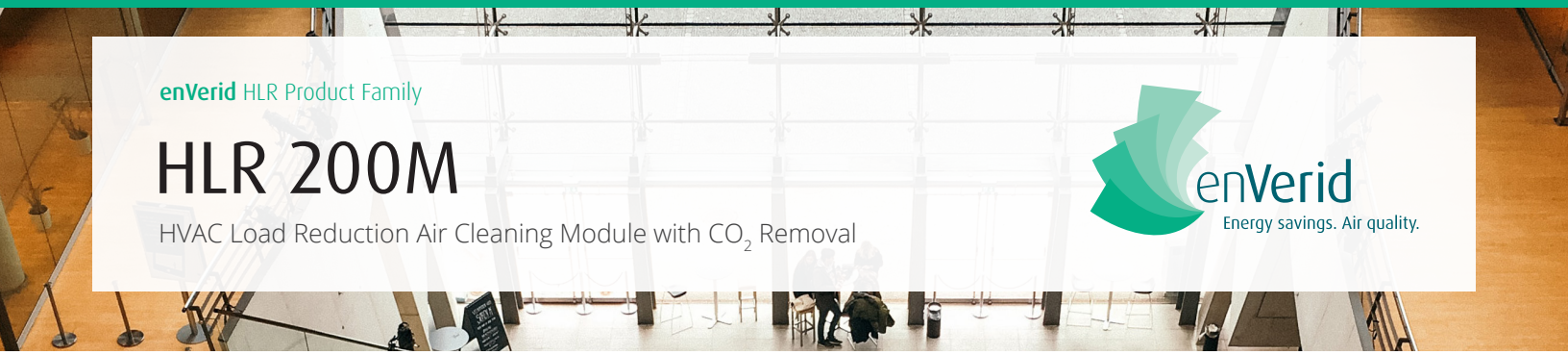


enVerid HLR Product Family

HLR 200M

HVAC Load Reduction Air Cleaning Module with CO_2 Removal

enVerid
Energy savings. Air quality.

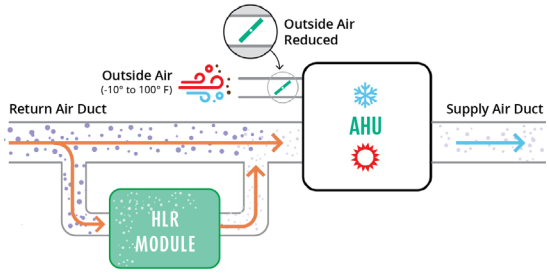
Improved Air Quality, Lower HVAC Costs

The HLR 200M is enVerid's award-winning air cleaning product that removes CO_2 and contaminants of concern from indoor air so that it can be safely recirculated. This solution reduces first costs and operating costs for new and existing HVAC systems, lowers a building's carbon footprint, and improves indoor air quality while also generating LEED and WELL building credits. Indoor air quality is improved by removing indoor-generated contaminants and reducing the intake of outdoor pollutants. The HLR 200M solution is compliant under ASHRAE 62.1 and IMC 403.2. The HLR 200M module is designed for indoor use. The HLR 15R module (not shown) is an outdoor model designed for rooftop installations.

HLR 200M Module

- IMPROVE AIR QUALITY
- SAVE ENERGY
- REDUCE COSTS
- REMOVE CO_2
- REDUCE CARBON
- EARN LEED/WELL POINTS
- NO BYPRODUCTS

Ventilation and Scrubbing



Outside airflow decreased using ASHRAE Standard 62.1 IAQP[1] calculations and maintaining positive building pressure.

[1] The mass balance analysis is performed per contaminant and per zone to ensure all contaminants are properly below their established limits. These "per zone" outside air CFMs are summed to yield the total ventilation required for the building. enVerid's IAQP calculator makes it easy.

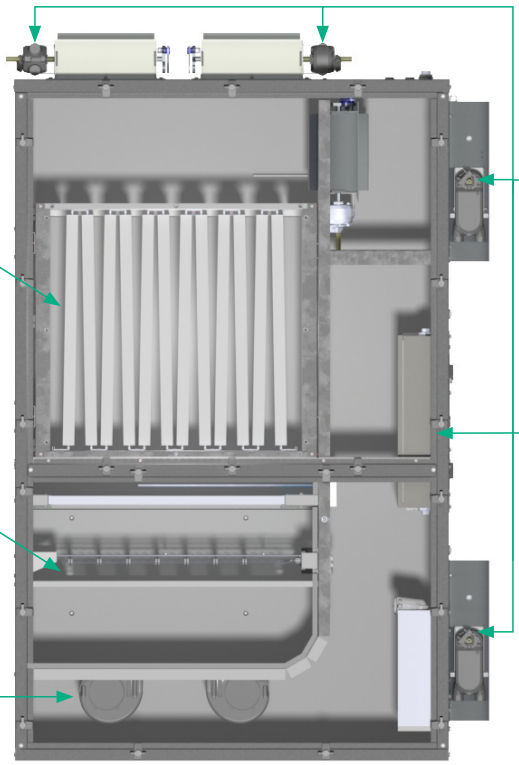
How it Works

Indoor Air Scrubbing – One or more HLR 200M modules can be installed on the return air side of an air handling unit (AHU). Air is drawn into the HLR 200M by internal fans, which blow the air through sorbent cartridges that capture and remove carbon dioxide (CO_2) and contaminants of concern from the air stream. Without producing any byproducts, the HLR 200M then blows clean air back into the return.

Automatic Self-Cleaning – The sorbents are designed to release captured contaminants upon heating. The HLR 200M module is equipped with a built-in heater and performs a periodic regeneration process to clean the sorbents and expel contaminants outside the building. Regeneration is managed for optimal performance and minimal energy use.

Outside Air Intake Reduction – By cleaning recirculated air, outside air ventilation rates can be safely reduced by up to 85%, and new HVAC equipment can be downsized, using the ASHRAE Standard 62.1 IAQ Procedure.

What's Inside the HLR 200M Module?



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

Heater
Raises the internal temperature to release captured contaminants during regeneration

Fans (2)
Fans control airflow through the module

Actuators and Dampers (5)
Automatically control airflow paths during adsorption and regeneration

Control Cabinet
Includes Niagara-based controller, plus power and controls components

Optional Air Quality Monitor
Measure the indoor air quality

Broadly Applicable

The 200M is ideally suited to integrate with custom and semi-custom airside systems, including systems with dedicated outside air systems (DOAS) and energy recovery ventilation (ERV) components, in office buildings, schools, and other commercial buildings.

- **Office Spaces**
- **Higher Education**
- **K-12 Schools**
- **Light Commercial**

Proven, Award Winning HLR Technology®

Hundreds of HLR modules have been specified and installed around the world by leading consulting engineers and HVAC contractors. Air cleaning efficiency has been validated by ASHRAE 145.2 testing, and energy savings have been field validated by multiple utilities who have provided incentives for installing HLR modules as well as by the U.S. Department of Energy. Unlike many other air cleaning technologies, independent lab tests show that HLR modules do not produce any byproducts. In 2019, HLR technology received the AHR Expo Product of the Year Award, the most prestigious award for an HVAC product.

AHR EXPO INNOVATION AWARDS 2019 PRODUCT OF THE YEAR

200M Module Specifications

GENERAL SPECS

Installation	Mechanical Room or Air Plenum
Construction	Single wall, Insulated, Powder-coated Galvanized Steel
Sorbent Cartridges per Set	12
Typical Airflow (Adsorption)	850 - 950 SCFM 1,444 - 1,615 CMH
Typical Airflow (Regeneration)	150 - 250 SCFM 255 - 425 CMH
Static Pressure Increase to AHU Fan	None
Sound Level	55 dBA
Maximum Allowed External Static Pressure	0.3" WG / 75 Pa
Maintenance	Two-year Cartridge Replacement
Operating Life	20+ years with scheduled maintenance

COMMUNICATIONS

BMS Integration	BACnet IP with BTL
Security	FIPS 140-2 compliant (2002 standard)

POWER (Single Phase)

Voltage (VAC)	Frequency (Hz)	MCA	MOCP
208 V	60 Hz	38.1 A	40 A
277 V	60 Hz	34.3 A	40 A
230 V	50 Hz	36.5 A	40 A

SYSTEM POWER CONSUMPTION

	208 V	277 V	230 V
Adsorption Mode	300 W	300 W	300 W
Regeneration Mode	5,500 W	6,500 W	5,800 W

DIGITAL INPUT (On/Off Signal)

Fire Alarm	Safety Stop for HLR Module
Regen OK	Permits Regen As Scheduled
AHU On	Permits Adsorption When AHU Is On

DIGITAL OUTPUT (On/Off Signal)

Exhaust Fan Start/Stop	Controls External Exhaust Fan
Aux Scrub Fan Start/Stop	Controls External Booster Fan
Unit Status	Signals Module On / Off State
Unit Alarm	Signals Normal Or Alarm State

WEIGHTS

Module Shipping Weight	650 lbs	295 kg
Cartridge Shipping Weight	200 lbs	91 kg
Installation (Module Only)	398 lbs	181 kg
Operating (With Cartridges)	598 lbs	271 kg

DIMENSIONS (Front View)

Height (Allow Additional 21" Clearance for Elbow)	72" / 1,829 mm
Width (Allow Additional 36" Clearance for Control Panel Service)	48" / 1,219 mm
Depth (Allow Additional 36" Clearance for Cartridge Service)	27" / 686 mm
Ducts	10" x 14" w/ 1.0" flange 254 mm x 356 mm w/ 25 mm flange

CERTIFICATIONS

HLR Module Safety	UL 1995:2015 Ed.5
	CSA C22.2#236:2015 ed.5
Cartridge Bank and Cartridges	UL 900:2015 Ed.8
Air Cleaning Efficiency	ASHRAE 145.2

ASHRAE Standard Compliance

Standard 62.1 for Ventilation & Acceptable Indoor Air Quality

All of enVerid's HLR products are fully compliant under ASHRAE Standard 62.1. By using ASHRAE's performance-based Indoor Air Quality Procedure (IAQP) rather than the prescriptive Ventilation Rate Procedure (VRP), engineers can calculate a minimum ventilation rate that optimizes indoor air quality and energy efficiency. Introduced in 1981, IAQP determines outdoor air intake rates based on an analysis of contaminant sources and air cleaning capacity to stay below recommended contaminant concentration limits. Tools developed by enVerid's in-house engineering team, including enVerid's online IAQP Calculator, streamline the application of IAQP for engineers.

Standard 145.2 for Assessing the Performance of Gas-Phase Air Cleaning Systems

HLR technology is one of the only air cleaning technologies to have undergone independent lab tests for cleaning efficiency using ASHRAE Standard 145.2. Independent labs have conducted ASHRAE 145.2 single-pass efficiency testing for all the contaminants of concern required to maintain acceptable indoor air quality in buildings.

enVerid helps buildings achieve ESG (Environmental, Social, and Governance), healthy building, and cost saving goals by improving indoor air quality while saving money and reducing energy consumption and carbon emissions. For new HVAC systems, enVerid's award-winning HVAC Load Reduction (HLR) Modules enable immediate capital cost savings. HLR Modules also deliver up to 40% energy savings and improved indoor air quality in new and existing buildings. enVerid's air filtration products remove particulate and microorganism contamination from indoor air without the significant cost of upgrading mechanical systems and increasing mechanical ventilation rates. enVerid's products are deployed in commercial, academic and government buildings globally. enVerid's HLR Modules comply with ASHRAE Standard 62.1, deliver significant LEED and WELL points, and are eligible for utility rebates. For more information visit enverid.com.