

ACB Chilled Beams

Catalog





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Heating and cooling ceiling systems



Comfortable indoor ventilation



Clean air solutions

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NuClimate Active Overhead Chilled Beam

A Chilled Beam takes a source of primary air at an inlet static pressure ranging from 0.2" to 0.8" of WC. It distributes this air through a bank of specially designed aerodynamic nozzles and discharges the air at a high velocity into a mixing chamber. This creates a differential pressure which enables a draw of room air across a coil. This imparts either cooling or heating to the induced air as it passes over the coil. The primary air and induced air are mixed and discharged through a grille in a coanda effect air distribution at the ceiling. This air circulates throughout the room and is gently drawn back up through the return section of the Chilled Beam grille. The total room air circulation is created solely by the induction principle within the terminal. This eliminates the need for an electric motor and its power source. As a result, the Chilled Beam is a very quiet and efficient way to provide comfort in a space. Chilled Beams are sensible only terminal devices and do not have the ability to handle latent conditioning in the occupied space. In Chilled Beam designs the latent load in the space must be handled by the primary air source.

Chilled beam systems offer energy savings for little additional costs over conventional systems. Since traditional (sensible only) chilled beams utilize water with temperatures that are above the dew point of the space, maximizing chiller efficiency becomes possible. Using dedicated chillers that produce water temperatures typically from 56° F to 60° F can increase efficiency dramatically in a building by lowering the KW per ton of cooling. These elevated water temperatures can also lead to other benefits, such as the option to use water-side economizer or free cooling. In some moderate climates, electric chillers can even be eliminated and chilled water can be produced directly from a cooling tower with a storage tank. For heating, the use of condensing boilers that produce lower water temperatures (i.e. 100° F to 120° F) can be used to efficiently and effectively meet the heating load in the space.

Model ACB

1-Way & 2-Way Blow Ceiling Mounted Chilled Beam

The model ACB is a 1-way or 2-way blow, ceiling mounted Chilled Beam that is linear in dimension. ACB models are available in 24" x 24", 48" x 24", and 72" x 24". It is offered in 4 series: Series 18 is low capacity, Series 24 is medium capacity, Series 31 is medium-high capacity, and Series 38 is high capacity. These units have a linear grille which discharges air through a single (2-way blow) or double (1-way blow) slot on the supply side. The return air is brought back to the unit through a perforated return section.

They are available in various dimensions and configurations and can be custom designed for a specific job. They were primarily created for areas that require between 8 CFM and 180 CFM of ventilation air. ACB units are available in 2- and 4-pipe configurations. These units do not have drain pans thus they should only be designed to handle sensible loads in the occupied space.

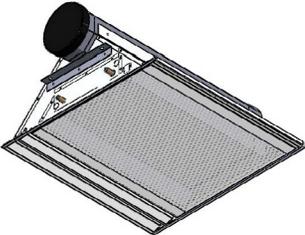
ACB Chilled Beams are perfect for:

- Office Space
- Dormitory Rooms
- Labs
- As a supplement to other Chilled Beams

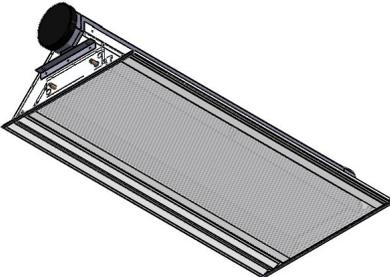


Size Options

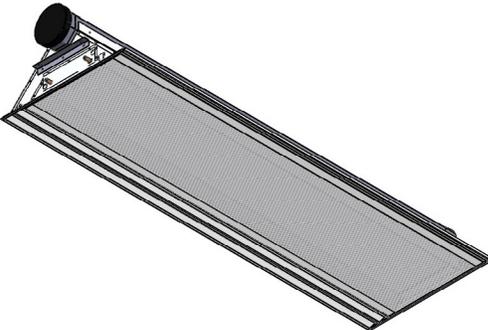
Model ACB (1 Way Side Connection)



2' x 2'

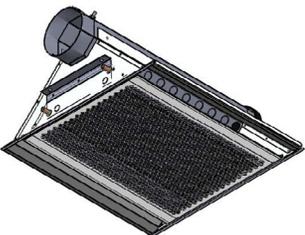


2' x 4'



2' x 6'

Model ACB (2 Way Side Connection)



2' x 2'

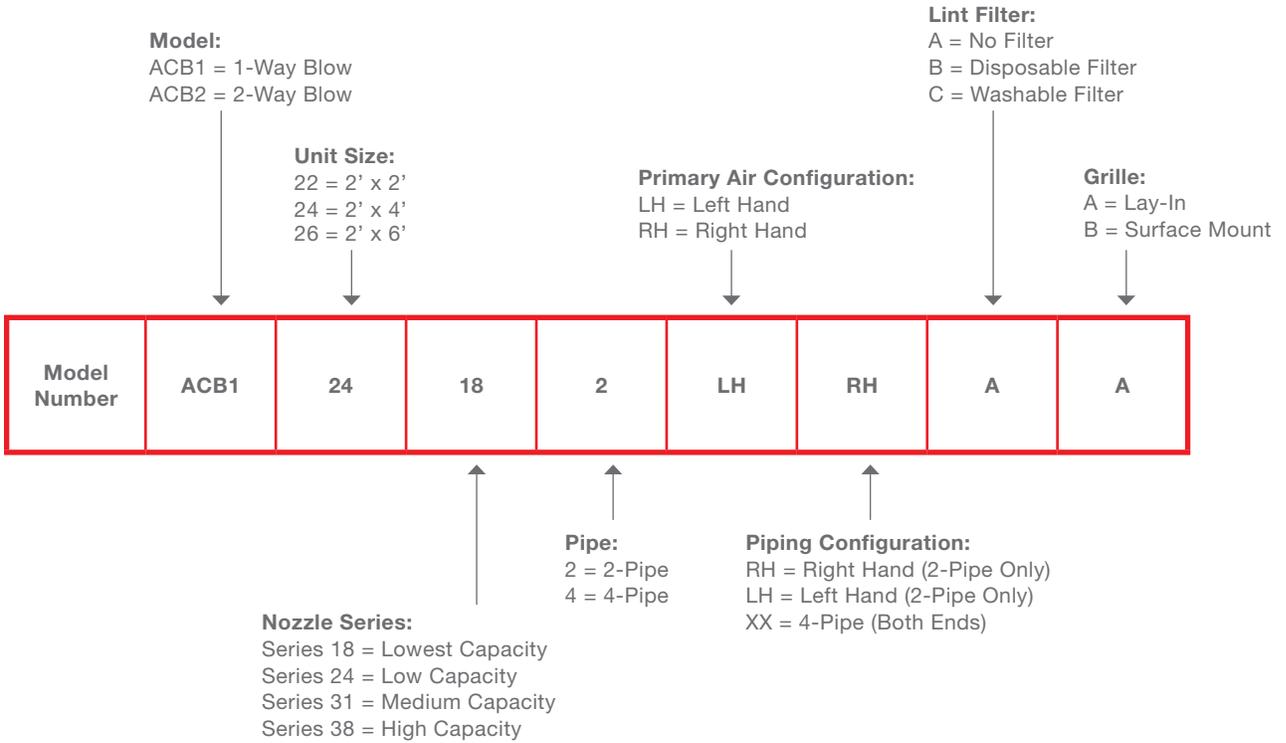


2' x 4'



2' x 6'

Nomenclature



ACB Model Specifications

Standard Dimensions:

- 24" x 24", 24" x 48", 24" x 72"

Height:

- 12"

Weight Dry:

- 24" x 24" = 40 lbs., 24" x 48" = 58 lbs., 24" x 72" = 76 lbs.

Weight Wet:

- 24" x 24" = 56 lbs., 24" x 48" = 74 lbs., 24" x 72" = 92 lbs.

Chilled Beam Construction:

- 20 gauge galvanized sheet metal construction

Return Air Chamber:

- Insulated
- Aerodynamically designed

Primary Air Chamber:

- 6" round collar primary air connection
- Primary air connection is available in right hand (RH) or left hand (LH) configurations

Induction Nozzles:

- Available in Size 18, 24, 31, or 38
- DuPont Hytel 4069 engineered polymers
- Temperature range of -40F to 122F
- Rated in accordance with UL94 and UL746

Fasteners:

- Pop rivet SSD62SSBS 3/16 DIA. X .063-.125 grip range
- Typical ultimate strength in pounds; Shear 1000; Tensile 1375

Grille:

- 23¾" x 23¾", 23¾" x 47¾", 23¾" x 71¾" grille available in various colors
- Lay-in or Surface mount
- Grille is shipped attached to the unit

Model Specifications

Coils

- 2-Pipe units are available in right hand (RH) or left hand (LH) piping configurations
- 2 row copper coil ½" OD
- Sheet Metal: 16 gauge galvanized
- Fins: 8 aluminum fins per inch
- Tested at 350 PSI water pressure
- All coils are ARI performance certified to the most current standard.

Coil Connections

- 2-Pipe Units: There is one common 3/4" CWS/HWS and one common 3/4" CWR/HWR on every unit.
- 4-Pipe Units: There is one 3/4" CWS, one 3/4" HWS, one 3/4" CWR, and one 3/4" HWR on every unit.

Interior Insulation

- Sound Coat Sound Foam – "M" and "M" with surface film treatment. Acoustic quality, open cell, flexible polyether based urethane foam

Pressure Tap:

- Units can be supplied with a pressure tap on the primary air collar for easy balancing

Mounting:

- Bracket for use with wire hanging systems
- Contact factory for special hanging methods

Lint Filters (Optional):

- 1/2" Cleanable Lint Screen—aluminum with woven nylon mesh
- 1/2" Fiberglass disposable panel filters complies with UL 217V

Exterior Insulation (Optional):

- The exterior of the beam cabinet and the primary air tube shall be insulated at the factory with Armacell model AP sheet insulation. Insulation shall be ¼" thick to prevent beam cabinet from sweating.
- Thermal conductivity of 0.27 BTU-in/hr. ft² F per ASTM C 177 or C 518.
- Water vapor permeability of 0.08 (1.16 x 10⁻⁹) per ASTM E 96
- Water absorption % by volume of 0.2% per ASTM E 84
- Flame spread rating shall be 25 or less per ASTM E 84
- Smoke spread rating shall be 50 or less per ASTM E 84
- Upper temperature limit shall be 220F/105C
- Lower temperature limit shall be 70F/57C
- Specific compliance shall include ASTM C 534 Type II sheet grade 1, ASTM E 84, NFPA 255, UL 723, CAN/ULC S-102, UL94 5V-A, V-0, File E 55798, NFPA 90A, 90B, ASTM D 1056, 2B1, Mil-P-15280J Form S, Mil-C-3133C (Mil Std 670B) Grade SBE 3, MEA 107-89-M, City of Los Angeles – RR 7642, CGSB Can 2-51.40-M80, ASTM C 1534

Unit Specifications

Summary

- A.** This section describes Active Overhead Chilled Beams.
- B.** Model ACB1 or ACB2 – Size 24" x 24", 48" x 24", and 72" x 24"

Submittals

- A.** Submit as specified herein.
- B.** Submit for review product data for all items. Data shall be complete with the following information:
 1. Operating weight and dimensions of assembled units.
 2. Performance data, including water-tube, air flow, water pressure drop, air-side pressure drop, and noise and air velocities.
 3. Construction details, including materials of construction and fastening methods.
 4. Certified test data for air and sound for each beam.
 5. Coils must be ARI certified to the most current standard.

Warranty

- A.** Units shall be warranted against failures on parts for a period of 18 months from shipment or 12 months from startup, whichever occurs first. The on-board heating and cooling coil shall carry a 5 year limited warranty on equipment failure.
- B.** In-warranty labor shall be the responsibility of the installing contractor within the 12 month in-warranty period. Contractor must submit a detail worksheet on completed 12 month warranty before payment.

Manufacturers

- A.** Units shall be as manufactured by NuClimate Air Quality Systems, model ACB1 or ACB2 with supplied 24" x 24", 48" x 24", or 72" x 24" diffuser as specified on drawings.
- B.** Considering the innovative technology utilized to engineer and manufacturer the applied equipment specified for this project the following substitution considerations shall apply to any manufacture requesting prior approval:
- C.** Fifteen day prior to bid date any manufacturer who would like to be considered shall submit the following
 1. Audited financial statements demonstrating the capital strength of the manufacturer to be considered given the nature of the owners resource in the event of any product application challenges.
 2. Detailed organization chart listing all degreed engineers with resumes documenting their experience directly relating to high performance low pressure heat transfer systems.
 3. Company documentation of their channel of distribution for the manufacturer listing the local representative and the projects that the local representative has completed utilizing this specific technology.
 4. Complete listing of all installation the manufacturer has shipped nationally including school name, engineering firm, construction manager, and contacts.
 5. Submittal documentation for every product proposed including schedule and performance for each with physical and thermal calculations.

6. Control sequence recommendations and guidelines to eliminate all indoor air quality concerns.
7. Service organization credentials listing all service technicians, their location, and experience servicing this specific technology systems.
8. Any and all costs associated with using a substituted product shall be the responsibility of the Mechanical contractor. This includes but is not limited to redesign fees, additional piping and ductwork, and controls required.

General

- A.** It is the design intent of these specifications to provide a fully integrated HVAC system with all parts working together. These Chilled Beams need clean, dehumidified primary air from a Dedicated Outdoor Air System (DOAS) unit, hot and chilled water from a boiler and chiller, piping, and controls to coordinate each component to perform as intended. In addition to the items mentioned above that are specified on other sections in division 15, wiring and power requirements in division 16 may also be impacted. Changes, modifications, or substitutions on any component will impact all the other parts of the system and can not be made without a careful review of all related specifications.
- B.** Chilled Beam units shall be primary air flow units designed to induce a secondary airflow within the conditioned space using the primary conditioned air supply. Units shall be designed for ceiling installation with factory supplied hanging brackets. Hanger rods or other approved hanging system to be field supplied and installed in the field by installing contractor.
- C.** Units shall be equipped with a 6" round duct primary air intake, one air plenum tube with air induction nozzles, chilled/hot water coil, supply and a return chilled water piping connections, supply and return hot water piping connections, and one combination supply / return air grille suitable for 1-way or 2-way coanda effect room air distribution. The grille shall have a hinged core to provide full access to the return air side of the coil. The unit shall be capable of inducing the secondary airflow within the conditioned space using the velocity pressure of the primary airflow. This secondary air must flow directly from the room to the unit and shall not use the ceiling as a return air plenum. Chilled beams using the ceiling plenum as a return air path are not acceptable.
- D.** The primary air plenum tube shall be one piece. The primary air intake connection shall have the ability for rearrangement in the field by the installing contractor. Each unit shall have an end cap for the primary air plenum tube supplied by the factory.
- E.** A static pressure port is factory supplied on the aerodynamic inlet tube so the balancing contractor can read via a pressure airflow gauge the inlet pressure to the induction beam and set the proper pressure to meet the airflow schedules on the drawings.

- F.** Each AIB unit shall be equipped with a multiple row water coil for chilled water and hot water. Latent conditioning of the primary air supplied to the space shall be performed at the Dedicated Outdoor Air unit and controlled by exhaust air humidity sensors. Humidity within the building envelope is to be controlled to not exceed 55% relative humidity.
- G.** A zone moisture sensor or dew point sensor shall be provided by the ATC as a safety to shut off the chilled water valve to prevent the chilled beam coil from sweating. All wiring is to be done by the contractor in the field and connected to the DDC controls by the ATC.
- H.** The ACB unit shall contain an integral factory supplied supply/return diffuser to evenly distribute the mixed primary air in a linear 1-way or 2-way blow coanda effect air distribution pattern. The diffuser shall incorporate a single slot in each direction (2-way blow) or double slot in one direction (1-way blow) for the supply air to the space. The diffuser shall fit into a standard ceiling grid. The grille return section shall be perforated. The grille shall be hinged for easy access to the interior of the unit without tools. Access to the unit interior shall occur through the grille face from within the occupied space. Grille latches and hinges shall be concealed.
- I.** A test report showing the velocities within the space and the throw values shall be included in the approval process. Noise levels shall be certified below NC35 at 0.8" primary air inlet pressure. The primary air connection is a single 6" diameter aerodynamic inlet tube, which directs the primary air to the nozzles.

Casings

- A.** The entire unit shall be constructed of 20 gauge galvanized sheet metal. The exterior casing shall be powder coated white. The primary air plenum tube and nozzles shall be designed and configured to provide uniform air distribution with low noise operation to all nozzles.

Induction Nozzels

- A.** Induction nozzles shall be aerodynamically designed and made of DuPont Hytrel 4069 engineering polymers with a temperature range of -40 to 122 degrees and tested and rated by test method UL94 and UL746. Each nozzle shall incorporate a tapered design allowing the airflow to enter the nozzle more

Water Coil Assembly

- A.** Coils shall be of the hot and chilled water type utilizing aluminum fins and copper tubes. Coils shall be two or four pipe configuration as scheduled. Coils shall be mounted vertically not horizontally. Coil connections shall be ¾" sweat connections or as indicated on the drawings.
- B.** Each coil must be one flat plate assemblies with no interconnecting joints to minimize leakage. Coils shall be built of minimum ½" seamless copper tubing. Copper tube wall shall be a minimum .016 thickness. Coils shall be factory leak tested at 350 PSI water. Each coil shall be of the fin plate design surrounding the copper tube wall via fin

spacing of 8 fins per inch. Fins shall be mechanically bonded to copper tubes. Each coil shall be enclosed on the ends with sealed flanges to eliminate leakage around the coil.

- C.** A water coil assembly shall consist of a two row thick copper tube with aluminum fin coil(s) for cooling and heating. A drainable condensate pan shall be provided to collect any condensate that might form. Drip trays are unacceptable as a drain pan.
- D.** Control valves for cooling and heating can control one or more induction unit in a given zone. Control valves for the units shall be supplied by the Automatic Temperature Control Contractor.

Quality Assurance

- A.** All Chilled Beams shall be tested for performance, throws, and sound levels. Test reports shall be submitted with contractor submittals.

Control Systems

- A.** All controls shall be provided by the Automatic Temperature Control Contractor.

Exterior Cabinet Insulation (optional)

- A.** The exterior of the beam cabinet and the primary air tube shall be insulated at the factory with Armacell model AP sheet insulation. Insulation shall be ¼" thick and shall meet the following criteria:
 1. Thermal conductivity of 0.27 BTU-in/hr. ft2 F per ASTM 177 or C 518.
 2. Water vapor permeability of 0.08 (1.16 x 10⁻⁹) per ASTM E 96
 3. Water absorption % by volume of 0.2% per ASTM E 84
 4. Flame spread rating shall be 25 or less per ASTM E 84
 5. Smoke spread rating shall be 50 or less per ASTM E 84
 6. Upper temperature limit shall be 220F/105C
 7. Lower temperature limit shall be 70F/57C
 8. Specific compliance shall include ASTM C 534 Type II sheet grade 1, ASTM E 84, NFPA 255, UL 723, CAN/ULC S-102, UL94 5V-A, V-0, File E 55798, NFPA 90A, 90B, ASTM D 1056, 2B1, Mil-P-15280J Form S, Mil-C-3133C (Mil Std 670B) Grade SBE 3, MEA 107-89-M, City of Los Angeles – RR 7642, CGSB Can 2-51.40-M80, ASTM C 1534

Lint Filters (optional)

- A.** Lint filters shall be supplied by the beam manufacturer as washable or disposable type.
- B.** Washable filters are ½" in depth and have an aluminum frame with woven nylon mesh media.
- C.** Disposable panel filters are ½" in depth and have fiberglass media. Disposable filter comply with UL 217V.

Installation

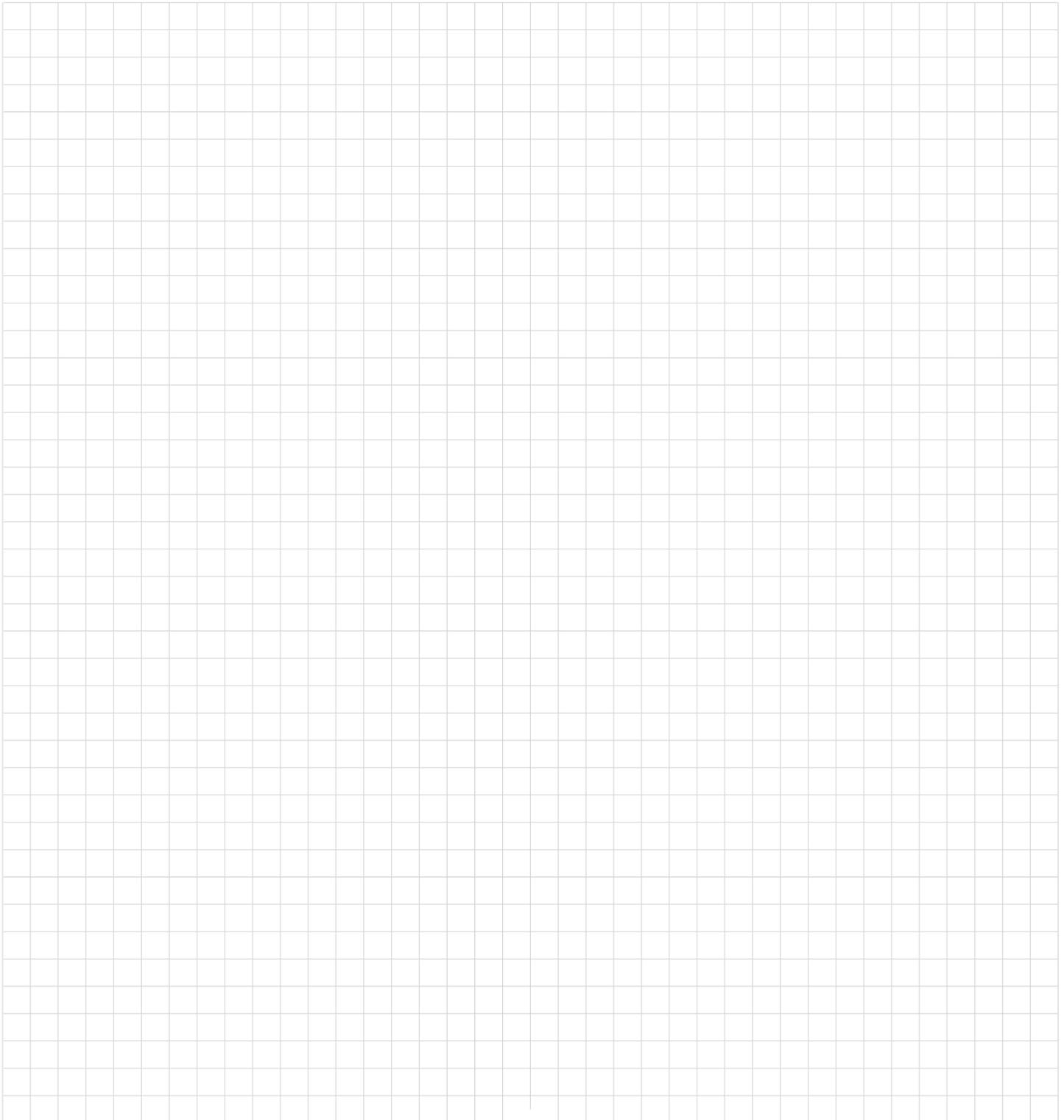
- A.** Follow manufacturer's installation instructions and recommendations for all equipment.
- B.** Install Chilled Beams in ceiling in such a manner as to allow easy access to all controls.
- C.** Use the hanging brackets on each unit which are supplied by the manufacturer. Chilled beams shall be supported using field supplied threaded rod or other secure hanging systems.
- D.** Provide primary supply air connection and seal with duct sealer after installation. A volume control balancing damper shall be installed at the branch takeoffs for each induction beam for the air balancing contractor. A static pressure port is factory supplied on the aerodynamic inlet tube so the balancing contractor can read via a pressure airflow gauge the inlet pressure to the Chilled Beam and set the proper pressure to meet the airflow schedules on the drawings.
- E.** Provide water supply / return connection and install shut off valves and temperature control valves.
- F.** Connect the condensate drain to available building drains if required on plans. Connect and wire safety float switch if provided in sensible only applications.

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SMART IDEAS



The brand with the best indoor climate solutions.

FOUR COMPLEMENTARY PRODUCT LINES

The broad and clearly structured portfolio from the Zehnder Group is split into four product lines. Consequently, we can provide the right product, the perfect system and the matching service for all types of projects - from new builds to renovations, single- or multiple- family homes, as well as commercial projects. This variety ensures that our wealth of experience is continuously expanding, providing tangible added value to our customers on a daily basis.



Decorative radiators

Our individual decorative radiators for living and bathrooms not only make a home warmer but also more attractive. Created by renowned designers, they impress with excellent functionality.

NUMBERS THAT SPEAK FOR THEMSELVES

MANUFACTURER OF THE

1ST

STEEL RADIATOR IN
THE WORLD

121

YEARS OF INNOVATIVE TRADITION

AROUND

3,000

EMPLOYEES

FOUNDED IN

1895

REPRESENTED IN
COUNTRIES

19

1,800,000

TONNES OF CO₂ SAVED SINCE 2005

WARRANTY

Zehnder guarantees its products to be free from defects in material and workmanship for a period of two years from date of shipment from our Buffalo, NY factory, whichever comes first.

Should there be any defects in the good(s), the purchaser should promptly notify Zehnder. Upon receipt of written consent from Zehnder, the purchaser shall return the defective good(s) to the factory for inspection with freight prepaid. If inspection shows the goods to be defective, Zehnder will at its discretion repair or replace the said item(s).

Defects arising from damage due to shipment, improper installation, negligence or misuse by others are not covered by this warranty.



Comfortable indoor ventilation

Our comfortable indoor ventilation is energy-efficient and provides a healthy indoor climate. It promotes the well-being of the occupants and increases the value of the property.



Heating and cooling ceiling systems

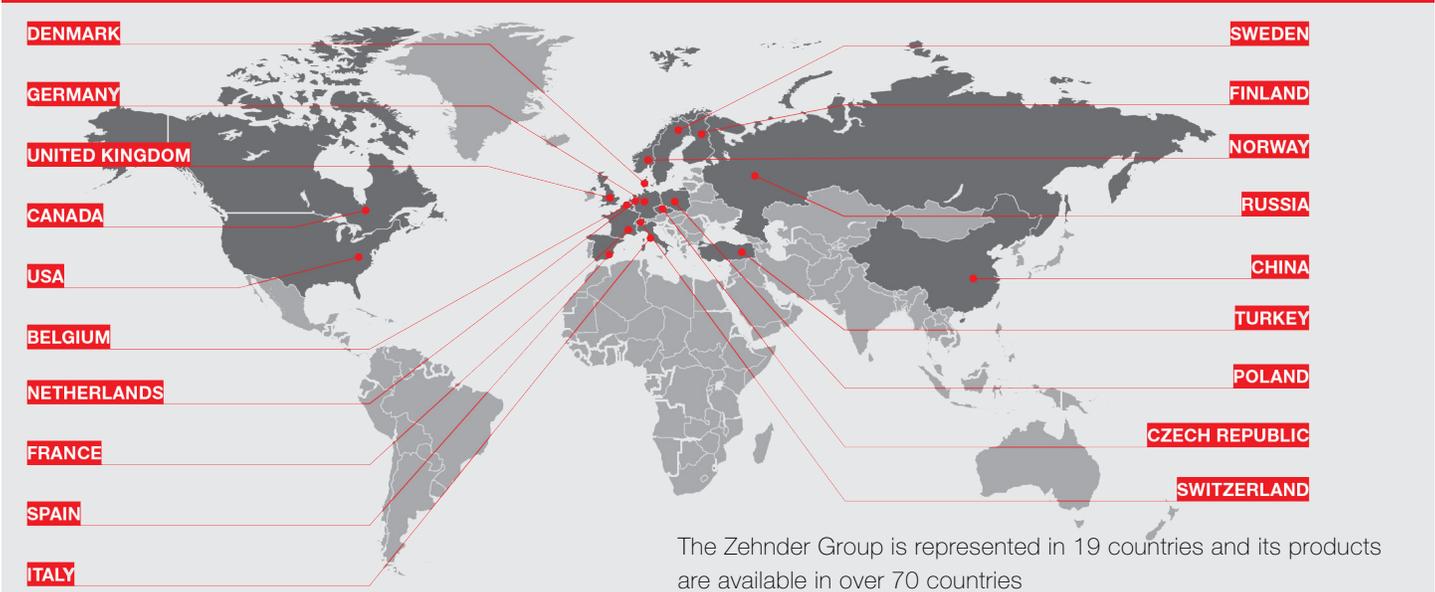
Zehnder heating and cooling ceiling systems are convenient and energy-efficient for heating and cooling. They are perfectly attuned to the relevant environment.



Clean air solutions

Clean air solutions from Zehnder reduce the level of dust in the air, create a healthier working climate and reduce the amount of cleaning required.

BEST CLIMATE IN THE WORLD



This warranty is extended only to the original purchaser from Zehnder.

IMPORTANT: Approved submittal documentation, specific to each project, supersedes the general guidelines contained within this document.

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The Zehnder brand offers excellent indoor climate solutions within the sectors of decorative radiators, clean air solutions, comfortable indoor ventilation and heating and cooling ceiling systems.

