Indoor Unit Installation Manual

Indoor Unit

MODELS:

ENVBR24HPJ1IB
ENVBR36HPJ1IB
ENVBR48HPJ1IB
ENVBR60HPJ1IB

Thank you for choosing our product.
Please read this Quick Start Guide carefully before operation and retain it for future reference.
If you have lost the Quick Start Guide, please contact the local agent or visit www.borealsplits.com or send email to info@borealsplits.com for electronic version.

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SAFETY PRECAUTIONS

1. Safety Precautions……..

WARNING

Please read this manual in its entirety and contact your local distributor with any questions before installing and operating this equipment.

Installation must be completed by a licensed HVAC contractor, and must comply with all applicable local, state, and federal codes and regulations. Licensed HVAC installing contractor must use factory-authorized kits or accessories when modifying this equipment. Improper installation, operation, adjustment, alteration, service, maintenance, or use can cause an explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage.

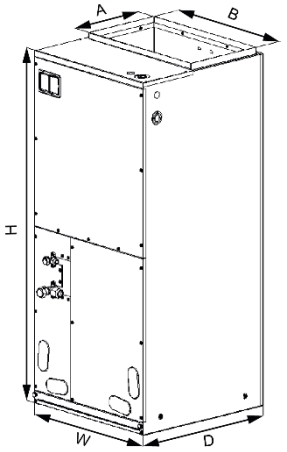
Recognize and be aware of all safety information and alert symbols. When you see the following symbols on the equipment and in the Installation Manuals, be alert to the potential for personal injury.

DANGER	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.
NOTICE	Indicates important but non-hazard related information, used to indicate risk of property damage.

It is important to understand these signal words: **DANGER**, **WARNING**, **CAUTION**, and **NOTICE**, as these words are used with the safety-alert symbol.

GENERAL INFORMATION

2.1 Physical Dimensions……



Unit: inch (mm)

Indoor Unit	Dimensions				
	W	D	H	A	B
ENVBR24HPJ1IB	21-1/4 (540)	21-1/4 (540)	48-1/4 (1224)	11-5/8 (295)	20 (508)
ENVBR36HPJ1IB					
ENVBR48HPJ1IB	24-3/4 (630)	21-1/4 (540)	57 (1448)	11-5/8 (295)	20 (508)
ENVBR60HPJ1IB					

Air Filter	Dimensions
ENVBR24HPJ1IB	19-1/4 x 20-1/4 x 1/2 (490 x 516 x 15)
ENVBR36HPJ1IB	
ENVBR48HPJ1IB	20-1/2 x 20-1/4 x 1/2 (525 x 516 x 15)
ENVBR60HPJ1IB	

2.2 Fan Performance……

Model	ENVBR24HPJ1IB											
Level	Static Pressure (In W.c.) and CFM											
	0	0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Speed 1	1030	900	840	-	-	-	-	-	-	-	-	-
Speed 2	1080	960	900	840	-	-	-	-	-	-	-	-
Speed 3	1220	1120	1060	990	850	-	-	-	-	-	-	-
Speed 4	1390	1290	1240	1180	1070	960	-	-	-	-	-	-
Speed 5	1580	1490	1440	1390	1290	1180	1090	970	830	-	-	-
Speed 6	1720	1640	1600	1550	1450	1360	1250	1130	960	-	-	-
Speed 7	1800	1730	1680	1630	1550	1460	1370	1270	1150	970	830	-
Speed 8	1850	1820	1790	1740	1660	1580	1500	1410	1340	1200	1080	930

Model	ENVBR36HPJ1IB											
Level	Static Pressure (In W.c.) and CFM											
	0	0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Speed 1	1150	1050	950	880	-	-	-	-	-	-	-	-
Speed 2	1200	1100	1000	940	850	-	-	-	-	-	-	-
Speed 3	1380	1260	1200	1100	950	-	-	-	-	-	-	-
Speed 4	1550	1460	1390	1310	1160	1010	830	-	-	-	-	-
Speed 5	1710	1650	1600	1560	1480	1400	1310	1210	1080	930	-	-
Speed 6	1840	1800	1750	1710	1640	1590	1500	1420	1330	1220	1100	960
Speed 7	1870	1830	1810	1800	1760	1690	1620	1520	1440	1350	1250	1150
Speed 8	1900	1860	1840	1830	1790	1720	1660	1600	1540	1440	1320	1220

Model	ENVBR48HPJ1IB											
Level	Static Pressure (In W.c.) and CFM											
	0	0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Speed 1	1640	1500	1450	1350	-	-	-	-	-	-	-	-
Speed 2	1680	1560	1500	1380	1300	-	-	-	-	-	-	-
Speed 3	1810	1690	1620	1550	1380	-	-	-	-	-	-	-
Speed 4	1930	1830	1770	1710	1580	1430	1280	-	-	-	-	-
Speed 5	2200	2110	2040	1980	1860	1720	1620	1490	1380	-	-	-
Speed 6	2240	2190	2145	2100	2010	1870	1750	1615	1500	1380	-	-
Speed 7	2280	2240	2200	2180	2130	2080	2000	1880	1750	1600	1420	-
Speed 8	2300	2260	2220	2190	2140	2090	2040	1980	1930	1800	1700	1550

Model	ENVBR60HPJ1IB											
Level	Static Pressure (In W.c.) and CFM											
	0	0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Speed 1	1660	1540	1470	1400	-	-	-	-	-	-	-	-
Speed 2	1850	1720	1650	1600	1400	-	-	-	-	-	-	-
Speed 3	1920	1800	1730	1650	1480	1315	-	-	-	-	-	-
Speed 4	2110	2000	1950	1860	1760	1640	1490	1325	-	-	-	-
Speed 5	2250	2200	2190	2140	2040	1930	1800	1670	1520	1370	-	-
Speed 6	2260	2220	2200	2170	2090	2010	1910	1760	1650	1550	1430	1380
Speed 7	2300	2260	2230	2200	2150	2115	2050	1990	1920	1840	1750	1660
Speed 8	2320	2280	2250	2230	2190	2140	2080	2040	2000	1950	1920	1890

INSTALLATION

3.1 Preparation……..

EQUIPMENT SIZING AND DUCT DESIGN
Using ACCA Manual J Residential Load Calculation and Manual D Residential Duct Design is recommended prior to installing the Indoor Unit to ensure optimum performance, efficiency, and comfort. **Installing undersized or oversized equipment and ductwork will result in insufficient cooling or heating, high energy costs, premature failure, and will reduce the overall lifespan of the equipment.**

CODES & REGULATIONS
This product is designed and manufactured to comply with all national codes. It is the licensed HVAC installing contractors responsibility to install the product in accordance with all local, state, and federal codes and regulations. The manufacture assumes no responsibility for equipment installed in violation of any codes or regulations.

FRIEGHT DAMAGE, CONCEALED DAMAGE, AND MISSING ITEMS
It is the licensed HVAC installing contractors responsibility to inspect the Indoor Unit for any damage and missing items at the time of receiving the equipment. **Contact your local distributor immediately to report any issues before beginning the installation process.**

EQUIPMENT AND MATERIALS
It is the licensed HVAC installing contractors responsibility to **VERIFY** all of the following before installing the Indoor Unit:

1. Model number of Indoor Unit and Outdoor Unit are compatible sizes.
2. Refrigerant pipe sizes required and minimum/maximum allowable lengths.
3. Condensate drain line size required.
4. Size/rating required for power supply wiring, circuit breaker, and fused disconnect.
5. Size/rating required for 24VAC low voltage control wiring.
6. Size, length, and ductwork material required per Duct Design to ensure that the airflow is in accordance with the Indoor Unit fan performance.

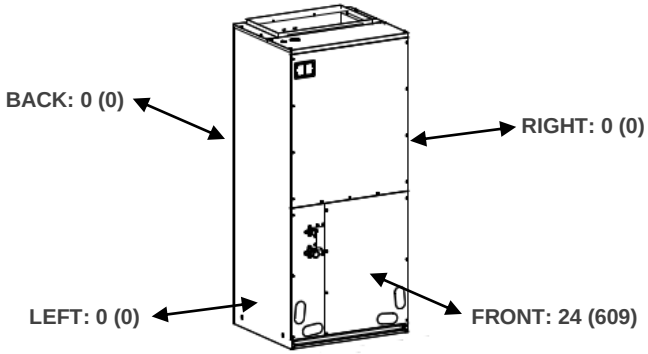
PERSONAL PROTECTIVE EQUIPMENT
It is the licensed HVAC installing contractors responsibility to follow all safety procedures and to utilize all required personal protective equipment including but not limited to gloves, safety glasses, steel toe boots, ear plugs, hard hats, respirators, coveralls, etc.

TOOLS
It is the licensed HVAC installing contractors responsibility to ensure the proper tools are utilized during the Installation and Start-Up of the Indoor Unit including but not limited to a Level, Tubing Cutter, Deburring Tool, R-410a Flaring Tool, Torque Wrench, Allen Wrenches, R-410a Refrigerant Gauges & Hoses, 1/4" x 5/16” Adapter, Digital Refrigerant Scale, Dry Nitrogen and Regulator capable of reaching 500psi minimum, Vacuum Pump, Micron Gauge, Multimeter, Amp Clamp, Wire Strippers & Cutter, all miscellaneous screw drivers & wrenches, and any additional tools needed to complete a proper installation.

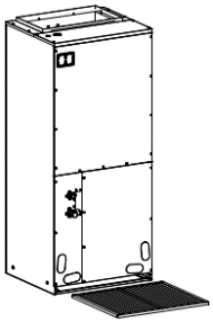
INSTALLATION

3.2 Required Clearances……

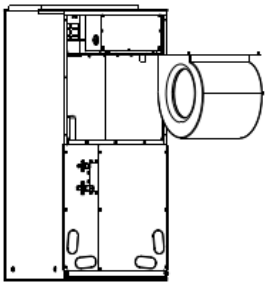
Unit: inch (mm)



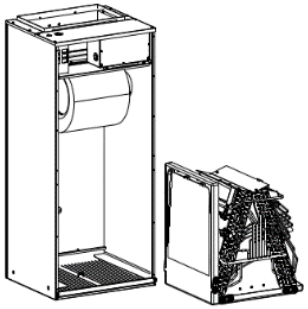
NOTE:
Front clearance required for air filter, blower wheel, evaporator coil, and condensate drain pan maintenance. **It is the licensed HVAC installing contractors responsibility to install the product in accordance with any prevailing local, state, and federal codes and regulations.**



Air Filter



Blower Wheel



Evaporator Coil & Condensate Drain Pan

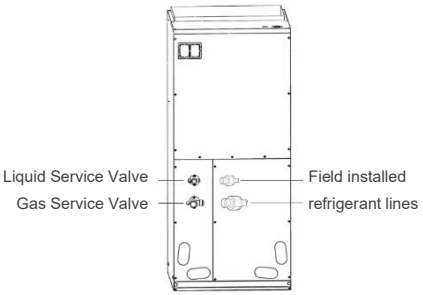
3.3 Refrigerant Piping……..

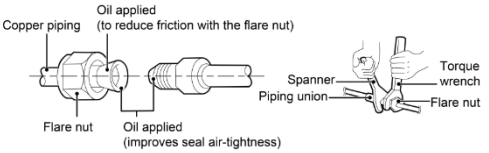
REFRIGERANT PIPE SIZES

Model	Outside Pipe Diameter (inch)	
	Liquid Pipe	Gas Pipe
ENVBR24HPJ1IB	3/8	3/4
ENVBR36HPJ1IB		
ENVBR48HPJ1IB		
ENVBR60HPJ1IB		

FLARED CONNECTION

Remove factory flare nuts from service valves and use with field installed refrigerant lines.

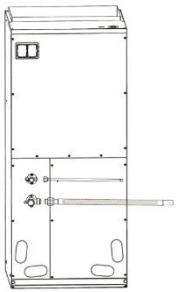




Outside Pipe Diameter (inch)	Tightening Torque (N-m)
3/8	35 - 40
3/4	70 - 75

BRAZED CONNECTION (With use of optional accessory Adapter Pipe Kit)

Removed factory flare nuts from service valves and install optional accessory Adapter Pipe Kit. Braze field installed refrigerant lines to the coupled end of each adapter pipe while flowing dry nitrogen through the copper pipe during the brazing process.



Part No.	Outside Pipe Diameter (inch)	
	Liquid Pipe	Gas Pipe
FLEXXADAPTER36	3/8	3/4

3.4 Condensate Drain……...

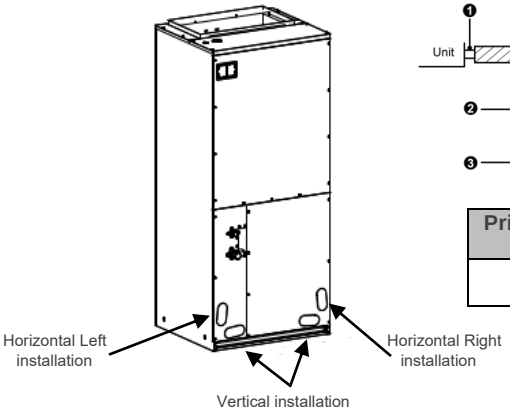
CONDENSATE DRAIN LINE CONNECTION

Remove condensate drain line cover to access primary and secondary drain line connections. Remove the 3/4" male threaded plug in order to field install a 3/4" I.D. copper or PVC adapter fitting, P-trap, and drain line to allow for the condensate drainage during the cooling mode operation.

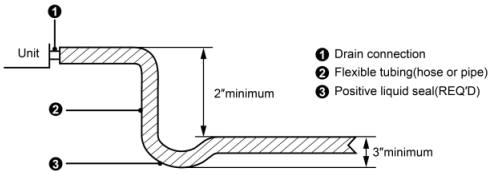
NOTE:

It is the licensed HVAC installing contractors responsibility to install the condensate drain line in accordance with any prevailing local, state, and federal codes and regulations.

Primary & Secondary drain line connections:



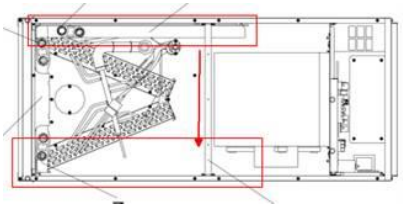
P-trap must be deep enough to overcome static pressure while the fan is operating during the cooling mode operation.

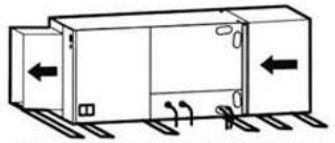


Primary & Secondary Condensate Drain Line Connections
3/4" I.D.

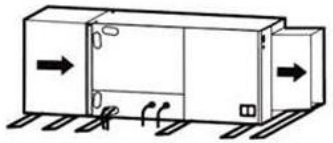
CONDENSATE DRAIN PAN CONFIGURATION

Condensate drain pan is configured from the factory to allow for a Vertical or Horizontal **Left** installations. For Horizontal **Right** installations, remove the condensate drain pan and configure it to the opposite side of the Indoor Unit as shown below, for all condensate to drain through the factory drain pan and drain line connection.





Horizontal Left Configuration - No Modification Needed



Horizontal Right Configuration - Must Relocate Drain Pan

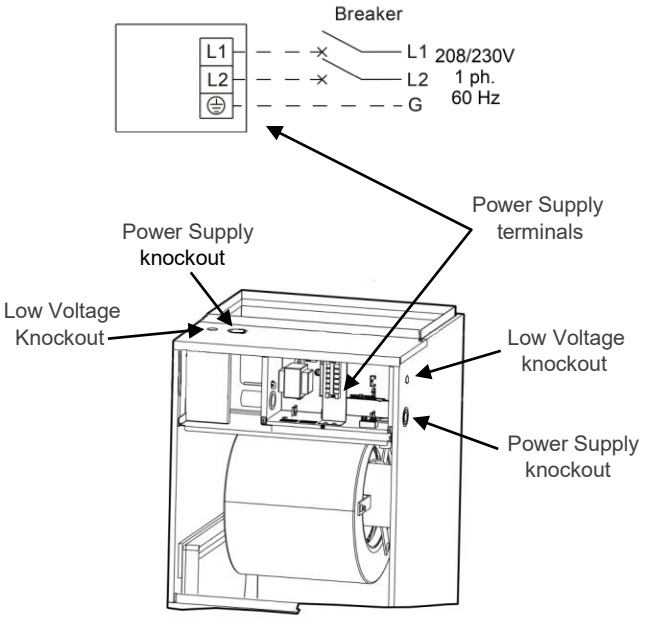
3.5 Electrical……

POWER SUPPLY

Model	Nominal Operating Voltage	Operating Voltage Range	Minimum Circuit Ampacity	Maximum Overcurrent Protection
ENVBR24HPJ1IB	208-230V /1Ph / 60Hz	187-253V	4	15
ENVBR36HPJ1IB				
ENVBR48HPJ1IB			8	
ENVBR60HPJ1IB				

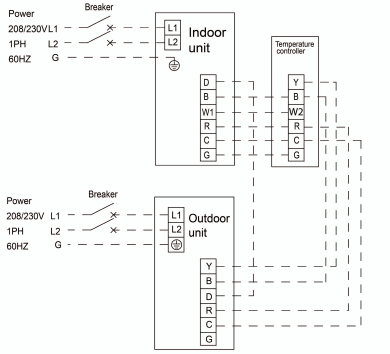
⚠ WARNING

The Indoor Unit is manufactured for use with 208-230V / 1Ph / 60Hz electrical power supply and must not be reconfigured to operate with any other voltages. The Indoor Unit must have an uninterrupted, unbroken, electric grounding to minimize the possibility of serious injury or death if an electric fault occurs. **It is the licensed HVAC installing contractors responsibility to install and/or hire a licensed electrical contractor to install the proper sized wiring, circuit breaker, fused service disconnect as well as follow all proper grounding methods in accordance with all local, state, and federal codes and regulations.**



NOTE:
Installation of a field supplied line monitor is recommended to help protect equipment and electronics from electrical surges, blackouts, brownouts, and any other power supply issues.

LOW VOLTAGE CONTROL WIRING



NOTE: Y is Compressor control signal for the outdoor unit;
B energizes reversing valve during heating cycle;

D is defrosting signal;

R is 24V AC power supply;

C is 24V common;

G is indoor blower signal;

W1 is electric heater control signal.

NOTE: For cooling only unit, there is no need to connect the B and D terminals.

NOTE: During defrost cycle, D terminal on outdoor unit will send 24V to indoor unit. Indoor fan will not run during defrost cycle.

NOTE: When using an electric heat kit, you can connect D on outdoor unit to W1 on indoor unit to energize heat kit and blower during defrost cycle.

⚠WARNING

① High and low voltage wires should be led through different rubber rings of the electric box cover.

② Do not kink or damage thermostat wires. Keep thermostat wires away from high voltage sources. Errors can occur.

③ High and low voltage wires should be secured separately. Secure the former ones with big clamps and the latter ones with small clamps.

④ Properly tighten thermostat wires and line voltage wires. Loose connections may lead to fire hazard.

⑤ If the thermostat wires or line voltage wires are not correctly connected, the air conditioner may get damaged.

⑥ Ground the unit through connecting the ground wire.

⑦ The units should comply with applicable local and national rules and regulations on power consumption.

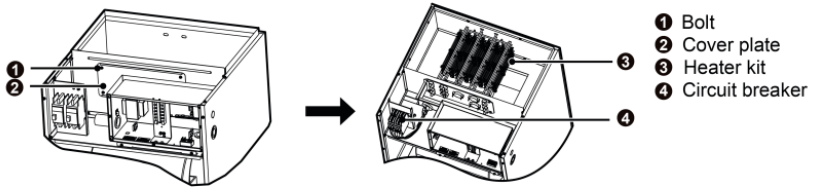
⑧ When connecting the power cords, make sure the phase sequence of the power supply matches with the corresponding terminals, otherwise the compressor will get reversed and operate abnormally.

3.6 Optional Electric Heater……

Indoor Unit Model	Cooling Capacity	Electric Heater Model	Electric Heater Size (kW)
ENVBR24 / 36	24K / 36K	ENERMAXXHTR5KW	5
ENVBR24 / 36	24K / 36K	ENERMAXXHTR8KW	8
ENVBR36 / 48 / 60	36K / 48K / 60K	ENERMAXXHTR10KW	10
ENVBR36 / 48 / 60	36k / 48K / 60K	ENERMAXXHTR15KW	15
ENVBR48 / 60	48K / 60K	ENERMAXXHTR20KW	20

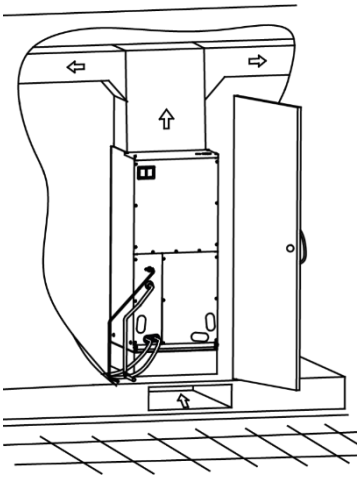
NOTES:

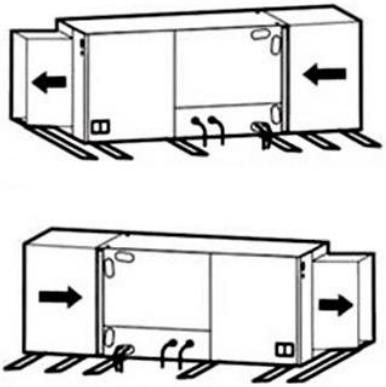
1. Optional Electric Heater “Sold Separately”.
2. When Optional Electric Heater is installed, Indoor Unit power supply must be connected to circuit breakers provided with Electric Heater. Line voltage must be disconnected from L1 and L2 on the air handler terminal block or damage will occur. ***Refer to Electric Heater Installation Instructions for all electrical requirements***



For more information on the optional Electric Heater, power supply requirements, and step-by-step installation instructions please visit www.borealsplits.com

3.7 Ductwork……..





⚠ WARNING

Do not install any return ductwork in an area that can introduce toxic, or objectionable fumes and/or odors into the system and supply air. **It is the licensed HVAC installing contractors responsibility to properly install, seal, and insulate all ductwork and air distribution in accordance with all local, state, and federal codes and regulations.**

NOTES:

1. Do not operate the Indoor Unit without all ductwork attached and completed.
2. Do not operate the Indoor Unit in any dust-laden construction sites or high chemical latent load environments where corrosion and damage to the equipment will occur.
3. Indoor Unit can be ducted for a Vertical, Horizontal Left, or Horizontal Right installation.
4. **Indoor Unit cannot be installed in downflow applications.**
5. See previous “2.1 Physical Dimensions” section for dimensions needed to size plenums.
6. Ductwork must be designed based off the Indoor Units fan capabilities, see previous “2.2 Fan Performance” section for details.
7. Using the ACCA Manual D Residential Duct Design to size all ductwork, and properly air balancing the system, is recommended to ensure optimum performance, efficiency, and comfort.

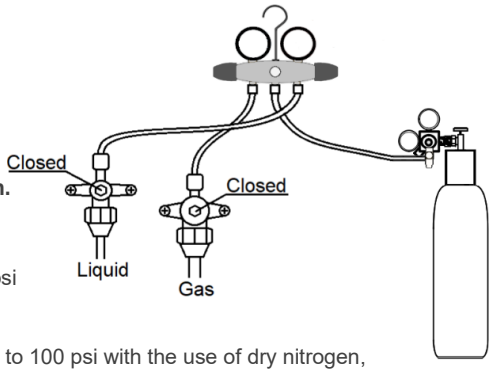
3.8 Leak Test……

⚠ WARNING

It is the licensed HVAC installing contractors responsibility to follow all safety procedures and to utilize all required personal protective equipment while leak testing with high pressure dry nitrogen. Failure to do so could result in death or serious injury.

NOTES:

1. **Indoor Unit has a factory R-410a holding charge as shown on data plate. Liquid and Gas service valves on Indoor Unit must remain in the closed position while leak testing both refrigerant lines with dry nitrogen.**
2. Refrigerant lines must be leak tested to a minimum of 500 psi with the use of dry nitrogen and pressure must hold at 500 psi or higher for a minimum of 1 hour.

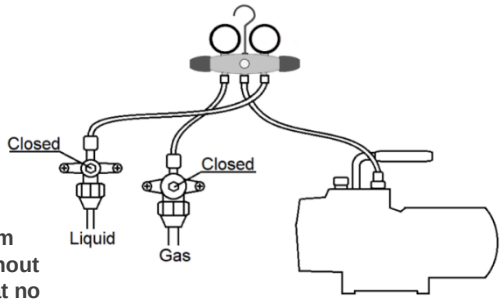


Recommend first pressurizing refrigerant lines to 100 psi with the use of dry nitrogen, then continuing to a minimum of 500 psi if no leaks are found to be present.

3.9 Evacuation……

NOTES:

1. Safely release dry nitrogen from refrigerant lines.
2. Evacuate refrigerant lines with the use of a vacuum pump and micron gauge.
3. **Refrigerant lines must be evacuated to a minimum of 200 microns or less. After shutting of vacuum pump, vacuum must hold for a minimum of 1 hour without rising above 500 microns to ensure that no moisture or non-condensables are present.**



Recommend attaching micron gauge directly to the vacuum pump to test and verify it is capable of reaching 50-100 microns or less, before starting evacuation process. If this level of vacuum cannot be reached during the test, replacing the vacuum pump oil or vacuum pump itself may be necessary to achieve the 500 micron or less vacuum required.

3.10 Refrigerant Charge……

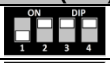
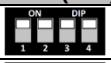
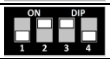
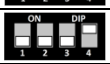
NOTES:

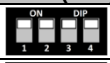
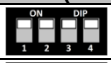
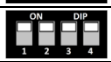
1. Indoor Unit has a factory R-410a holding charge as shown on data plate.
2. Refer to EnerMaxx Outdoor Unit Installation Manual for refrigerant charge instructions.

3.11 Dip Switch Settings……..

NOTES:

1. **Any changes to dip switch settings must be done while power is off.**
2. **Blower motor will NOT operate if dip switch configuration does not meet what is shown below for each setting.**
3. Dip switches will be viewed in an upside-down orientation when Indoor Unit is installed vertically, and will change orientation in a Horizontal Left and Horizontal Right installation.
4. See previous “2.2 Fan Performance” section for details of Static Pressure and CFM.

Model	ENVBR24HPJ1IB	
	HEAT (SA2)	COOL (SA1)
Speed 1		
Speed 2		
Speed 3		
Speed 4		
Speed 5		
Speed 6		
Speed 7		
Speed 8		

Model	ENVBR36HPJ1IB	
	HEAT (SA2)	COOL (SA1)
Speed 1		
Speed 2		
Speed 3		
Speed 4		
Speed 5		
Speed 6		
Speed 7		
Speed 8		

Model	ENVBR48HPJ1IB	
	HEAT (SA2)	COOL (SA1)
Speed 1		
Speed 2		
Speed 3		
Speed 4		
Speed 5		
Speed 6		
Speed 7		
Speed 8		

Model	ENVBR60HPJ1IB	
	HEAT (SA2)	COOL (SA1)
Speed 1		
Speed 2		
Speed 3		
Speed 4		
Speed 5		
Speed 6		
Speed 7		
Speed 8		

START-UP

5.1 Start-Up Checklist .....

It is the licensed HVAC installing contractors responsibility to **CHECK** and **VERIFY** all of the following **BEFORE** turning on power and starting up the Indoor Unit:

1. The Indoor Unit has been installed in accordance with all local, state, and federal codes and regulations.

2. Front clearance required for air filter, blower wheel, evaporator coil, and condensate drain pan maintenance has been met.

3. Refrigerant pipe sizes and lengths are in accordance with the size and lengths required.

4. Condensate drain line size has been installed in accordance with the size required.

5. Condensate drain line has been tested by pouring water in drain pan and verifying all water drains properly.

6. Power supply wiring, circuit breaker, and fused disconnect has been installed in accordance with the size/rating required.

7. Power supply has been verified with a multimeter to ensure it is in accordance with the Nominal Operating Voltage and Operating Voltage Range required.

8. Low voltage control wiring has been installed in accordance with the size/rating required.

9. Low voltage control wiring has been verified to ensure each wire is landed on the correct terminal in the Indoor Unit and at the field supplied/installed thermostat.

10. All ductwork is completely installed and sealed and volume dampers are in the open position.

11. All return and supply grilles in each room are in the open position and are not closed or blocked.

12. Leak test and evacuation has been completed.

13. Dip switches have been set in accordance to the required positions for the desired fan performance.

14. Air filter is installed and all access panels of Indoor Unit have been reinstalled and secured.

15. Liquid and Gas service valves are in the open position.

5.2 Start-Up Report……

COMPLETE SECTIONS BELOW AND KEEP FOR FUTURE REFERENCE

Product Information

Installation Date: _____

Indoor Model No: _____

Indoor Serial No: _____

Outdoor Model No: _____

Outdoor Serial No: _____

Installer Information

Contractor Company: _____

Contractor Name: _____

Operating Data	Cooling	Heating
Power Supply (At Indoor Unit)		
L1 to Ground:		
L2 to Ground:		
L1 to L2:		
Low Voltage (At Indoor Unit)		
R to C terminals:		
Amps		
Blower Motor:		
Electric Heater (If installed):		
Airflow		
Supply External Static Pressure:		
Return External Static Pressure:		
Total External Static Pressure:		
Temperature		
Setpoint at thermostat:		
Supply Air:		
Return Air:		
Indoor Ambient:		

It is the licensed HVAC installing contractors responsibility to provide the homeowner/end user with instruction and training on how to operate the system in cooling and heating from the field supplied/installed thermostat.

5. Troubleshooting……..

Check the following before contacting your local distributor or Tech Support:

Problem	Possible Cause	Possible Remedy
Cooling, heating, or indoor fan does not operate.	Thermostat not set to cool, heat, or fan on.	Verify thermostat mode settings and adjust accordingly.
	Thermostat temperature setting.	Adjust thermostat temperature setpoint.
	No power.	Verify circuit breakers and service disconnects are in the on position
	Utility company override control.	If enrolled in an energy discount plan, contact utility company for further details.
Insufficient cooling or heating.	Dirty air filter.	Clean or replace indoor return air filter.
	Thermostat temperature setting.	Adjust thermostat temperature setpoint.
	Closed or blocked grilles.	Verify all return and supply grilles in each room are not closed or blocked.
	Opened doors or windows.	Keep all doors and windows closed while operating system in cooling or heating.
	Rooms exposed to excessive direct sunlight.	Close window covering to reduce heat load.
	Restricted airflow at outdoor unit.	Keep area around outdoor unit clear and remove any debris or leaves from unit.

If none of the possible remedies above were able to resolve the problem, then please contact your local distributor and Tech support for further assistance in troubleshooting.

5. Troubleshooting.....……..

There are LED indicators on the main board of the indoor unit, which are used to display the operating status and malfunction information of the unit.

LED Indicator	Color	Function
Power Indicator	Red	Indoor unit main board is powered on, Power Indicator is on.
Running Indicator	Green	After detecting the indoor fan turn-on signal, the running indicator light is on, when detecting the indoor fan turning-off signal, the running indicator light is off. When detecting a system failure, the running indicator light flashes.

If error occurs, the running indicator light may flash to show which error occurred. Please see chart below for error flash codes.

Error	Running Indicator Status	Note
Indoor jumper cap failure	Light off 3S then flash once	Flash means light on 0.5S then light off 0.5S
Indoor fan failure	Light off 3S then flash twice	
Indoor coil sensor error	Light off 3S then flash four times	

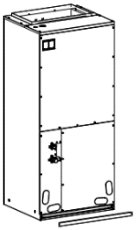
6. Maintenance & Care……

Routine maintenance & care must be performed on this equipment to ensure that the system is running at its optimum performance and efficiency.

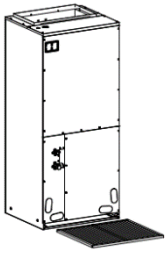
AIR FILTER

Check air filter every 30 days during cooling and heating seasons, and clean or replace it if its dirty. To access air filter, remove the filter access door and pull the air filter out of the Indoor Unit, as shown in the steps below:

Step 1:

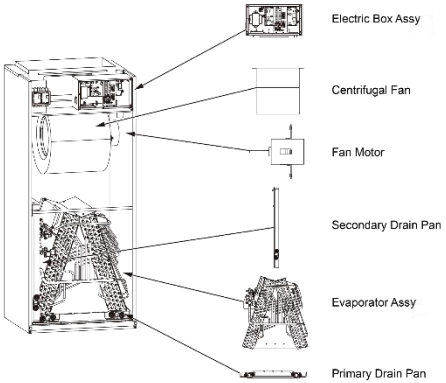


Step 2:



INDOOR UNIT

Routine inspection and maintenance of the following must be completed regularly by a licensed HVAC contractor:



- Inspect and clean blower motor, blower wheel, and housing.
- Inspect all electrical components and tighten all wiring connections.
- Inspect and clean evaporator coil, condensate drain pan, and drain line.
- Test operation of equipment and perform any repairs necessary.

boreal
Air Conditioning

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