

INSTALLATION INSTRUCTIONS for the HOYME AIR EXCHANGER (HAE)-HRV A FURNACE FAN GENERATED AIR EXCHANGER (HRV) FOR THE 'WHOLE HOUSE AS A SYSTEM'



Inline Model HAE-1000-x00 *



Offset Model HAE-1001-x00*



Interior bottom view HAE-1000-x00*

* Where "x" = CFM x 100

LD-1502

THIS LAB TESTED AIR EXCHANGER (HAE) SHOWED AN APPARENT SENSIBLE EFFECTIVENESS OF OVER *10% HIGHER THAN THE CONVENTIONAL HRV, IS LOW IN MAINTENANCE, EASY TO INSTALL AND PROVIDES A CONTINUAL FLOW OF FRESH AIR EVEN DURING LONG PERIODS OF EXTREME COLD TEMPERATURES

Specifications:

HAE-1000(1) -100-14"x13"x50"

HAE-1000(1) -200-14"x17"x50"

Shipping Weight:

Models: 100~34lbs.; 200~38lbs.

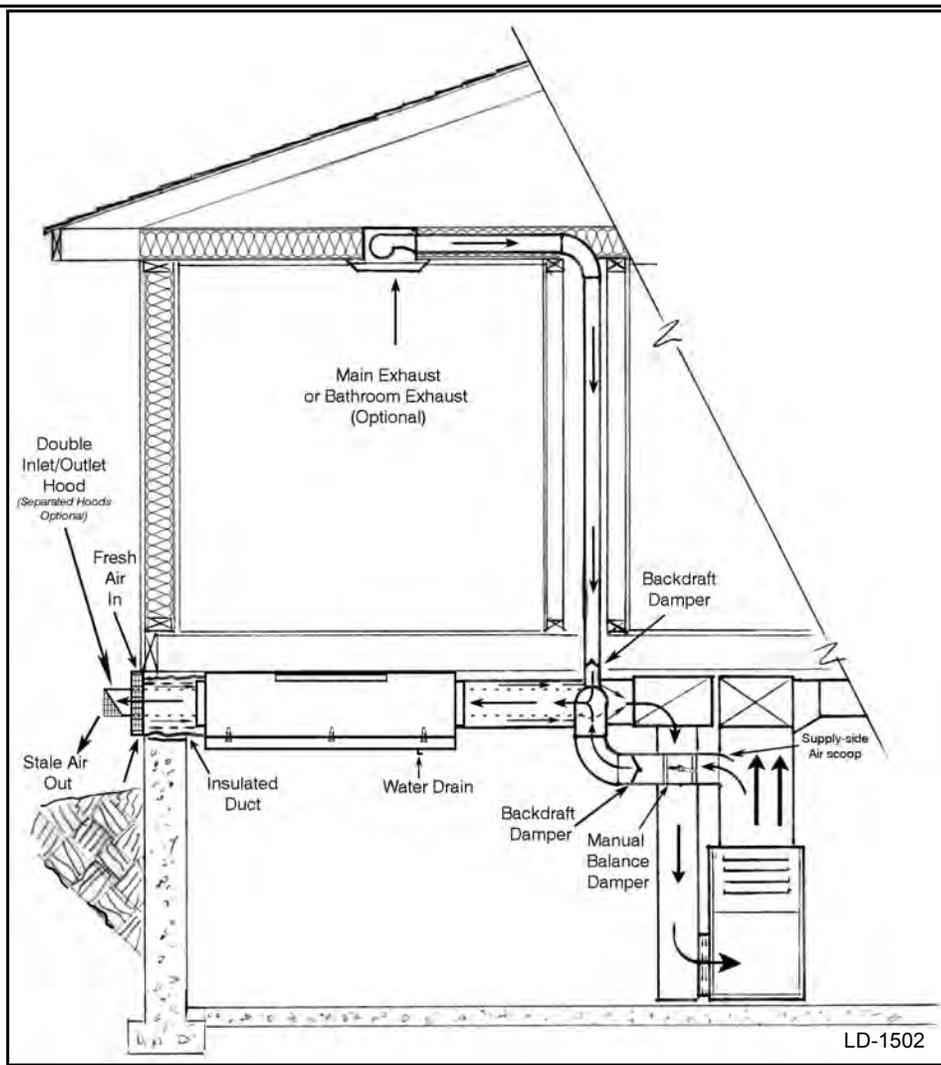
Installation Kits: ~19lbs.

All Models Come With:

- Plastic Drain Hose ½" (#9) (15')
- Mounting Brackets 24" (#10) (x2)
- Add a matching Kit as shown on pages 7 and 8.
- Installer is to supply ducting.
- Numbered parts and assembly drawings are shown on page 6.

The Hoyme Air Exchanger (HAE)-HRV is a Heat Recovery Ventilator that distributes fresh/exhaust air to and from the 'Whole House as a System' by simply using the furnace fan. See page 5&6 (HAAS) For maximum expected efficiency, the HAE-HRV is to be connected close to the furnace on both return and supply plenums with nothing in between except the appliance filter. If a 6"Ø Power Humidifier (PH) is mounted between the two plenums, the efficiency of the HAE can be maintained by adding a power open damper to the PH to open only during the humidifying cycle.

The HAE operates continual, even during the defrosting cycle, making it ideal to vent bathrooms, kitchens & central vac systems through it. See page 8 for details.



LD-1502

*Based on tests done by National Research Council, Ottawa, 2014

READ INSTRUCTIONS COMPLETELY BEFORE STARTING THE INSTALLATION OF THIS PRODUCT.

INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE ENFORCING AUTHORITIES.

Air supply and installation shall be in accordance with National Building Codes and/or Local Codes.

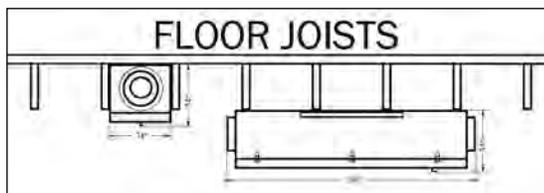
THE HAE IS DESIGNED FOR A FORCED AIR FURNACE /AIR HANDLER SYSTEM PREFERABLY HAVING A MULTI-STAGE MOTOR RUNNING 24/7.

SECTION "A": - INLINE TYPE HAE - HRV

INLINE HAEs are not to be fastened directly to Connectors/Hoods. Use flex/rigid ducting instead.

Models HAE-1000-100 and HAE-1000-200.

1. Select suitable location for the **HAE** making allowances for Plenum connectors, Ducting, and removal of the Bottom Inspection Pan.
2. Mount the **HAE** securely between or below the floor joists as shown using screws and two metal **Mounting Brackets #10** supplied. **Numbered parts are listed and shown on page 6.**



LD-1502

Mount the **HAE** to be level for water drainage and with the **drain spout end of the HAE** positioned closest to the return plenum.

DOUBLE PLENUM CONNECTOR #3

3. Mount the **Double Plenum Connector #3** to the **horizontal return plenum** and as close as possible to the furnace. Cut the proper size hole in the plenum to match the diameter of the **DPC** plus 1/4" for clearance. **Before mounting**, turn the **DPC** so that the 5"Ø/6"Ø elbow on the side of the **DPC** faces the **supply plenum**. Also note the proper position for fastening the **Shield #4** so that, when

fastened, it will point in the same direction as the air flow in the **return plenum**. The **Shield** is to help increase the flow of incoming air. Fasten the **Shield** in this position with three sheet metal screws. Fasten the **DPC** to the return plenum with sheet metal screws using holes in the **DPC** collar for spacing.

MANUAL AIR BALANCE DAMPER #5

4. Mount the **Manual Air Balance Damper** to the **supply plenum** and as close as possible to the furnace. Cut a 5/6"Ø hole plus clearance to accept the diameter of the **MABD**. Turn the **MABD** to a position for ease of adjusting the damper lever while at the same time noting the position to fasten the **Scoop #5b** so that it points against the air flow in the plenum. In this position more air will be directed to the HAE exhaust. Fasten the **Scoop** in this position with 3 sheet metal screws. Mount the **MABD** securely to the supply plenum with sheet metal screws using the holes in the **MABD** collar for spacing.

ABOUT RIGID DUCTING

Using Rigid Ducting increases the efficiency of Air Flow plus it assists in draining any water that may accumulate. These Instructions, however, refer to the use of flex ducting.

Flex ducting is to be stretched and cut to length so that the maximum diameter of the ducting can be realized when installed.

Follow acceptable trade practices when installing, routing and connecting all duct work leaving it neat and tidy.

NOTE: All 5/6"Ø concentric ducting is not to be insulated. Outer Ducting between the HAE and the Plenum may not require insulation. All Outer Ducting between the HAE to the Outside Hood(s) requires insulation.

CONNECT HAE TO PLENUM CONNECTORS

5. Connect the **Manual Air Balance Damper** to the 5/6"Ø elbow of the **Double Plenum Connector #3** by using the **Aluminum Foil Ducting #8** supplied. Stretch, cut to length and fasten ducting into place. If the supplied **Ducting #8** is too short, contractor is to supply longer ducting of equal or better quality.

6. Connect the **Double Plenum Connector #3 to the HAE**. First, insert the **HAE Extension Sleeve #6a** into the **HAE** and fasten into place with a sheet metal screw. Stretch and cut both 5/6"Ø and 8"Ø / 9"Ø ducts to length to reach between the **DPC** and the **HAE**. Fasten both ducts to the **DPC** with the inner duct to be connected first. The other ends of the ducts are to be connected to the **HAE** with the 5/6"Ø duct to be fastened to the **Extension Sleeve #6a** and the Outer Duct to be fastened directly to the **HAE**. Fasten and seal all connections.

OUTSIDE DOUBLE HOOD #2

7. Mount the **Double Hood** to the outside wall of the building above the level of anticipated snow. Make an opening in the outside wall large enough to match the diameter of the **Hood** plus extra room for ease of insulation and installation. Fasten into place with proper screws.

CONNECT DOUBLE HOOD #2 TO THE HAE

8. Insert the **Extension Sleeve #6a** into the **HAE** and fasten into place with a sheet metal screw. The **Hood** has an adjustable 5"Ø sleeve that is to protrude far enough for ease of connecting the 5/6"Ø duct. Stretch both 5/6"Ø ducting and the **insulated** 8"Ø / 9"Ø ducting to extend between the **Hood** and the **HAE** and cut to length. Fasten both ducts to the **HAE** with the inner duct to be connected first to the **HAE Extension Sleeve #6a**. The other ends of the ducts are to be connected to the **Hood**

with the 5/6"Ø duct fastened to the adjustable sleeve and then the **Insulated Duct** fastened directly to the **Hood**.

1/2"Ø PLASTIC DRAIN HOSE #9

Connect the 1/2"Ø **plastic hose #9** (supplied) to the drain spout and always position this hose lower than the bottom of the pan for draining water caused by the defrost cycle.* Provide a low spot in the hose to act as an air/water trap. Rigid copper tubing 1/2"Ø is often used for horizontal distances.

** Ice forms in the HAE during cold weather but automatically defrosts during the heating cycle of the furnace.*

TWO OUTSIDE HOODS CAN BE USED TO REPLACE THE DOUBLE HOOD.

9. Where it is advisable to use two **Outside Hoods** instead of the **Double Hood**, a **Two-Hood Connector #2a** is required. Mount the **THC** **securely** and preferably close to the outside wall. Connect the **THC** to the **HAE** by first fastening the **Extension Sleeve #6a** to the **HAE** with a sheet metal screw. The 5/6"Ø duct and the **insulated** 8"Ø / 9"Ø duct is to be stretched and cut to length to reach between the **THC** and the **HAE**. Fasten both ducts to the **HAE** with the 5/6" Ø duct fastened to the **Extension Sleeve #6a** and the insulated duct to the **HAE**. The other ends of the ducts are to be connected to the **THC**.

TWO OUTSIDE HOODS #2b(5/6"Ø) #2c(6"Ø)

10. Mount the **Two Hoods** on the outside wall 6' apart and above the level of anticipated snow. Proper sized holes plus clearances are required for the two hoods. Mount and fasten the **Hoods** into place with proper screws. Cut to size/length and connect **two insulated ducts** between the **Two-Hood Connector** and two **Hoods**. Also insulate the **Two-Hood Connector** so that all ducting from the **HAE** to the outside wall is insulated.

SECTION "B": - OFFSET TYPE HAE -

Where space is limited, Offset Models HAE-1001-100, HAE-1001-200 plus two Hoods allow it to be placed in a variety of smaller places plus the availability of installation kits to match. See page 7 for available kits.

11. Select suitable location for the **HAE** while making allowances for Plenum Connectors, Ducting, and the removal of the Bottom Pan.

12. Mount the **HAE** securely, preferably to the floor joists, using screws and two metal **Mounting Brackets #10** supplied. Mount the **HAE** to be level for drainage and the **drain spout end of the HAE** to be positioned closest to the return plenum.

RETURN PLENUM CONNECTOR #3a(6"Ø)

13. Mount the **Return Plenum Connector 6"Ø** to the **horizontal return plenum** as close as possible to the furnace. Cut the proper size hole in the plenum plus ¼" to accept the diameter of the **RPC**. Fasten the **Shield #4** to the **RPC** with three sheet metal screws. When mounting the **RPC** into the plenum, turn it so that the **Shield** will point in the same direction as the air flow in the plenum. The **Shield** is to help increase the flow of incoming air. Fasten the **RPC** with sheet metal screws using holes in the collar for spacing.

MANUAL AIR BALANCE DAMPER #5

14. Mount the **Manual Air Balance Damper** to the **supply plenum** and as close as possible to the furnace. Cut a 5/6"Ø hole plus ¼" to accept the diameter of the **MABD**. Turn the **MABD** to a position for ease of adjusting the damper lever while at the same time noting the position to fasten the **Scoop #5b** so that it points against the airflow in the plenum. More air will then be directed to the exhaust of the HAE. Fasten the **Scoop** in this position with 3 sheet

metal screws supplied. Mount the **MABD** securely to the supply plenum with sheet metal screws using the holes in the **MABD** collar for spacing.

CONNECTING MABD #5 TO THE HAE

15. Connect the **MABD** to the **HAE 5/6"Ø** fixed sleeve located at the drain spout end of the **HAE** by using the **Aluminum Foil Ducting #8** supplied. Stretch, cut to length and fasten ducting into place. If **Ducting #8** supplied is too short, Contractor is to supply ducting of equal or better quality.

CONNECTING RPC #3a(6"Ø) TO THE HAE

16. Connect the **Return Plenum Connector #3a** to the **HAE 6"Ø** fixed side sleeve at the drain spout end of the **HAE** using ducting supplied by the Contractor. **Insulated ducting is not required here.**

OUTSIDE HOODS #2b(5/6"Ø) #2c(6"Ø)

17. Mount the **Two Hoods** to the outside wall **6' apart and above the level of any anticipated snow**. Proper sized holes plus clearances are required to match the size of hoods. Mount and fasten the **Hoods** into place with proper screws.

18. Connect the **Two Hoods** to the **HAE** using proper sized **Insulated Ducting**.

Follow acceptable trade practices when installing, routing and connecting all duct work leaving it neat and tidy, free from holes and away from excess heat.

OFFSET TYPE HAE WITH A DOUBLE HOOD AND A DOUBLE HOOD CONNECTOR

If a **Double Hood (DH) #2** is used instead of the **Two Outside Hoods**, it is necessary to add an **Offset Double Hood Connector [ODHC #2d 5/6" (8/9"Ø)]** to be placed and connected between the HAE and the DH.

19. Make only one opening in the outside wall above the level of any anticipated snow to accept the diameter of the **Double Hood** plus ¼" clearance. Fasten the **Hood** into place with proper screws.

20. Install and fasten the **ODHC#2d** securely close to the **Double Hood (DH)** with the concentric ends facing the **DH**. Extend and fasten adjustable 5/6"Ø sleeve that is inside the **DH** to protrude far enough for ease of connecting the 5/6"Ø **non insulated** duct. Stretch both 5/6"Ø ducting and the **insulated** 8"Ø / 9"Ø ducting to extend between the **DH** and the **ODH Connector** and cut to length. Fasten both ducts to the **DH** with the inner duct to be connected to the adjustable sleeve first. The other ends of the ducts are to be connected to the **ODH Connector** with the 5/6"Ø duct connected first.

Also insulate the ODHC. Follow acceptable trade practices when installing, routing and connecting all duct work.

21. Connect the **Offset Double Hood Connector** to the sleeves of **Offset HAE** using proper length and size of **Insulated Ducting**.

½"Ø PLASTIC DRAIN HOSE #9

The ½"Ø **plastic hose #9** (supplied) is to be fastened to the drain spout and always kept lower than the bottom of the pan for draining water collected during the defrost cycle.* Provide a low spot in the hose to act as an air/water trap. Rigid copper tubing ½"Ø is often used for horizontal distances.

* *Ice forms in the HAE during cold weather but automatically defrosts during the heating cycle of the furnace.*



BALANCING AIR FLOW WITH THE MANUAL AIR BALANCE DAMPER

A single furnace fan generates the movement of air in and out of the HAE to automatically supply/exhaust air to the house where needed. Therefore, the main purpose of the Manual Air Balance Damper is not to balance the flow of air through the HAE but to control the amount

of hot air that flows through HAE so as not to lose too much heat during the furnace firing cycle (de-icing cycle) and at the same time to allow enough hot air to heat the incoming air during the regular non-heating cycle.

Suggestion: Start by setting the **Manual Air Balance Damper (#5)** to be two-thirds open. **With the Furnace NOT FIRING but the Furnace FAN RUNNING for approximately five minutes, and any intermittent house exhaust fans turned off, adjust the Manual Air Balance Damper so that the following approximate temperatures can be obtained.**

1) If outside temperature is 0°C, then **air entering the return plenum** should be 18 to 20°C while the **air leaving the HAE** should read approximately 6 to 10°C.

2) If outside temperature is -30 to -35°C, then **air entering the return plenum** should read approximately 12 to 16°C while **the air leaving the HAE** should read approx. 0°C to -6°C. These are typical installation readings.

With these settings in winter months, ice forms during the regular non-firing cycle and melts during the firing cycle. During the summer, the HAE works in reverse with the air conditioned air that is exhausted cools the incoming summer air.

THE 'HOUSE AS A SYSTEM' (HAAS)

Question: A single furnace fan moves air in and out of the HAE and ultimately to the whole house. But tests show there is more air coming in through the HAE than is being exhausted? This appears to be an unbalanced system.

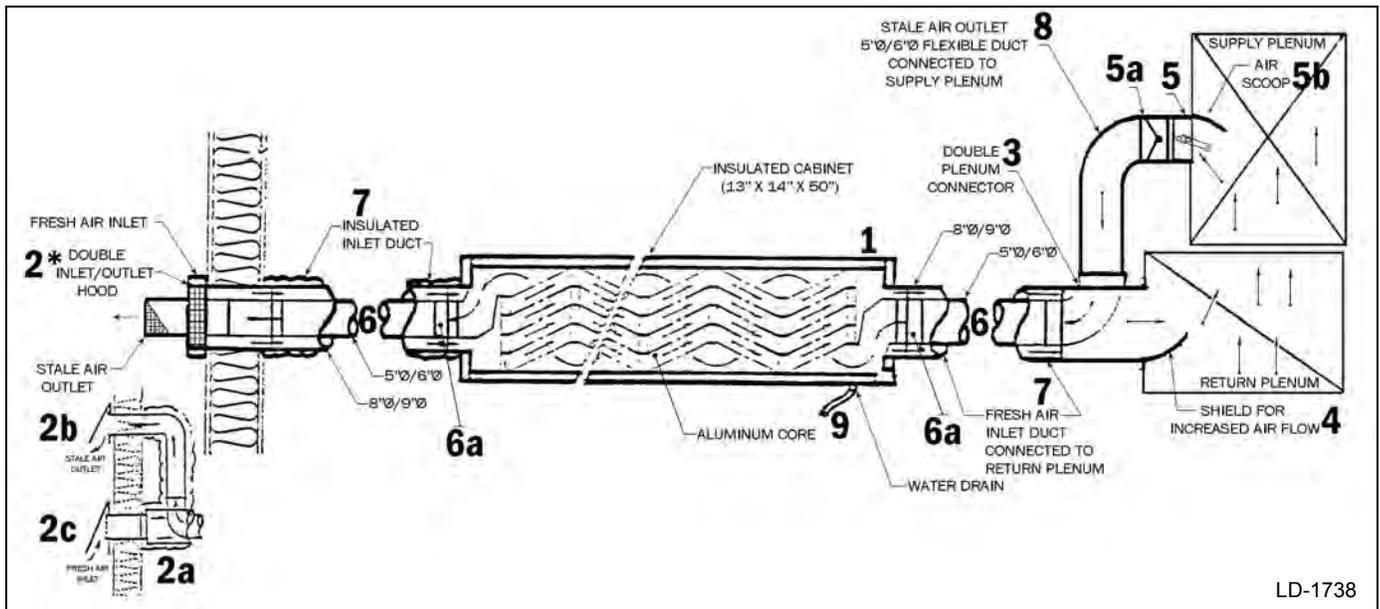
Answer: If houses were perfectly sealed and free from any exhaust fans, air leakage included, then the amount of incoming air through the HAE and being circulated through the house would return in an equal amount to be exhausted through the HAE. The HAE would then appear to be a balanced system.

One cubic foot of air in equals one cubic foot of air out. But all houses have some air leakage, plus air being exhausted by separate fans. This results in less air being returned to the HAE for exhausting. Since the HAE has less air being exhausted than there is air entering, the HAE itself does show an imbalance of air flow. But when we consider the 'House as a System' and factor in air that is lost through leakage and exhaust fans, it follows that using the HAE, generated by a single furnace fan,

allows the 'House as a System' to adjust and to maintain a more natural balanced condition.

The defrost cycle of the HAE is also automatic that occurs only during the heating cycle of the furnace. There is no 'down time' for defrosting which will then actually allow a continual flow exhausting of air even during extreme cold temperatures. This means that it is ideal for venting bathrooms, kitchens and central vacuum systems through the HAE.

Typical Installation of the Inline Hoyme Air Exchanger HAE-1000-x00



LD-1738

Part Numbers include:

- #1 - HAE-100x-x00 AIR EXCHANGER. 100 (W=14", H=13", L=50") -or- 200 (W=14", H=17", L=50")
- #2 - 8"Ø (9"Ø) DOUBLE HOOD (INLET & EXHAUST)
- #2a - 8"Ø (9"Ø) TWO-HOOD CONNECTOR
- #2b - 5"Ø (6"Ø) EXHAUST ALL WEATHER HOOD-(OOH-0500-000-V) VELCRO TYPE
- #2c - 6"Ø INLET ALL WEATHER HOOD-(OOH-0x00-000)
- #2d - 8"Ø (9"Ø) OFFSET DOUBLE-HOOD CONNECTOR
- #3 - 8"Ø (9"Ø) DOUBLE PLENUM CONNECTOR, (SUPPLY & RETURN)
- #3a - 6"Ø RETURN PLENUM CONNECTOR
- #4 - AIR FLOW SHIELD
- #5 - 5"Ø (6"Ø) MANUAL AIR BALANCE DAMPER
- #5a - 5"Ø (6"Ø) BACKDRAFT DAMPER
- #5b - AIR SCOOP
- #6 - 5"Ø (6"Ø) NON-INSULATED FLEX(RIGID) DUCTING.(NOT SUPPLIED)
- #6a - 5"Ø (6"Ø) HAE EXTENSION SLEEVE X 2
- #7 - 8"Ø (9"Ø) INSULATED FLEX(RIGID) DUCTING.(NOT SUPPLIED)
- #8 - 5"Ø (6"Ø) FLEXIBLE ALUMINUM FOIL DUCTING X 4 FT.
- #9 - ½"Ø PLASTIC DRAIN HOSE X 15 FT.
- #10 - MOUNTING BRACKETS - 24" X 2
- #11 - 8"Ø (9"Ø) DUCT CLAMPS X 4; 5"Ø (6"Ø) DUCT CLAMPS X 6 (OPTIONAL)

"HAE 1000 x00" - Inline Type

Includes ITEMS #1, 9, & 10.

- #1 - HAE 1000-x00 AIR EXCHANGER.
100 model (W=14", H=13", L=50")
200 model (W=14", H=17", L=50").
- #9 - ½"Ø PLASTIC DRAIN HOSE X 15 FT.
- #10 - MOUNTING BRACKETS X 2.



HAE KITS FOR HAE-1000-x00 Inline Type

The IKIT-100 & IKIT-200 Includes

- #2 - HAE DOUBLE HOOD - ALL WEATHER, 8"Ø
(9"Ø for 200 model)
- #3 - HAE DOUBLE PLENUM CONNECTOR, 8"Ø
(9"Ø for 200 model)
- #4 - AIR FLOW SHIELD 8"Ø (9"Ø for 200 model)
- #5 - HAE MANUAL AIR BALANCE DAMPER, 5"Ø
(6"Ø for 200 model)
- #5b - AIR FLOW SCOOP, 5"Ø (6"Ø for 200 model)
- #6a - HAE EXTENSION SLEEVE, 5"Ø X 4"L (x2)
(6"Ø for 200 model)
- #8 - FLEXIBLE ALUMINUM FOIL DUCT, 5"Ø, (4')
(6"Ø for 200 model)

The IKIT-101 & IKIT-201 Includes

- #2a - HAE TWO HOOD CONNECTOR, 8"Ø
(9"Ø for 200 model)
- #2b - ALL WEATHER HOOD, 5"Ø, VELCRO
(6"Ø for 200 model)
- #2c - ALL WEATHER HOOD, 6"Ø
- #3 - HAE DOUBLE PLENUM CONNECTOR, 8"Ø
(9"Ø for 200 model)
- #4 - AIR FLOW SHIELD 8"Ø (9"Ø for 200 model)
- #5 - HAE MANUAL AIR BALANCE DAMPER, 5"Ø
(6"Ø for 200 model)
- #5b - AIR FLOW SCOOP, 5"Ø (6"Ø for 200 model)
- #6a - HAE EXTENSION SLEEVE, 5"Ø X 4"L (x2)
(6"Ø for 200 model)
- #8 - FLEXIBLE ALUMINUM FOIL DUCT, 5"Ø, (4')
(6"Ø for 200 model)

HAE-1001-x00" – Offset Type

Includes ITEMS #1, 9, & 10.

- #1 - HAE-1001-x00 AIR EXCHANGER.
100 model (W=14", H=13", L=50")
200 model (W=14", H=17", L=50")
- #9 - ½"Ø PLASTIC DRAIN HOSE X 15 FT.
- #10 - MOUNTING BRACKETS X 2.



HAE KITS for HAE-1001-x00 Offset Type

The OKIT-101 & OKIT-201 Includes

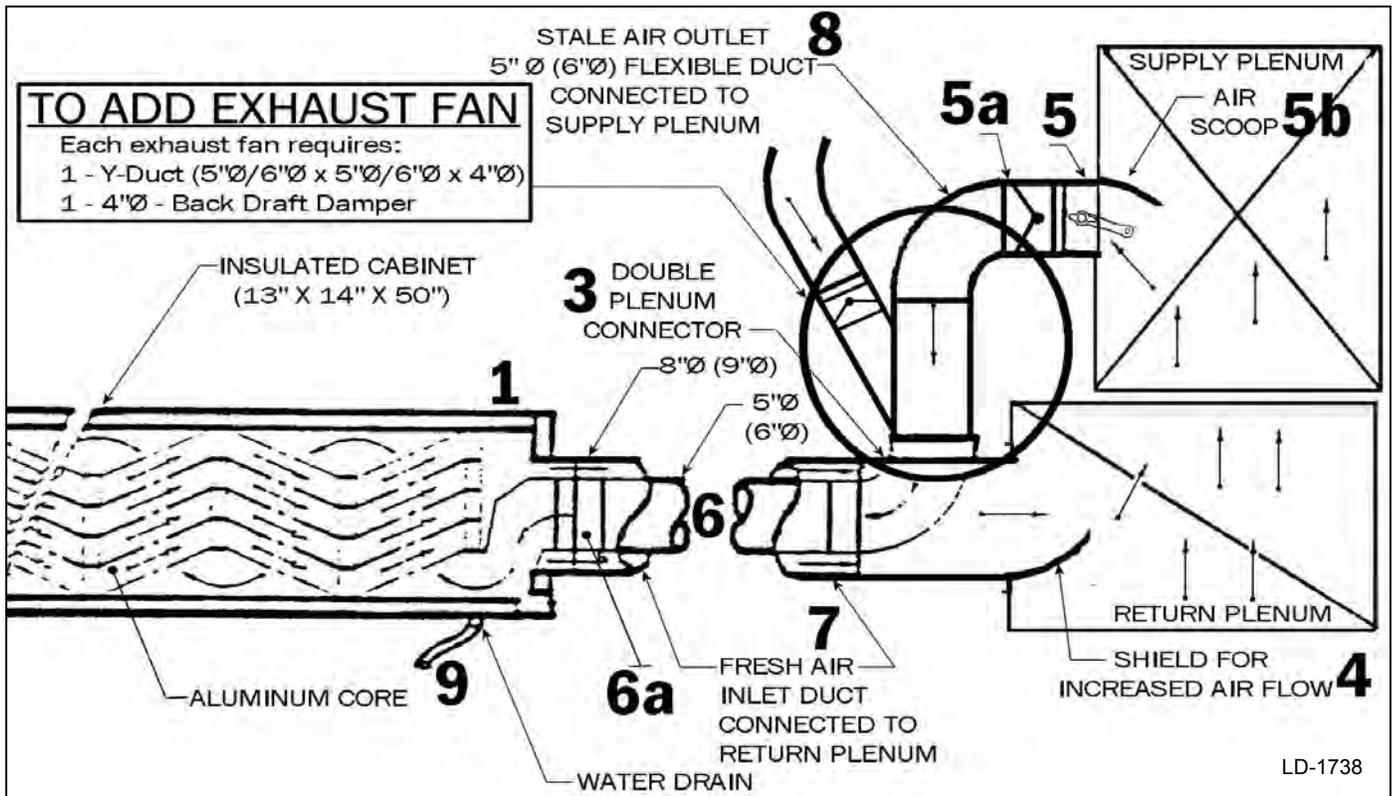
- #2b - ALL WEATHER OUTLET HOOD, 5"Ø, VELCRO
(6"Ø for 200 model)
- #2c - ALL WEATHER INLET HOOD, 6"Ø
- #5 - HAE MANUAL AIR BALANCE DAMPER, 5"Ø
(6"Ø for 200 model)
- #5b - AIR FLOW SCOOP, 5"Ø (6"Ø for 200 model)
- #4 - AIR FLOW SHIELD 6"Ø
- #3a - RETURN PLENUM CONNECTOR 6"Ø

The OKIT-100 & OKIT-200 Includes

- #2 - HAE DOUBLE HOOD - ALL WEATHER, 8"Ø
(9"Ø for 200 model)
- #2d - HAE OFFSET DOUBLE HOOD CONNECTOR, 8"Ø
(9"Ø for 200 model)
- #5 - HAE MANUAL AIR BALANCE DAMPER, 5"Ø
(6"Ø for 200 model)
- #5b - AIR FLOW SCOOP, 5"Ø (6"Ø for 200 model)
- #4 - AIR FLOW SHIELD 6"Ø
- #3a - RETURN PLENUM CONNECTOR 6"Ø

ADDING AN EXHAUST FAN(S)

FROM BATHROOM, KITCHEN AND OTHER AREAS



Mechanics of a Furnace Fan Generated Hoyme Air Exchanger (HAE), with Continual Air Flow

