



DUCK STRIP 4.1

- IT** ISTRUZIONI PER INSTALLAZIONE, USO E MANUTENZIONE
- EN** INSTRUCTIONS FOR INSTALLATION, USE AND MAINTENANCE
- FR** INSTRUCTIONS POUR L'INSTALLATION, L'UTILISATION ET LA MAINTENANCE
- DE** ANWEISUNGEN FÜR INSTALLATION, GEBRAUCH UND WARTUNG
- ES** INSTRUCCIONES DE INSTALACIÓN, USO Y MANTENIMIENTO



IT *Gentile cliente,
la ringraziamo per la fiducia accordataci con l'acquisto di un nostro prodotto.
Se Lei avrà la costanza di seguire attentamente le indicazioni contenute nel presente manuale, siamo certi che potrà apprezzare nel tempo e con soddisfazione la qualità della nostra macchina.
Prima della messa in funzione, leggere attentamente il manuale di istruzioni.*

EN *We thank you for your custom in the purchase of this product.
By carefully following the instructions contained in this manual you will be sure to appreciate the quality of our machine.
Please therefore carefully read the instructions of use contained in this manual, which comply with essential safety regulations.*

FR *Cher client,
nous vous remercions de la confiance que vous nous accordez en achetant un de nos produits.
Si vous avez la constance de suivre attentivement les indications contenues dans le présent manuel, nous sommes certains que vous pourrez apprécier, dans le temps et avec satisfaction, la qualité de notre machine.
Nous vous prions de lire attentivement les indications contenues dans le manuel, concernant l'utilisation correcte de notre produit, conformément aux prescriptions essentielles de sécurité.*

DE *Sehr geehrter Kunde,
wir danken Ihnen für das uns durch den Erwerb eines unserer Produkte entgegengebrachte Vertrauen.
Wenn Sie die Ausdauer haben, aufmerksam die im vorliegenden Handbuch enthaltenen Hinweise zu beachten, sind wir gewiß, daß Sie lange und mit Zufriedenheit die Qualität unserer Maschine schätzen werden können.
Wir bitten Sie, aufmerksam die im Handbuch enthaltenen Hinweise bezüglich der richtigen Verwendung unseres Produktes in Übereinstimmung mit den wesentlichen Sicherheitsvorschriften zu lesen.*

ES *Apreciado cliente:
Le agradecemos que haya decidido confiar en nosotros al adquirir uno de nuestros productos.
Si es usted perseverante y sigue escrupulosamente las instrucciones contenidas en este manual, estamos seguros de que podrá apreciar la calidad de nuestra máquina con el paso del tiempo.
Lea atentamente las instrucciones contenidas en el manual que informan sobre el uso correcto de nuestro producto, de acuerdo con los requisitos básicos de seguridad.*

1 ESSENTIAL SAFETY RULES

Read this manual carefully before starting unpacking and assembly operations!

Radiant panels are built according to the standards and recognised safety rules. However, use may cause hazards for people or damage to the product or other property if it is not installed and commissioned correctly or used improperly.

Radiant panels must be used exclusively for heating indoor environments, therefore it is not suitable to be used:

- for outdoor installations;
- for installations in damp environments such as, for example, swimming pools;
- for installation in corrosive atmospheres.

During storage and installation, the products must be protected against moisture.

If in doubt, use must be agreed with the manufacturer. Any other or further use is considered an improper use.

The installer/operator is held solely responsible for any damage caused.

Proper use also includes compliance with the installation instructions described in this manual.

The installation of this product requires skills in the heating sector. This knowledge, which is usually taught in vocational training in the employment fields mentioned above, is not described separately. Malfunctions or damage due to improper installation are the responsibility of the installer.

2 SAFETY REQUIREMENTS

Attenzione! Radiant panels have sharp edges that can cause injuries.

Handling the panel incorrectly can result in even heavy wounds due to its weight.

For this reason, during assembly wear gloves, a hard hat and safety shoes and, if possible, only move panels with a hoist or forklift!

3 USING AND STORING THE MANUAL

This instruction manual is intended for the machine user, owner and technical installer and must always be available for consultation.

The instruction manual indicates the intended use of the machine, its technical features and provides indications as to its correct use, cleaning, adjustments and use. It also provides important indications for maintenance, for residual risks and anyhow to carry out operations with particular attention.

This manual must be considered as a part of the machine and must be kept for future reference until the final scrapping of the product.

The instruction manual must always be available for consultation and preserved in a dry and protected area.

Should it be lost or damaged, the user can request a new manual from the manufacturer or retailer, indicating the product model and its code displayed on the rating plate.

This manual reflects the state of technology at the moment it was drafted. The manufacturer reserves the right to update production and following manuals without being obliged to update previous versions as well.

The manufacturer will not be held liable in case of:

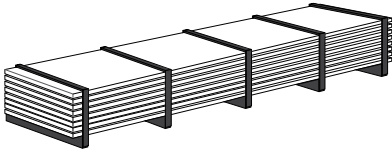
- improper use or misuse;
- use nonconforming to that expressly specified in this publication;
- changes to the product or any other unauthorised intervention;
- total or partial failure to comply with the instructions;
- exceptional events.

4 DELIVERY AND STORAGE

Radiant panels are supplied on wooden pallets with cardboard separators to prevent damage. Upon receipt, make sure that the material is intact and corresponds to the supply.

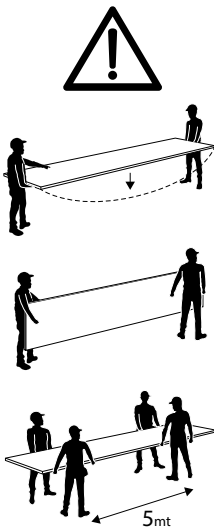
The vehicle unloading operations are the responsibility of the recipient.

To prevent the separators from staining the painted surface of the panel, avoid storing the material outside, exposed to the elements (rain and/or fog). The panels must in any case be stored in a dry place away from the elements.



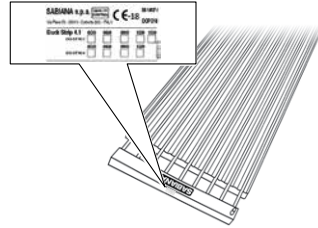
5 HANDLING

Panels must be handled by at least two people.



6 PRODUCT IDENTIFICATION

Each panel features an identification label indicating the manufacturer's details and the relative model. The DS Sabiana series is CE marked in compliance with European Standard EN 14037-1.



7 DISPOSAL

Consumables and replaced parts should be disposed of safely and in accordance with the environmental protection legislation.

The person performing installation and maintenance throughout the entire service life of the device must carefully follow the instructions below and comply with the following requirements:

The packaging consists of recyclable materials such as cardboard and polystyrene (EPS). Also the paper instructions, bags and protective polythene sheets (PE) are made with recyclable material.

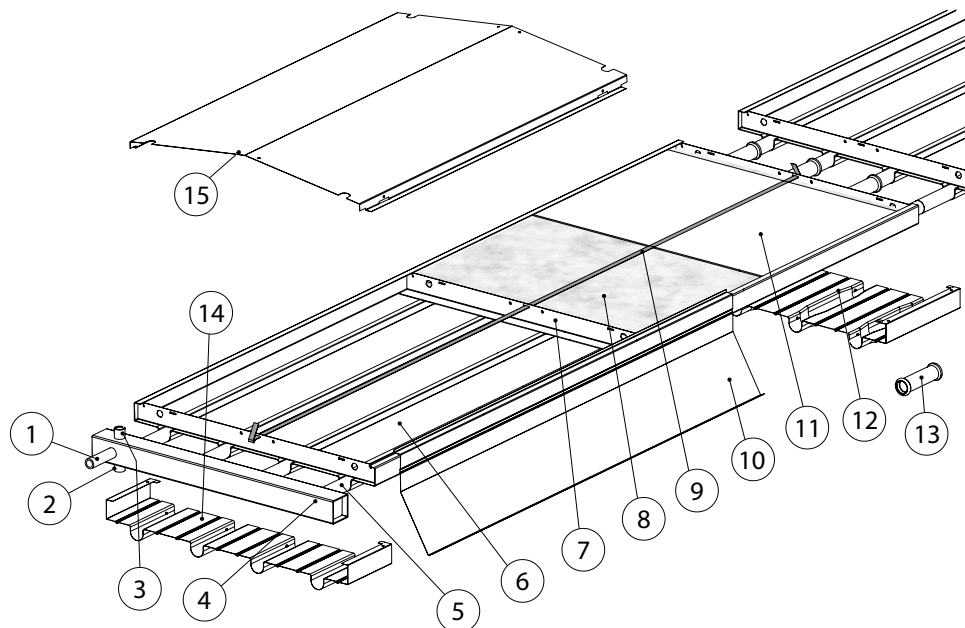
If the system has antifreeze liquid added to it, the latter must not be discharged freely, because it is a polluting substance and it must be collected and suitably disposed of; oil, grease, detergents, solvents and paint residues must be disposed of in accordance with current laws and regulations.

The materials resulting from dismantling the appliances must be separated and disposed of in authorised collection centres in accordance with the laws and regulations in force.

Insulation material is considered as non-hazardous waste; it must be removed and disposed of in authorised collection centres in accordance with the laws and regulations in force.



8 PARTS DIAGRAM



1. Male threaded connection (\varnothing 1/2" - 3/4" - 1" - 1.1/4")
2. Water drain connection \varnothing 3/8"
3. Air vent connection \varnothing 3/8"
4. Start or end head manifold
5. Steel pipe
6. Steel radiant plate
7. Suspension crosspiece
8. Insulation padding
9. Padding fastening straps
10. Anti-convective skirt (on request)
11. Flat cover (on request)
12. Connector cover plate
13. Press-fitting (on request)
14. Pipe cover between panel and manifold (on request)
15. Upper plate for gyms (on request)

9 TECHNICAL SPECIFICATIONS

DS-ST18 series

- Radiant plate made of 0.8 mm thick high quality steel.
- 18 mm diameter electrowelded steel pipes with smooth ends for joining with clamp-on sleeves.
- Pipe/plate coupling through spot welding.
- Pipe pitch 100 mm (DS-ST18-3) or 75 mm (DS-ST18-4).
- Square section manifolds welded at the factory on the start and end heads.
- Possibility of raised manifold.
- Angular suspension crosspieces.
- Sheet metal strips for fastening the insulation padding.
- Contoured and painted connector cover plates for covering the junction area.
- Protection with a special phosphodegreasing process and epoxy-polyester powder coating, dried in a furnace at 180°C - RAL 9016 (white) or RAL 9002 (light grey), in compliance with Directive 76/769/EEC. Other RAL colours available on request.
- Insulation padding available (supplied in bulk rolls).
- Emission of the radiant surface $\epsilon = 0.96$.

Note: for MODEL and DIMENSIONS see dedicated chapter.

DS-ST28 series

- Radiant plate made of 1.2 mm thick high quality steel.
- 28 mm diameter electrowelded steel pipes with smooth ends for joining with clamp-on sleeves.
- Pipe/plate coupling through spot welding.
- Version with special pipe for superheated water systems (DS-SP).
- Pipe pitch 150 mm.
- Square section manifolds welded at the factory on the start and end heads.
- Possibility of raised manifold.
- Angular suspension crosspieces.
- Sheet metal strips for fastening the insulation padding.
- Contoured and painted connector cover plates for covering the junction area.
- Protection with a special phosphodegreasing process and epoxy-polyester powder coating, dried in a furnace at 180°C - RAL 9016 (white) or RAL 9002 (light grey), in compliance with Directive 76/769/EEC. Other RAL colours available on request.
- Insulation padding available (supplied in bulk rolls).
- Emission of the radiant surface $\epsilon = 0.96$.

Note: for MODEL and DIMENSIONS see dedicated chapter.

Insulation padding

Insulation padding with 30 mm standard thickness, or 40 mm on request, with 25 micron aluminium sheet support:

- fire behaviour: Class A1 according to Standard EN 13501-1;
- thermal conductivity at 20°C: 0.036 W/mK for 30 mm thickness, 0.034 W/mK for 40 mm thickness;
- density: 20 kg/m³ for 30 mm thickness, 25 kg/m³ for 40 mm thickness;
- thermal resistance: 0.83 m²K/W for 30 mm thickness, 1.17 m²K/W for 40 mm thickness.

10 DECLARATION OF PERFORMANCE DS-ST18



Declaration of Performance n° DOP014

- Unique identification code of the product-type:
Ceiling mounted radiant panel Duck Strip – EN 14037:2013
Maximum operating pressure: 10 bar
- Model type: **DS-ST18**
18-3-030; 18-3-060; 18-3-090; 18-3-120; 18-3-150; 18-4-030; 18-4-060; 18-4-090; 18-4-120
- Intended use: **Heating in buildings**
- Manufacturer: Sabiana Spa – Via Piave 53 – 20011 Corbetta (MI) – Italy – Tel.: +39 02 972031 – info@sabiana.it – www.sabiana.it
- Systems of assessment and verification of constancy of performance of the construction product as set out in CPR305/2011, Annex V: **System 4 for reaction to fire - System 3 for the rest of characteristics**
- Test Laboratory: KERMI GmbH – Plattling
- Declared performances:

Essential characteristics ¹	Performance	Harmonized technical specification
Reaction to fire	Class A1	EN 14037-1
Release of dangerous substances	No release	
Pressure tightness	Pass	
Surface temperature	Maximum 120 °C	
Resistance to pressure	Pass	
Durability Surface protection	Class 0	

Characteristics	DS-ST	18-3-030	18-3-060	18-3-090	18-3-120	18-3-150	18-4-030	18-4-060	18-4-090	18-4-120	EN 14037-1
Rated thermal output	W/m	201	335	489	620	761	218	372	521	667	
Thermal output in different operating conditions	K	1,933	3,247	4,448	5,731	7,173	2,075	3,354	4,569	5,852	
	n	1,159	1,157	1,173	1,169	1,164	1,161	1,175	1,182	1,182	

- The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by: Mr Nicola Binaghi (President)

Corbetta, 27/05/2020

Nicola Binaghi
Presidente

Costruzione e vendita di apparecchi per riscaldamento e condizionamento industriale e civile



SABIANA SpA Società a socio unico
Sede Legale e stabilimento:
via Piave 53 - 20011 Corbetta (MI) Italia
Direzione e coordinamento: Arbonia AG

E-mail: info@sabiana.it
Pec: info@pec.sabiana.it
T. +39 02 972031 r.a.
F. +39 02 9777282

Cap. Sociale € 4.060.000 Int. vers.
C. F. P. IVA IT 09076750158
Reg. Imprese MI 09076750158
C.C.I.A.A. n. R.E.A. 1267681 Milano

A company of Arbonia Group
ARBONIA

11 DECLARATION OF PERFORMANCE DS-ST28



Declaration of Performance n° DOP015

- Unique identification code of the product-type:
Ceiling mounted radiant panel Duck Strip – EN 14037:2013
Maximum operating pressure: 10 bar
- Model type: **DS-ST28**
28-2-030; 28-2-045; 28-2-060; 28-2-075; 28-2-090; 28-2-105; 28-2-120; 28-2-135; 28-2-150
- Intended use: **Heating in buildings**
- Manufacturer: Sabiana Spa – Via Piave 53 – 20011 Corbetta (MI) – Italy – Tel.: +39 02 972031 – info@sabiana.it – www.sabiana.it
- Systems of assessment and verification of constancy of performance of the construction product as set out in CPR305/2011, Annex V: **System 4 for reaction to fire - System 3 for the rest of characteristics**
- Test Laboratory: KERMI GmbH – Plattling
- Declared performances:

Essential characteristics\	Performance	Harmonized technical specification
Reaction to fire	Class A1	EN 14037-1
Release of dangerous substances	No release	
Pressure tightness	Pass	
Surface temperature	Maximum 120 °C	
Resistance to pressure	Pass	
Durability Surface protection	Class 0	

Characteristics	DS-ST	28-2-030	28-2-045	28-2-060	28-2-075	28-2-090	28-2-105	28-2-120	28-2-135	28-2-150	EN 14037-1
Rated thermal output	W/m	191	258	329	415	486	556	635	703	769	
Thermal output in different operating conditions	K	1,794	2,514	3,090	3,938	4,750	5,137	5,838	6,472	7,075	
	n	1,165	1,156	1,165	1,162	1,155	1,169	1,170	1,170	1,170	

- The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by: Mr Nicola Binaghi (President)

Corbetta, 27/05/2020

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Pec: info@pec.sabiana.it
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F. +39 02 977282

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C.C.I.A.A. n. R.E.A. 1267681 Milano

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12 INSTALLATION HEIGHT

There are limitations in terms of the minimum installation height of the radiant panels, according to the average temperature values of the heating fluid. The recommended minimum values are shown in the table below, applicable for places where people carry out stationary work.

12.1 Minimum recommended assembly height

(in m compared to the floor) medium T H₂O average

DS-ST18				
	4-030	3-090	4-090	4-120
	3-030	4-060	3-120	3-150
T med H ₂ O	3-060			
60°	3,0	3,10	3,20	3,30
70°	3,10	3,20	3,30	3,40
80°	3,20	3,30	3,40	3,50
90°	3,30	3,50	3,70	3,80
100°	3,40	3,70	3,90	4,0
110°	3,50	4,0	4,30	4,40
120°	-	-	-	-
130°	-	-	-	-
140°	-	-	-	-

DS-ST28				
	2-045	2-090	2-120	2-150
	2-030	2-075	2-105	2-135
T med H ₂ O	2-060			
60°	3,10	3,20	3,30	3,40
70°	3,20	3,30	3,40	3,50
80°	3,30	3,50	3,60	3,70
90°	3,40	3,70	3,90	4,0
100°	3,50	4,0	4,20	4,30
110°	3,60	4,20	4,40	4,60
120°	3,70	4,40	4,70	4,90
130°	3,80	4,60	4,90	5,10
140°	3,90	4,80	5,20	5,40

13 SUSPENSION METHODS

The radiant panels can be suspended in various ways from the structures of the buildings. The illustrations in this manual show several suspension examples.

By fitting the tie rods in the relevant holes of the crosspieces, on the upper part of the radiant panels, it is possible to create non-visible suspensions arranged with fixed and modular pitches of approximately 2 m. Since suspensions with a different pitch, ranging between 1 and 2.5 m, are envisaged, the tie rods must support the panel on the bottom side of the plate, or be provided as indicated in the next pages.

The suspension tie rods are not included in the supply of the radiant panels and must be provided by the installer.

They can be installed with steel cables, with threaded rods, with chains or with perforated straps and must be adjustable.

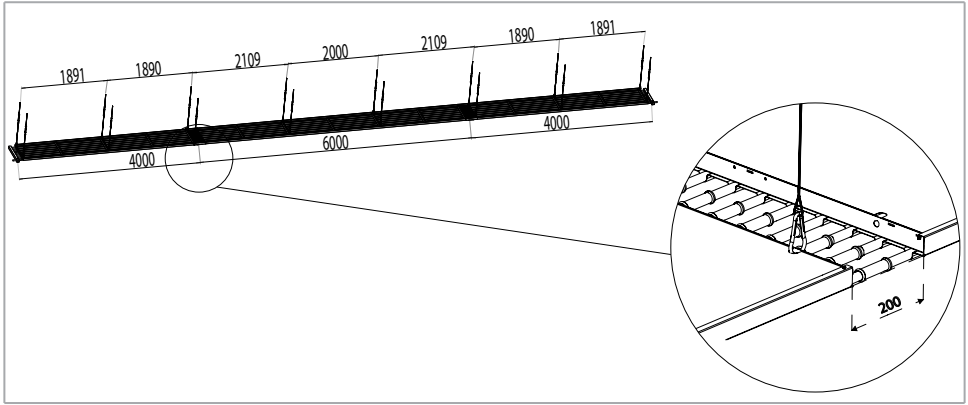
The length of the suspension tie rods must be proportionate to the total thermal expansion of the radiant strip: it is therefore necessary to take into account both the total maximum length and the average operating temperature of the heat transfer fluid, in order to limit the angular displacement of the tie rods to acceptable values.

The minimum length of the tie rods recommended for the various lengths and for the various operating temperatures of the radiant panels are indicated in the relevant table.

Check that the chosen ceiling fastening system is compatible with the weight of the panel and complies with the standards in force.



The head and intermediate modules of the radiant panels can be joined together by clamp-on sleeves, in order to compose all the desired lengths.



The maximum distance between each suspension is around 2 m.

14 BENDING

Table of vertical bending *f* according the distance between two suspension points.

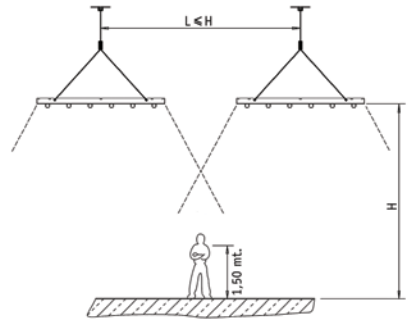
BENDING <i>f</i> (mm)		Distance 2 m
Model		
DS-ST18	DS-ST28	
030		3
	030 - 045	1,5
060		3,5
	060 - 075	2
090		3,5
	090 - 105	2
120		3,7
	120 - 135	2,5
150		3,9
	150	3,0

The table indicates the maximum bending expressed in mm between two suspension points of the radiant panels. The values refer to a distance between the suspension points of 2 m.

Avoid loading the radiant panels with a weight greater than once the weight of the radiant panel.

The maximum curvature with respect to the longitudinal axis on 6 m panels is 10 mm.

15 CORRECT SPACING BETWEEN THE RADIANT PANELS

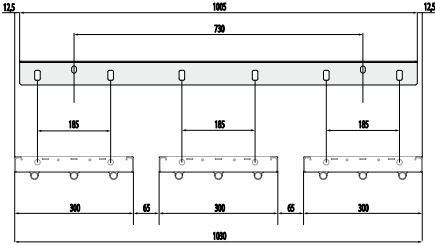


It has been experimentally and practically found that the good uniformity of heat irradiation over a central area of a building (where the cooling effect of the outer walls can be considered null) is obtained when the centre-to-centre distance between two adjacent radiant panels is equal to or less than the height from the floor.

For example, where the installation height of the radiant panels is 4 m above the floor, the centre-to-centre distance of the adjacent panels must be set at 4 m or less, in order to achieve the best heating uniformity.

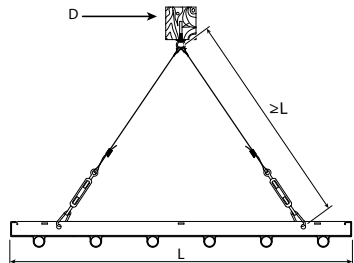
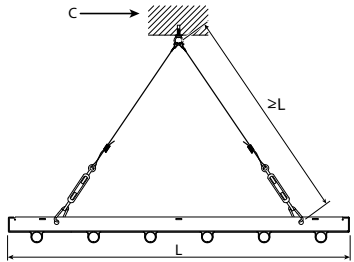
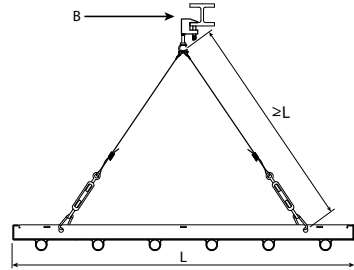
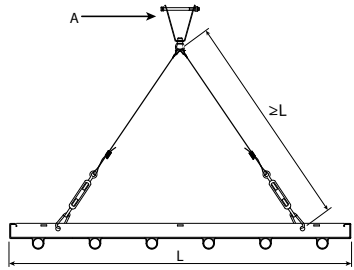
16 SUSPENSION CROSSPIECE FOR HANGING MULTIPLE PANELS

This suspension crosspieces are used for the hanging of several panels.
For more details see the related section.



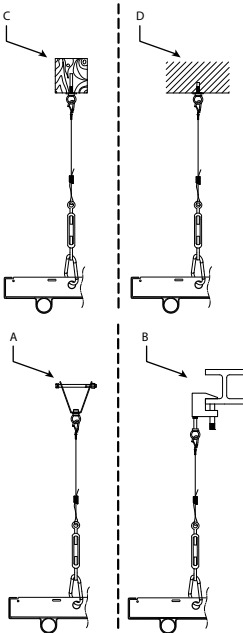
18 ANCHORING POINTS FOR HANGING PANELS

For Mod. 030÷105



17 SUSPENSION SYSTEMS

(not supplied)

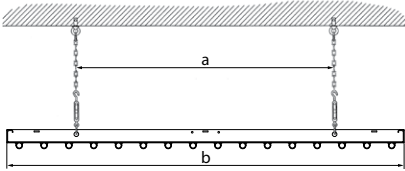


- A with bracket
- B with clamp
- C with screw for wood
- D with plug

- A with bracket
- B with clamp
- C with plug
- D with screw for wood

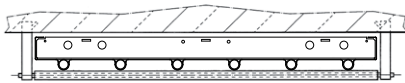
For radiant panels with a width of 120, 135 e 150, the suspensions must have the distances indicated in the table below:

Mod.	120	135	150
a	780	855	965
b	1200	1350	1500



Provided by the customer

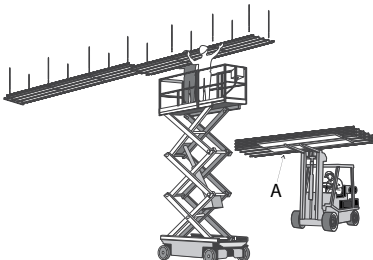
In the event that the radiant panels have to be installed with tie rods shorter than the minimum length recommended by the table (for example in the event of installation close to the ceiling), the suspensions must be of a rigid type with horizontal sliding support crosspiece.



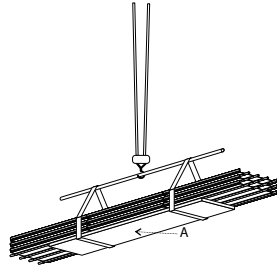
(Supports not supplied).

19 INSTALLATION

If the panels are to be mounted on the ceiling in buildings measuring over four meters in height, the safest and cheapest way to do this is to use lifting platforms with a lifting capacity of over 400 kg and which can reach the highest parts of the building. These machines can be hired nationally.



A wooden planks



A wooden plank

Start by securing the suspension ties to the roof. The ties are not included in the supply. They can consist of chains, steel cables, threaded bars or other devices. On the ground, place the insulation on the panels and secure it as indicated in the dedicated section. Once the insulation is positioned, stack three or four modules, according to the capacity of the lifting platform, and load them onto the platform using a forklift truck.

Lift the panels onto in the correct position and attach them, one at a time, to the previously positioned suspensions.

Once the panels have been installed join the head pipes of two adjacent modules.

20 SLOPES, AIR VENTS, WATER DRAINS

The radiant panels, with the pipes connected to each other in parallel by means of manifolds, must be installed as follows:

- the transversal axis, even in the case of horizontal installation, must slope slightly upwards towards the inlet connection of the heat transfer fluid;

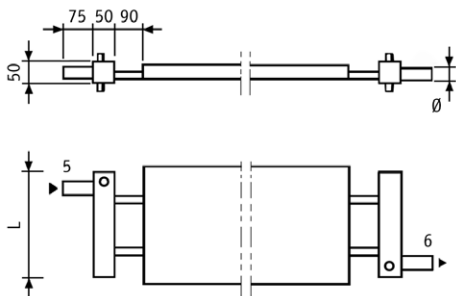
- the longitudinal axis must slope upwards towards the inlet connection of the heat transfer fluid;
- the fluid inlet connection must be the highest point of the heating body, in order to facilitate air venting, while the heat transfer fluid outlet connection is the lowest point from which it is possible to drain.

21 MANIFOLDS

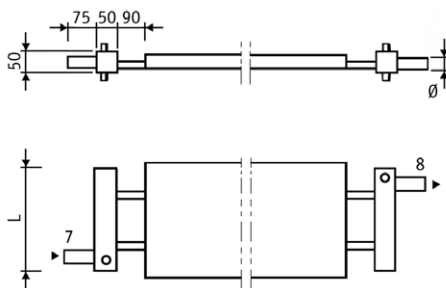
The manifolds are available with connections measuring \varnothing 1/2", 3/4", 1" e 1 1/4".

21.1 Execution B

Connections 5-6



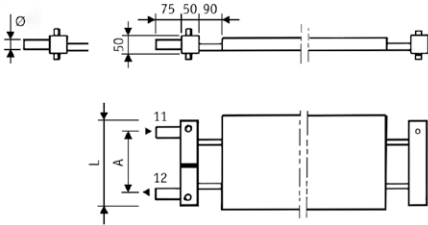
Connections 7-8



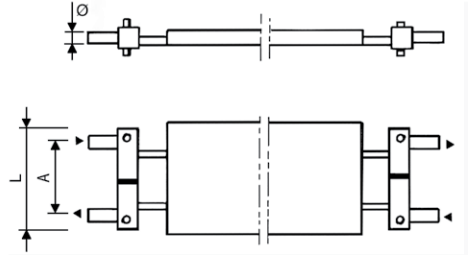
Mod.	030	045	060	075	090	105	120	135	150
L	300	450	600	750	900	1050	1200	1350	1500

21.2 Execution D - D+D

Execution D



Execution D+D

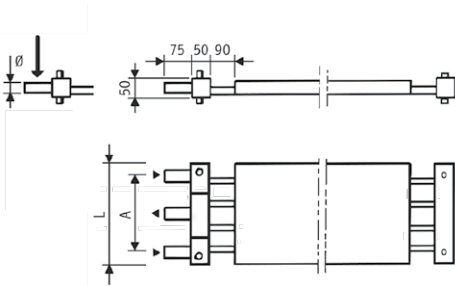


Warning

The "D" and "D+D" type manifolds are not suitable for operation with superheated water or steam. Manifold "D" can be used with hot water up to lines with a maximum length of 50 m and using slow and soft opening valves.

Mod.	030	045	060	075	090	105	120	135	150
L	300	450	600	750	900	1050	1200	1350	1500
A	200	350	500	650	800	950	1100	1250	1400

21.3 Execution G

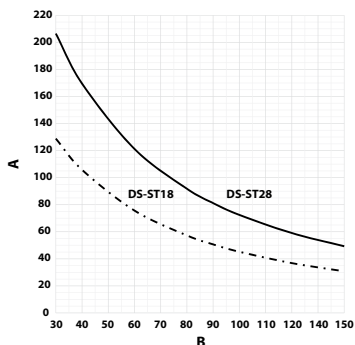


Mod.	120	135	150
L	1200	1350	1500
A	1100	1250	1400

22 MINIMUM WATER FLOW VALUES INSIDE THE PANELS

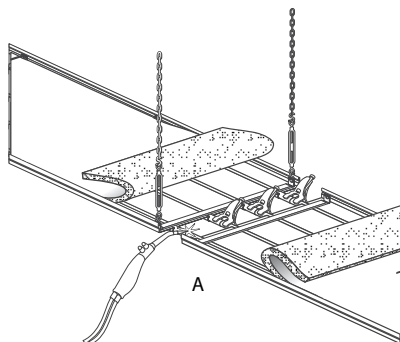
If the speed of the water in the panel pipes is too low, the water will not be able to discharge the air. This could cause a blockage in the circulation of the water with a substantial reduction in the thermal emission of the panel.

When determining the size of the systems, it is advisable to make sure that the speed of the water in every single pipe is never lower than the values shown in the chart.

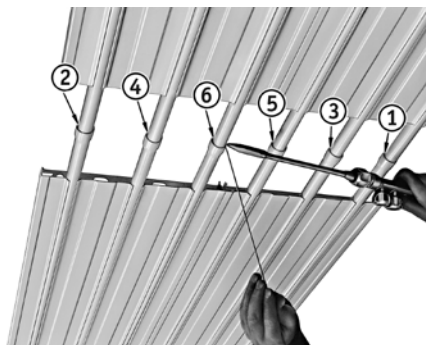


A Minimum water flow per pipe (l/h)

B Outgoing water temperature (°C)

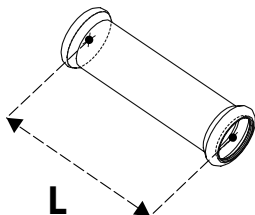


A clamped with pliers



23 ASSEMBLY WITH FITTINGS

See chap. "Assembly with fittings".



24 ASSEMBLY WITH WELDING

Align the pipes of the head and intermediate elements, check the clearance between the panels and clamp with the pliers. Weld the pipes as per the numbered sequence. Fit the connector cover plate as shown in the "assembly with fittings" section.

25 HYDRAULIC CIRCUIT

Water parameters

Maximum permissible values for the water used inside a closed loop cooling or heating circuit.

Parameter		Unit	Value
pH value (at 20°C)	-	-	8-9
Conductivity (at 20°C)	-	µS/cm	< 700
Oxygen content	O ₂	mg/l	< 0,1
Total hardness	-	°dH	1-15
Sulphur ions	S	-	not detectable
Sodium ions	Na ⁺	mg/l	< 100
Iron ions	Fe ²⁺ , Fe ³⁺	mg/l	< 0,1
Manganese ions	Mn ²⁺	mg/l	< 0,05
Ammonia ions	NH ₄ ⁺	mg/l	< 0,1
Chlorine ions	Cl ⁻	mg/l	< 100
Sulphate ions	SO ₄ ²⁻	mg/l	< 50
Nitrite ions	NO ₂ ⁻	mg/l	< 50
Nitrate ions	NO ₃ ⁻	mg/l	< 50

In open circuits (for example when using well water), the water used must be purified from suspended materials by means of a filter which must be fitted on the inlet (otherwise there is the risk of erosion by suspended particles).

The "Standard" radiant panels can be supplied with hot water at a maximum temperature of 120°C and with a maximum hydraulic pressure of 10 bar.

"Special" panels can even be supplied with super-heated water, up to 16 bar of hydraulic pressure.

Pay special attention to the choice of the mixing valve serving the radiant panels.

In fact, in order to prevent problems due to the different pipe-sheet metal expansion, in the cold start phase and when changing between the reduced temperature and the comfort temperature, the flow water temperature can easily reach 45°C without any limitation, beyond which it can rise from 45°C up to 85°C, with an increase of 10°C every 3 minutes for radiant panels equipped with manifold "B", and an increase of 10°C every 4 minutes for radiant panels with manifold "D".

Provide hydraulic flow shut-off valves.

The supply pipes of the radiant panels must be designed in order to absorb the movements created by thermal expansions.

If necessary, fit a dilator in the circuit.

Put a tap or a vent valve on the inlet manifold in the relevant Ø 3/8" threaded connection, to eliminate air

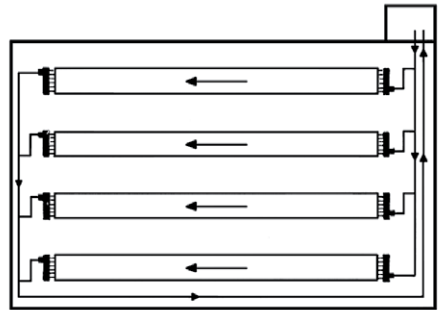
from the circuit and, on the outlet manifold, a tap for draining the water.

Plug the other Ø 3/8" connections.

26 CONNECTION DIAGRAMS

Example diagram of connection with manifold "B". For the other connection diagrams, see chap. "Connection diagrams".

MANIFOLD "B" - Compensated lines

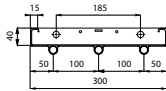


MODELLI E DIMENSIONI / MODELS AND DIMENSIONS / MODÈLES ET DIMENSIONS / MODELLE UND ABMESSUNGEN / MODELOS Y DIMENSIONES

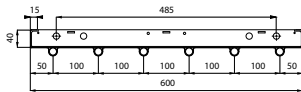
SERIE / SÉRIE / SERIES DS-ST18

Tubi / Pipes / Tuayux / Rohre / Tubos 18 mm ø;
passo / pitch / pas / Achsenabstand / paso 100 mm

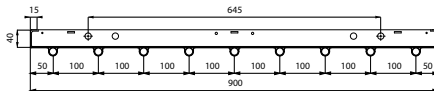
DS-ST18-3-030; 3 Tubi / Pipes / Tuyaux / Rohre / Tubos



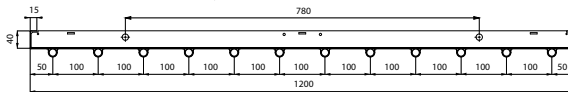
DS-ST18-3-060; 6 Tubi / Pipes / Tuyaux / Rohre / Tubos



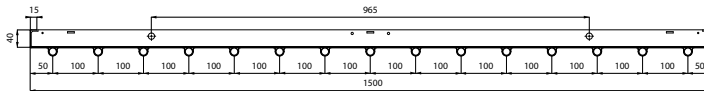
DS-ST18-3-090; 9 Tubi / Pipes / Tuyaux / Rohre / Tubos



DS-ST18-3-120; 12 Tubi / Pipes / Tuyaux / Rohre / Tubos

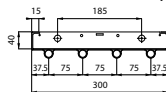


DS-ST18-3-150; 15 Tubi / Pipes / Tuyaux / Rohre / Tubos

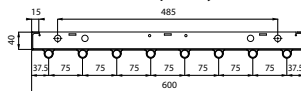


Tubi / Pipes / Tuyaux / Rohre / Tubos 18 mm ø;
passo / pitch / pas / Achsenabstand / paso 75 mm

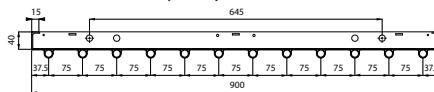
DS-ST18-4-030; 4 Tubi / Pipes / Tuyaux / Rohre / Tubos



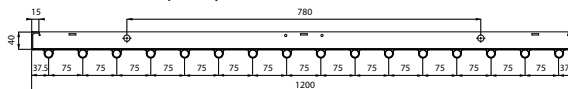
DS-ST18-4-060; 8 Tubi / Pipes / Tuyaux / Rohre / Tubos



DS-ST18-4-090; 12 Tubi / Pipes / Tuyaux / Rohre / Tubos



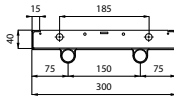
DS-ST18-4-120; 16 Tubi / Pipes / Tuyaux / Rohre / Tubos



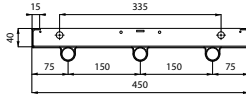
SERIE / SÉRIE / SERIES DS-ST28

**Tubi / Pipes / Tuayux / Rohre / Tubos 28 mm ø;
passo / pitch / pas / Achsenabstand / paso 150 mm**

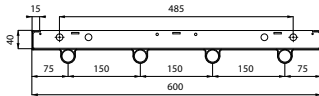
DS-ST28-2-030; 2 Tubi / Pipes / Tuyaux / Rohre / Tubos



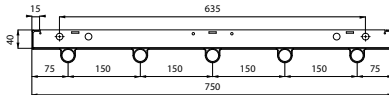
DS-ST28-2-045; 3 Tubi / Pipes / Tuyaux / Rohre / Tubos



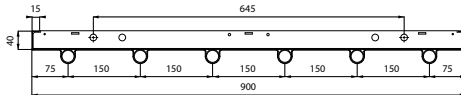
DS-ST28-2-060; 4 Tubi / Pipes / Tuyaux / Rohre / Tubos



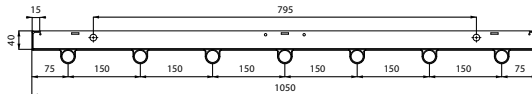
DS-ST28-2-075; 5 Tubi / Pipes / Tuyaux / Rohre / Tubos



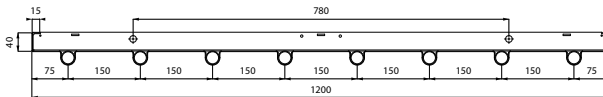
DS-ST28-2-090; 6 Tubi / Pipes / Tuyaux / Rohre / Tubos



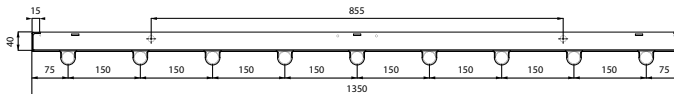
DS-ST28-2-105; 7 Tubi / Pipes / Tuyaux / Rohre / Tubos



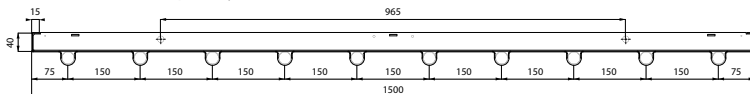
DS-ST28-2-120; 8 Tubi / Pipes / Tuyaux / Rohre / Tubos



DS-ST28-2-135; 9 Tubi / Pipes / Tuyaux / Rohre / Tubos



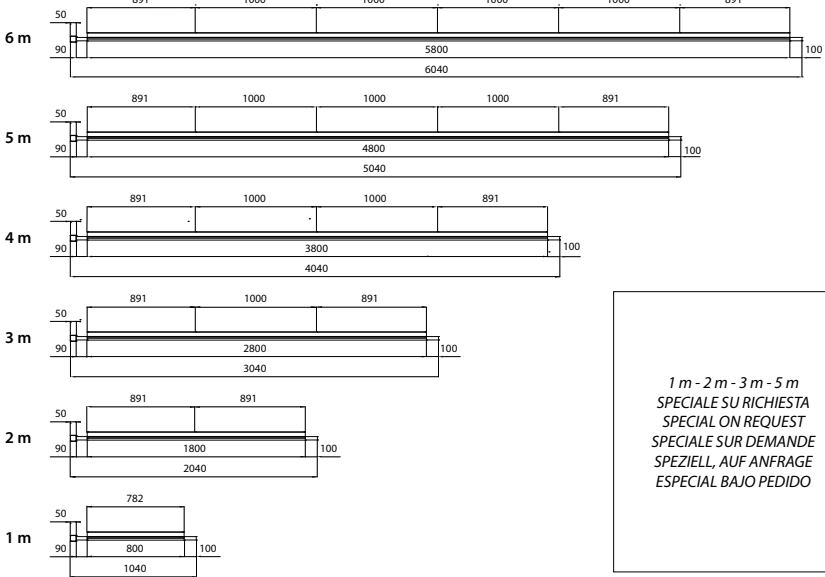
DS-ST28-2-150; 10 Tubi / Pipes / Tuyaux / Rohre / Tubos



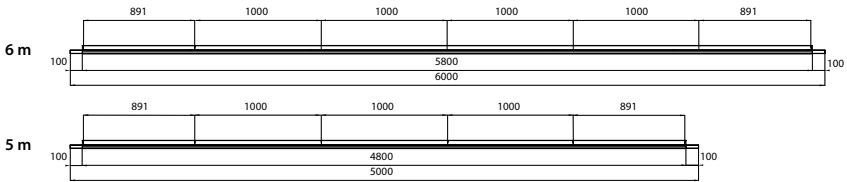
SERIE / SÉRIE / SERIES DS-ST18 - DS-ST28:

Lunghezze modulari e passi traverse
Modular lengths and crosspiece pitches
Longueurs modulaires et pas traverses
Modulare Längen und Abstände Querverbindungen
Longitudes modulares y pasos travesaños

Testata iniziale e finale / Start and final head / Tête initiale et finale / Anfangs- oder Endstück / Cabeza inicial y final



Intermedio / Intermediate / Intermédiaire / Zwischenstück / Intermedio



SERIE / SÉRIE / SERIES DS-ST18 - DS-ST28:

Lunghezze modulari e passi traverse

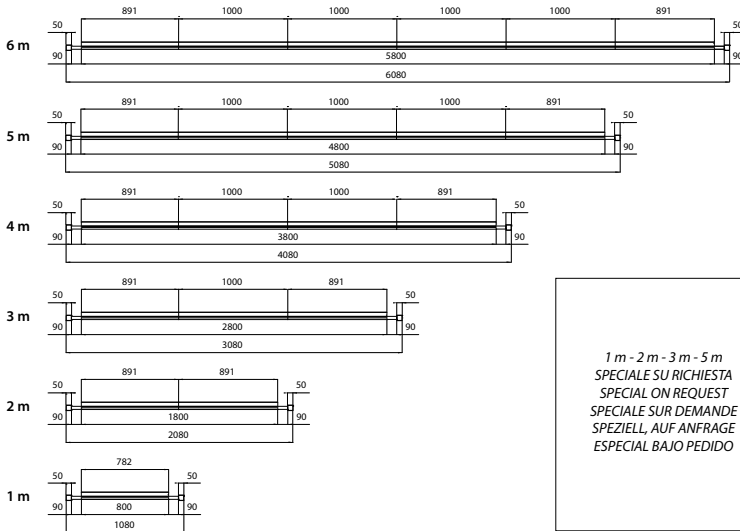
Modular lengths and crosspiece pitches

Longueurs modulaires et pas traverses

Modulare Längen und Abstände Querverbindungen

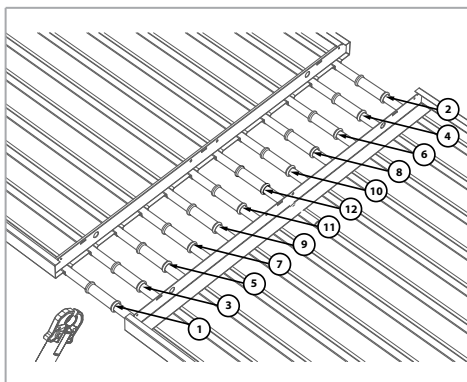
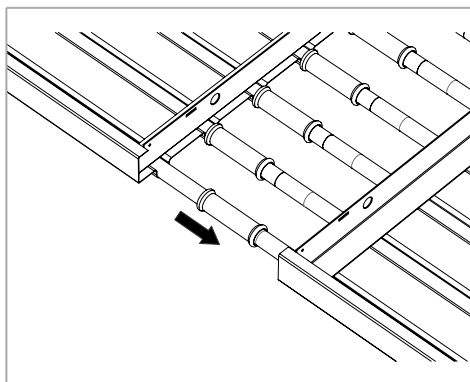
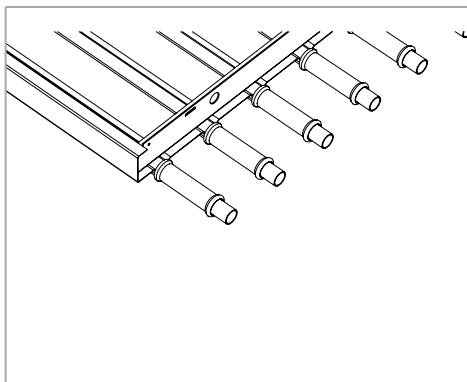
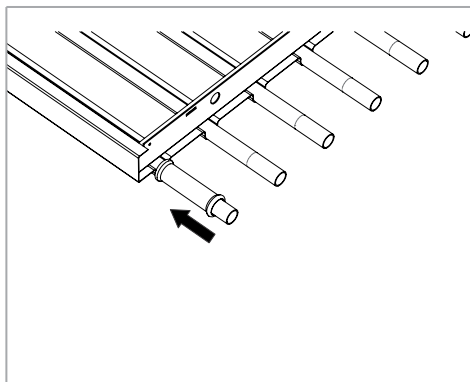
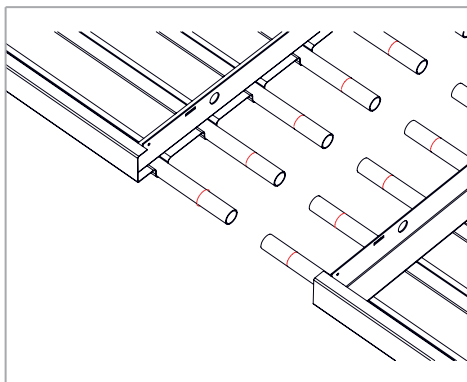
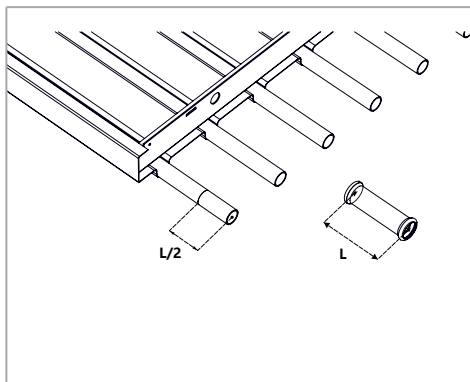
Longitudes modulares y pasos travesaños

Testate doppie / Double heads / Têtes doubles / Doppelstücke / Cabezas dobles

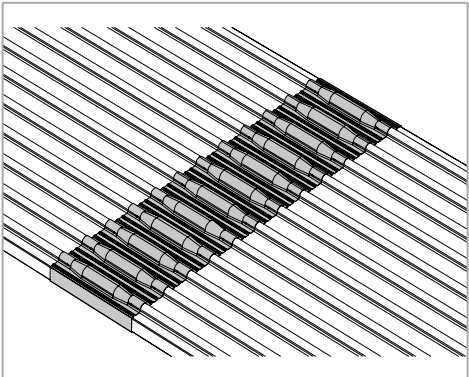
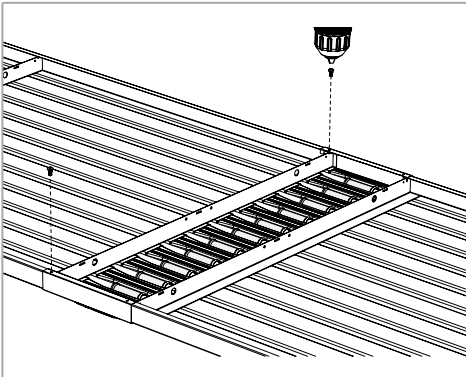
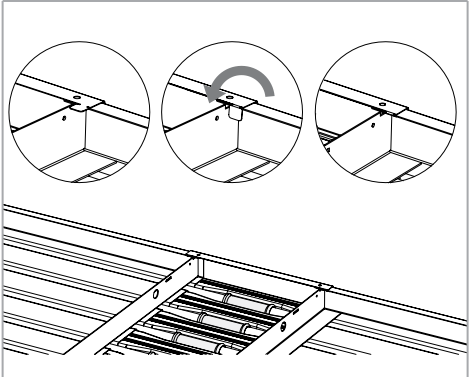
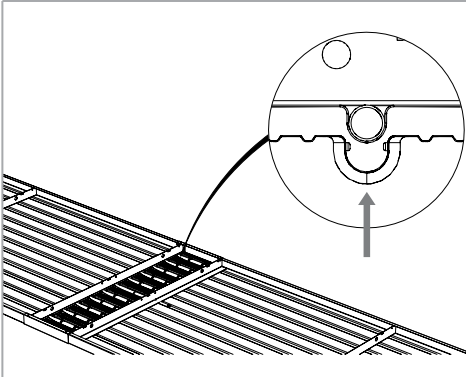
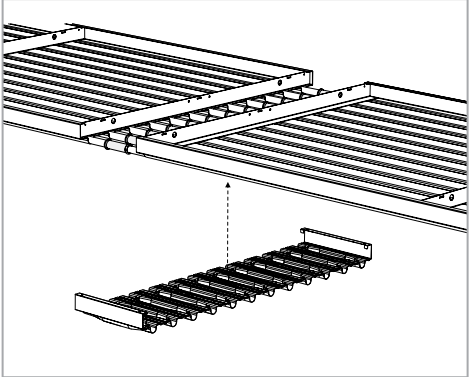
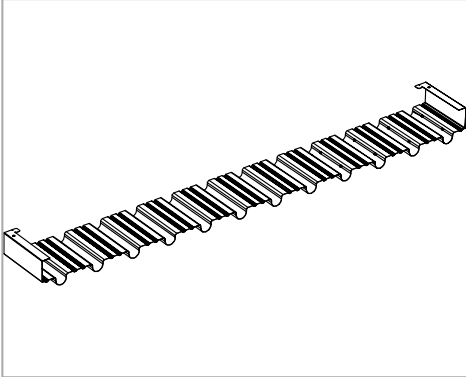


1 m - 2 m - 3 m - 5 m
SPECIALE SU RICHIESTA
SPECIALE ON REQUEST
SPECIALE SUR DEMANDE
SPEZIELLE AUF ANFRAGE
ESPECIAL BAJO PEDIDO

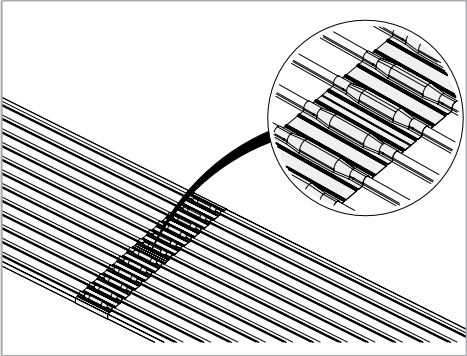
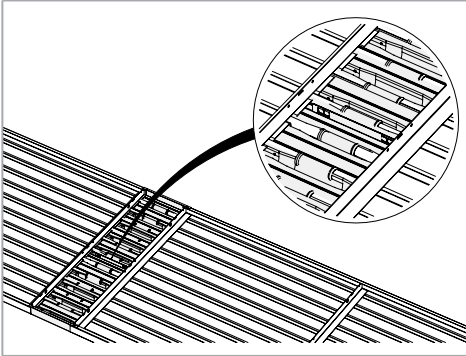
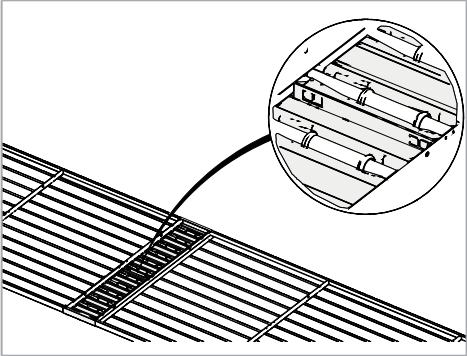
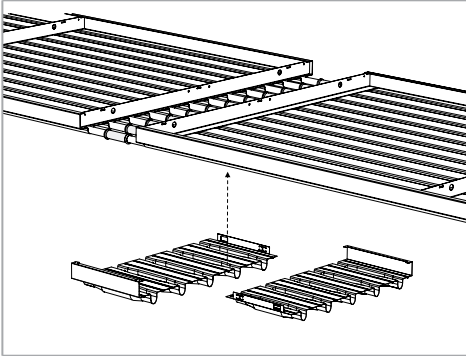
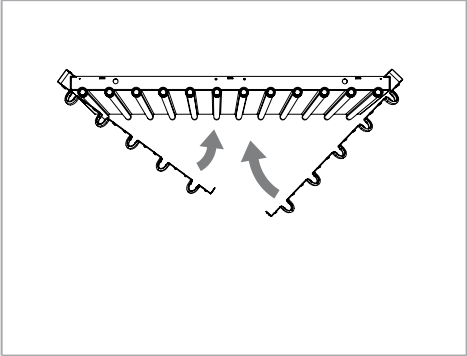
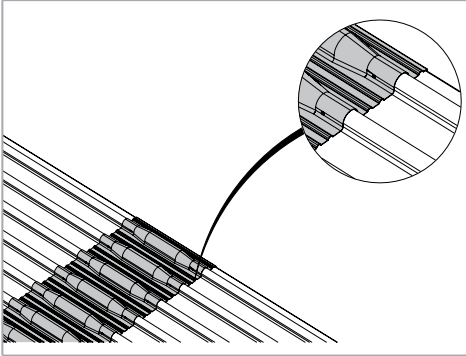
**ASSEMBLAGGIO CON RACCORDI A PINZARE / ASSEMBLY WITH PRESSFITTINGS /
ASSEMBLAGE AVEC RACCORDS À SERTIR / ZUSAMMENBAU MIT ANSCHLÜSSEN
MIT PRESSFITTINGEN / ENSAMBLAJE CON RACORES POR COMPRESIÓN**



**INSTALLAZIONE COPRIGIUNTO / MAKE-UP JOINT INSTALLATION /
INSTALLATION COUVRE-JOINT / INSTALLATION ZWISCHENABDECKBLECH /
INSTALACIÓN TAPAJUNTA**



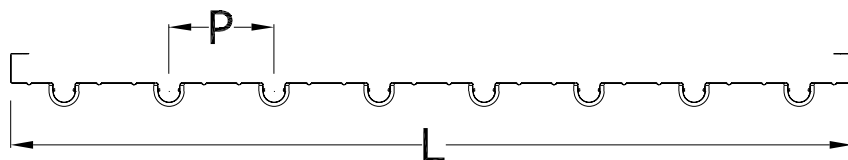
**INSTALLAZIONE COPRIGIUNTO IN DUE PEZZI / TWO PIECES MAKE-UP JOINT
INSTALLATION / INSTALLATION COUVRE-JOINT AUX DEUX PIECES / ZWEI
STÜCKE ZWISCHENABDECKUNG INSTALLATION / INSTALCIÓN TAPAJUNTA EN
DOS PIEZAS**



COPRIGIUNTO / MAKE-UP JOINT / COUVRE-JOINT / ZWISCHENABDECKBLECH / TAPAJUNTAS

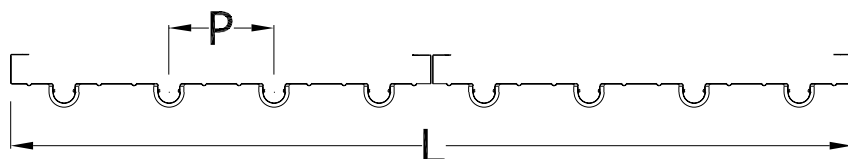
Per Mod. 030÷090

Modello Model Modèle Modell	L	Ø	N° tubi No. pipes N° tuyaux N° Rohre	P	Cod. Code	kg
DS-ST18-3-030	302	18	3	100	9090A221	0,5
DS-ST18-3-060	602	18	6	100	9090A223	0,8
DS-ST18-3-090	902	18	9	100	9090A225	1,2
DS-ST18-4-030	302	18	4	75	9090A241	0,5
DS-ST18-4-060	602	18	8	75	9090A243	0,9
DS-ST18-4-090	902	18	12	75	9090A245	1,3
DS-ST28-2-030	302	28	2	150	9090A231	0,5
DS-ST28-2-045	452	28	3	150	9090A232	0,7
DS-ST28-2-060	602	28	4	150	9090A233	0,9
DS-ST28-2-075	752	28	5	150	9090A234	1
DS-ST28-2-090	902	28	6	150	9090A235	1,2



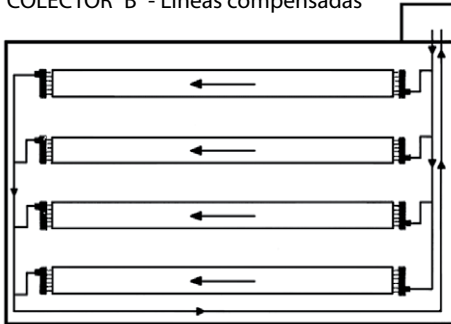
Per Mod. 105÷150

Modello Model Modèle Modell	L	Ø	N° tubi No. pipes N° tuyaux N° Rohre	P	Cod. Code	Kg
DS-ST18-3-120	1202	18	12	100	9090A227	1,6
DS-ST18-3-150	1502	18	15	100	9090A229	2,1
DS-ST18-4-120	1202	18	16	75	9090A247	1,7
DS-ST28-2-105	1052	28	7	150	9090A236	1,4
DS-ST28-2-120	1202	28	8	150	9090A237	1,7
DS-ST28-2-135	1352	28	9	150	9090A238	1,8
DS-ST28-2-150	1502	28	10	150	9090A239	2,1

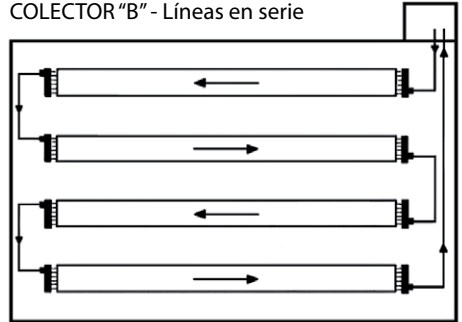


SCHEMI DI COLLEGAMENTO / CONNECTION DIAGRAMS / SCHÉMAS DE RACCORDEMENT / ANSCHLUSSPLÄNE / ESQUEMAS DE CONEXIÓN

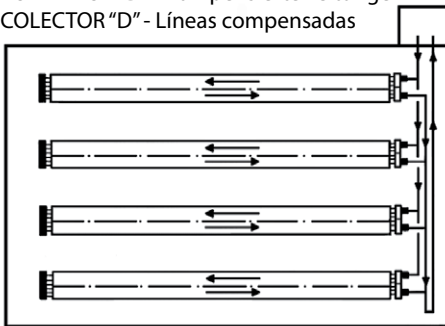
COLLETTORE "B" - Linee compensate
 MANIFOLD "B" - Compensated lines
 COLLECTEUR "B" - Lignes compensées
 KOLLEKTOR "B" - Kompensierte Leitungen
 COLECTOR "B" - Líneas compensadas



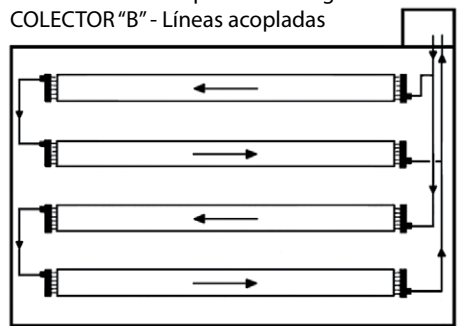
COLLETTORE "B" - Linee in serie
 MANIFOLD "B" - Lines in series
 COLLECTEUR "B" - Lignes en série
 KOLLEKTOR "B" - Reihengeschaltete Leitungen
 COLECTOR "B" - Líneas en serie



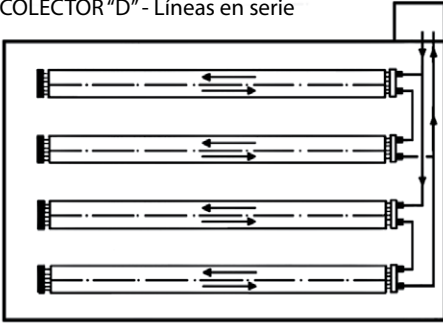
COLLETTORE "D" - Linee compensate
 MANIFOLD "D" - Compensated lines
 COLLECTEUR "D" - Lignes compensées
 KOLLEKTOR "D" - Kompensierte Leitungen
 COLECTOR "D" - Líneas compensadas



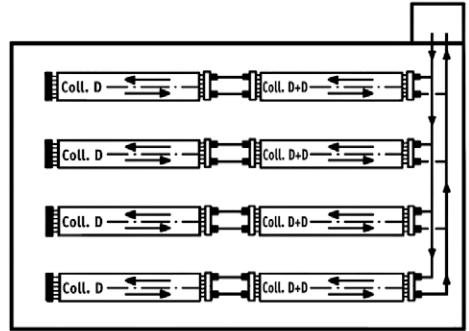
COLLETTORE "B" - Linee accoppiate
 MANIFOLD "B" - Coupled lines
 COLLECTEUR "B" - Lignes couplées
 KOLLEKTOR "B" - Gepaarte Leitungen
 COLECTOR "B" - Líneas acopladas



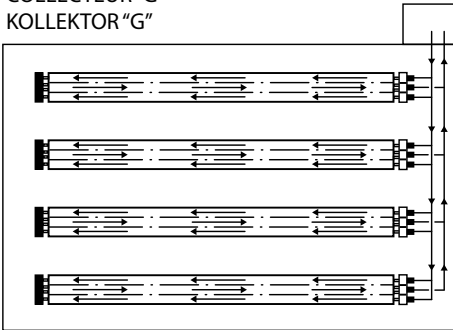
COLLETTORE "D" - Linee in serie
 MANIFOLD "D" - Lines in series
 COLLECTEUR "D" - Lignes en série
 KOLLEKTOR "D" - Reihengeschaltete Leitungen
 COLECTOR "D" - Líneas en serie



COLLETTORE "D+D"
 MANIFOLD "D+D"
 COLLECTEUR "D+D"
 KOLLEKTOR "D+D"

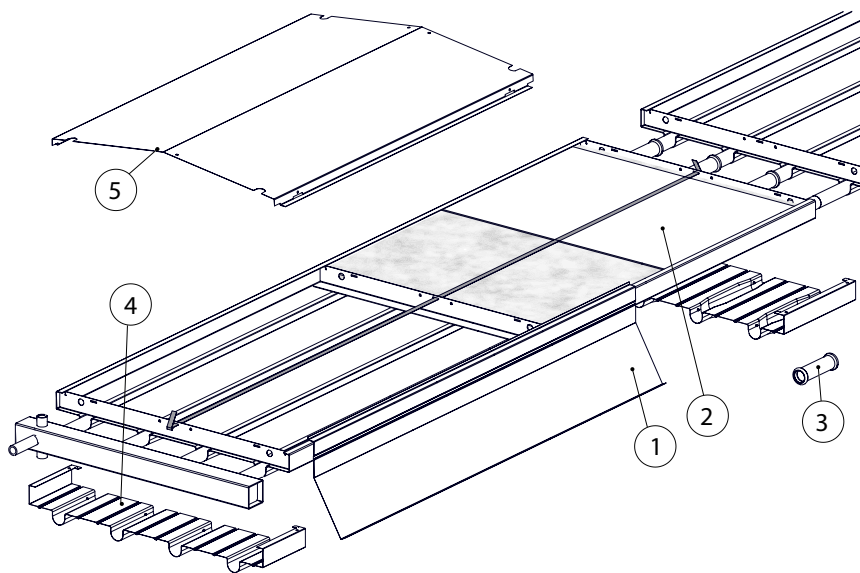


COLLETTORE "G"
 MANIFOLD "G"
 COLLECTEUR "G"
 KOLLEKTOR "G"



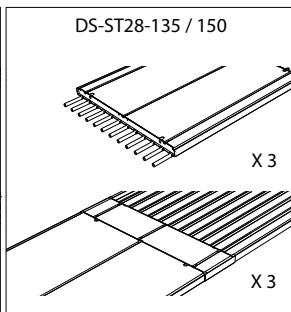
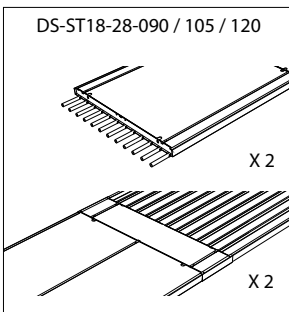
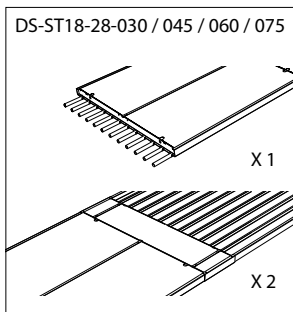
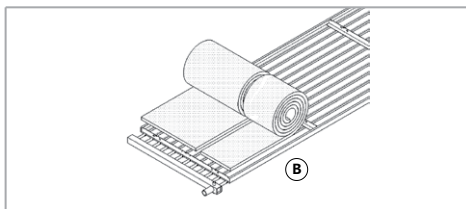
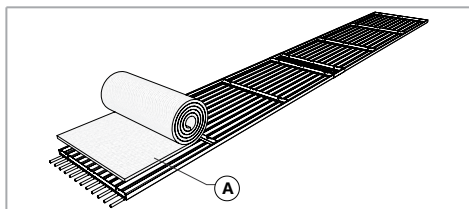
ACCESSORI / ACCESSORIES / ACCESSOIRES / ZUBEHÖR / ACCESORIOS

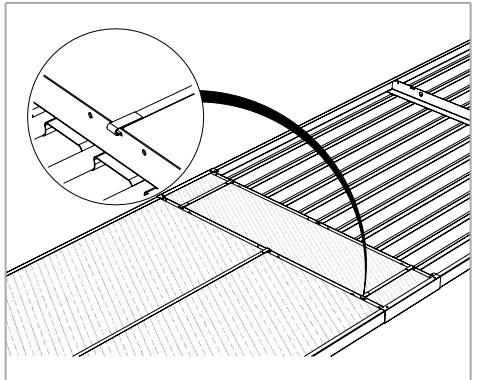
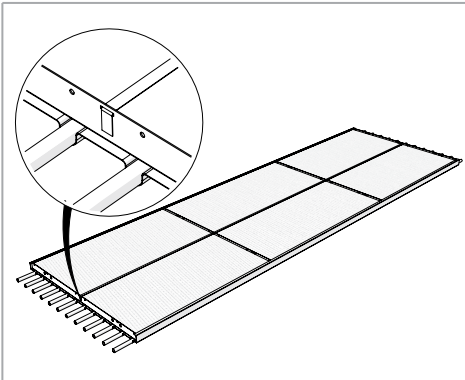
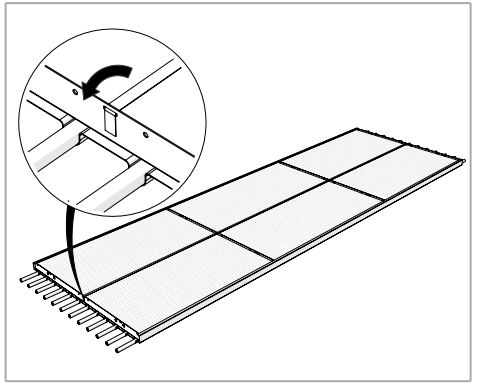
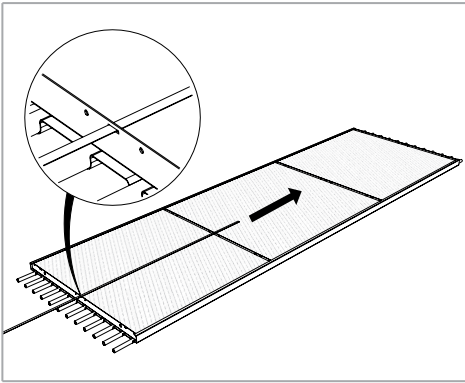
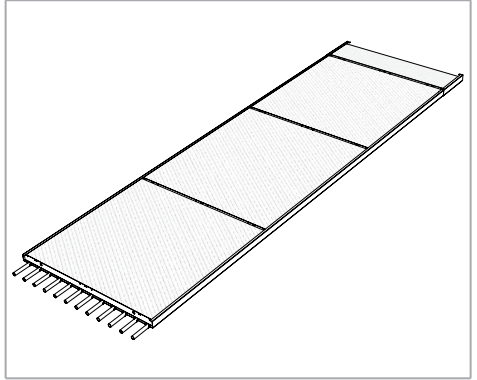
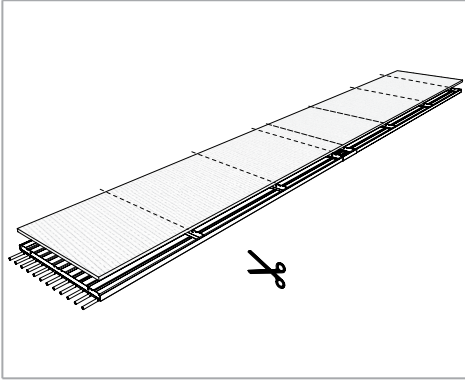
1. Scossalina anticonvettiva / Anti-convective skirt / Solin anti-convection / Abschirmblech (auf Anfrage) / Perfilado metálico anticonvector
2. Copertura piana / Flat cover / Couverture plane / Fache Abdeckung / Cubierta plana
3. Pressfitting / Press-fitting / Pressfitting / Pressfitting / Pressfitting
4. Copri-tubi tra pannello e collettore / Pipe cover between panel and manifold / Couvre-tuyaux entre le panneau et le collecteur / Rohrabdeckungen zwischen Platte und Kollektor / Tapatubos entre panel y colector
5. Elemento di giunzione per copertura superiore per palestre / Junction element for upper cover for gyms / Élément de jonction pour couverture supérieure pour gymnases / Kupplungselemente für obere Abdeckungen für Sporthallen / Elemento de unión para cubierta superior de gimnasios



MATERASSINO ISOLANTE E REGGETTE DI FISSAGGIO / INSULATION PADDING AND SHEET METAL RETAINING CLIPS / TAPIS ISOLANT ET BANDES EN TOLE FINE / DÄMMMATTE UND HALTEBÄNDER / MANTA AISLANTE Y FLEJE DE FIJACIÓN

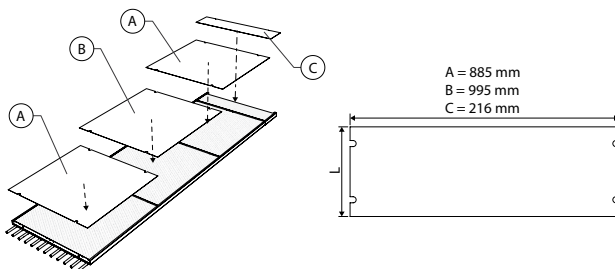
A						B					
Modello Model Modèle Modell	L	H	Codice Code	Peso specifico Specific weight Poids spécifique Spezifisches Gewicht Peso específico kg/m ³	Peso Weight Poids Gewicht Peso kg/m	Modello Model Modèle Modell	L	H	Codice Code	Peso specifico Specific weight Poids spécifique Spezifisches Gewicht Peso específico kg/m ³	Peso Weight Poids Gewicht Peso kg/m
DS-ST18-28	300		1050201		0,18				1050202		
DS-ST28	450		1050202		0,27				+		
DS-ST18-28	600		1050203		0,36				1050205	20	0,81
DS-ST28	750	30	1050204	20	0,45				1050203		
DS-ST18-28	900		1050205		0,54				+		0,90
DS-ST28	1050		1050206		0,63				1050205		
DS-ST18-28	1200		1050207		0,72				1050212		
DS-ST18-28	300		1050211		0,30				+		
DS-ST28	450		1050212		0,45				1050215	25	1,35
DS-ST18-28	600		1050213		0,60				1050213		
DS-ST28	750	40	1050214	25	0,75				+		
DS-ST18-28	900		1050215		0,90				1050215		1,50
DS-ST28	1050		1050216		1,05						
DS-ST18-28	1200		1050217		1,20						



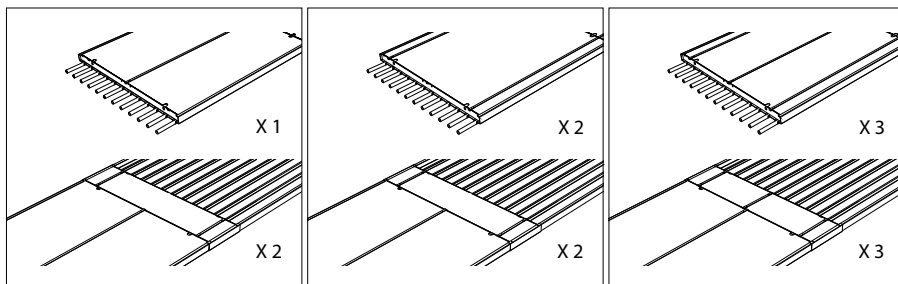


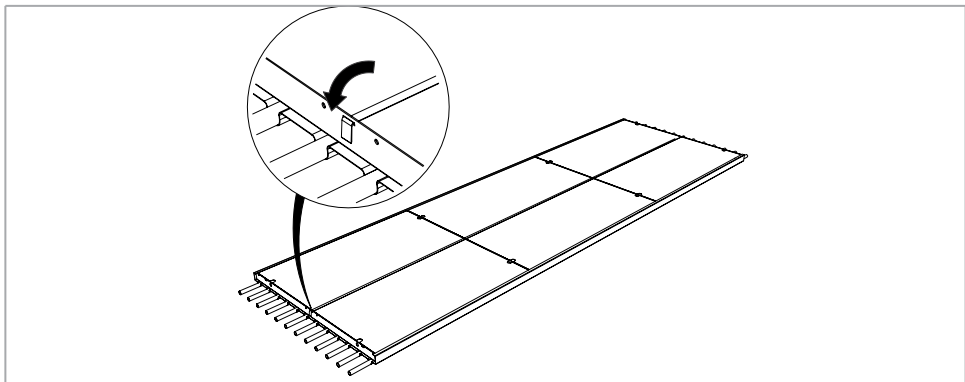
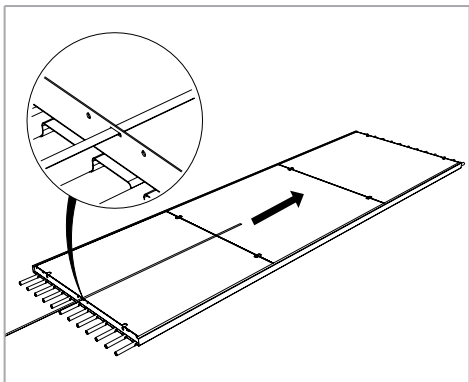
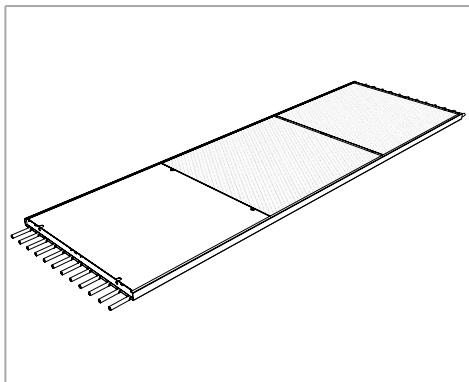
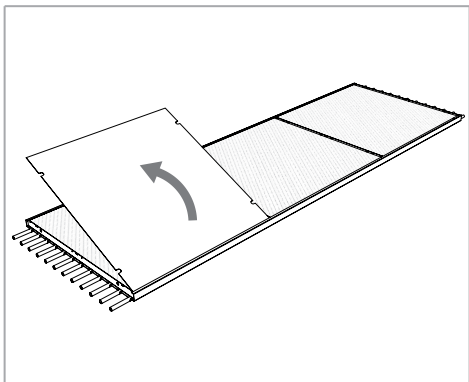
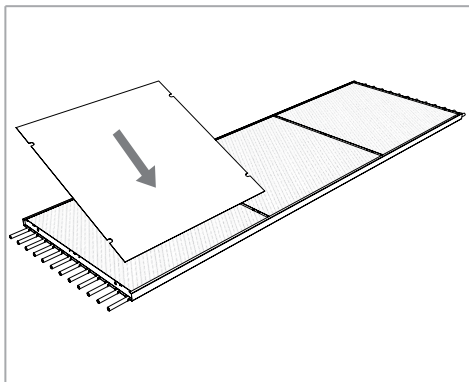
COPERTURA PIANA / FLAT COVER / COUVERTURE PLANE / FLACHE ABDECKUNG / CUBIERTA PLANA

	1m	2m	3m	4m	5m	6m
A	1	2	2	2	2	2
B	-	-	1	2	3	4



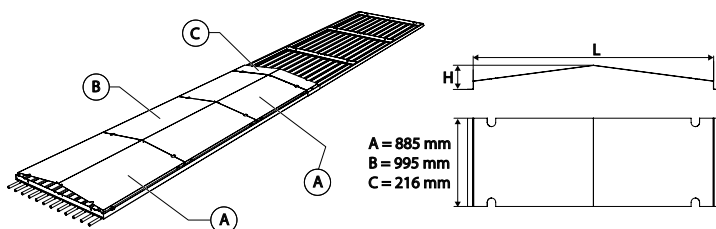
Modello Model Modèle Modell	L	Kit A/B										Kit C			
		1m		2m		3m		4m		5m		6m		Codice Code	Kg
		Codice Code	Kg	Codice Code	Kg	Codice Code	Kg	Codice Code	Kg	Codice Code	Kg	Codice Code	Kg		
18-030 28-030	298	9090A091	1,2	9090A101	2,4	9090A111	3,8	9090A121	5,2	9090A131	6,6	9090A141	8,0	9090A151	0,3
28-045	448	9090A092	1,8	9090A102	3,6	9090A112	5,7	9090A122	7,8	9090A132	10,0	9090A142	12,0	9090A152	0,4
18-060 28-060	598	9090A093	2,4	9090A103	4,8	9090A113	7,6	9090A123	10,4	9090A133	13,2	9090A143	16,0	9090A153	0,6
28-075	748	9090A094	3,1	9090A104	6,2	9090A114	9,7	9090A124	13,2	9090A134	16,7	9090A144	20,0	9090A154	0,7
18-090 28-090	898	9090A095	3,7	9090A105	7,4	9090A115	11,6	9090A125	15,8	9090A135	20,0	9090A145	24,0	9090A155	0,9
28-105	1048	9090A096	4,3	9090A106	8,6	9090A116	13,5	9090A126	18,4	9090A136	23,3	9090A146	28,0	9090A156	1,0
18-120 28-120	1198	9090A097	4,9	9090A107	9,8	9090A117	14,5	9090A127	21,0	9090A137	26,6	9090A147	32,0	9090A157	1,2
28-135	1348	9090A098	5,6	9090A108	11,2	9090A118	17,5	9090A128	23,8	9090A138	30,0	9090A148	36,4	9090A158	1,3
18-150 28-150	1498	9090A099	6,2	9090A109	12,4	9090A119	19,4	9090A129	26,4	9090A139	33,4	9090A149	40,4	9090A159	1,5



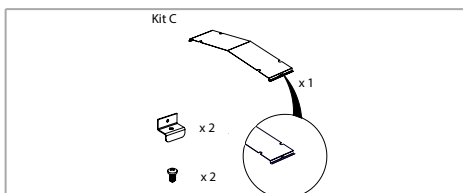
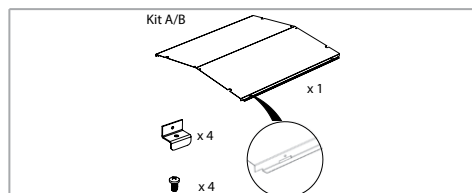


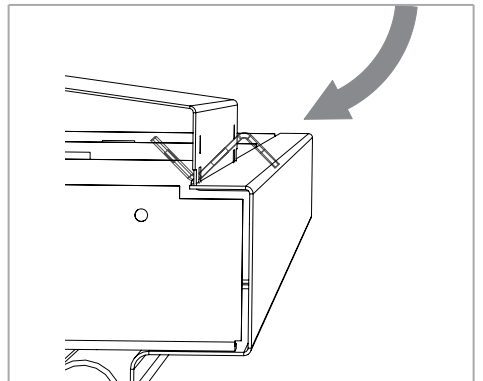
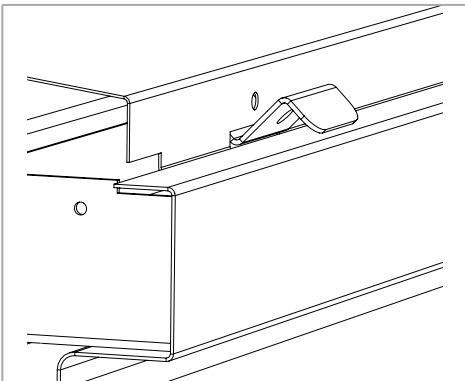
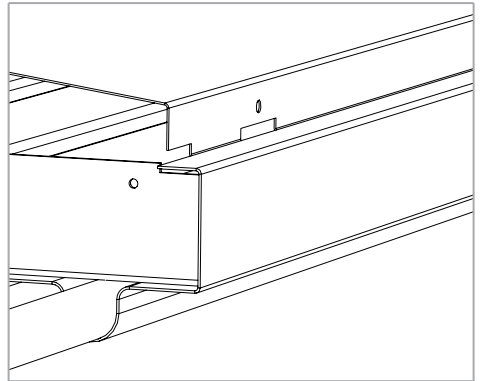
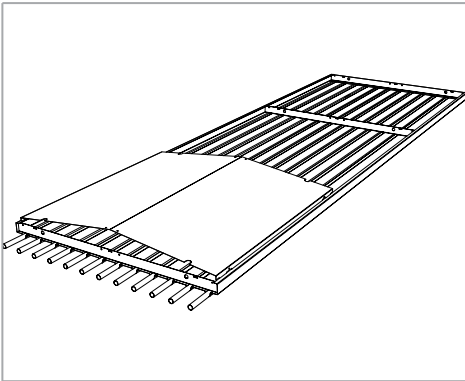
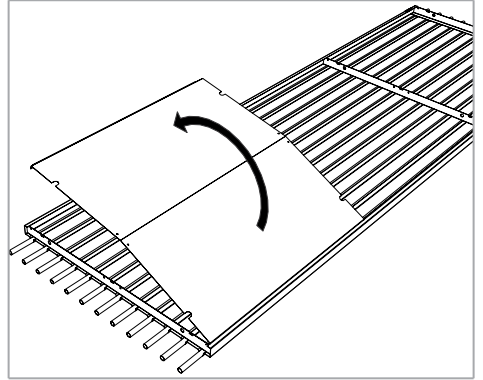
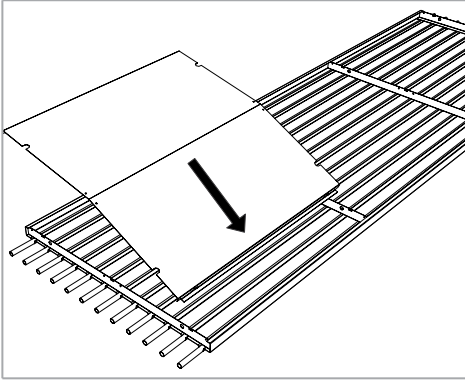
ELEMENTO DI GIUNZIONE PER COPERTURA SUPERIORE PER PALESTRE / JUNCTION ELEMENT FOR UPPER COVER FOR GYMS / ÉLÉMENT DE JONCTION POUR COUVERTURE SUPÉRIEURE POUR GYMNASES / KUPPLUNGSELEMENT FÜR OBERE ABDECKUNGEN FÜR SPORTHALLEN / ELEMENTO DE UNIÓN PARA CUBIERTA SUPERIOR DE GIMNASIOS

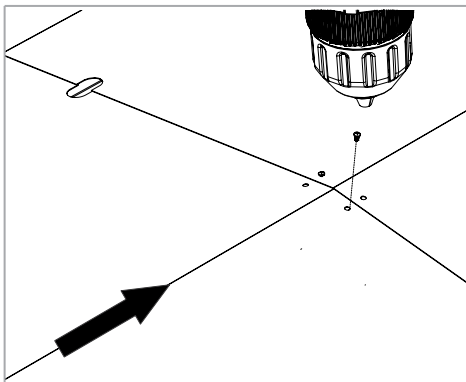
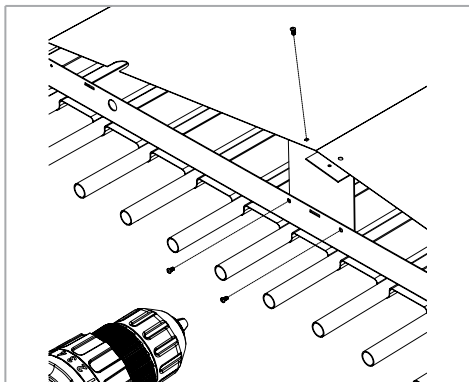
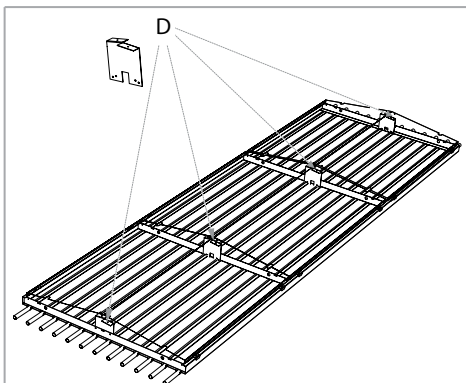
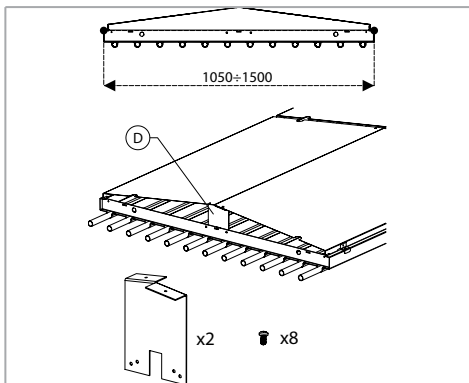
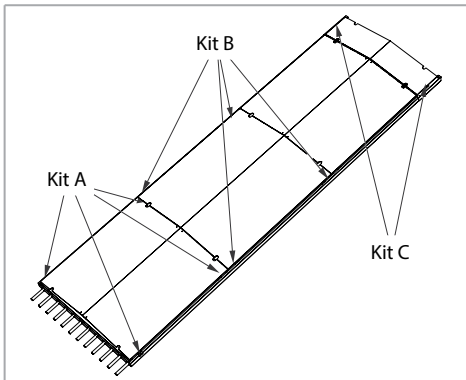
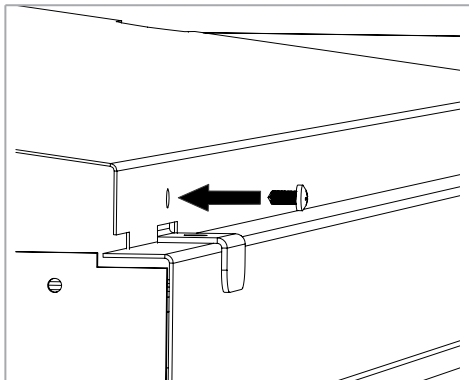
	1m	2m	3m	4m	5m	6m
A	1	2	2	2	2	2
B	-	-	1	2	3	4



Mo- dello Model Modèle Modell	L	H	Kit A/B												Kit C	
			1m		2m		3m		4m		5m		6m		Codice Code	Kg
			Codice Code	Kg	Codice Code	Kg	Codice Code	Kg	Codice Code	Kg	Codice Code	Kg	Codice Code	Kg		
18-030 28-030	272	38	9090A001	1,2	9090A011	2,4	9090A021	3,8	9090A031	5,2	9090A041	6,6	9090A051	8,0	9090A071	0,3
28-045	442	48	9090A002	1,8	9090A012	3,6	9090A022	5,7	9090A032	7,8	9090A042	10,0	9090A052	12,0	9090A072	0,4
18-060 28-060	572	58	9090A003	2,4	9090A013	4,8	9090A023	7,6	9090A033	10,4	9090A043	13,2	9090A053	16,0	9090A073	0,5
28-075	722	68	9090A004	3,1	9090A014	6,2	9090A024	9,7	9090A034	13,2	9090A044	16,7	9090A054	20,0	9090A074	0,6
18-090 28-090	872	77	9090A005	3,7	9090A015	7,4	9090A025	11,6	9090A035	15,8	9090A045	20,0	9090A055	24,0	9090A075	0,7
28-105	1022	87	9090A006	4,3	9090A016	8,6	9090A026	13,5	9090A036	18,4	9090A046	23,3	9090A056	28,0	9090A076	0,8
18-120 28-120	1172	97	9090A007	4,9	9090A017	9,8	9090A027	14,5	9090A037	21,0	9090A047	26,6	9090A057	32,0	9090A077	0,9
28-135	1322	107	9090A008	5,6	9090A018	11,2	9090A028	17,5	9090A038	23,8	9090A048	30,0	9090A058	36,4	9090A078	1,0
18-150 28-150	1472	117	9090A009	6,2	9090A019	12,4	9090A029	19,4	9090A039	26,4	9090A049	33,4	9090A059	40,4	9090A079	1,3







COPRI-TUBI TRA PANNELLO E COLLETTORE / PIPE COVER BETWEEN PANEL AND MANIFOLD AND MANIFOLD COUVRE-TUYAUX ENTRE LE PANNEAU ET LE COLLECTEUR ROHRABDECKUNGEN ZWISCHEN PLATTE UND KOLLEKTOR / TAPATUBOS ENTRE PANEL Y COLECTOR

Il copri-tubo tra pannello e collettore è composto da un unico pezzo per le grandezze 030÷090 e da due pezzi per le grandezze 105÷150.

The pipe cover between the panel and the manifold consists of a single piece for sizes 030÷090 and two pieces for sizes 105÷150.

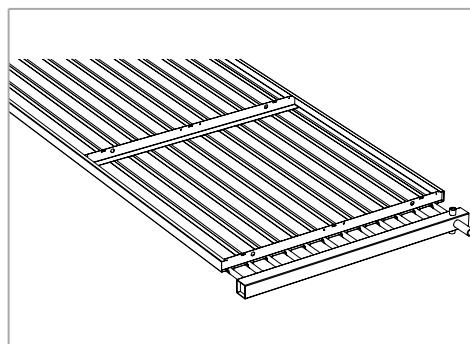
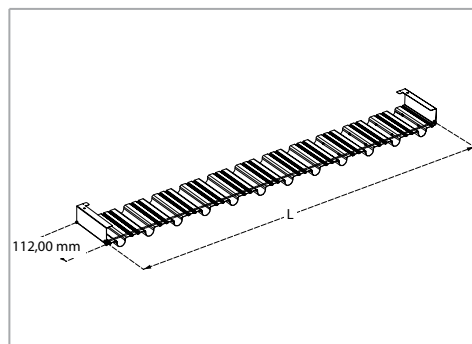
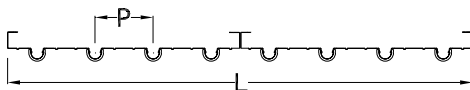
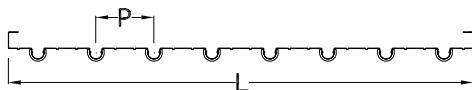
Le couvre-tuyau entre le panneau et le collecteur est composé d'une seule pièce pour les grandeurs 030÷090 et de deux pièces pour les grandeurs 105÷150.

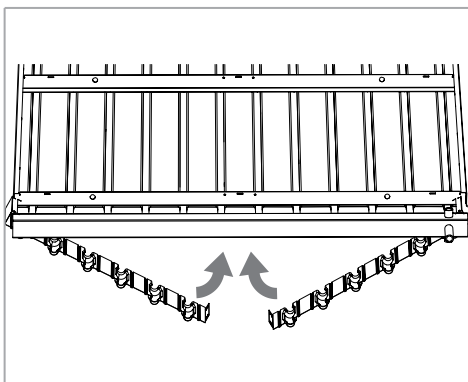
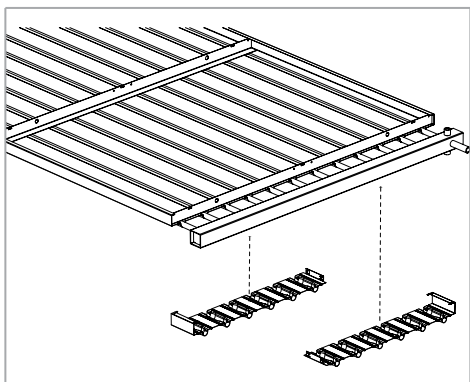
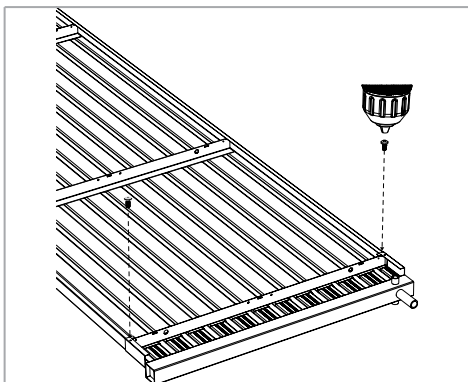
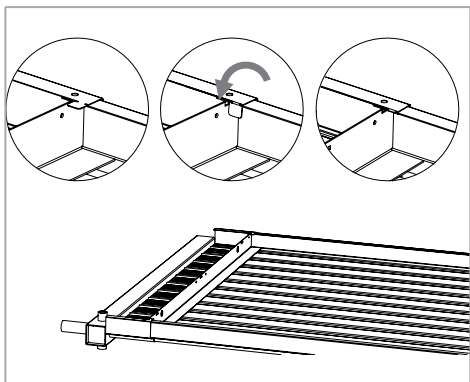
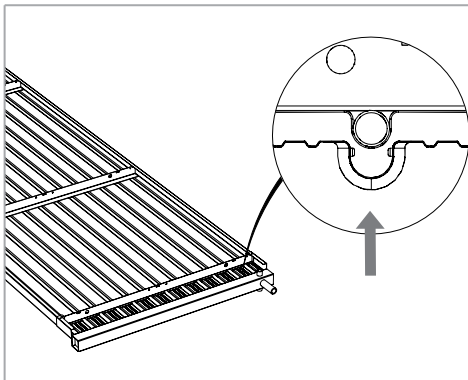
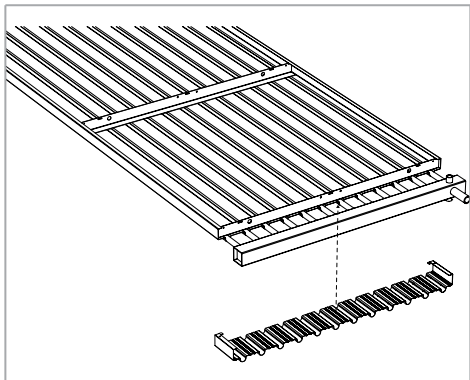
Die Rohrabdeckung zwischen Platte und Kollektor besteht für Größen 030÷090 aus einem Stück und für Größen 105÷150 aus zwei Stücken.

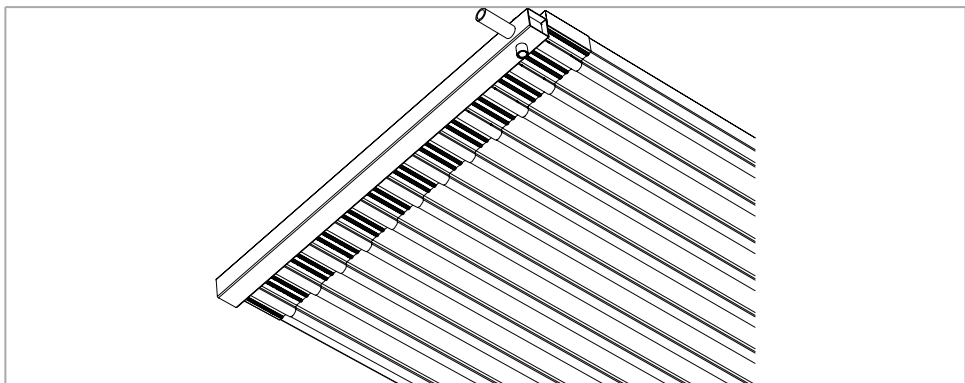
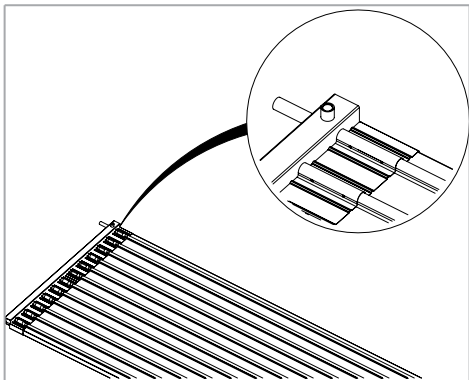
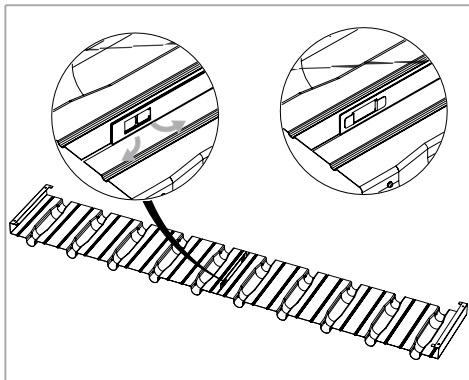
El tapatubo entre el panel y el colector consta de una sola pieza para los tamaños 030÷090 y de dos piezas para los tamaños 105÷150.

Modello Model Modèle Modell	L	Ø	N° tubi No. pipes N° tuyaux N° Rohre	P	Cod. Code	kg
DS-ST18-3-030	302	18	3	100	9090A161	0,2
DS-ST18-3-060	602	18	6	100	9090A163	0,5
DS-ST18-3-090	902	18	9	100	9090A165	0,9
DS-ST18-4-030	302	18	4	75	9090A171	0,2
DS-ST18-4-060	602	18	8	75	9090A173	0,5
DS-ST18-4-090	902	18	12	75	9090A175	0,9
DS-ST28-2-030	302	28	2	150	9090A181	0,2
DS-ST28-2-045	452	28	3	150	9090A182	0,4
DS-ST28-2-060	602	28	4	150	9090A183	0,6
DS-ST28-2-075	752	28	5	150	9090A184	0,7
DS-ST28-2-090	902	28	6	150	9090A185	0,9

Modello Model Modèle Modell	L	Ø	N° tubi No. pipes N° tuyaux N° Rohre	P	Cod. Code	Kg
DS-ST18-3-120	1202	18	12	100	9090A167	1,3
DS-ST18-3-150	1502	18	15	100	9090A169	1,8
DS-ST18-4-120	1202	18	16	75	9090A177	1,4
DS-ST28-2-105	1052	28	7	150	9090A186	1,1
DS-ST28-2-120	1202	28	8	150	9090A187	1,4
DS-ST28-2-135	1352	28	9	150	9090A188	1,5
DS-ST28-2-150	1502	28	10	150	9090A189	1,7

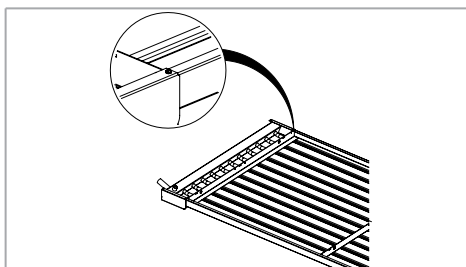
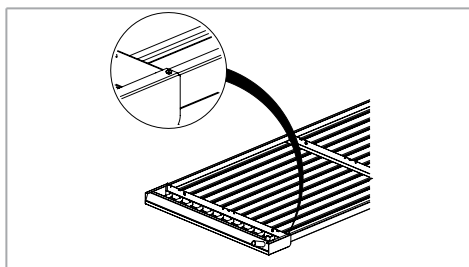
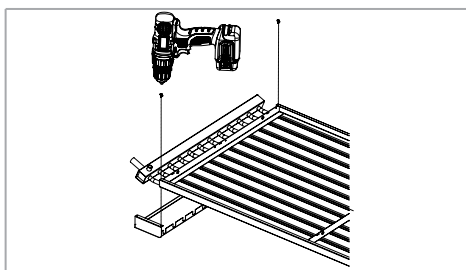
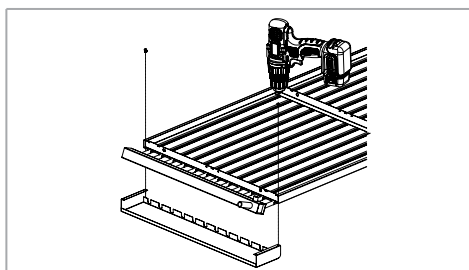
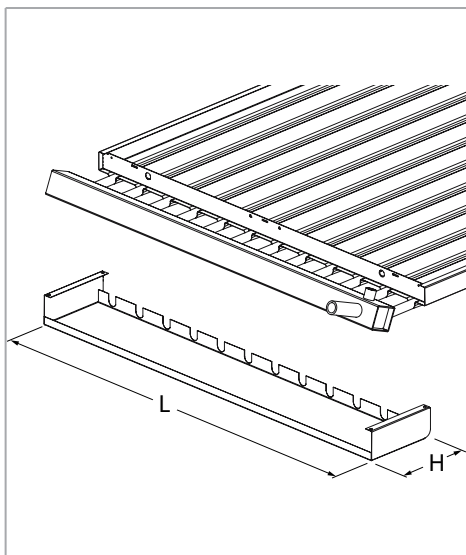






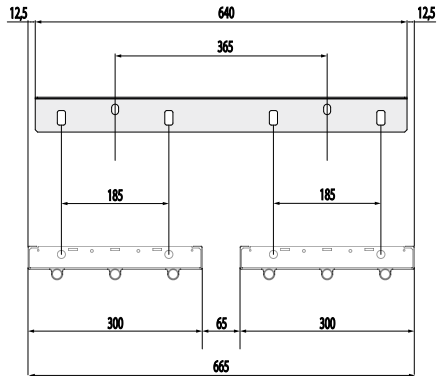
COPRI COLLETTORE RIALZATO / RAISED MANIFOLD COVER / COUVRE-COLLECTEUR SURÉLEVÉ / ABDECKUNG FÜR ERHÖHTEN KOLLEKTOR / TAPACOLECTOR ELEVADO

KIT/BAUSATZ	L	H	Kg	Cod./Code
DS-ST28-2-030	302	75	0,59	9090A211
DS-ST18-3-030	302	65	0,62	9090A191
DS-ST18-4-030	302	65	0,62	9090A201
DS-ST28-2-045	452	75	0,78	9090A212
DS-ST28-2-060	602	75	0,97	9090A213
DS-ST18-3-060	602	65	0,95	9090A193
DS-ST18-4-060	602	65	0,95	9090A203
DS-ST28-2-075	752	75	1,16	9090A214
DS-ST28-2-090	902	75	1,34	9090A215
DS-ST18-3-090	902	65	1,31	9090A195
DS-ST18-4-090	902	65	1,31	9090A205
DS-ST28-2-105	1052	75	1,53	9090A216
DS-ST28-2-120	1202	75	1,72	9090A217
DS-ST18-3-120	1202	65	1,69	9090A197
DS-ST18-4-120	1202	65	1,69	9090A207
DS-ST28-2-135	1352	75	1,91	9090A218
DS-ST28-2-150	1502	75	2,10	9090A219
DS-ST18-3-150	1502	65	1,90	9090A199

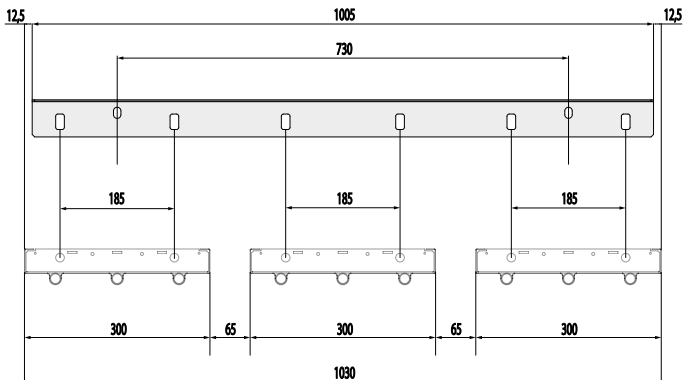


TRAVERSA DI SOSPENSIONE PER APPENSIONI MULTIPLE / SUSPENSION CROSSPIECE FOR HANGING MULTIPLE PANELS / TRAVERSE DE SUSPENSION POUR SUSPENSIONS MULTIPLES / AUFHÄNGEWINKEL FÜR MEHRFACHAUFHÄNGUNGEN / TRAVESAÑO DE SUSPENSIÓN PARA SUSPENSIONES MÚLTIPLES

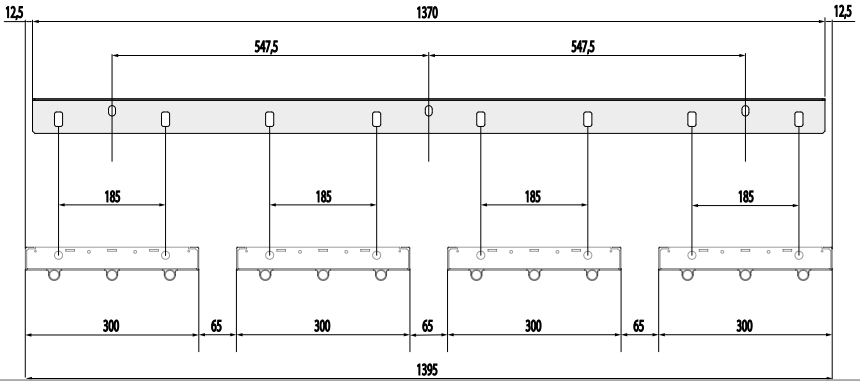
Mod. 030/2



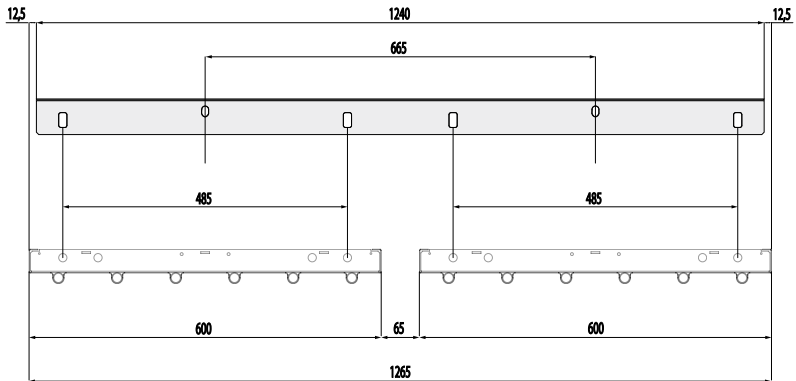
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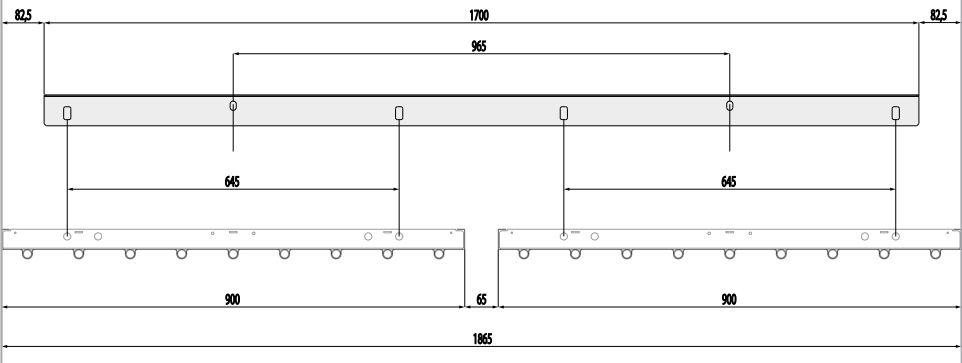
Mod. 030/4



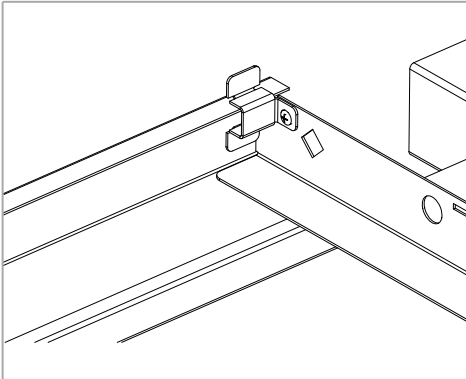
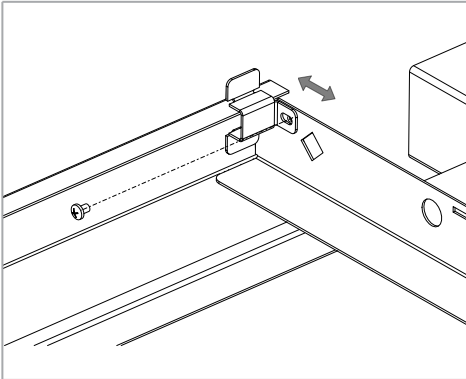
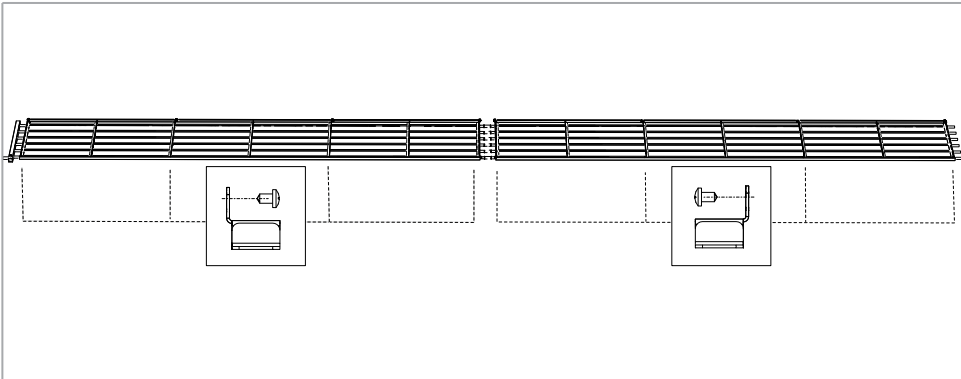
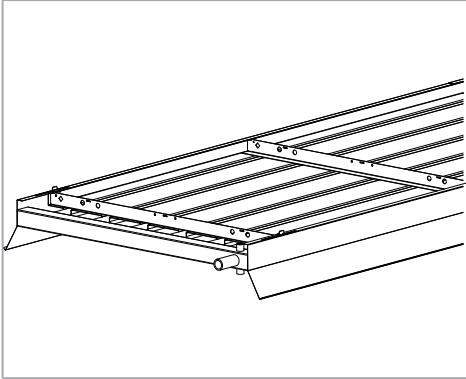
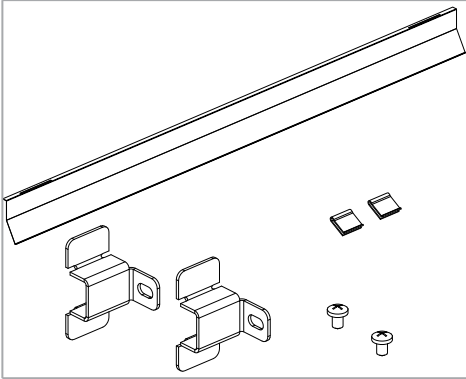
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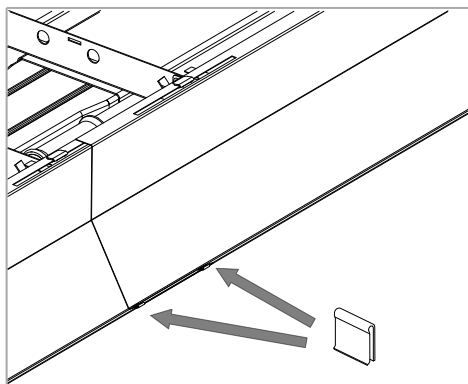
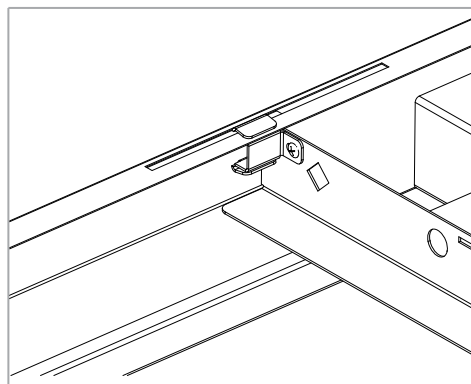
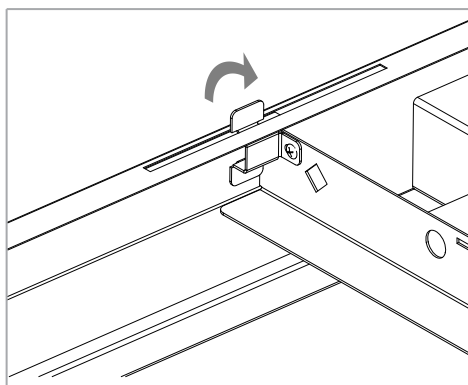
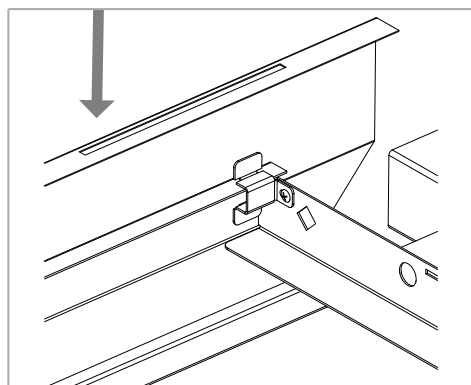
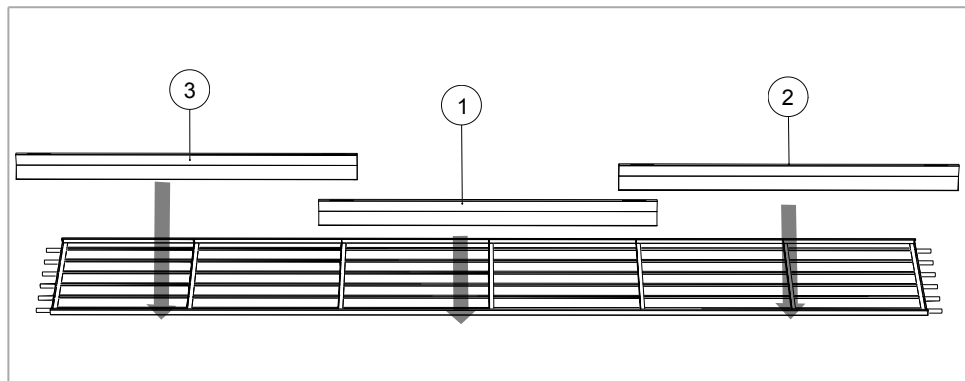


Mod. 090/2



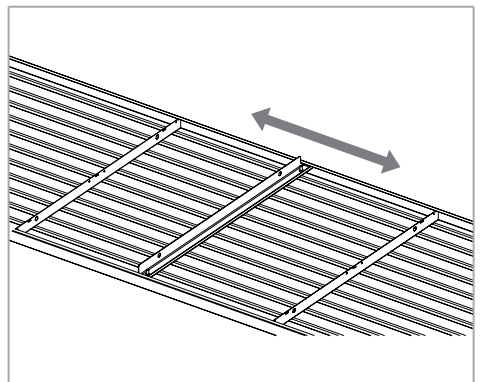
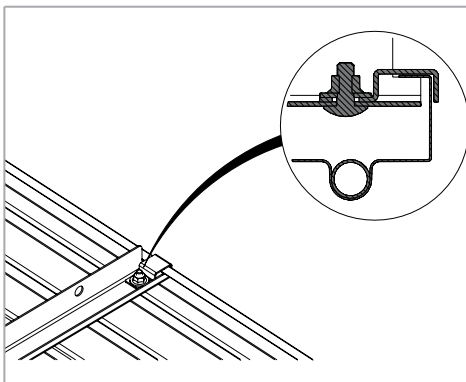
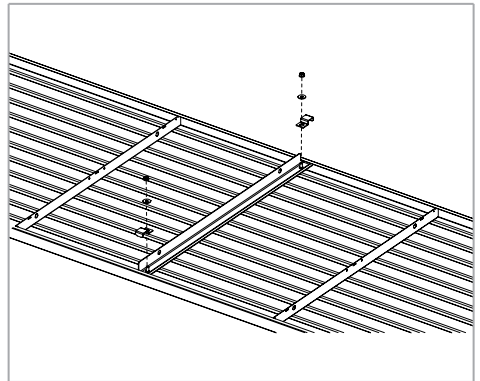
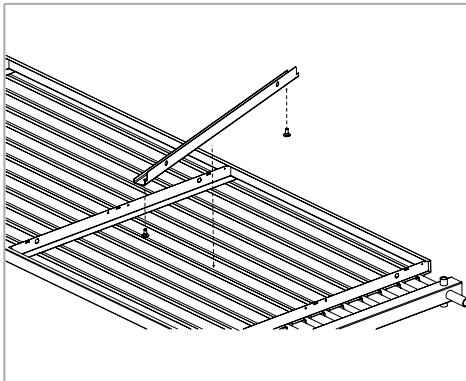
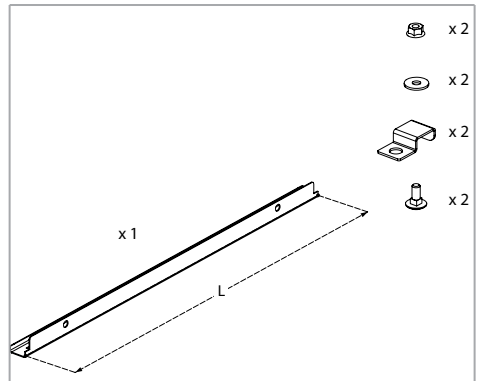
SCOSSALINA ANTICONVETTIVA / ANTI-CONVECTIVE SKIRT / SOLIN ANTI-CONVECTION / ABSCHIRMBLECH / PERFILADO METÁLICO ANTICONVECTOR



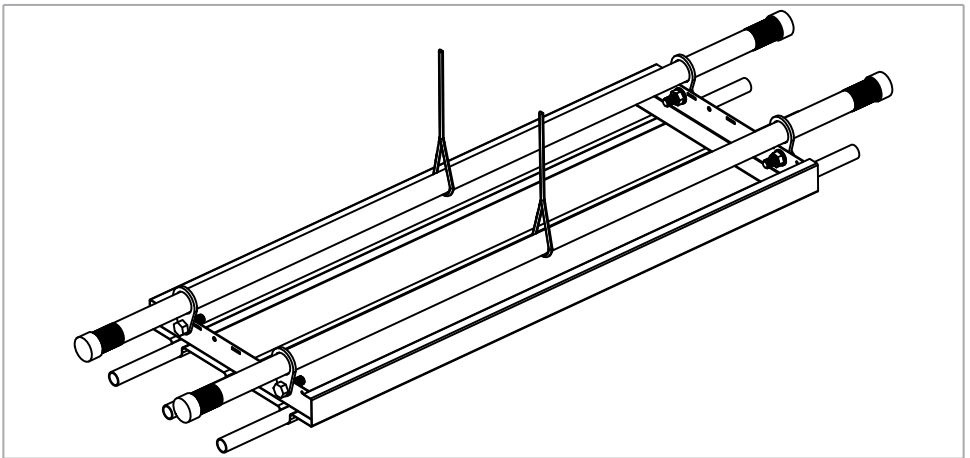
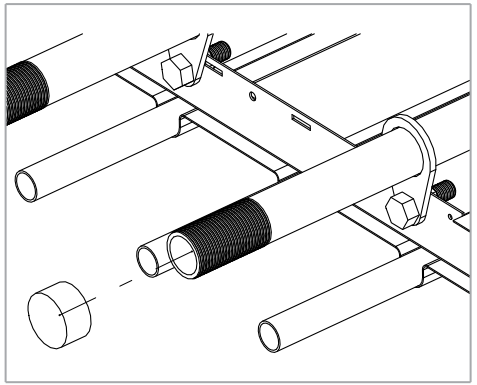
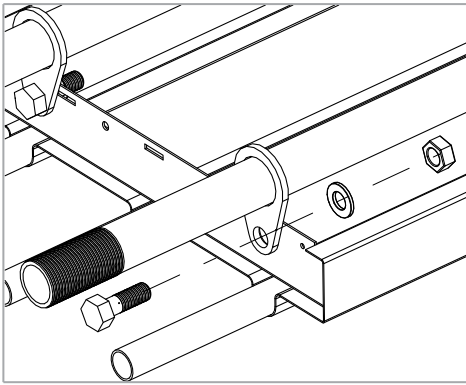
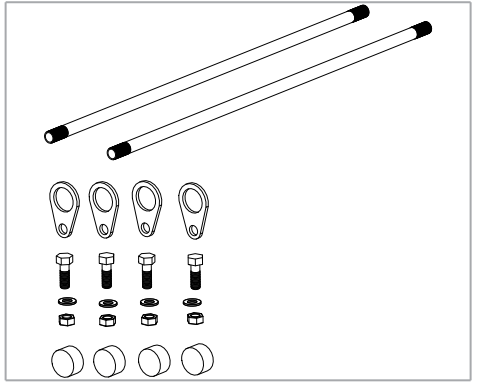


**TRAVERSA APPENSIONE (SCORREVOLE) / HANGING CROSSPIECE (SLIDING) /
 TRAVERSE SUSPENSION (COULISSANTE) / AUFHÄNGEWINKEL (VERSCHIEBBAR)
 / SOPORTE TRANSVERSAL DE SUSPENSIÓN (CORREDERO)**

Kit/Bausatz	L	Cod./Code	Kg
030	297	9090A081	0,4
045	447	9090A082	0,6
060	597	9090A083	0,8
075	747	9090A084	1,0
090	897	9090A085	1,2



Kit/Bausatz	Cod./Code
105	
120	
135	9090A080
150	



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SABIANA SpA

Società a socio unico

via Piave 53 - 20011 Corbetta (MI) Italia

T. +39 02 97203 1 r.a. - F. +39 02 9777282

info@sabiana.it

www.sabiana.it

Cooke Industries - Phone: +64 9 579 2185

Email: sales@cookeindustries.co.nz Web: www.cookeindustries.co.nz