

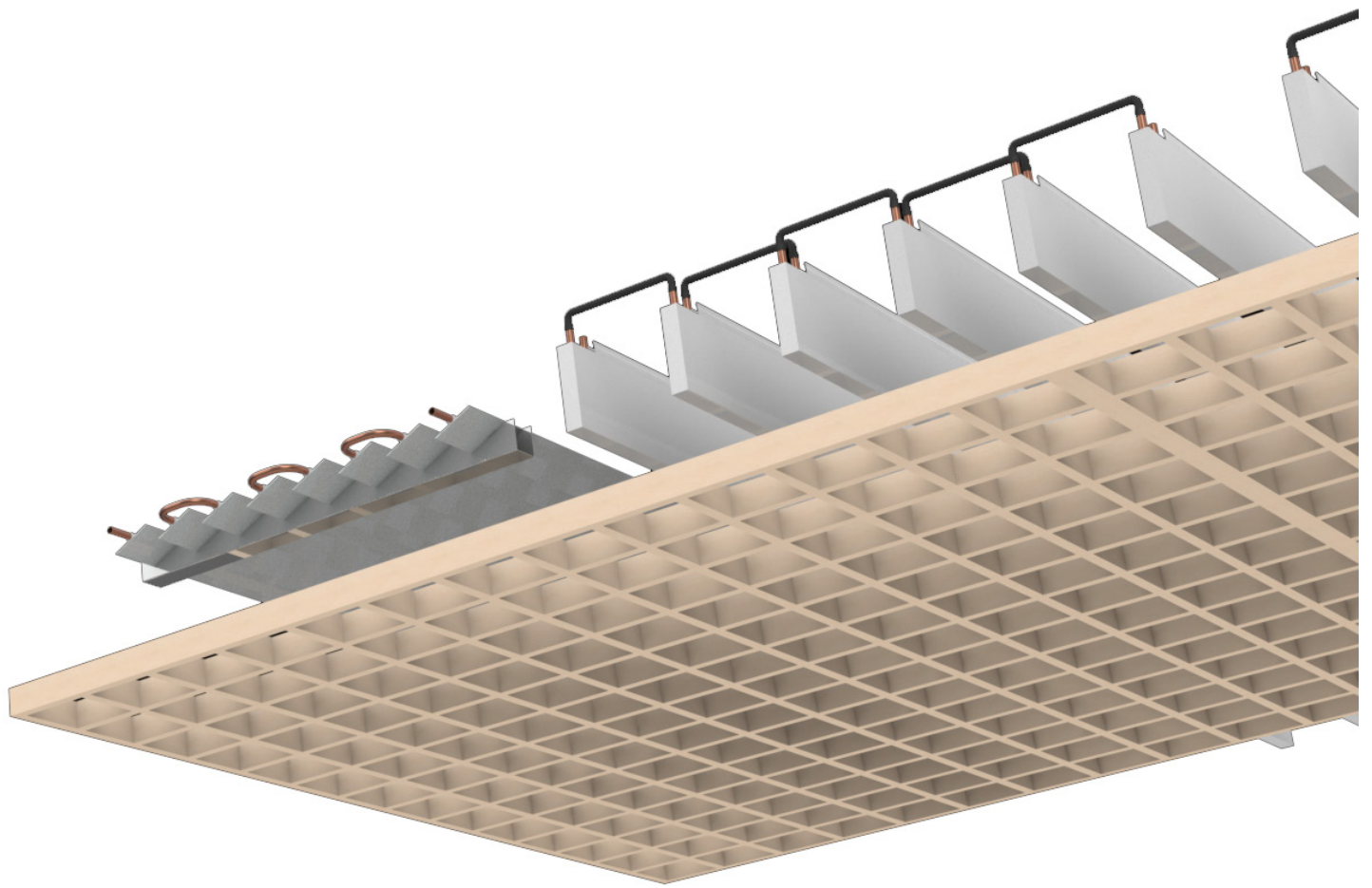
# PLAFORAD ACR

High-capacity cooling suspended ceiling panels



Technical manual

PLAFORAD ACR



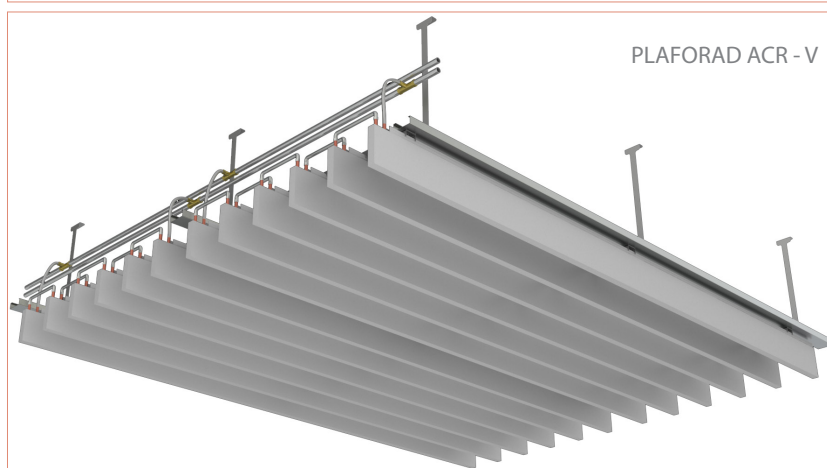
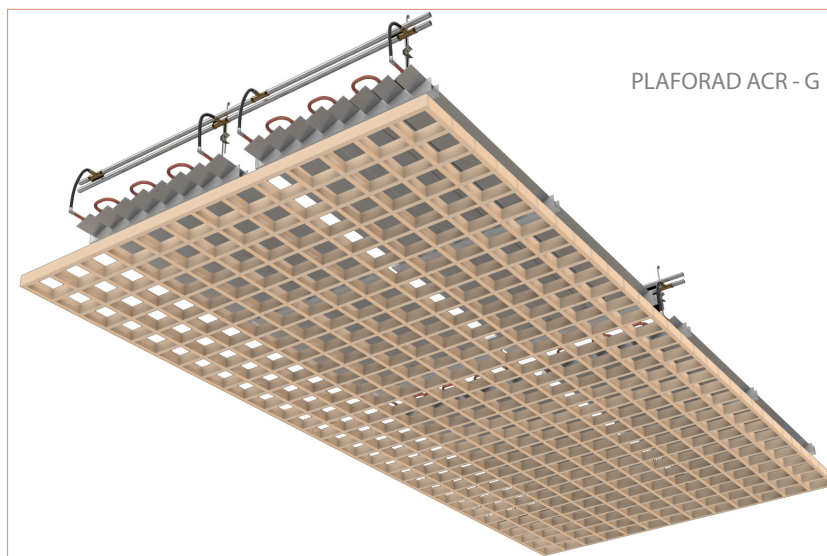
# ■ Quality

Fraccaro quality reaches new frontiers

PLAFORAD ACR panels are manufactured to the highest quality standards and consist of a high-capacity convective exchange and radiant module. Both the visual appearance and the cooling efficiency can be changed by modifying the panel spacing thus providing an infinite number of solutions.

PLAFORAD ACR provides the maximum design flexibility and any plant can be adapted to all types of design requirements. The space above the panels remains in view and is easily accessible, while the installation is easy and practical since it is not dependent on the false ceiling and is consequently cost effective.

PLAFORAD ACR panels are particularly suited for use in airports, railway and maritime stations, shopping centres, exhibition halls, conference centres, cinemas, auditoriums and for all those situations in crowded areas where there is a need for a high-output.



## » Technical characteristics

### PLAFORAD ACR - G

The Plaforad ACR-G panels are characterised by the open type ceiling mounted high-capacity exchanger, consisting of standard 2000 x 1000 mm. modules. The aluminium profiles are mounted on appropriately shaped stainless steel beams. The copper element is pressure mounted and perfectly integrated to ensure an optimal thermal conduction contact between the profile and the copper pipe.

The aluminium profiles are inclined so as to optimise the convective exchange by facilitating the passage of air between these. The metal support frame, including the aluminium heat exchanger profiles with the copper pipe, is bespoke designed to meet customer requirements.

The PLAFORAD ACR – G type is installed underneath grid type or stretched sheet type suspended ceilings.

### PLAFORAD ACR - V

This type consists of micro-perforated metal panels consisting of standard 3000 x 300 mm. aluminium conductor profiles and copper pipe. The panels are hooked to support beams at a variable distance depending on requirements. The use of micro-perforated panels installed vertically on both sides permits an optimal reduction in noise and at the same time provides an optimal thermal, radiant and convective exchange.

### PLAFORAD ACR - V COLOURS AND MATERIALS

The standard product is available in RAL 9010 white. Other polyester paint colours are available as an optional extra.

### HANGING STRUCTURE

Suspension hangers made from adjustable galvanized rods.

### COUPLING AND CONNECTION

The single panels must be connected in series until a recommended maximum pressure drop of approx. 2,5 - 3 m H<sub>2</sub>O (25 - 30 kPa) is achieved. Connections are realised with push-fit flexible steel mesh pipes with oxygen barrier.

#### **MAXIMUM OPERATING TEMPERATURE AND PRESSURE**

The maximum operating pressure is 10 bar and the maximum operating temperature shall not exceed 65° C.

#### **INSTALLATION AND MAINTENANCE**

It is recommended to follow the instructions provided in the operation and maintenance manual and to use neutral cleaning products when cleaning the elements.

#### **NOISE ABSORPTION**

For the ACR-V version the panels have micro-perforations on both sides and are fitted with a nonwoven fabric (TNT) so as to guarantee a good noise absorption coefficient.

#### **INTEGRATED TECHNOLOGIES**

The open structure of the panels permits the combined use of lighting accessories such as ceiling lights, light conduits, flush mounted spot lights, as well as aeration systems like intakes, linear, square or circular type air recovery and sprinkler and smoke detection systems.



» THERMAL EMISSIONS



ACR - G - THERMAL EMISSIONS DURING COOLING

$\Delta t_m$ [°C]	6	7	8	9	10	11	12	13
Cooling effect [W/m <sup>2</sup> ]	90	107	124	142	159	177	195	213

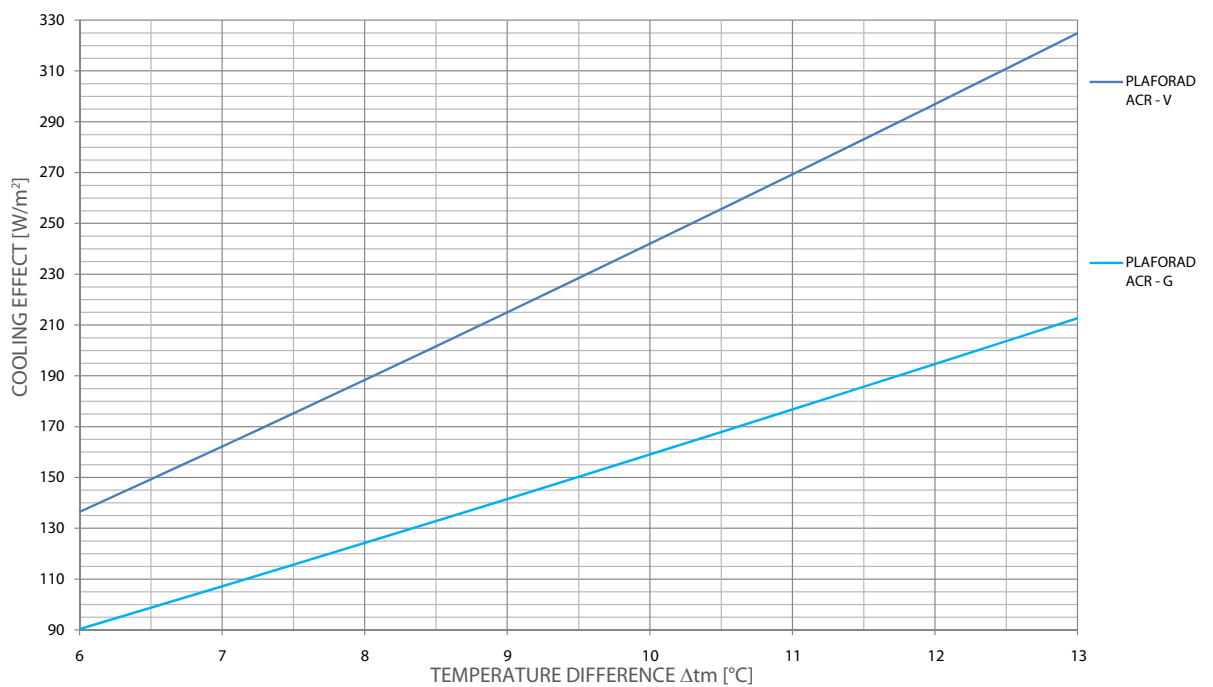


TIPO ACR - V - THERMAL EMISSIONS DURING COOLING

$\Delta t_m$ [°C]	6	7	8	9	10	11	12	13
Cooling effect [W/m <sup>2</sup> ]	136	162	188	215	242	269	297	325



COOLING EFFECT



Definition:  $\Delta t_m = T_a - (T_u + T_i) / 2$

$T_i$  = water inlet temperature;

$T_u$  = water outlet temperature;

$T_a$  = room temperature.

» DRILLING TABLE

TYPES	HOLE Ø [mm]	DRILLED SURFACE
	1,5	22%
	1,5	11%
	2	11%
	2,5	16%
	3	16%
	3	16%

Other types of drilling patterns are available as an optional extra

PLAFORAD ACR	Panel weight per m <sup>2</sup> [kg/m <sup>2</sup> ]		Cooling effect with Δt 10 [W/m <sup>2</sup> ]
	With water	No load	
ACR - G	9,87	8,87	159
ACR - V	13,50	12,50	242



» WATER FLOW RATE AND PRESSURE DROP

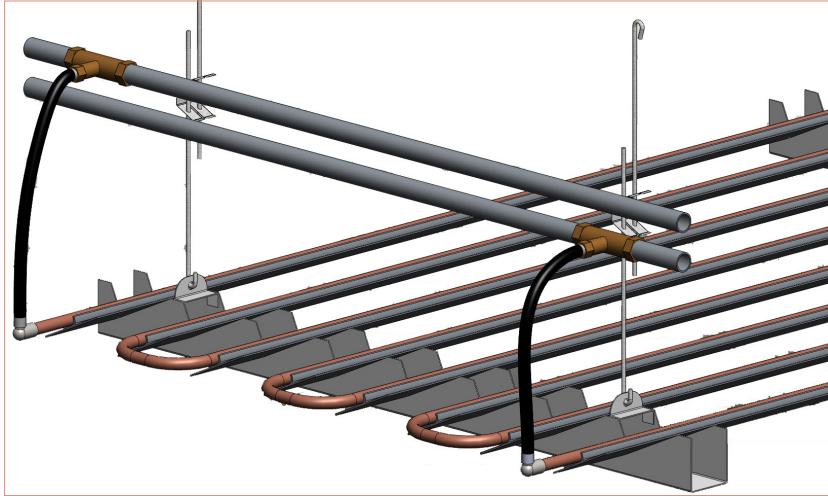
PLAFORAD ACR			
Flow rate [l/h]	Panel pressure drop per m <sup>2</sup> [m H <sub>2</sub> O/m <sup>2</sup> ]	Flow rate [l/h]	Panel pressure drop per m <sup>2</sup> [m H <sub>2</sub> O/m <sup>2</sup> ]
100	0,170	250	0,814
150	0,338	300	1,117
200	0,554	350	1,460

» EXAMPLES OF TENDER SPECIFICATIONS

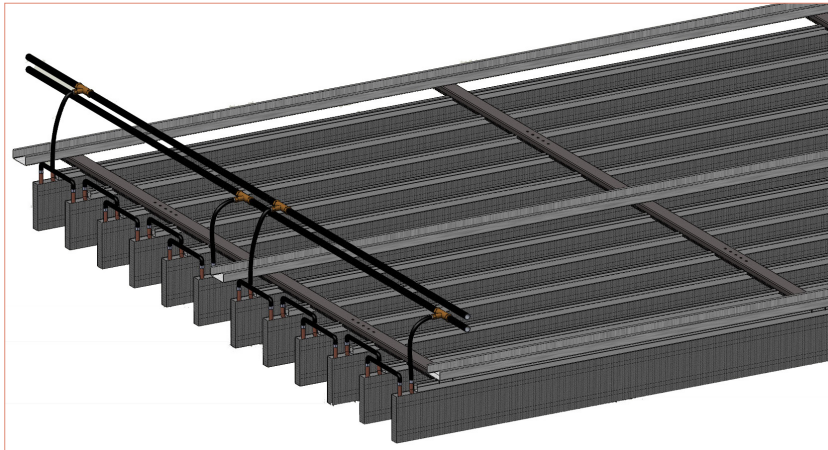
Pos.	Description
1	The high-capacity cooling modules ACR-G consist of extruded aluminium exchanger profiles mounted on appropriately shaped stainless steel beams. The copper element is mounted and perfectly integrated to ensure an elevated convective radiant effect.
2	The high-capacity cooling modules ACR-V consist of metal sheets with micro-perforations on both sides, implemented by appropriately shaped extruded adhesive aluminium profiles containing the 12 mm copper pipe, in compliance with UNI EN 1412, together with straight terminations for plug-in connection with the inlet and outlet circuits. They are provided with calibrated bronze inserts (bushes) to continuously maintain the circumference of the pipe.



» EXAMPLES OF CONNECTING AND HANGING THE ACR - G MODULE



» EXAMPLES OF CONNECTING AND HANGING THE ACR - V MODULE



» SOME EXAMPLES OF INSTALLATION







# S O L U T I O N S

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