

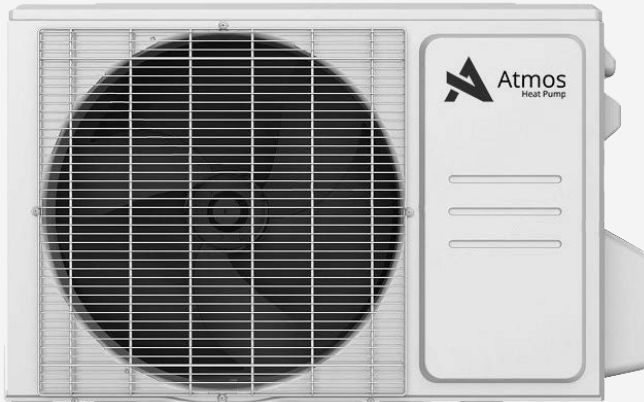


Atmos
Heat Pump

Owner's Manual & Installation Manual

Central Heat Pump Outdoor Unit

MHD-18 / MHD-24 & MHD-18U / MHD-24U



www.dettson.com

IMPORTANT NOTE:

Read this manual carefully before installing or operating your new air conditioning unit. Make sure to save this manual for future reference.

2023-05-23

X62434 Rev.B

INSTALLER / SERVICE TECHNICIAN:

Use the information in this manual for the installation / servicing and keep the document near the furnace for future reference.

Communication wire connected between the indoor and outdoor units must be properly rated for 240VAC, they are protected by the outdoor unit breaker and must be sized appropriately.

Do not install any metering device on the indoor coil. The expansion valve is located in the outdoor unit. If a metering device is already installed in the indoor coil, it must be removed.

Both refrigerant lines must be separately insulated in order to avoid condensation and to ensure proper efficiency.

	MHD-18	MHD-24	A-Coil	Line
Dia. ligne liquide (po.)	1/4	3/8	3/8	3/8
Dia. ligne gaz (po.)	1/2	5/8	3/4	3/4

HOMEOWNER:

Please keep this manual near the furnace for future reference.

CAUTION:

Do not tamper with the unit or its controls. Call a qualified service technician.

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1 SAFETY

Installing, starting up, and servicing air conditioner can be hazardous due to system pressure, electrical components, and equipment location, etc.

Only trained, qualified installers and service personnel are allowed to install, start-up, and service this equipment.

When handling the equipment, observe precautions in the manual and on tags, stickers on the equipment. Follow all safety codes. Wear safety glasses and work with gloves. Keep quenching cloth and fire extinguisher nearby when brazing.

Read the instructions thoroughly and follow all warnings or cautions in literature and attached to the unit. Always follow building codes and current edition of national as well as local electrical codes.

Recognize the following safety information:



Warning: Incorrect handling could result in personal injury or death.

Caution: Incorrect handling may result in minor injury, or damage to product or property.

1.1 Warning



All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.

- Before installing, modifying, or servicing the system, the main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switches with a suitable warning label;
- Never supply power to the unit unless all wiring and tubing are completed, connected and checked;
- This system contains dangerous electrical voltage. Incorrect connection or inadequate grounding can cause personal injury or death. Stick to the wiring diagram and all the instructions when wiring;
- Have the unit adequately grounded in accordance with the local electric codes;

- Have all wiring connected tightly. Loose connections may lead to overheating and a possible fire hazard. All installation or repair work shall be performed by your dealer or a specialized subcontractor as there is the risk of fire, electric shock, explosion or injury.
- Make sure the outdoor unit is installed on a stable, level surface with no accumulation of snow, leaves, or trash beside;
- Avoid contact between refrigerant and fire as it generates poisonous gas;
- Apply specified refrigerant only. Never have it mixed with any other refrigerant. Never have air remain in the refrigerant lines as it may lead to rupture and other hazards;
- Make sure no refrigerant gas is leaking out when installation is completed;
- Should there be refrigerant leakage, the density of refrigerant in the air shall in no way exceed its limited value, or it may lead to explosion;
- Keep your fingers and clothing away from any moving parts;
- Clear the site after installation. Make sure no foreign objects are left in the unit;

1.2 Caution



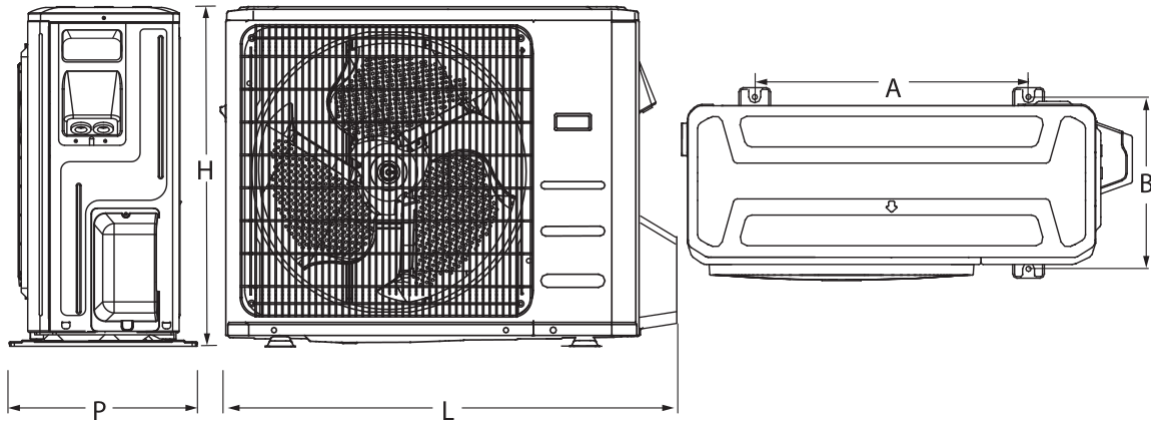
- Never install the unit in a place where a combustible gas might leak, it may lead to fire or explosion;
- Provide a ground fault interrupter (GFI) when it is installed in a wet environment;
- Never wash the unit with water
- Handle unit transportation with care. The unit should not be carried by only one person if it is more than 20 kg;
- Never touch the heat exchanger fins with bare hands;
- Never touch the compressor or refrigerant piping without wearing gloves;
- Make sure that the air handler filter is clean;
- Should any emergency occur, stop the unit and disconnect the power immediately;
- Properly insulate ALL refrigerant tubing from outdoor units to the interior cooling coil to prevent condensation.

2 Specifications

Table 1: Outdoor Unit Specifications

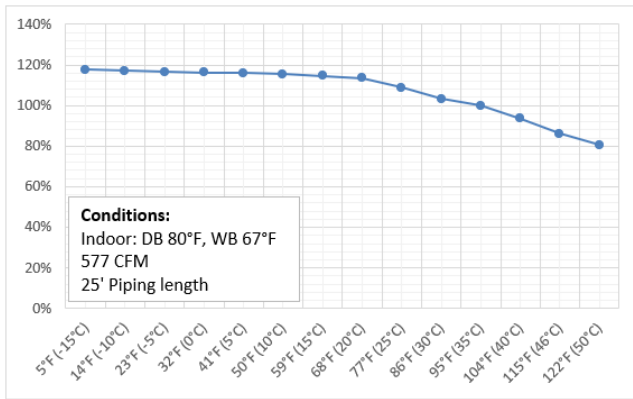
Outdoor unit		MHD-18 / MHD-18U	MHD-24 / MHD-24U
Indoor coil		MHD-CC2.0-17.5-M	MHD-CC2.0-17.5-M
Power Supply		208/230 VAC, 60 Hz, 1 phase	
Cooling Capacity (min-max)	BTU/h	18000 (8870-19400)	24000 (6850-27000)
Heating Capacity (min-max)	BTU/h	18000 (15100-19500)	29000 (11900-31000)
Cooling Input (min-max)	W	1440 (230-1760)	1845 (310-2400)
Heating Input (min-max)	W	1700 (1390-2050)	2500 (670-2700)
Rated Current	A	7.3	10.9
MCA	A	16	25
MOCP	A	25	35
EER	BTU/h/W	11.7	11.3
SEER		16.2	16.2
EER 2	BTU/h/W	11.7	11.7
SEER 2		15.2	15.2
COP	W/W	2.2	2.1
HSPF		10.1	10.0
HSPF 2		9.5	9.8
AHRI Number		210365427	210365428
(CC) Energy Star		✓	✓
Compressor LRA	A	14.25	17.1
Compressor RLA	A	36	58
Compressor Power Input	W	2045	2045
Fan Motor RLA	A	0.76	0.50
Air Flow Volume	CFM	1765	2235
Sound Level	dB(A)	59	62
Cooling Amb. Temp.	°C (°F)	-30 - 50 (-22 - 122)	
Heating Amb. Temp.	°C (°F)	-30 - 30 (-22 - 86)	
Net Weight	lb	101	134
Refrigerant		R410A	
Refrigerant Charge	oz	65.2	91.7
Additional Charge	oz/ft	0.16	0.32
Pipe Length	ft	25	25
Pipe Max Length	ft	98	164
Pipe Max Height	ft	66	82
Pipe Diameter		See page 2	

Figure 1: Dimensions

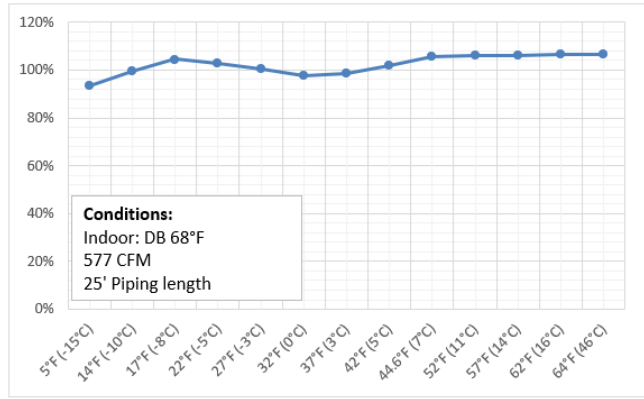


	L		H		P		A		B	
Outdoor unit	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
MHD-18	35 1/16	890	26 1/2	673	13 7/16	342	26 1/8	663	13 11/16	348
MHD-24	37 1/4	946	31 7/8	810	16 1/8	410	26 1/2	673	17 15/16	455

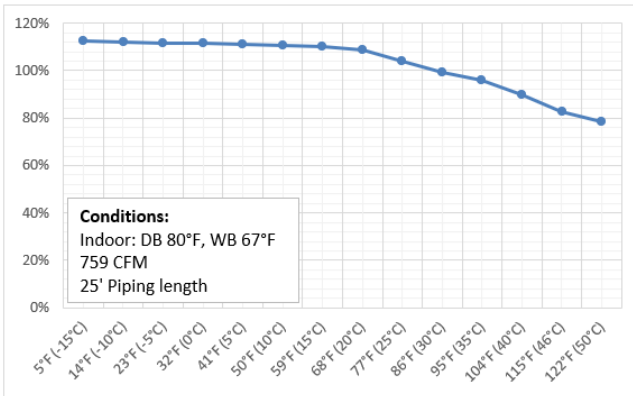
Figure 2: Capacity vs Outdoor Temperature



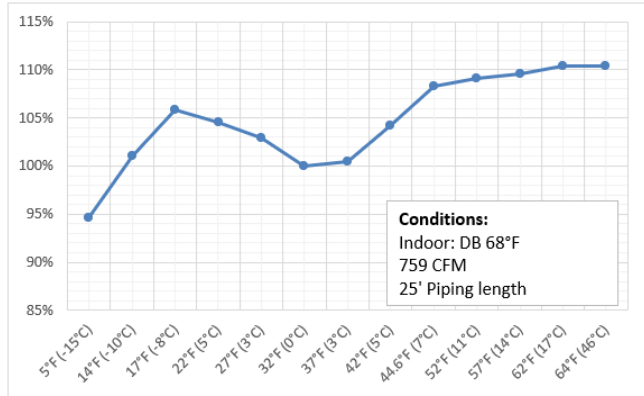
(a) MHD-18 Cooling



(b) MHD-18 Heating



(c) MHD-24 Cooling



(d) MHD-24 Heating

3 Installation

3.1 Notices



1. This unit must be installed only by authorized qualified technicians according to local and/or government regulations and in compliance with this manual;
2. Warning: before obtaining access to terminals, all supply circuits must be disconnected;
3. The temperature of refrigerant line will be high; please keep the interconnection cable away from the copper tube.

3.2 Installation Site

Proper installation site is vital for correct and efficient operation of the unit. Avoid the following sites where:

- Strong heat sources, vapours, flammable gas or volatile liquids are emitted;
- High-frequency electro-magnetic waves are generated by radio equipment, welders and medical equipment;
- Salt-laden air prevails (such as close to coastal areas);
- Large amounts of dust are present;
- The air is contaminated with industrial vapours and oils;
- The air contains sulphuric gases such as in hot spring zones;
- Corrosion or poor air quality exists;
- Obstacles will block air inlets and outlets;
- Noise from the unit will disturb others;
- Animals or plants could be harmed by hot air discharge.

For the outdoor unit:

- Select a site where there is sufficient ventilation;
- Select a site where there is no obstructions blocking the inlet and outlet;
- The site should be able to withstand the full weight and vibration;

- Select a dry place, and do not expose the unit to direct sunlight nor strong winds;
- Make sure that the outdoor unit is installed in accordance with the installation instructions, and is convenient for maintenance and repair;
- The maximum pipe height and length must comply with unit specifications (table 1).

Special considerations:

- Where snowfall is anticipated, take appropriate measures to prevent ice buildup and coil damage;
- If the unit is exposed to heavy rain or snow, build a shelter above the unit.
- If the unit is exposed to heavy winds, install the unit so that the air outlet fan is at a 90° angle from the direction of the wind, or build a barrier if needed;

3.3 Safety Precautions for Electric Appliances

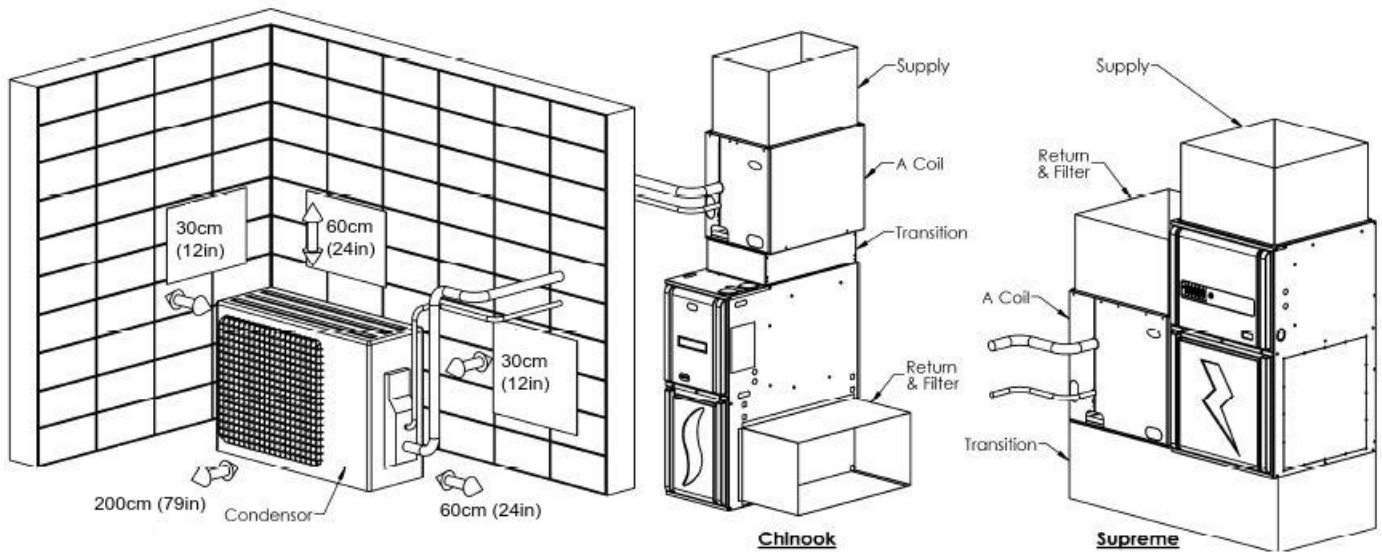
1. A dedicated power supply circuit should be used in accordance with local electrical safety regulations;
2. The unit should be reliably grounded and connected to an exclusive ground device by the professionals;
3. The circuit breaker must have the functions of magnetic tripping and heat tripping to prevent short circuit and overload;
4. The minimum distance between the unit and combustible surface is 4,9 ft.(1.4935 m);
5. The appliance shall be installed in accordance with national wiring regulations;
6. An all-pole disconnection switch with a contact separation of at least 0.1 inch in all poles should be connected in fixed wiring.

Grounding

1. Please ensure that the unit is reliably grounded;
2. The yellow-green wire in the outdoor unit is the grounding wire which cannot be used for the other purposes. Improper grounding may cause electric shock;
3. The ground must have reliable terminal. Please do not connect wire with the following: water pipe, gas pipe, sewer pipe, or other place that professional personnel consider is unreliable.
4. The model and rated values of fuses should accord with the silk print on fuse cover or related PCB.

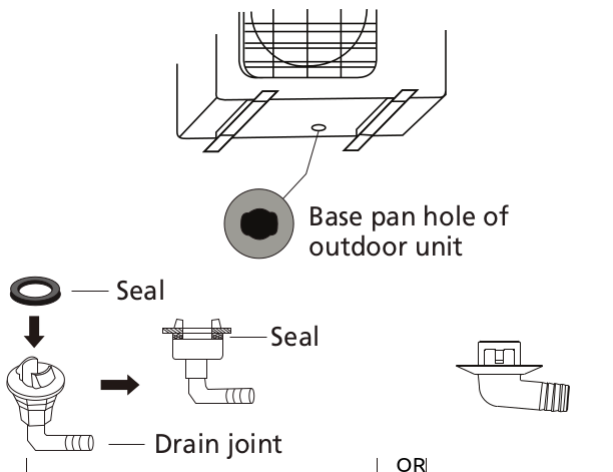
3.4 Clearances

Figure 3: Installation and Clearances



3.5 Drain Joint

Before the outdoor unit is bolted in place, the drain joint must be installed. In cold climates, make sure the drain hose is as vertical as possible to ensure swift water drainage.



3.6 Indoor Coil

Check the coil for shipping damage and verify the contents of the box containing the evaporator coil. If you should find damage, immediately contact the last carrier. Coils are shipped with a 10 psi dry air holding charge. Puncture rubber plug on suction line to release charge before removing plugs. The absence of pressure does not verify a leak. Check the coil for leaks before installing or returning it to your wholesaler.

Coil should be level, or pitched slightly toward the drain connection. Airflow face velocity above 350 ft/min is not recommended for downflow or counterflow applications due to potential water blow-off.

For an installation with a **Chinook**, position the coil on the supply outlet of the furnace using sheet metal screws. Drain pans are made of a polymer that can withstand temperatures up to 232 °C (450 °F). Maintain a minimum of 3" clearance over the heat exchanger.

For an installation with a **Supreme**, position the coil on the return outlet of the furnace.

A splashguard is included for horizontal installations (multiposition coils). In downflow and counter flow configurations, aluminum foil tape must be applied to seal the top edge of the insulation to the cabinet.

Do not install any metering device on the indoor coil. The expansion valve is located in the outdoor unit. If a metering device is already installed in the indoor coil, it must be removed.

Condensate Drain

Coils are equipped with multiple drain connections. Determine the drain connections to be used and note the difference between the primary and secondary openings. Drain plugs are provided for all openings; remove and discard the appropriate plugs with 1/2" drive ratchet and verify that remaining plugs are tight (2.5 ft-lbs). Attach drain line to pan with 3/4" male pipe thread PVC fittings. Hand tight is adequate – **do not over tighten and do not reduce drain line size.**

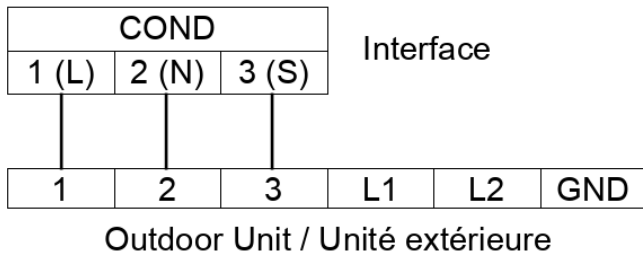
Route drain line(s) line so they will not be exposed to freezing temperatures and do not interfere with accessibility to the coil, air handling system or filter. The drain should be pitched downward 1" per 10' with a 2" trap as close to the coil as possible. If line makes a second trap, or has an extended run before termination, a vent tee should be installed after the trap closest to the pan.

If the coil is located in or above a living space where damage may occur from condensate overflow, a separate 3/4" drain must be provided from the secondary drain connection. Run this drain to a place in compliance with local installation codes where it will be noticed when unit is operational. Condensate flowing from the secondary drain indicates a plugged primary drain. Prime the trap with water. Test line for leaks. Test water flow with unit in operation. An auxiliary drain pan should also be installed under the unit as specified by most local building codes.

3.7 Interface Board (K03085)

Installation of the interface card is made easy on the Dettson's Chinook and Supreme furnaces. Installation port has been designed on these furnaces. Refer to the installation instructions provided with the interface board for installation location and thermostat wiring. Wire to the outdoor unit as shown in the figure.

Figure 4: Winting Interface Board to ODU



Communication wire connected between the indoor and outdoor units must be rated for 240VAC, they are protected by the outdoor unit breaker and must be sized appropriately.

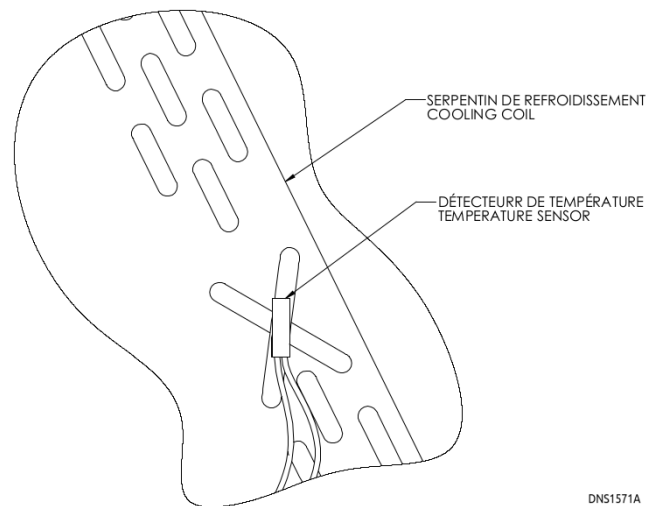
Make sure to set the outdoor unit capacity using the dip switches on the interface board, as explained in the instructions.

Coil Sensor

With the interface board kit comes a coil sensor. It must be properly installed.

1. Attach the provided temperature sensor to the evaporator coil as shown;
2. Get the wire through the refrigerant line opening;
3. Cut the wire and skin the conductors. Add wire length if necessary;
4. Connect the two conductors to T1 and TC on the interface card. The polarity is not important.

Figure 5: Indoor Coil Sensor Location



3.8 Electrical Wiring

1. Remove the handle on the right side plate of outdoor unit;
2. Remove cord anchor. Connect and fasten power connection cord to the terminal board;
3. Secure the power connection cord cord anchor;
4. Make sure the wires have been fastened properly.

NOTE: Incorrect wiring may cause malfunction.

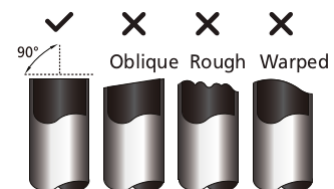
L1 and L2 must be connected to the 208/230VAC power supply. The unit must be properly grounded via the ground terminal.

3.9 Refrigerant Piping Connection

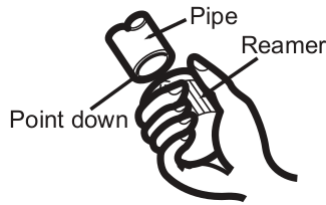
When connecting refrigerant piping, **do not** let substances or gases other than the specified refrigerant enter the unit.

The piping length will affect the efficiency of the unit. A minimum pipe run of 3 meters is required.

1. Cut pipes
 - (a) Measure the distance between the indoor and outdoor units.
 - (b) Using a pipe cutter, cut the pipe a little longer than the measured distance.
 - (c) Make sure the pipe is cut at a perfect 90° angle. Do not deform the pipe while cutting.



2. Completely remove burrs using a reamer or deburring tool. Hold the pipe down to prevent burrs from falling into the pipe.



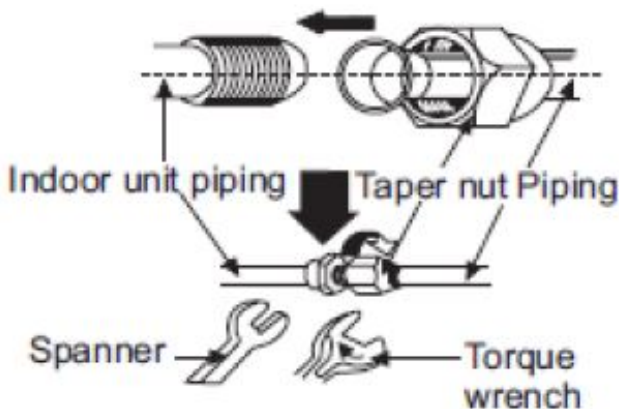
3. Properly flare pipe ends.
4. Connect the piping to the indoor coil and the outdoor unit.
 - Use the provided line size adapters for the indoor coil.
 - Do not use excessive torque and do not deform the piping.
 - Connect the low-pressure pipe first and then the high-pressure.
 - Minimum bend radius is 10 cm (4").
 - Use a spanner to grim the main body of the outdoor unit valve.

Both refrigerant lines must be separately insulated in order to avoid condensation and to ensure proper efficiency.

Table 2: Tubing Torque Tightening

Hex Nut Diameter	Tightening Torque (N·m)
$\phi 0.25''$	18-20
$\phi 0.375''$	32-39
$\phi 0.5''$	49-59
$\phi 0.63''$	57-71
$\phi 0.75''$	67-101

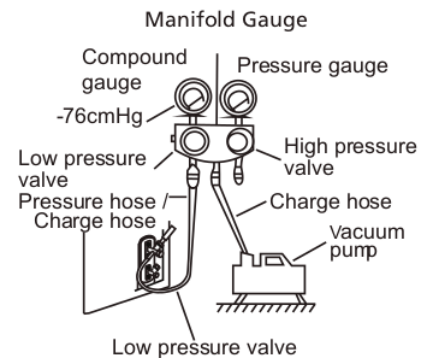
Figure 6: Tube Tightening



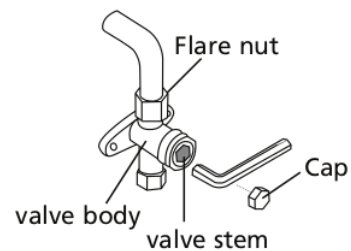
3.10 Air Purging and Leakage Test

Air and foreign matter in the refrigerant circuit can damage the unit. Use a vacuum pump and manifold gauge to purge the refrigerant circuit, removing any moisture and non-condensable gas from the system.

1. Connect the charge hose of the manifold gauge to service port on the outdoor unit's low pressure valve.
2. Connect another charge hose from the manifold gauge to the vacuum pump.
3. Open the Low Pressure side of the manifold gauge. Keep the High Pressure side closed.
4. Turn on the vacuum pump to evacuate the system.
5. Run the vacuum for at least 15 minutes, or until the Compound Meter reads -100 kPa(-76 cmHg).



6. Close the Low Pressure side of the manifold gauge, and turn off the vacuum pump.
7. Wait for 20 minutes, then check that there has been no change in system pressure.
8. If there is a change in system pressure, check for leaks. If there is no change in system pressure, unscrew the cap from the packed valve (high pressure valve).
9. Insert hexagonal wrench into the packed valve (high pressure valve) and open the valve by turning the wrench in a 1/4 counterclockwise turn. Listen for gas to exit the system, then close the valve after 5 seconds.



10. Watch the Pressure Gauge for one minute to make sure that there is no change in pressure. The Pressure Gauge should read slightly higher than atmospheric pressure.
11. Remove the charge hose from the service port.

12. Using hexagonal wrench, fully open both the high pressure and low pressure valves.
13. Tighten valve caps on all three valves (service port, high pressure, low pressure) by hand. You may tighten it further using a torque wrench if needed.

3.11 Operation Test

Before operation test

1. Do not switch on power before installation is completely finished;
2. Electric wiring (with ground wire) must be connected correctly and securely;
3. Cut-off valves of the connection pipes should be opened;
4. All the impurities such as scraps and thrums must be cleared from the unit.
5. Check all flare nut connections and confirm the system is not leaking.

Operation test method

Switch on power and call for heating or cooling on thermostat to check whether the operation is normal or not. Leave running for at least 5 minutes.

Table 3: Checklist After Installation

Items to be checked	Possible malfunction
Has the unit been fixed firmly?	The unit may drop, shake or emit noise
Has the refrigerant leakage test been performed?	It may cause insufficient cooling (heating)
Is thermal insulation sufficient?	It may cause condensation
Is water drainage satisfactory?	It may cause water leakage
Is the voltage in accordance with the rated voltage marked on the nameplate?	It may cause electric malfunction or damage the unit
Is the electric wiring or piping connection installed correctly and securely?	It may cause electric malfunction or damage parts
Has the unit been securely grounded?	It may cause electrical leakage
Is the inlet or outlet blocked?	It may cause insufficient cooling (heating)
Have the refrigerant charge and the length of connection pipes and been recorded?	The refrigerant charge is not accurate

4 Troubleshooting

This is a list of common issues and possible causes. If the problem persists, turn off the unit and contact your authorized local service centre.

The outdoor unit makes noises

- The unit will make different sounds based on its current operating mode.

Dust is emitted from the unit

- The unit may accumulate dust during extended periods of non-use. The unit may be covered during long periods of inactivity to prevent this.

The fan does not operate

- The fan speed is controlled to optimize product operation.

Operation is erratic, unpredictable or unit is unresponsive

- Interference from cell phone towers and remote boosters may cause malfunction.
- Try disconnecting the power and reconnecting.

Poor cooling performance

- Temperature setting may be higher than the ambient temperature. Lower the temperature setting.
- Heat exchanger or air filter is dirty. Clean it.
- Air inlet or outlet is blocked. Turn the unit off before removing the obstruction.
- Doors and windows are open. Make sure that all doors and windows are closed while operating the unit.
- Excessive heat is generated by sunlight. Close windows and curtains during periods of high heat or bright sunshine.
- Too many sources of heat in the room (people, computers, electronics, etc.). Reduce amount of heat sources.
- Low refrigerant due to leak or long-term use. Check for leaks, re-seal if necessary and top off refrigerant.

The unit is not working

- Power failure. Wait for the power to be restored.
- The power is turned off. Turn on the power.

- The fuse is burned out. Replace the fuse.
- The Unit's 3-minute protection has been activated. Wait three minutes after restarting the unit.

The unit starts and stops frequently

- There's too much or too little refrigerant in the system. Check for leaks and recharge the system with refrigerant.
- Incompressible gas or moisture has entered the system. Evacuate and recharge the system with refrigerant.
- The compressor is broken. Replace the compressor.
- The voltage is too high or too low. Install a voltage regulator.

Poor heating performance

- The outdoor temperature is extremely low. Use auxiliary heating device.
- Cold air is entering through doors and windows. Make sure that all doors and windows are closed during use.
- Low refrigerant due to leak or long-term use. Check for leaks, re-seal if necessary and top off refrigerant.

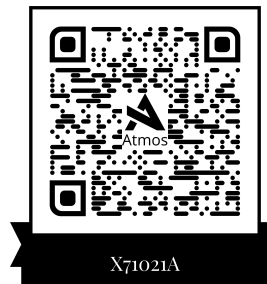
Important Links

Advanced Troubleshooting Manual



www.dettson.com/x62435_atmos_troubleshooting

Unit Disassembly Manual



www.dettson.com/x62436_atmos_disassembly

5 Commissioning Checklist

Indoor Unit: _____ s/n#: _____

Outdoor Unit: _____ s/n#: _____

- Filter is clean
- Line length: _____ ft Line height: _____ ft
- Temp sensor position at mid-height on A-coil
- Error code: _____
- Temp rise through the coil:

T before: _____ °F

T after: _____ °F

Rise Δ T: _____ °F

- Static pressure:

P return: _____ " W.C.

P supply: _____ " W.C.

Δ P: _____ " W.C.

- Temperature readings:

T ext.: _____ °F

T discharge: _____ °F

T condensor tube: _____ °F

T at coil mid-height: _____ °F

- In Cooling:

T mesured on suction line (Tm): _____

Converted pressure to temperature: _____

Super heat: _____

Compressor frequency: _____ Hz

- In Heating:

Discharge pressure: _____

Compressor frequency: _____ Hz

Notes:

6 Replacement Parts

Figure 7: Exploded View

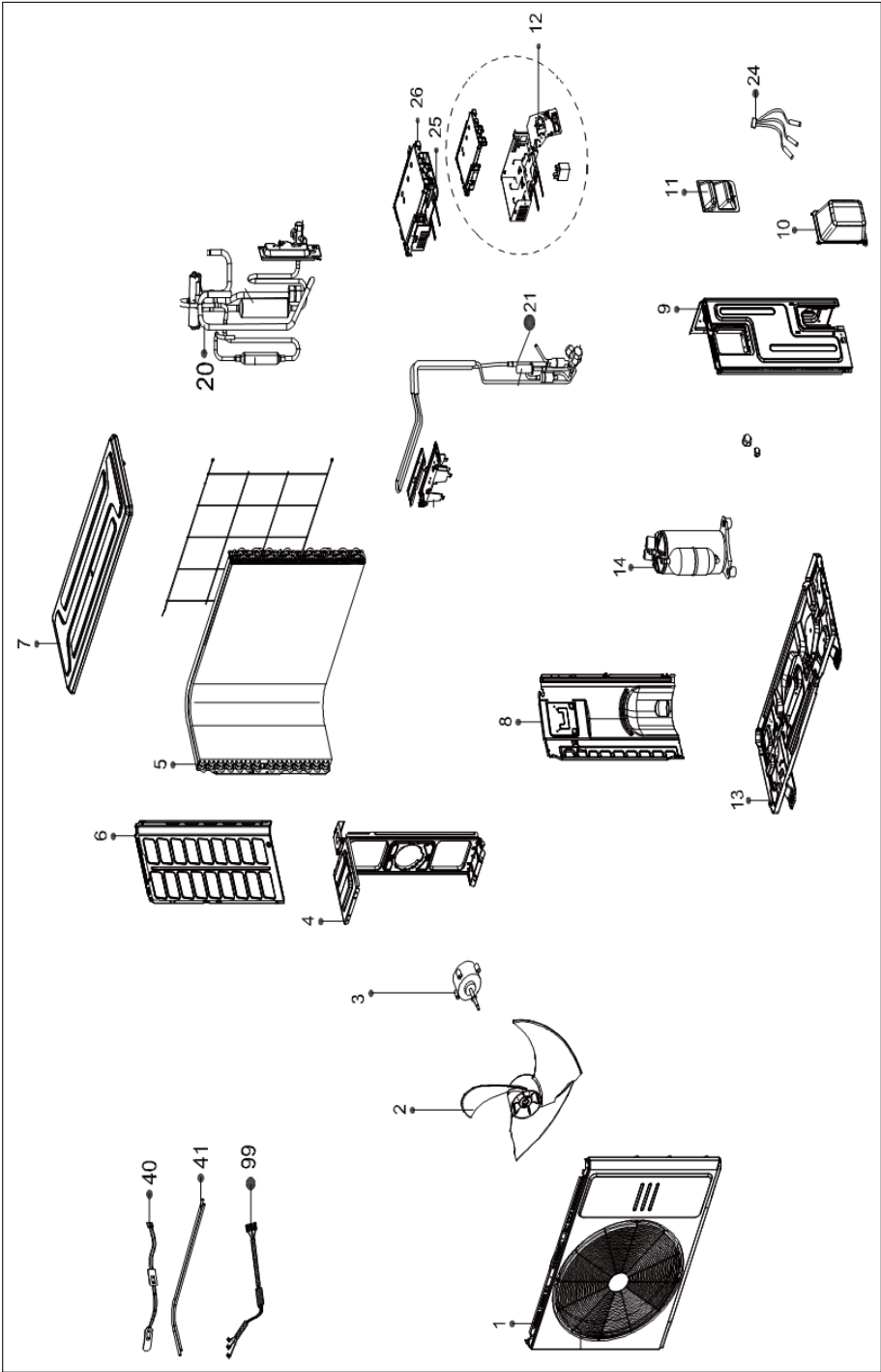


Table 4: Part List

#	Description	MDH-18 / MHD-18U	MDH-24 / MHD-24U
1	Front panel	12222000A06282	12222000A01431
1	Air grille	-	12222000014845
1	Front right panel	-	12222500A00135
2	Axial flow fan	12100105000841	12100105000084
3	Brushless DC motor	11002015000366	11002015000247
4	Fan motor support	12222000012371	12222000005162
5	Condenser assembly	15822000009796	15822000011096
6	Left panel	12222000013472	12222000006665
7	Top cover	12222000013465	12222500000587
8	Partition board	12222000013245	12222000012328
9	Right panel	12222000013466	12222000006664
10	Water collector	12122000007150	12122200002695
11	Big handle	12222000010966	12222000011086
12	Terminal	17400401000068	17400401000068
13	Chassis	12222000014054	12222000004018
14	Compressor	11103020006879	11103020006879
20	4-way valve assembly	15422000018634	15422000018634
21	Liquid valve assembly	15422000018633	15422000018612
24	Combination sensors	11201011000188	11201011000188
25	Terminal board	12222000014405	17222000036685
26	Control box assembly	17222000038687	17222000037695
40	Crankcase heater	17402001000603	17402001000603
41	Tube type heater	17402002000544	17402002000466
99	Compressor wire	17401203012697	17401203000751

