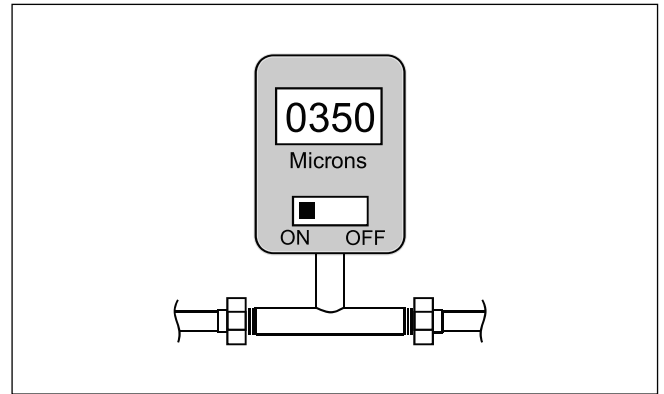


Figure 23

2. Observe the micron gauge. Evacuation is complete if the micron gauge does not rise above 500 microns in one (1) minute.

Once evacuation is complete blank off the vacuum pump and micron gauge, and close the valves on the manifold gauge set.

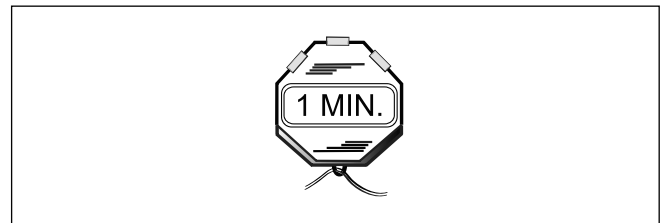


Figure 24

10. Service valves

10.1 Open the service valves



WARNING:

Extreme caution should be exercised when opening the Liquid Line Service Valve. Turn counterclockwise until the valve stem just touches the rolled edge. No torque is required. Failure to follow this warning will result in abrupt release of system charge and may result in personal injury and/or property damage.



Leak check and evacuation must be completed before opening the service valves.

1. Remove service valve cap (Figure 25).
2. Fully insert hex wrench into the stem and back out counterclockwise until valve stem just touches the rolled edge.
3. Replace the valve stem cap to prevent leaks. Tighten finger tight plus an additional 1/6 turn.

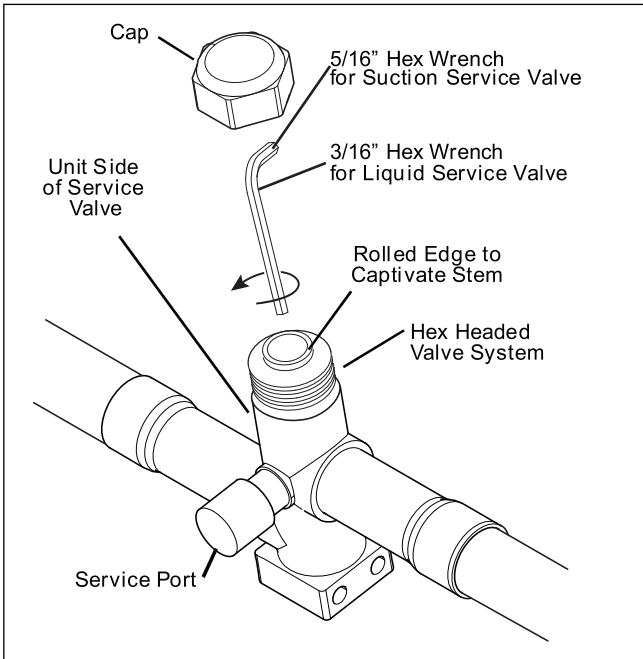


Figure 25

11. Electrical - low voltage

11.1 Low Voltage Maximum Wire Length

Table 6 defines the maximum total length of low voltage wiring from the outdoor unit to the indoor unit and to the thermostat.

24 Volts - Wire size	Max. wire length
18 AWG	150 Ft.
16 AWG	225 Ft.
14 AWG	300 Ft.

Table 6

11.2 Low voltage hook-up diagrams

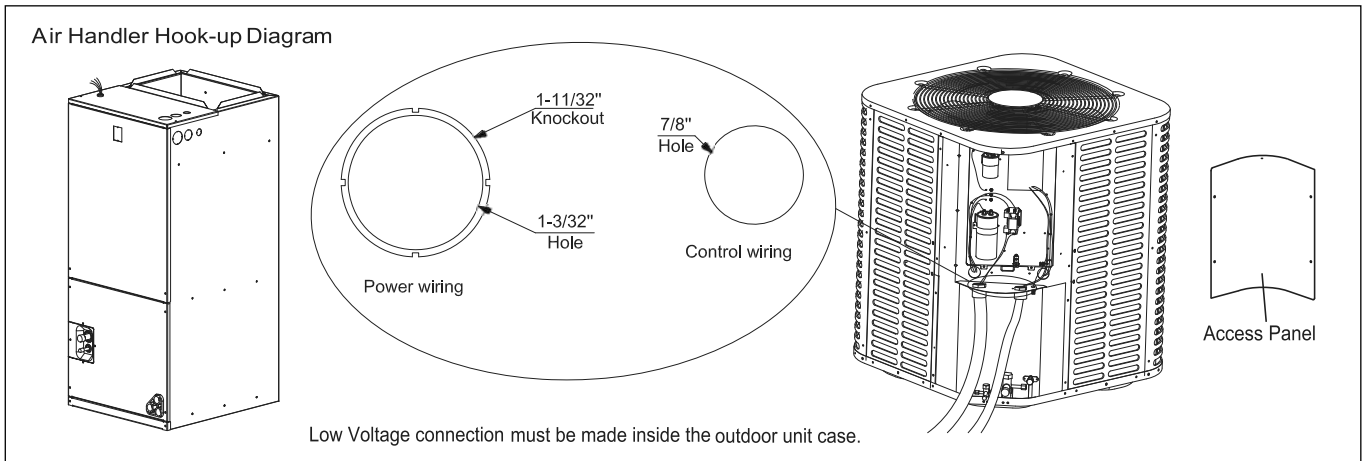
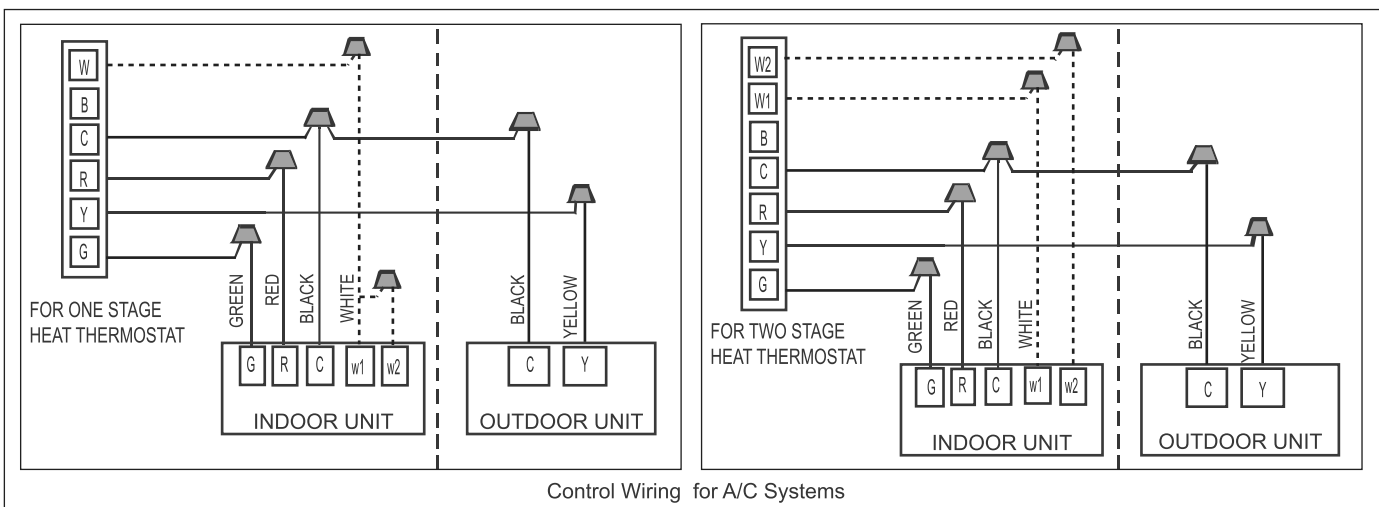


Figure 26



Control Wiring for A/C Systems

Figure 27

- Notes:
- “-----”The electric auxiliary heat connection(optional).
 - W:Electric auxiliary heat signal.
 - W1 :The first Electric auxiliary heat signal.
 - W2 :The second Electric auxiliary heat signal.

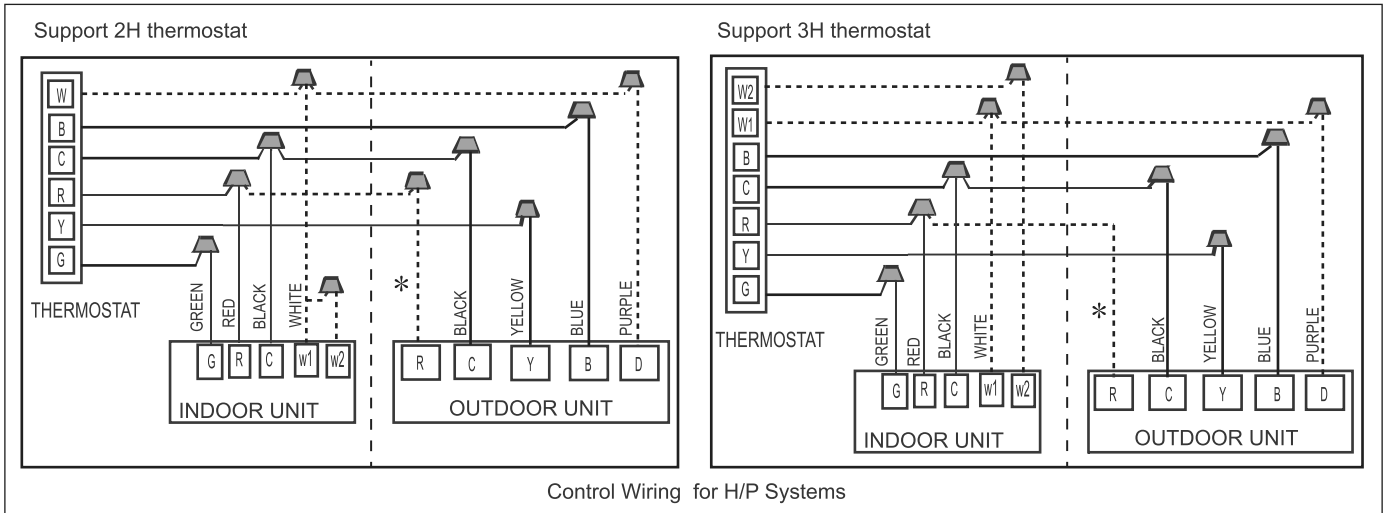


Figure 28

- Notes: "-----"The electric auxiliary heat connection(option).
 W:Electric auxiliary heat signal.
 W1 :The first Electric auxiliary heat signal.
 W2 :The second Electric auxiliary heat signal.
 D signal is connect to the Electric auxiliary heat or The first Electric auxiliary heat.
 "*" :Outdoor unit signal. Only for single-stage compressor systems.

12. Electrical - high voltage

12.1 High voltage power supply

⚠ WARNING: LIVE ELECTRICAL COMPONENTS!

During installation, testing, servicing, and trouble shooting of this product, it may be necessary to work with live electrical components. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

The high voltage power supply must agree with the equipment nameplate.

Power wiring must comply with National, State and Local Codes.

Follow instructions on unit wiring diagram located on the inside of the access panel.

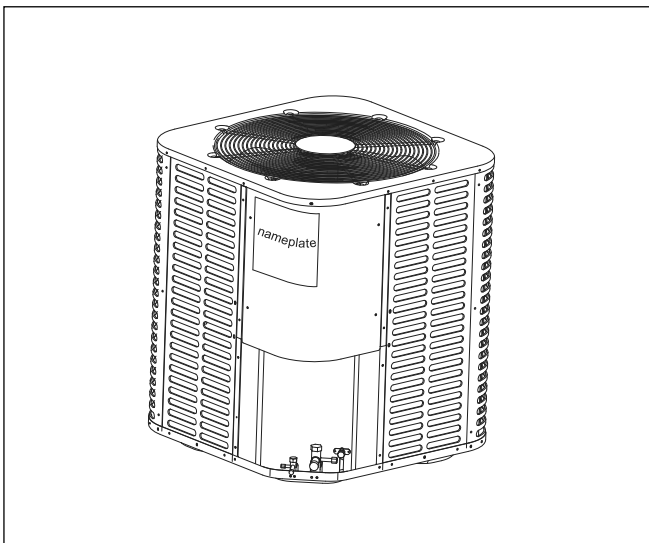


Figure 29

12.2 High voltage disconnect switch

Install a separate disconnect switch at the outdoor unit.

Field provided flexible electrical conduit must be used for high voltage wiring.

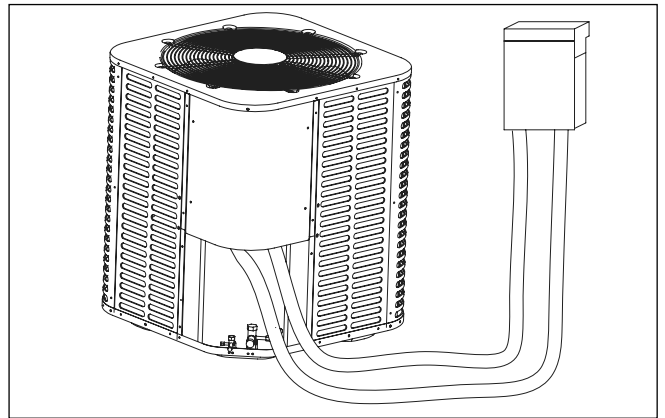


Figure 30

12.3 High voltage ground

Ground the outdoor unit per National, State and Local Code requirements.

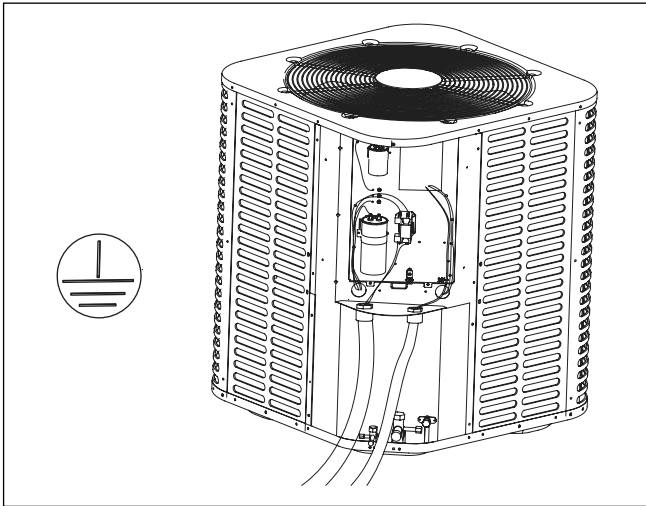


Figure 31

13. Start up

13.1 System start up

1. Ensure Sections 7, 8, 9, 10, 11 and 12 have been completed.
2. Set System Thermostat to OFF.

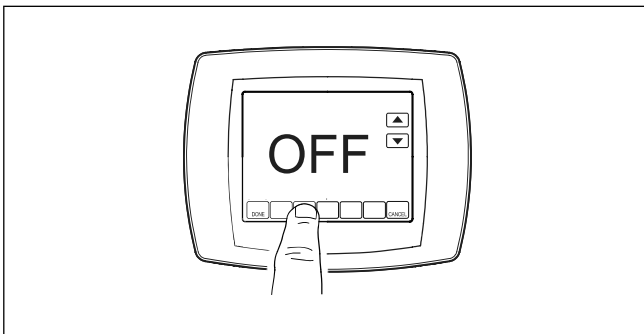


Figure 32

3. Turn on disconnect to apply power to the indoor and outdoor units.

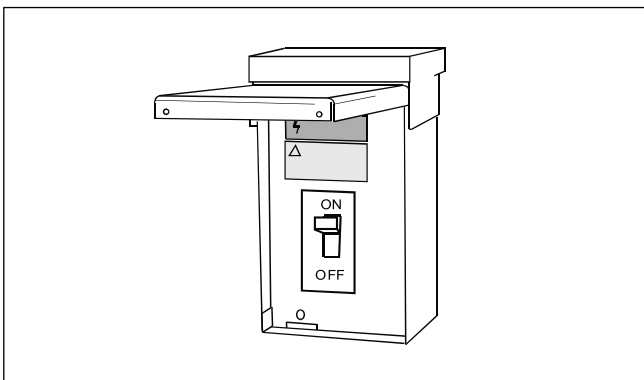


Figure 33

4. Wait one (1) hour before starting the unit if compressor crankcase heater is used and the outdoor ambient temperature is below 70 °F.

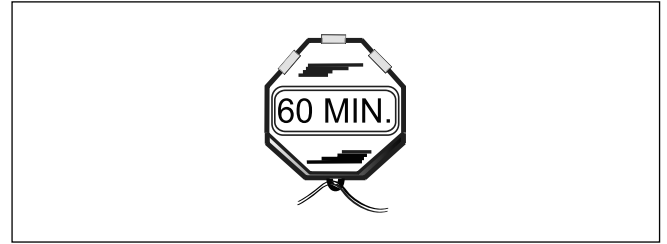


Figure 34

5. Set system thermostat to ON.

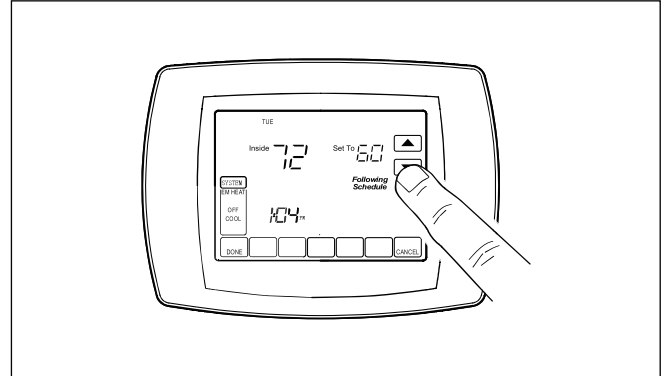


Figure 35

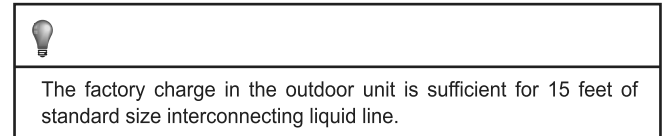
14. System charge adjustment

14.1 Charging: Weigh-In Method

Weigh-In method can be used for the initial installation, or anytime a system charge is being replaced. Weigh-In Method can also be used when power is not available to the equipment site or operating conditions (indoor/outdoor temperatures) are not in range to verify with the liquid line pressure charging method.

Model	Factory Charge	Charge multiplier for liquid line length		
		5/16"	3/8"	1/2"
All models	The data on nameplate	0.4 oz/ft	0.6 oz/ft	1.2 oz/ft

Table 7



New Installations — Calculating additional charge for lineset greater than 15 feet.

1. Total Line Length (ft) = _____ (a)
2. Standard Line set (ft) = 15 (b)
3. (a) minus (b) = _____ (c)
4. Refrigerant Multiplier = _____ (d)
5. Refrigerant Adder (c*d) = _____ (e*)

*If lineset is less than 15 feet, (e) = 0

Sealed-System Repairs — Calculating total system charge.

1. Total Line Length (ft) = _____ (a)
2. Standard Line set (ft) = 15 (b)
3. (a) minus (b) = _____ (c)
4. Refrigerant Multiplier = _____ (d)
5. Refrigerant Adder (c*d) = _____ (e*)
6. Factory Charge (nameplate) = _____ (f)
7. Total System Charge (e+f) = _____

*If line set is less than 15 feet, (e) = 0

The only mode approved for validating system charge is while in Cooling Mode. Outdoor Temperature must be between 55°F and 115°F with Indoor Temperature kept between 70°F and 80°F.

2. Ensure Sections 7, 8, 9, 10,11,12 and 13 have been completed.
3. Stabilize the system by operating for a minimum of 20 minutes.

At startup, or whenever charge is removed or added, the system must be operated for a minimum of 20 minutes to stabilize before accurate measurements can be made.

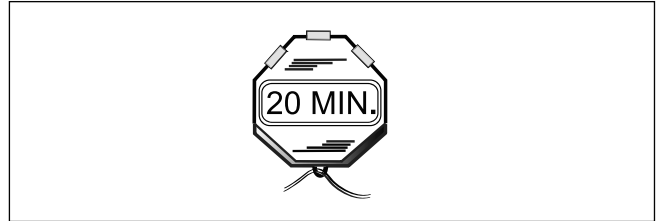


Figure 38

14.2 Liquid line pressure charging and refrigerant adjustment in cooling (above 55°F outdoor temp.)

1. Check the outdoor ambient temperatures.

Liquid line pressure (in cooling mode) is the only recommended method of charging above 55°F outdoor ambient temperatures.

For outdoor ambient temperatures below 55°F , use weigh-in charge method.

Note:It is important to return in the spring or summer to accurately charge the system in the cooling mode when outdoor ambient temperature is above 55°F.

4. Calculate liquid line pressure (According to Refrigerant Charging Chart)

- ▶ Measured Suction Line Pressure = _____ PSIG
- ▶ Outdoor Ambient Temperature = _____ °F
- ▶ Calculate Liquid Line Pressure = _____ PSIG

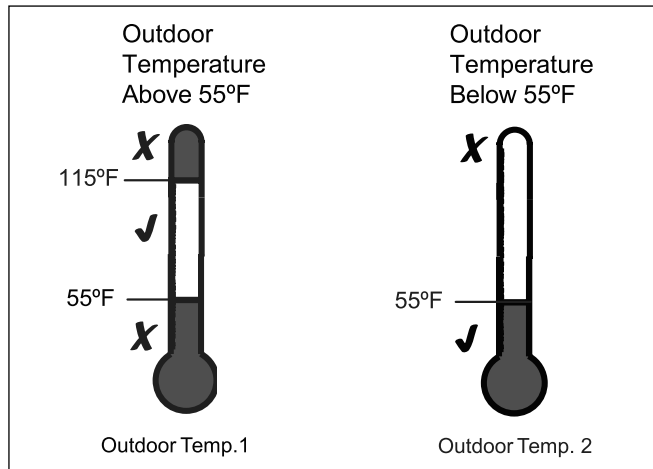


Figure 36

For best results the indoor temperature should be kept between 70°F to 80°F.

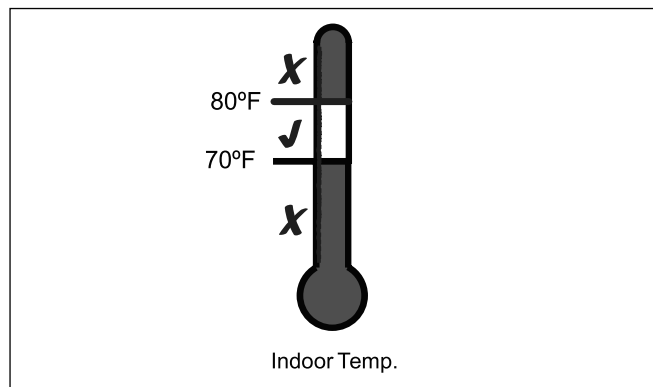


Figure 37

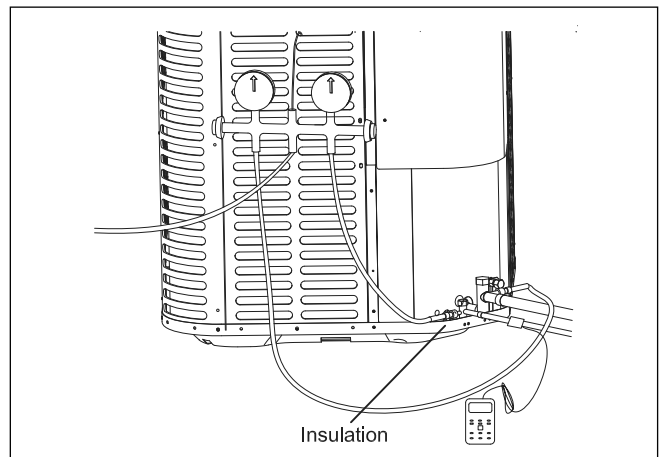


Figure 39

Cooling Mode		14 SEER R410A AC Charge Chart 3.5 TON												
		Outdoor Ambient Temperature(°F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Suction Pressure at Large Service Valve(psig)	165			250	269	288	307	329	351	373	400	426	453	479
	161			248	267	286	305	327	349	371	398	424	451	477
	157			246	265	284	303	325	347	369	396	422	449	475
	153		227	244	263	282	301	323	345	367	394	420	447	473
	149		225	242	261	280	299	321	343	365	392	418	445	471
	145		223	240	259	278	297	319	341	363	390	416	443	469
	141	204	221	238	257	276	295	317	339	361	388	414	441	467
	137	202	219	236	255	274	293	315	337	359	386	412	439	465
	133	200	217	234	253	272	291	313	335	357	384	410	437	463
	129	198	215	232	251	270	289	311	333	355	382	408	435	461
	125	196	213	230	249	268	287	309	331	353	380	406	433	459
	121	194	211	228	247	266	285	307	329	351	378	404	431	457
	117	192	209	226	245	264	283	305	327	349	376	402	429	455
	113	190	207	224	243	262	281	303	325	347	374	400	427	453
	109	188	205	222	241	260	279	301	323	345	372	398	425	451
	105	186	203	220	239	258	277	299	321	343	370	396	423	449

Cooling Mode		14 SEER R410A AC Charge Chart 4 TON												
		Outdoor Ambient Temperature(°F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Suction Pressure at Large Service Valve(psig)	165			258	277	297	316	339	361	384	411	438	465	492
	161			256	275	295	314	337	359	382	409	436	463	490
	157			254	273	293	312	335	357	380	407	434	461	488
	153		234	252	271	291	310	333	355	378	405	432	459	486
	149		232	250	269	289	308	331	353	376	403	430	457	484
	145		230	248	267	287	306	329	351	374	401	428	455	482
	141	210	228	246	265	285	304	327	349	372	399	426	453	480
	137	208	226	244	263	283	302	325	347	370	397	424	451	478
	133	206	224	242	261	281	300	323	345	368	395	422	449	476
	129	204	222	240	259	279	298	321	343	366	393	420	447	474
	125	202	220	238	257	277	296	319	341	364	391	418	445	472
	121	200	218	236	255	275	294	317	339	362	389	416	443	470
	117	198	216	234	253	273	292	315	337	360	387	414	441	468
	113	196	214	232	251	271	290	313	335	358	385	412	439	466
	109	194	212	230	249	269	288	311	333	356	383	410	437	464
	105	192	210	228	247	267	286	309	331	354	381	408	435	462

Cooling Mode		14 SEER R410A AC Charge Chart 5 TON												
		Outdoor Ambient Temperature(°F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Suction Pressure at Large Service Valve(psig)	165			265	285	305	325	348	372	395	423	450	478	505
	161			263	283	303	323	346	370	393	421	448	476	503
	157			261	281	301	321	344	368	391	419	446	474	501
	153		242	259	279	299	319	342	366	389	417	444	472	499
	149		240	257	277	297	317	340	364	387	415	442	470	497
	145		238	255	275	295	315	338	362	385	413	440	468	495
	141	219	236	253	273	293	313	336	360	383	411	438	466	493
	137	217	234	251	271	291	311	334	358	381	409	436	464	491
	133	215	232	249	269	289	309	332	356	379	407	434	462	489
	129	213	230	247	267	287	307	330	354	377	405	432	460	487
	125	211	228	245	265	285	305	328	352	375	403	430	458	485
	121	209	226	243	263	283	303	326	350	373	401	428	456	483
	117	207	224	241	261	281	301	324	348	371	399	426	454	481
	113	205	222	239	259	279	299	322	346	369	397	424	452	479
	109	203	220	237	257	277	297	320	344	367	395	422	450	477
	105	201	218	235	255	275	295	318	342	365	393	420	448	475

REFRIGERANT CHARGING CHART FOR HP SYSTEM

Cooling Mode		14SEER R410A HP Charge Chart 1.5 TON(Cooling mode)												
		Outdoor Ambient Temperature(°F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Suction Pressure at Large Service Valve(psig)	165			246	265	284	303	323	343	364	390	416	441	467
	161			244	263	282	301	321	341	362	388	414	439	465
	157			242	261	280	299	319	339	360	386	412	437	463
	153		221	240	259	278	297	317	337	358	384	410	435	461
	149		219	238	257	276	295	315	335	356	382	408	433	459
	145		217	236	255	274	293	313	333	354	380	406	431	457
	141	196	215	234	253	272	291	311	331	352	378	404	429	455
	137	195	213	232	251	269	288	309	328	350	376	402	427	453
	133	193	211	230	249	267	286	306	326	347	373	399	425	451
	129	191	209	228	247	265	284	304	323	344	370	397	423	449
	125	190	209	227	245	264	282	302	320	341	368	394	421	447
	121	190	208	226	244	262	280	300	320	341	367	393	419	445
	117	188	206	224	242	260	278	298	318	339	365	391	417	443
	113	186	204	222	240	258	276	296	316	337	363	389	415	441
	109	184	202	220	238	256	274	294	314	335	361	387	413	439
	105	182	200	218	236	254	272	292	312	333	359	385	411	437

Cooling Mode		14SEER R410A HP Charge Chart 2 TON(Cooling mode)												
		Outdoor Ambient Temperature(°F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Suction Pressure at Large Service Valve(psig)	165			255	274	294	313	335	358	381	407	434	461	486
	161			253	272	292	311	333	356	379	405	432	459	484
	157			251	270	290	309	331	354	377	403	430	457	482
	153		230	249	268	288	307	329	352	375	401	428	455	480
	149		228	247	266	286	305	327	350	373	399	426	453	478
	145		226	245	264	284	303	325	348	371	397	424	451	476
	141	204	224	243	262	282	301	323	346	369	395	422	449	474
	137	203	222	241	260	279	298	320	344	367	393	420	447	472
	133	201	220	239	258	277	296	318	342	365	391	418	445	470
	129	199	218	237	256	275	294	316	340	363	389	416	443	468
	125	197	216	235	254	273	292	314	338	361	387	414	441	466
	121	195	214	233	252	271	290	312	336	359	385	412	439	464
	117	193	212	231	250	269	288	310	334	357	383	410	437	462
	113	191	210	229	248	267	286	308	332	355	381	408	435	460
	109	189	208	227	246	265	284	306	330	353	379	406	433	458
	105	187	206	225	244	263	282	304	328	351	377	404	431	456

Cooling Mode		14SEER R410A HP Charge Chart 2.5 TON(Cooling mode)												
		Outdoor Ambient Temperature(°F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Suction Pressure at Large Service Valve(psig)	165			253	269	288	305	327	348	370	390	414	435	461
	161			251	267	286	303	325	346	368	388	412	433	459
	157			249	265	284	301	323	344	366	386	410	431	457
	153		231	247	263	282	299	321	342	364	384	408	429	455
	149		229	245	261	280	297	319	340	362	382	406	427	453
	145		227	243	259	278	295	317	338	360	380	404	425	451
	141	208	225	241	257	276	293	315	336	358	378	402	423	449
	137	206	223	239	255	274	291	313	334	356	376	400	421	447
	133	204	221	237	253	272	289	311	332	354	374	398	419	445
	129	202	219	235	251	270	287	309	330	352	372	396	417	443
	125	199	215	232	249	267	285	307	328	350	370	394	415	441
	121	195	213	230	247	267	285	306	327	348	368	392	413	439
	117	193	211	228	245	265	283	304	325	346	366	390	411	437
	113	191	209	226	243	263	281	302	323	344	364	388	409	435
	109	189	207	224	241	261	279	300	321	342	362	386	407	433
	105	187	205	222	239	259	277	298	319	340	360	384	405	431


Cooling Mode		14SEER R410A HP Charge Chart 3 TON(Cooling mode)												
		Outdoor Ambient Temperature(°F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Suction Pressure at Large Service Valve(psig)	165			260	278	296	314	336	359	381	402	427	454	482
	161			258	276	294	312	334	357	379	400	425	452	480
	157			256	274	292	310	332	355	377	398	423	450	478
	153		236	254	272	290	308	330	352	374	395	420	448	476
	149		234	252	270	288	306	328	350	372	393	418	446	474
	145		232	250	268	286	304	326	347	369	390	416	444	472
	141	212	230	248	266	284	302	323	345	366	388	413	442	470
	137	210	228	246	264	282	300	321	342	363	385	411	439	468
	133	208	226	244	262	280	298	319	339	360	382	408	437	466
	129	206	224	242	260	278	296	316	337	357	379	406	435	464
	125	204	222	240	258	276	294	314	335	355	377	404	433	462
	121	202	220	238	256	274	292	312	333	353	375	402	431	460
	117	200	218	236	254	272	290	310	331	351	373	400	429	458
	113	198	216	234	252	270	288	308	329	349	371	398	427	456
	109	196	214	232	250	268	286	306	327	347	369	396	425	454
	105	194	212	230	248	266	284	304	325	345	367	394	423	452

Cooling Mode		14SEER R410A HP Charge Chart 3.5 TON(Cooling mode)												
		Outdoor Ambient Temperature(°F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Suction Pressure at Large Service Valve(psig)	165			254	271	288	305	327	348	370	394	417	441	464
	161			252	269	286	303	325	346	368	392	415	439	462
	157			250	267	284	301	323	344	366	390	413	437	460
	153		231	248	265	282	299	321	342	364	388	411	435	458
	149		229	246	263	280	297	319	340	362	386	409	433	456
	145		227	244	261	278	295	317	338	360	384	407	431	454
	141	208	225	242	259	276	293	315	336	358	382	405	429	452
	137	206	223	240	257	274	291	313	334	356	380	403	427	450
	133	204	221	238	255	272	289	311	332	354	378	401	425	448
	129	202	219	236	253	270	287	309	330	352	376	399	423	446
	125	200	217	234	251	268	285	307	328	350	374	397	421	444
	121	198	215	232	249	266	283	305	326	348	372	395	419	442
	117	196	213	230	247	264	281	303	324	346	370	393	417	440
	113	194	211	228	245	262	279	301	322	344	368	391	415	438
	109	192	209	226	243	260	277	299	320	342	366	389	413	436
	105	190	207	224	241	258	275	297	318	340	364	387	411	434


Cooling Mode		14SEER R410A HP Charge Chart 4 TON(Cooling mode)												
		Outdoor Ambient Temperature(°F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Suction Pressure at Large Service Valve(psig)	165			255	273	291	310	330	351	371	396	420	445	469
	161			253	271	289	308	328	349	369	394	418	443	467
	157			251	269	287	306	326	347	367	392	416	441	465
	153		231	249	267	285	304	324	345	365	390	414	439	463
	149		229	247	265	283	302	322	343	363	388	412	437	461
	145		227	245	263	281	300	320	341	361	386	410	435	459
	141	206	225	243	261	279	298	318	339	359	384	408	433	457
	137	204	223	241	259	277	296	316	337	357	382	406	431	455
	133	204	222	240	258	275	294	314	335	355	380	404	429	453
	129	202	220	238	256	273	292	312	333	353	378	402	427	451
	125	200	218	236	254	271	290	310	331	351	376	400	425	449
	121	198	216	234	252	269	288	308	329	349	374	398	423	447
	117	196	214	232	250	267	286	306	327	347	372	396	421	445
	113	194	212	230	248	265	284	304	325	345	370	394	419	443
	109	192	210	228	246	263	282	302	323	343	368	392	417	441
	105	190	208	226	244	261	280	300	321	341	366	390	415	439

Cooling Mode		14SEER R410A HP Charge Chart 5 TON(Cooling mode)												
		Outdoor Ambient Temperature(°F)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
Suction Pressure at Large Service Valve(psig)	165			249	267	285	303	323	344	364	392	415	441	466
	161			247	265	283	301	321	342	362	391	413	439	464
	157			245	263	281	299	319	340	360	389	411	437	462
	153		225	243	261	279	297	317	338	358	387	409	435	460
	149		223	241	259	277	295	315	336	356	385	407	433	458
	145		221	239	257	275	293	313	334	354	383	405	431	456
	141	201	219	237	255	273	291	311	332	352	381	403	429	454
	137	199	217	235	253	271	289	309	330	350	379	401	427	452
	133	197	215	233	251	269	287	307	328	348	377	399	425	450
	129	195	213	231	249	267	285	305	326	346	375	397	423	448
	125	193	211	229	247	265	283	303	324	344	373	395	421	446
	121	191	209	227	245	263	281	301	322	342	371	393	419	444
	117	189	207	225	243	261	279	299	320	340	369	391	417	442
	113	187	205	223	241	259	277	297	318	338	367	389	415	440
	109	185	203	221	239	257	275	295	316	336	365	387	413	438
	105	183	201	219	237	255	273	293	314	334	363	385	411	436

5. Adjust refrigerant level to attain proper gage pressure.

 **Add refrigerant** if the design liquid line pressure is lower than the chart value.

- Connect gages to refrigerant bottle and unit as illustrated (Figure 40).
- Purge all hoses.
- Open bottle.
- Stop adding refrigerant when liquid line pressure matches the Refrigerant Charging Chart.

 **Recover refrigerant** if the design liquid line pressure is lower than the chart value.

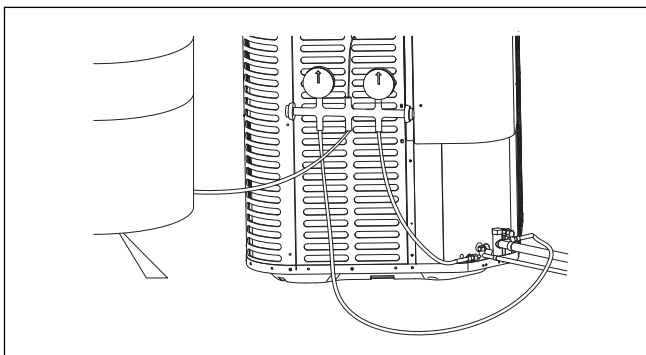



Figure 40

6. Stabilize the system.

- Wait 20 minutes for the system condition to stabilize between adjustments.

 When the liquid line pressure match the chart, the system is properly charged.

- Remove gages.
- Replace service port caps to prevent leaks. Tighten finger tight plus an additional 1/6 turn.

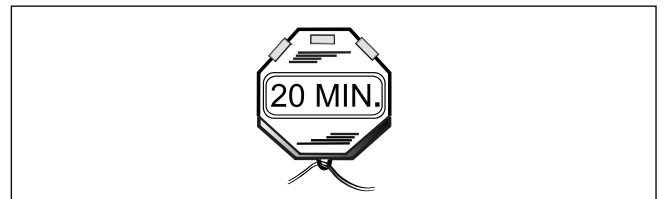


Figure 41

7. Record system information for reference (Table 8).

Record system pressures and temperatures after charging is complete.

Description	Value
Outdoor model number	
Measured Outdoor Ambient	°F
Measured Indoor Ambient	°F
Liquid Gage Pressure	PSIG
Suction Gage Pressure	PSIG

Table 8

15. System operation and troubleshooting

15.1 Compressor crankcase heater (CCH) (Heat pump only)

The crankcase heating start must meet two conditions:

- A. Outdoor temperature < 37.4°F
- B. At power up or if the compressor has been off for more than 3 hours

The crankcase heating stop must meet the following condition:

Outdoor temperature > 44.6°F or compressor starts.

15.2 Reversing valve (Heat pump only)

Reversing valve energizes at the heating conditions, and cuts off at the cooling condition.

15.3 Protection function (Heat pump only)

- T3 = Outdoor Coil Temperature
T3 > 143.6°F, compressor stops working
T3 < 125.6°F, compressor restarts working
- T4 = Ambient Temperature
T4 < 5°F, compressor stops working
T4 > 10.4°F, compressor restarts working
If 55°F ≤ T4 ≤ 115°F, unit can operate in cooling
If 5°F ≤ T4 ≤ 75°F, unit can operate in heating



When T4 < 5°F, the outdoor unit would provide a signal to drive up the heater installed in the indoor unit.

- Discharge temperature protection
Discharge temperature > 275°F, compressor stops working.
Discharge temperature < 194°F, compressor restarts working.
- High pressure protection
High pressure > 638 PSIG, compressor and outdoor fan motor stop working.
High pressure < 464 PSIG, compressor and outdoor fan motor restart working (3 minutes delay necessary).
- Low pressure protection
Low pressure < 21 PSIG, compressor and outdoor fan motor stop working.
Low pressure > 44 PSIG, compressor and outdoor fan motor restart working (3 minutes delay necessary).



In stand-by status, the compressor will not start in low pressure protection. Within 30 minutes, if 4 protection cycles occur. The system will be locked. It will be restore after power cycle.

15.4 Protection function (Air conditioner only)

- High pressure protection
High pressure > 638 PSIG, compressor and outdoor fan motor stop working.
High pressure < 464 PSIG, compressor and outdoor fan motor restart working (3 minutes delay necessary).

15.5 Defrost mode (Heat pump only)

Manual defrost mode

When the switch SW3-1 is set to "ON", the system turns to the defrost mode. The defrost mode exits by the logic of shut-down conditions of defrost mode.



Once the manual defrost mode is finished, please turn the switch SW3-1 back to "off".

Start-up conditions of defrost mode

When SW3-3 switch is set to "ON" (Figure 4), the mode will start up in any of the following conditions:

- Compressor operates and T3 < 32°F for a period of 30 minutes.
- T3 < 28.4°F and compressor operates for the first time after connected to the power source.
- When T3 < 28.4°F and the system is on standby for two hours continuously.

When SW3-3 switch is set to "OFF" (Figure 41), the mode will start up in any of the following conditions:

- Compressor operates and T3 < 32 °F for a period of 60 minutes.
- T3 < 28.4 °F and compressor operates for the first time after connected to the power source.
- When T3 < 28.4 °F and the system is on standby for two hours.

Shut-down conditions of defrost mode:

The mode will shut down in any of the following conditions:

- The defrosted time lasts 10 minutes
- T3 ≥ 64.4°F and T4 ≥ 28.4°F
- Compressor stops operating
- T3 ≥ 64.4°F lasts 60 seconds when T4 < 28.4°F

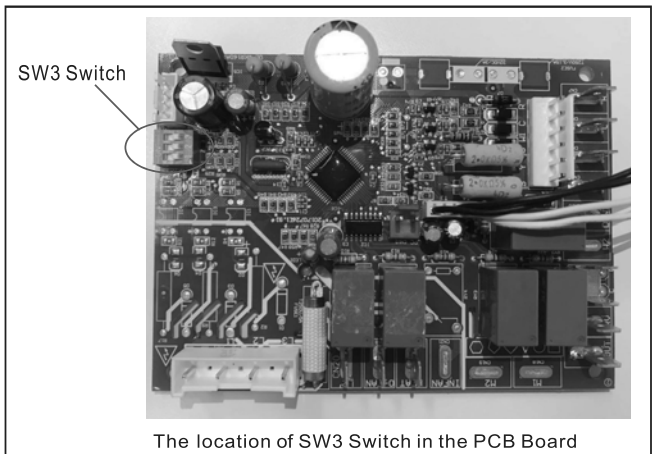


Figure 42

15.6 Temperature sensor resistance table

Temperature °F	Resistance kΩ	Temperature °F	Resistance kΩ	Temperature °F	Resistance kΩ	Temperature °F	Resistance kΩ
-4	106.73	37	29.87	78	10.00	119	3.69
-3	103.25	38	29.22	79	9.50	120	3.61
-2	99.89	39	28.19	80	9.26	121	3.53
-1	96.65	40	27.39	81	9.03	122	3.45
0	93.53	41	26.61	82	8.81	123	3.38
1	90.53	42	25.85	83	8.59	124	3.30
2	87.62	43	25.12	84	8.38	125	3.23
3	84.83	44	24.42	85	8.17	126	3.16
4	82.13	45	23.73	86	7.97	127	3.10
5	79.52	46	23.07	87	7.78	128	3.03
6	77.01	47	22.42	88	7.59	129	2.96
7	74.58	48	21.80	89	7.40	130	2.90
8	72.24	49	21.20	90	7.22	131	2.84
9	69.98	50	20.61	91	7.05	132	2.78
10	67.80	51	20.04	92	6.88	133	2.72
11	65.69	52	19.49	93	6.72	134	2.67
12	63.65	53	18.96	94	6.56	135	2.61
13	61.68	54	18.44	95	6.40	136	2.56
14	59.78	55	17.94	96	6.25	137	2.50
15	57.95	56	17.45	97	6.10	138	2.45
16	56.17	57	16.98	98	5.96	139	2.40
17	54.46	58	16.52	99	5.82	140	2.35
18	52.80	59	16.08	100	5.68	141	2.30
19	51.20	60	15.65	101	5.55	142	2.25
20	49.65	61	15.23	102	5.42	143	2.21
21	48.16	62	14.83	103	5.30	144	2.16
22	46.71	63	14.43	104	5.18	145	2.12
23	45.31	64	14.05	105	5.06	146	2.08
24	43.95	65	13.68	106	4.94	147	2.03
25	42.64	66	13.32	107	4.83	148	1.99
26	41.38	67	12.97	108	4.72	149	1.95
27	40.15	68	12.64	109	4.61	150	1.91
28	38.97	69	12.31	110	4.51	151	1.88
29	37.82	70	11.99	111	4.41	152	1.84
30	36.71	71	11.68	112	4.31	153	1.80
31	35.64	72	11.38	113	4.21	154	1.77
32	34.60	73	11.09	114	4.12	155	1.73
33	33.59	74	10.80	115	4.03	156	1.70
34	32.61	75	10.53	116	3.94	157	1.66
35	31.67	76	10.00	117	3.85	158	1.63
36	30.76	77	10.00	118	3.77	159	1.60

Table 9

15.6 Electrical data table

Model	AC							HP						
	18	24	30	36	42	48	60	18	24	30	36	42	48	60
Minimum circuit ampacity(A)	10.4	13.4	14.7	19.4	21.6	24.6	28.0	10.4	13.4	16.5	19.4	21.6	24.6	29.6
Maximum circuit protector(A)	15	20	25	30	35	40	45	15	20	25	30	35	40	50

Table 10

15.7 Troubleshooting table

SYSTEM FAULTS	WHAT TO CHECK	MODE	TROUBLESHOOTING TABLE																			
			Wiring	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	Control Transformer	
REFRIGERANT CIRCUIT																						
Head Pressure Too High	C																					
	H																					
Head Pressure Too Low	C																					
	H																					
Suction Pressure Too High	C																					
	H																					
Suction Pressure Too Low	C																					
	H																					
Liquid Refrig. Floodback (TXV)	C																					
	H																					
I.D. Coil Frosting	C																					
	H																					
Compressor Runs Inadequate or No Cooling/Heating	C																					
	H																					
ELECTRICAL																						
Compressor & O.D. Fan Won't Start	C	P	P				S	S	P	S	P	P										
	H	P	P				S	S	P	S	P	P									S	S
Compressor Will Not Start But O.D. Fan Runs	C	P	P									P										
	H	P	P				S				P	P									S	S
O.D. Fan Won't Start	C	P	P																			
	H	P	P																		S	
Compressor Hums But Won't Start	C		P				S					P										
	H		P				S					P										
I.D. Blower Won't Start	C	P	P	S			P	S	P	S	S											
	H	P	P	S			P	S	P	S	S											
DEFROST																						
Unit Won't Initiate Defrost	C																					
	H																				P	P
Defrost Terminates on Time	C																					
	H																					P
Unit Icing Up	C																					
	H																					P

C- Cooling H - Heating P - Primary Causes S - Secondary Causes

16. Warranty

Assist owner with processing Warranty cards and/or online registration.

16.1 Maintenance

Dirt should not be allowed to accumulate on the indoor or outdoor coils or other parts in the air circuit. Clean as often as necessary to keep the unit clean. Use a brush, vacuum cleaner attachment or other suitable means.

The outdoor fan motor is permanently lubricated and does not require periodic oiling.

Refer to the furnace or air handler instructions for filter and blower motor maintenance.

The indoor coil and drain pan should be inspected and cleaned regularly to assure proper drainage.



It is unlawful to knowingly vent, release or discharge refrigerant into the open air during repair, service, maintenance or the final disposal of this unit. When the system is functioning properly and the owner has been fully instructed, secure the owner's approval.

16.2 Changing motor

When motor requires changing, follow the steps below:

STEP 1 - Go into electrical panel, disconnect motor power lines.

Note: Disconnect main power to unit. Severe burns and electrical shock will occur if you do not disconnect main power.

STEP 2 - Remove cover (be careful of motor wires).

STEP 3 - Be sure to place fan cover unit on the ground (Figure 43).

Note: Do not place or lean fan blades on ground or against surface.

STEP 4 - Remove fan motor by removing 5/16" nuts from cover.

STEP 5 - Remove fan blade from motor by removing 1/2" nut and place fan on the ground.

STEP 6 - Reverse removal process to reinstall the fan and motor.

Note: When connecting motor wires be sure to check motor direction.

Damage will occur to condenser unit if you remove 5/16" nuts prior to cover removal.

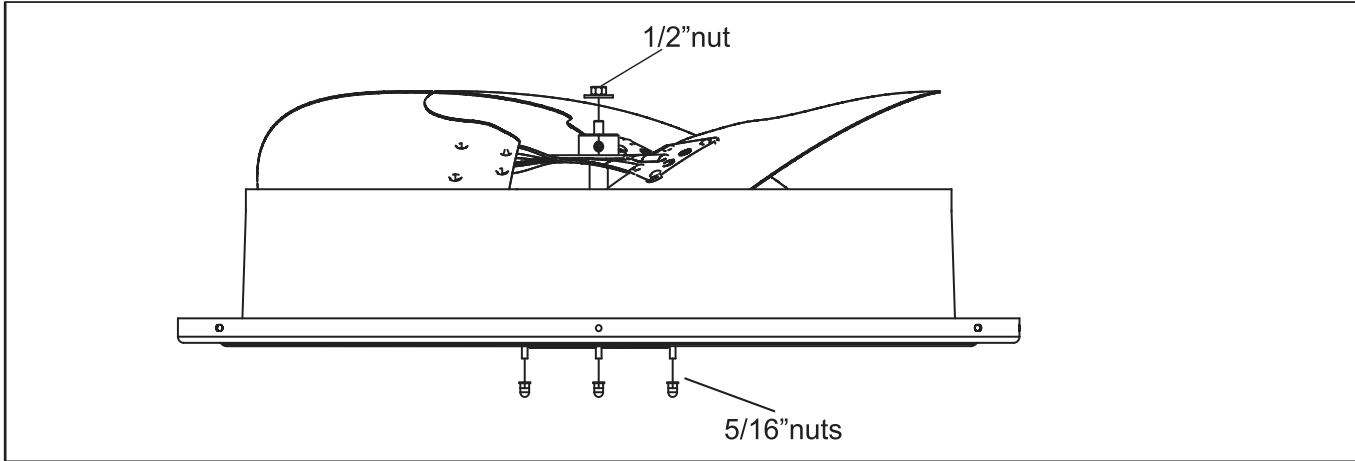


Figure 43

17. Wiring diagrams

17.1 For AC

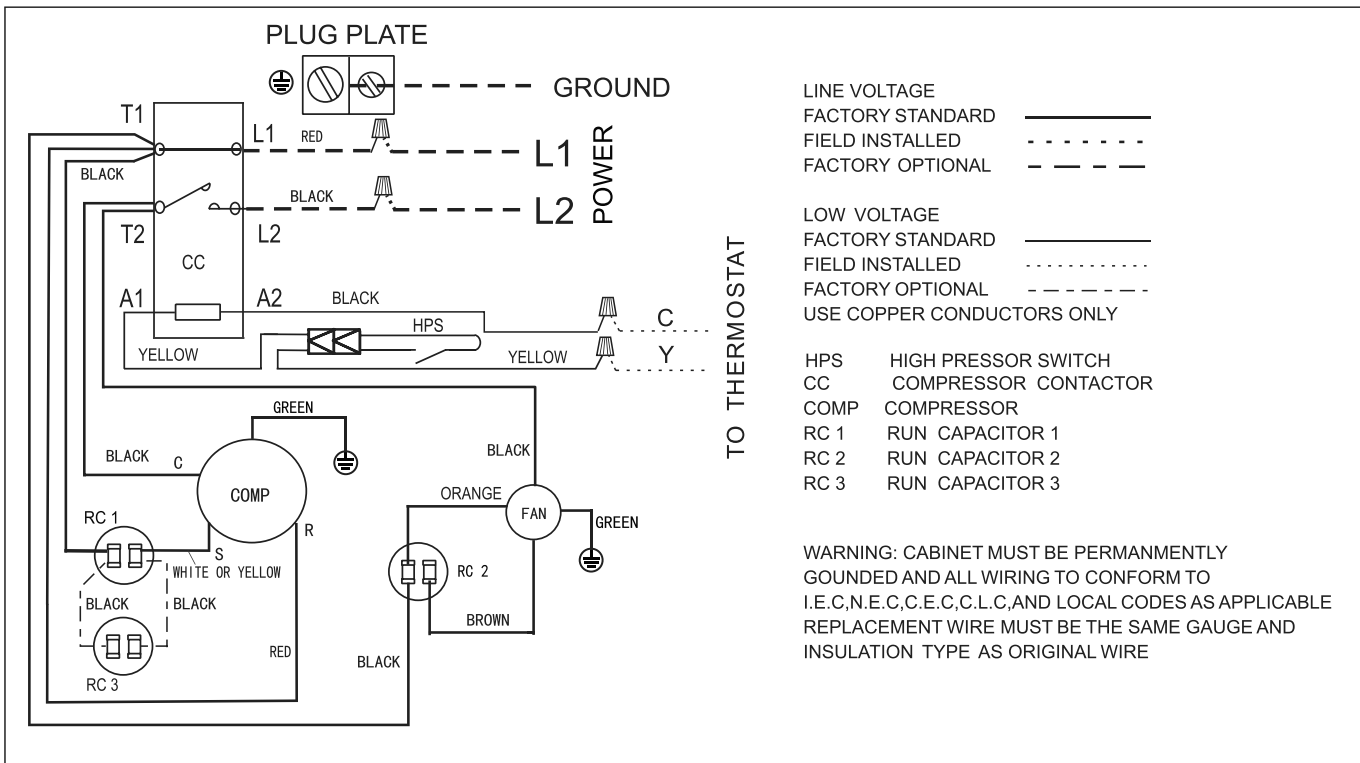


Figure 44

17.1 For HP

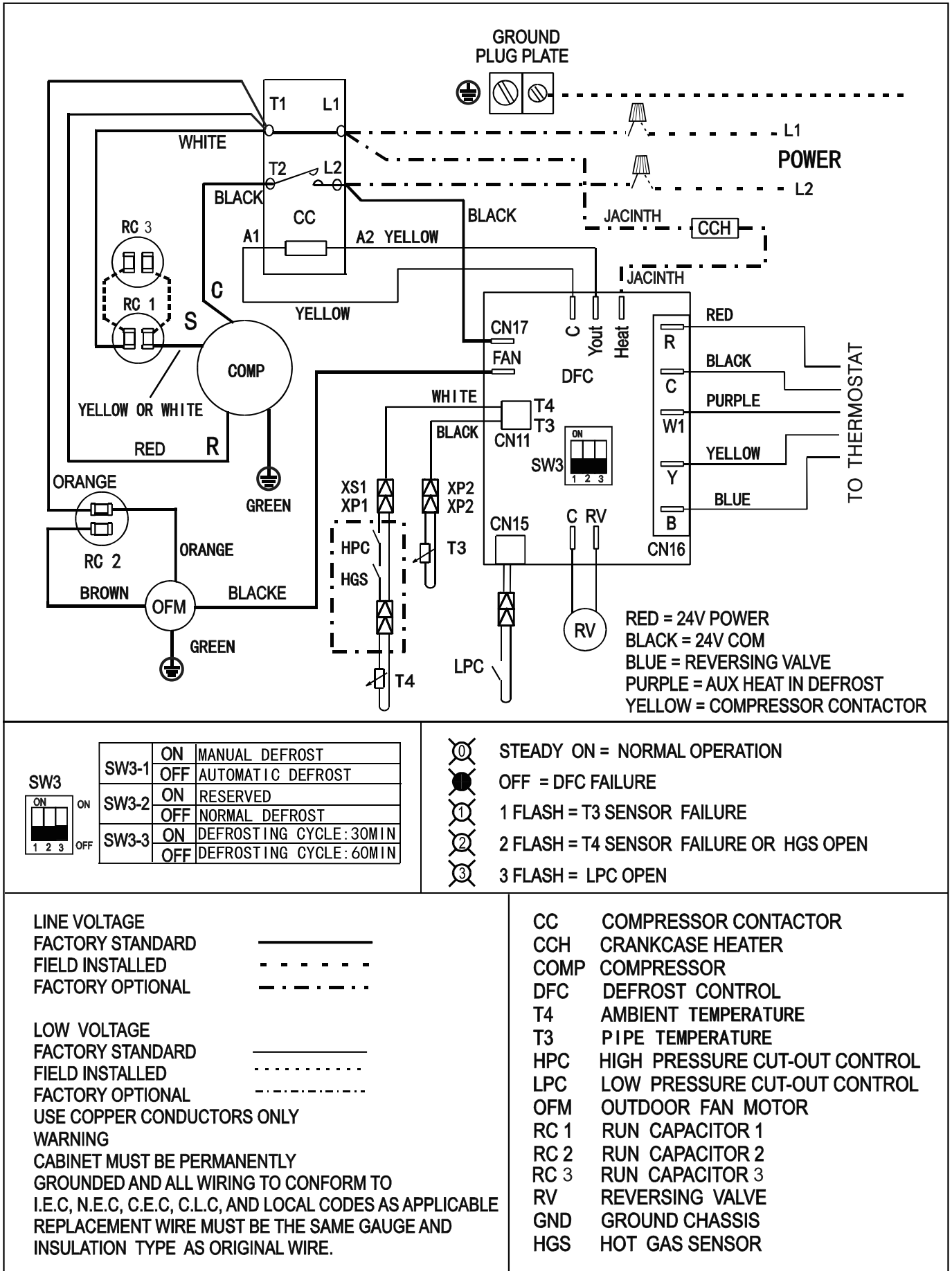


Figure 45

18. Matching table and Checkout Procedures

18.1 Matching table

Condensing Unit	Air Handle / A-Coil	Piston Size / TXV Valve Model	SEER	If Preinstalled Piston Replace Required
M4AC4018D1000AA	M4CXC028BA1CAA	051/(MAYTXVACHP1830AA)	14	YES
	M4CXC030BB1CAA	051/(MAYTXVACHP1830AA)	14	YES
	M4AH4018A1000AA	051/(MAYTXVACHP1830AA)	14	YES
M4AC4024D1000AA	M4CXC028BA1CAA	058/(MAYTXVACHP1830AA)	14	YES
	M4CXC030BB1CAA	058/(MAYTXVACHP1830AA)	14	YES
	M4AH4025A1000AA	058/(MAYTXVACHP1830AA)	14	YES
M4AC4030D1000AA	M4CXC028BA1CAA	064/(MAYTXVACHP1830AA)	14	NO
	M4CXC030BB1CAA	064/(MAYTXVACHP1830AA)	14	YES
	M4AH4032A1000AA	064/(MAYTXVACHP1830AA)	14	YES
M4AC4036D1000AA	M4CXC028BA1CAA	069/(MAYTXVACHP1830AA)	14	YES
	M4CXC030BB1CAA	070/(MAYTXVACHP1830AA)	14	YES
	M4CXC036BC1CAA	071/(MAYTXVACHP1830AA)	14	YES
	M4AH4036A1000AA	071/(MAYTXVACHP1830AA)	14	YES
M4AC4042D1000AA	M4CXC048AB1CAA	077/(MAYTXVACHP3642AA)	14	YES
	M4CXC049BC1CAA	077/(MAYTXVACHP3642AA)	14	YES
	M4CXC061BD1CAA	077/(MAYTXVACHP3642AA)	14	YES
	M4AH4044A1000AA	077/(MAYTXVACHP3642AA)	14	YES
M4AC4048D1000AA	M4CXC049BC1CAA	082/(MAYTXVACHP3642AA)	14	YES
	M4CXC061BD1CAA	082/(MAYTXVACHP3642AA)	14	YES
	M4AH4048A1000AA	082/(MAYTXVACHP3642AA)	14	YES
M4AC4060C1000AA	M4CXC063AD1CAA	MAYTXVACHP6060AA	14	YES
	M4AH3060B1000AA	090/(MAYTXVACHP6060AA)	14	YES
M4HP4018C1000AA	M4AH4018B1A00AA	050	14	NO
M4HP4024C1000AA	M4AH4025B1B00AA	056	14	NO
M4HP4030B1000AA	M4AH4032B1B00AA	063	14	NO
M4HP4036B1000AA	M4AH4036B1B00AA	068	14	NO
M4HP4042B1000AA	M4AH4044B1C00AA	076	14	NO
M4HP4048B1000AA	M4AH4048B1C00AA	083	14	NO
M4HP4060B1000AA	M4AH4060B1C00AA	090	14	NO

18.2 Operational and Checkout Procedures

Final phases of this installation are the unit Operational and Checkout Procedures. To obtain proper performance, all units must be operated and charge adjustments made in accordance with procedures found in the Service Facts of the Outdoor Unit.

After installation has been completed, it is recommended that the entire system be checked against the following list:

- | | |
|--|--|
| 1. Be sure unit suspension(if used) is secure and that there are no tools or loose debris in or around or on top of the unit.....[] | 5. Check all duct outlets; they must be open and unrestricted. [] |
| 2. Properly insulate suction lines and fittings.....[] | 6. Check drain lines and be sure all joints are tight..... [] |
| 3. Properly secure and isolate all refrigerant lines... [] | 7. Be sure that a return air filter is installed..... [] |
| 4. Verify that all electrical connections are tight.[] | 8. Operate complete system in each mode to verify proper performance. Verify operation of supplementary electric heater.[] |

Base Limited Warranty

Single Phase R-410A Outdoor Units, Single Phase R-22 Outdoor Units, Air Handlers, Furnaces, Packaged Units, Cased Coils, Ductless and Specific Terms for Commercial Applications.

Subject to the terms and conditions of this limited warranty, Ingersoll Rand ("Company") extends a limited warranty against manufacturing defects for the product(s) identified in **Table 1** attached hereto ("Products") that are installed in a residential/multi-family application (personal, family or household purposes) under normal use and maintenance in the United States and Canada.

In order to maximize the available benefits under this limited warranty, the Purchaser (as defined below) should read it in its entirety. All repairs of Product parts covered under this limited warranty must be made with authorized service parts and by a licensed HVAC service provider. Additionally, commercial applications are treated differently under this limited warranty as stated in **Table 1** attached hereto. For purposes of this limited warranty, "commercial applications" shall mean any application other than for personal, family, or household use.

TERM: The limited warranty period for Products is as stated in **Table 1** attached hereto. If the Purchaser properly registers the Products, the limited warranty period shall be extended as stated in **Table 1** attached hereto. Regardless of registration, the Commencement Date for a limited warranty period shall be the date that the original installation is complete and all Product start-up procedures have been properly completed and verified by an installer's invoice. If the installation and start-up date cannot be verified by the installer's invoice, the Commencement Date shall be sixty (60) days after the factory manufacture date which is verified by the Product serial number. Where a Product is installed in a newly constructed home, the Commencement Date is the date the Purchaser purchased the residence from the builder. Proof of Product purchase, installation, and/or closing date of the residence may be required to confirm the Commencement Date.

The installation of Product replacement parts under this limited warranty shall not extend the original warranty period. The warranty period for any Product part replaced under this limited warranty is the applicable warranty period remaining under the original Product warranty.

WHO IS COVERED: This limited warranty is provided only to the original owner and his or her spouse ("Purchaser") of the residence where the Products are originally installed. This warranty is not transferable except according to terms stated on the applicable website identified below under Registration Requirements. Company has the right to request any and all proof of Product purchase or installation and/or closing date of the residence.

WHAT COMPANY WILL DO: Company may request proof of Product purchase and/or installation in order to provide Product parts under this limited warranty. As Company's only responsibility and Purchaser's only remedy under this limited warranty, Company will furnish a replacement part to the licensed HVAC service provider, without charge for the part only, to replace any Product part that fails due to a manufacturing defect under normal use and maintenance. The Purchaser must pay for any and all shipping and handling charges and other costs of warranty service for the replacement part. If a Product part is not available, Company will, at its option, provide a free suitable substitute part or provide a credit in the amount of the then factory selling price for a new suitable substitute part to be used by the Purchaser towards the retail purchase price of a new Company product. Any new Product purchase shall be at Purchaser's sole cost and expense including, but not limited to, all shipping, removal, and installation costs and expenses.

REGISTRATION REQUIREMENTS: All Products must be properly registered online by the Purchaser within sixty (60) days after the Commencement Date to receive the registered limited warranty terms. To register online, go to:

<http://www.ameristarac.com>

and click "Begin Online Registration." If a Purchaser does not register within this stated time period, the base limited warranty terms shall apply.

ELIGIBILITY REQUIREMENTS: The following items are required in order for the Products to be covered under this limited warranty:

- The Products must be in the same location where they were originally installed.
- The Products must be properly installed, operated, and maintained by a licensed HVAC service provider in accordance with the Product specifications or installation, operation, and maintenance instructions provided by Company with each Product. Failure to conform to such specifications and/or instructions shall void this limited warranty. Company may request written documentation showing the proper preventative maintenance.
- All Product parts replaced by Company under this limited warranty must be given to the servicing provider for return to Company.
- Air handlers, air conditioners, heat pumps, cased or uncased coils, stand-alone furnaces, and packaged units must be part of an Air Conditioning, Heating, and Refrigeration Institute rated and matched system or a specification in a Company provided bulletin or otherwise approved in writing by a Company authorized representative.

EXCLUSIONS: The following are not covered by this limited warranty:

- Labor costs including, but not limited to, costs for diagnostic calls or the removal and reinstallation of Products and/or Product parts.
- Shipping and freight expenses required to ship Product replacement parts.
- Failures, defects, or damage (including, but not limited to, any loss of data or property) caused by (1) any third party product, service, or system connected or used in conjunction with the Products; (2) any use that is not designed or intended for the Products; (3) modification, alteration, abuse, misuse, negligence, or accident; (4) improper storage, installation, maintenance, or operation including, but not limited to, operation of electrical equipment at voltages other than the range specified on the Product nameplate; (5) any use in violation of written instructions or specifications provided by Company; (6) any acts of God including, but not limited to, fire, water, storms, lightning, or earthquakes; or any theft or riots; or (7) a corrosive atmosphere or contact with corrosive materials such as, but not limited to, chlorine, fluorine, salt, sulfur, recycled waste water, urine, fertilizers, rust, or other damaging substances or chemicals.
- Products purchased direct including, but not limited to, Internet or auction purchases and purchases made on an uninstalled basis.
- Cabinets or cabinet pieces that do not affect product performance, air filters, refrigerant, refrigerant line sets, belts, wiring, fuses, surge protection devices, non-factory installed driers, and Product accessories.
- Increased utility usage costs.

REFRIGERANT POLICY: (1) **Manufacturer-Installed Refrigerant:** Beginning on January 1, 2010, R-22 refrigerant will no longer be used as a manufacturer-installed refrigerant as required by federal regulation. All Products with manufacturer-installed refrigerant will include R410-A refrigerant. Any and all expenses or costs associated with replacing Product parts that are not R-410A compatible will not be covered by the terms and conditions of this limited warranty. (2) **Non-Manufacturer installed Refrigerant:** For Products manufactured and sold by the Company without refrigerant, only manufacturer approved and genuine alternate refrigerants shall be used. The use of contaminated, counterfeit, non-genuine, or non-manufacturer approved alternate refrigerant will void this limited warranty. (3) **All Products:** Products include a liquid line filter drier which must be replaced when a compressor replacement is necessary. A suction line filter drier must be added for compressors defined as burnouts and failure to do so will void this warranty. Non-approved refrigerant and/or non-approved refrigerant system additives including, but not limited to dyes will void this limited warranty.

ADDITIONAL TERMS:

THIS LIMITED WARRANTY AND LIABILITY SET FORTH HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, WHETHER IN CONTRACT OR IN NEGLIGENCE, EXPRESS OR IMPLIED, IN LAW OR IN FACT. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THE APPLICABLE PRODUCT WARRANTY. COMPANY DOES NOT AUTHORIZE ANY PERSON TO CREATE FOR IT ANY OBLIGATION OR LIABILITY IN CONNECTION WITH THE PRODUCTS.

NOTWITHSTANDING ANYTHING IN THIS LIMITED WARRANTY TO THE CONTRARY, COMPANY SHALL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL AND/OR PUNITIVE DAMAGES, WHETHER BASED ON CONTRACT, WARRANTY, TORT (INCLUDING, BUT NOT LIMITED TO, STRICT LIABILITY OR NEGLIGENCE), PATENT INFRINGEMENT, OR OTHERWISE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. COMPANY'S MAXIMUM LIABILITY HEREUNDER IS LIMITED TO THE ORIGINAL PURCHASE PRICE OF THE PRODUCTS.

No action arising out of any claimed breach of this limited warranty may be brought by a Purchaser more than one (1) year after the cause of action has arisen.

This limited warranty gives you specific legal rights, and you may also have other rights as otherwise permitted by law. If this Product is considered a consumer product, please be advised that some local laws do not allow limitations on incidental or consequential damages, how long a warranty lasts based on registration, or how long an implied warranty lasts, so that the above limitations may not fully apply. Refer to your local laws for your specific rights under this limited warranty. If you have any questions regarding this limited warranty, please contact your original installation dealer, or any participating dealer, should your original installation dealer no longer be available.

GW-659-3317

TABLE 1: Warranty Time Periods

COVERAGE TERMS FOR RESIDENTIAL APPLICATIONS: Pursuant to the Ingersoll Rand (“Company”) limited warranty terms and conditions, the following Products are covered for the base time periods as stated below (“Base Limited Warranty Period”). If registered, the Base Limited Warranty Periods for certain Products will be extended as stated below (“Registered Limited Warranty Period”).

FURNACES:

M801P, M951P, M952V

Base Limited Warranty Period: Parts – five (5) years, Heat Exchanger – twenty (20) years.

Registered Limited Warranty Period: Parts – ten (10) years, Heat Exchanger: twenty (20) years.

AIR HANDLERS:

M4AH3, M4AH4

Base Limited Warranty Period: Indoor Coil and Parts – five (5) years.

Registered Limited Warranty Period: Indoor Coil and Parts – ten (10) years.

TMM4, TMM5

Base Limited Warranty Period: Indoor Coil and Parts – three (3) years.

Registered Limited Warranty Period: Indoor Coil and Parts – ten (10) years.

ELECTRIC HEATERS, installed in M4A3/4 AIR HANDLERS:

MAYHTR1A

Limited Warranty Period: Parts – ten (10) years.

SINGLE PHASE R410 OUTDOOR UNITS:

M4AC3 (M4AC3018, 24, 30, 36, 42, 43, 48, 60 only), M4HP3, M4AC4, M4HP4

Base Limited Warranty Period: Compressor, Outdoor Coil, Parts: five (5) years.

Registered Limited Warranty Period: Compressor, Outdoor Coil, Parts – ten (10) years.

SINGLE PHASE R410 OUTDOOR UNITS:

M4AC3 (M4AC3017, 23, 29 only)

Base Limited Warranty Period: Compressor, Outdoor Coil, Parts: one (1) year.

Registered Limited Warranty Period: Compressor, Outdoor Coil, Parts – five (5) years.

SINGLE PHASE R22 OUTDOOR UNITS:

M2AC3, M2HP3

Base Limited Warranty Period: Compressor, Outdoor Coil, Parts - one (1) year.

Registered Limited Warranty Period: Compressor, Outdoor Coil, Parts – five (5) years.

CASED COILS:

M4CXC

Base Limited Warranty Period: Coil, Parts –five (5) years.

Registered Limited Warranty Period: Coil and Parts – ten (10) years.

4MXC, 4GXC

Base Limited Warranty Period: Coil, Parts –three (3) years.

Registered Limited Warranty Period: Coil and Parts – ten (10) years.

PACKAGED UNITS:

M4PH3, M4PG3, M4PH4, M4PW4, M4PG4

Base Limited Warranty Period: Compressor, Coil, Parts – five (5) years, Heat Exchanger – ten (10) years.

Registered Limited Warranty Period: Compressor, Coil, Parts – ten (10) years, Heat Exchanger – ten (10) years.

ELECTRIC HEATERS, installed in M4PH4 PACKAGED UNITS:

MAYHTR1P

Limited Warranty Period: Parts – ten (10) years.

DUCTLESS SYSTEMS:**

M4THS/M4MHW, M4TCS/M4MCW, M4MLW/M4TLS, M4THM:

Base Limited Warranty Period:

All Parts – five (5) year.

Registered Limited Warranty Period:

All Parts – ten (10) years.

***There is no distinction between residential and commercial use for this Limited Warranty term and coverage.*

SPECIFIC TERMS FOR COMMERCIAL APPLICATIONS

Base Limited Warranty Period Applies