

MADEL®



WAAB-ROOM

Horizontal active chilled beams with front supply / return grille

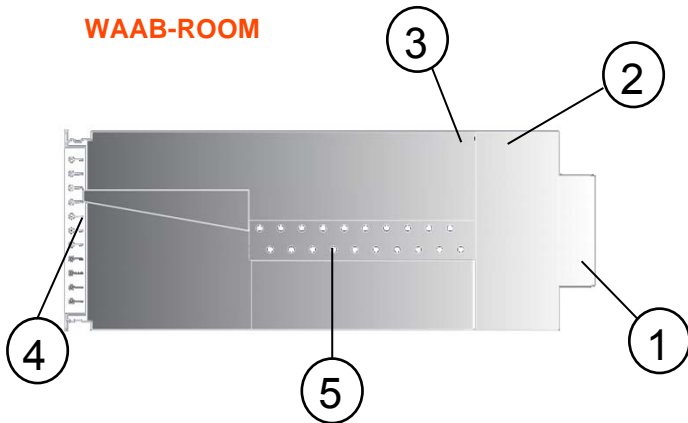
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The **WAAB-ROOM** chilled beam is an air-water induction terminal unit that simultaneously allows the supply, heat treatment and diffusion of supply air, in order to maintain indoor conditions at the desired level of comfort. The chilled beams take advantage of water's excellent thermal properties guarantee an optimum level of comfort with minimum energy consumption.

WAAB-ROOM is specially designed to be installed on a false ceiling where the return grille cannot be placed at the bottom, using a single grille for supply and return.

WAAB-ROOM is supplied with a side connection only and is available in widths of 1200 and 1500.

WAAB-ROOM



- 1.- Primary air inlet
- 2.- Plenum
- 3.- Nozzles
- 4.- Removable supply-return grille (S)
- 5.- Battery

WAAB-ROOM /2T/LD/...



WAAB-ROOM /4T/LI/...



Classification

WAAB-ROOM Horizontal active chilled beams with front supply / return grille.
.../2T/ Two-pipe battery.
.../4T/ Four-pipe battery.
.../LD/ Right side connection.
.../LI/ Left side connection.
.../KS/ Small supply nozzles.
.../KM/ Medium supply nozzles.
.../KL/ Large supply nozzles.
.../AMT/ AMT single deflection grille
.../LMT/ LMT linear grille
.../LMT-15/ LMT-15 linear grille
.../LN/ Nominal length (1200 and 1500)

Fixing

(D) Slots on the plenum for securing to ceiling (see page 5).

Finishes

AA... Matt silver anodised (only for LMT grilles)
M9016 White lacquered similar to RAL 9016
R9010 White lacquered RAL 9010
RAL... Lacquered in other colours RAL

Material

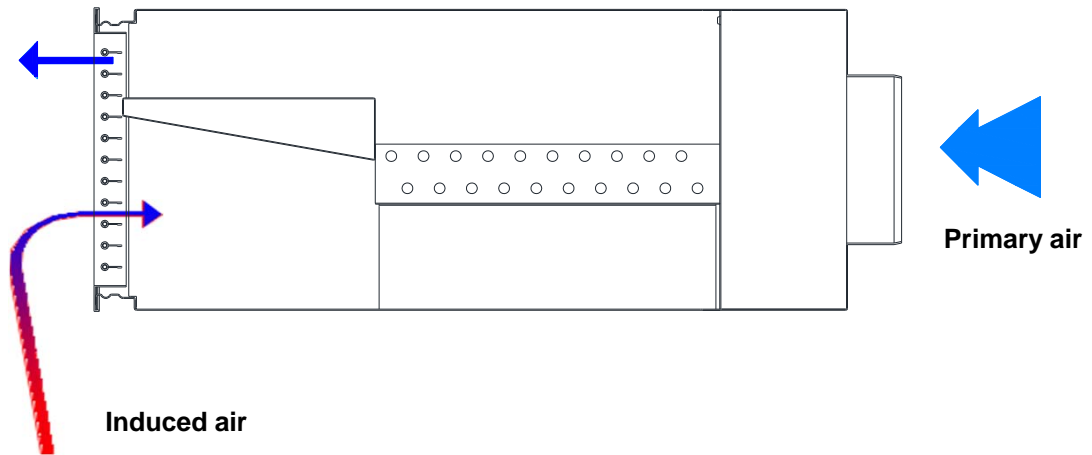
Galvanized steel body, battery with copper pipes and aluminium fins.
 The battery's connection pipes have a diameter of 12 mm and a thickness of 1 mm, complying with the European Standard EN 1057:1996. The battery's maximum working pressure is 1 MPa.

Prescription text

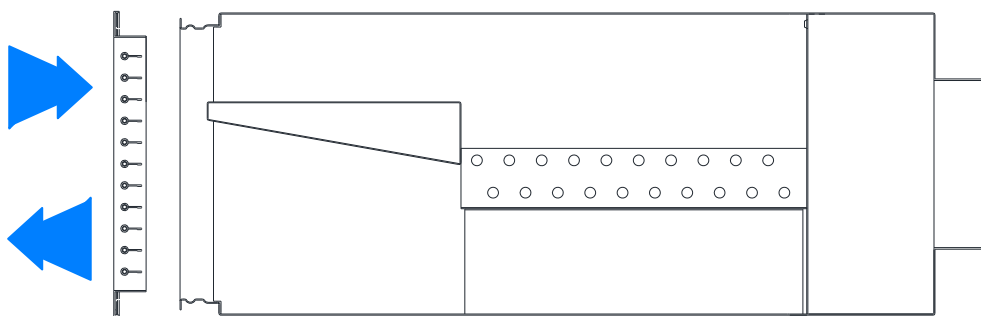
Supply and installation of Horizontal active chilled beams with front supply / return grille, with 4-pipe battery, plenum with right side connection, prefixed medium nozzles
WAAB-ROOM / 4T / LD / KM / LMT / 1200 with fixed bars LMT linear grille in matt silver anodized **AA**. **MADEL** trademark.

CONSTRUCTION AND OPERATING SYSTEM

The ventilation air is injected through nozzles that accelerate it, inducing and forcing the induction of air from the room through the battery. Subsequently, the mixture of the two air masses, the induced air and the ventilation air, is supplied to the space to be air conditioned.



WAAB-ROOM has been designed to be easily accessible for maintenance and service operations. For these operations the supply / return grille, fixed by clips (S) can be removed.

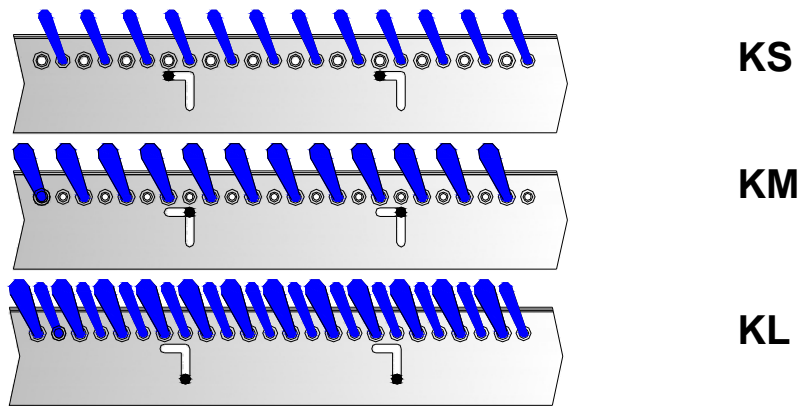


Once the grille has been released, the adjustment of the discharge nozzles at the top can be carried out and the top and bottom of the battery can be accessed.

CONSTRUCTION AND OPERATING SYSTEM

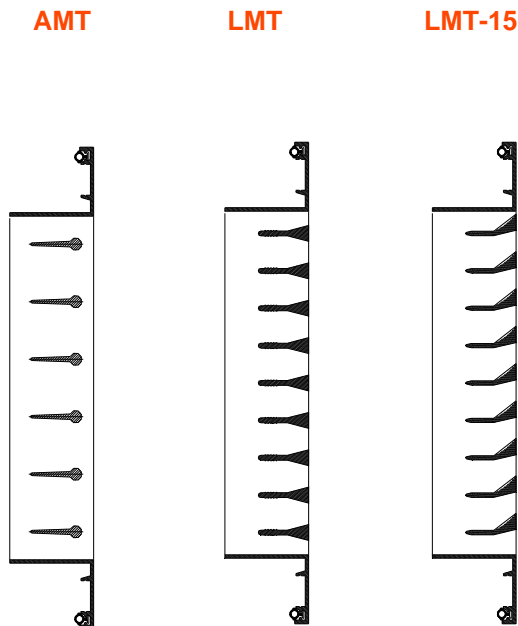
Adjusting the air flow

The **WAAB-ROOM** chilled beam can be supplied with a primary air flow adjustment system. This adjustment is carried out with a Phillips screwdriver, and enables the simple selection between three outgoing air configurations. This way, if there is a change in the project specifications, the primary air flow can be readjusted in the actual installation.



Modification of the air deflection angle.

The **WAAB-ROOM** chilled beam can be supplied with the single deflection grilles **AMT** with adjustable blades or with **LMT** linear grilles with fixed bars at 0° or 15°.





TYPES AND SIZES

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LD Right side connection

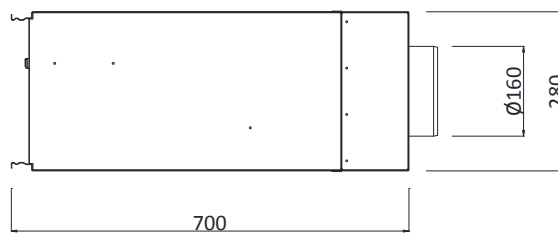
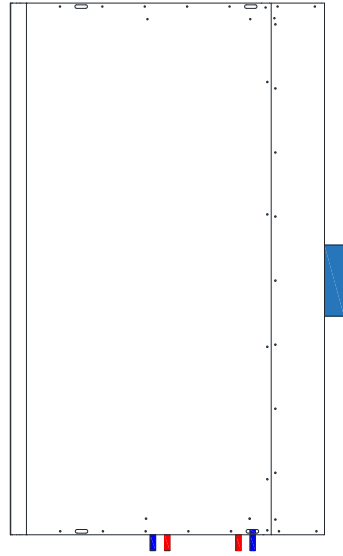
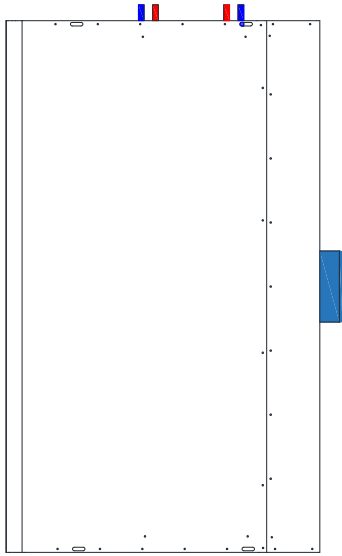
LI Left side connection



● Cold water connection

● Hot water connection

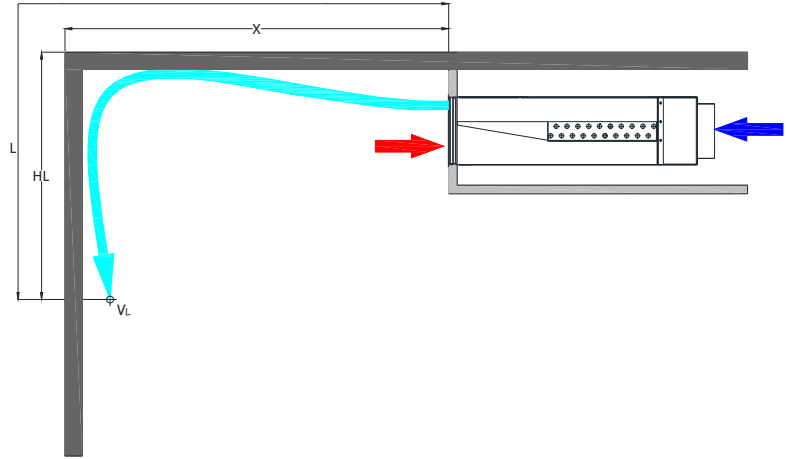
■ Circular lateral air supply connection



DEFINITIONS

The characterization of the chilled beams requires both thermal and diffusion testing taking as a reference standards EN 15116, EN 13182 and EN 14240.

Below are the characteristic curves of each of the models corresponding to the WAAB-ROOM product. The referencing method will be:



V_L	(m/s)	Air speed at height L
H	(m)	Distance from ceiling to living area (1.8 m)
L_N	(m)	Nominal length of chilled beam
L_{WA}	(dBA)	Sound power level
P	(W)	Total power ($P=P_{dr}+P_{w,r}$)
P_{dr}	(W)	Primary air-flow rate
P_w	(W)	Nominal water cooling or heating output
$P_{w,r}$	(W)	Water cooling or heating output
m_{dr}	(m^3/h)	Primary air flow
m_{wh}	(l/h)	Hot water flow
m_{wc}	(l/h)	Cold water flow
T_{dr}	(°C)	Primary air temperature
T_R	(°C)	Reference temperature of the premises
$T_{i,wc}$	(°C)	Battery incoming cold water temperature
$T_{o,wc}$	(°C)	Battery outgoing cold water temperature
$T_{i,wh}$	(°C)	Battery incoming hot water temperature
$T_{o,wh}$	(°C)	Battery outgoing hot water temperature
P_a	(Pa)	Static pressure inside plenum
ΔP_w	(kPa)	Load loss in water circuit
Δt_{aw}	(°C)	Difference in reference temperature of premises and water supply ($\Delta t_{aw} \leq T_R - T_{i,w}$)
Δt_{pr}	(°C)	Difference in reference temperature of premises and primary air supply ($\Delta t_{pr} = T_R - T_{dr}$)
F_w		Correction factor of water flow rate according to water flow ($P_{w,r} = P_w \cdot F_w$)
Δt_w	(°C)	Shighthermal in the battery (°C)

The nominal working conditions of WAAB-ROOM chilled beams are as follows:

Cooling 2 and 4 Pipes		Heating 2T		Heating 4 Pipes	
<i>RT</i>	26 °C	<i>RT</i>	22 °C	<i>RT</i>	22 °C
<i>mwc</i>	110 l/h	<i>mwc</i>	110 l/h	<i>mwc</i>	110 l/h
<i>T_{i,wc}</i>	16 °C	<i>T_{i,wc}</i>	35-40 °C	<i>T_{i,wc}</i>	35-40 °C
<i>T_{pr}</i>	16 °C	<i>T_{pr}</i>	22 °C	<i>T_{pr}</i>	22 °C

- (1) The recommended flow maintains a thermal gap of 2-4 °C in the battery.
- (2) It is recommended to use a water flow temperature between 14-16 °C to avoid condensation.
- (3) It is recommended to use a water flow temperature between 35-40 °C to avoid air stratification.

