

Outdoor Air Conditioner

User's Information and Installation Instructions

12 SEER R410-A High Efficiency Split System

These units have been designed and tested for capacity and efficiency in accordance with A.R.I. Standards. Split System Air Conditioning units are designed for use with a wide variety of fossil fuel furnaces, electric furnaces, air handlers, and evaporator coil combinations.

These instructions are primarily intended to assist qualified individuals experienced in the proper installation of heating and/or air conditioning appliances. Some local codes require licensed installation/service personnel for this type of equipment. Read all instructions carefully before starting the installation.

USER'S INFORMATION

IMPORTANT

Read this owner information to become familiar with the capabilities and use of your appliance. Keep this with literature on other appliances where you have easy access to it in the future. If a problem occurs, check the instructions and follow recommendations given. If these suggestions don't eliminate your problem, call your servicing contractor .

OPERATING INSTRUCTIONS

To Operate Your Air Conditioner for Cooling —

1. Set the thermostat system switch to COOL or AUTO and the thermostat fan switch to AUTO. (See Figure 1)
2. Set the thermostat temperature to the desired temperature level by pressing the WARMER or COOLER button. Please refer to the separate detailed thermostat user's manual for complete instructions regarding thermostat programming. The outdoor unit and indoor blower will both cycle on and off to maintain the indoor temperature at the desired cooling level.

To Operate Your Furnace for Heating —

1. Set the thermostat system switch to HEAT or AUTO and the thermostat fan switch to AUTO. (See Figure 1)
2. Set the thermostat temperature to the desired temperature level by pressing the WARMER or COOLER button. Please refer to the separate detailed user's manual for complete thermostat programming instructions. The furnace and indoor blower will cycle on and off to maintain the indoor temperature at the desired heating level.

To Shut Off Your Air Conditioner —

Set the thermostat system switch to OFF and the thermostat fan switch to AUTO. (See Figure 1)

The system will not operate, regardless of the thermostat temperature setting.

To Operate the Indoor Blower Continuously —

Set the thermostat fan switch to ON (See Figure 1)

The indoor blower will start immediately, and will run continually until the fan switch is reset to AUTO.

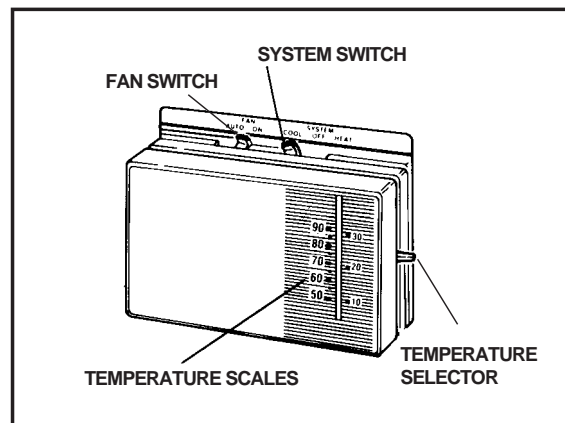


Figure 1. Typical Thermostat

The continuous indoor blower operation can be obtained with the thermostat system switch set in any position, including OFF.

The continuous indoor blower operation is typically used to circulate the indoor air to equalize a temperature unbalance due to a sun load, cooking, or fireplace operation.

To Maintain Your Air Conditioner —

 **CAUTION:**

Be certain the electrical power to the outdoor unit and the furnace/air handler is disconnected before doing the following recommended maintenance.

1. Regularly:

- a. Clean or replace the indoor air filter at the start of each heating and cooling season, and when an accumulation of dust and dirt is visible on the air filter.
- b. Remove any leaves and grass clippings from the coil in the outdoor unit, being careful not to damage the aluminum fins.
- c. Check for any obstruction, such as twigs, sticks, etc.

2. Before Each Cooling Season:

If the furnace/air handler blower motor and the outdoor unit fan motor(s) have oil tubes at the motor bearings, apply 10 drops of SAE No. 20 motor oil to each oil tube.

 **CAUTION:**

Do not over-oil, or oil motors not factory-equipped with oil tubes. The compressor is hermetically “sealed” and does not require lubrication.

3. Before Calling a Service Technician, Be Certain:

- a. The unit thermostat is properly set — see “To Operate Your Air Conditioner for Cooling” and “To Operate Your Furnace for Heating.”
- b. The unit disconnect fuses are in good condition, and the electrical power to the unit is turned on.

1. GENERAL INFORMATION

Read the following instructions completely before performing the installation.

 **CAUTION:**

This unit uses refrigerant R410A. DO NOT under any circumstances use any other refrigerant besides R410-A in this unit. Use of another refrigerant will damage this unit.

Condensing Unit Section — Each condensing unit is shipped with a refrigerant charge adequate to operate the outdoor section with an indoor matching coil or air handler, and 15 feet of refrigeration line.

NOTE: DO NOT USE ANY PORTION OF THE CHARGE FOR PURGING OR LEAK TESTING.

Matching coils and air handlers are shipped with a small pressurized holding charge to pressurize them to keep out contaminants. To release the pressure, read the indoor section installation instructions carefully.

Liquid and Suction Lines — Refrigerant grade copper tubing should be used when installing the system. Refrigerant suction line tubing should be fully insulated.

Field Connections for Electrical Power Supply — All wiring must comply with current provisions of the “National Electrical Code” (ANSI C1.) and with applicable local codes having jurisdiction. The minimum size of electrical conductors and circuit protection must be in compliance with information listed on the outdoor unit data label.

2. SAFETY CONSIDERATIONS

Pressures within the System — Split system air conditioning equipment contains liquid and gaseous refrigerant under pressure. Installation and servicing of this equipment should be accomplished by qualified, trained personnel thoroughly familiar with this type of equipment. Under no circumstances should the Homeowner attempt to install and/or service the equipment.

Labels, Tags, Precautions — When working with this equipment, follow all precautions in the literature, on tags, and on labels provided with

the equipment. Read and thoroughly understand the instructions provided with the equipment prior to performing the installation and operational checkout of the equipment.

Brazing Operations — Installation of equipment may require brazing operations. Safety codes must be complied with. Safety equipment (e.g.; safety glasses, work gloves, fire extinguisher, etc.) must be used when performing brazing operations.

 **WARNING:**

Ensure all electrical power to the unit is off prior to installing or servicing the equipment. Failure to do so may cause personal injury or death.

3. SITE PREPARATION

Unpacking Equipment — Remove the cardboard carton and User's Manual from the equipment. Take care not to damage the tubing connections when removing the carton.

Inspect for Damage — Inspect the equipment for damage prior to installing the equipment at the job site. Ensure coil fins are straight and, if necessary, comb fins to remove flattened and bent fins.

Preferred Location of the Outdoor Unit at the Job Site — Conduct a survey of the job site to determine the optimum location for mounting the outdoor unit. Overhead obstructions, poorly ventilated areas, and areas subject to accumulation of debris should be avoided. The outdoor unit must be installed in such a manner that airflow through the coil is not obstructed and that the unit can be serviced.

Facility Prerequisites — Electrical power must be supplied to the equipment. Electrical power supplied must be adequate for proper operation of the equipment. The system must be wired and provided with circuit protection in accordance with local building codes and the National Electrical Code.

Minimum Circuit Ampacity — Electrical wiring to the equipment must be compatible and in compliance with the minimum circuit ampacity listed on the outdoor unit data label.

Maximum Fuse/Circuit Breaker Size — Circuit protection for the outdoor unit must be compat-

ible with the maximum fuse/circuit breaker size listed on the outdoor unit data label.

4. INSTALLING THE OUTDOOR UNIT

Slab Mount — The site selected for a slab mount installation requires a stable foundation and one not subject to erosion. The slab should be level and anchored (if necessary) prior to placing the equipment on the slab.

Cantilever Mount — The cantilever mount should be designed with adequate safety factor to support the weight of the equipment, and for loads subjected to the mount during operation. Installed equipment should be adequately secured to the cantilever mount and levelled prior to operation of the equipment.

Roof Mount — The method of mounting should be designed so as not to overload roof structures nor transmit noise to the interior of the structure. Refrigerant and electrical line should be routed through suitably waterproofed openings to prevent water leaking into the structure.

5. INSTALLING THE INDOOR UNIT

The indoor section should be installed before proceeding with routing of refrigerant piping. Consult the installation instructions of the indoor unit (i.e.: air handler, furnace, etc.) for details regarding installation.

6. CONNECTING REFRIGERANT TUBING BETWEEN THE INDOOR AND OUTDOOR UNIT

 **CAUTION:**

This system utilizes R410-A refrigerant with POE oil. When servicing, cover or seal openings to minimize the exposure of the refrigerant system to air to prevent accumulation of moisture and other contaminants.

General — Once outdoor and indoor unit placement has been determined, route refrigerant tubing between the equipment in accordance with sound installation practices. Refrigerant tubing should be routed in a manner that minimizes the length of tubing and the number of bends in the tubing. Refrigerant tubing should

be supported in a manner that the tubing will not vibrate or abrade during system operation. Tubing should be kept clean of foreign debris during installation and installation of a liquid line filter drier is recommended if cleanliness or adequacy of system evacuation is unknown or compromised. Every effort should be made by the installer to ensure that the field installed refrigerant containing components of the system have been installed in accordance with these instructions and sound installation practices so as to insure reliable system operation and longevity. The maximum recommended interconnecting refrigerant line length is 75 feet, and the vertical elevation difference between the indoor and outdoor sections should not exceed 20 feet. Consult long line application guide for installations in excess of these limits.

Filter Dryer Installation—A filter dryer is provided with the unit and must be installed in the liquid line of the system. If the installation replaces a system with a filter dryer already present in the liquid line, the filter dryer must be replaced with the one supplied. The filter dryer must be installed in strict accordance with the manufacturer's installation instructions.

Optional Equipment — Optional equipment (e.g.: filter/driers, liquid line solenoid valves, etc.) should be installed in strict accordance with the manufacturer's installation instructions.

7. MAKING ELECTRICAL CONNECTIONS

WARNING:

Turn off all electrical power at the main circuit box before wiring electrical power to the outdoor unit. Failure to comply may cause severe personnel injury or death.

Wiring Diagram/Schematic — A wiring diagram/schematic is located on the inside cover of the electrical box of the outdoor unit. The installer should become familiar with the wiring diagram/schematic before making any electrical connections to the outdoor unit.

Outdoor Unit Connections — The outdoor unit requires both power and control circuit electrical connections. Refer to the unit wiring diagram/schematic for identification and location of outdoor unit field wiring interfaces.

Control Circuit Wiring — The outdoor unit is designed to operate from a 24 VAC Class II control circuit. Control circuit wiring must comply with the current provisions of the "National Electrical Code" (ANSI C1.) and with applicable local codes having jurisdiction.

Thermostat Connections — Thermostat connections should be made in accordance with the instructions supplied with the thermostat, and with the instructions supplied with the indoor equipment.

Electrical Power Wiring — Electrical power wiring shall comply with the current provisions of the "National Electrical Code" (ANSI C1.) and with applicable local codes having jurisdiction. Use of rain tight conduit is recommended. Electrical conductors shall have minimum circuit ampacity in compliance with the outdoor unit rating label. The facility shall employ electrical circuit protection at a current rating no greater than that indicated on the outdoor unit rating label.

Disconnect Switch — An electrically compatible disconnect switch must be within line of sight of the outdoor unit. This switch shall be capable of electrically de-energizing the outdoor unit.

Optional Equipment — Optional equipment requiring connection to the power or control circuits must be wired in strict accordance with current provisions of the "National Electrical Code" (ANSI C1.), with applicable local codes having jurisdiction, and the installation instructions provided with the equipment. Optional Equipment (e.g.: liquid line solenoid valves, hard start kits, low suction pressure cutout switch kit, high pressure cutout switch kit, refrigerant compressor crankcase heater, etc.) should be installed in strict accordance with the manufacturer's installation instructions.

8. STARTUP AND CHECKOUT

WARNING:

Ensure electrical power to the unit is off prior to performing the following steps. Failure to do so may cause personal injury or death.

Air Filters — Ensure air filters are clean and in place prior to operating the equipment.

Thermostat — Set the room thermostat function switch to OFF, fan switch to AUTO, and move temperature setpoint to its highest setting. Prior to applying electrical power to the outdoor unit, ensure that the unit has been properly and securely grounded, and that power supply connections have been made at both the facility power interface and outdoor unit.

Outdoor Unit — Ensure the outdoor coil and top of the unit are free from obstructions and debris, and all equipment access/control panels are in place.

Using extreme caution, apply power to the unit and inspect the wiring for evidence of open, shorted, and/or improperly wired circuits.

Functional Checkout:

 **CAUTION:**

If equipped with a compressor crankcase heater, wait 24 hours prior to performing a function checkout to allow for heating of the compressor crankcase. Failure to comply may result in damage and could cause premature failure of the system.

Indoor Blower — Set the thermostat function switch to COOLING and the fan switch to ON. Verify that the indoor blower is operating and that airflow is not restricted. Set the fan switch back to AUTO.

Blower time delay relay: A time delay relay is provided with the unit and must be installed in the indoor section. The relay will keep the indoor blower running an additional 40 seconds for increased cooling efficiency after the outdoor unit shuts off. The relay has four terminals and one mounting hole.

Connect terminal "1" to load side of blower relay. Connect terminal "2" to terminal "R" of T'stat. Connect terminal "3" to common terminal at blower relay or transformer. Connect terminal "4" to terminal "G" on T'stat.

Low-Pressure Switch—(Select Models) A low-pressure switch is factory-installed and located in the suction line internal to the outdoor unit. The switch is designed to protect the compressor from a loss of charge. Under normal conditions, the switch is closed. If the suction pressure falls below 5 psig, then the switch will open and de-energize the outdoor unit. The switch will close again once the suction pressure increases above 20 psig. Please note that the switch interrupts the thermostat inputs to the unit. Thus when the switch opens and then

Orifice Usage
12 SEER Split System Air Conditioner

Model Number	Restrictor Size (In.)	System Charge R-410A oz.
1-1/2 Ton	0.045	75
2 Ton	0.055	78
2-1/2 Ton	0.062	89
3 Ton	0.069	94
3-1/2 Ton	0.070	105
4 Ton	0.075	136
5 Ton	0.085	153

closes, there will be a 5 minute short cycling delay before the outdoor unit will energize.

High-Pressure Switch—A High-pressure switch is factory-installed and located in the compressor discharge line internal to the outdoor unit. The switch is designed to de-energize the system when very high pressures occur during abnormal conditions. Under normal conditions, the switch is closed. If the discharge pressure rises above 575 psig, then the switch will open and de-energize the outdoor unit. The switch will close again once the discharge pressure decreases to 460 psig. Please note that the switch interrupts the thermostat inputs to the unit. Thus, when the switch opens and then closes, there will be a 5 minute short cycling delay before the outdoor unit will energize.

Short Cycle Protection—(Select Models) With the system operating in COOLING mode, note the setpoint temperature setting of the thermostat, and gradually raise the setpoint temperature until the outdoor unit and indoor blower de-energize. Immediately lower the setpoint temperature of the thermostat to its original setting and verify that the indoor blower is energized and that the outdoor unit remains de-energized. Verify that, after approximately 5 minutes, the outdoor unit energizes and that the temperature of the air supplied to the facility is cooler than ambient temperature.

Cooling — Gradually lower the thermostat temperature setpoint below the actual room temperature and observe that the outdoor unit and indoor blower energize. Feel the air being circulated by the indoor blower and verify that it is cooler than ambient temperature. Listen for any unusual noises. If present, locate and determine the source of the noise and correct as necessary.

Heating — If provided with heating equipment, lower the thermostat setpoint temperature to the lowest obtainable setting and set the thermostat function switch to HEATING. The indoor blower and outdoor unit should stop running. Increase the setpoint temperature of the thermostat to the maximum setting. Verify that the heating equipment has been energized (i.e., fossil fuel burner operating, etc.) and that the indoor blower energizes after a short period of time. Feel the air being circulated by the indoor blower and verify that it is warmer than ambient

temperature. Listen for any unusual noises. If present, locate and determine the source of the noise and correct as necessary.

NOTE: Other sources for heating (i.e.: electric furnace, fossil fuel furnace, air handler with electric heat options, etc.) that interface with the heat pump should be functionally checked to verify system operation and compatibility with the heat pump. Refer to the installation instructions for this equipment and perform a functional checkout in accordance with the manufacturer's instructions.

Adjustment of Refrigerant Charge:

CAUTION:

Split system air conditioner equipment contains liquid and gaseous refrigerant under pressure. Adjustment of refrigerant charge should only be attempted by qualified, trained personnel thoroughly familiar with the equipment. Under no circumstances should the homeowner attempt to install and/or service this equipment. Failure to comply with this warning could result in equipment damage, personal injury, or death.

NOTE: The following Refrigerant Charging Charts are applicable to matched assemblies of our equipment and at listed airflows for the indoor coil. Assemblies of indoor coils and outdoor units not listed are not recommended and deviations from rated airflows or non-listed equipment combinations may require modifications to the expansion device(s) and refrigerant charging procedures for proper and efficient system operation.

Refrigerant Charging Chart — Refer to Refrigerant Charging Charts for correct system charging, and to Orifice Usage Chart for correct restrictor sizes.

Optional Equipment — A functional checkout should be performed in accordance with the checkout procedures supplied with the equipment.

Refrigerant Charging Charts Legend For Cooling Mode of Operation

*Note: All pressures are listed in psig. and all temperatures in deg. F.



- Shaded Boxes indicate flooded conditions



- Rated Design Values. Suction Pressure will be lower than design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.

- Discharge temperatures greater than charted values indicates a refrigerant undercharge.

Refrigerant Charging Charts For Cooling Mode of Operation

018K Suction Press.	OUTDOOR TEMPERATURE (deg. F)																
	70		75		80		85		90		95		100		105		
	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	
133																	
135	275	143															
137	277	155	299	146													
139	278	166	301	156	322	148											
141	277	193	303	166	325	157	345	152	364	150							
143	278	210	303	187	326	170	348	158	368	157	387	153					
145			304	201	327	184	350	168	372	165	391	159	409	156			
147					329	197	352	181	374	175	395	166	414	162	432	160	
149							354	195	376	184	397	175	418	168	437	165	
151									378	195	400	185	421	177	441	171	
153											402	195	423	186	444	179	
155													426	196	447	188	
157															449	197	
159																	

Refrigerant Charging Charts For Cooling Mode of Operation

024K Suction Press.	OUTDOOR TEMPERATURE (deg. F)																							
	70			75			80			85			90			95			100			105		
	Liq. Press.	Dis. Temp.		Liq. Press.	Dis. Temp.		Liq. Press.	Dis. Temp.		Liq. Press.	Dis. Temp.		Liq. Press.	Dis. Temp.		Liq. Press.	Dis. Temp.		Liq. Press.	Dis. Temp.		Liq. Press.	Dis. Temp.	
133																								
135	283	183																						
137	285	194	306	174																				
139	286	205	309	184	328	167																		
141	283	248	311	194	331	175	154																	
143	284	265	308	225	330	195	162	385	152															
145			310	240	332	209	170	389	158	404	150													
147					333	223	182	393	165	408	156	422	149											
149							191	395	174	413	162	427	155											
151							201	398	184	416	169	432	160											
153								400	194	419	178	437	164											
155										421	188	440	173											
157																								
159																								

Refrigerant Charging Charts For Cooling Mode of Operation

030K Suction Press.	OUTDOOR TEMPERATURE (deg. F)																															
	70				75				80				85				90				95				100				105			
	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.						
129																																
131	259	183																														
133	260	194	282	171																												
135	261	205	284	181	304	162																										
137	257	254	286	191	307	171	324	158	340	148																						
139	258	271	283	226	305	193	328	164	344	155	359	145																				
141			284	240	307	207	327	179	348	164	363	151	377	142																		
143					308	221	329	192	348	176	367	158	381	148	395	141																
145							331	206	351	185	369	167	386	154	399	147																
147									353	195	372	177	390	161	404	153																
149											374	187	392	170	410	156																
151													395	180	413	165																
153															415	173																
155																																

Refrigerant Charging Charts For Cooling Mode of Operation

Suction Press.	OUTDOOR TEMPERATURE (deg. F)																	
	70		75		80		85		90		95		100		105			
	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.		
128																		
130	261	164																
132	262	175	283	159														
134	264	187	285	169	305	154												
136	261	224	288	179	308	163	326	153	342	147								
138	262	241	286	207	307	181	329	159	346	154	362	146						
140			287	221	309	195	329	172	350	162	366	152	381	145				
142					311	208	331	185	351	174	370	159	386	151	400	146		
144							333	199	353	182	372	168	390	157	405	152		
146									355	193	375	178	393	165	410	157		
148											377	188	396	174	414	163		
150													398	184	417	172		
152															419	181		
154																		

Refrigerant Charging Charts For Cooling Mode of Operation

042K		OUTDOOR TEMPERATURE (deg. F)																								
		70		75		80		85		90		95		100		105										
		Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.									
126																										
128	271	168																								
130	272	179	293	163																						
132	273	191	295	173	314	158																				
134	271	228	297	183	317	167	334	157	351	151																
136	272	245	295	211	317	185	338	163	354	158	370	150														
138			297	225	318	199	338	176	358	166	374	156	389	149												
140					320	212	340	189	359	178	378	163	393	155	408	150										
142							342	203	361	186	380	172	398	161	412	156										
144									364	197	383	182	401	169	417	161										
146											385	192	403	178	422	167										
148													406	188	424	176										
150														427	185											
152																										

Refrigerant Charging Charts For Cooling Mode of Operation

048K	OUTDOOR TEMPERATURE (deg. F)															
	70		75		80		85		90		95		100		105	
Suction	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.
Press.	Press.	Temp.	Press.	Temp.	Press.	Temp.	Press.	Temp.	Press.	Temp.	Press.	Temp.	Press.	Temp.	Press.	Temp.
131																
133	278	181														
135	280	192	302	173												
137	281	204	304	183	324	167										
139	278	247	306	193	327	176	345	165	362	157						
141	279	264	304	225	326	196	349	171	366	165	382	156				
143			305	239	328	210	349	185	370	173	386	162	401	155		
145					329	223	350	198	371	185	390	169	406	161	420	155
147							352	212	373	193	392	178	410	167	425	161
149									375	204	395	188	414	174	429	167
151											397	198	416	183	435	171
153													419	193	438	180
155															440	189
157																

060K	OUTDOOR TEMPERATURE (deg. F)															
	70		75		80		85		90		95		100		105	
Suction	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.	Liq.	Dis.
Press.	Press.	Temp.	Press.	Temp.	Press.	Temp.	Press.	Temp.	Press.	Temp.	Press.	Temp.	Press.	Temp.	Press.	Temp.
122																
124	281	158														
126	282	170	305	158												
128	284	181	308	168	329	158										
130	282	213	310	178	332	166	353	160	372	157						
132	283	230	309	203	332	182	356	166	376	164	395	159				
134			310	217	334	196	357	178	380	172	399	165	417	161		
136					336	209	359	190	381	183	403	172	422	167	440	164
138							361	205	383	192	405	181	426	173	444	170
140									385	202	408	191	429	181	449	176
142											410	201	432	191	453	182
144													434	200	456	191
146															458	200
148																

**INSTALLER: PLEASE LEAVE THESE
INSTALLATION INSTRUCTIONS
WITH THE HOMEOWNER**



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Specifications and illustrations subject to change
without notice and without incurring obligations.
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