WHISPER / i-WHISPER

HFC R-410A

High efficiency rooftop units

- **WHISPER**
  High efficiency reversible or cooling only Rooftop
- **WHISPER ENTHALPY**
  High efficiency reversible or cooling only Rooftop with enthalpic heat recovery
- **WHISPER HALL**
  High efficiency reversible Rooftop with enthalpic heat recovery, for high crowding applications
- **i-WHISPER ENTHALPY**
  High efficiency reversible Rooftop with modulation of the capacity and enthalpic heat recovery

VAIR Variable Air Flow

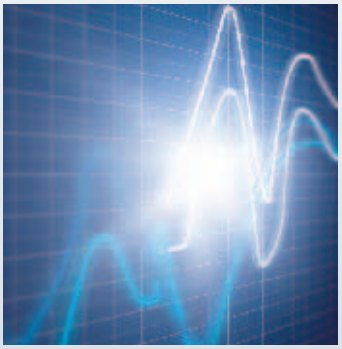
INVERTER DRIVEN COMPRESSOR

THERMODYNAMIC

ROTARY

PLUGFUN

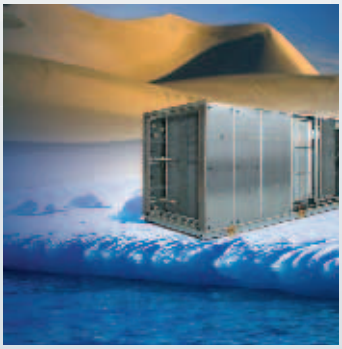
Maximum efficiency and perfect comfort



Advanced control and complete integration

Simplified installation and maintenance

Extensive operation range



CLIMAVENETA

WHISPER

VAIR Variable Air Flow

Technological innovation for Energy efficiency

Whisper range consists of air to air reversible units, realized with double refrigerant circuit and plug fan, with different constructive specifications that distinguish 6 different models. All the units are aimed to maximize the energy efficiency and are characterize by technological innovation, building quality and high reliability.

High efficiency

Every technological aspect of WHISPER is aimed to achieve the highest energy efficiency, in every operating condition: even at part loads, or in ventilation-only operation.

- Refrigerant circuits with intertwined coils,
- Thermodynamic effect by forcing the exhaust air on the outdoor coil,
- High efficiency plug-fans for the air treatment section,
- Variable air flow based upon the operating conditions and the cooling / heating load,
- Enthalpy recovery with high contribution to overall performances (-ENTHALPY, -HALL models).

Variable air flow

Not available for iWhisper Enthalpy model

Climaveneta deemed it fundamental to develop an advance logic and exclusive management with the main aim to reduce the ventilation electrical consumption.

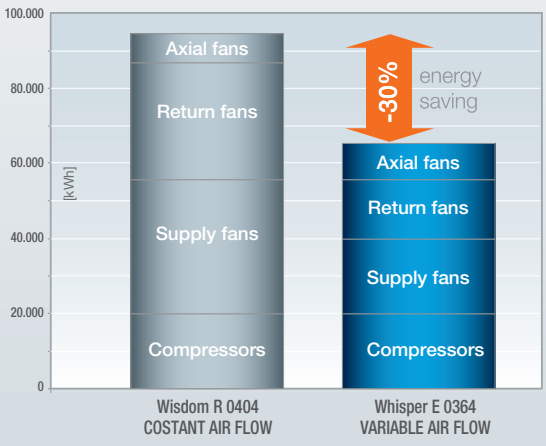
The Variable Air Flow function allows to change the supply and return air flow on the base of the real load in the ambient, calculating the active percentage of each resource of the unit, like compressors, heaters, burner, free cooling or free heating. In this way the air flows are managed on the base of the real demand, respecting in any case the working limits of the components and of the plant.

-30% running costs

The electrical consumption coming from the ventilation section of a Rooftop unit rapresents more than 50% of the total annual consumption: the supply and return fans operate continuously whenever the plant is active, whatever is the instantaneous heating / cooling demand.

With WHISPER the incidence of such item is already strongly reduced thanks to the adoption of high efficiency plug-fans.

Now the VAir function allows a further, dramatic reduction, granting on the other hand high standards for the indoor air quality and the safe operation of the unit's components. Operating costs' savings around 30% are easily achievable.



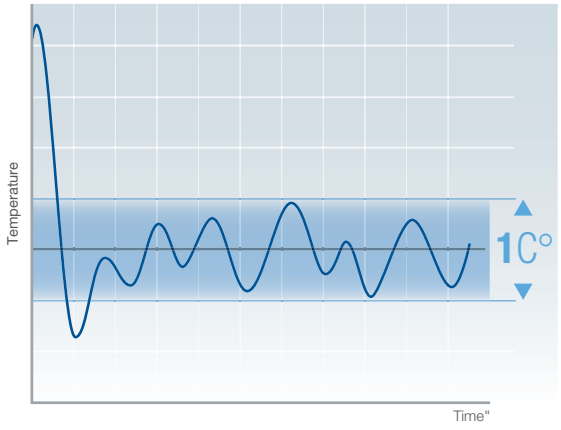
Simulation on annual base, commercial area in the north of Italy

i-WHISPER ENTHALPY

INVERTER DRIVEN COMPRESSOR

Technical innovation for Comfort

The i-Whisper Enthalpy model is different from the other models for the approach aimed at the comfort. The constructive specifications that distinguish the units are the variable speed scroll compressor and the supply temperature control, as well as the electronic thermostatic valve, the integrated post heating coil and the continuous regulation of the fan speed.

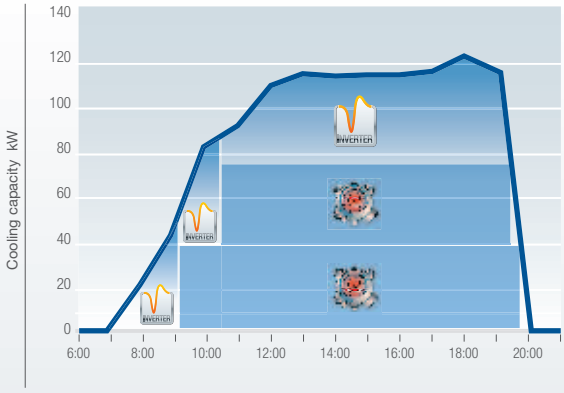


Complete comfort

Precise supply temperature control means energy savings and the highest level of comfort attainable for packaged units.

The unit guarantees maximum indoor comfort by always supplying air at the desired temperature, with a precision of 1°C and without causing discomfort for the occupants, also during critial operations like dehumidifcation or low load.

Simulation maximum summer load
Commercial area - Bologna



Perfect load adaptability

The use of variable-speed scroll compressors allows a precise response to variations in load, avoiding excess energy production during operation at part loads.

This means also less ON/OFF cycles, less stress on the system, high reliability and longer compressor life.

The high level of adaptability to current load conditions is further guaranteed by the use of an electronic expansion valve and the device for continuous speed control of the axial fans.

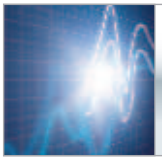
Application solution

The technological solutions and the innovative control logics developed for the i-Whisper Enthalpy revolutionise the traditional concept of rooftop units and offer a compelling alternative for applications that until now have been traditionally covered by combinations of air handling units and chillers.

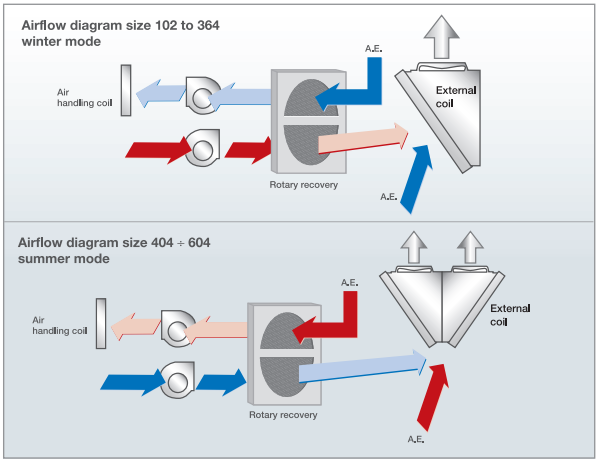
It can thus be used in applications in which the load, both sensible and latent, varies considerably, and where a high percentage of fresh air (max 80%) is required while guaranteeing comfort for the occupants.

- Sports centres and gyms
- Discotheques
- Shopping centres
- Conference rooms

WHISPER / i-WHISPER



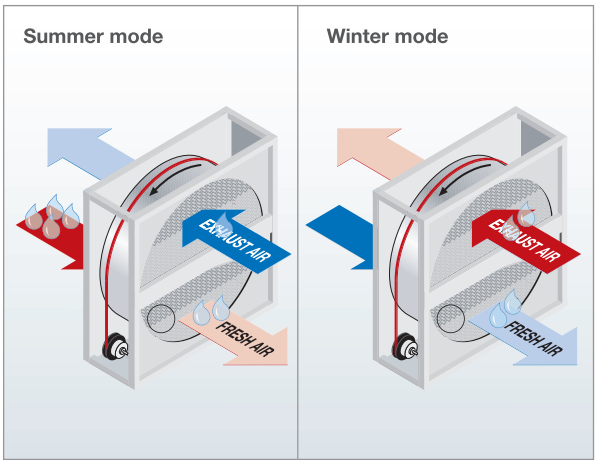
Technological choices



High efficiency thermodinamic effect
(For all models)

Thanks to the exhaust air flow forced through the external section of the circuit, the unit's capacity is increased, enabling it to work at more favourable temperatures than the actual outdoor temperature, resulting in higher output and lower power consumption.

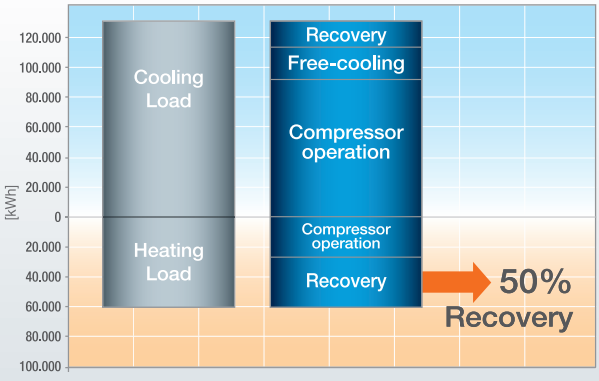
The capacity output is continuously adjusted depending on the required heating/cooling load until the unit switches to full free-cooling or freeheating mode. In such modes, the action of the thermodynamic effect ceases since all compressors are off and the unit operates with ventilation only.



Rotary enthalpic recovery
(-Enthalpy, - HALL)

The most efficient recovery system, with efficiency ranging from 60% to 90% depending on operating conditions, due to the large exchange surface compared to its volume. It allows recovery of latent heat as well as sensible heat, with a considerable increase in the unit's overall capacity.
The main component is the rotor, made with aluminium sheets plus hygroscopic coating. The heat exchange process is based on the storage of heat by the wheel: while it rotates slowly, the exhaust air is expelled through one half of its cross section and gives up heat to the wheel matrix. The fresh air, which flows through the other half, absorbs the stored heat. As the wheel continues to rotate, the parts which absorb and transfer heat swap over continuously.

Annual energy contribution of the enthalpic heat recovery



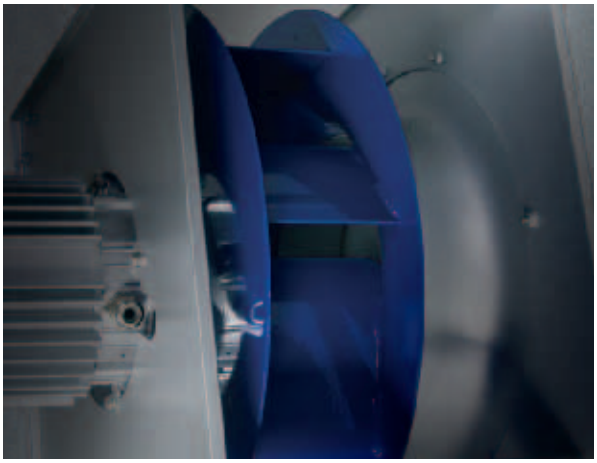
Simulation on annual base with Whisper Enthalpy 0364, commercial area in the north of Italy

Advantages of the enthalpic recovery

The contribution given by the recovery permits a more favourable selection of the rooftop's size, with inherent advantages in terms of:

- Purchase cost of the unit.
- Dimensioning of the power supply equipment.
- Occupied spaces.

Besides this, the energy contribution by the recovery is a cost-free source itself, with impact on the operating costs, and such source may exceed 50% of the heating load.
Furthermore, the recovery of the latent heat fraction allows a reduction of the need for humidification (heating mode) or de-humidification via operation of compressors (cooling mode).



Plug Fan section

Highly energy-efficient plug-fan type delivery and intake sections, with backward blades. In addition to energy saving, the plug fans are directly coupled to the motor, meaning they boast intrinsic reliability and efficiency due to the absence of belts and related energy loss. Resultantly, they are also simple to install, with no need to adjust airflow thanks to the fans' built-in electronic control.

Electronic speed regulation allows an ample range of adjustment to the system's features while comfort is assured during the unit's operation as the regulation compensates the flow changes otherwise caused by the progressive fouling of the filters.

Technologies for comfort and simplified use

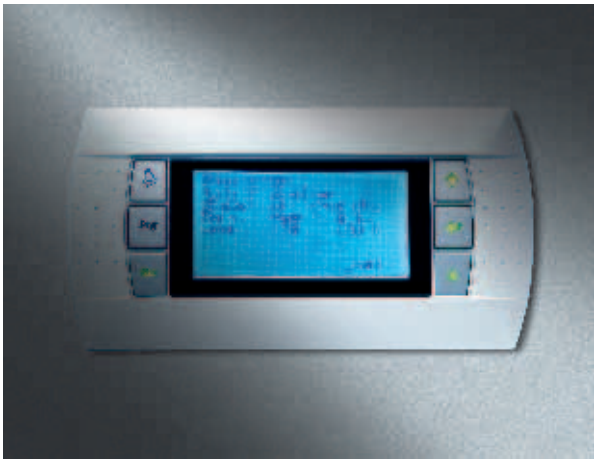
- Complete access to the unit's functions via the controller, with ability to set the various operational parameters safely - in particular the supply and return air flow rates with associated head values. This is correlated to the available choice of multiple strategies for both air flows and resources' regulation.
- Compact dimensions, compared to traditional rooftops of same capacity, especially if heat recovery is featured. This gives significant savings in transporting, handling, lifting and positioning the rooftop on-site.
- Easy and safe access to internal sections and devices, for fast and simple routine maintenance.

Extended operating range

The wide operating range ensure top performances and comfort, even in the heaviest conditions.

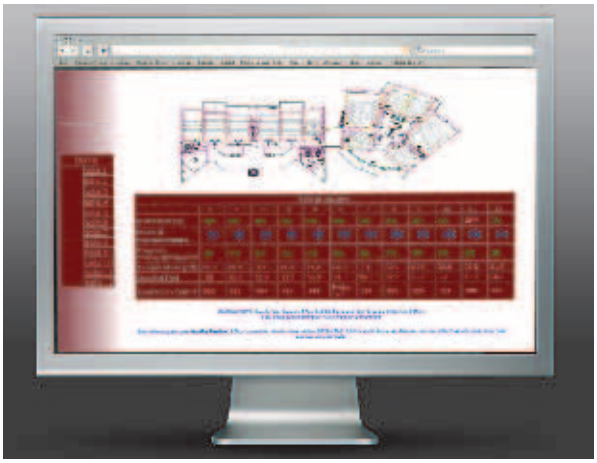
- Ability to work with high fresh-air percentage, upt to 80% with i-WHISPER ENTHALPY - due to the generously sized components
- Modulating management of free-cooling, related to the air conditions (temperature possibly combined humidity). The mixing of fresh- and re-circulated air flows grants, together with the ventilation, that prescribed indoor conditions are maintained, even without resorting to other cooling resources.
- Auto-adaptive management of the defrost, by monitoring numerous operational and climatic parameters. This allows, even with the harshest winter-mode operation, the reduction of the defrost cycles' duration, without the need of heating integration sources.
- Application flexibility in the different climatic situations, sustained by the offer of reversible units and of numerous built-in options, managed by the unit itself.

Advanced controller and comprehensive range



AIR3000SE

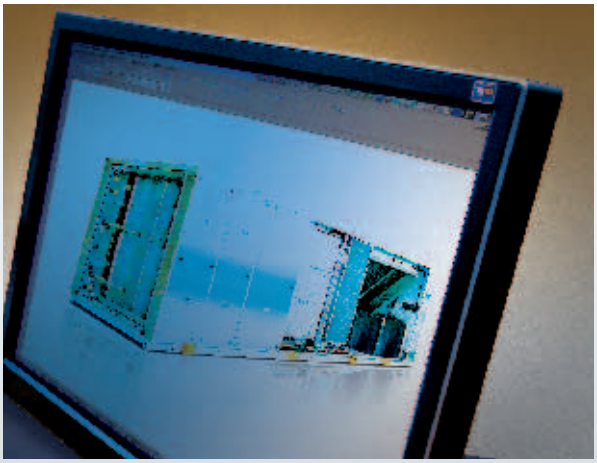
- Generously sized keypad with full LCD display, multi-level & multi-language menu.
- Built-in real-time clock for operation scheduling (4-day profiles with 10 hour belts).
- Proportional, step-wise regulation, referred to the return air temperature; PID regulation referred to supply temperature only for i-Whisper Enthalpy.
- Ventilation management ON/OFF, fixed speed, costant pressure, costant air flow
- Complete alarm management, with "black-box" (via PC) and alarm logging (via display or PC as well).
- Supervision can be easily developed via proprietary devices or the integration in third party systems by means of the most common protocols as ModBus, Bacnet, Bacnet-over-IP, Echelon LonWorks.
- Compatibility with the remote keyboard managing up to 10 units.



FWS3000 Filed Web Server

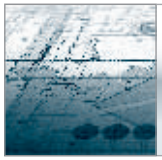
Units can be connected serially to the innovative Climaveneta FWS (Field Web Server) supervisor system as well as to the main BMS systems available in the marketplace.

Compatibility with all Climaveneta controllers means that supervision can be introduced at the commissioning stage or can be retrofitted on systems already in operation, thus affording considerable flexibility. Possibility to use common PC browsers, without the need for additional dedicated software.
This enables users to monitor units in real time, set the relevant operating values and tackle alarm events. All with the reliability that only a system directly developed by Climaveneta can promise.



Models

WHISPER	Reversible Heat pump unit
WHISPER/T	Cooling -only unit
WHISPER ENTHALPY:	Reversible Heat pump unit with rotary enthalpy recovery
WHISPER ENTHALPY/T	Cooling-only unit with rotary enthalpy recovery
WHISPER HALL	Reversible Heat pump unit with rotary enthalpy recovery for high attendance applications
i-WHISPER ENTHALPY	Heat pump unit with modulation of the cooling/heating capacity and rotary enthalpy recovery



General technical data

i-WHISPER ENTHALPY		0182	0202	0262	0302	0352	0402	0553	0653	0753
Cooling										
Cooling capacity + Recovery	kW	87	112	134	151	166	201	243	293	338
Compressor power input	kW	19	20	26	27	34	40	55	63	74
Heating										
Heating capacity + Recovery	kW	85	103	121	136	154	187	234	282	340
Compressor power input	kW	17	19	21	23	30	36	48	56	69
Supply fans				Plug fan (EC)				Plug fan (inverter)		
Nominal air flow	m³/h	7.200	9.000	11.000	12.500	13.500	16.500	20.000	24.000	30.000
Available static pressure	Pa	600	600	600	600	600	600	600	600	600
Power input	kW	1,4	1,8	2,0	2,5	2,8	2,9	3,1	4,0	5,8
Return fans				Plug fan (EC)				Plug fan (inverter)		
Nominal air flow	m³/h	7.200	9.000	11.000	12.500	13.500	16.500	20.000	24.000	30.000
Available static pressure	Pa	600	600	600	600	600	600	600	600	600
Power input	kW	1,3	1,7	2,0	2,3	2,5	3,2	2,9	3,7	5,4
N. copressors/N. circuits	N.	2/2	2/2	2/2	2/2	2/2	2/2	3/2	3/2	3/2
Dimensions										
A	mm	4.350	4.500	4.500	4.500	4.500	5.300	6.500	6.500	6.500
B	mm	1.700	2.250	2.250	2.250	2.250	2.250	2.250	2.250	2.250
H	mm	1.630	2.390	2.390	2.390	2.390	2.390	2.390	2.390	2.390

WHISPER		102	122	152	182	202	252	302	352	364	404	454	504	604
Cooling														
Cooling capacity	kW	36	45	52	61	73	95	103	122	125	139	153	182	197
Compressors absorbed power	kW	9	12	14	17	17	22	26	32	34	37	41	45	53
Heating														
Heating capacity	kW	32	43	50	58	65	87	95	113	115	130	140	172	186
Compressors absorbed power	kW	7	9	10	12	13	17	19	22	23	25	31	35	41
WHISPER/T		**102**	**122**	**152**	**182**	**202**	**252**	**302**	**352**	**364**	**404**	**454**	**504**	**604**
Cooling														
Cooling capacity	kW	36	45	52	61	72	95	103	123	126	139	154	182	197
Compressors absorbed power	kW	9	12	14	17	17	22	26	31	33	37	41	44	53
WHISPER Enthalpy		**102**	**122**	**152**	**182**	**202**	**252**	**302**	**352**	**364**	**404**	**454**	**504**	**604**
Cooling														
Cooling capacity + Recovery	kW	47	58	67	78	97	122	133	157	160	176	195	225	243
Compressors absorbed power	kW	9	12	13	16	17	22	26	31	33	37	41	44	52
Heating														
Heating capacity + Recovery	kW	41	53	61	71	83	108	118	140	143	159	173	207	224
Compressors absorbed power	kW	7	10	11	13	14	18	21	23	24	27	33	37	43
WHISPER Enthalpy / T		**102**	**122**	**152**	**182**	**202**	**252**	**302**	**352**	**364**	**404**	**454**	**504**	**604**
Cooling														
Cooling capacity + Recovery	kW	47	58	67	78	97	122	133	158	161	176	196	225	243
Compressors absorbed power	kW	9	12	13	16	17	22	26	31	33	37	40	44	52
Common data														
N. Compressors/N. Circuits	N.	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	4/2	4/2	4/2	4/2	4/2
Supply fans					Plug fan (EC)					Plug fan (inverter)				
Nominal air flow	m³/h	6.500	7.800	8.600	10.500	13.000	15.500	17.500	21.000	21.000	23.000	27.000	29.000	32.000
Power input	kW	5	5	5	5	7,2	7,2	7,2	8	8	15	15	15	15
Return fans					Plug fan (EC)					Plug fan (inverter)				
Nominal air flow	m³/h	6.500	7.800	8.600	10.500	13.000	15.500	17.500	21.000	21.000	23.000	27.000	29.000	32.000
Power input	kW	5	5	5	5	7,2	7,2	7,2	8	8	8	8	8	15
Dimensions														
A	mm	4.350	4.350	4.350	4.350	4.500	4.500	4.500	5.295	5.295	5.295	6.500	6.500	6.500
B	mm	1.700	1.700	1.700	1.700	2.250	2.250	2.250	2.250	2.250	2.250	2.250	2.250	2.250
H	mm	1.630	1.630	1.630	1.630	2.390	2.390	2.390	2.390	2.390	2.390	2.390	2.390	2.390

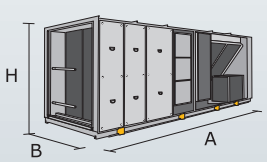
WHISPER Hall		110	140	180	200	260	300	360	400
Cooling									
Cooling capacity + Recovery	kW	46	56	64	72	98	115	128	146
Compressor absorbed power	kW	8	11	12	15	15	20	24	29
Heating									
Heating capacity + Recovery	kW	53	65	76	84	115	137	151	171
Compressors absorbed power	kW	7	9	10	12	12	17	19	22
Supply fans					Plug fan (EC)				
Nominal air flow	m³/h	4.300	5.400	6.800	7.800	10.000	11.700	14.000	15.000
Power input	kW	5	5	5	5	7,2	7,2	7,2	7,2
Return fans					Plug fan (EC)				
Nominal air flow	m³/h	4.300	5.400	6.800	7.800	10.000	11.700	14.000	15.000
Power input	kW	5	5	5	5	7,2	7,2	7,2	7,2
N. Compressors/N. Circuits	N.	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Dimensions									
A	mm	4.350	4.350	4.350	4.350	4.500	4.500	4.500	5.295
B	mm	1.700	1.700	1.700	1.700	2.250	2.250	2.250	2.250
H	mm	1.630	1.630	1.630	1.630	2.390	2.390	2.390	2.390

Data referred to:

i-WHISPER ENTHALPY:
Cooling:
External 35 °C, 50% RH;
Internal 26 °C, 50% RH; Fresh air 80%
Heating:
External 6 °C W.B.;
Internal 20 °C, 50% RH; Fresh air 80%

WHISPER / WHISPER/T / WHISPER ENTHALPY / WHISPER ENTHALPY/T:
Cooling:
External 35°C, 50% RH;
Internal 27°C, 47% RH; Fresh air 30%
Heating:
External: 6°C W.B.;
Internal 20°C, 50% RH;Fresh air 30%

WHISPER HALL:
Cooling:
External 32°C, 50% RH;
Internal 27°C, 47% RH; Fresh air 75%
Heating:
External -5°C, 85% RH;
Internal 20°C, 50% RH; Fresh air 75%



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