

Active & Passive Beams

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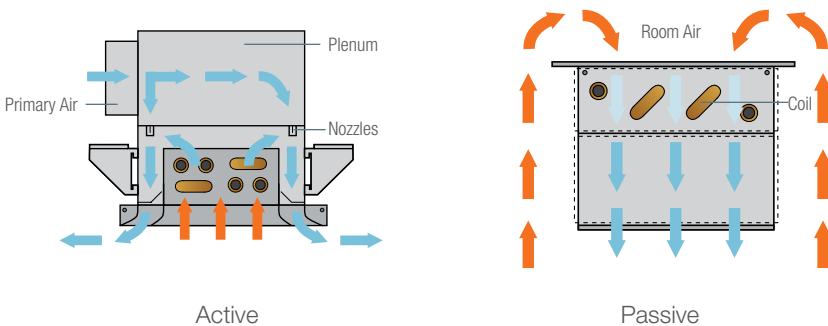
Introduction

Beam systems are an alternative to traditional “all-air” conditioning systems.

Beams use water to move energy through a building and service the building’s sensible cooling load, relying on the air-side simply to meet ventilation requirements and satisfy latent loads. This drastically reduces primary air volumes supplied to a space and leads to energy savings, improved comfort levels, and the ability to effectively integrate a dedicated outdoor air system (DOAS).

All-Air Systems	Beam Systems
Use air for both sensible and latent load	Use water for sensible load and air for latent load and ventilation
Generally re-circulate air	Generally supply up to 100% outside air

Beam systems result in energy savings since water is more efficient at transporting heat than air is.



There are two types of beam products – Active Beams and Passive Beams.

Active Beams

- Supply primary air for ventilation and increased capacity.
- High velocity primary air induces room air across the coil.
- Inject combined primary and induced air into the room.
- Provide heating and cooling.

Passive Beams

- Induce warm room air across a cool coil to condition the space.
- Are available in concealed and exposed configurations
- Require a separate ventilation system to condition latent loads as no primary air flow is supplied.

Advantages

Energy Efficiency

Using beams to satisfy sensible room loads greatly reduces the supply air volume required (typically by 60-80%). This can lead to reduced fan power requirements and associated energy savings. Additional savings are derived from:

- Reduction or elimination of reheat
- Chiller efficiency
- Taking advantage of free cooling through a DOAS in locations where the climate is appropriate

Quiet Operation

The reduction in air-side mechanical equipment inherent of a hydronic system results in less noise, thus a quieter, more comfortable occupant experience.

Passive beams produce an NC level under 15, while active beams usually produce a NC level under 30 (depending on air volume and duct size.)

Smaller Footprint

The reduced supply air volume of a hydronic system reduces ductwork requirements, resulting in the ability to reduce plenum heights. This allows beam systems to be installed in tight spaces, and creates the potential for lower construction costs, higher ceilings, and more usable floor space. In addition, the air handling equipment may be able to be downsized – saving cost and potentially allowing it to be moved indoors.

Reduced Maintenance

Due to the reduction in moving parts and mechanical equipment associated with beams, these systems typically have lower maintenance costs than all-air systems.

Applications

Beams are well suited to buildings with high sensible load requirements, including:

Commercial Office Buildings



Schools



Large Public Spaces



Laboratories

Active and passive beams can present significant energy savings in laboratories where the supply air rate is driven by internal loads rather than exhaust requirements. The primary air quantity can be reduced to manage the ventilation air requirement instead of the loads, resulting in a fan power reduction and resultant energy savings.

Hotels and Dormitories

The quiet operation of active and passive beams makes them an attractive option in hotels and dormitories, while the energy savings produced by reduced fan power requirements are an additional benefit.

Credible Performance Data



Price Hydronic Test Chamber

Price tests to the only recognized standards for beams product.

Capacity

Active Beams

EN15116

Passive Beams

EN14518

Noise and Throw

ASHRAE 70

Price Hydronic Test Chamber

The Price Hydronic Test Chamber is the most advanced radiant testing facility in North America. In addition to rapid product development, the hydronic test chamber allows Price to perform mock-ups of beam systems and, allows Price to design, test, and manufacture custom beam systems all in one North American facility.

Meaningful Metrics

Price believes that beam system design should seek to minimize the air-side of the system and maximize the water-side, as this is much more efficient. As a result, Price considers **Transfer Efficiency** and **Air Diffusion Performance Index** the primary metrics of beam performance. While other manufacturers emphasize beam capacity and throw data as the metrics of beam performance, these can increase by increasing the air volume supplied to an active beam, which counteracts the energy efficiency, thermal comfort and quiet operation benefits of the beam system.

Transfer Efficiency: The amount of sensible thermal energy moved per volume of primary air. Systems maximizing transfer efficiency use minimum primary air to condition a space. Transfer efficiency is measured in Btu/h.cfm or W/(L/s).

Air Diffusion Performance Index: An index that uses effective draft temperature and air velocity to quantify the comfort level of a space using a mixed air system for cooling.

Complete Beam Systems

Price offers the most comprehensive beam systems in North America, including a variety of Active and Passive Beam products with a wide selection of controls to complete the system.

Price Beam Features:

- Custom Widths available
- Custom Exposed Cabinets
- Integrated Return
- Plenum Integrated Controls Enclosure
- Adjustable Mounting Brackets
- Low Profile Height
- Room-Side Removable Coil
- Plenum Pressure Port
- Inlet Damper
- Custom Face Options
- Condensate Sensors
- Hose Kits

Active Beams

Active Beams have integrated primary air for ventilation. This can be leveraged to increase capacity as well as provide fresh air and a latent load sink.

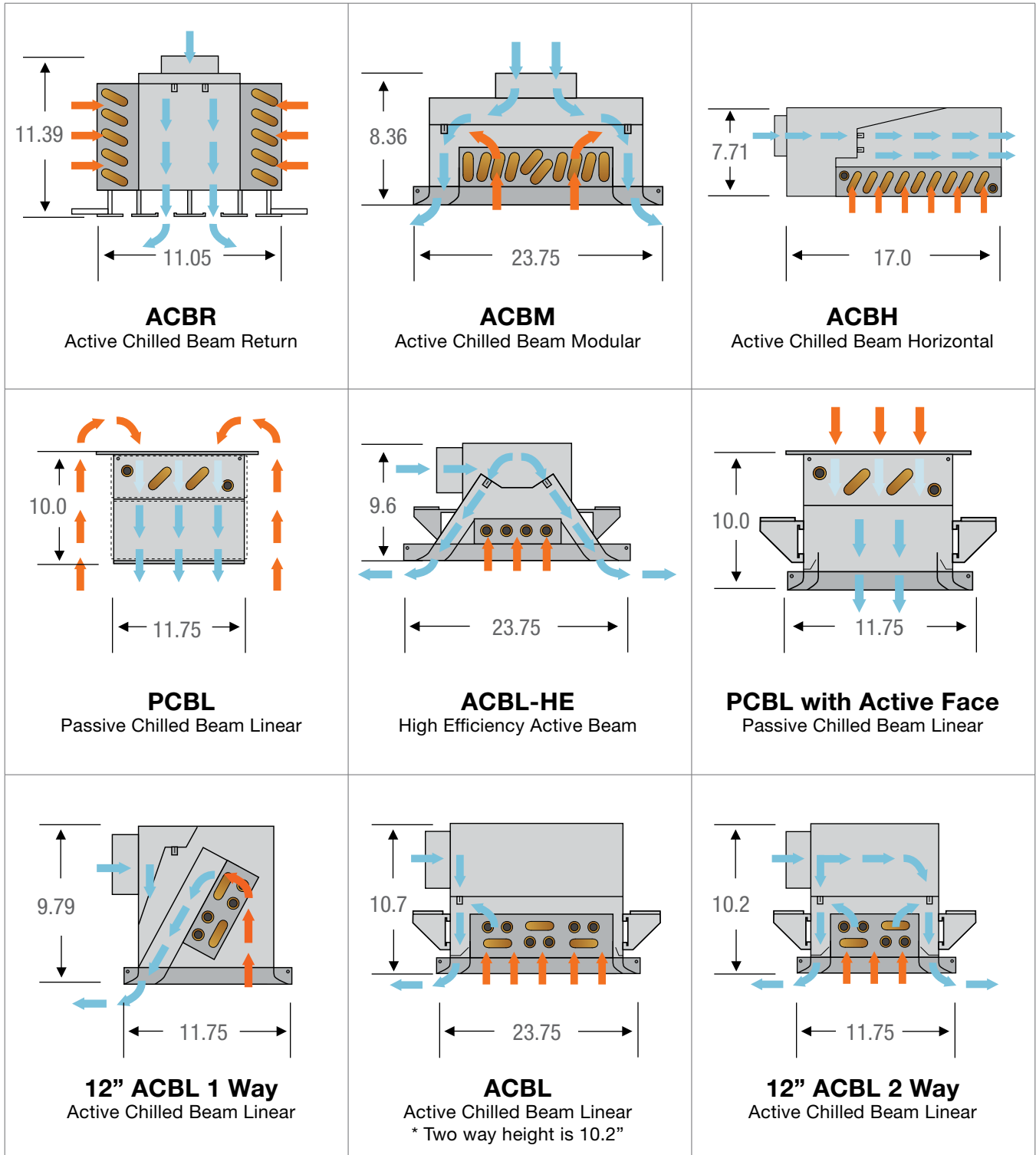
Products Offered	Capacity (Btu/h.ft)		Transfer Efficiency (Btu/h.cfm)	
	Cooling	Heating	Cooling	Heating
12" 1 way	300-1130	745-2120	47-85	65-110
12" 2 way	260-1630	750-2575	32-112	40-348
24" 1 way	340-1340	880-2555	46-113	75-300
ACBL-HE (24" 2 way)	525-2165	1335-3415	38-133	50-345
ACBM	225-2220	935-3050	32-107	37-327

Passive Beams

Passive Beams increase capacity compared to radiant panels and can be partnered with an existing ventilation system, such as UFAD or displacement to improve occupant comfort and air quality.

Products Offered	Cooling Performance (Btu/h.ft)
12" Linear Passive Beam	208
18" Linear Passive Beam	274
24" Linear Passive Beam	349

Airflow Diagrams



Beam System Controls

Price Intelligent Controller for Hydronic Products (PIC-HP)

Designed specifically to manage the control requirements of hydronic systems, the PIC-HP is ideal for managing the sequences of Price beam products.

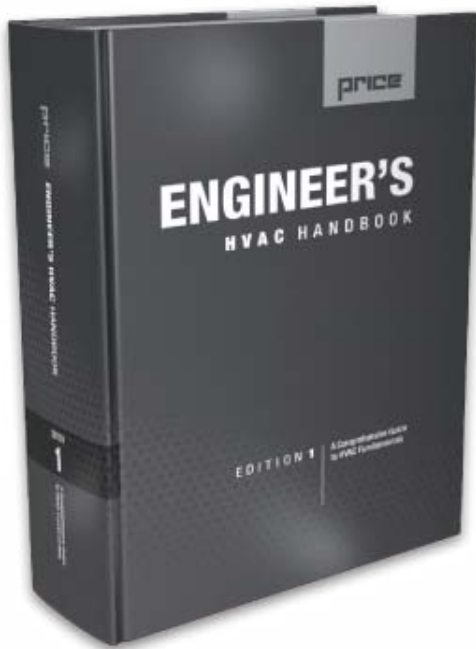
The PIC-HP is designed with a modular architecture and includes BACnet networking as a standard feature. Various sensors for improved zone communication and control are also available as add-on options. These optional sensors include **condensate sensor, a window interlock sensor, and an occupancy sensor.**

Thermostat Options

- Room Sensor
- Dial
- LCD
- LCD with Motion Sensor
- Wireless



Beam System Controls



Price Engineer's HVAC Handbook

The Most Comprehensive Guide to HVAC Fundamentals

The Price Engineer's HVAC Handbook is a compilation of the engineering knowledge related to the application of air distribution and noise control products and approaches gained at Price over the past 60 years.

The handbook contains chapters on beams and their applications which feature examples and graphics to help illustrate and explain concepts and systems.

Chapter 19: Active and Passive Beams

Contact your local Price sales representative to reserve your copy.



Price Sustainable Building Website

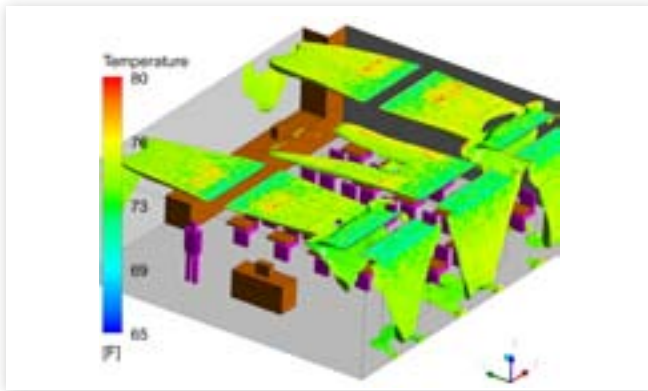
The Price Sustainable Building Website is the ultimate online resource for those looking to learn more about sustainable HVAC technologies like active and passive beams.

The site features:

- Product Information
- Research Papers
- Case Studies
- Training Modules
- Smoke Test Videos
- Product Videos

Visit www.price-hvac.com/sustainable today!

Resources and Support



Computational Fluid Dynamics (CFD) Modeling

CFD provides a means to validate design before construction and the confidence that the system will perform as intended in the field. Price's CFD team is amongst the most experienced and proficient in the industry, and we encourage designers to work with us to validate their designs.

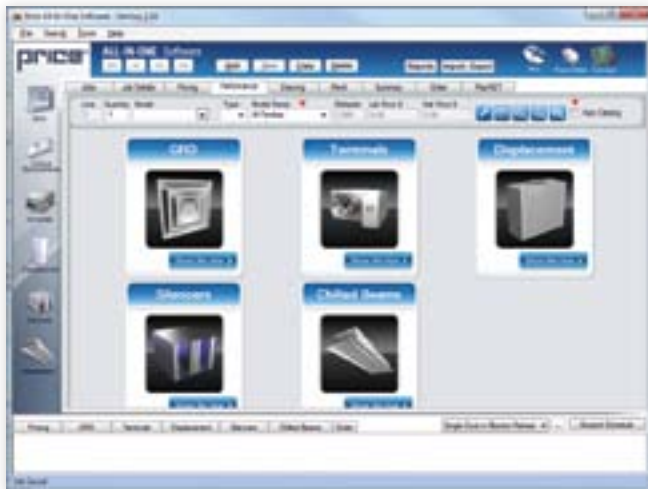


PRCN: Price Research Center North

Price's state-of-the-art research laboratory, Price Research Center North, features the most advanced hydronics lab in North America.

This lab allows designers to simulate field conditions and evaluate system performance- providing them with the confidence that our products will perform as expected.

Ask about our mock-up services on your next job, or better yet, visit PRCN yourself and tour our facilities.



Software Tools

The **Chilled Beams Performance Calculator** was added to the Price All-In-One software in 2011. This new tool allows designers to select a Price beam and determine performance quickly and accurately.



Applications Support

Price is a service oriented company and has a dedicated beams applications team devoted to answering your questions quickly, completely, and correctly. We are here to help! Our applications team regularly provides support on:

- Model Selection
- Layout Assistance
- Calculation Assistance
- On-site Training
- On-site Performance Validation

Price Training Programs and Webinars

Price Training Programs (PTP) provides Consulting and Design Engineers with the training needed to specify and select air distribution equipment to best meet their design criteria. The hydronics course covers everything you need to know about beam products, including:

- History and Introduction to Hydronics
- Theory and System Design
- Applications
- Hydronic Heating and Cooling Products
- PRCN and Engineering Support

Our webinars are another excellent way to learn about specific topics while gaining professional development hours. Visit www.price-hvac.com/ptp to register today!

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Product Improvement is a continuing endeavour at Price. Therefore, specifications are subject to change without notice. Consult your Price Sales Representative for current specifications or more detailed information. Not all products may be available in all geographic areas.

All goods described in this brochure are warranted as described in the Limited Warranty shown at the web site www.price-hvac.com.

The Price catalog is available online at www.price-hvac.com

Grilles & Diffusers	Critical Environments	Terminals & Controls	Sustainable Building	Noise Control