Direct-Fired Air-Turnover Indirect-Fired Infrared Unit Heaters Duct Furnaces Cooling

4000-Series Rapid® Engineering LLC

Air Handling Systems
Cooling, Energy Recovery, Heating & Pressurization

- Improved indoor air quality – Helps dilute airborne contaminants helping exhaust systems operate more efficiently.
- Superior ventilation - System can be designed to automatically modulate outdoor air volume from 20% to 100% to help meet ventilation requirements in cold weather and decrease heat buildup in warm weather.
- More consistent temperatures and less stratification – Free ventilation cooling effectively helps reduce indoor air temperatures to help keep people and processes productive.
- Improved efficiency and quiet operation from airfoil style fans.
- Design flexibility with a variety of heating options - Direct-fired burner, electric, hot water or steam.
- Customization - Broad range of sizes and options.
- Ease of management and control – Computer-based Intelligent Controls provide system information easily and effectively.
- Cost savings – Heating systems deliver up to 100% of the heat generated into the building resulting in energy savings.
- Installation flexibility and convenience - Heating systems require little to no ductwork. The evaporative cooling systems do not require condensers, chillers, water towers or distribution piping.

1.800.536.3461

www.rapidengineering.com

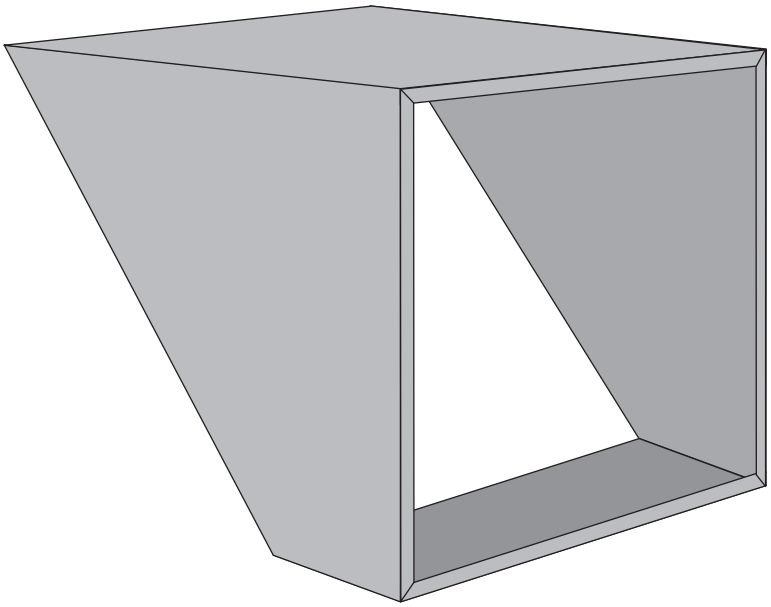
C ETL CM US LISTED Intertek

CANADA: 100% OUTSIDE AIR ONLY

Features and Benefits of the Customizable RAPID® 4000-Series Air Handler

Inlet Hood

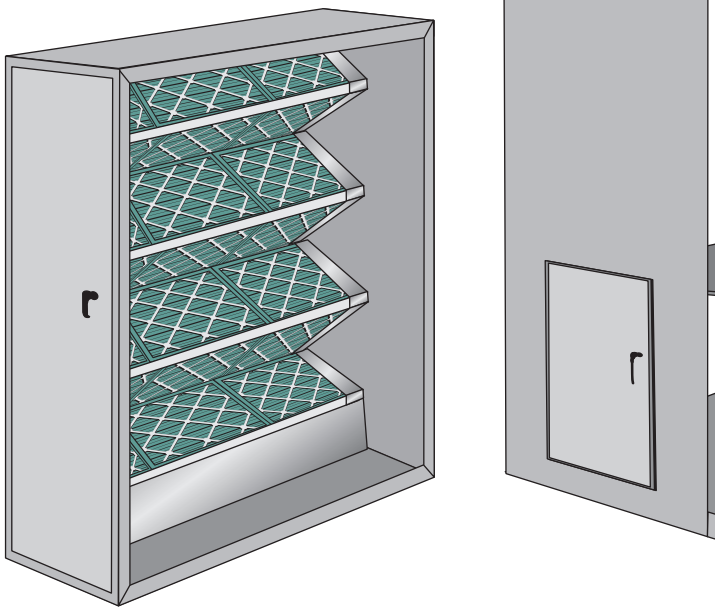
Inlet hoods help minimize water entrainment into the air handler. Incoming air enters the air handler via an angled face covered with birdscreen.



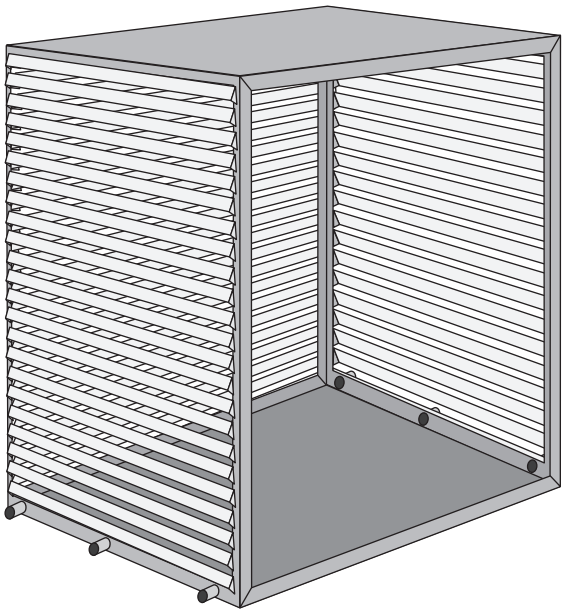
An inlet plenum may be used in place of an inlet hood.

Filter Section

The filter section cleans the outside air before it is delivered to the conditioned space. Various filters are available, including pleated, polyester, aluminum mesh, bag and cartridge.

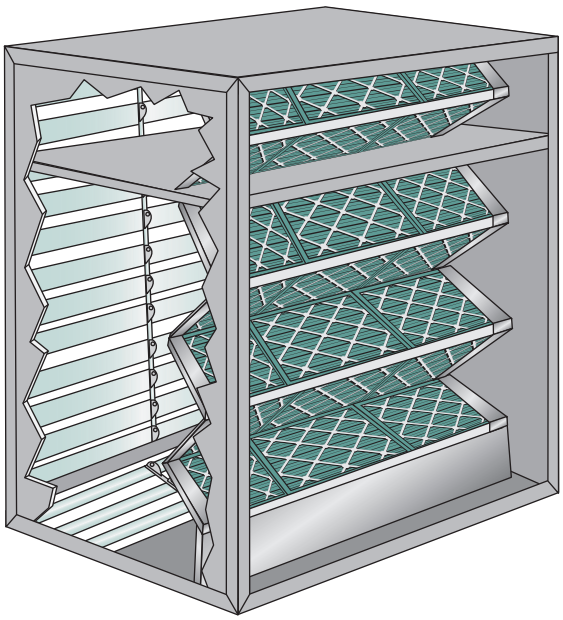


Instead of a filter section, a filtered mix box section may be used.



Inlet Plenum

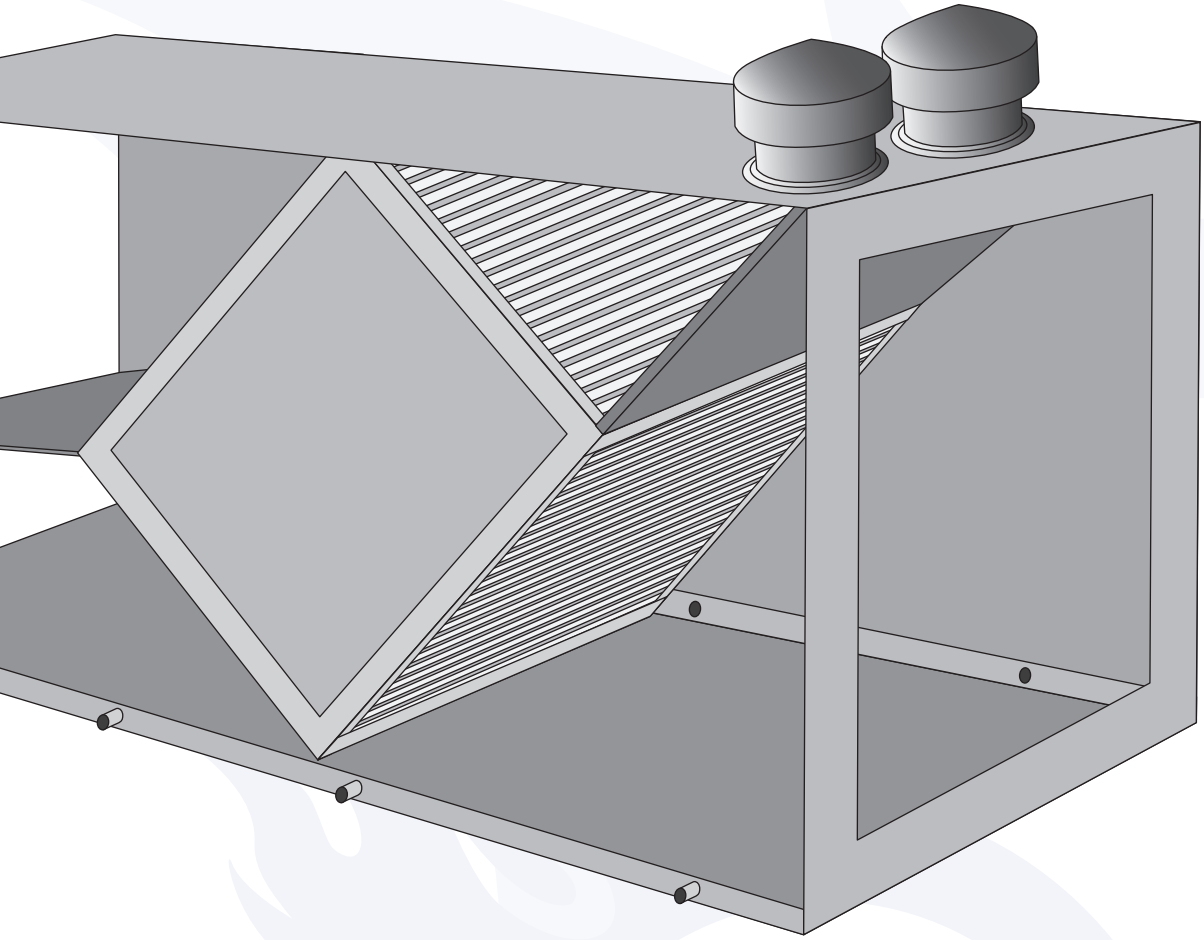
Inlet plenums help minimize water entrainment into the air handler. Incoming air enters the inlet plenum through three sides covered with moisture limiter media or optional metal louvers. With a sloped floor, the inlet plenum is equipped with drain outlets to the roof or pad for water removal.



Filtered Mix Box Section

Treating both outside and return air, filtered mix box sections help clean the incoming air before it is delivered to the conditioned space. Various filters are available, including pleated, polyester, aluminum mesh, bag and cartridge. Damper options include manual positioning, summer ventilation economizer and automatic positioning based on building pressure.

Mix and Match **various combinations of optional sections to meet specific design requirements. Create one of the greenest air handlers available today by combining filtration, energy recovery, a direct-fired burner and the standard backward inclined airfoil fan.**



Energy Recovery

Standard energy recovery modules are available for air flows up to 60,000 CFM (larger custom sizes also available). When the air handler is heating, an energy recovery module unit can help greatly reduce fuel consumption by using warm exhaust air to pre-heat the incoming outdoor air. During summer ventilation, during the use of a mechanical cooling section or when defrost is required, face and bypass dampers may be used to divert outside air around the energy recovery module. With a plate-style energy recovery module, exhaust air and incoming air pass each other in a cross-flow pattern, divided by thin metal plates. Sensible energy is transmitted from the exhaust air to the incoming air via conduction. There are several benefits of the plate-style exchanger over other types of energy recovery, including minimal wear and long life because there are no moving parts. In addition, the exhaust air will not cross-contaminate the supply air.

Exterior Finish (Paint)

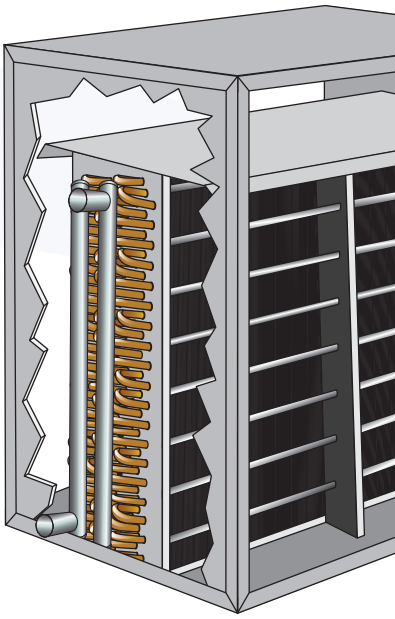
Three standard colors are available for equipment exterior finish. Each color is represented below (actual color may vary due to print quality vs. product application). Colors are available for enamel or epoxy paint. The final external coating incorporates a high gloss solvent borne acrylic modified alkyd enamel. Special paint colors and/or exterior coatings are available upon request.

Basalt Gray	Silk Grey	Traffic White
RAL 7012	RAL 7044	RAL 9016

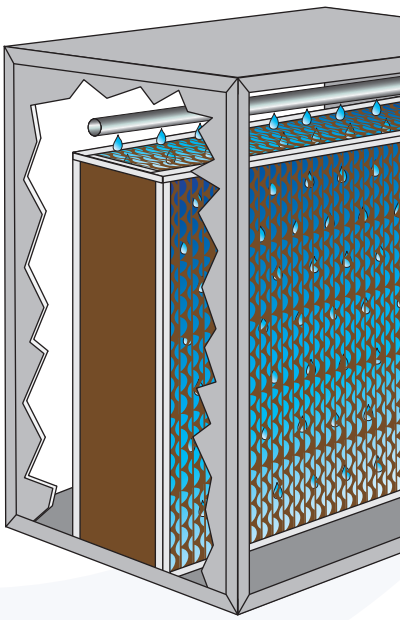
Cooling Coils

A variety of mechanical cooling c
are available, including:

- Direct Expansion (DX) Coils - Co
Row quantity, fin spacing, circui
fit the specific application.
- Chilled Water - Well suited for
coil sizes and materials are availa
- Many other options, including a



Evaporative cooling can be instead of cooling coils.



Evaporative Cooling

The evaporative cooling system
Evaporative cooling works whe
specially treated wetted
media. The heat passes from th
causing water to evaporate and
airstream.

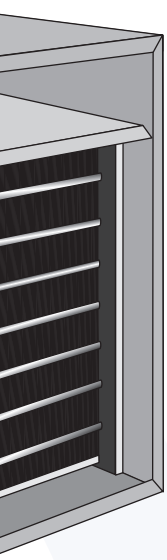
coils

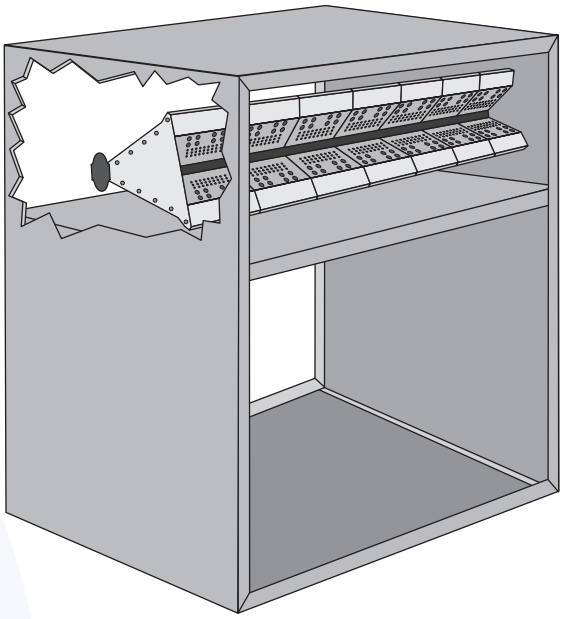
ommon in systems up to 100-150 tons.
ting and refrigerant can be customized to

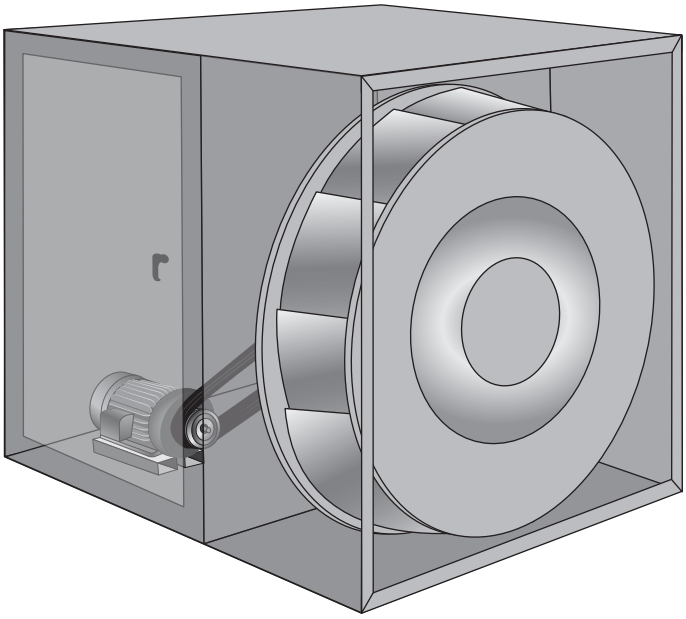
100-250 plus tonnage range. A variety of
able.
auto defrost and reheat are also available.

Direct-Fired Burner

Direct-fired burners maintain 100% combustion efficiency and have a nominal turndown of 30:1. Burners consist of an aluminum manifold and stainless steel burner plates. Burner assembly includes manually-adjustable profile plates, ultra-violet scanner flame failure system, electric spark ignition, main and pilot gas lines.





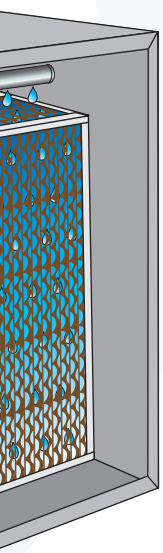


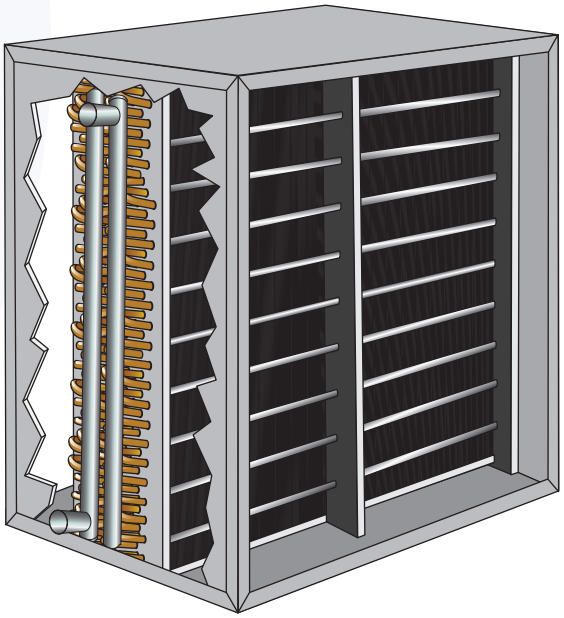
used

Heating coils can also be used in addition to or instead of the direct-fired burner

Fan Section

Featuring a single width, single inlet (SWSI) backward-inclined airfoil fan, the fan section easily moves large air volumes ranging from 5,000 to 150,000 CFM at higher static pressures and with lower motor horsepowers. An inlet cone is used to streamline air flow into the fan wheel to help ensure full and even loading of the fan blades. Fan bearings have a minimum American Bearing Manufacturers Association (ABMA) rating of L10 at 100,000 hours for long life. Each fan is driven by multiple V-belt drives connected to the motor. Five discharge openings are available (top, bottom, left, right, end) for flexibility.





n is an economical solution.
n warm air passes over

e air to the wetted media,
d resulting in cooling of the

Heating Coils

In place of, or in addition to the direct-fired burner, electric, hot water or steam coils can be used. Coils are factory-installed with the appropriate safety devices.

RAPID® 4000-Series

RAPID™ 4000-Series air management systems help improve indoor air quality and provide air comfort.

RAPID™ 4000-Series air handlers can be designed to efficiently establish and maintain a slightly pressurized condition in your facility, while gently tempering outdoor air and, as required, mixing it with existing indoor air.

Note: All models are available in upright or horizontal, as well as indoor or outdoor configurations.

Model	4024	4036	4040	4044	4049	4054	4060	4066	4073	4080	4089
Airflow (CFM)	5,000 - 10,000	10,000 - 25,000	15,000 - 30,000	20,000 - 35,000	25,000 - 45,000	30,000 - 50,000	30,000 - 60,000	35,000 - 80,000	40,000 - 95,000	55,000 - 100,000	55,000 - 150,000
Output (MBH)*	540- 1,080	1,080- 2,700	1,620- 3,240	2,160- 3,780	2,700- 4,860	3,240- 5,400	3,240- 6,480	3,780- 8,640	4,320- 10,260	5,940- 10,800	5,940- 16,200

*1 MBH=1,000 Btu/h. Output range indicates range at maximum temperature rise.

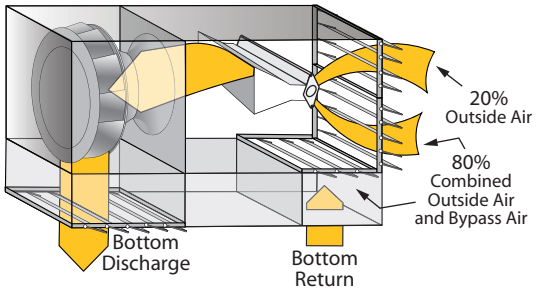
Model Configurations

Air Management (AM) Models

Design: Variable outside air/return air ratio within the range of 100% outdoor air/0% return air to 20% outdoor air/80% return air. Discharge air volume is fixed.

Function: Automatically responds to building pressure and temperature needs.

Application: Used in industrial and commercial buildings that have air quality and specific air management requirements.

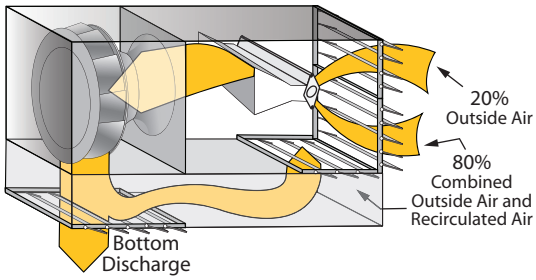


Variable Air Volume (VAV) Models

Design: 100% outdoor air with a variable discharge air volume from 20%-100% with use of bypass section.

Function: Automatically responds to building pressure needs.

Application: Used in buildings requiring various levels of replacement air.

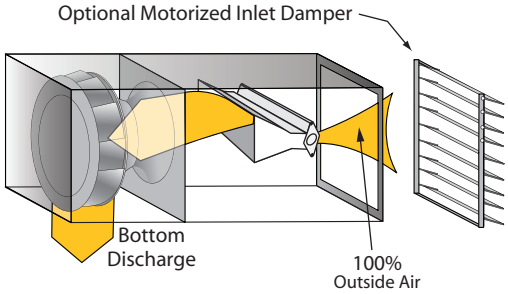


Make-Up Air (MUA) Models

Design: 100% outdoor air with a fixed discharge air volume (or a variable discharge air volume if a variable frequency drive is used).

Function: Supplies direct replacement air for building mechanical exhaust.

Application: Used as make-up air for industrial applications which incorporate mechanical exhaust.

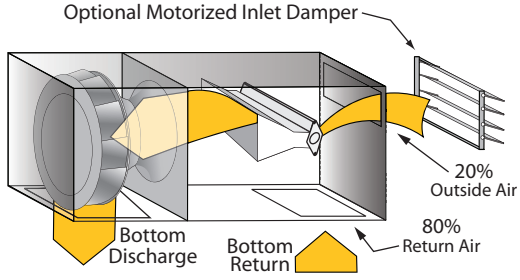


Fixed Recirculation (FR) Models

Design: Fixed 80% return air and 20% outdoor air. Discharge air volume is fixed.

Function: Provides efficient, low-cost heating where minimum ventilation rates are required.

Application: Used in warehouses, distribution centers, retail outlets, etc.



RAPID® 4000-Series Intelligent Controls

Intelligent Controls are key to keeping HVAC and productivity costs in line. Each air handler can be controlled by a DDC module to monitor, control, diagnose, log and report on a variety of functions. Time-saving benefits of Intelligent Controls include:

• **Easy to use and service** - Helps simplify set up and allows for quick and efficient programming changes.

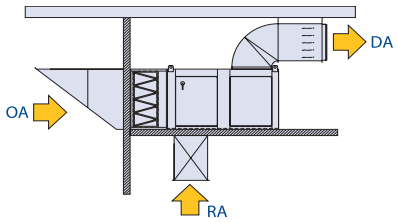
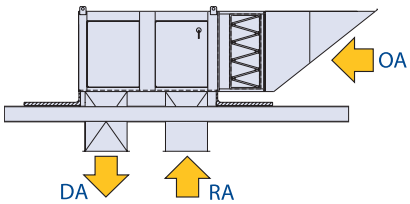
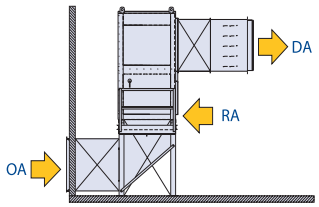
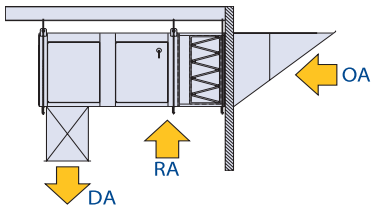
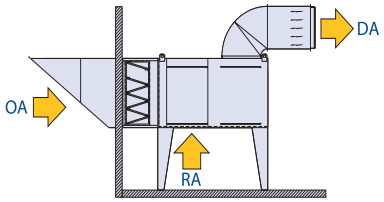
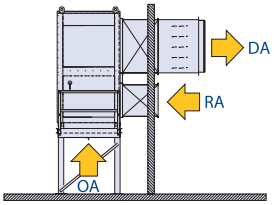
• **Greater control** - Temperature, humidity and building pressure can be precisely monitored. Automatic tracking and recording of heating energy use and test operating parameters also available.

• **Early detection of problems** - System can proactively detect and notify of potential problems.

• **Data collection and trending** - Hourly logs of each air handler available. Information can be downloaded into a spreadsheet program for in-depth analysis.

• **Compatibility -** Via modem, Internet or local network; controls communicate via the leading protocols including BACnet®, ModBus, N2Bus and LonWorks systems.*

Typical Installations

Mezzanine Supported (Indoor)	Horizontal on Roof Curb (Outdoor)	Upright (Indoor)
		
Suspended (Indoor)	**Horizontal on Legs (Indoor or Outdoor)**	**Upright (Outdoor)**
		

LEGEND	OA = Outside Air	DA = Discharge Air	RA = Return Air

Rapid Engineering LLC
1100 Seven Mile Road NW
Comstock Park, MI 49321
Telephone: +1.616.784.0500
Toll Free: +1.800.536.3461
Fax: +1.616.784.1910
www.rapidengineering.com

Installation Code and Annual Inspections:
All installation and service of RAPID® equipment must be performed by a contractor qualified in the installation and service of equipment sold and supplied by Rapid Engineering LLC and conform to all requirements set forth in the Rapid Engineering LLC manuals and all applicable governmental authorities pertaining to the installation, service, operation and labeling of the equipment. To help facilitate optimum performance and safety, Rapid Engineering LLC recommends that a qualified contractor conduct, at a minimum, annual inspections of your RAPID® equipment and perform service where necessary, using only replacement parts sold and supplied by Rapid Engineering LLC.

This product is not for residential use.
This document is intended to assist licensed professionals in the exercise of their professional judgment.

Further Information: Applications, engineering and detailed guidance on systems design, installation and equipment performance is available through RAPID® representatives. Please contact us for any further information you may require, including the Installation, Operation and Service Manual.