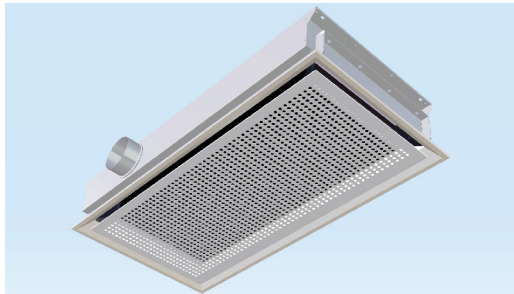


Technical Brochure

# LTG Air-Water Systems

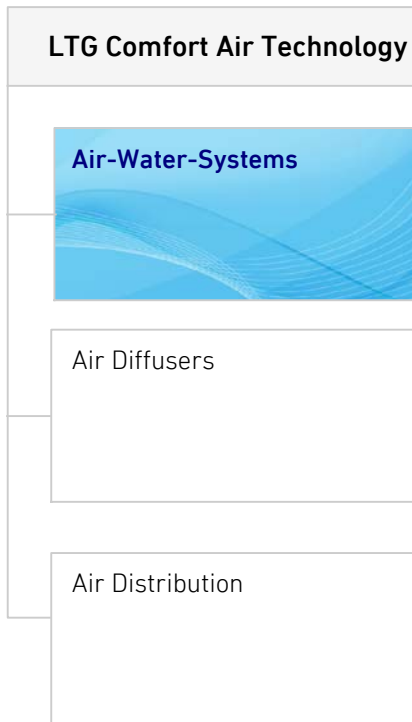
## LTG Induction

Active chilled beams



Ceiling installation

## Active chilled beams for ceiling installation



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### Notes

Dimensions stated in this brochure are in inches and mm.

Dimensions stated in this brochure are subject to General Tolerances according to DIN ISO 2768-vL.

For the outlet grille special tolerances stated in the drawing apply.

Straightness and twist tolerances for extruded aluminum profiles according to DIN EN 12020-2.

The surface finish is designed to meet the requirements for applications in buildings - room climate according to DIN 1946 part 2. Other requirements on request.

The actual specifications are available as a word document at your local distributor or at [www.LTG-INC.net](http://www.LTG-INC.net).

## Active chilled beams for ceiling installation

LTG offers active chilled beams for all room air flow patterns:

- Tangential air flow along the ceiling
- Mixed air flow from the ceiling
- Mixed/displacement air flow (indirect flow) from the ceiling

Active chilled beams are units for induction systems.

The induction system is a combined air and water system:

- The air system ensures ventilation and room air humidity control.
- The water system, which is very economical for the transport of energy, additionally heats or cools the air using heat exchangers.

This provides the two most significant features of the induction unit: energy-saving operation and low space requirements.

### Mode of operation

The primary air (outside air required for ventilation) from the central air conditioning unit is discharged through nozzles at high speed. This pulls in secondary air from the room.

The secondary air flows into the unit through a heat exchanger being heated or cooled.

The primary air is mixed with the heated or cooled secondary air inside the unit and flows through an outlet grille or diffuser into the room.

### Models

LTG offers different models and sizes for any application. The main distinctive feature of the LTG active chilled beams is the way the temperature is controlled

#### Two-pipe system

The unit has only one heat exchanger through which chilled water flows for cooling and hot water for heating. Therefore, it is only possible to either heat or cool within a single water circuit.




#### Four-pipe system

The unit has two separate water systems, one for heating, the other one for cooling. Therefore, chilled and hot water always remain separate. The four-pipe system fulfills all requirements on varying loads and small control zones.

#### Valve control (water-side control)

The heating or cooling output of the heat exchanger is controlled by modifying the water flow.

### Product overview active chilled beams for ceiling installation

Type	Active chilled beam type HDF-300	Active chilled beam type HDF-600	Active chilled beam type HDC
View of units			
Application	Modular ceiling system for ventilation using processed outside air and individual temperature control of rooms based on the induction principle, i.e. without the use of a fan. Dry cooling without dehumidification and condensate drainage		Specifically designed for low band grid ceilings. In the cooling mode, the facade-heated air enters the unit the shortest way and is immediately cooled
Water system	2-pipe system, 4-pipe system		
Options	Low installation height Fresh air unit Blind diffuser	Fresh air unit Blind diffuser	Blind diffuser
Installation	In T-bar, grid and plasterboard ceilings Flanged, recessed		
Supply air pattern	2-way	2-way, 4-way	1-way

## Active chilled beams for ceiling installation Type HDF-300

### View of unit



### Specification

The active chilled beam type HDF has been designed as a modular ceiling unit to condition rooms regarding humidity and temperature based on the induction principle, i.e. without the use of a fan. The active chilled beam is designed for dry cooling without dehumidification and condensate drain.

### Installation, positioning

Its low construction height allows installation in false ceilings with limited space.

The reduced width and the selectable length allow an easy integration in 1' or 2' ceiling grids. Unit lengths from 4' (in 12" increments) to band installation may be realized.

It is designed to provide complete separation from the ceiling cavity and to suppress sound transmission from adjacent rooms (telephony sound insulation).

### Functional principle

Room air humidity is controlled through the centrally dehumidified supply air avoiding involuntary dehumidification in the active chilled beam. The 2-pipe system may be used for either cooling only or change-over operation with cooling/heating. The 4-pipe system with independent water circuits automatically switches from cooling to heating and vice versa.

During operation, 100% of the primary air is pretreated fresh air from a central fresh air unit. It assures the use-dependent basic ventilation using outside air, e.g. in conformity with local codes and recommendations. Through uniformly arranged nozzles over the entire unit length, the primary air is led in an injector-type diffuser which induces secondary air. Depending on the room load, this secondary air is either heated or cooled in a 2-pipe or 4-pipe heat exchanger.

The supply air, a mixture of primary and secondary air, is distributed into the room in two directions via ceiling jets.

### Advantages

- **Low primary air pressures between 0.2 to 0.4" H<sub>2</sub>O**
  - Low-noise operation; sound pressure may be selected to remain below 35 dB(A) (NC 25)
  - High secondary (water-side) capacity of up to 365 BTU/hxft
  - Easy air flow balance of the units within a single duct run
  - Energy-efficient operation
- **Flexible nozzle design**
  - Selection for fixed primary pressure possible
  - Primary air flow may be selected according to room use between 4 and 18 cfm/ft
  - Non combustible metal nozzles
- **Low installation height**
  - Standard 9"
  - HDF-300/N-unit 6.3"
- **Efficient heat exchanger**
  - High heating capacity even with low warm water supply temperatures (e.g. 86 °F)
  - High cooling capacity with high chilled water supply temperatures (e.g. 61 °F)
  - Low water flow rates, designed for a temperature difference of 6 F
- **Flexible connection of media**
  - Primary air connection with 4" diameter on the long side (standard)
  - Water connections on unit top surface for convenient pipe connections from left or right
- **Designed for easy maintenance**
  - Easily removable secondary air inlet grille
  - No protective air filter required for the heat exchanger.
- **Perfect integration in false ceilings**
  - Width 11.6", recessed installation
  - Width 12.55", flanged installation
- **Pleasing design**
  - Air diffuser construction of aluminum profiles
  - Visible surfaces powder coated
  - Secondary air inlet grille out of expanded metal panel (free area > 63%)
  - Secondary air grille out of a perforated sheet metal optional (square perforation)
- **Simplified commissioning**
  - Measuring point to determine the air flow rate (standard)
  - Pressure balancing with a perforated sheet metal balancing damper

# Active chilled beams for ceiling installation

## Type HDF-300

### Design

Active chilled beam type HDF-300 in the sizes 4', 5', 6' and 7' as:

- 4-pipe system for cooling and heating
- 2-pipe system for cooling or heating
- Flanged installation or recessed installation
- Balancing damper KLI

### Options

- HDF-300/N - low installation height
- HDF-300/L - fresh air unit
- HDF-300/B - blind diffuser

### Materials and finish

Primary air duct of galvanized sheet steel, nozzle duct and induction nozzles of black coated sheet steel 20 gauge (1 mm thick), longitudinal profiles of aluminum, either anodized or powder coated.

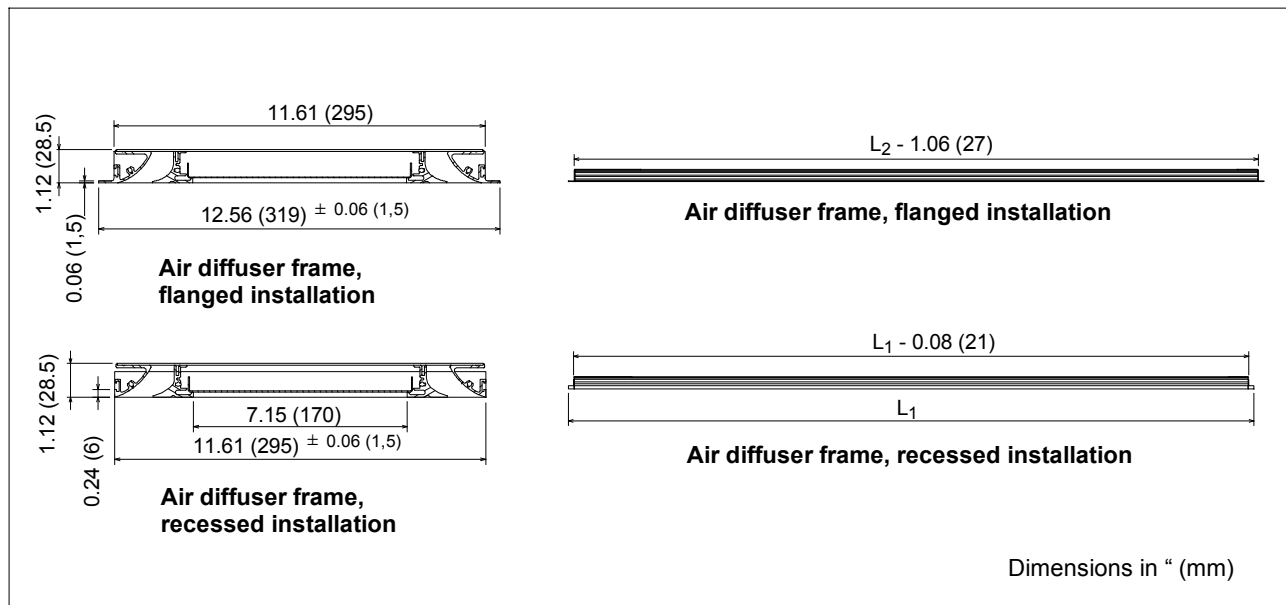
Secondary air inlet grille of galvanized sheet metal, powder coated to match the air diffuser frame.

### Accessories

- Return air connection 4" diameter, integrated in the diffuser frame
- Blind unit extension, to be used to match specific lengths required on site
- Sheet metal console to mount valves on unit top-side or end side
- Thermal control valves
- Flexible water connections with 1/2" quick coupling

### Dimensions

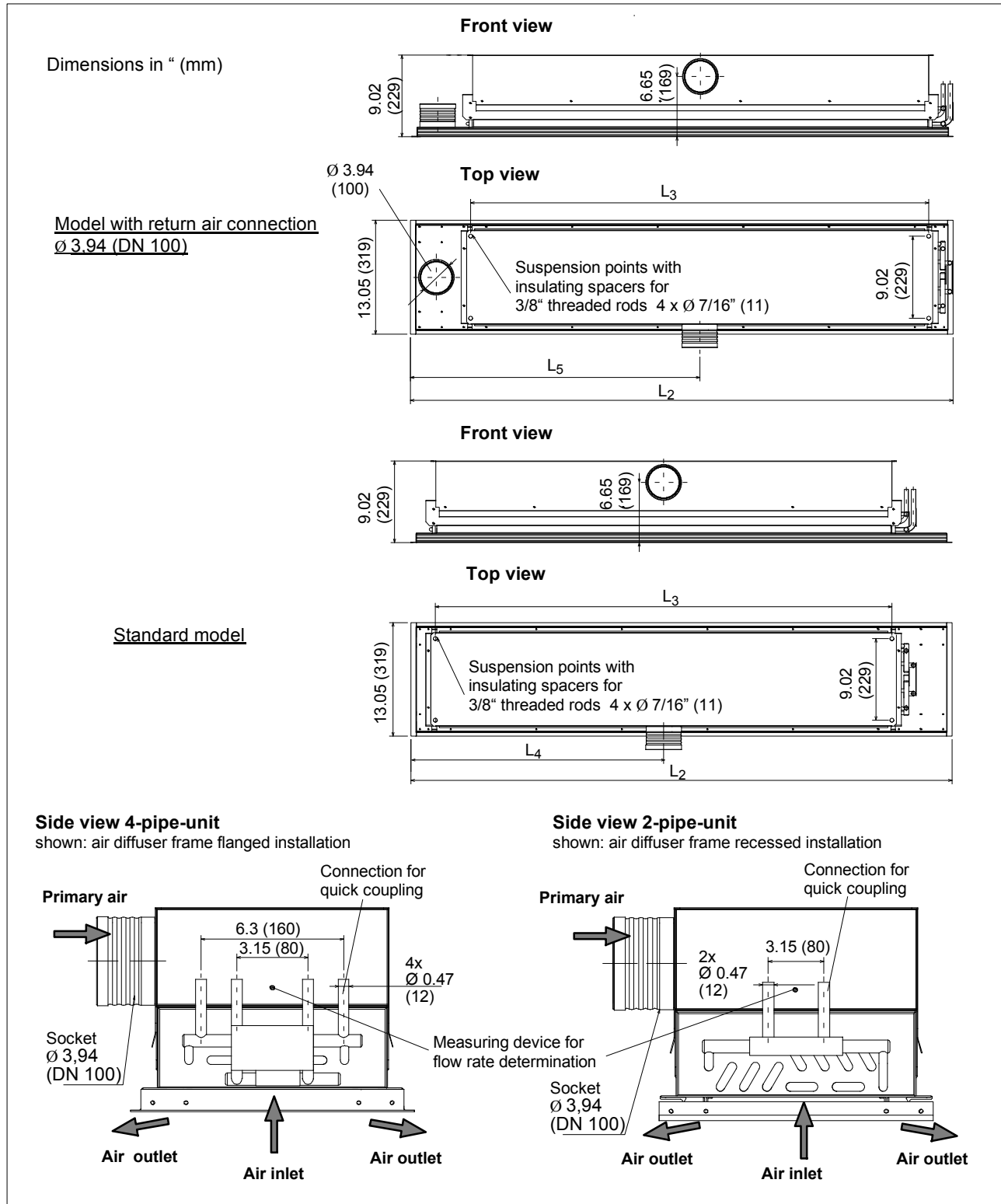
See drawings on the next 2 pages.



Size	L <sub>1</sub> recessed		L <sub>2</sub> flanged		L <sub>3</sub>		L <sub>4</sub>		L <sub>5</sub>		Weight	
	["]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	["]	[mm]	[lbs]	[kg]
1200	47	1195	48	1219	38.7	982	22	560	26	660	37	17
1500	58.9	1495	60	1519	50.5	1282	28	710	32	810	48.5	22
1800	70.7	1795	71.6	1819	62.3	1582	34	860	38	960	59	27
2100	82.5	2095	83.5	2119	74	1882	39.8	1010	43.7	1110	70	32

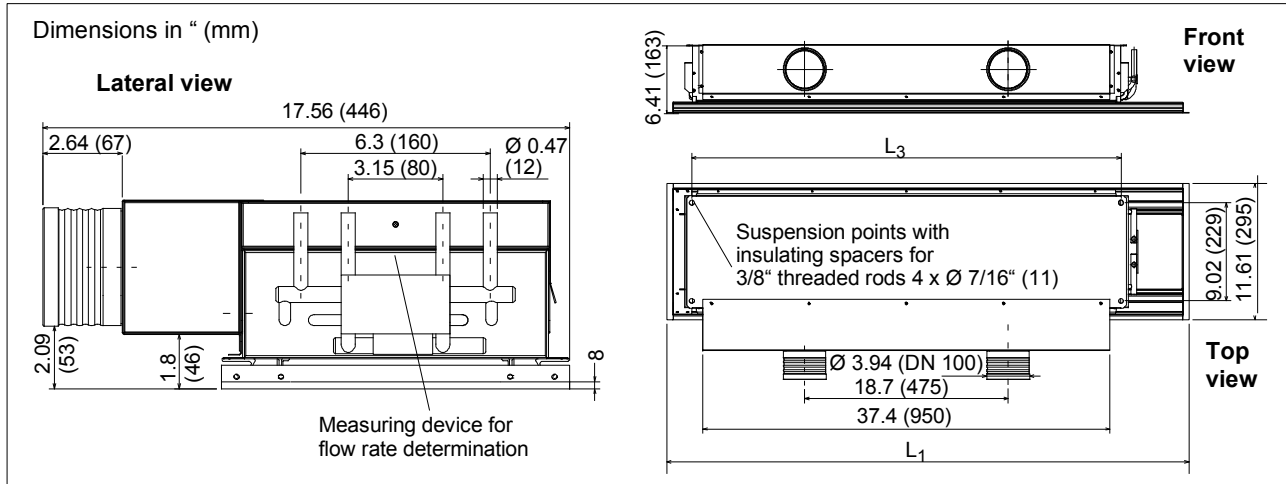
# Active chilled beams for ceiling installation Type HDF-300

## Dimensions

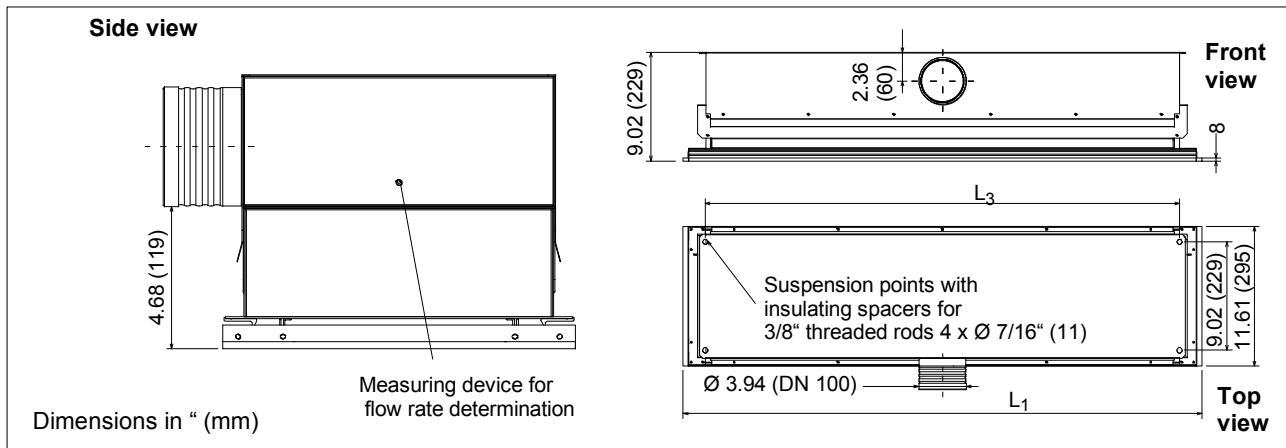


# Active chilled beams for ceiling installation Type HDF-300

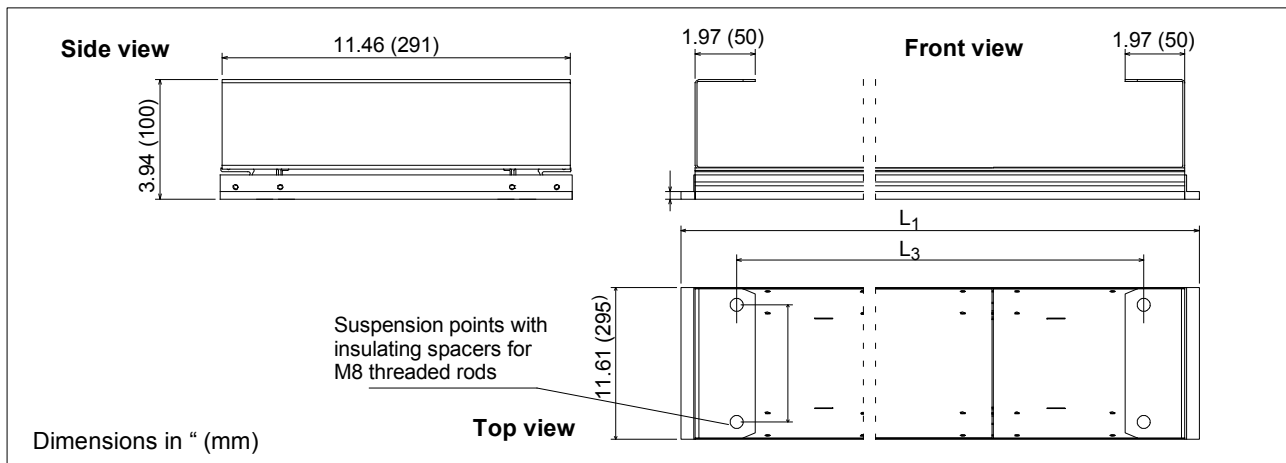
## Dimensions model HDF-300/N - low installation height



## Dimensions model HDF-300/L - fresh air unit



## Dimensions model HDF-300/B - blind diffuser



## Active chilled beams for ceiling installation Type HDF-300

### Technical data size 1200 (4 ') - 4-pipe system - cooling and heating

V <sub>P</sub> cfm	Δp " H <sub>2</sub> O	L <sub>WA</sub> [dB(A)]	Q <sub>p</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>c</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>c</sub> <sup>1)</sup> BTU/h	w <sub>oc</sub> gpm	Δp <sub>w</sub> feet	Q <sub>h</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>h</sub> <sup>2)</sup> BTU/h	w <sub>oh</sub> gpm	Δp <sub>w</sub> feet
8	0.20	21	9.5	39.8	730	0.53	1.7	32.2	1,017	0.4	0.7
11	0.32	27	11.4	47.4	850	0.53	1.7	36.0	1,174	0.4	0.7
13	0.48	33	13.3	53.1	959	0.53	1.7	41.7	1,317	0.4	0.7
13	0.20	22	13.3	43.6	785	0.53	1.7	34.1	1,078	0.4	0.7
16	0.32	28	17.1	51.2	925	0.53	1.7	39.8	1,266	0.4	0.7
20	0.48	34	20.8	58.8	1,058	0.53	1.7	43.6	1,436	0.4	0.7
21	0.20	23	20.8	47.4	867	0.53	1.7	36.0	1,177	0.4	0.7
26	0.32	30	26.5	58.8	1,044	0.53	1.7	43.6	1,406	0.4	0.7
31	0.48	36	34.1	68.2	1,218	0.53	1.7	49.3	1,624	0.4	0.7
32	0.20	25	34.1	55.0	996	0.53	1.7	41.7	1,331	0.4	0.7
40	0.32	32	43.6	68.2	1,211	0.53	1.7	49.3	1,624	0.4	0.7
49	0.48	39	53.1	73.9	1,337	0.53	1.7	58.8	1,914	0.4	0.7
49	0.20	27	53.1	60.7	1,092	0.53	1.7	49.3	1,569	0.4	0.7
62	0.32	35	66.3	60.7	1,088	0.53	1.7	60.7	1,958	0.4	0.7

### Technical data size 1500 (5 ') - 4-pipe system - cooling and heating

11	0.20	22	11.4	53.1	948	0.66	2.0	41.7	1,320	0.4	0.8
14	0.32	29	15.2	60.7	1,102	0.66	2.0	47.4	1,528	0.4	0.8
16	0.48	35	17.1	70.1	1,245	0.66	2.0	53.1	1,713	0.4	0.8
17	0.20	23	19.0	56.9	1,017	0.66	2.0	43.6	1,402	0.4	0.8
21	0.32	30	22.7	66.3	1,204	0.66	2.0	51.2	1,644	0.4	0.8
26	0.48	36	28.4	75.8	1,378	0.66	2.0	56.9	1,870	0.4	0.8
26	0.20	25	28.4	62.5	1,126	0.66	2.0	47.4	1,528	0.4	0.8
34	0.32	32	36.0	75.8	1,358	0.66	2.0	56.9	1,825	0.4	0.8
41	0.48	39	43.6	87.2	1,583	0.66	2.0	64.4	2,112	0.4	0.8
41	0.20	27	43.6	72.0	1,296	0.66	2.0	53.1	1,730	0.4	0.8
52	0.32	35	55.0	87.2	1,576	0.66	2.0	64.4	2,108	0.4	0.8
64	0.48	42	68.2	96.7	1,737	0.66	2.0	77.7	2,491	0.4	0.8
64	0.20	31	68.2	79.6	1,419	0.66	2.0	62.5	2,040	0.4	0.8
81	0.32	39	87.2	79.6	1,416	0.66	2.0	79.6	2,549	0.4	0.8

### Technical data size 1800 (6 ') - 4-pipe system - cooling and heating

14	0.20	24	15.2	64.4	1,167	0.79	2.3	49.3	1,624	0.5	1.0
17	0.32	30	17.1	75.8	1,358	0.79	2.3	58.8	1,880	0.5	1.0
21	0.48	36	22.7	85.3	1,532	0.79	2.3	64.4	2,108	0.5	1.0
21	0.20	25	22.7	70.1	1,252	0.79	2.3	53.1	1,726	0.5	1.0
26	0.32	32	28.4	81.5	1,481	0.79	2.3	62.5	2,023	0.5	1.0
32	0.48	38	34.1	94.8	1,696	0.79	2.3	72.0	2,300	0.5	1.0
32	0.20	27	34.1	77.7	1,389	0.79	2.3	58.8	1,883	0.5	1.0
41	0.32	34	43.6	92.9	1,672	0.79	2.3	70.1	2,248	0.5	1.0
51	0.48	41	3.8	108.0	1,948	0.79	2.3	79.6	2,600	0.5	1.0
51	0.20	30	53.1	89.1	1,597	0.79	2.3	66.3	2,129	0.5	1.0
64	0.32	38	68.2	108.0	1,941	0.79	2.3	79.6	2,596	0.5	1.0
79	0.48	45	83.4	119.4	2,139	0.79	2.3	94.8	3,064	0.5	1.0
79	0.20	34	83.4	96.7	1,747	0.79	2.3	77.7	2,508	0.5	1.0
100	0.32	43	106.1	96.7	1,743	0.79	2.3	96.7	3,135	0.5	1.0



## Active chilled beams for ceiling installation Type HDF-300

### Technical data size 2100 (7') - 4-pipe-system - cooling and heating

V <sub>P</sub> cfm	Δp " H <sub>2</sub> O	L <sub>wA</sub> [dB(A)]	Q <sub>P</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>C</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>C</sub> <sup>1</sup> BTU/h	w <sub>oc</sub> gpm	Δp <sub>w</sub> feet	Q <sub>H</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>H</sub> <sup>2</sup> BTU/h	w <sub>oh</sub> gpm	Δp <sub>w</sub> feet
16	0.20	25	17.1	77.7	1,385	0.88	2.4	77.7	2,508	0.6	1.0
20	0.32	32	20.8	89.1	1,614	0.88	2.4	89.1	2,903	0.6	1.0
25	0.48	38	26.5	100.5	1,818	0.88	2.4	100.5	3,255	0.6	1.0
25	0.20	26	26.5	83.4	1,488	0.88	2.4	81.5	2,661	0.6	1.0
31	0.32	33	34.1	98.6	1,757	0.88	2.4	96.7	3,125	0.6	1.0
38	0.48	40	41.7	111.8	2,013	0.88	2.4	109.9	3,552	0.6	1.0
39	0.20	28	41.7	91.0	1,648	0.88	2.4	89.1	2,907	0.6	1.0
49	0.32	36	51.2	109.9	1,986	0.88	2.4	108.0	3,470	0.6	1.0
60	0.48	43	62.5	128.9	2,317	0.88	2.4	123.2	4,012	0.6	1.0
60	0.20	32	64.4	106.1	1,897	0.88	2.4	102.4	3,286	0.6	1.0
76	0.32	40	81.5	128.9	2,303	0.88	2.4	123.2	4,009	0.6	1.0
94	0.48	48	98.6	140.3	2,538	0.88	2.4	145.9	4,729	0.6	1.0
94	0.20	37	100.5	115.6	2,074	0.88	2.4	119.4	3,872	0.6	1.0
118	0.32	47	127.0	115.6	2,068	0.88	2.4	149.7	4,841	0.6	1.0

The chart shows selection examples.

Selection software is available for other flow rates, primary pressures, temperatures and water flow rates.

Data are based on a unit with secondary air inlet grille  
≥ 63 % free area.

Correction for other water flow rates see pages 12 - 14.

- 1) 61°F water supply temperature  
79°F air inlet temperature or return air temperature
- 2) 104°F water supply temperature  
72°F air inlet temperature or return air temperature

#### Legend

- V<sub>P</sub> - primary air flow rate (± 3 %)
- Δp - static pressure at the primary air connection
- L<sub>wA</sub> - sound power (± 3 dB)
- NC - expected Noise Criterion adhered based on a total room sound absorption of 10 dB
- Q<sub>P</sub> - air-side cooling capacity (primary air ± 3 %)
- Q<sub>C</sub> - water-side cooling capacity (secondary ± 6 %)
- Δt - temperature difference between air inlet and water supply
- w<sub>oc</sub> - standard water flow rate (cooling)
- Δp<sub>w</sub> - water-side pressure loss
- Q<sub>H</sub> - water-side heating capacity (secondary ± 6 %)
- w<sub>oh</sub> - standard water flow rate (heating)

## Active chilled beams for ceiling installation Type HDF-300

### Technical data size 1200 (4') - 2-pipe system - cooling or heating

V <sub>P</sub> cfm	Δp " H <sub>2</sub> O	L <sub>WA</sub> [dB(A)]	Q <sub>P</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>C</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>C</sub> <sup>(1)</sup> BTU/h	w <sub>oc</sub> gpm	Δp <sub>w</sub> feet	Q <sub>H</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>H</sub> <sup>(2)</sup> BTU/h	w <sub>oh</sub> gpm	Δp <sub>w</sub> feet
8	0.20	21	9.5	26.5	484	0.53	1.7	37.9	1,228	0.4	0.7
11	0.32	27	11.4	34.1	607	0.53	1.7	43.6	1,436	0.4	0.7
13	0.48	33	13.3	41.7	734	0.53	1.7	51.2	1,627	0.4	0.7
13	0.20	22	13.3	34.1	600	0.53	1.7	41.7	1,331	0.4	0.7
16	0.32	28	17.1	43.6	774	0.53	1.7	49.3	1,583	0.4	0.7
20	0.48	34	20.8	53.1	959	0.53	1.7	56.9	1,822	0.4	0.7
21	0.20	23	20.8	43.6	788	0.53	1.7	45.5	1,494	0.4	0.7
26	0.32	30	26.5	58.8	1,041	0.53	1.7	56.9	1,812	0.4	0.7
31	0.48	36	34.1	73.9	1,314	0.53	1.7	66.3	2,129	0.4	0.7
32	0.20	25	34.1	60.7	1,078	0.53	1.7	53.1	1,743	0.4	0.7
40	0.32	32	43.6	79.6	1,443	0.53	1.7	66.3	2,170	0.4	0.7
49	0.48	39	53.1	89.1	1,617	0.53	1.7	79.6	2,603	0.4	0.7
49	0.20	27	53.1	73.9	1,317	0.53	1.7	66.3	2,136	0.4	0.7
62	0.32	35	66.3	55.0	972	0.53	1.7	83.4	2,723	0.4	0.7

### Technical data size 1500 (5') - 2-pipe system - cooling or heating

11	0.20	22	11.4	34.1	628	0.66	2.0	49.3	1,597	0.4	0.8
14	0.32	29	15.2	43.6	788	0.66	2.0	56.9	1,866	0.4	0.8
16	0.48	35	17.1	53.1	955	0.66	2.0	66.3	2,115	0.4	0.8
17	0.20	23	19.0	43.6	781	0.66	2.0	53.1	1,730	0.4	0.8
21	0.32	30	22.7	56.9	1,010	0.66	2.0	64.4	2,057	0.4	0.8
26	0.48	36	28.4	70.1	1,249	0.66	2.0	73.9	2,371	0.4	0.8
26	0.20	25	28.4	56.9	1,024	0.66	2.0	60.7	1,941	0.4	0.8
34	0.32	32	36.0	75.8	1,354	0.66	2.0	72.0	2,358	0.4	0.8
41	0.48	39	43.6	94.8	1,709	0.66	2.0	85.3	2,767	0.4	0.8
41	0.20	27	43.6	77.7	1,402	0.66	2.0	70.1	2,265	0.4	0.8
52	0.32	35	55.0	104.2	1,876	0.66	2.0	87.2	2,818	0.4	0.8
64	0.48	42	68.2	117.5	2,105	0.66	2.0	104.2	3,385	0.4	0.8
64	0.20	31	68.2	94.8	1,713	0.66	2.0	85.3	2,774	0.4	0.8
81	0.32	39	87.2	70.1	1,266	0.66	2.0	109.9	3,538	0.4	0.8

### Technical data size 1800 (6') - 2-pipe system - cooling or heating

14	0.20	24	15.2	41.7	771	0.79	2.3	60.7	1,965	0.5	1.0
17	0.32	30	17.1	53.1	969	0.79	2.3	70.1	2,300	0.5	1.0
21	0.48	36	22.7	64.4	1,174	0.79	2.3	79.6	2,603	0.5	1.0
21	0.20	25	22.7	53.1	962	0.79	2.3	66.3	2,132	0.5	1.0
26	0.32	32	28.4	68.2	1,242	0.79	2.3	77.7	2,532	0.5	1.0
32	0.48	38	34.1	85.3	1,535	0.79	2.3	91.0	2,917	0.5	1.0
32	0.20	27	34.1	70.1	1,262	0.79	2.3	73.9	2,388	0.5	1.0
41	0.32	34	43.6	92.9	1,665	0.79	2.3	89.1	2,900	0.5	1.0
51	0.48	41	3.8	117.5	2,102	0.79	2.3	106.1	3,405	0.5	1.0
51	0.20	30	53.1	96.7	1,726	0.79	2.3	85.3	2,791	0.5	1.0
64	0.32	38	68.2	128.9	2,310	0.79	2.3	108.0	3,470	0.5	1.0
79	0.48	45	83.4	144.1	2,590	0.79	2.3	128.9	4,166	0.5	1.0
79	0.20	34	83.4	117.5	2,108	0.79	2.3	106.1	3,415	0.5	1.0
100	0.32	43	106.1	87.2	1,556	0.79	2.3	134.6	4,353	0.5	1.0

## Active chilled beams for ceiling installation Type HDF-300

### Technical data size 2100 (7') - 2-pipe system - cooling or heating

V <sub>P</sub> cfm	Δp " H <sub>2</sub> O	L <sub>wA</sub> [dB(A)]	Q <sub>P</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>C</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>C</sub> <sup>1)</sup> BTU/h	w <sub>oc</sub> gpm	Δp <sub>w</sub> feet	Q <sub>H</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>H</sub> <sup>2)</sup> BTU/h	w <sub>oh</sub> gpm	Δp <sub>w</sub> feet
16	0.20	25	17.1	77.7	1,385	0.88	2.4	92.9	3,037	0.6	1.0
20	0.32	32	20.8	89.1	1,614	0.88	2.4	109.9	3,548	0.6	1.0
25	0.48	38	26.5	100.5	1,818	0.88	2.4	125.1	4,019	0.6	1.0
25	0.20	26	26.5	83.4	1,488	0.88	2.4	102.4	3,289	0.6	1.0
31	0.32	33	34.1	98.6	1,757	0.88	2.4	121.3	3,910	0.6	1.0
38	0.48	40	41.7	111.8	2,013	0.88	2.4	138.4	4,504	0.6	1.0
39	0.20	28	41.7	91.0	1,648	0.88	2.4	113.7	3,688	0.6	1.0
49	0.32	36	51.2	109.9	1,986	0.88	2.4	138.4	4,476	0.6	1.0
60	0.48	43	62.5	128.9	2,317	0.88	2.4	163.0	5,258	0.6	1.0
60	0.20	32	64.4	106.1	1,897	0.88	2.4	132.7	4,306	0.6	1.0
76	0.32	40	81.5	128.9	2,303	0.88	2.4	164.9	5,357	0.6	1.0
94	0.48	48	98.6	140.3	2,538	0.88	2.4	199.0	6,431	0.6	1.0
94	0.20	37	100.5	115.6	2,074	0.88	2.4	163.0	5,271	0.6	1.0
118	0.32	47	127.0	115.6	2,068	0.88	2.4	206.6	6,721	0.6	1.0

The chart shows selection examples.

Selection software is available for other flow rates, primary pressures, temperatures and water flow rates.

Data are based on a unit with secondary air inlet grille ≥ 63 % free area.

Correction for other water flow rates see pages 12 - 14.

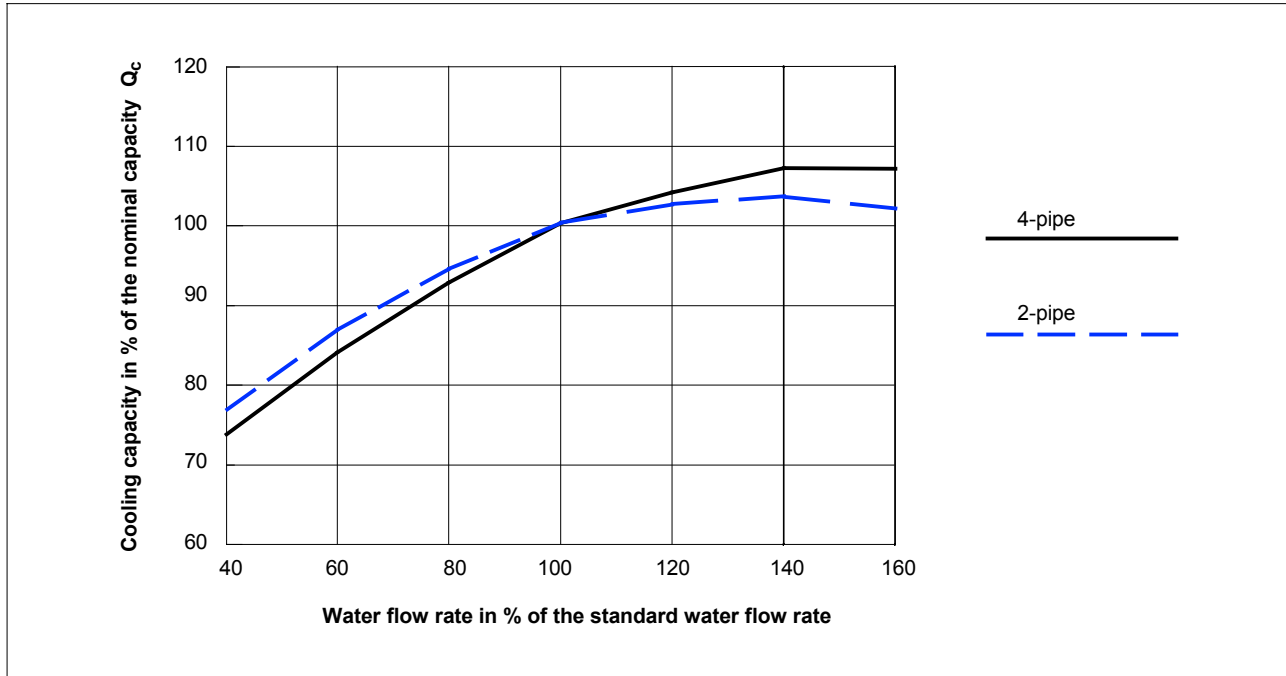
- 1) 61°F water supply temperature  
79°F air inlet temperature or return air temperature
- 2) 104°F water supply temperature  
72°F air inlet temperature or return air temperature

#### Legend

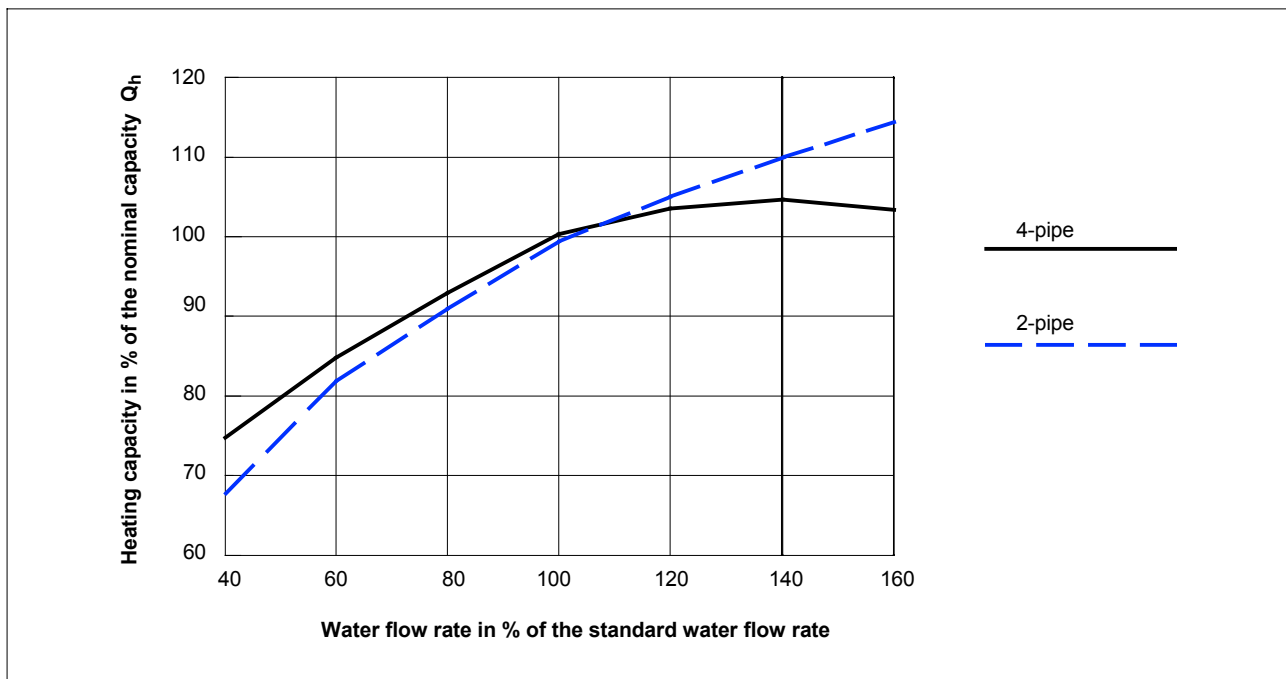
- V<sub>P</sub>** - primary air flow rate (± 3 %)
- Δp** - static pressure at the primary air connection
- L<sub>wA</sub>** - sound power (± 3 dB)
- NC** - expected Noise Criterion adhered based on a total room sound absorption of 10 dB
- Q<sub>P</sub>** - air-side cooling capacity (primary air ± 3 %)
- Q<sub>C</sub>** - water-side cooling capacity (secondary ± 6 %)
- Δt** - temperature difference between air inlet and water supply
- w<sub>oc</sub>** - standard water flow rate (cooling)
- Δp<sub>w</sub>** - water-side pressure loss
- Q<sub>H</sub>** - water-side heating capacity (secondary ± 6 %)
- w<sub>oh</sub>** - standard water flow rate (heating)

## Active chilled beams for ceiling installation Type HDF-300

### Cooling capacity with different water flow rates

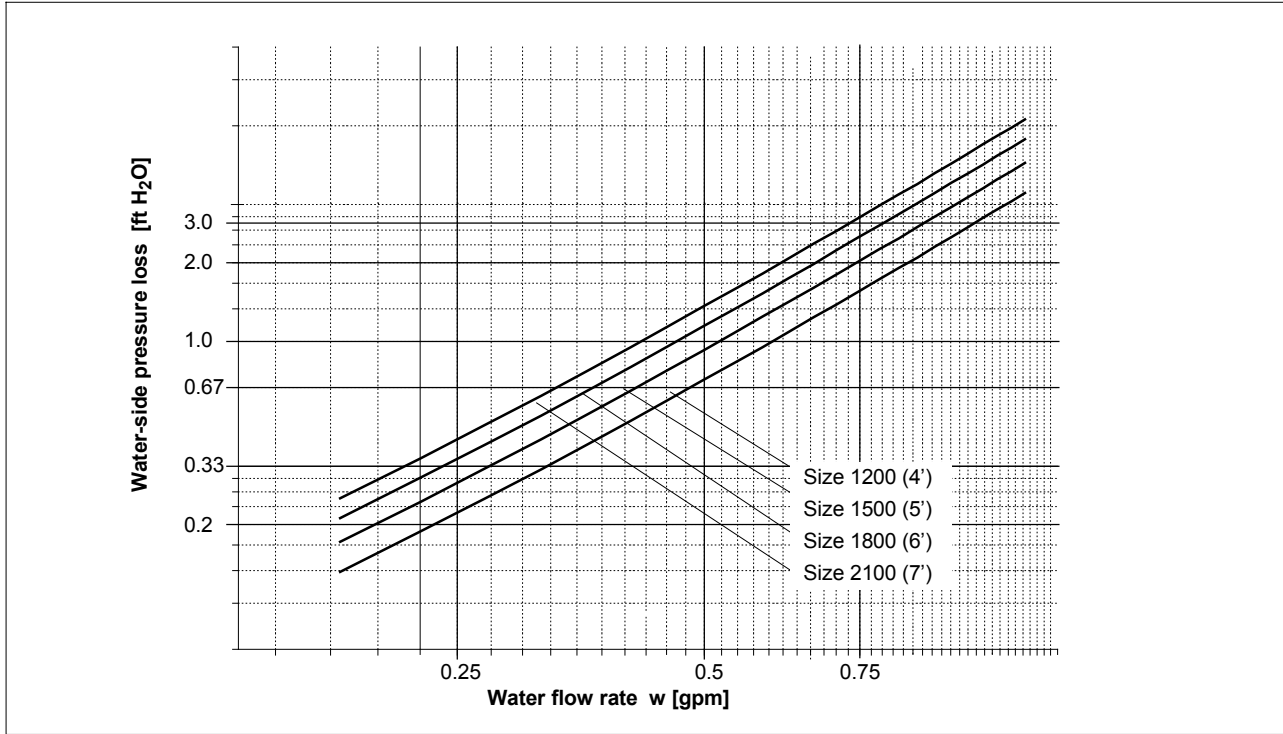


### Heating capacity with different water flow rates

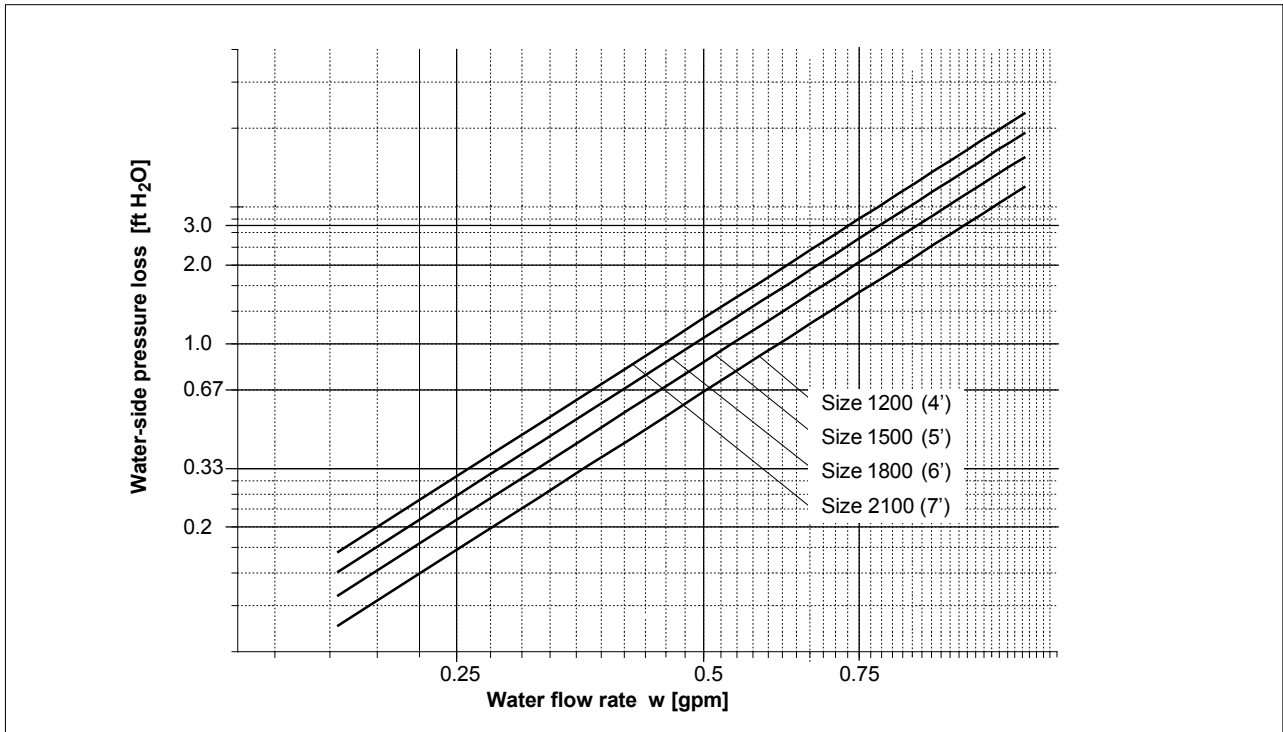


## Active chilled beams for ceiling installation Type HDF-300

### Water-side pressure loss with different water flow rates, 4-pipe system - cooling

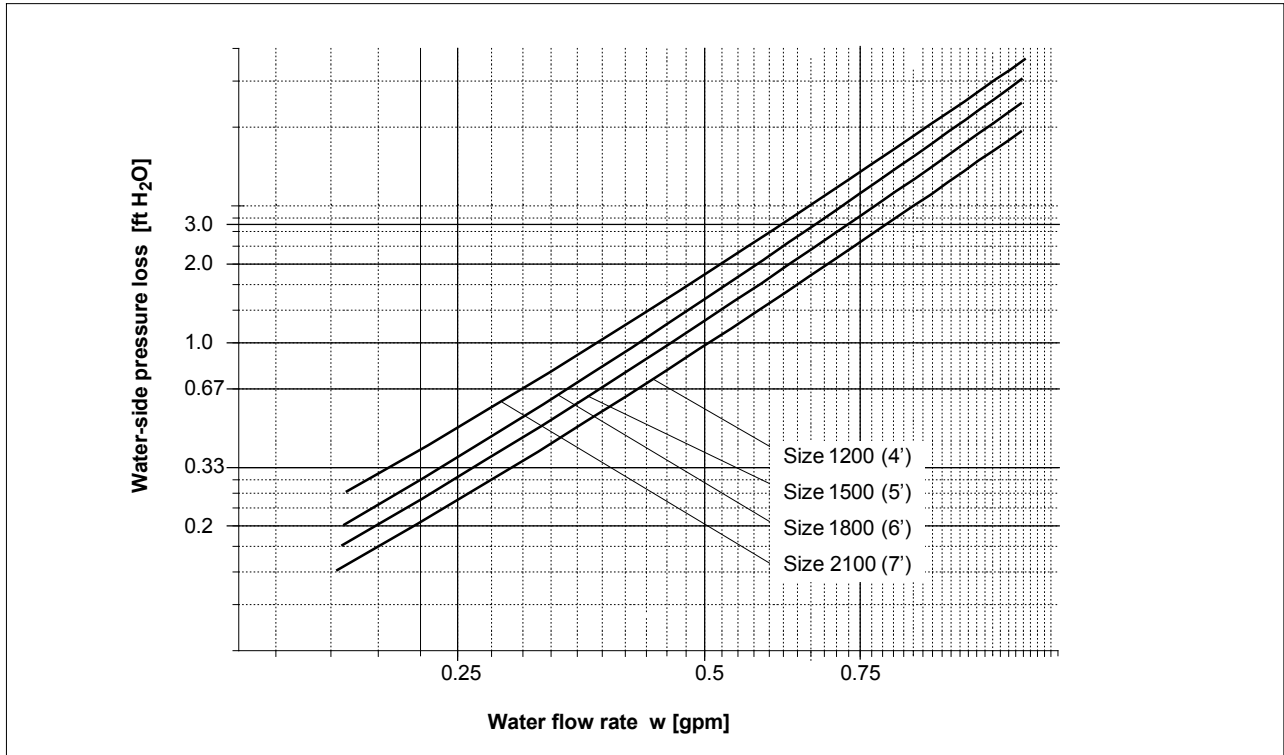


### Water-side pressure loss with different water flow rates, 4-pipe system - heating



## Active chilled beams for ceiling installation Type HDF-300

Water-side pressure loss with different water flow rates, 2-pipe system - cooling or heating



## Active chilled beams for ceiling installation Type HDF-300

### Nomenclature

**HDF-300 / 2A / - / 2 / 1200 / 45 / 80 / A / S / 600 / RAL....**

(1)                    (2)    (2) (3) (4)            (5)    (6)    (7)    (8)    (9)    (10)

- |                                  |                |   |
|----------------------------------|----------------|---|
| (1) <b>Series</b>                | <b>HDF-300</b> | = HDF-300 (unit width 1')                   |
| (2) <b>Type</b>                  | <b>2A</b>      | = Air diffusion on 2 sides                  |
|                                  | <b>-</b>       | = Standard height                           |
|                                  | <b>N</b>       | = Low installation height                   |
|                                  | <b>L</b>       | = Fresh air unit                            |
|                                  | <b>B</b>       | = Blind diffuser                            |
| (3) <b>Heat exchanger</b>        | <b>2</b>       | = 2-pipe unit                               |
|                                  | <b>4</b>       | = 4-pipe unit                               |
| (4) <b>Size</b>                  | <b>1200</b>    | = 1200 (4')                                 |
|                                  | <b>1500</b>    | = 1500 (5')                                 |
|                                  | <b>1800</b>    | = 1800 (6')                                 |
|                                  | <b>2100</b>    | = 2100 (7')                                 |
| (5) <b>Primary air flow rate</b> | <b>45</b>      | = E.g. 45 m <sup>3</sup> /h                 |
| (6) <b>Primary pressure</b>      | <b>80</b>      | = E.g. 80 Pa                                |
| (7) <b>Return air spigot</b>     | <b>A</b>       | = With return air spigot                    |
|                                  | <b>O</b>       | = Without return air spigot                 |
| (8) <b>Secondary air grille</b>  | <b>S</b>       | = Expanded metal                            |
|                                  | <b>L</b>       | = Perforated sheet                          |
| (9) <b>Ceiling grid diffuser</b> | <b>300</b>     | = 300                                       |
| (10) <b>Surface diffuser</b>     | <b>RAL....</b> | = Coated similar to RAL, specify RAL colour |

## Active chilled beams for ceiling installation Type HDF-600

### View of unit



### Application

The active chilled beam HDF is a ceiling-mounted active chilled beam for ventilation and individual temperature control based on the induction principle, i.e. without the use of a fan, using processed outside air. The active chilled beam is designed for dry cooling without dehumidification and condensate drain.

### Installation, positioning

Its low construction height (8" / 200 mm) allows installation in false ceilings with limited space.

The active chilled beam is suitable for installation in 2' grid ceilings and may be positioned in or adjacent to T-bar profiles. With grid and plasterboard ceilings, installation may be recessed or flanged.

### Functional principle

During operation, the primary air is 100% pretreated outside air from a central AHU. It assures the use-dependent basic ventilation rate using outside air, e.g. in conformity with ASHRAE guidelines or local codes recommendations. Through uniformly arranged nozzles over the entire unit length, the primary air is led in an injector-type diffuser which induces secondary air. Depending on the room load, this secondary air is either heated or cooled in a 2-pipe or 4-pipe heat exchanger.

The supply air, a mixture of primary and secondary air, is uniformly diffused to four sides into the room via preset, divergent ceiling jets covering all four room directions.

Room air humidity is controlled through the centrally dehumidified primary air avoiding involuntary dehumidification inside the active chilled beam. The 2-pipe system may be used for either cooling only or change-over operation with cooling/heating. The 4-pipe system with independent water circuits automatically switches from cooling to heating and vice versa.

It is designed to provide complete separation from the ceiling cavity and to suppress sound transmission from adjacent rooms (telephony sound insulation).

### Advantages

- **Low primary air pressures between 0.2 to 0.6" H<sub>2</sub>O**
  - Low-noise operation; sound pressure may be selected to remain below 35 dB(A) (NC 25)
  - Very low SFP value for secondary air transport (< 0.04 kW/(m<sup>3</sup>/s)) possible
  - High secondary (water-side) capacity with low primary pressure
  - Easy air flow balance of the units within a duct run
  - Flexible nozzle design
  - Six calibrated, well-matched nozzle combinations
  - Non combustible metal nozzles
  - Exchangeable nozzle strip, optional
- **Low installation height (8")**
  - Installation possible in low height suspended ceilings
  - Facilitates the crossing of utility lines
- **Efficient injector and heat exchanger**
  - High specific secondary output even with low primary air flow rate
  - High heating capacity even with low warm water supply temperatures (e.g. 86 °F)
  - Lower overtemperature in the heating mode, thus better ventilating efficiency
  - High cooling capacity with high chilled water supply temperatures (e.g. 61 °F)
  - Low water flow rates designed for a temperature difference of 6 F
- **Flexible connection of services**
  - Primary air connection with 5" diameter on the longitudinal side (standard)
  - Air connection left or right, as required
  - Eccentric air connection, if desired, not conflicting with ceiling suspension parts
  - Water connections outside the unit on top in order to connect from the left or right side
- **Designed for easy maintenance**
  - Easy removal of secondary air grille, secured by metal wires
  - Easy access for cleaning of heat exchanger and nozzles
  - No protective air filter required for the heat exchanger.
- **Virtually draft-free indoor air flow**
  - Optimized air distribution with steady, preset divergent, inductive ceiling jet
- **Attractive appearance**
  - Visible surfaces powder coated e.g. sim. to RAL 9010
  - Secondary air grille in the form of a perforated sheet grille (free area > 63%)
- **Easy commissioning**
  - Measuring point to determine the air flow rate (standard)



# Active chilled beams for ceiling installation Type HDF-600

## Design

Active chilled beam type HDF-600 in the size 2' x 4', as:

- 4-pipe-system for cooling and heating
- 2-pipe-system for cooling or heating
- 2' ceiling grid
- Balancing damper KLI

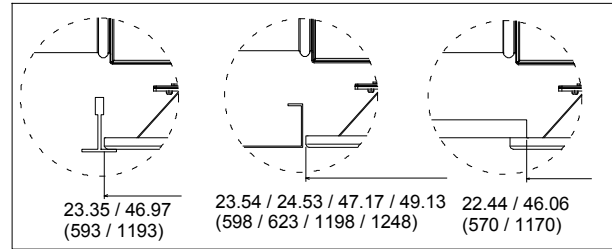
## Accessories

- Thermal control valves
- Flexible water connections with 1/2" quick coupling

## Materials and finish

Primary air duct of galvanized sheet steel, nozzle duct and induction nozzles of black coated sheet steel, 20 gauge, secondary air grille of galvan. sheet steel, powder coated.

## Installation in different ceiling systems



## Dimensions 2-pipe system, air diffusion on 2 sides

**Isometric views**

**Dimensions in "(mm)**

**Front view**  
 2(50) 10.8(275) 2(50) 4.3(109)  
 1.5(38) 2.8(72) Ø 12

**Lateral view left side**  
 Ø 5(125) 5(128) 7.8(199)

**Top view**  
 23.3(592) 25.47(647)  
 2 connections with large primary flow rates  
 A\* L

Shown: spigot on the left side

BG	L	A*
1200	46.9 (1192)	21.6 (550)
1800	70.6 (1792)	33.5 (850)
2400	94.2 (2392)	45.3 (1150)

\* only valid with one spigot

**Example line assembly**

## Active chilled beams for ceiling installation Type HDF-600

### Technical data size 1200 (2' x 4'), 4-pipe-system - cooling and heating, air diffusion on 2 sides

V <sub>p</sub> cfm	p " H <sub>2</sub> O	L <sub>WA</sub> [dB(A)]	NC	Q <sub>p</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>c</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>c tot</sub> <sup>1)</sup> BTU/h	w <sub>oc</sub> gpm	Δp <sub>w</sub> feet	Q <sub>h</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>h tot</sub> <sup>2)</sup> BTU/h	w <sub>oh</sub> gpm	Δp <sub>w</sub> feet
37	0.28	21	15	39.8	88.0	2,286	0.75	2	63.3	2,051	0.48	2.3
45	0.40	26	19	48.2	102.5	2,711	0.75	2	73.2	2,373	0.48	2.3
54	0.60	31	23	57.8	119.0	3,190	0.75	2	84.3	2,733	0.48	2.3
47	0.28	25	20	49.8	95.7	2,602	0.75	2	68.3	2,212	0.48	2.3
57	0.40	30	25	60.3	111.4	3,098	0.75	2	78.8	2,554	0.48	2.3
68	0.60	35	30	72.2	129.3	3,620	0.75	2	90.6	2,937	0.48	2.3
59	0.28	29	24	62.2	102.2	2,962	0.75	2	72.2	2,340	0.48	2.3
71	0.40	33	28	75.4	119.0	3,506	0.75	2	83.2	2,697	0.48	2.3
85	0.60	39	29	90.3	138.1	4,116	0.75	2	95.5	3,094	0.48	2.3
73	0.28	33	27	77.8	106.5	3,311	0.75	2	74.3	2,408	0.48	2.3
89	0.40	37	30	94.2	124.0	3,913	0.75	2	85.4	2,768	0.48	2.3
106	0.60	42	34	112.9	143.9	4,625	0.75	2	97.8	3,167	0.48	2.3

### Technical data size 1800 (2' x 6'), 4-pipe-system - cooling and heating, air diffusion on 2 sides

59	0.28	23	17	63.1	138.8	3,627	0.75	2.8	98.0	3,175	0.48	3.3
72	0.40	25	18	76.5	161.6	4,276	0.75	2.8	112.9	3,659	0.48	3.3
86	0.60	30	22	91.6	187.6	5,027	0.75	2.8	129.5	4,197	0.48	3.3
74	0.28	24	19	78.9	150.9	4,150	0.75	2.8	105.2	3,409	0.48	3.3
90	0.40	29	24	95.6	175.7	4,893	0.75	2.8	120.9	3,918	0.48	3.3
108	0.60	34	29	114.5	203.9	5,746	0.75	2.8	138.3	4,482	0.48	3.3
93	0.28	28	23	98.6	161.2	4,676	0.75	2.8	110.7	3,586	0.48	3.3
112	0.40	33	28	119.5	187.7	5,528	0.75	2.8	126.9	4,111	0.48	3.3
135	0.60	38	28	143.2	217.8	6,500	0.75	2.8	144.7	4,687	0.48	3.3
116	0.28	32	26	123.3	167.9	5,256	0.75	2.8	113.2	3,666	0.48	3.3
140	0.40	36	29	149.3	195.5	6,202	0.75	2.8	129.2	4,187	0.48	3.3
168	0.60	41	33	178.9	226.9	7,315	0.75	2.8	146.8	4,756	0.48	3.3

### Technical data size 2400 (2' x 8'), 4-pipe-system - cooling and heating, air diffusion on 2 sides

81	0.28	21	15	86.4	189.6	4,968	0.75	3.7	131.4	4,258	0.48	4.3
98	0.40	26	19	104.7	220.7	5,842	0.75	3.7	150.9	4,890	0.48	4.3
118	0.60	31	23	125.5	256.2	6,864	0.75	3.7	172.4	5,586	0.48	4.3
102	0.28	25	20	108.0	206.0	5,664	0.75	3.7	140.5	4,552	0.48	4.3
123	0.40	29	24	130.9	239.9	6,689	0.75	3.7	160.8	5,210	0.48	4.3
147	0.60	34	29	156.8	278.5	7,838	0.75	3.7	183.1	5,932	0.48	4.3
127	0.28	29	24	135.1	220.1	6,389	0.75	3.7	147.1	4,765	0.48	4.3
154	0.40	33	28	163.6	256.3	7,550	0.75	3.7	167.7	5,433	0.48	4.3
184	0.60	38	28	196.0	297.5	8,885	0.75	3.7	190.1	6,160	0.48	4.3
159	0.28	32	26	168.8	229.3	7,167	0.75	3.7	149.4	4,841	0.48	4.3
192	0.40	37	30	204.5	267.0	8,491	0.75	3.7	169.6	5,495	0.48	4.3
230	0.60	42	34	245.0	309.9	10,006	0.75	3.7	191.3	6,199	0.48	4.3

The chart shows examples for the unit design. A special selection program is available for other flow rates, primary pressures, temperatures and water flow rates.

Measuring parameters see page 20.

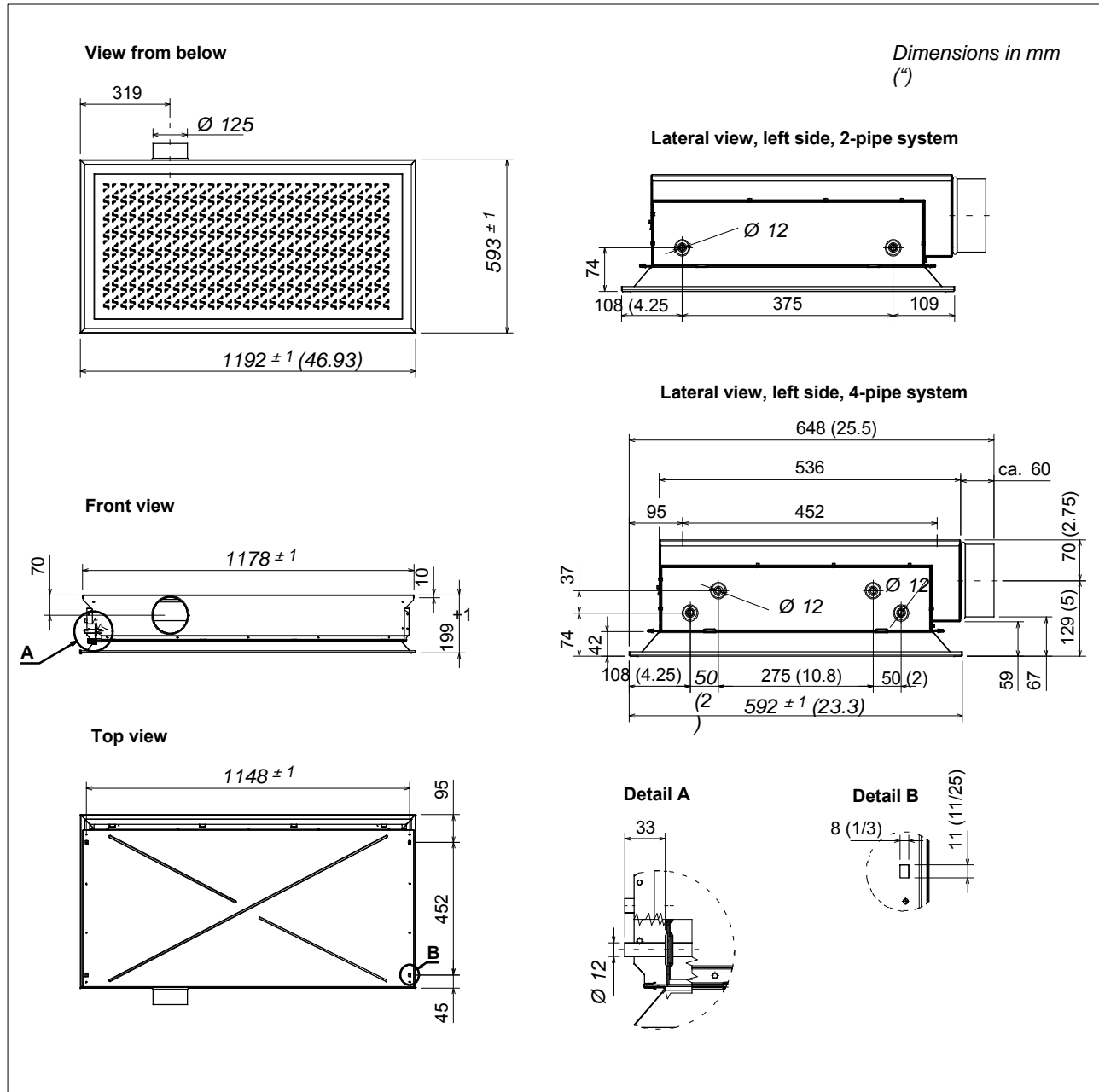
Legend see page 20.

Correction for other flow rates see page 21.

# Active chilled beams for ceiling installation

## Type HDF-600

Dimensions, air diffusion on 4 sides



## Active chilled beams for ceiling installation Type HDF-600

### Technical data size 1200 (2' x 4'), 2-pipe-system - cooling or heating, air diffusion on 4 sides

V <sub>P</sub> cfm	Δp " H <sub>2</sub> O	L <sub>WA</sub> [dB(A)]	Q <sub>P</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>C</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>C tot</sub> <sup>1)</sup> BTU/h	w <sub>oc</sub> gpm	Δp <sub>w</sub> feet	Q <sub>H</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>H tot</sub> <sup>2)</sup> BTU/h	w <sub>oh</sub> gpm	Δp <sub>w</sub> feet
32	0.28	18	34.1	85.3	2,143	0.75	2.3	75.8	2,119	0.48	1.0
38	0.40	23	39.8	100.5	2,508	0.75	2.3	89.1	2,446	0.48	1.0
46	0.60	28	49.3	119.4	3,033	0.75	2.3	106.1	2,931	0.48	1.0
39	0.28	22	41.7	94.8	2,446	0.75	2.3	83.4	2,276	0.48	1.0
47	0.40	27	49.3	108.0	2,852	0.75	2.3	96.7	2,600	0.48	1.0
58	0.60	32	60.7	130.8	3,432	0.75	2.3	115.6	3,091	0.48	1.0
49	0.28	26	51.2	102.4	2,784	0.75	2.3	91.0	2,405	0.48	1.0
59	0.40	30	62.5	117.5	3,238	0.75	2.3	104.2	2,729	0.48	1.0
72	0.60	35	75.8	140.3	3,886	0.75	2.3	125.1	3,217	0.48	1.0
62	0.28	30	64.4	111.8	3,170	0.75	2.3	98.6	2,511	0.48	1.0
74	0.40	34	77.7	127.0	3,681	0.75	2.3	113.7	2,825	0.48	1.0
90	0.60	39	94.8	149.7	4,411	0.75	2.3	134.6	3,306	0.48	1.0
77	0.28	33	81.5	119.4	3,613	0.75	2.3	106.1	2,579	0.48	1.0
92	0.40	38	96.7	136.5	4,190	0.75	2.3	121.3	2,880	0.48	1.0
112	0.60	43	117.5	161.1	5,015	0.75	2.3	142.2	3,340	0.48	1.0
98	0.28	37	104.2	128.9	4,193	0.75	2.3	115.6	2,607	0.48	1.0
118	0.40	42	123.2	145.9	4,862	0.75	2.3	130.8	2,876	0.48	1.0

### Technical data size 1200 (2' x 4'), 4-pipe-system - cooling and heating, air diffusion on 4 sides

32	0.28	18	34.1	77.7	1,989	0.75	2.3	55.0	1,436	0.48	1.0
38	0.40	23	39.8	91.0	2,368	0.75	2.3	66.3	1,699	0.48	1.0
46	0.60	28	49.3	113.7	2,921	0.75	2.3	81.5	2,088	0.48	1.0
39	0.28	22	41.7	87.2	2,323	0.75	2.3	62.5	1,576	0.48	1.0
47	0.40	27	49.3	104.2	2,753	0.75	2.3	73.9	1,839	0.48	1.0
58	0.60	32	60.7	127.0	3,367	0.75	2.3	87.2	2,201	0.48	1.0
49	0.28	26	51.2	98.6	2,702	0.75	2.3	70.1	1,696	0.48	1.0
59	0.40	30	62.5	115.6	3,183	0.75	2.3	81.5	1,948	0.48	1.0
72	0.60	35	75.8	138.4	3,855	0.75	2.3	96.7	2,300	0.48	1.0
62	0.28	30	64.4	108.0	3,125	0.75	2.3	75.8	1,774	0.48	1.0
74	0.40	34	77.7	125.1	3,654	0.75	2.3	87.2	1,992	0.48	1.0
90	0.60	39	94.8	147.8	4,381	0.75	2.3	102.4	2,276	0.48	1.0
77	0.28	33	81.5	119.4	3,589	0.75	2.3	81.5	1,791	0.48	1.0
92	0.40	38	96.7	134.6	4,159	0.75	2.3	92.9	1,938	0.48	1.0
112	0.60	43	117.5	155.4	4,920	0.75	2.3	104.2	2,095	0.48	1.0
98	0.28	37	104.2	127.0	4,152	0.75	2.3	87.2	1,682	0.48	1.0
118	0.40	42	123.2	140.3	4,756	0.75	2.3	92.9	1,696	0.48	1.0

The chart shows examples for the unit design. A special selection program is available for other flow rates, primary pressures, temperatures and water flow rates.

Data refer to the unit with secondary air grille  
≥ 63 % free surface

Correction for other flow rates see page 21.

- 1) 61°F water supply temperature  
79°F air inlet temperature or return air temperature  
61°F primary air temperature

- 2) 104°F water supply temperature  
72°F air inlet temperature or return air temperature  
61°F primary air temperature

- V<sub>P</sub> - primary air flow rate (± 3%)  
Δp - static pressure at the primary air connection  
L<sub>WA</sub> - sound power (± 3 dB)  
NC - expected Noise Criterion adhered based on a total room sound absorption of 10 dB  
Q<sub>P</sub> - air-side cooling capacity (primary air ± 3%)  
Q<sub>C</sub> - water-side cooling capacity (secondary ± 6%)  
Q<sub>C tot</sub> - total cooling capacity  
Δt - temp. differ. between air inlet and water supply  
w<sub>oc</sub> - standard water flow rate (cooling)  
Δp<sub>w</sub> - water-side pressure loss  
Q<sub>H</sub> - water-side heating capacity (secondary ± 6%)  
Q<sub>H tot</sub> - total heating capacity  
w<sub>oh</sub> - standard water flow rate (heating)

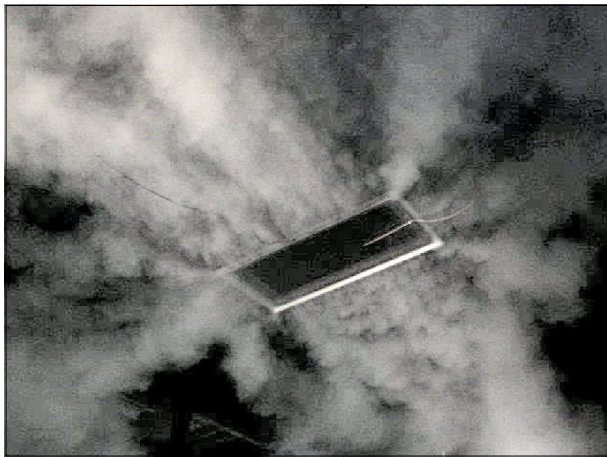


## Active chilled beams for ceiling installation Type HDF-600

### Selection

Induction systems are economical if operated locally using the primary air flow based on ASHRAE standards or local codes while covering the cooling loads in the room. An occupancy rate typical for offices of 100 sqft floor space/person results in a calculated specific primary air flow rate of 0.3 cfm/sqft for a low-emission building. A “non-low-emission” building requires an outside air flow rate of 1.2 cfm/sqft/unit. The cooling loads of offices provided with good solar protection are usually about 10 - 20 BTU/h x sqft.

The specialty of HDF-600 active chilled beam is the supply air diffusion in all 4 directions. It requires a minimum distance between two units or between unit and wall, respectively, in order to avoid excessive downward jet deflection.



*Air flow: Supply air is diffused in all four directions*

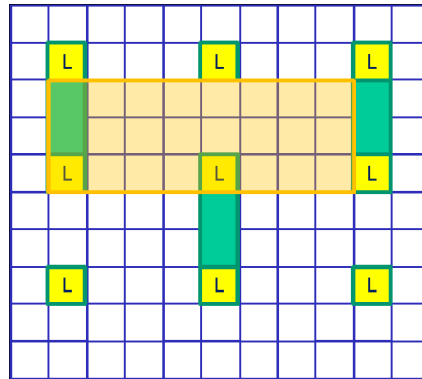
### Location of terminals in the ceiling grid

Positioning of the units in the ceiling grid should harmonize with the overhead lights. Avoid close vicinity of the units to protruding overhead lights.

The following examples provide suggestions for a 2' grid ceiling with square, mirrored grid lights installed flush.

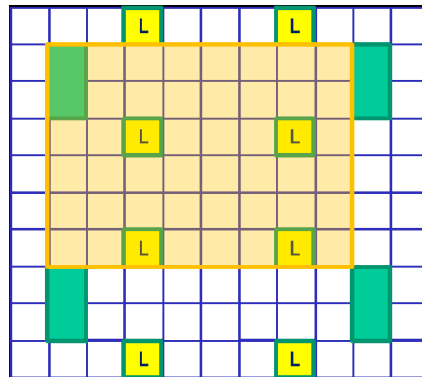
Examples apply to

- 110 sqft/person
- 79 °F room temperature
- 61 °F water supply temperature
- 61 °F primary air temperature



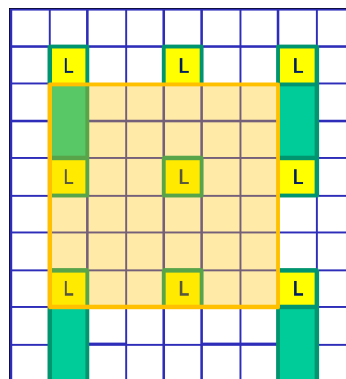
#### 2' x 2' ceiling grid, 4 x 3 light grid

With 92.5 sqft/unit and 1.2 cfm/sqft  
 · 38 cfm/unit · 2500 BTU/h · 27 BTU/h x sqft



#### 2' x 2' ceiling grid, 4 x 3 grid light

With 186 sqft/unit and 0.3 cfm/sqft:  
 · 51 cfm/unit · 2880 BTU/H · 15.5 BTU/H x sqft  
 With 186 sqft/unit and 1.2 cfm/sqft:  
 · 76 cfm/unit · 3820 BTU/H · 20.5 BTU/H x sqft



#### 2' x 2' ceiling grid, 3 x 3 grid light

With 140 sqft/unit and 0.3 cfm/sqft:  
 · 38 cfm/unit · 2500 BTU/h · 18 BTU/H x sqft  
 With 140 sqft/unit and 1.2 cfm/sqft:  
 · 58 cfm/unit · 3400 BTU/h · 24.5 BTU/h x sqft

## Active chilled beams for ceiling installation Type HDF-600

### Nomenclature

	<b>HDF-600</b>	<b>/</b>	<b>4A</b>	<b>/</b>	<b>2</b>	<b>/</b>	<b>1200</b>	<b>/</b>	<b>45</b>	<b>/</b>	<b>80</b>	<b>/</b>	<b>A</b>	<b>/</b>	<b>S</b>	<b>/</b>	<b>600</b>	<b>/</b>	<b>RAL....</b>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)										
(1) <b>Series</b>	<b>HDF-600</b>	=	HDF-600, unit width 2'																
(2) <b>Type</b>	<b>2A</b>	=	Air diffusion on 2 sides																
	<b>4A</b>	=	Air diffusion on 4 sides																
(3) <b>Heat exchanger</b>	<b>2</b>	=	2-pipe unit																
	<b>4</b>	=	4-pipe unit																
(4) <b>Size</b>	<b>1200</b>	=	1200 (4')																
	<b>1800</b>	=	1800 (6', only available for HDF-600/2A, air diffusion on 2 sides)																
	<b>2400</b>	=	2400 (7', only available for HDF-600/2A, air diffusion on 2 sides)																
(5) <b>Primary air flow rate</b>	<b>45</b>	=	E.g. 45 cfm																
(6) <b>Primary pressure</b>	<b>80</b>	=	E.g. 80 Pa (0.4 " H <sub>2</sub> O)																
(7) <b>Return air spigot</b>	<b>A</b>	=	With return air spigot																
	<b>O</b>	=	Without return air spigot																
(8) <b>Secondary air grille</b>	<b>S</b>	=	Expanded metal (only avail. for HDF-600/2A, air diffusion on 2 sides)																
	<b>L</b>	=	Perforated sheet																
(9) <b>Ceiling grid diffuser</b>	<b>600</b>	=	600 (23.6 ")																
	<b>625</b>	=	625 (24.6 ")																
(10) <b>Surface diffuser</b>	<b>RAL....</b>	=	Coated similar to RAL, specify RAL colour																

## Active chilled beams for ceiling installation Type HDC

### Views of unit



Active chilled beam type HDC 1000 (4-pipe system)



Active chilled beam type HDC 1000, view from below

### Advantages

- Virtually noiseless operation
- Low installation height (9.5"/240 mm)
- Pleasing, combined air inlet/outlet grille
- High thermal comfort in the occupied zone
- Condensate-free operation
- Ventilation air supply to the room
- Non combustible metal housings and nozzles
- Maintenance friendly design  
Valves and heat exchanger are easily accessible by removing the grille
- Energy efficient  
through use of low primary flow rates and low static pressure at the primary air duct
- Installation near facade or wall possible

### Application

The active chilled beam type HDC 1000 is specifically designed for installation in false ceilings. In the cooling mode room air is heated at the facade, entrained into the unit, cooled and recirculated to the space.

### Installation, positioning

Flanged or recessed frame options.

### Mode of operation

Primary air is pushed through internal metal nozzles, which induces room air through a heat exchanger where it is cooled or heated. The primary air is mixed with the heated or cooled secondary air and delivered into the room.

For hygienic reasons should the unit be operated without condensation and not be used for dehumidification.

### Specification

The active chilled beam type HDC 1000 is available as:

- 4-pipe unit for cooling and heating
  - 1 way supply air pattern
- 2-pipe unit for cooling or heating
  - 1 way supply air pattern



## Active chilled beams for ceiling installation Type HDC

### Indoor air flow for cooling mode

Room air heated at the facade is drawn directly into the units where it is cooled. Supply air diffused along the ceiling, mixes with the ambient air to reduce air velocity and temperature difference.

High thermal comfort  
 up to 17 BTU/h x sqft or 0.4 cfm/sqft (primary air).



Figure 1

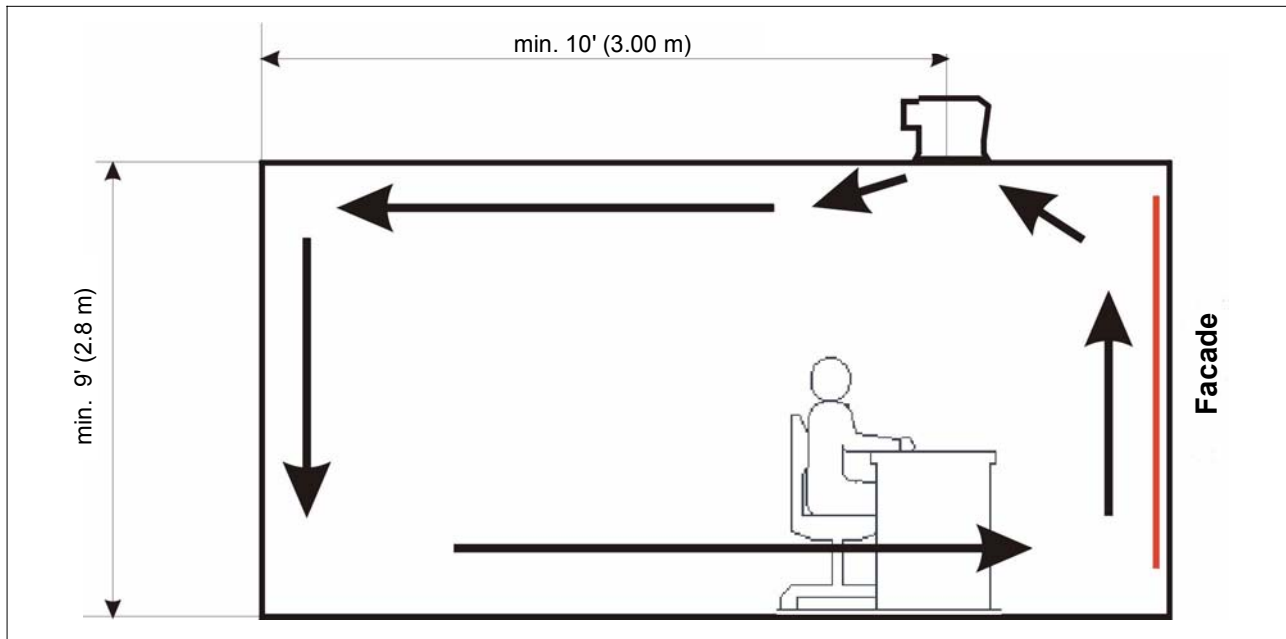


Figure 2



Figure 3

### Recommended installation position for 2-pipe system (cooling only)



Section through a typical office room, length = 18' (6 m), height = 9' (2.8 m). Schematic illustration of indoor air flow.

# Active chilled beams for ceiling installation

## Type HDC

### Technical data size 1000 - 4-pipe system - cooling and heating

V <sub>p</sub> cfm	Δp " H <sub>2</sub> O	L <sub>wA</sub> [dB(A)]	NC	Q <sub>p</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>c</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>c</sub> <sup>1</sup> BTU/h	w <sub>oc</sub> gpm	Δp <sub>w</sub> feet	Q <sub>h</sub> /Δt BTU/h·Δt <sup>-1</sup>	Q <sub>h</sub> <sup>2</sup> BTU/h	w <sub>oh</sub> gpm	Δp <sub>w</sub> feet
24	0.20	28		24.6	43.6	785	0.44	2.11	34.1	2,456	0.44	0.80
29	0.31	29		32.2	53.1	955	0.44	2.11	41.7	3,002	0.44	0.80
35	0.44	32		37.9	64.4	1,160	0.44	2.11	49.3	3,548	0.44	0.80
41	0.60	35		43.6	70.1	1,262	0.44	2.11	55.0	3,858	0.44	0.80
47	0.78	39		51.2	79.6	1,433	0.44	2.11	60.7	4,367	0.44	0.80

### Technical data size 1000 - 2-pipe system - cooling or heating

24	0.20	28		24.6	45.5	819	0.44	2.84	37.9	2,729	0.44	2.07
29	0.31	29		32.2	56.9	1,024	0.44	2.84	47.4	3,412	0.44	2.07
35	0.44	32		37.9	68.2	1,228	0.44	2.84	56.9	4,094	0.44	2.07
41	0.60	35		43.6	75.8	1,365	0.44	2.84	62.5	4,504	0.44	2.07
47	0.78	39		51.2	85.3	1,535	0.44	2.84	70.1	5,049	0.44	2.07

Data is based on the unit with the inlet/outlet grille installed.

The suction air temperature at the unit is usually 1.5 K higher than the room temperature.

Standard water flow rate for heating and cooling: 0.4 gpm.  
Correction values for other flow rates see pages 26/27.

- 61°F water supply temperature  
Room temperature at a height of 1.1 m: 79°F  
Non-condensing operation
- Water supply temperature: 140°F  
Air inlet temperature: 70°F

#### Legend

- V - flow rate (± 10%)
- Δp - static pressure at primary air spigot
- L<sub>wA</sub> - sound power (±3 dB)
- NC - expected Noise Criterion adhered based on a total room sound absorption of 10 dB
- Q<sub>p</sub> - primary cooling capacity (fresh air) (± 5%)
- Q<sub>c</sub> - cooling capacity, secondary (heat exchanger) (± 5%)
- Δt - temperature difference between room air and water supply
- w<sub>oc</sub> - standard flow rate at cooling capacity
- Δp<sub>w</sub> - water-side pressure loss
- Q<sub>h</sub> - heating capacity, secondary (± 5%)
- w<sub>oh</sub> - standard flow rate at heating capacity

#### Dimensions

Flanged installation:

Size 1000 - L x W x H = approx. 48.8" x 13.4" x 9.45"  
(1240 x 340 x 240 mm)

Recessed installation:

Size 1000 - L x W x H = approx. 47.17 x 11.73 x 9.45  
(1198 x 298 x 240 mm)  
suitable for plank tiles 11.8" wide x 47.24" / 49.2" mm long  
(300 wide x 1200 / 1250 mm long)

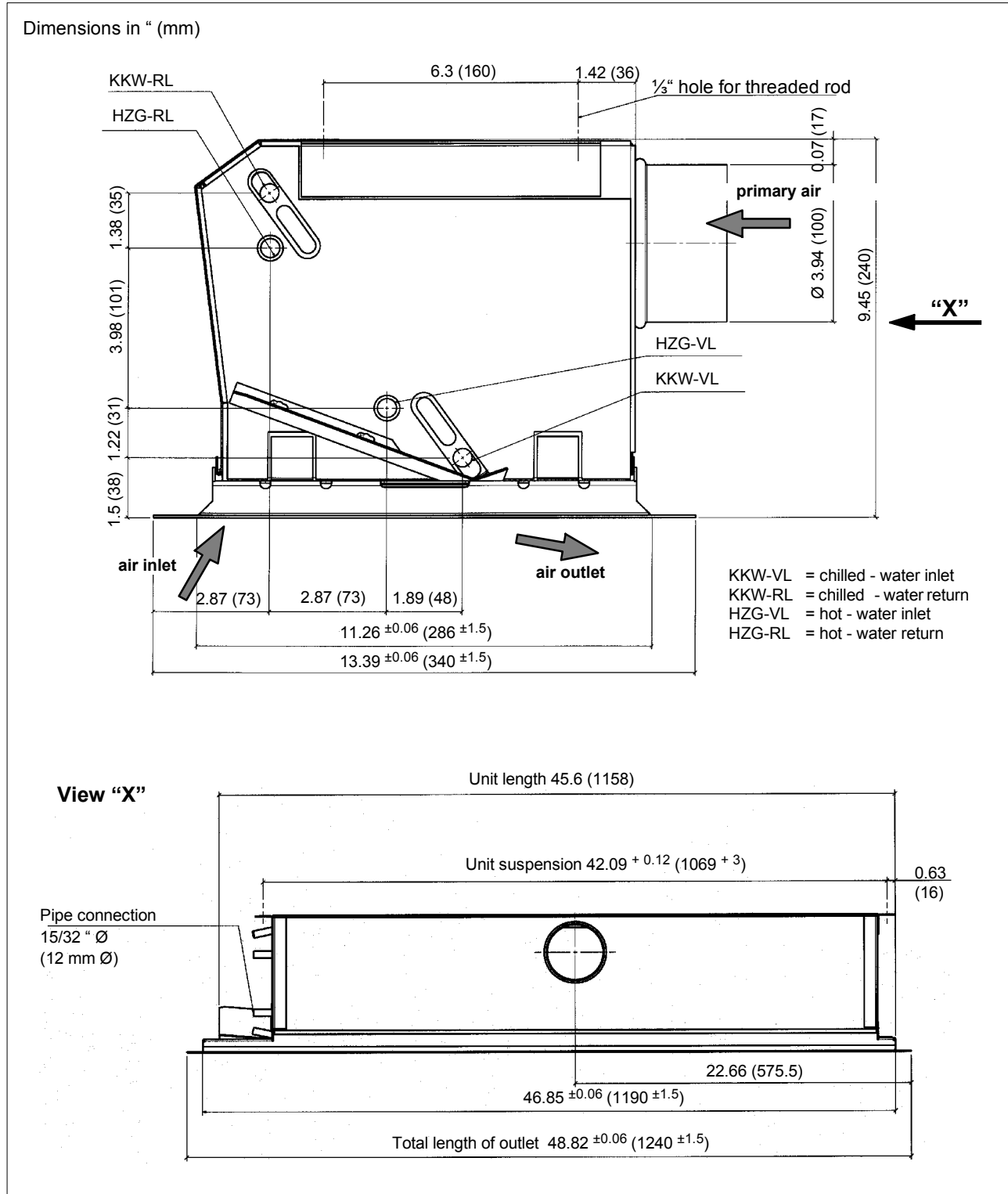
Weight: Basic unit: 37.5 lbs (17 kg) without water  
Inlet/outlet grille: 13.2 lbs (6 kg)

#### Accessories, special versions

Straight-way valves with electrothermal actuator.

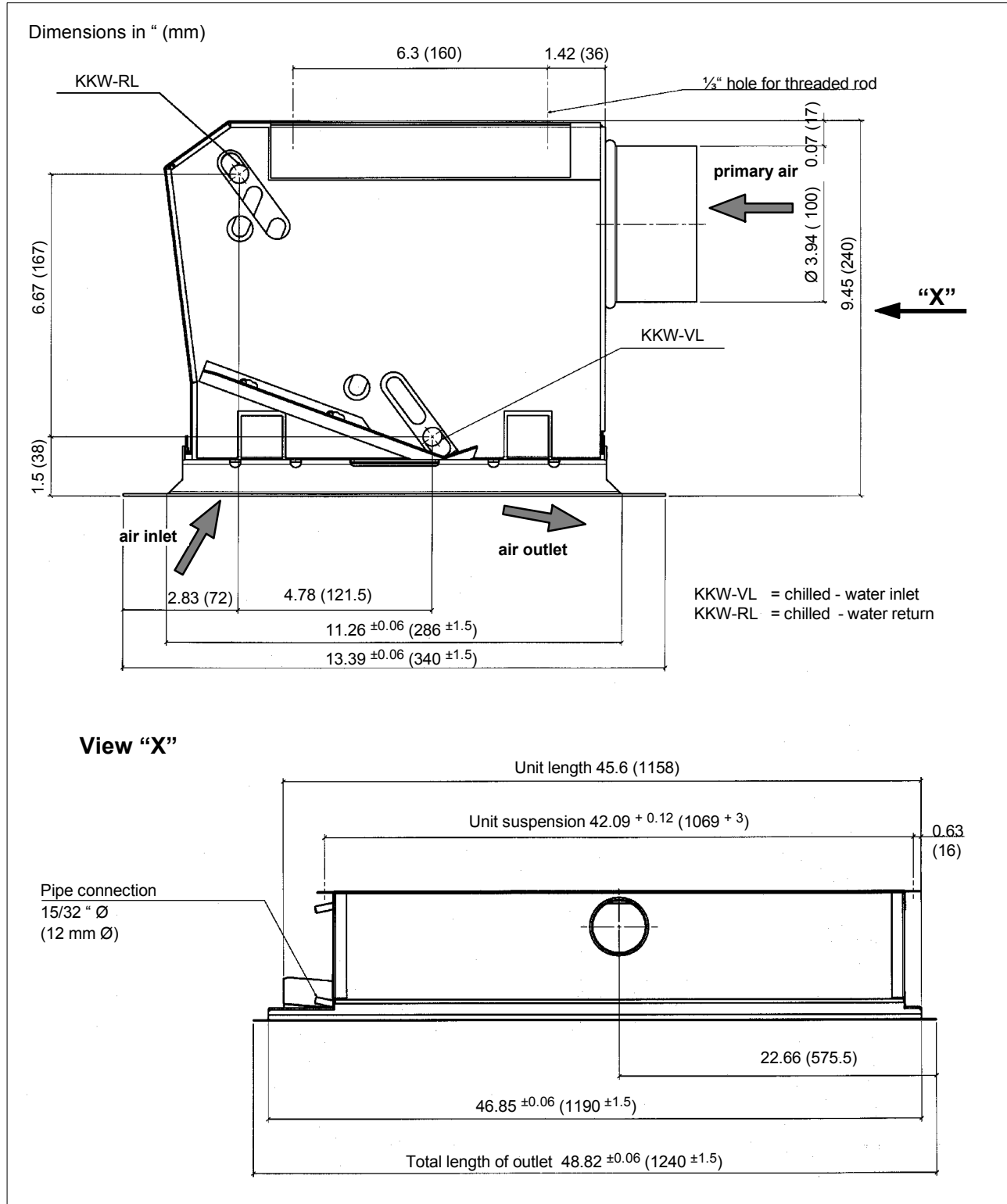
# Active chilled beams for ceiling installation Type HDC

## Dimensions size 1000 - 4-pipe system - cooling and heating, flanged installation



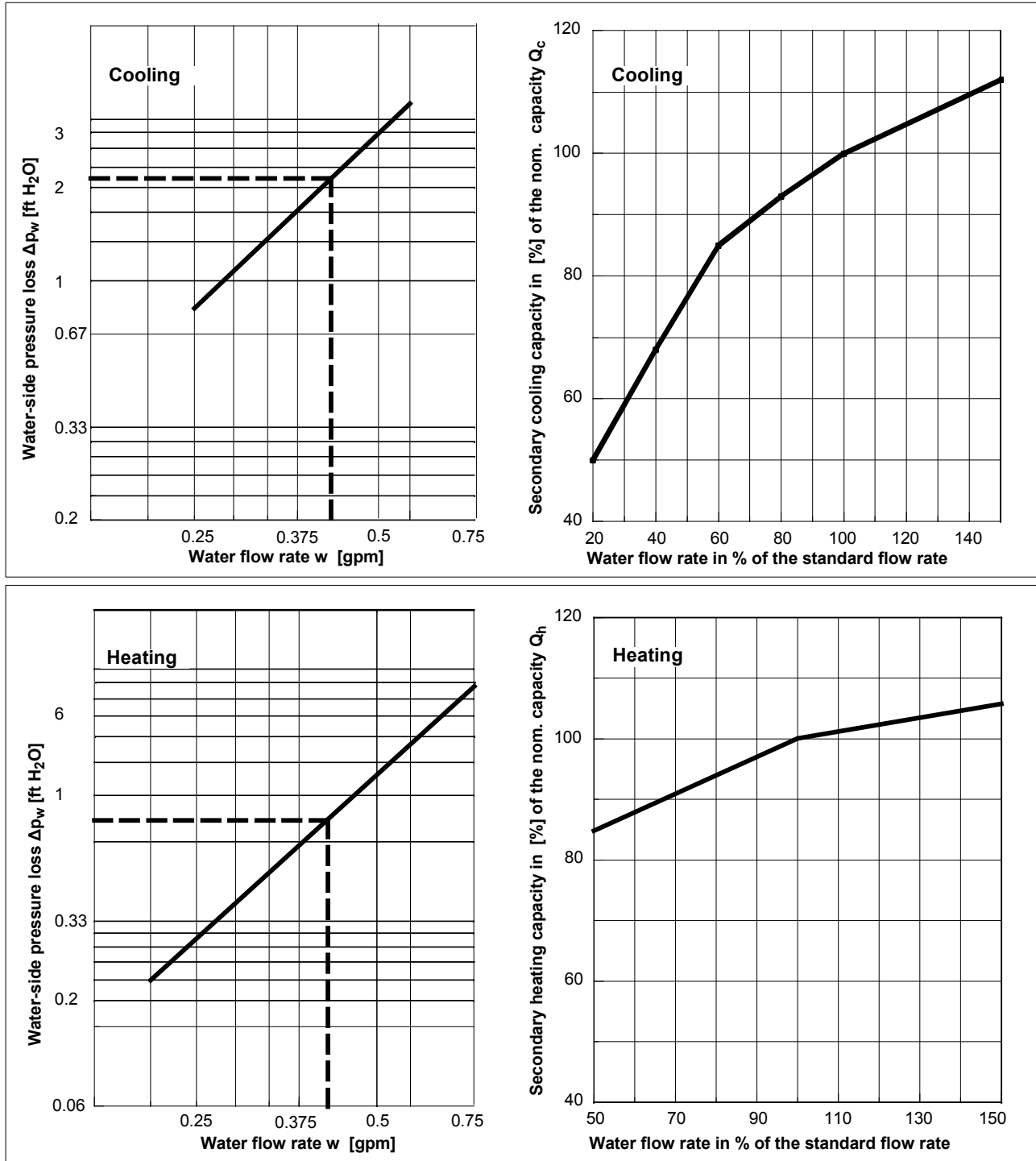
# Active chilled beams for ceiling installation Type HDC

## Dimensions size 1000 - 2-pipe system - cooling or heating, flanged installation



## Active chilled beams for ceiling installation Type HDC

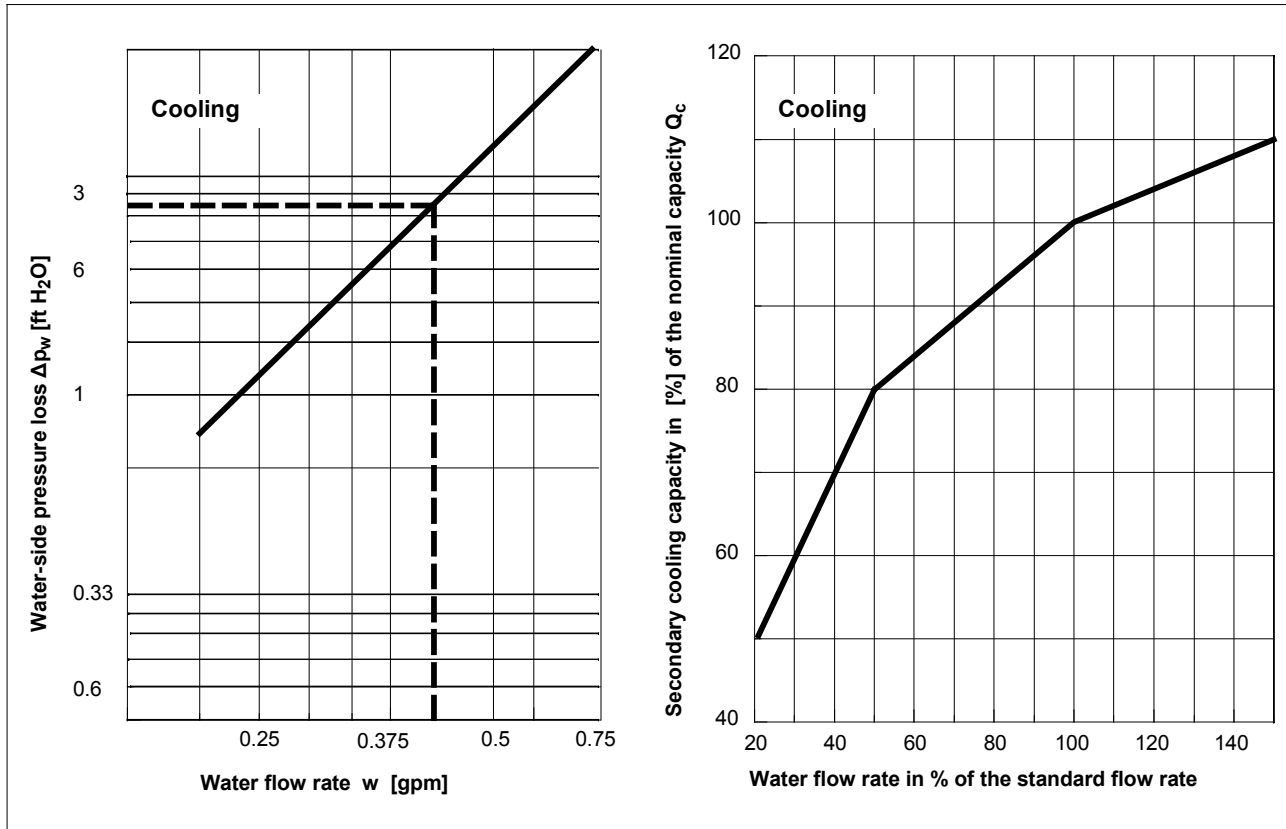
Water-side pressure loss and cooling capacity with different water flow rates  
 Size 1000, 4-pipe system - cooling and heating, standard flow rate 0.4 gpm



**Note:** The minimum flow rate must be at least 20% of the standard flow rate in the cooling mode and 40% in the heating mode (to ensure water-side pressure equalization).

## Active chilled beams for ceiling installation Type HDC

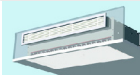
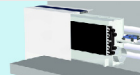
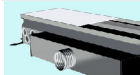
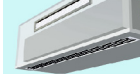
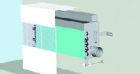
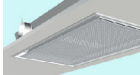
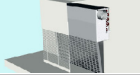

**Water-side pressure loss and cooling capacity for other flow rates**  
 Size 1000, 2-pipe system - cooling or heating, standard flow rate 0.4 gpm



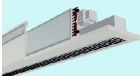
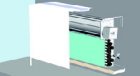
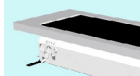
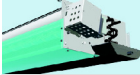
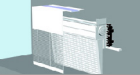
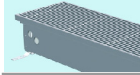
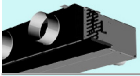
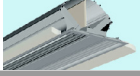


## Product Overview **LTG Air-Water Systems**





### **LTG Induction** – Induction Units

Ceiling installation	Sill Installation	Floor Installation
 HFF <i>suite</i> SilentSuite	 HFV / HFV <i>sf</i> System SmartFlow	 HFB / HFB <i>sf</i> System SmartFlow
 LHG System Indivent®	 HFG	
 HDF / HDF <i>sf</i> System SmartFlow	 QHG	
 HDC		

### **LTG FanPower** – Fan Coil Units

Ceiling Installation	Sill Installation	Floor Installation
 LVC System Indivent®	 VFC	 VKB
 VKH	 QVC	 SKB
 VKE		
 KFA <i>cool wave</i> ®		

### **LTG Decentral** – Decentralised Ventilation Units

Ceiling Installation	Sill Installation	Floor Installation
 FVS Univent®	 FVM	 FVD
		 FVP <i>pulse</i> System PulseVentilation

## Engineering Services

