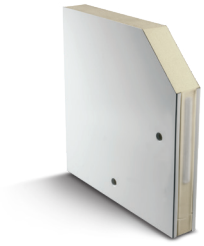
Multi Cubed - Technical file of the system

Multisystem is a modular and extensive range of cold rooms. The modular and comprehensive nature of the accessories permits both simple and complex configurations with cam-locks, the possibility of future development and the use of few types of panels to create cold rooms in a great variety of sizes. The system stands out, among other things, for its rounded internal corners.



Wall panels:
Sandwich panels consisting of rigid polyurethane foam between 2 metal sheets. Available in 5 thicknesses of 60 - 80 - 100 - 120 - 140 mm and in 9 widths of 200 - 300 - 400 - 600 - 700 - 800 - 900 - 1000 - 1200 mm. The lengths are in multiples of 200 mm, from 800 mm and up to a max of 4000 mm. The standard internal height of the multisystem cold rooms can be 2030 - 2230 - 2430 - 2630 - 2830 - 3230 mm.

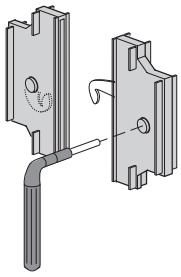
Metal supports: Standard: Sendzmir galvanized sheet metal 0.55 mm thick, pre-varnished with a 30 micron layer of white RAL 9010 (.ΔE<1) polyester paint, suited to contact with food (refer to Infotec G-00.04). There are various panel finishes available on request, such as sheet metal with a 110 micron layer of rigid PVC film (refer to Infotec G-00.03), X5CrNi18-10 (AISI 304) stainless steel, and stainless steel with a 110 micron layer of rigid PVC film. Dimensional tolerances in compliance with the EN 10143 European standard.

Insulation core: Standard in polyurethane foam (PUR) without CFCs, Density 41 Kg/m^3 ± 10% Kg/m^3, Initial thermal conductivity coefficient **λ** = 0.023 W/m K, Closed cells 95%, Adhesion > 100 KPa, Compression ⩾ 150 Kpa, Blowing agent HFO, Range of application - 40 °C to 60 °C.

Thermal transmission coefficient $U_{init.}$ According to standards EN 13165 - EN 14509						
Thickness mm	60	80	100	120	140	160
W/m^2 K	0,39	0,29	0,23	0,19	0,16	0,14

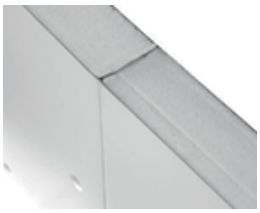
Environmental Compatibility: Index of the global warming potential GWP = 4,
Index of ozone depletion potential ODP = 0

Reaction to fire (Euroclass) according to EN 13501-1: Standard class **B s2 d0.**



Fastening devices: Double-acting camlocks along the perimeter of the panel, embedded in the polyurethane foam at suitable points for creating multiple modules of 200 mm.
Tensile strength > 350 dN.

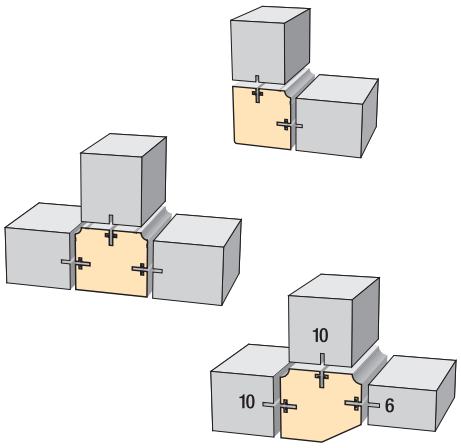
Alignment devices: There are tongue and groove (Corner Line) alignment devices in the 4 corners of the panels that facilitate assembly. There are also other alignment (In- Line) devices on the longer sides of the panels, between the camlocks, to help support ceiling applications. **The combined use of the 2 alignment devices guarantees that the ceilings can be walked on and that the various elements to be coupled are correctly aligned.**



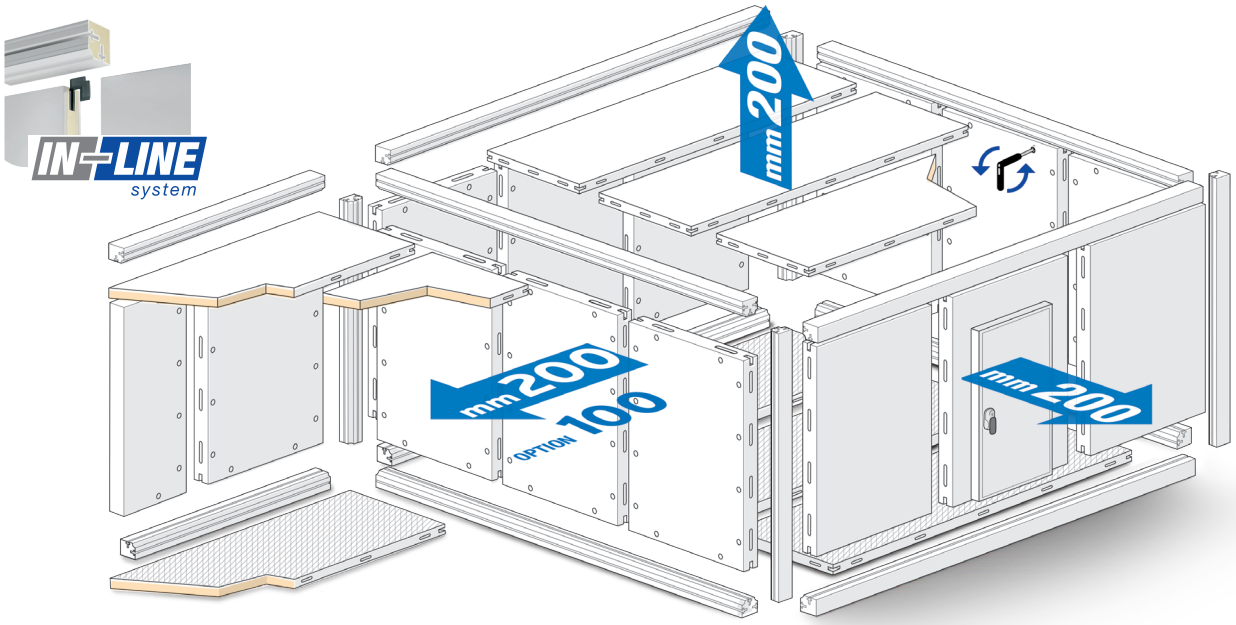
Joints between the panels: The perimeter of the panels is smooth and consists of expanded polyethylene gasket which guarantees the heat resistance of the joint after mechanical fastening with the camlocks.

Multi Cubed - Technical file of the system

Corner joints between Wall/Wall, Walls/Ceiling, Wall/Floor:
The Multi system includes a series of sections for coupling, always by hooks, all the parts that comprise the cold room, as shown in the exploded view below. These sections consist of 2 metal frames, one inner and one outer, linked to each other by PVC extrusions and rack-holder, between which PUR foam is injected, and these have the same aesthetic and insulation characteristics as the panels. They are made with a 15 mm radius rounded inner corner which, once the panels are coupled, forms a hygienic finish inside that is easy to clean in compliance with the European directives. Lengthwise, there are steel racks inside the PVC rack-bearing profiles and the eccentric hooks along the panel perimeter are locked onto them; this locking system, along with the expanded polyethylene gasket, ensures the joint is sealed hermetically. The coupling profiles can be 2 way, if used along the edges, or 3 way, if used to form partitions.
As an alternative, honeycomb PVC coupling profiles are available.



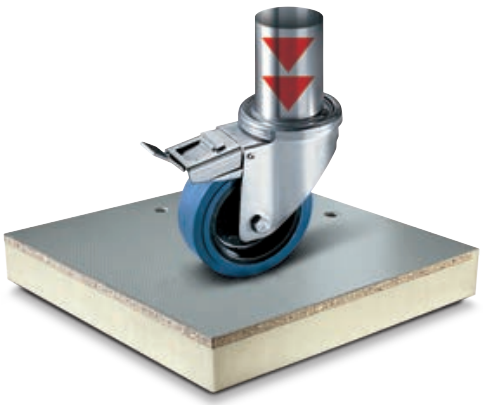
The modular multisystem: the components of the system are shown in the exploded drawing below.



Floor panels:

Standard P100
Standard with 0.7 thick galvanized sheet metal floor with a 200 micron layer of rigid PVC film, grey in colour, R9 anti-slip, a 10 mm chipboard reinforcement glued onto the metal sheet, and polyurethane insulation injected at high pressure with a density of 43 Kg/m^3 ± 10% and a 0.55 mm thick outer panel of Sendzmir galvanized sheet metal pre-varnished with a 30 micron layer of white RAL 9010 polyester paint.
Capacity: Evenly distributed static load 3000 Kg/m^2, Concentrated load: 300 Kg/50 cm^2, Maximum dynamic load on 1 rubber wheel with a minimum contact surface of 4 cm^2 100 Kg.
Conditions for application: Constant pressure on a per-fectly level and even floor (without subsidence), or resting on 330 x 330 x 40 mm E40 aeration plates, in which case the capacity decreases by 30%.

100 kg max

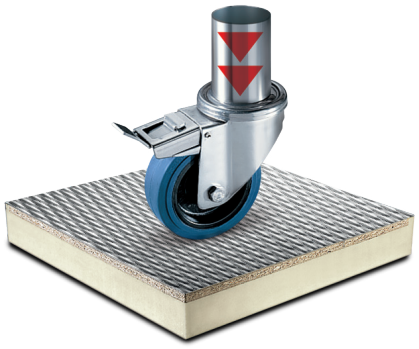


Multi Cubed - Technical file of the system

P100 IX (Inox R12)

A floor consisting of a 0.7 mm sheet of reinforced stainless steel with chequered and satin polished surface finish, R12 anti-slip, a 10 mm chipboard reinforcement glued onto the metal sheet, and polyurethane insulation injected at high pressure with a density of 43 Kg/m^3 ± 10% and a 0.55 mm thick outer panel of Sendzmir galvanized sheet metal pre-varnished with a 30 micron layer of white RAL 9010 polyester paint.
Capacities: Evenly distributed static load 3000 Kg/m^2, Concentrated load: 300 Kg/50cm^2, Maximum dynamic load on 1 rubber wheel with a minimum contact surface of 4 cm^2 100 Kg.
Conditions for application: Constant pressure on a perfectly level and even floor (without subsidence), or resting on 330 x 330 x 40 mm E40 aeration plates, in which case the capacity decreases by 30%.

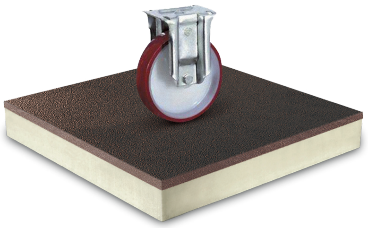
100 kg max



Reinforced P 250 F

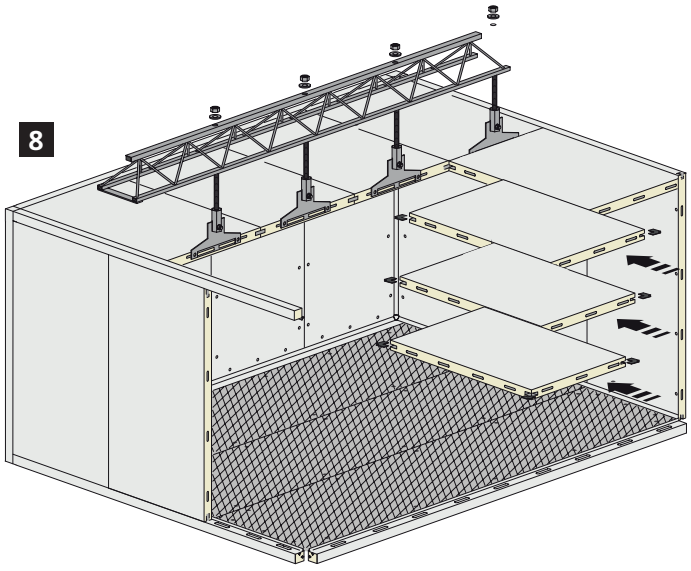
A floor consisting of a 10 mm layer of Phenolic stratified laminate integrated with the polyurethane foam, with orange peel surface finish, R10 anti-slip, and polyurethane insulation injected at high pressure with a density of 43 Kg/m^3 ± 10% Kg/m^3 and a 0.55 mm thick outer panel of Sendzmir galvanized sheet metal pre-varnished with a 30 micron layer of white RAL 9010 polyester paint.
Capacities: Evenly distributed static load 4000 Kg/m^2, Concentrated load: 400 Kg/50cm^2, Maximum dynamic load on 1 rubber wheel with a minimum contact surface of 4 cm^2 250 Kg.
Conditions for application: Constant pressure on a perfectly level and even floor (without subsidence), or resting on 330 x 330 x 40 mm E40 aeration plates, in which case the capacity decreases by 30%.

250 kg max

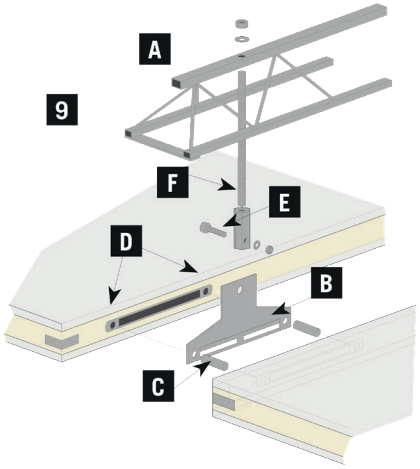


Ceiling panels: The panels are the same as the ones used for walls and are self-supporting for ceilings up to 4000 mm, but cannot be used to walk on or for storing materials, even temporarily. In the case of larger ceilings, i.e. when both sides of the room exceed 4000 mm, a layer of two or more panels is required; the ceiling is hung from trusses at a height of between 350 and 550 mm according to length. The suspended system is shown in pictures 8 and 9.

8



9

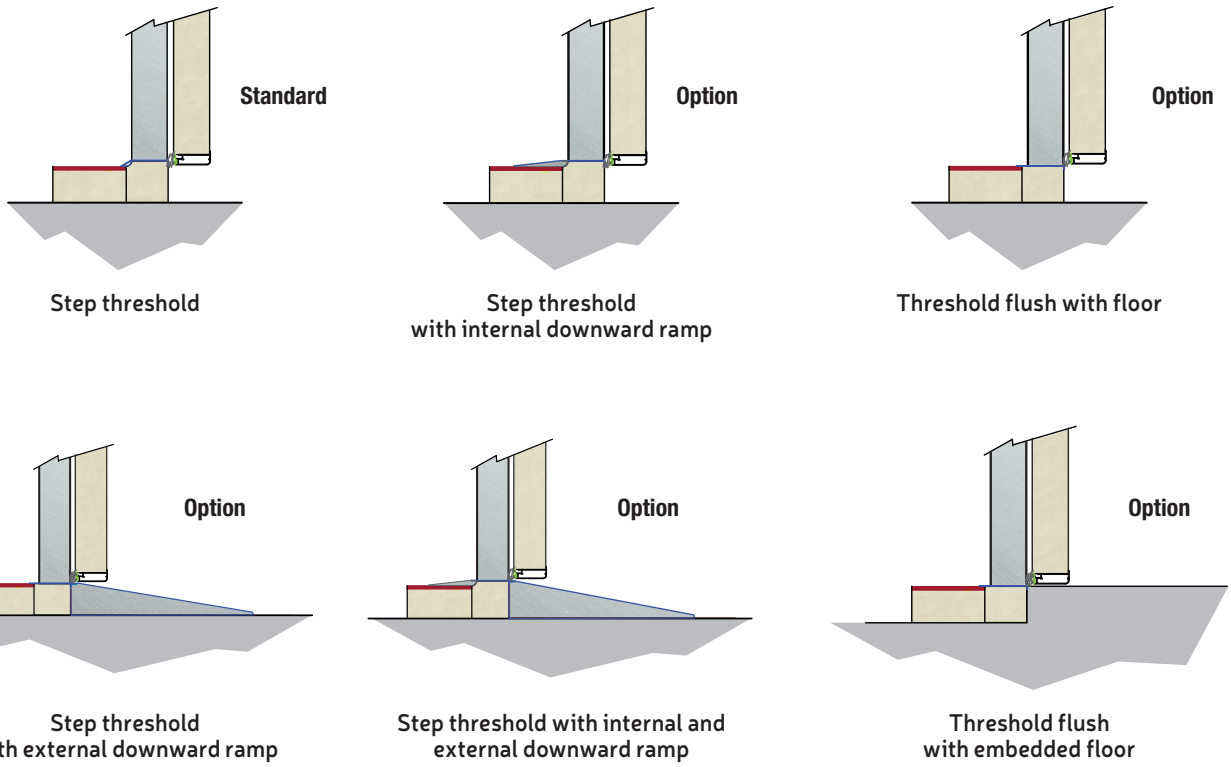


A = Truss
B = Suspension plate
C = Steel pins
D = Holes for the pins on eccentric hooks
E = Hexagonal joint with TE M8 screw
F = M8 threaded bar with hex nuts

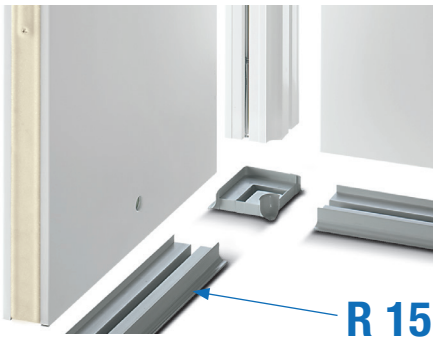
Multi Cubed - Technical file of the system

Doors:
Cold rooms can have one or more hinged or sliding doors. The door provided as standard is a hinged one measuring 950 x 1900 H, mounted directly on a suitably reinforced panel with the same properties as the wall panels. For more detailed information and details on doors of other sizes, refer to **Infotec M-05.01** (Multi hinged doors) and **Infotec M-05.02** (Multi sliding doors).

Types of thresholds: The thresholds for cold room doors can differ according to needs. The floor is usually below the level of the door for health reasons, unless specified otherwise, so the standard threshold is in the form of a step. If the user needs to be able to roll trolleys into the cold room, this step can be removed on request and the door fitted flush with the floor; in which case the customer has to specify the position of the door. The types of threshold are shown below.

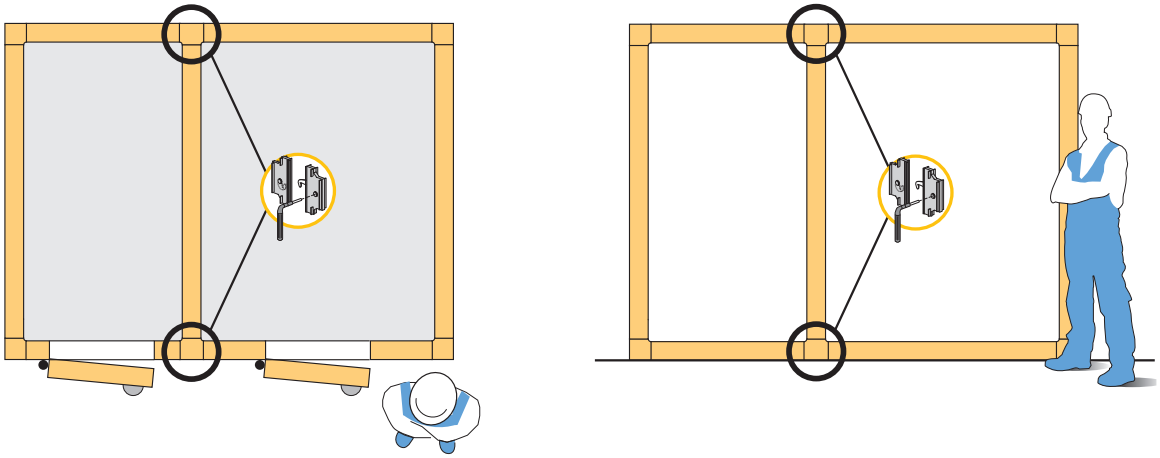


Configurations without floor: In the case of cold rooms at above-zero temperatures, the walls can be fitted directly on the original floor. There are U-shaped profiles and corner pieces for this very purpose, that also keep all the internal edges perfectly smooth, in keeping with the entire system. Under no circumstances can cold rooms for low temperature operation be built without floor insulation.

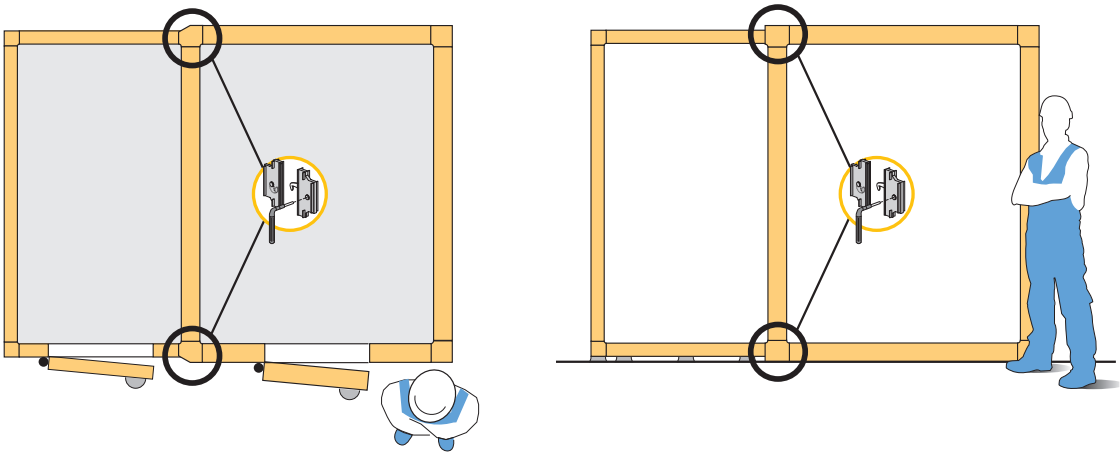


Possible configurations and combinations

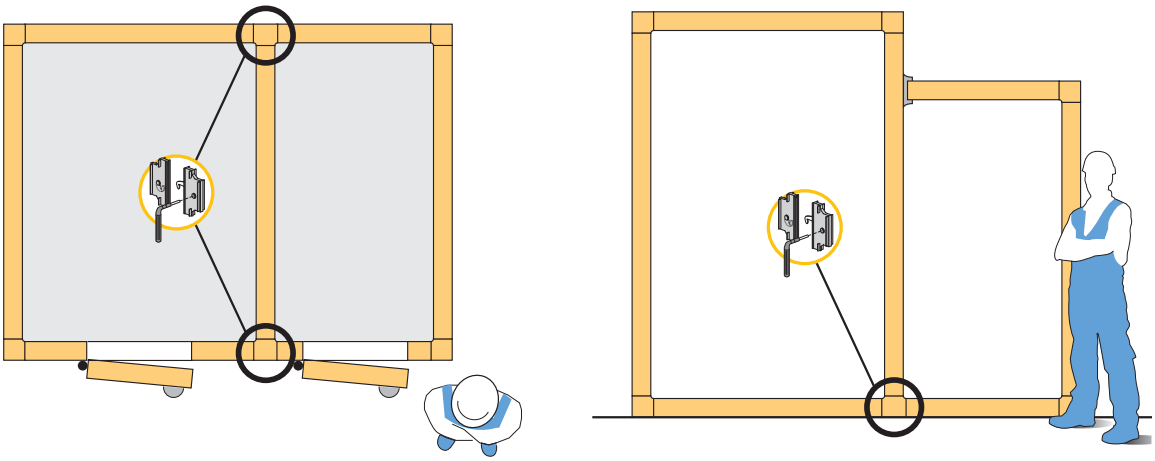
- **Rooms with modular partitions**



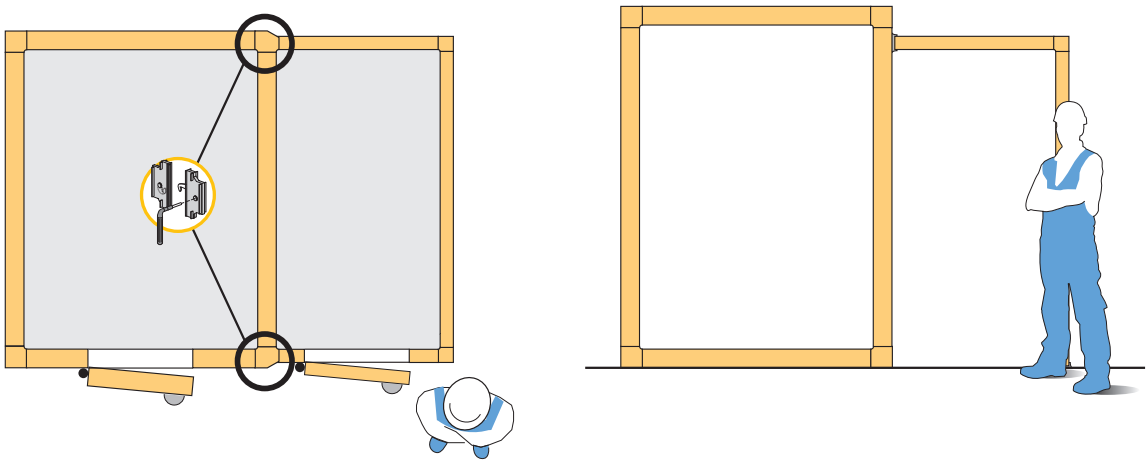
- **Cam-locked rooms, with floor, of different width**



- **Cam-locked rooms with floor, of different height**



- **Cam-locked rooms, with/without floor, of different width and height**



Accessories: Compensation valves

You are advised to install suitable pressure compensation valves to avoid the build-up of pressure in the cold rooms due to the contraction of the volume of air as it cools down, as this can subject the panels to stress and cause structural damage to the same panels and/or the supporting structures. These valves control the pressure in the cold room in relation to external pressure. Compensation valves for cold rooms at low temperature have an internal electric element that prevents ice from forming and blocking the floating fender. To determine the number and size of the compensation valves required, you need to know the working conditions of the cold room unit, for example: the speed at which the temperature is lowered over time, the temperature at which the goods are put in, and the average quantity of goods stored in the cold room. As INCOLD S.p.A. cannot normally know this data, it is the responsibility of the person who installs the cold room to determine the necessary parameters and establish the number and type of compensation valves required. General information on installation and sizing is given in Infotec F-00.16.

Installation, use and maintenance: Make sure you have read and understood the Assembly Instructions:
IT cod. 04030585 - EN cod. 04030586 - DE cod. 04030588 - FR cod. 04030587.
Cleaning instructions, instead, are given in **Infotec M-00.07**

References:

Infotec G-00.03 Plastic coated sheet
Infotec G-00.04 Pre-varnished sheet
Infotec M-05.01 Multi hinged doors
Infotec M-05.02 Multi sliding doors
Infotec F-00.16 Compensation valves