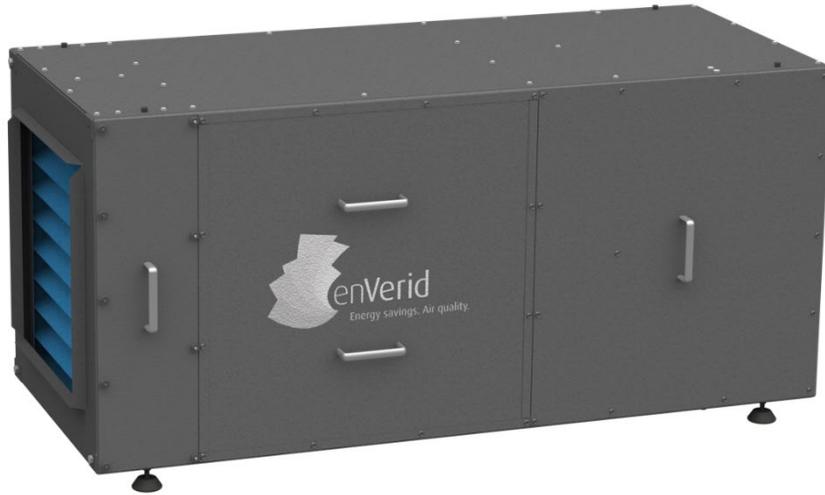


HLR[®] 100M

Installation Manual



21 Southwest Park, Westwood, MA 02090

617-795-4000

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Safety

Read this manual in its entirety prior to performing any work on the HLR 100M module. Follow the recommendations provided in this manual to ensure personal safety, proper installation and operation, optimal performance, and maximum module life.

WARNING! Personnel untrained to work with electrical equipment may be seriously injured or killed if allowed to work on the HLR 100M module. Do not attempt to perform any electrical work without proper personal protection equipment.

- Do not alter, puncture, or cut into the casing of the HLR module at any location without prior written approval from enVerid Systems Inc.
- All work performed on the HLR 100M module must comply with local and state codes, federal regulations, the construction documents, and this manual.
- Only authorized, trained, and certified personnel should perform or supervise any work on the HLR 100M module.
- Only qualified licensed electricians should perform any electrical work exterior to the HLR 100M module.

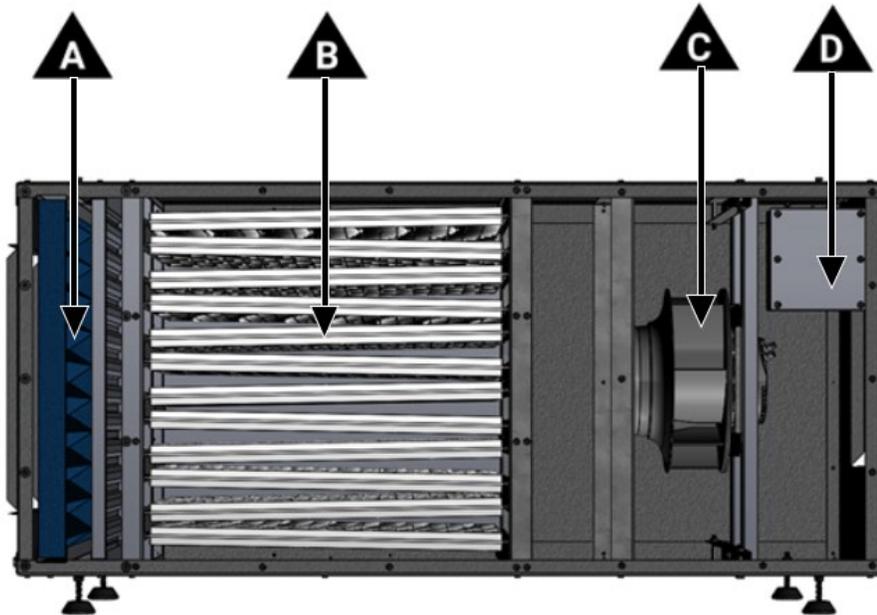
HLR 100M Module Overview

HLR 100M Module Components

The HLR 100M module can be installed in either a vertical or horizontal orientation. Descriptions and procedures for both configurations are given in this manual.

Each HLR 100M module is a self-contained cabinet pre-assembled with the components shown below.

Figure 1 HLR 100M Component Location and Description



Pre-filter: Houses a 24" x 24" x 2" pleated filter



Cartridge Bank: Houses a set of 12 air-permeable sorbent cartridges



Fan: Fan controls airflow through the module



Control Box: Electrical point of connection & fan speed controller

Component Descriptions

- **HLR Module Casing:** The casing is made of a single-wall, galvanized steel construction with powder-coated paint.
- **Sorbent Filter Bank:** The sorbent filter bank houses 12 sorbent filters that capture contaminants of concern (VOCs, aldehydes, carbon dioxide, and other inorganics).
- **Fans:** Integrated DC, brushless fans control airflow through the HLR 100M module.
- **Control Box:** Protected electrical component enclosure that houses the electrical point of connection, fan on/off relay, and manual speed controller (potentiometer).
- **Indoor Air Inlet:** 18" X 18" flanged inlet for indoor air to be cleaned.
- **Clean Air Outlet:** 12" X 12" flanged outlet with integral bird screen which delivers cleaned air to the airstream or directly to the occupied space.
- **Main Power Pathway:** External power connection port with (2) ¾" knockouts for power & signal.

Module Dimensions and Weights

Figure 2: 100M Module Dimensions

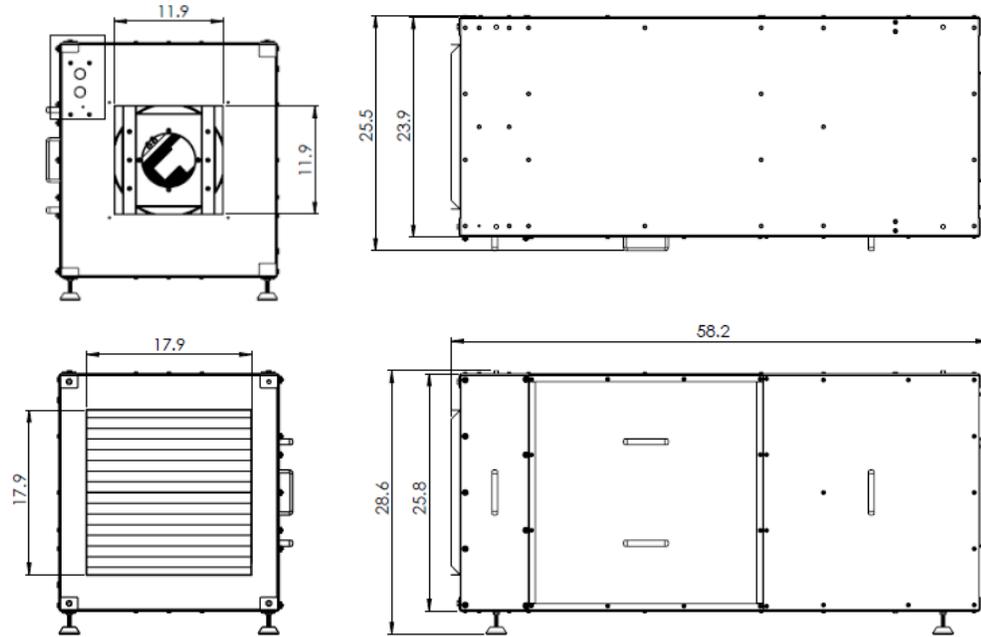


Table 1: Dimensions and Weights

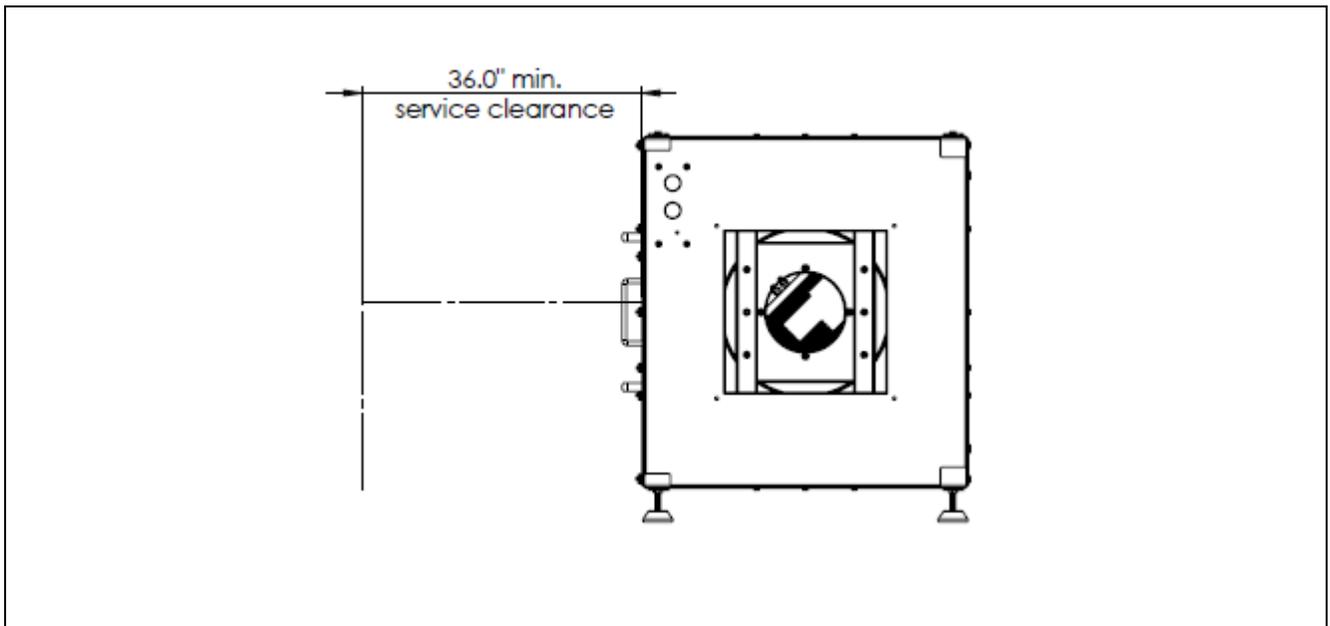
HLR 100M	Dimensions (Including Dampers and Handles)
Vertical Configuration	
Height	58.20" / 1,478 mm
Width	24.86" / 631.5 mm
Depth	25.75" / 654 mm
Horizontal Configuration	
Length	58.20" / 1,478 mm
Height	24.86" / 631.5 mm
Depth	25.75" / 654 mm
Inlet Duct Connection	17.88" X 17.88" with 1" flange
Outlet Duct Connection	11.88" X 11.88" with 1" flange
Weight	
Module Shipping Weight	150 lb/68.2 kg
Filter Shipping Weight	198 lb/90 kg
Module Installed Weight	348 lb/158.2 kg

Maintenance and Service Clearance Requirements

The area around the HLR 100M module should be kept clear for maintenance and service. The following diagrams show the clearances to be maintained for proper operation and installation, as well as the clearances required for servicing the module.

CAUTION: Keep the area in front of the control box clear of obstructions as required by the local electrical code.

Figure 3: HLR 100M Minimum Clearances



Installation

HLR 100M Module Installation

Each HLR 100M module with pre-filter is shipped in its own container. The sorbent filters are shipped in separate cartons.

Note: The sorbent filters may arrive separately from the HLR modules.

If any damage to the packaging for the HLR 100M module(s) is visible upon receipt, inspect the package further to see if there is any damage to the contents.

If the project is not ready for installation, store the HLR 100M module(s), pre-filter(s) and filter set(s) in the original packaging, in the proper orientation, and place them in a dry, clean, indoor space that minimizes fluctuations in relative humidity and maintains a temperature between 40 °F and 85 °F. The pre-filters and sorbent filters must remain dry while in storage.

When the project is ready for the HLR 100M module(s) to be installed, remove the module from its container and inspect it for any defects or damage. Report any problems to your local sales representative.

Each HLR 100M module comes with 4 X holes on top and bottom of the unit for hanging the unit or installation of threaded feet for floor-mounted applications.

We recommend unloading the module close to the installation site or placing it on corner dollies for easy transport.

Transport the HLR 100M module to its installation location and place in the orientation required for the installation.

Note: The HLR 100M operates in either a horizontal or vertical configuration.

Locate the module so that the proper clearances are maintained in either orientation, as shown in the Figure 5.

Once the HLR 100M module has been set in place, it is ready to be connected to the return air ductwork or plenum, electrical power, and controls.

Installation Requirements

Note: HLR 100M module(s) should be installed per local and federal code requirements.

Prior to installation, review the drawings issued for construction, any bulletins or addenda received, and requests for information responses pertaining to the installation of the HLR 100M module(s). Ensure that installation of the module(s) is done in accordance with the approved coordination drawings and that proper service and maintenance clearances are maintained.

The location of the HLR 100M module(s) is determined by the installation criteria discussed in the HLR Design Manual. Some of the considerations are:

- Unit geometry
- Clearances in the mechanical room
- Proximity to the return air duct
- Placement: The HLR 100M module can be set on the floor or hung in a horizontal position, or hung in a vertical position
- Ensure that the HLR 100M module has the correct single phase power connected
 - North America: 208V-277V, 60Hz
 - International: 200V-240V, 50 or 60Hz
- Provide a disconnect switch that can be locked in the off position, mounted externally to the unit

If the HLR 100M module(s) location does not appear to be suitable, request clarification from the design team.

Prior to setting the HLR 100M module(s) in the mechanical room, verify from the contract documents that a housekeeping pad is not required.

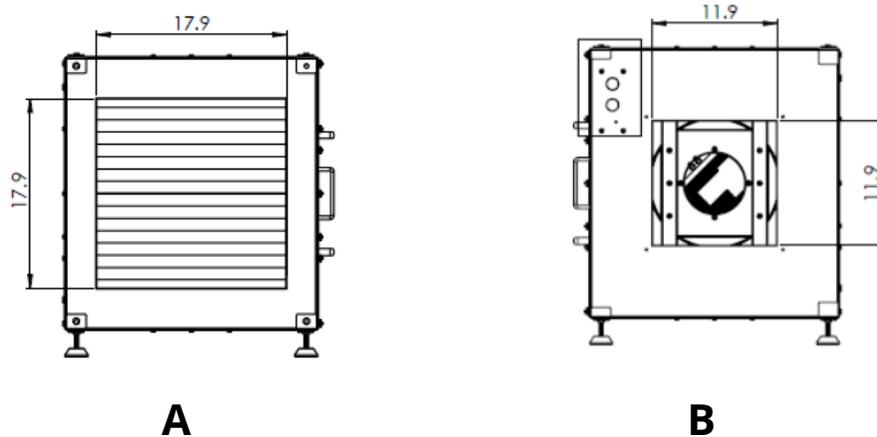
For additional technical support required during installation or operation, contact the manufacturer.

Ductwork Connections

The HLR 100M was designed to be installed in a plenum or in the space that it is cleaning. The figure below shows how to set up the HLR 100M for a plenum/space installation.

Note: Field installed ductwork cannot be smaller than the flange opening.

For ducted connections, see Figure 4.

Figure 4: HLR 100M Duct Connections

- A Indoor Air Inlet:** Connected to return air ductwork via a duct connection or terminated as an open end with bird screen (architectural grille also acceptable).
- B Clean Air Outlet:** This port is normally connected to a short length of ductwork, 2" or longer. This ductwork can be straight or elbowed to direct the cleaned air toward the mixing box. This port should terminate as an open end with bird screen (architectural grille also acceptable). Overhead clearance should be provided to maintain proper flow.

The inlet air and cleaned air outlet ductwork should be connected to the appropriate air handling module's return air ductwork, or as shown on contract drawings.

The ductwork should be separated by the amount shown on contract drawings or in the HLR Technology Design Guide. The inlet and outlet ductwork connections should be separated by a minimum of four (4) equivalent duct diameters. The HLR 100M can be installed as a single module, or in a cluster (multiple modules connected by common ductwork and acting as a single module).

The ductwork should be supported from the building structure. However, the electrical conduit for the HLR module(s) must be supported by its own supports, that is, the electrical conduits cannot be supported by the supports for the ductwork.

Neither the ductwork nor the electrical conduits can be supported off any existing supports or a support installed by any other trade without approval of the engineer of record. A flexible connector should be installed between the ductwork and the HLR 100M. The connector isolates the HLR 100M from the ductwork and minimizes the use of the module duct connectors to support the ductwork.

Ductwork should be insulated per local codes and installed in accordance with the contract documents.

HLR 100M Module Power

Note: HLR 100M module(s) should be installed per local and federal code requirements.

All requirements for wires, cables, raceways, and pull boxes should be verified in accordance with the project contract documents. All wiring should be installed in accordance with the local electric code (NEC with local amendments).

All conductors installed to supply power to the HLR 100M module(s) should be sized in accordance with the contract documents and local electric code. All wiring should be color coded in accordance with the electrical code. The wiring should include the required number of phase conductors, neutral, and full-size insulated (green) ground conductor.

Each HLR 100M module has a connection point for the branch conduit. The module should be connected to the branch conduit via a flexible connector. See the contract documents and local electrical code for length limitations. Coordinate the location of the power conduit, and the final location of the HLR 100M module(s) with the mechanical contractor and general contractor.

CAUTION: Only use the electrical connection as specified above. Do not drill any holes in the HLR module casing without prior written consent from the manufacturer.

The input power is based on the available voltage, as defined in Table 2.

Table 2: HLR 100M MCA/MOCP Ratings

Voltage In (VAC)	MCA (Rating)	MOCP (Rating)
@277	3.05 A	15 A
@230	3.25 A	15 A
@208	3.50 A	15 A

Provide a disconnect switch that is rated for 480 V. The enclosure for the disconnect switch shall have a minimum NEMA rating of 3R or greater, if called for in the contract documents.

The disconnect switch should allow locking in the off position to conform to the project/building's Lock Out Tag Out (LOTO) requirements.

The disconnect switch can be mounted on a Unistrut stand next to the HLR module or on a nearby wall.

Hardwired Control Points

The module can be hardwired to the building automation system via two pairs of 18 AEG wire connected to the single 14 VAC/DC relay located within the HLR 100M Module control box.

The relay controls Start/Stop for the unit and is required to isolate the HLR Module's 24 VDC powered control board from the Building Management System's 24 VAC power. The wiring contractor should only be wiring between the installed relays and the BMS. The wiring between the relays and control board is done at the factory.

The BMS supplies 24 VAC to the HLR Start/Stop Relay when the correct conditions are met to operate the Module/Cluster.

Optional 0-10VDC Fan Speed Control available. Factory mounted potentiometer allows for manual control for balancing.

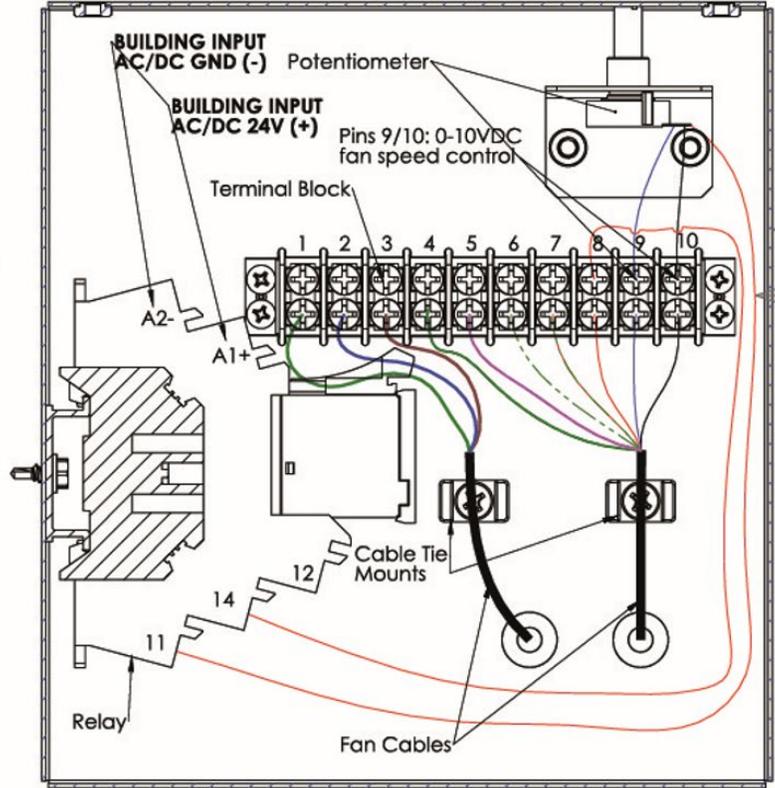
See wiring diagram on page 14.

Table 3: Hardwired Points

Control Point Name	Type
HLR Start/ Stop	Binary Output from the BAS
Fan Speed Control	0-10VDC from the BAS

Wiring Diagrams

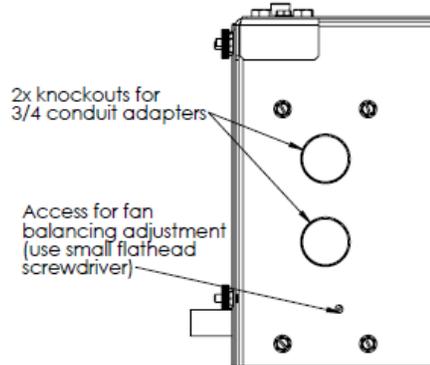
WIRING DETAIL			
COLOR	DESCRIPTION	TERMINATION A	TERMINATION B
FAN CABLES			
GREEN	AC Ground	-	1
BLUE	AC Neutral	-	2
BROWN	AC Hot	-	3
GRN/BLK	Alarm Relay 2	-	4
PNK/BLK	Alarm Relay 1	- </td <td>5</td>	5
GRN/WHT	RS-485+	-	6
GRN/RED	RS-485-	-	7
RED/PNK	+10V DC	-	8
BLU/WHT	0-10V Control	-	9
BLACK	DC Ground	-	10
POTENTIOMETER WIRING			
BLACK	DC Ground	A	10
BLUE	Pot Output	B	9
RED	+10V DC	C	14
RELAY WIRING			
RED	+10V DC	8	11
	+24V AC/DC BUILDING CTRL		A1+
	GND AC/DC BUILDING CTRL		A2-



Accessing the Control Box

Follow the steps below to access the control box.

Figure 5: Accessing the Control Box



To access the control box:

1. Remove 14 X bolts from left and right of fan access door using 5/16" wrench or socket. Lift and remove panel.
2. Remove 6 X bolts from electrical box panel using 5/16" wrench or socket. Lift and remove panel.

Installing Sorbent Filters

Before the arrival of support personnel on site, install the sorbent filters according to the instructions below.

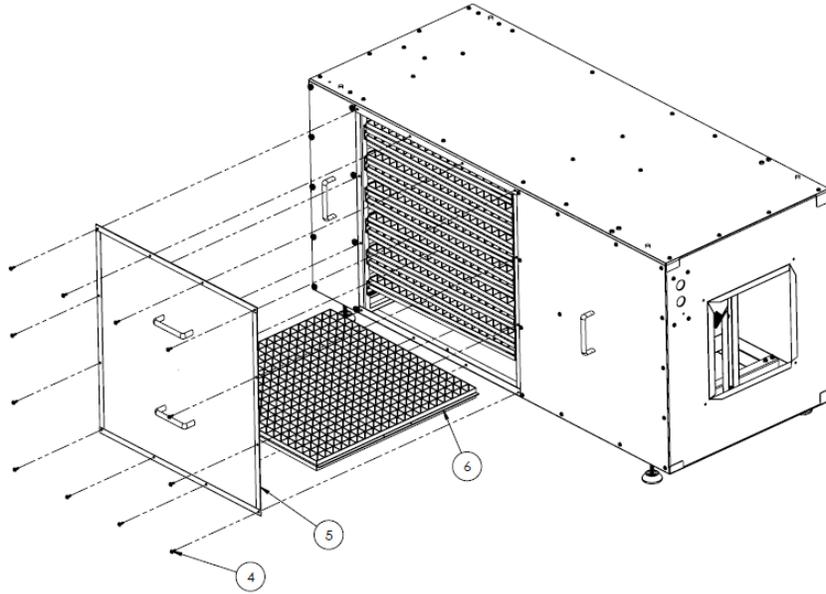
This section describes how to properly install new sorbent filters and verify the seal in the module. Before beginning this procedure, make sure you have all personal protection equipment that is required which should include the following:

- Work gloves
- OSHA- or company-approved work shoes

Ground HLR module to remove static charge

This procedure requires only a 5/16" or 8mm nut driver.

WARNING! Do not remove the filter access door without powering down the module, turning off the electricity, and locking the electrical cabinet.

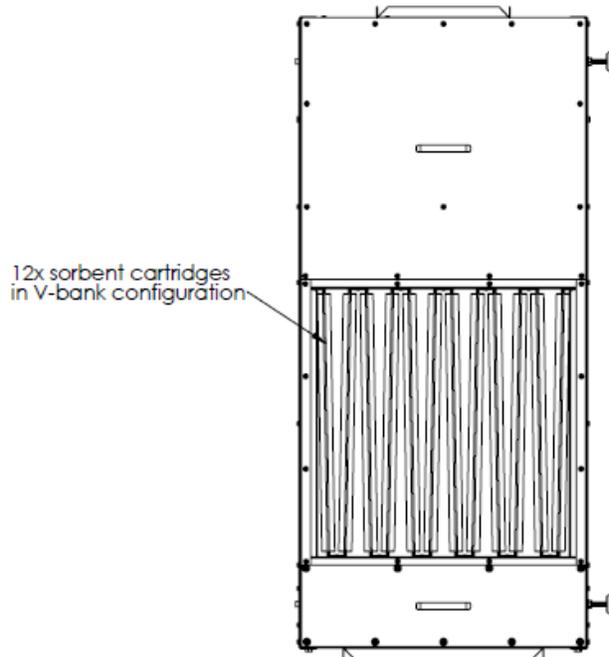
Figure 6: Remove Filter Access Door

To remove the filter access door:

1. Remove 12 X bolts (4) from left and right of filter bank access door (5) using 5/16" wrench or socket. Lift and remove panel.
2. Once panel is removed, 12 X sorbent filters (6) can be removed and replaced. Replace filters in V-bank arrangement so that protrusions on filters fit into sheet metal channels on both sides.
3. To replace panel, slip large portion of keyhole over 2 X bolts that were not removed and slide sideways into place. Replace 6 X bolts and tighten all 8 X bolts.

WARNING!

When in a high wind area such as a plenum, secure the removed cover. The cover may be pulled by moving air and cause injury to persons or damage to equipment.

Figure 7: Sorbent Filter V – Bank Arrangement

CAUTION: Use only hand tools. Using a power tool may strip the threads in the filter cabinet and degrade the quality of the seal.

CAUTION: Before handling the sorbent filters, read the Safety Data Sheet that is included in the shipping carton.

When handling sorbent filters, always hold them by the outside edge. If the fabric seal on the grid sorbent filter body is torn or punctured, send photos of the damaged filter to the manufacturer so they can be reviewed to determine if the filter can be repaired or should be discarded. Follow all written instructions in the return email.

Use gloves when handling sorbent filters.

CAUTION: Great care should be taken to prevent the filters from getting wet. If the filters should happen to get wet in transit, contact your local support representative.

CAUTION: Do not crush or perforate sorbent filters during handling.

1. To insert the first sorbent filter, open the carton and remove the top one by grasping the outside edge.
For vertical configurations, set one edge of the sorbent filter in the second rail from the right.
For horizontal configurations, set one edge of the sorbent filter in the second rail down from the top.

Note: The top/right rail is not used.

2. Make sure that the sorbent filter is over the rubber gasket.
3. Bring the sorbent filter toward the opposite rail and make sure that the rubber gaskets are pushed in sufficiently to allow the sorbent filter to be on both gaskets at the same time.
4. Slide the sorbent filter in by holding the outer edge.

CAUTION: Do not use any soap or lubricant on the flexible seal during the insertion process. This may damage the sorbent filter bank.

Note: Be firm when inserting the sorbent filter, but do not force it. If the sorbent filter stops, remove it and try again. Double-check and ensure that it is in the correct tracks on both sides.

5. Slide the sorbent filter in until it is well-seated against the rear wall gasket. Verify that it is well-seated against the back wall.
6. Continue installing the rest of the twelve sorbent filters.

Note: Each pair of the sorbent filter form a V-shape. This configuration is crucial for correct operation.

HLR 100M Hanging Bolt Installation

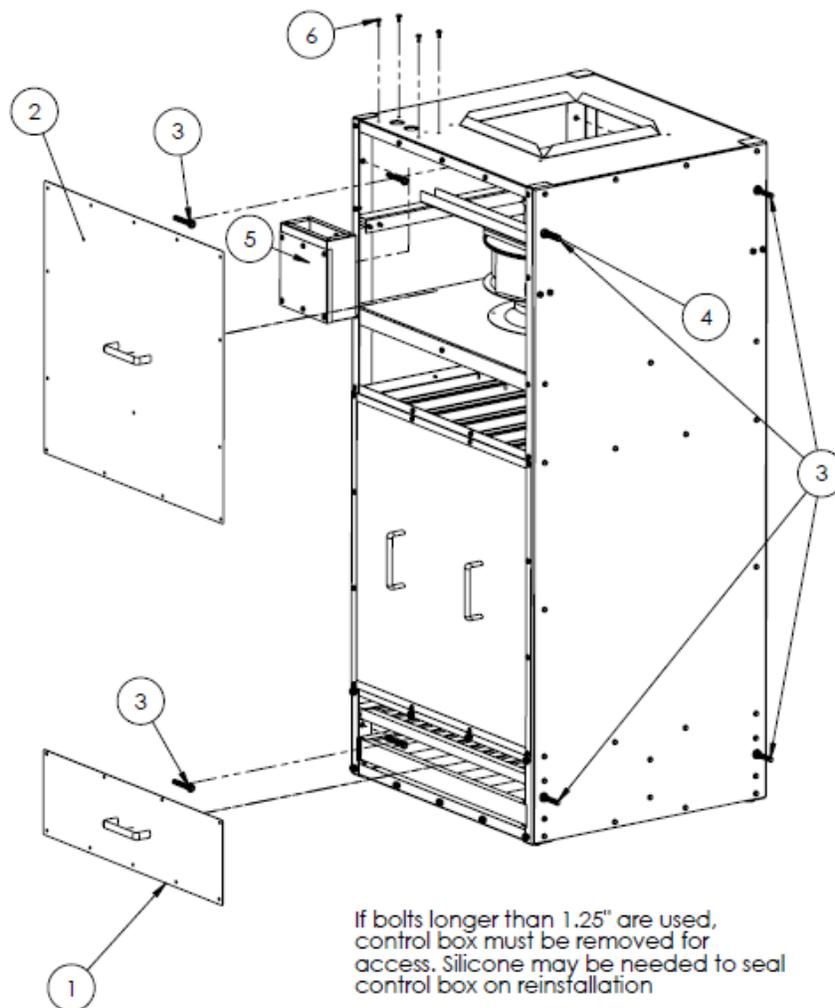
Before beginning this procedure, make sure you have all personal protection equipment that is required which should include the following:

- Work gloves
- OSHA- or company-approved work shoes

This procedure requires a 5/16" or 8mm nut driver and 9/16" wrench or socket.

Ground HLR module to remove static charge

Figure 8: Hanging Bolt Installation Detail



To remove the filter access door:

1. To gain access to mounting points, remove pre-filter access by removing the wing nuts. Slide out the pre-filter and the flame break panel to allow access to rear mounting points. Remove fan access panel screws using a 5/16" or 8mm socket and remove the panel.
2. The 4 X mounting points on each side will either have rubber plugs or feet installed. For vertical hanging (as shown in image), the plugs and feet should both be removed and 8 X mounting bolts should be installed. For horizontal hanging, only 4 X mounting bolts need to be installed, and the holes on opposite side should be sealed with either the rubber plugs or feet.
3. Obtain the correct numbers of 3/8" – 16 grade 8 bolts (1) and serrated flange nuts (2). Install bolts through the mounting points from the inside, and secure from the outside with 1x nut each.
4. Replace pre-filter, flame break panel, and access covers.
5. Unit may now be mounted to struts using the bolts and additional 3/8" – 16 grade 8 nuts. If unit is to be hung vertically, both sides must be supported. If unit is to be hung horizontally, the top, bottom, or both may be supported.

WARNING! When in a high wind area such as a plenum, secure the removed cover. The cover may be pulled by moving air and cause injury to persons or damage to equipment.

Pre-Filter Replacement Procedure

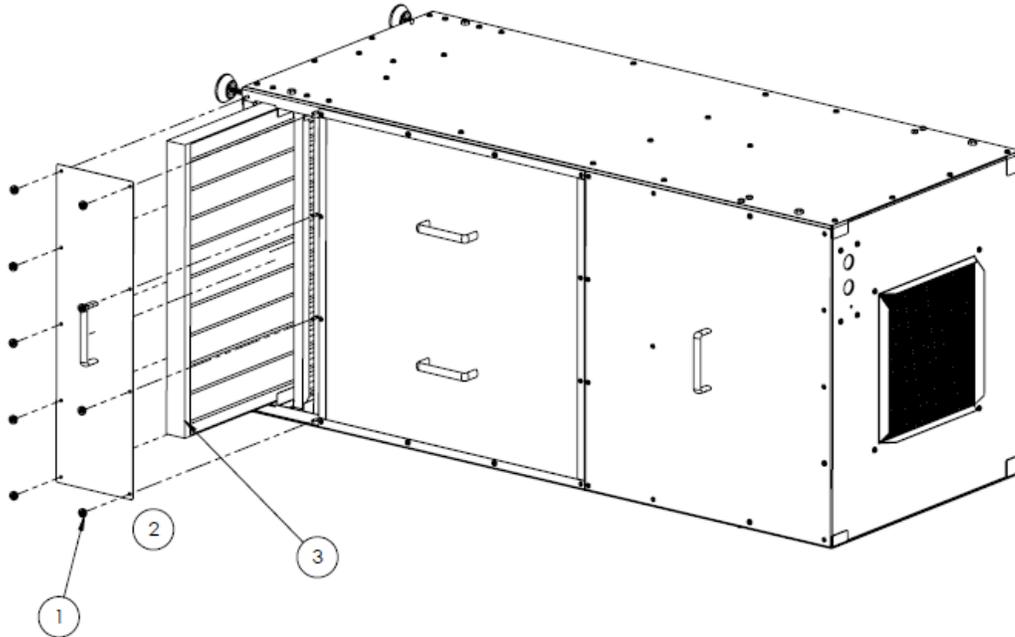
Before beginning this procedure, make sure you have all personal protection equipment that is required which should include the following:

- Work gloves
- OSHA- or company-approved work shoes

Ground HLR module to remove static charge

Note: Do not open the packaging for the inlet filter until you are ready for start-up.

Figure 9: Install Pre-Filter



Note: Before installing the pre-filter, verify that the perimeter gaskets are intact and have not been damaged.

To install the Pre-Filter:

1. Remove 9X thumb nuts (1) from studs on panel on intake side of machine.
2. Remove pre-filter access panel (2).
3. Slide pre-filter (3) directly outward in its rails to remove.
4. Reverse procedure to reinstall filter.

Initial Unit Startup

Once all the installation procedures have been completed and you have verified that the HLR 100M module is powered, complete and sign the Pre-Startup Checklist (page 230).

Pre-Startup Checklist

When this checklist has been filled in, scan it and email the signed form to your local representative or enVerid Systems Inc, at support@enverid.com

Equipment Installation

- Name Plate is attached to the HLR module and is readable.
- ETL Label is attached and legible.
- HLR module identification (HLR-1) is legible and matches construction documents.
- The units are free of scratches, dents, dings, and any other physical damage.
- Housekeeping pad or structural supports are per the plans, to allow for ease of removal of all doors.
- Vibration Isolation is installed in accordance with the manufacturer's written instructions:
 - Threaded feet for floor mounted units.
 - Flexible duct connectors installed on all duct connections.
- Proper maintenance clearances are maintained.

Ductwork Installation

- Ductwork is constructed and installed per the construction documents.
- Ductwork hangers and supports are constructed and installed per the contract documents.

Electrical

- Wiring is installed in accordance with the contract documents.
- Power wiring is installed in conduit/MC Cable from the HLR module to the electrical panel.
- Lockable disconnect is provided external to the HLR module per the manual.
- Conduit connects to the equipment at the designated location, and the connection is sealed airtight.
- Power wiring is run through the HLR module in the supplied pathway.
- Control wiring is installed and has been tested.
- AHU/ RTU has been started and balanced

Printed Name	Signature	Date

Service and Warranty

Scheduled Service

Item	Part Number	Replacement Frequency	Source
100M Filter Kit (12)	KC 100 L 2021 1 12	2 years	Sales Rep or enVerid
Pre-filter, 24" X 24" X 24" MERV-8	N/A	3 – 6 months*	HVAC supply store

* The Pre-filter replacement frequency varies based on building conditions and enVerid recommends changing it on the same schedule as other building filters.

Warranty Summary

For full details, see the enVerid Warranty Certificate supplied with the purchase documentation.

Warranty

enVerid warrants during the Warranty Period the HLR module(s) is free from defects in material and workmanship. For each HLR module, during the shorter of the 12-month period commencing on the start-up date or the 18-month period commencing on the shipping date of such HLR module (the "Warranty Period"), enVerid warrants that such HLR module will operate in all material respect in accordance with this warranty certificate. enVerid shall not be obligated to provide any other warranties or support beyond the terms of this warranty.

Coverage. During the Warranty Period, enVerid will provide without charge parts and labor to repair defects in the HLR module, subject to the provisions of this Warranty Certificate. enVerid's obligation is limited to repairing or replacing defective parts that prove, in enVerid's judgment or in that of an authorized representative, to be defective so as to impair normal operation of the HLR module. Where the HLR module is installed by enVerid, such installation is warranted against faulty workmanship for the same period (if any) as applies to the installed HLR module. During this concurrently running period, enVerid will correct, without charge, any workmanship it finds to be faulty.

Should you require immediate technical assistance with your enVerid HLR module:

- Call enVerid Systems Inc. at 617-795-4000
- Email us at support@enVerid.com
- Or contact your local rep

enVerid is committed to improving energy efficiency and indoor air quality in buildings worldwide through its innovative, award-winning HVAC Load Reduction® (HLR®) solutions. HLR technology enables immediate capital cost savings on new HVAC systems and provides up to 30% energy savings and superior indoor air quality. The HLR modules are deployed in commercial, academic and government buildings globally. enVerid's HLR Technology is ASHRAE and LEED compliant and eligible for utility rebates.

Please visit www.enverid.com



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