



RADIUS ACTIVE
radiant activator



From the RADIANT PANEL to the **RADIANT ACTIVATOR**

RADIUS ACTIVE goes beyond coupled systems, both of the milled type and with aluminum exchanger, which are heavier and bulkier, more complex to connect, more expensive and tiring to transport and handle.

Everything is faster, more practical, easier.

RADIUS ACTIVE GOES BEYOND



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RADIUS ACTIVE is the new thermal activator, in just three models, to create radiant ceiling and wall surfaces completely integrated into the standard plasterboard technology and its dimensional parameters.

Very high thermal efficiency, great simplicity and speed of installation, perfect division of roles between the plasterer and the plumber with consequent optimization of the construction phases and responsibilities.

With RADIUS ACTIVE, summer and winter radiant air conditioning reaches top performance and application, both in existing and new buildings. With Radius Active, as there is no longer a plasterboard sheet, transport and handling costs are significantly reduced, reducing inconveniences and waste of time and thus facilitating and lightening everyone's effort and work.

RADIUS ACTIVE respects the standard center distances and regulations of plasterboard structures, even taking advantage of a particular profile with built-in custom-made joints, marketed by Messana, which simplifies the plasterboarder's work even further, making it impossible to make mistakes.

Advantages for the plasterer: his work phases, thanks to the upper profiles with the built-in 50 pitch trapezoidal joints, which replace the riders, are speeded up compared to those they would have in the creation of normal false ceiling structures. In the closing phase with the slabs, the presence of the activators will be completely neutral for him and will be carried out in one go and with much less grouting. The sheets supplied by it will be in standard sizes (200-250-300) and in all the versions that the market makes available (normal, fireproof, water-repellent, sound-absorbing, etc.), thus making your work smooth and simplified.

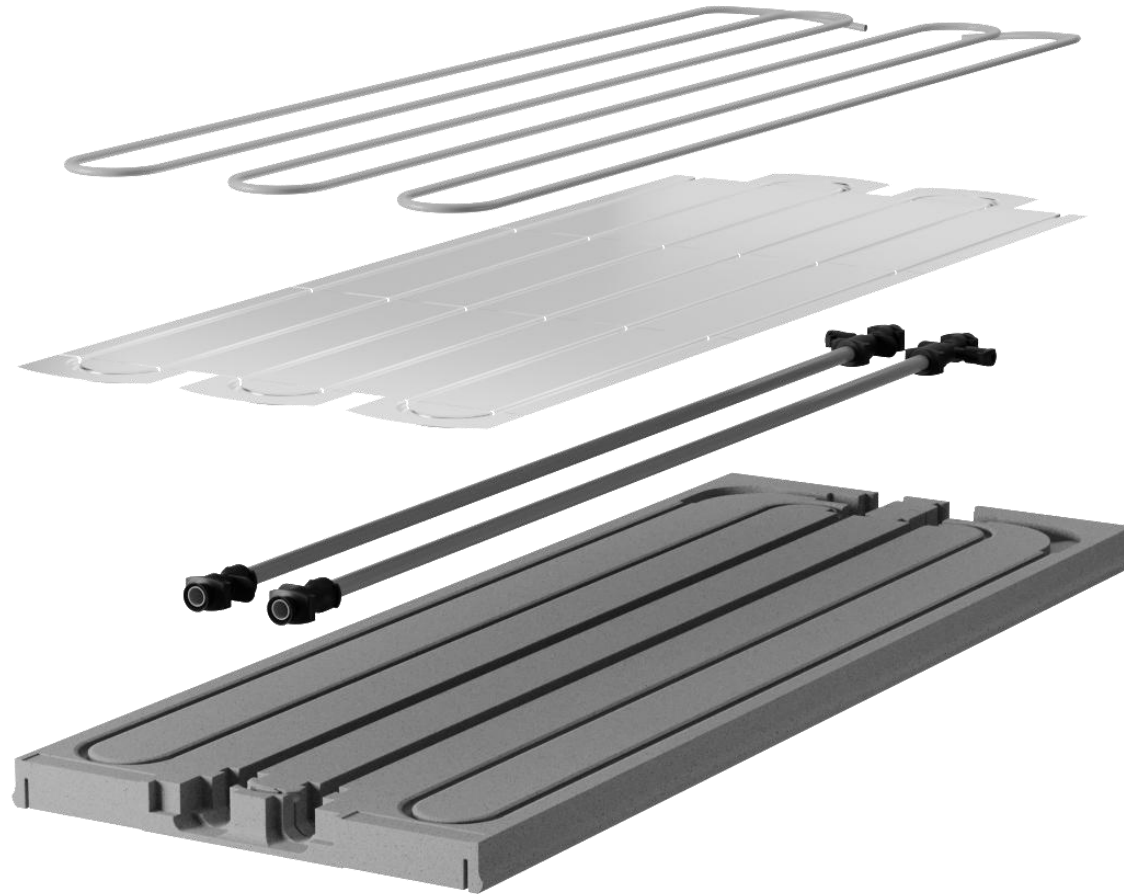
Advantages for the plumber: he will supply and install the activators and the entire quick connection system until the final testing. Installation times are significantly reduced compared to those required by floor systems, and facilitated by the extreme modularity which does not require specialized personnel and difficulties in interpreting the layouts.

The structural and hydraulic functions are therefore separate and independent, without overlapping responsibilities and with maximum optimization and clarity of the phases and roles.

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EXPLODED VIEW



8X1 SERPENTINE

4/10 ALUMINIUM EXCHANGER

**16X1.5 DORSALS WITH
TRIPLE AND DOUBLE
JOINTS**

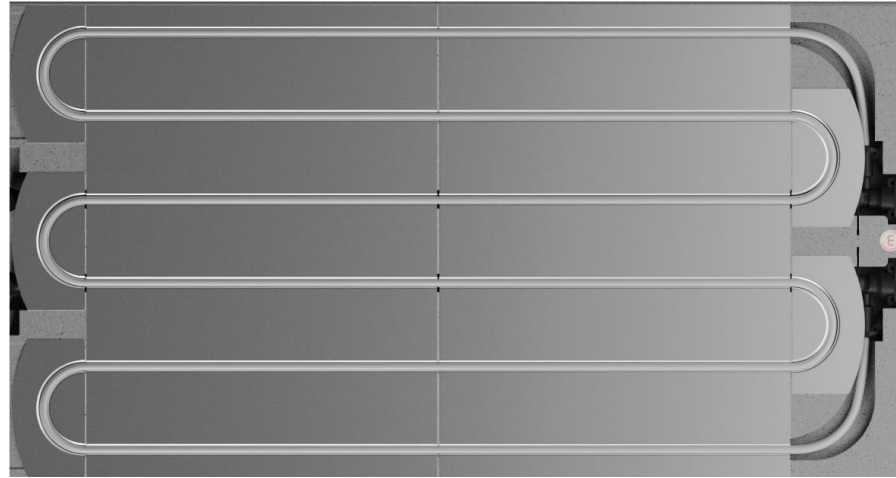
GRAPHITE EPS SUPPORT

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RA 90

thickness 42.6 mm



45

86

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RA 120

thickness 42.6 mm



45

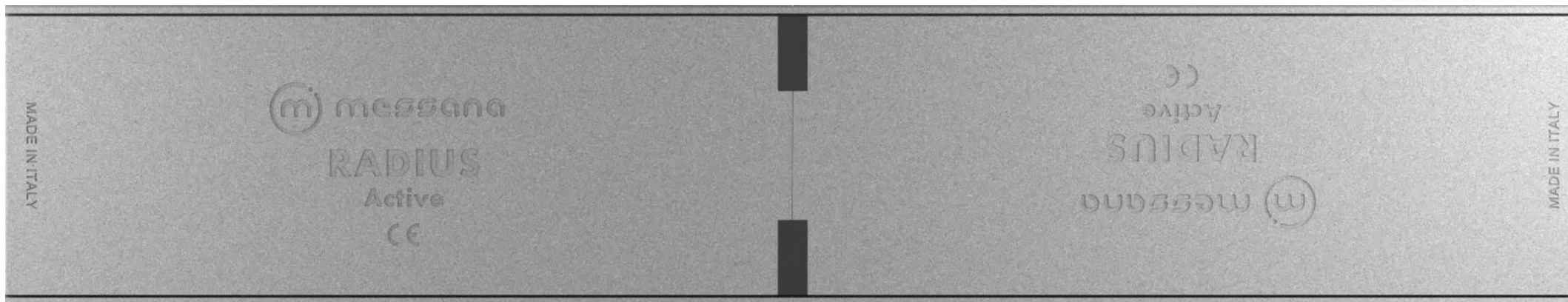
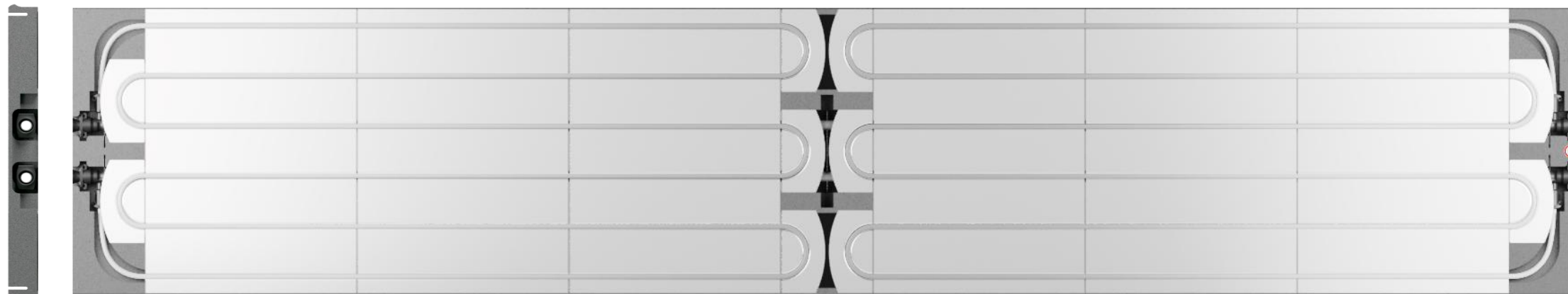
120

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RA 240

thickness 42.6 mm



240

45

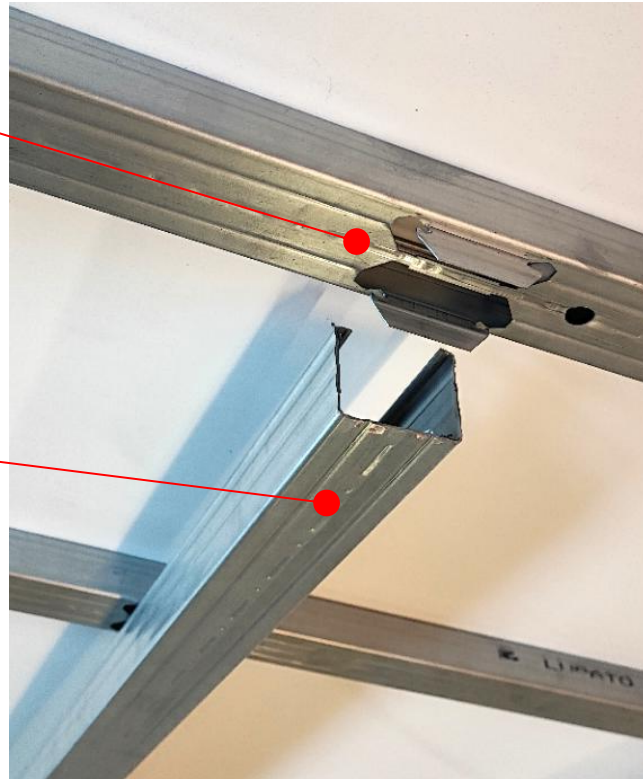
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THE PROFILES

Upper profile with built-in interlocking fins at 500 pitch, dim. 50x27xL2000

Lower profile for containing activators, dim. 50x40xL2400



The profiles, supplied by Messana, are part of the system and allow more precise and faster installation of the structure

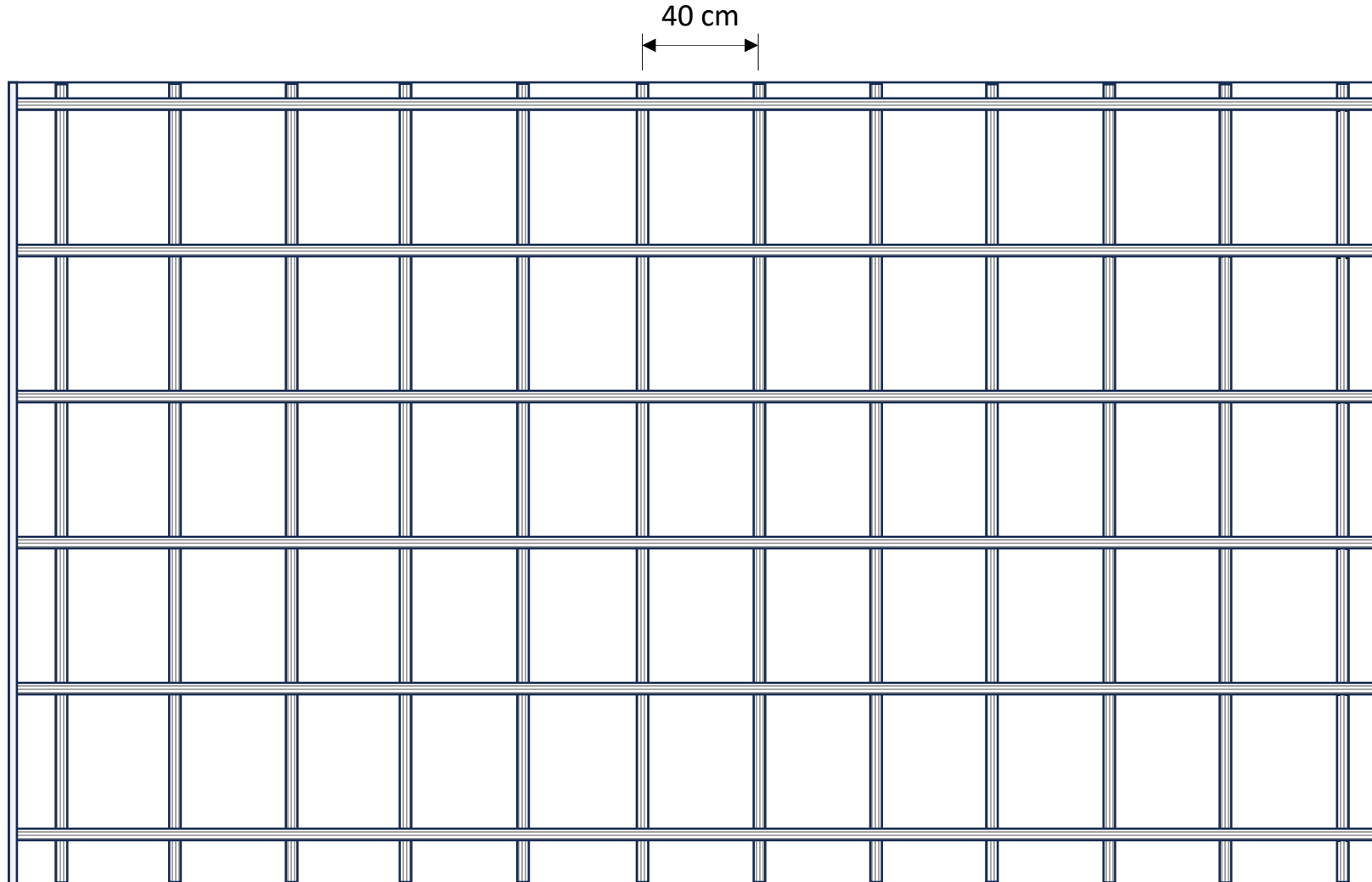
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Phase 1: THE STRUCTURE

The profiles are supplied directly by Messana as they are specific for assembly Radius activators.

The upper ones already have the joints for the lower profiles positioned at 50 pitch; the lower ones are symmetrical measuring 49x39x39 to guarantee flatness and correct coupling.

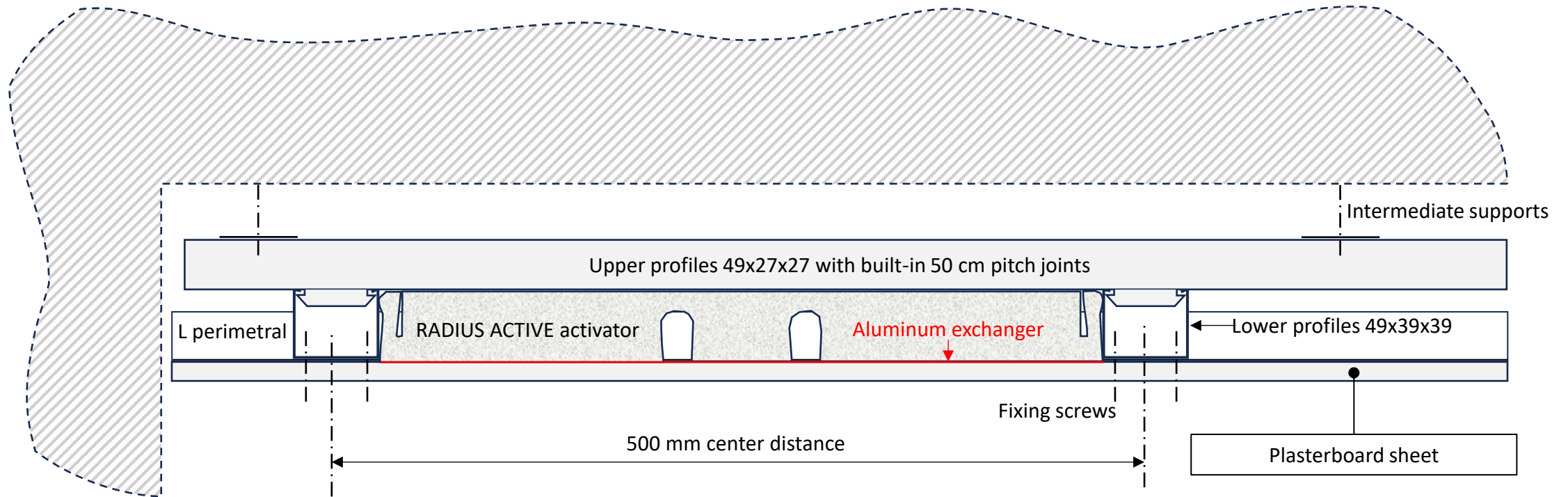


The 50 pitch of the lower profiles (49x39x39) represents the standard for plasterboard false ceilings. With it the sheets can be positioned both perpendicularly and parallelly as per the regulations.

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Phase 2: THE ACTIVATORS



Section

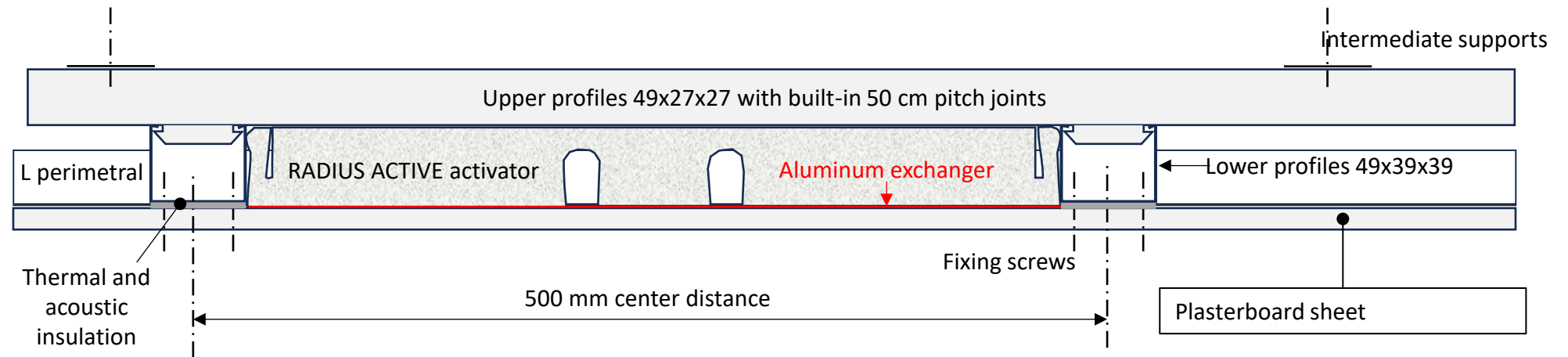
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Phase 2: THE ACTIVATORS

Solution with elimination of the thermoacoustic bridge

If you want to eliminate the thermal and acoustic bridge caused by metal profiles, you can apply a 2-3 mm foam adhesive as shown in the figure. This is only an on-site option that involves a slight additional cost; it is recommended only if acoustics are also important and possibly in combination with Knauf Diamant panels, which reduce sound levels by 8 dBa toward the upper floor.

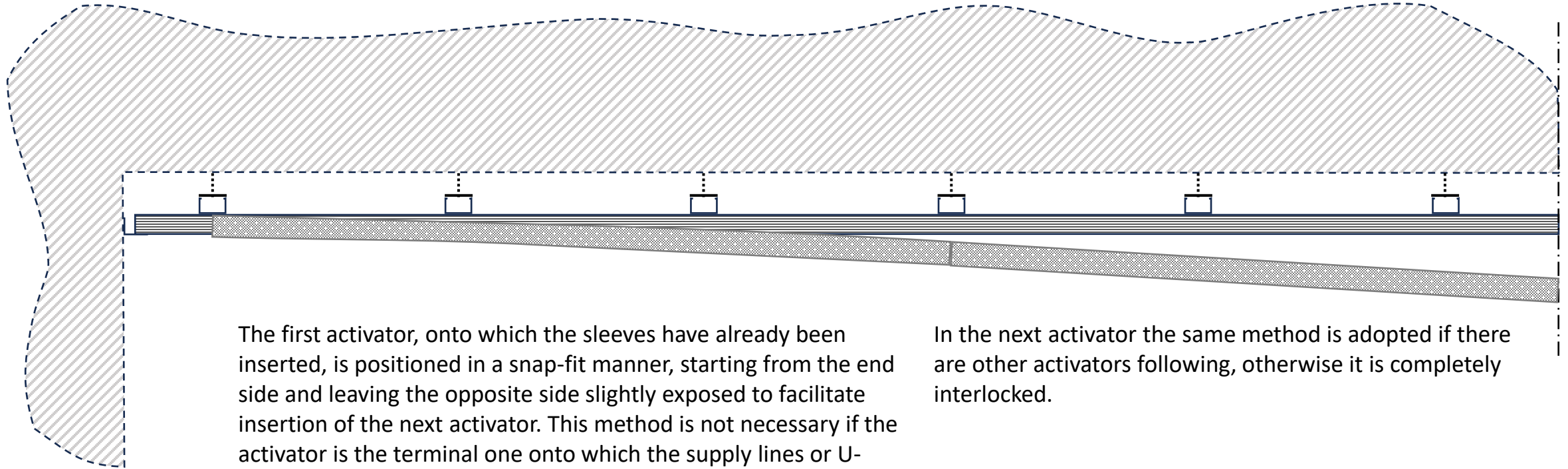


Section

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Phase 2: THE ACTIVATORS



The first activator, onto which the sleeves have already been inserted, is positioned in a snap-fit manner, starting from the end side and leaving the opposite side slightly exposed to facilitate insertion of the next activator. This method is not necessary if the activator is the terminal one onto which the supply lines or U-bridges are inserted.

In the next activator the same method is adopted if there are other activators following, otherwise it is completely interlocked.

Section

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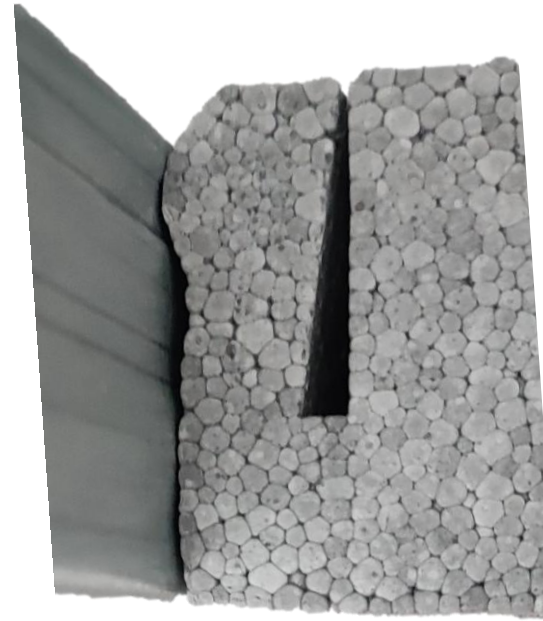
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Activator insertion sequence

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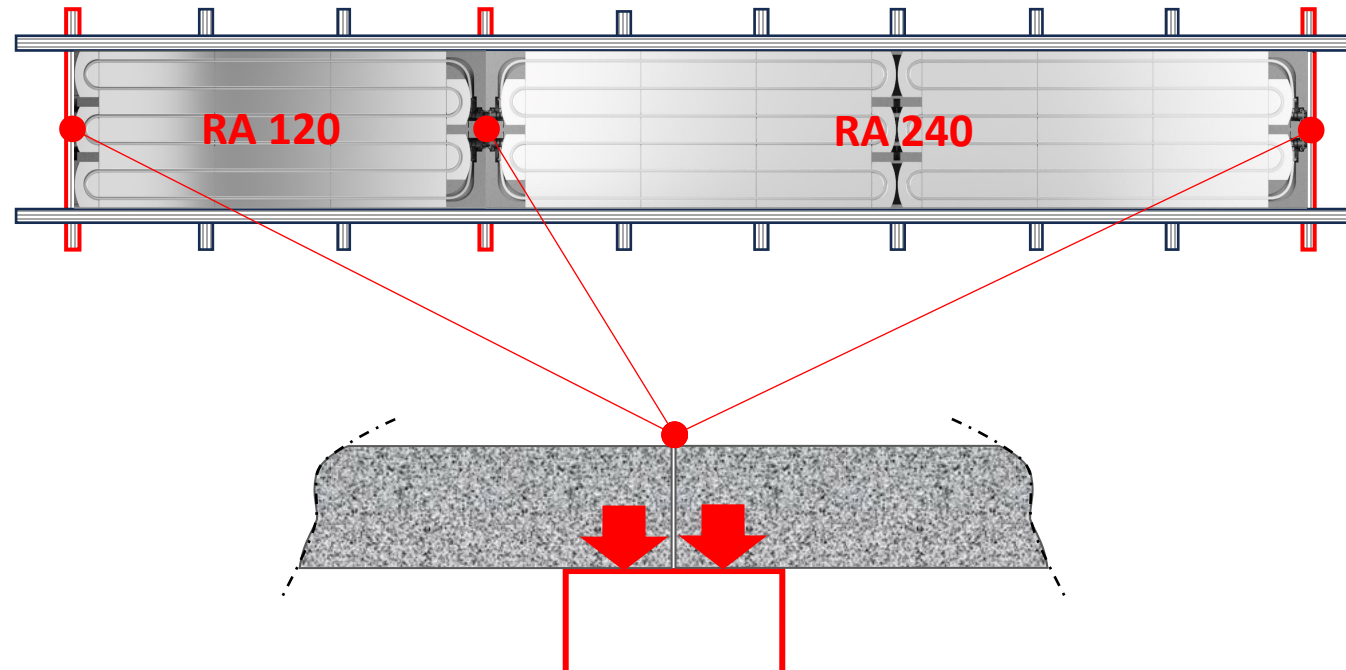
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The flexible edge along the entire length ensures that the activator fits and supports only when pressed.

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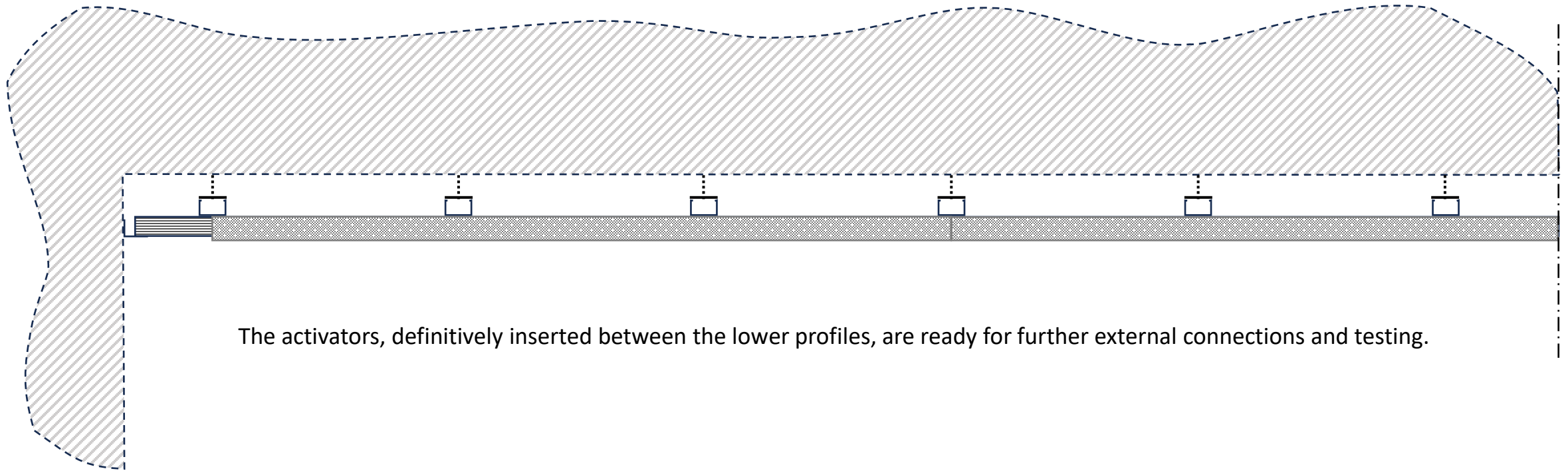


CAUTION!

The ends of the activators represent a point of inflection and must always be placed on the upper profiles so as not to compromise the contact of the aluminium with the plasterboard finishing sheet.

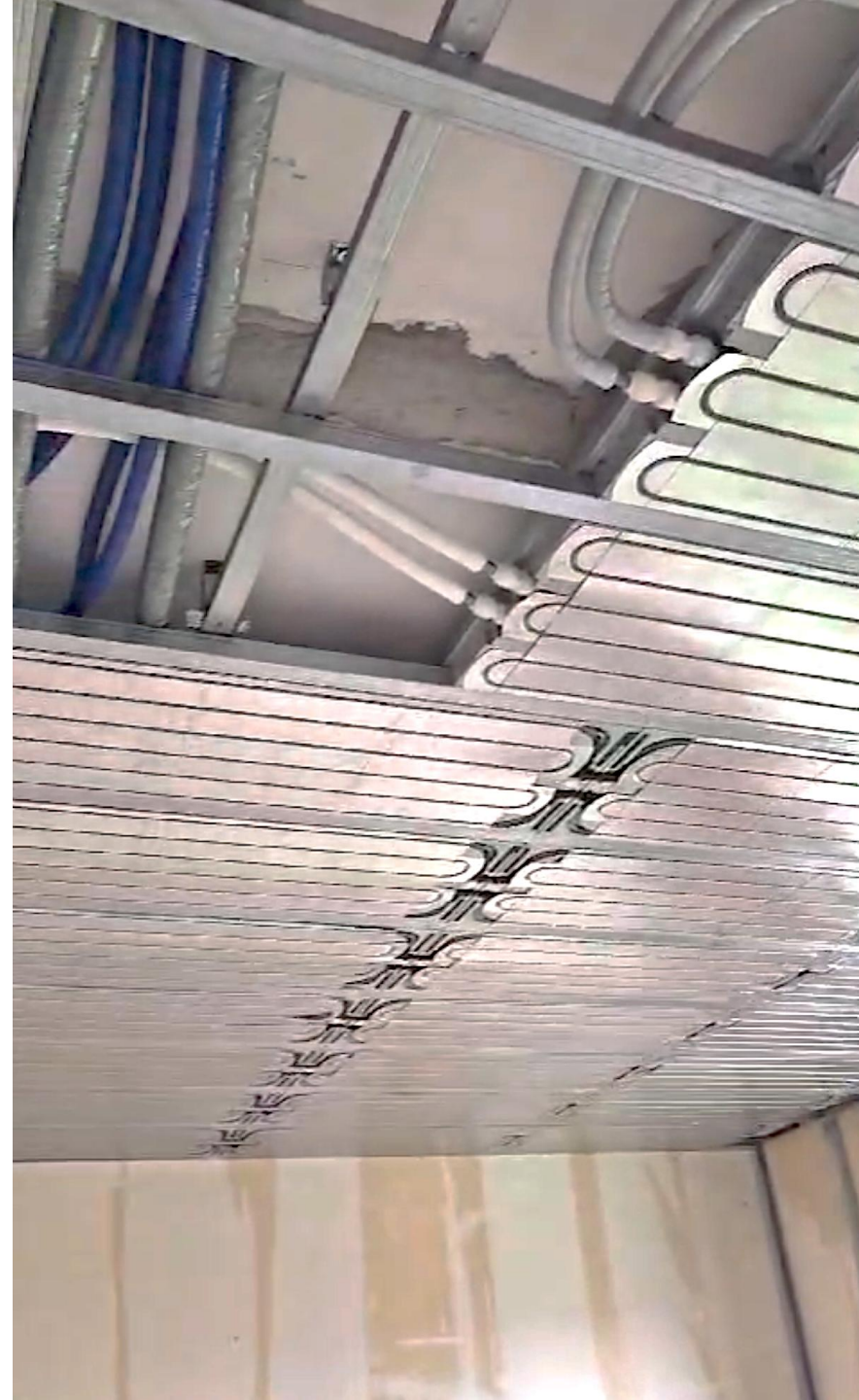
RADIUS ACTIVE

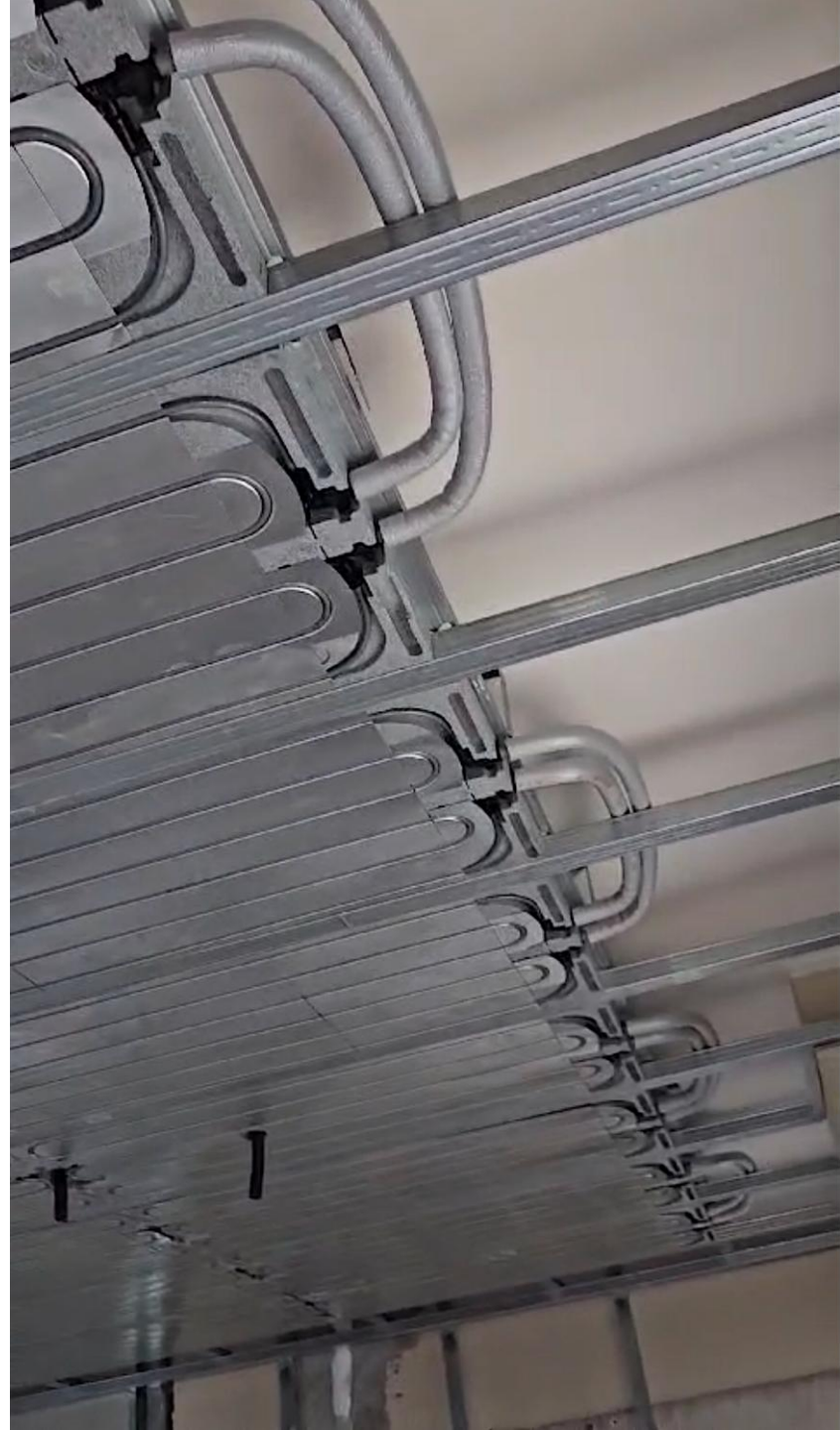
radiant activator



The activators, definitively inserted between the lower profiles, are ready for further external connections and testing.

Section



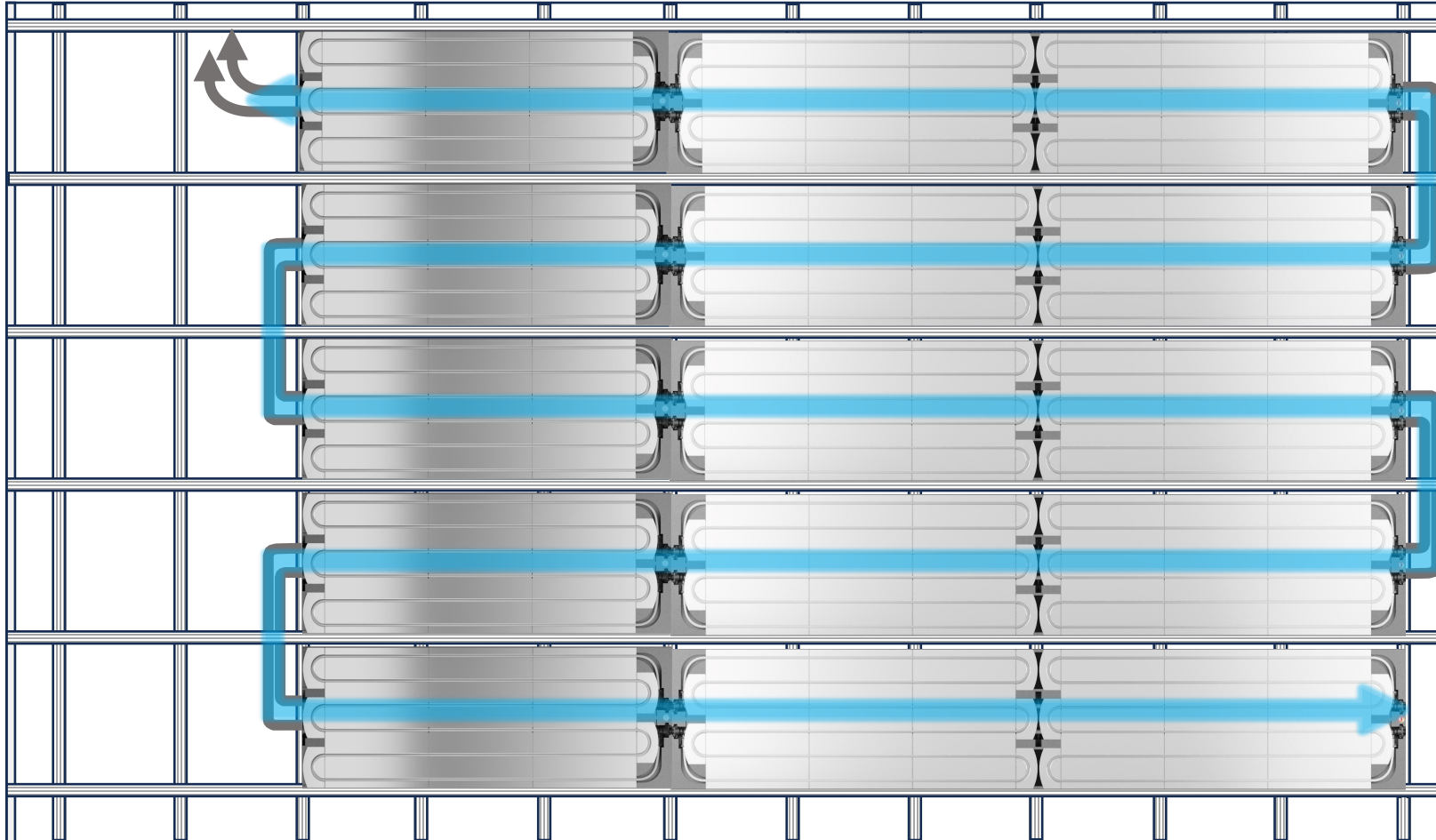




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Flow line



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PLASTERBOARD SHEETS

With RADIUS Active, the final plasterboard covering is made easier and quicker as it is carried out in a single phase, using standard sized sheets (200-250-300) and in a wide range of types, supplied by the plasterboard installer himself, with less waste, fewer elements and less work.

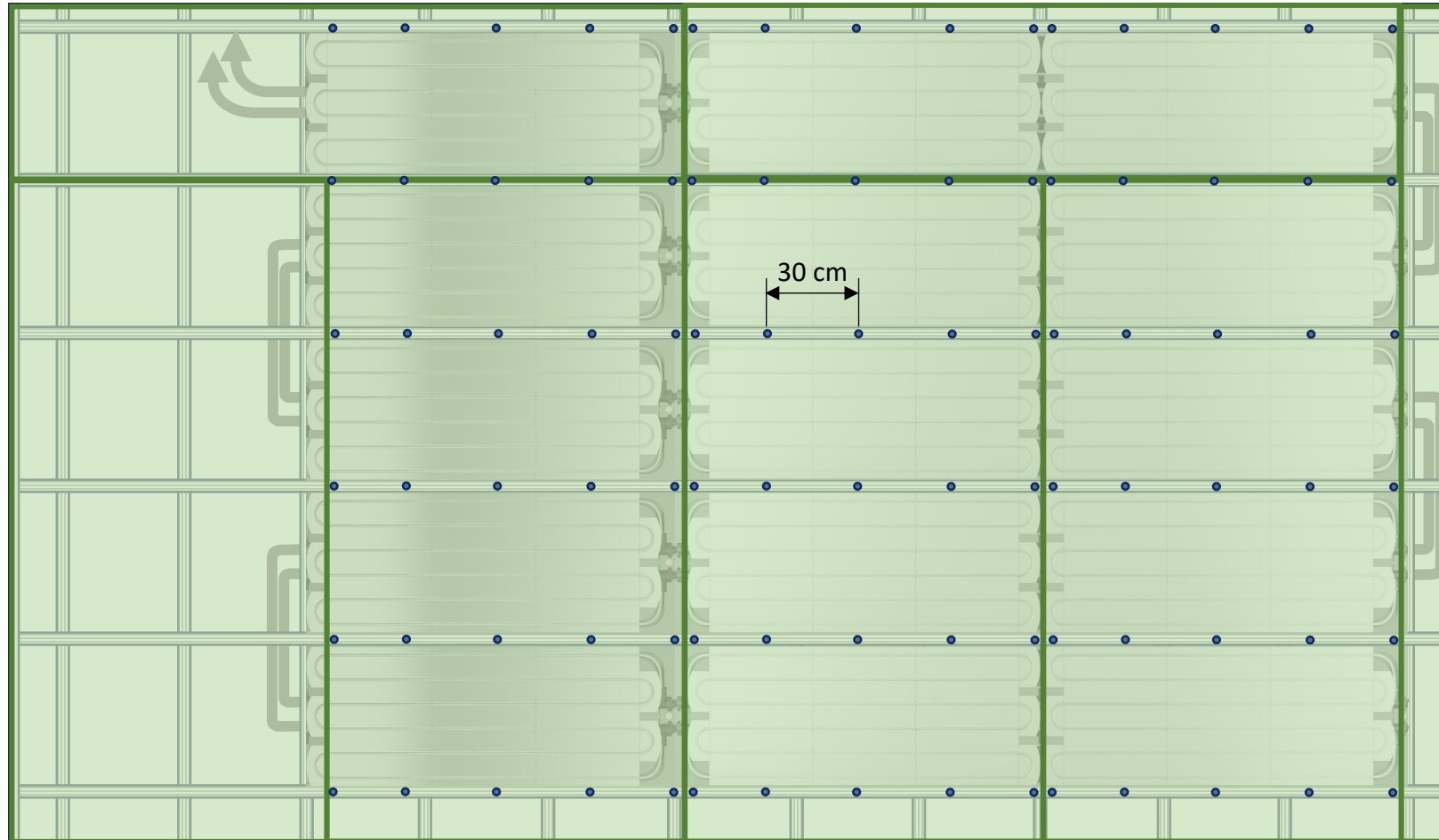
The sheets must have a density $\geq 850 \text{ kg/m}^3$.

E.g.:

Knauf KASA

Knauf DIAMANT

Knauf THERMOBOARD



RADIUS ACTIVE

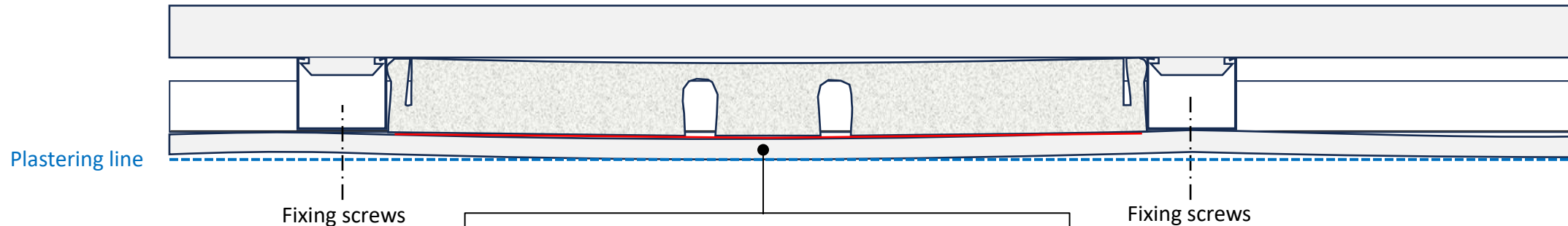
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PLASTERBOARD SHEETS

To ensure thermal contact between the aluminum exchanger and the top surface of the plasterboard, the Radius Active activator protrudes slightly from the side profiles containing it, creating downward pressure. Therefore, the boards must be high-density, as they are more rigid.

The cheaper standard boards, being more elastic (typical density 660 kg/m³), can create undulations that will require more grouting to compensate.

High-density boards also have the advantage of being better heat conductors than low-density boards, increasing the efficiency of the activators (up to 30% in the graphite version like Knauf Thermoboard Plus).



DO NOT USE STANDARD SHEETS

They can create undulations and depressions. Use boards with a density $\geq 850 \text{ kg/m}^3$.

E.g.:

Knauf KASA (870 kg/m³)

Knauf DIAMANT (1000 kg/m³)

Knauf THERMOBOARD (1000 kg/m³)

Section

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COMBINATIONS AND CONNECTIONS

RADIUS ACTIVE activators have very high yields, especially when coated with high-conductivity plates. For this reason, they require high water flow rates since they operate at very low ΔT , typically $<3^{\circ}\text{C}$.

A variety of circuits can be created to best meet the dimensional requirements of the environments. To ensure proper self-balancing, refer to the sample diagrams presented on pages 27 and 28.

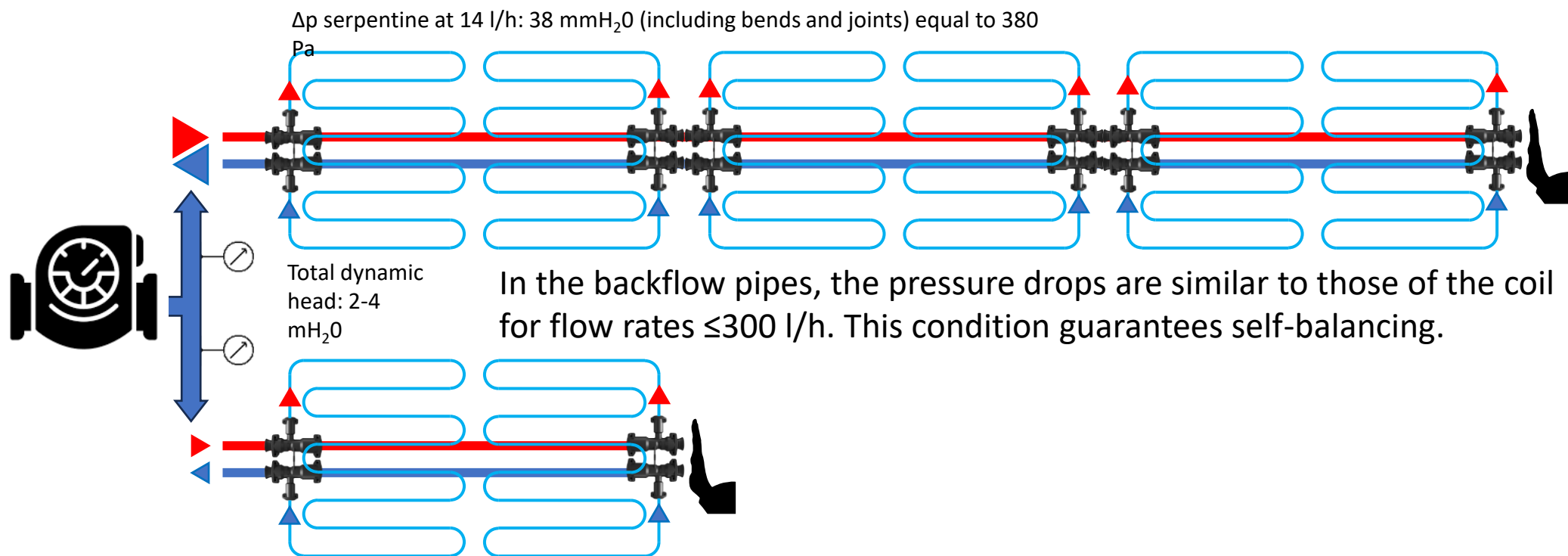
Each RA 240 module requires a nominal flow rate of 28 l/h. Do not exceed a flow rate of 300 l/h per circuit. The 3 module types can be combined in different ways.

It is also important to take into account the distance from the manifold, so it is best for the longest supply lines to feed the smaller circuits and vice versa.

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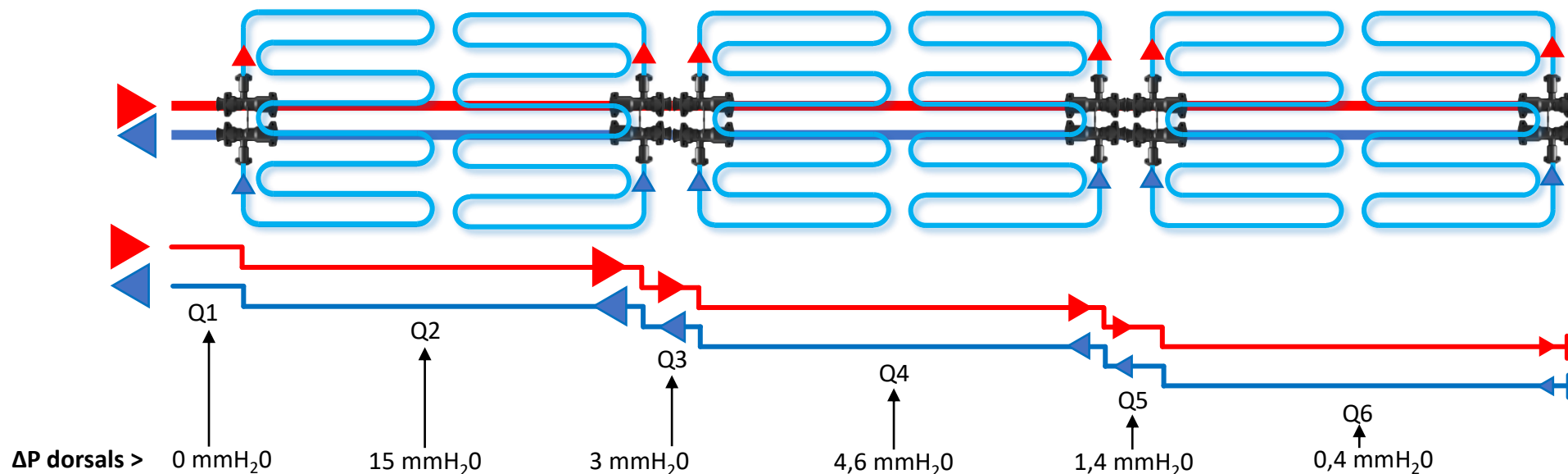
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In Radius Active activators, the coils are all identical and connected in parallel. The internal pipes, capped at the ends, act as an **extension of the main manifold (they are essentially linear manifolds)**, and their dynamic pressure towards the coils is the same for all of them. This allows for a uniform and constant flow rate.



In each circuit the total flow rate is given by the sum of the individual flow rates of each coil.

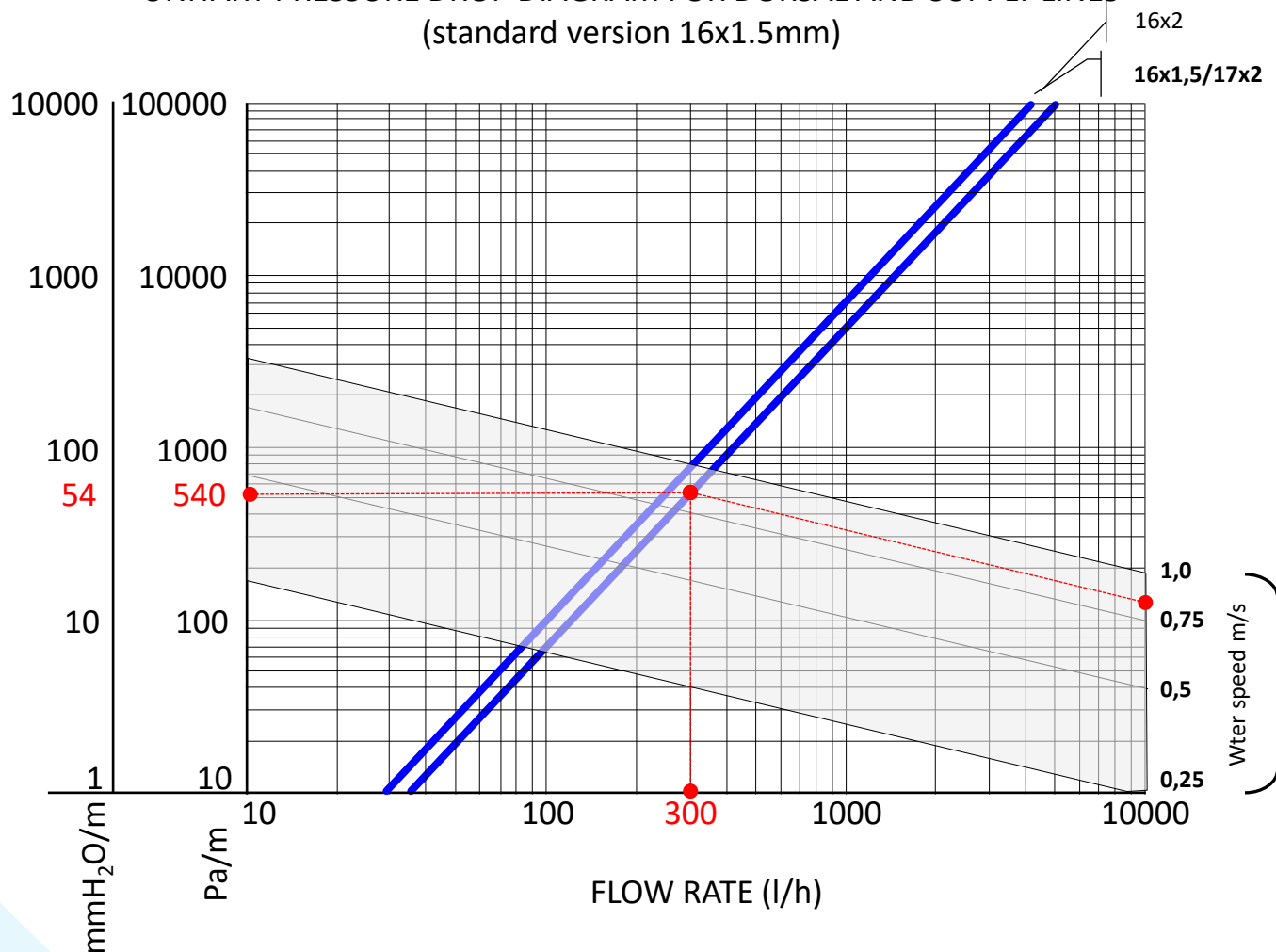
SELF-BALANCING



Along the dorsals, the pressure drops are very low and the flow rates progressively reduce as they feed the serpentine. In this way, the total dynamic head, which is enormously greater than the pressure drops of each individual serpentine, remains constant, guaranteeing pressure balance and the same flow rate for each.

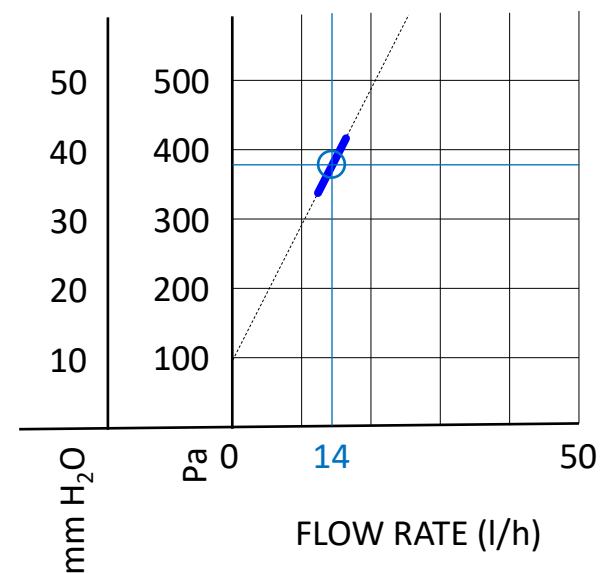
$$Q1 > Q2 > Q3 > Q4 > Q5 > Q6$$

UNITARY PRESSURE DROP DIAGRAM FOR DORSAL AND SUPPLY LINES
(standard version 16x1.5mm)



It is best not to exceed 300 l/h for each circuit and, if this value is approached, it is important to limit the length of the supply lines so that the pressure drops of the supplies **do not exceed 5kPa**.

SINGLE SERPENTINE PRESSURE DROP DIAGRAM
(8x1 mm - lunghezza 7,2 m)

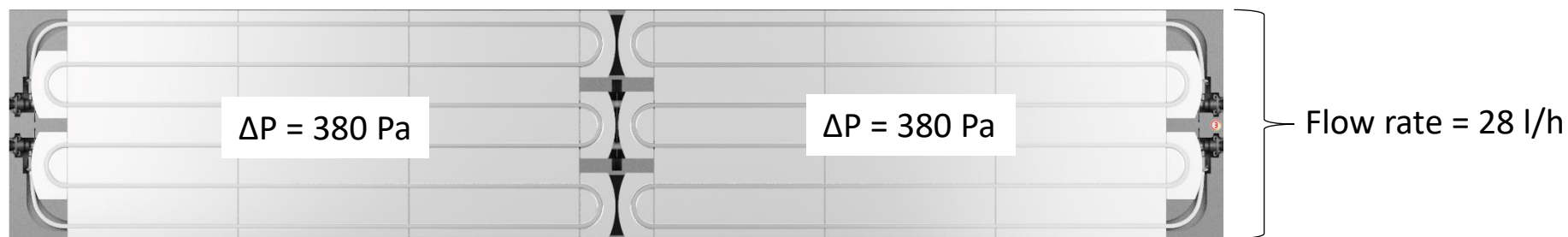
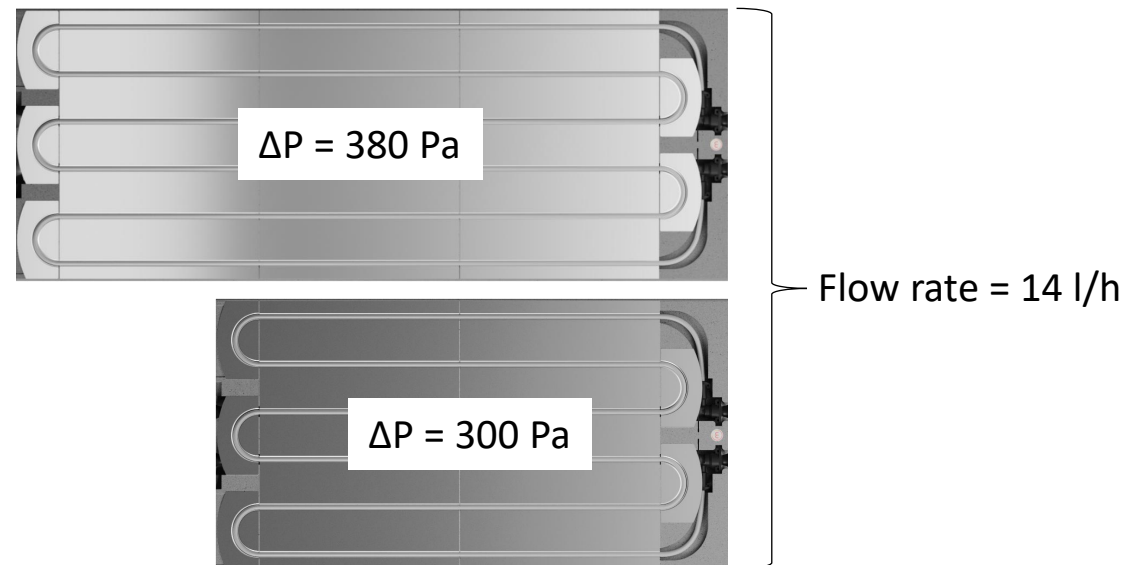


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Nominal flow rate and pressure drops of the activators

The values shown are the nominal and characteristic values of the activators. When sizing circulation pumps, it is advisable to maintain these values since RADIUS ACTIVE is characterized by very high efficiency, requiring high flow rates and low ΔT (typically $1\div 3^{\circ}\text{C}$). The characteristic ΔP s are not added together because the activators are all connected in parallel and only the flow rates are added together.



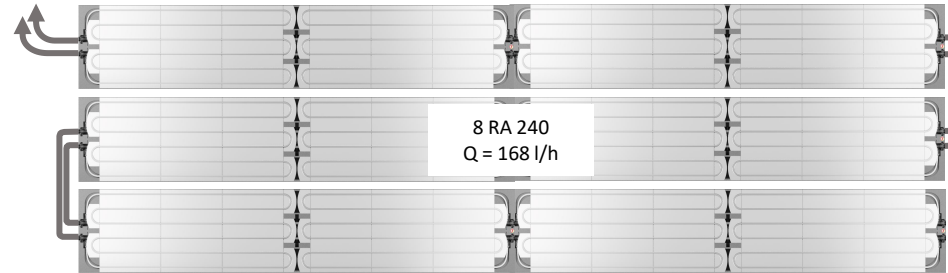
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CONNECTION TYPES 1 and 2

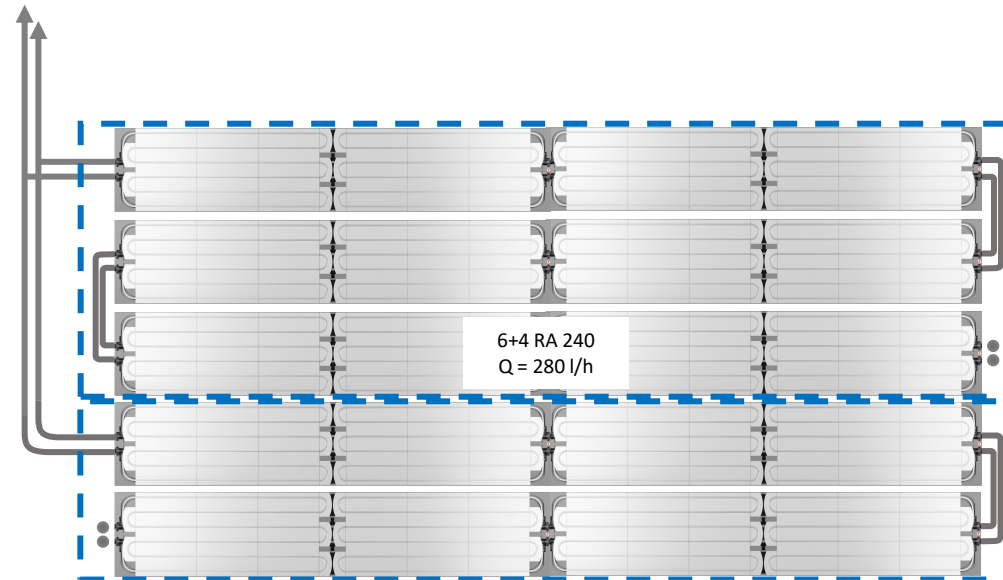
Connections with Input/Output on the same module

Do not exceed 6 RA 240 modules (or equivalent) per single circuit when powered on the same module.



TYPE 1

You can also get up to 10 RA 240 modules (or equivalent) by splitting the circuit into 2 subcircuits with TEEs and keeping the largest one closest to the manifold. It is best if the pressure drops of the supplies **do not exceed 5kPa**.



TYPE 2

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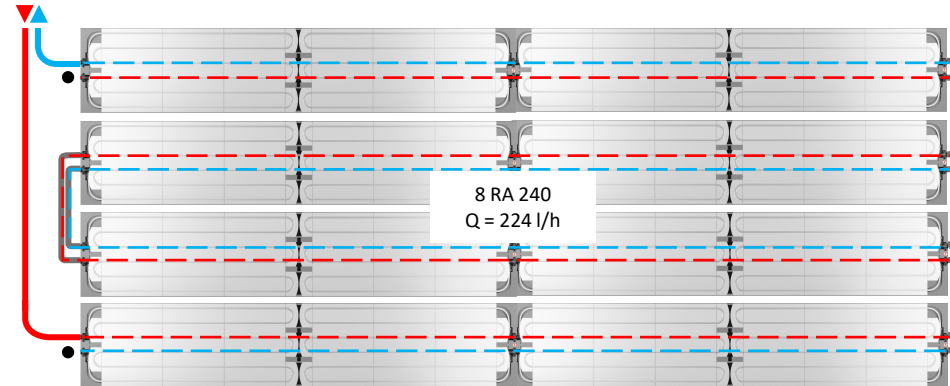
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CONNECTION TYPE 3

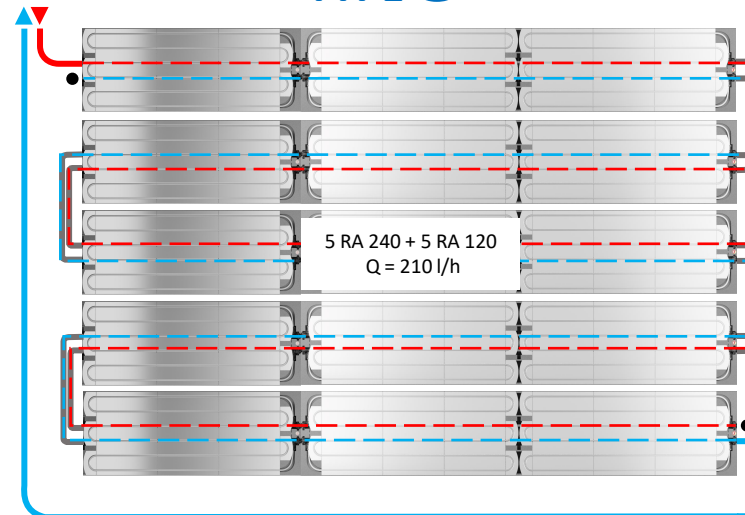
Connections with reverse return

Beyond 6 RA 240 modules and up to 10 or equivalent, if the circuits are not split, it is necessary to use the **reverse return**.

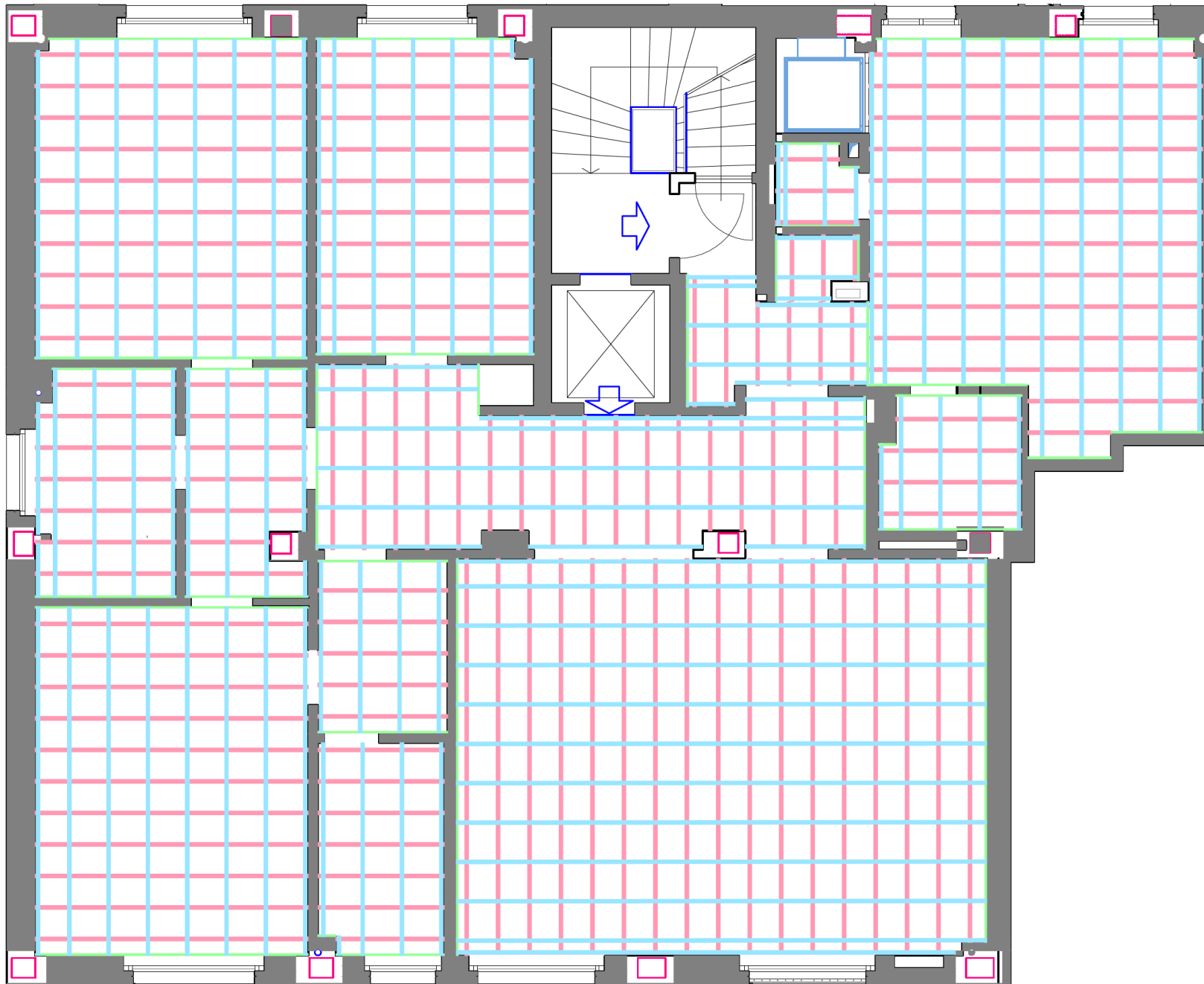
It's important to identify the exact position of the flow and return lines. Even in this case, it's best to ensure that the pressure drops in the supply lines **don't exceed 5kPa**.



TYPE 3



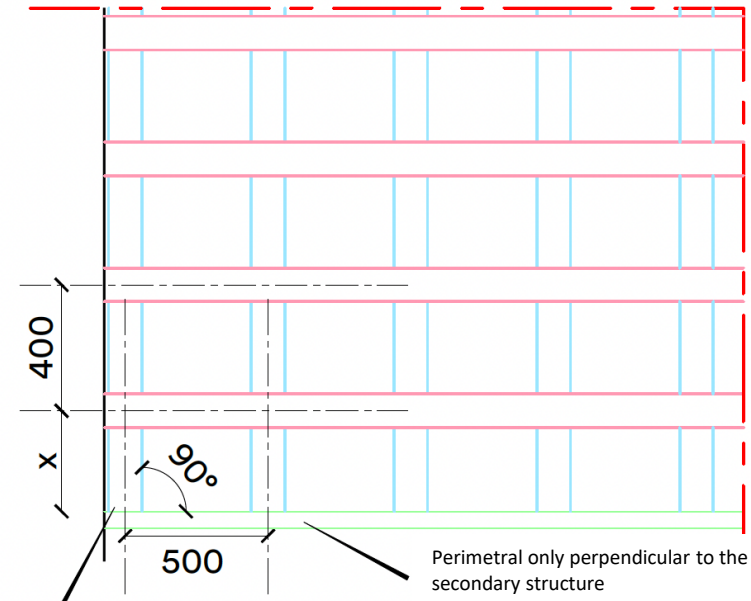
EXAMPLE OF THE STRUCTURE



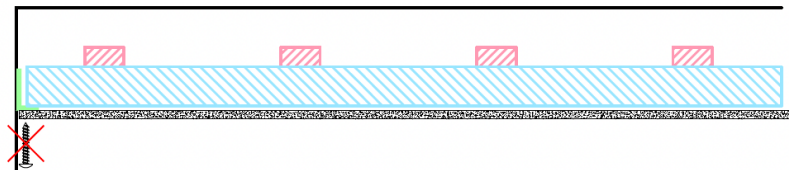
LEGEND:

- Perimetral
- Primary structure
- Secondary structure

* measurements expressed in mm



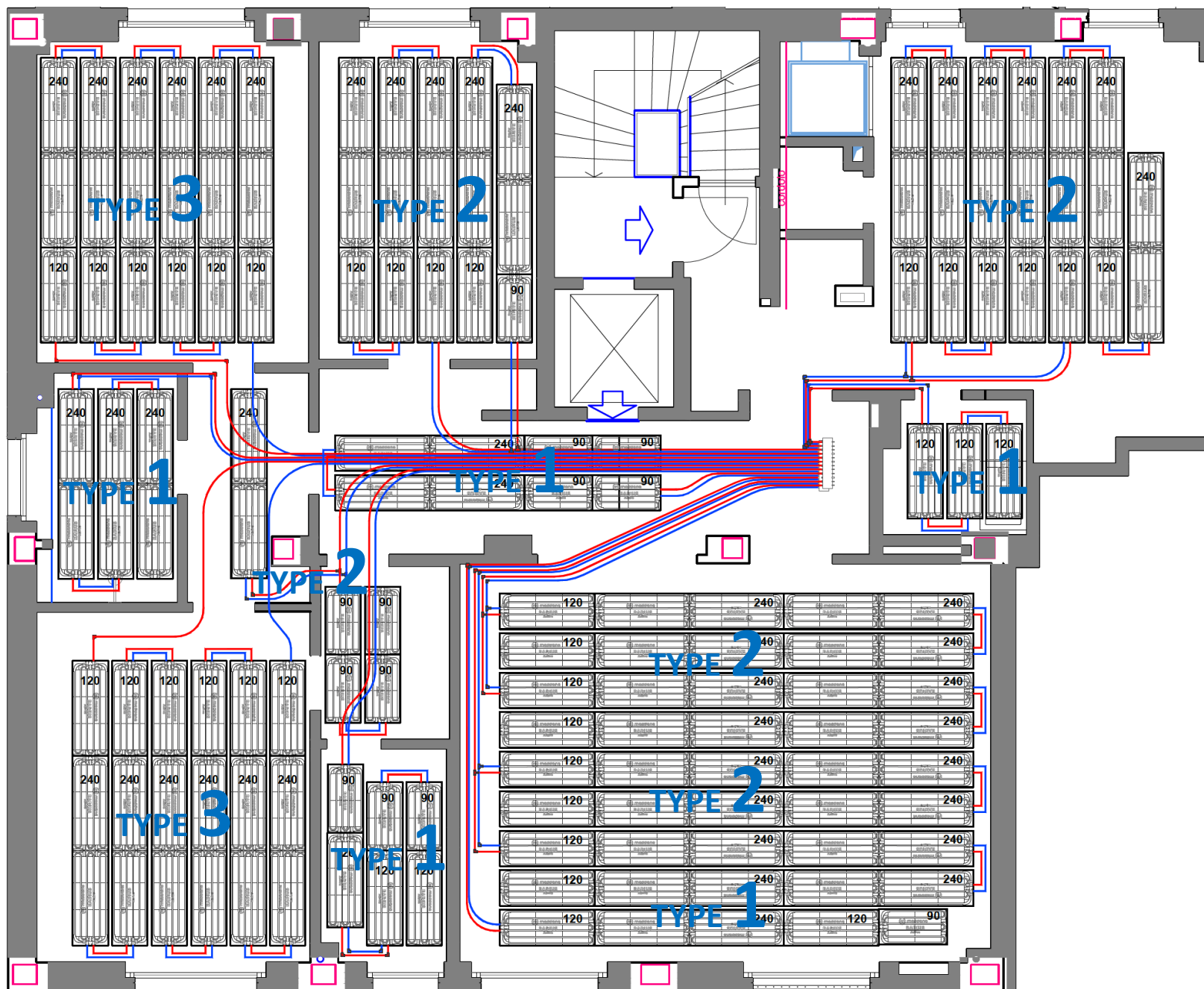
Secondary upright always immediately after the perimetral



It's strictly forbidden to put the screws to set the steel uprights and the plasterboard sheets to the perimetral upright. The uprights need to be leaned on the perimetral uprights.

Note: the measurements refer to the distance between the uprights

EXAMPLE ACTIVATORS with combination types



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THE CONNECTIONS

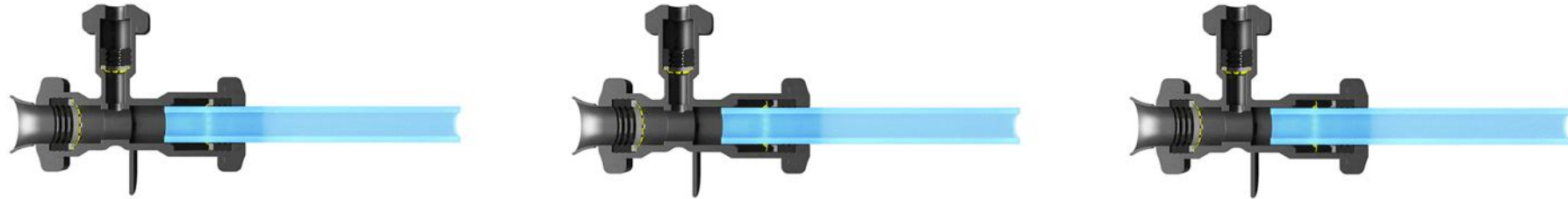
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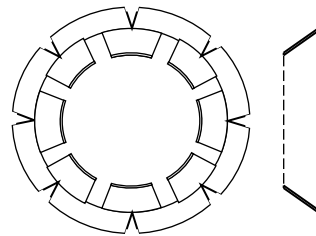
RADIUS features a triple internal joint with an extraordinary sealing system.

- Internal tube sliding
- Triple hydraulic seal (3-ring O-ring)
- Absolute mechanical retention

Thanks to it, you get incredible simplicity and speed of connection with a level of security that borders on the absolute.

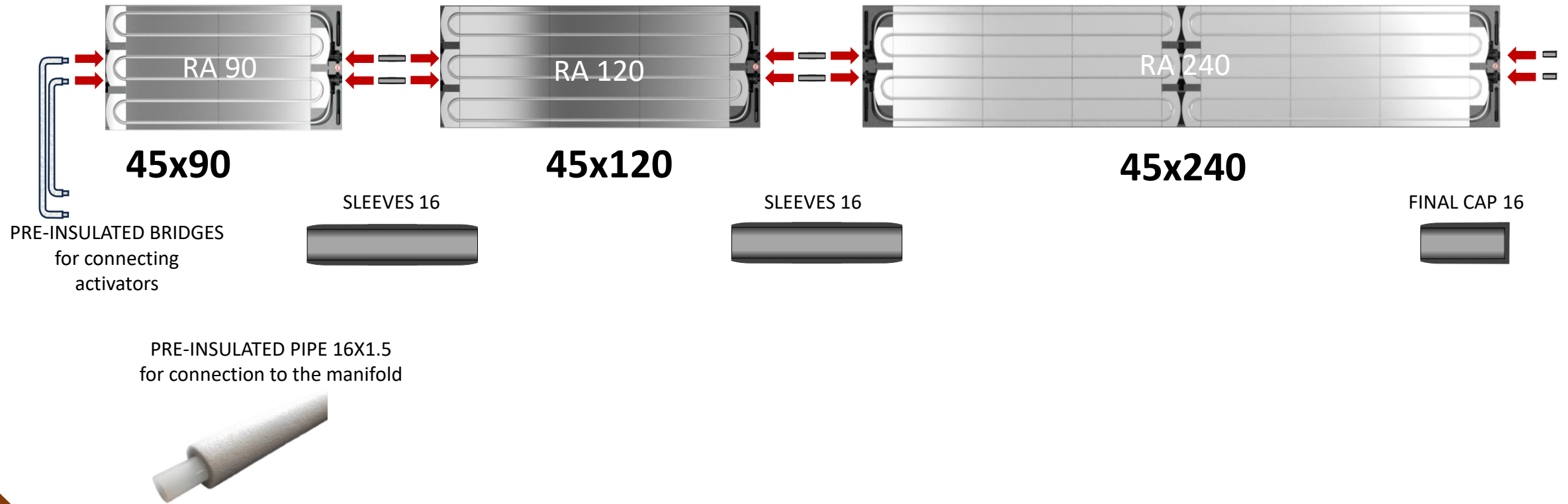


The joint is able to absorb the internal thermal expansion of the dorsals and the exchange serpentine while maintaining its position constant.



The special double-serrated sealing clip develops a gripping force on the pipe proportional to the tensile force. The harder you pull, the more it holds.

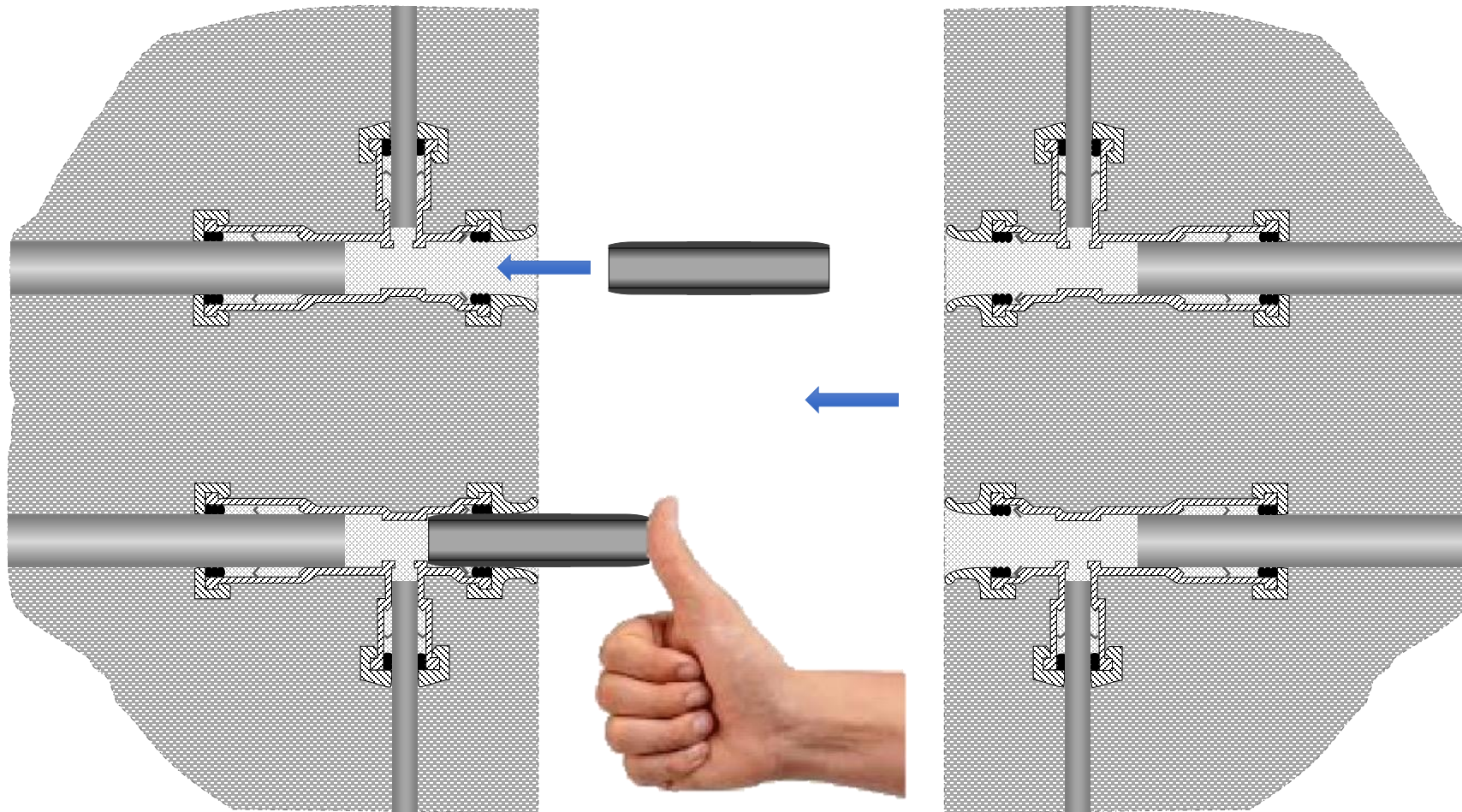
Connection types



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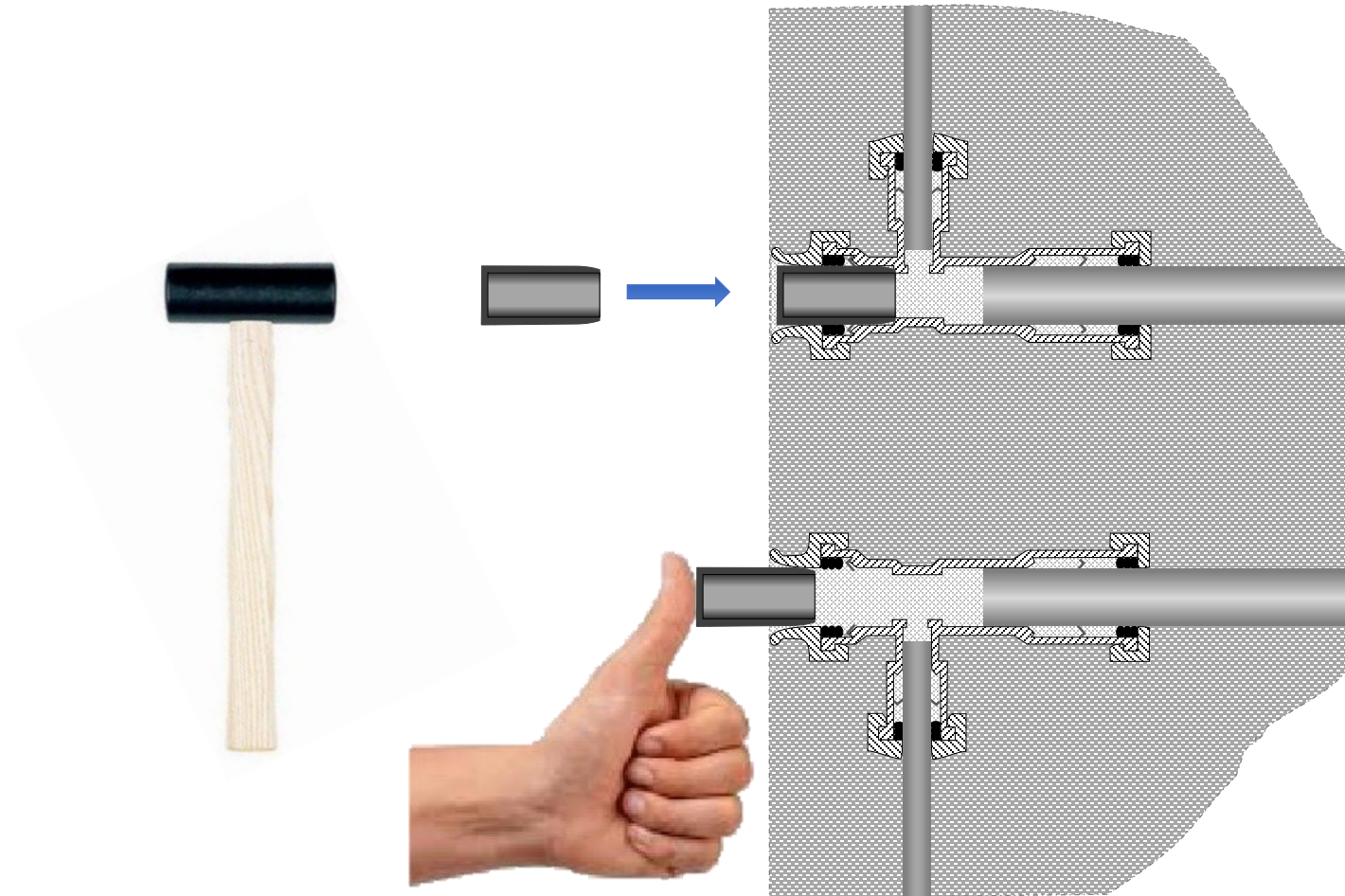
Connection between one panel and another, after inserting the supplied sleeves, in the Radius triple joints



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Closing of the end panel after inserting the supplied caps into the Radius triple joints. Be careful to insert the cap completely; it should retract slightly into the funnel. If necessary, use a rubber mallet.



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Tools

These tools must always be used for the correct insertion of pipes into the Radius triple couplings and quick couplings for supply lines.



Shears with triangular blade.

This type of shear is optimized for cutting Pex pipes as flat blade shears deform them and create cuts that are unsuitable for insertion into quick couplings.



Flaring tool

This tool rounds the tube and creates a uniform external bevel.

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Adduction joints



STRAIGHT 16/16



ELBOW SHAPE 90° -
16/16



TEE - 16/16/16

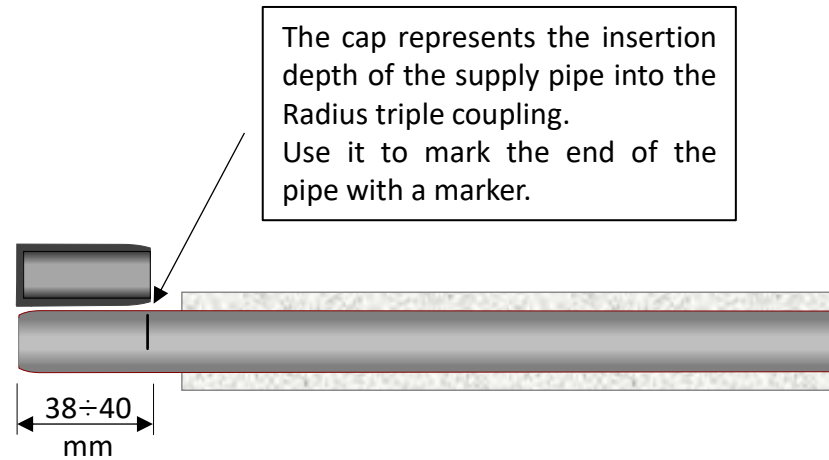
The joints are quick-release and can be removed by pressing the outer edge. Rotating the outer ring locks the extraction, so to remove them, it must be rotated counterclockwise.
The insertion depth for the supply couplings is 32 mm.



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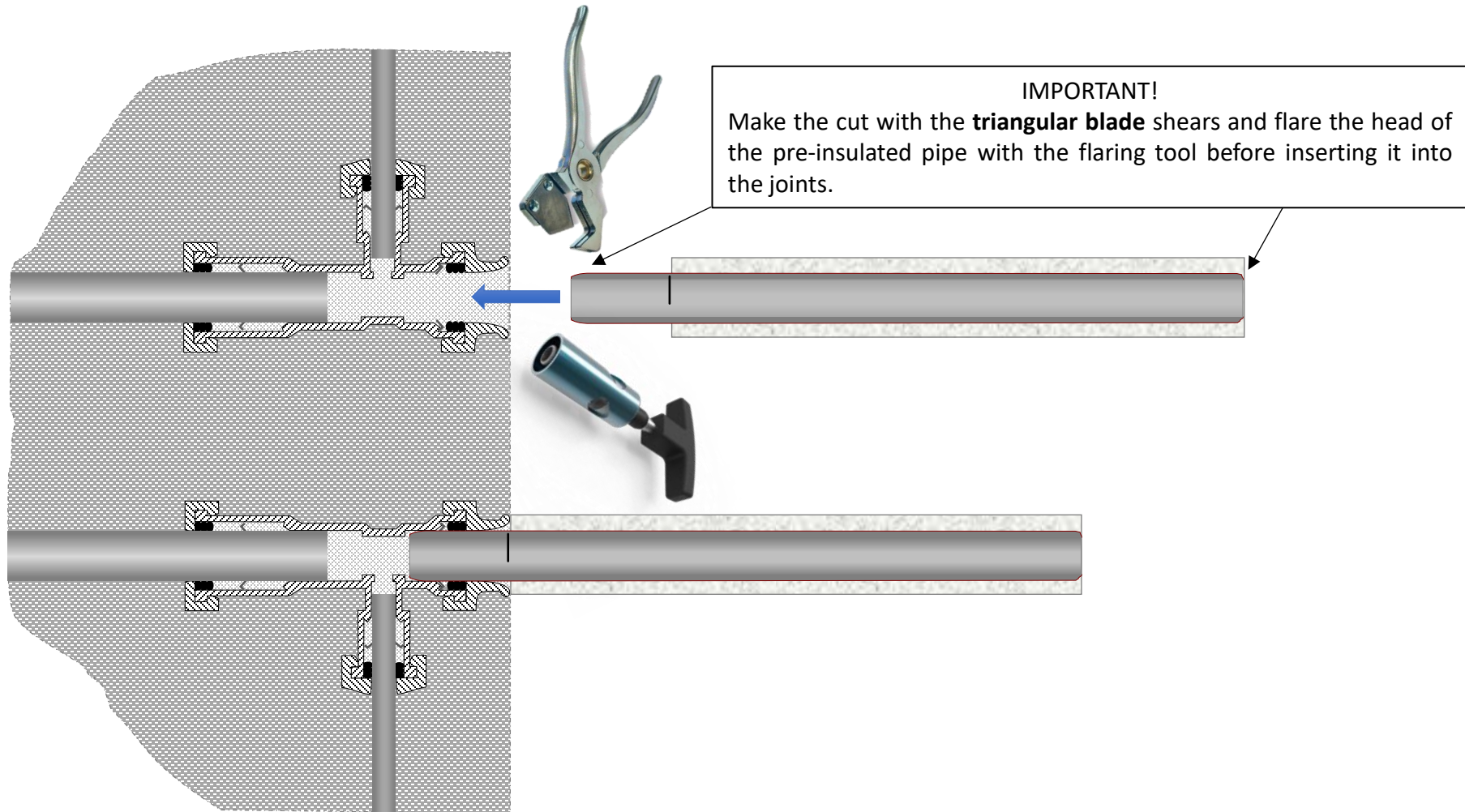
Graft depth in the triple radius joint



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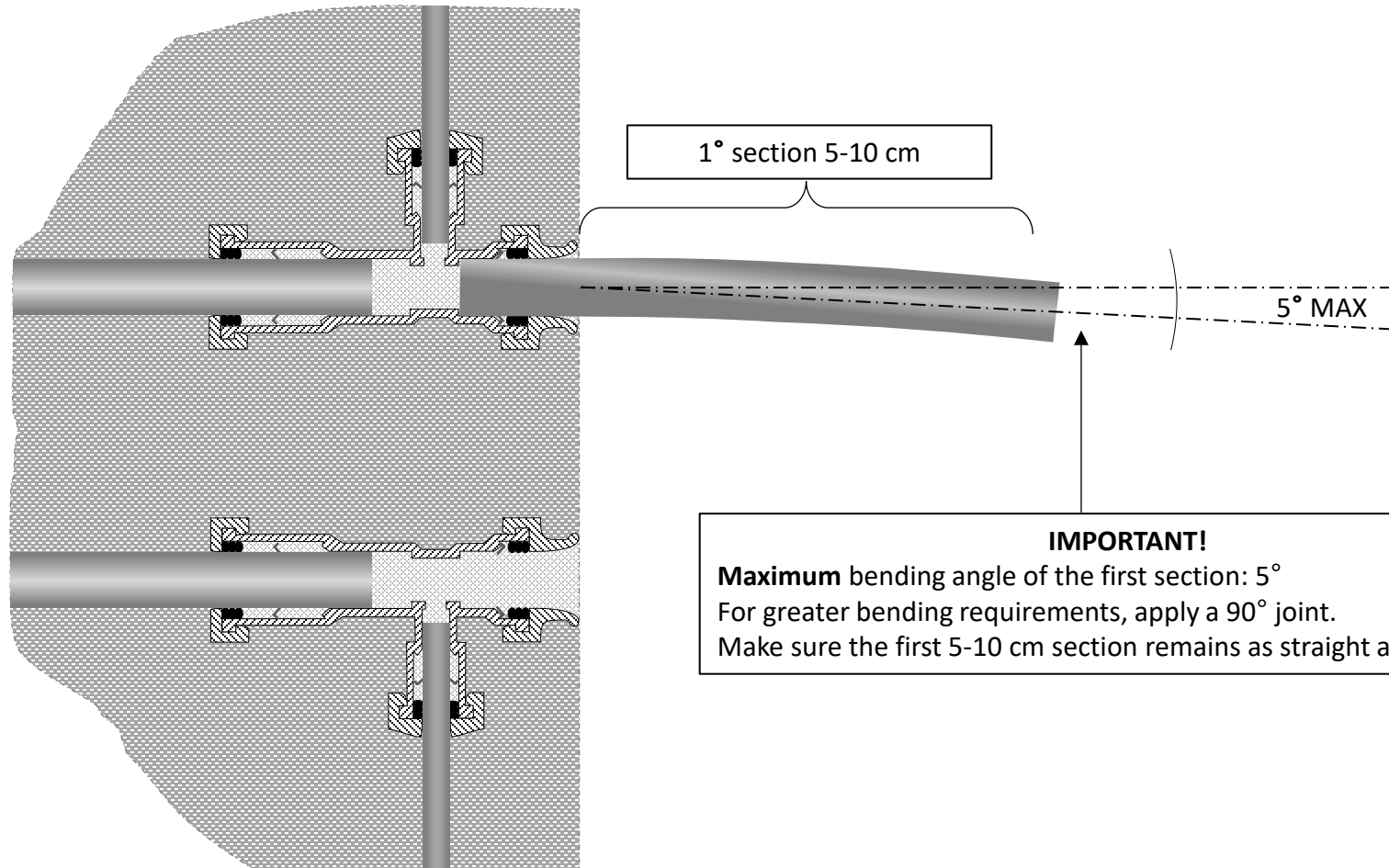
Connection of the panel with the supply lines



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Inclination of adduction lines



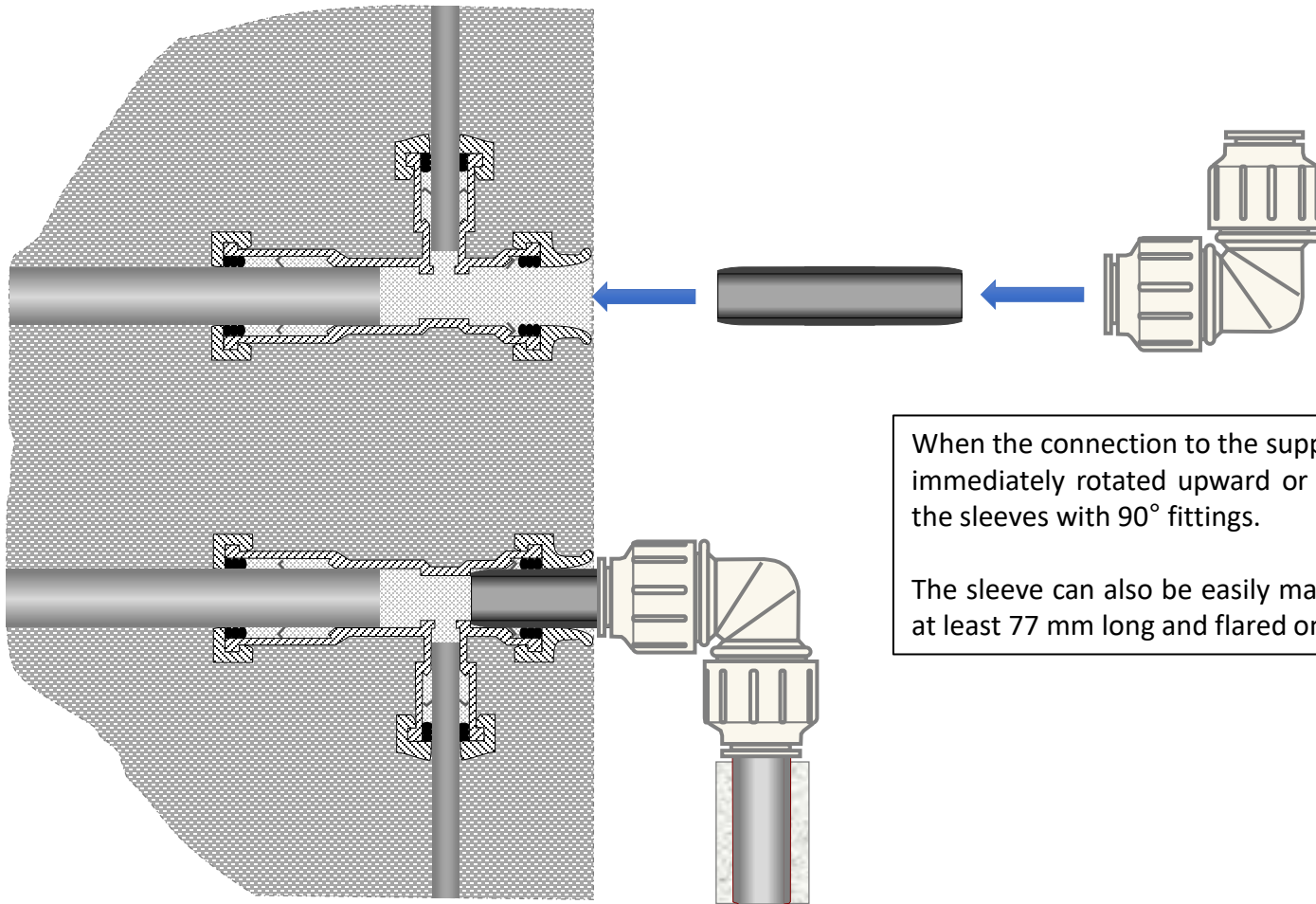
IMPORTANT!

Maximum bending angle of the first section: 5°
For greater bending requirements, apply a 90° joint.
Make sure the first 5-10 cm section remains as straight as possible.

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Elbow shape connection with supply lines



When the connection to the supply lines near the panel needs to be immediately rotated upward or in any other direction, simply use the sleeves with 90° fittings.

The sleeve can also be easily made with a piece of 16x1.5 Pex pipe at least 77 mm long and flared on both edges.