

ituGraf®

Handling & Installation Instructions 1.0



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Disclaimer: *Products, product information and guides in this document are subject to change change without notice. Printed copies are not controlled.*

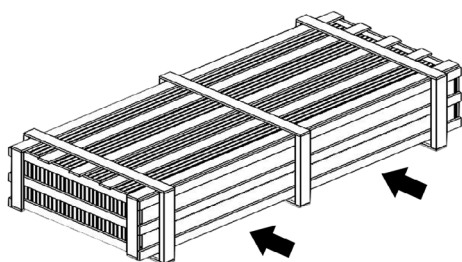
Inspection of Delivery

When accepting the panels, always inspect the condition of the shipment to ensure there is no external damage and check the number of delivered packages/items and that the delivery corresponds to the dispatch list. Only sign the waybill after the inspection. Make a record of any damage to the shipment or package in the reservations section on the waybill and take a photo of the damage. If any mistakes have been made in the delivery, immediately inform your Itula contact person and send a picture and written description of the mistake. The transportation durability of the panels and the wooden packaging has been tested using a Lansmont 6000-15 vibration test system with 5–40 Hz frequency cycles for two hours, corresponding to 2,400 km of lorry transportation.

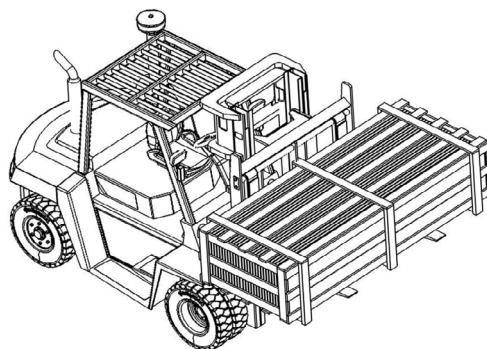
NOTE: *If the damage is not recorded in the reservations box, the claim may be rejected.*

Itula Panel Pallet Lifting Instructions

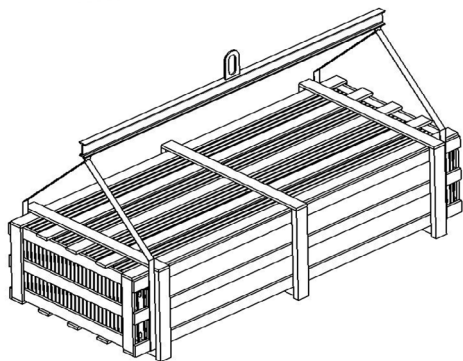
NOTE: *It is the consignee's responsibility to take care of the unloading of the delivered goods and the condition of the unloading equipment. Always follow the manufacturer's instructions when unloading and handling radiant panels. If sufficient personnel and suitable equipment for unloading as instructed are not available, make arrangements for the unloading with your Itula contact person. Itula is not responsible for any damages caused by failure to follow these instructions.*



Note: *Lift from here*



1. Itula radiant panels are delivered in wooden transport boxes. Boxes should always be lifted to be unloaded, never pushed or pulled. No other load must be placed on top of the boxes when they are being lifted. Do not remove the package label that indicates the products in the package.
2. Radiant panels can be unloaded from a lorry using a forklift truck. To avoid damage, transport boxes must be moved one at a time. When lifting a box, place the forks of the forklift truck in the middle of the box. The forks must be longer than the depth of the box. Make sure that the transport box is balanced!



3. If the radiant panels are unloaded from a lorry by crane, a beam must be used when lifting the load. The slings are placed around the box at the supports. To avoid damage, transport boxes must be lifted one at a time.
4. Do not stack more than two transport boxes on top of each other. In this case, the box on the top must be exactly aligned with the lower box. The boxes must be placed on a flat surface.

Handling of Panels

Storing and moving panels on work sites

The recipient is responsible for protecting the products against the elements and vandalism on the work site. If the panels are not needed right away, they should be stored in their packages in a dry location where they are protected against the elements. When panels are moved, care should be taken to make sure that the surface is not scratched. It is advisable to protect the radiant surface of the panel with a material such as corrugated cardboard or cellular plastic. Once the panels have been removed from the shipping box, they should always be carried sideways.

Unpacking

Only unpack the panels just before installation. This will avoid unnecessary movement and unprotected storage on the work site. Unpack the panels according to our instructions here.



1. Open the packaging screws and remove the cover of the package.



2. Place the panels so that the row of panels will not fall over when you lift the panels out of the box. Panels should always be placed so that same surfaces face each other.
3. Lift the panels out of the box in order, begin with the one closest to the edge. The identification label on the side of the panel designates the position and product code.



NOTE: *Be careful not to twist the panel during the handling!*

Installation Instructions



General Instructions for Installation

During installation, only use material and equipment intended for construction work. Before you begin installing the panels, familiarise yourself with the HVAC plans and the intended locations of the panels.

Hanging Options

Cable Wires

In freely hung and suspended ceiling integration installations, use adjustable cable wire mounting sets. You will find examples further in this document.

Threaded Rods

Threaded rods (not in our delivery) can also be used to hang the panels.

Patented Surface Brackets

Panels can be easily affixed directly to the ceiling surface using our patented surface bracket. The panels must be hung straight and the mounting sets must be aligned with each other to allow for thermal expansion and neat installation.

NOTE: *The designed water supply placement for panels can influence the ItuGraf panel type to be selected. See the installation type drawings on the pages 10-25 and the product type codification on page 26. **ItuCalc design tool** helps to choose the right product for your project.*

Hanging with Cable Wires

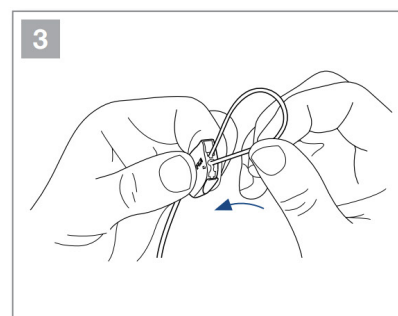
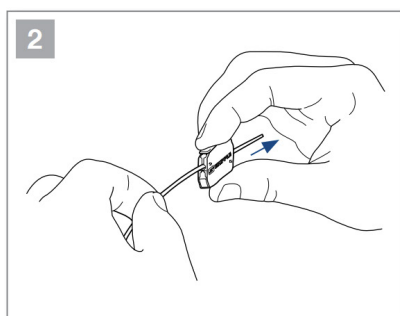
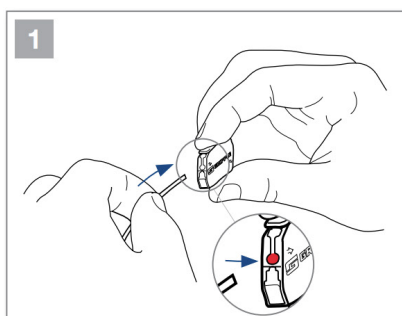
Hanging Details

Always operate the product within its stated safe working range which is visible in the packaging. The cable mounting sets can be used only for static load. Ensure that the installation cables are free of oil and paint and do not have any noticeable defects. Never join two cable ends together in line. The angle in which the cable is installed has an influence on the load bearing capability. Standard cables have supported weight value 15 kg at 0° installation angle.

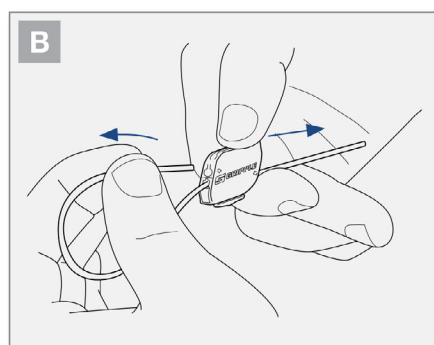
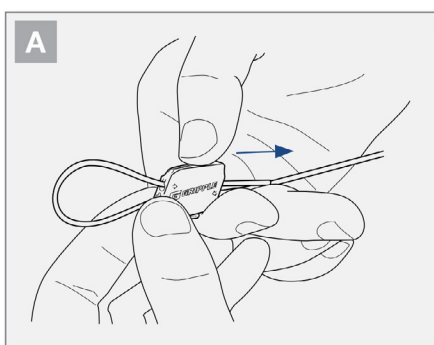
	Maximum working load limit (kg)				
	0°	15°	30°	45°	60°
HF Express No. 1	15	14	13	11	8
HF Express No. 2	45	43	39	32	23

1	2	3
Insert the cable into the middle hole.	Slide the locking system along the cable and loop around the load you want to suspend.	Then, insert the cable into the opposite middle hole to pre-form a loop.

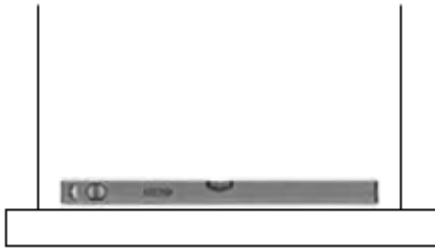
Note: Pre-adjust the cable length before loading the cable for easier installation



A	B
Release the load of the locking system and push the release button in the same direction of the wire entrance.	While the button is pressed, adjust the cable. When desired position is reached, release the button to come back to a working function. Never try to adjust the locking system while load is still applied.



Panel Leveling



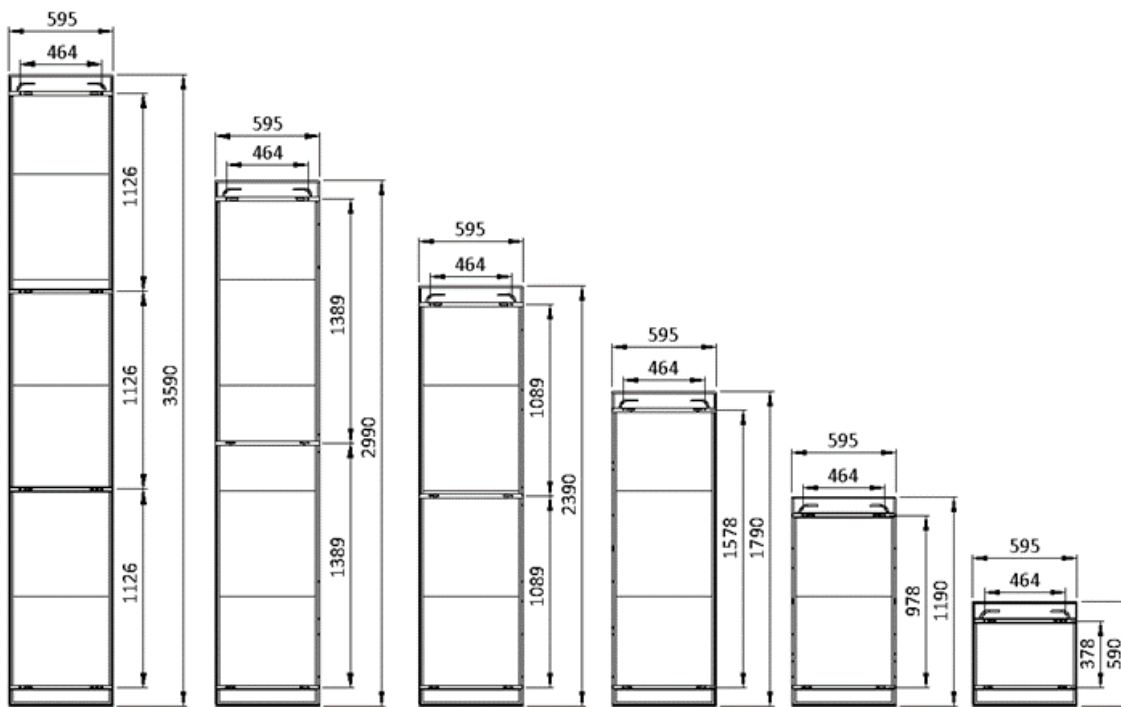
After the cables have been set into the designated fixing positions the panel can be lifted to the ceiling. Use a drywall lift with padded crossbards to lift the panel close installation height. The panels should always be levelled using a spirit level or similar instrument. Levelling the panels correctly and tightening the cables makes sure that the cables are equally loaded.

Fixing Options with Cable Wires

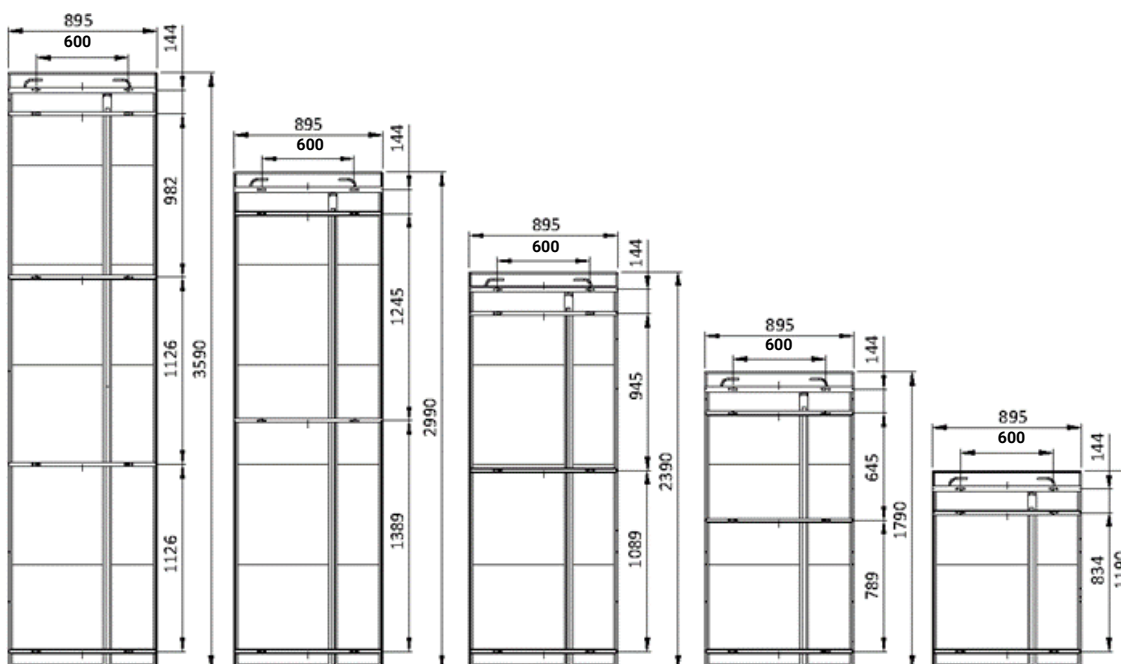
Fixing points of ItuGraf panels

The following figures and tables show the number and positioning of the fixing points for panels with widths of 595 mm, 895 mm and 1190 mm. Wires can be used to fix the panels into the ceiling through holes located in the fixing cross bar.

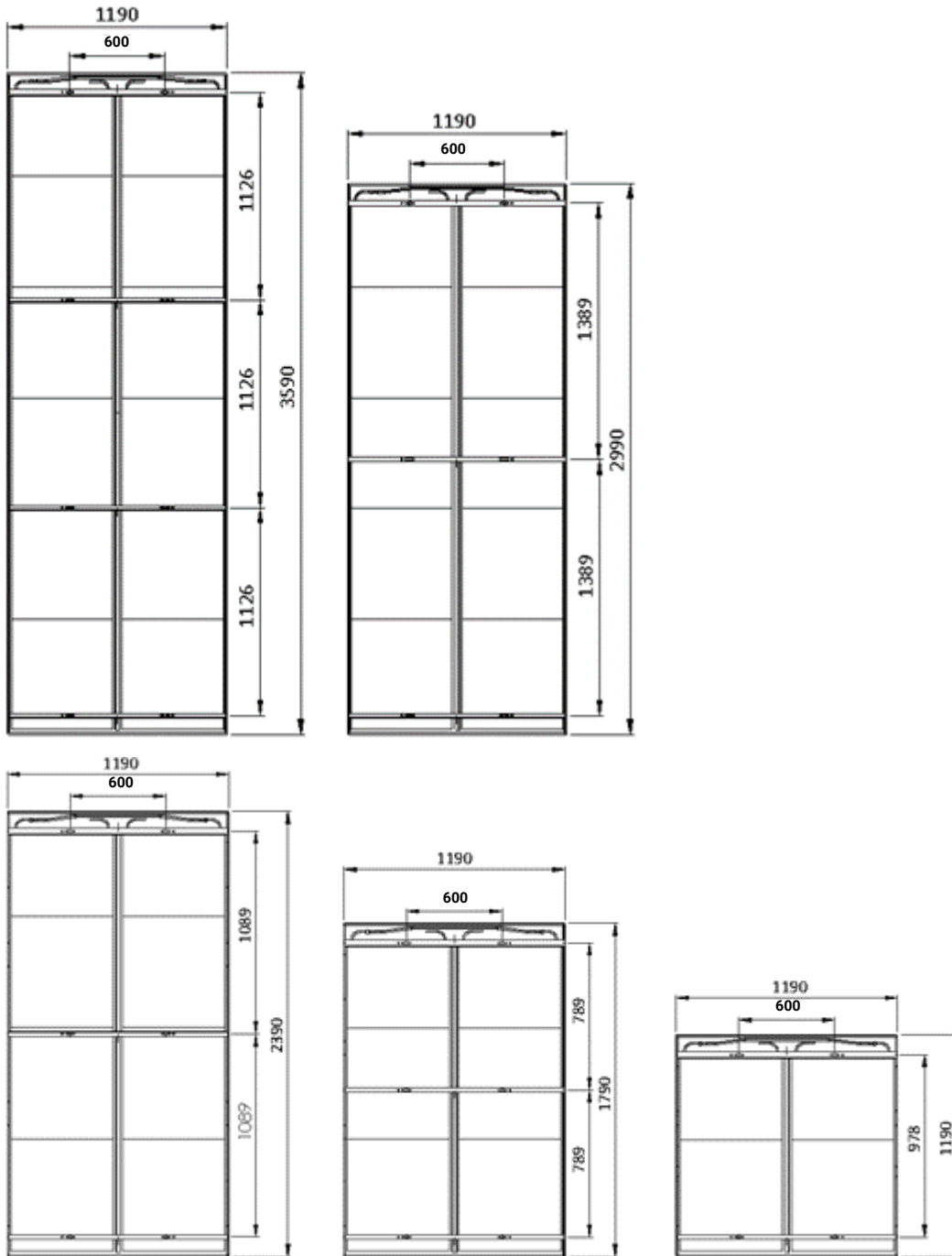
Panel width: 595mm

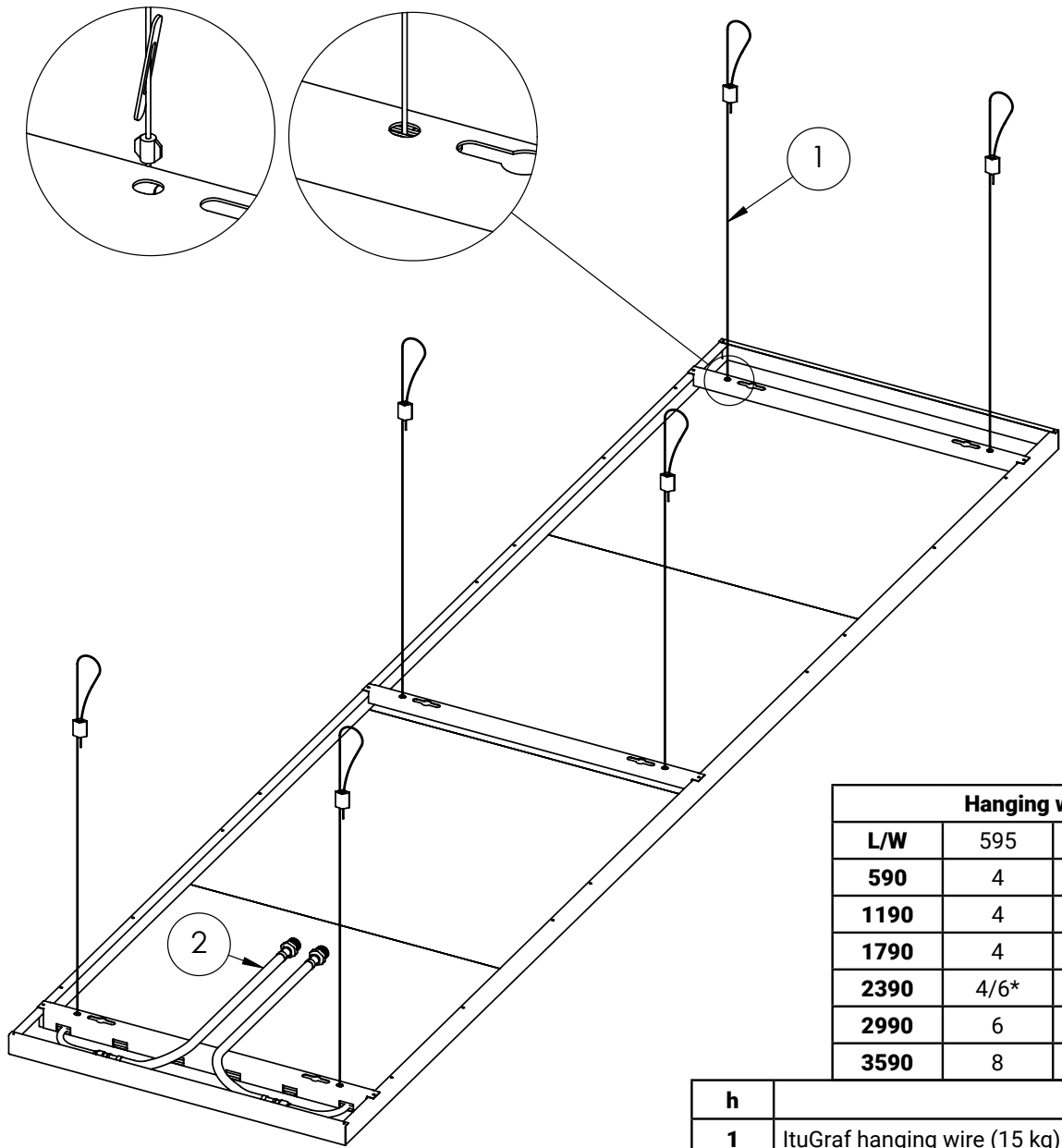
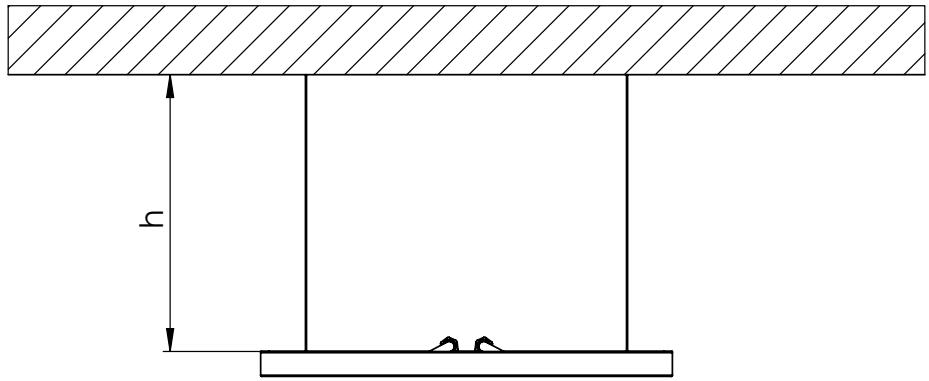


Panel width: 895mm



Panel width: 1190mm

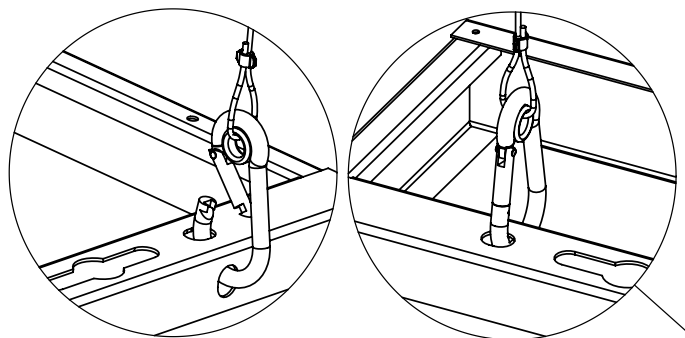
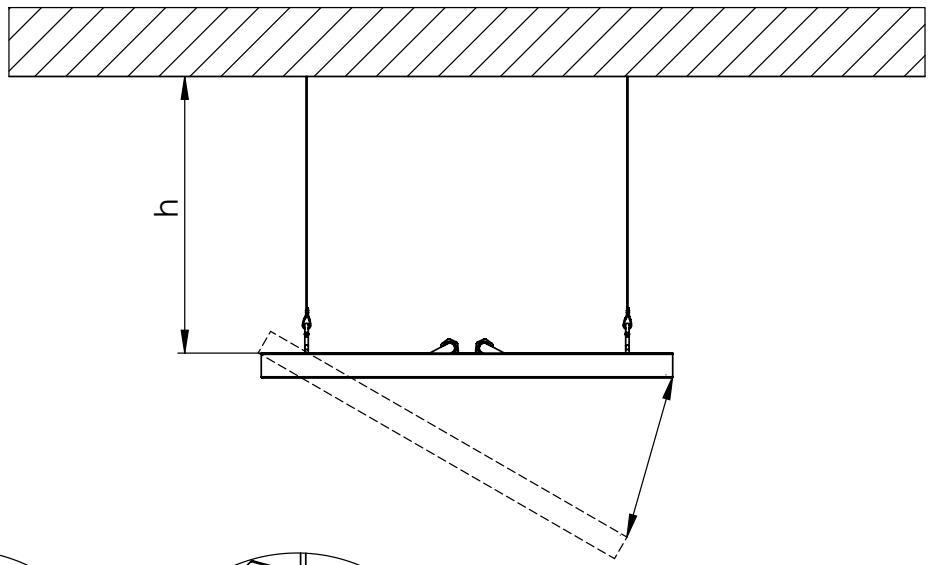




Hanging wire qty.			
L/W	595	895	1190
590	4	4	4
1190	4	4	4
1790	4	6	6
2390	4/6*	6	6
2990	6	6	6
3590	8	8	8

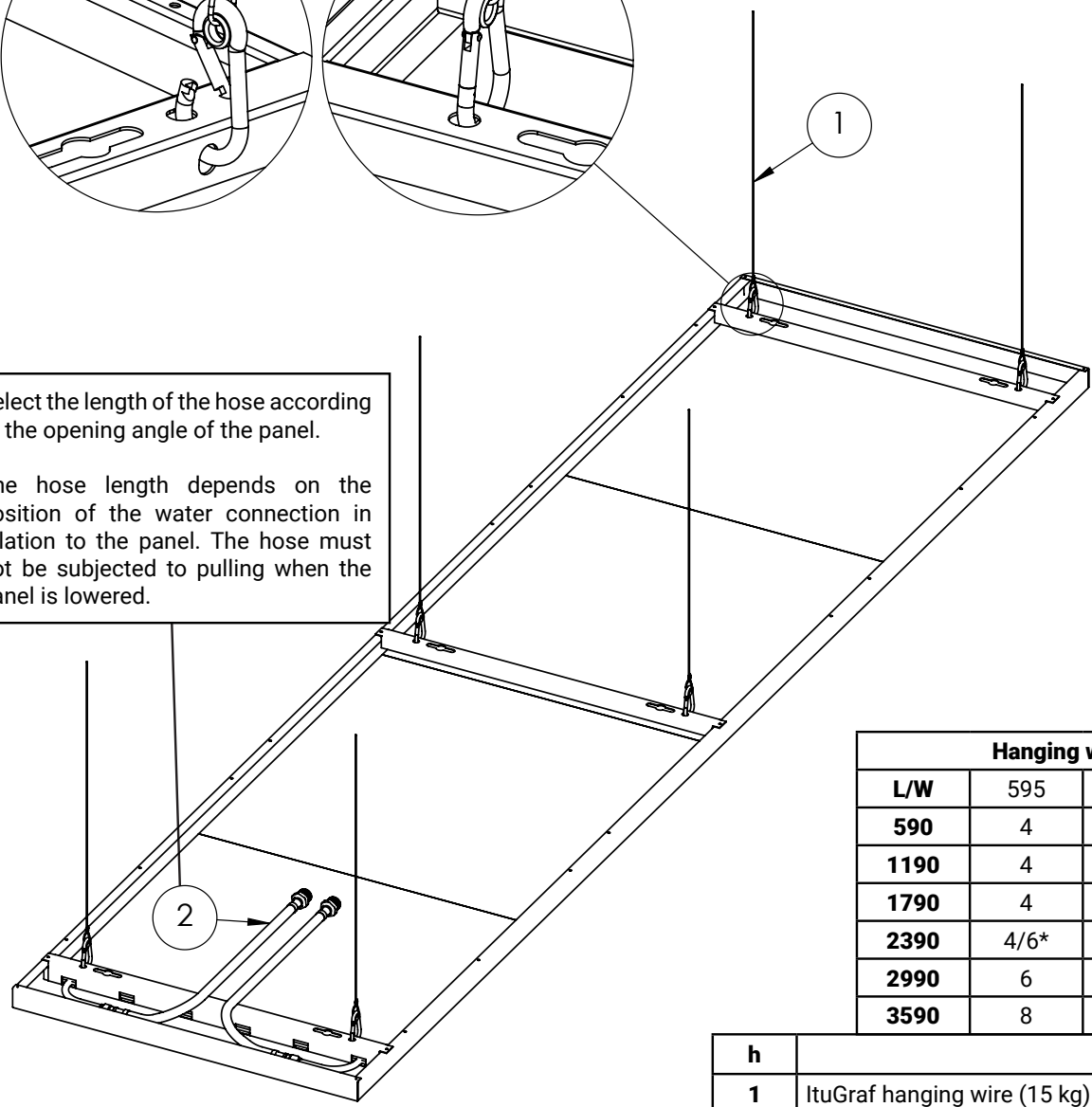
h	
1	ItuGraf hanging wire (15 kg)
2	Flexible connection hose DN10 x 1/2" M

*Quantity of wire depends on the accepted vertical deflection/sagging on site.



Select the length of the hose according to the opening angle of the panel.

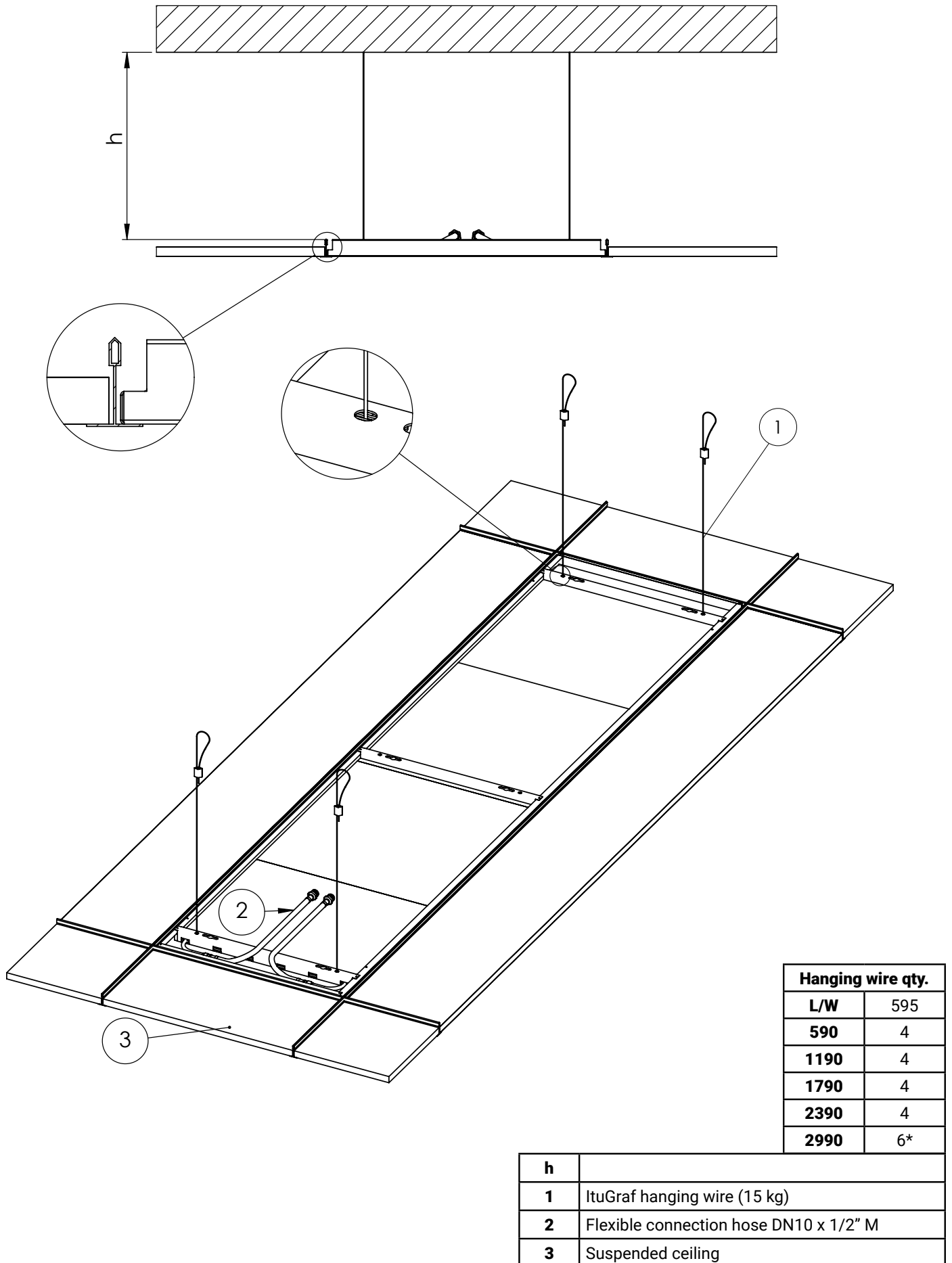
The hose length depends on the position of the water connection in relation to the panel. The hose must not be subjected to pulling when the panel is lowered.



Hanging wire qty.			
L/W	595	895	1190
590	4	4	4
1190	4	4	4
1790	4	6	6
2390	4/6*	6	6
2990	6	6	6
3590	8	8	8

h	
1	ItuGraf hanging wire (15 kg)
2	Flexible connection hose DN10 x 1/2" M

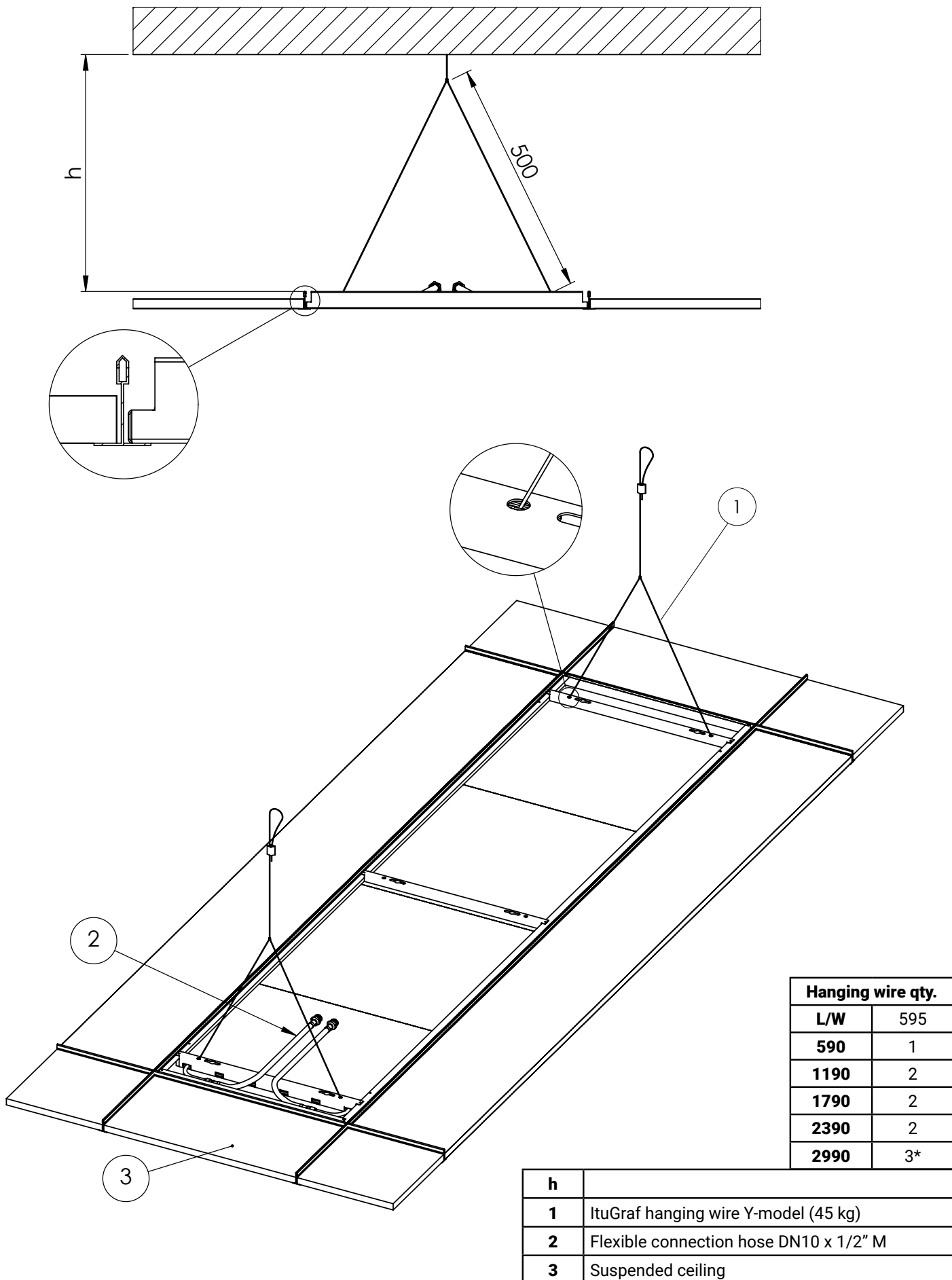
*Quantity of wire depends on the accepted vertical deflection/sagging on site.



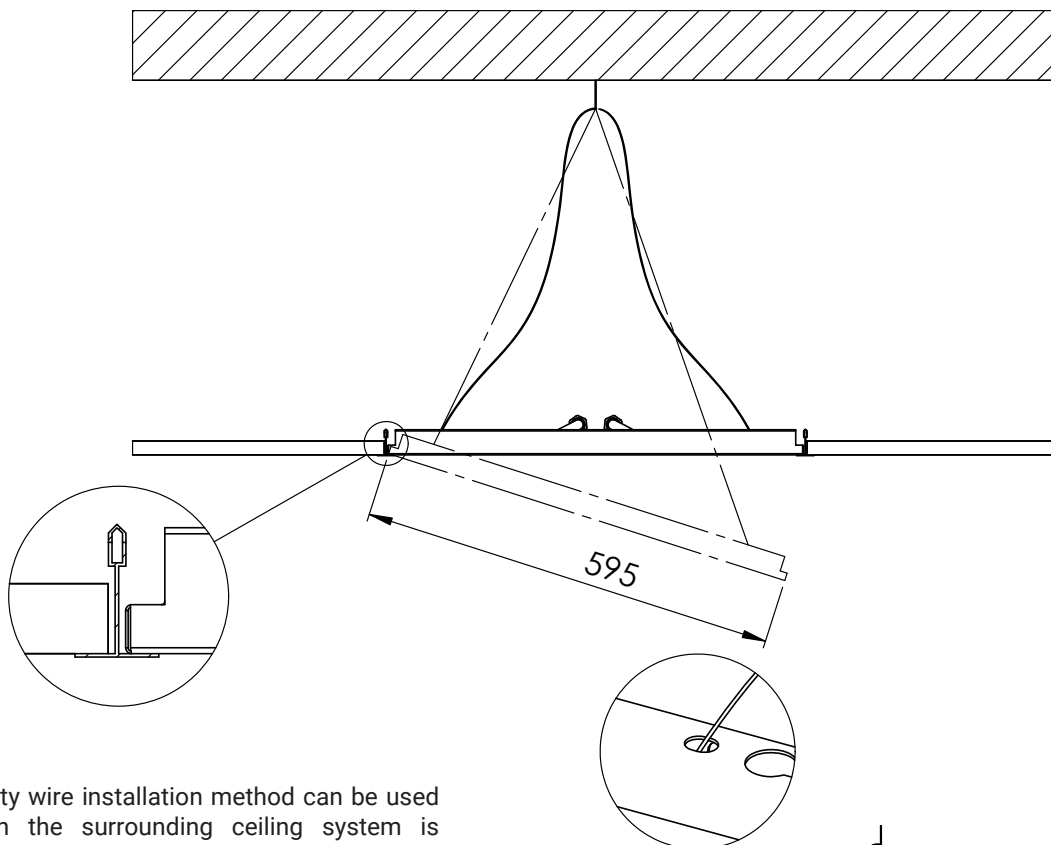
Hanging wire qty.	
L/W	Qty.
595	4
1190	4
1790	4
2390	4
2990	6*

h	
1	ItuGraf hanging wire (15 kg)
2	Flexible connection hose DN10 x 1/2" M
3	Suspended ceiling

*Add 2 hangers on the middle bar when the length is 2990 mm



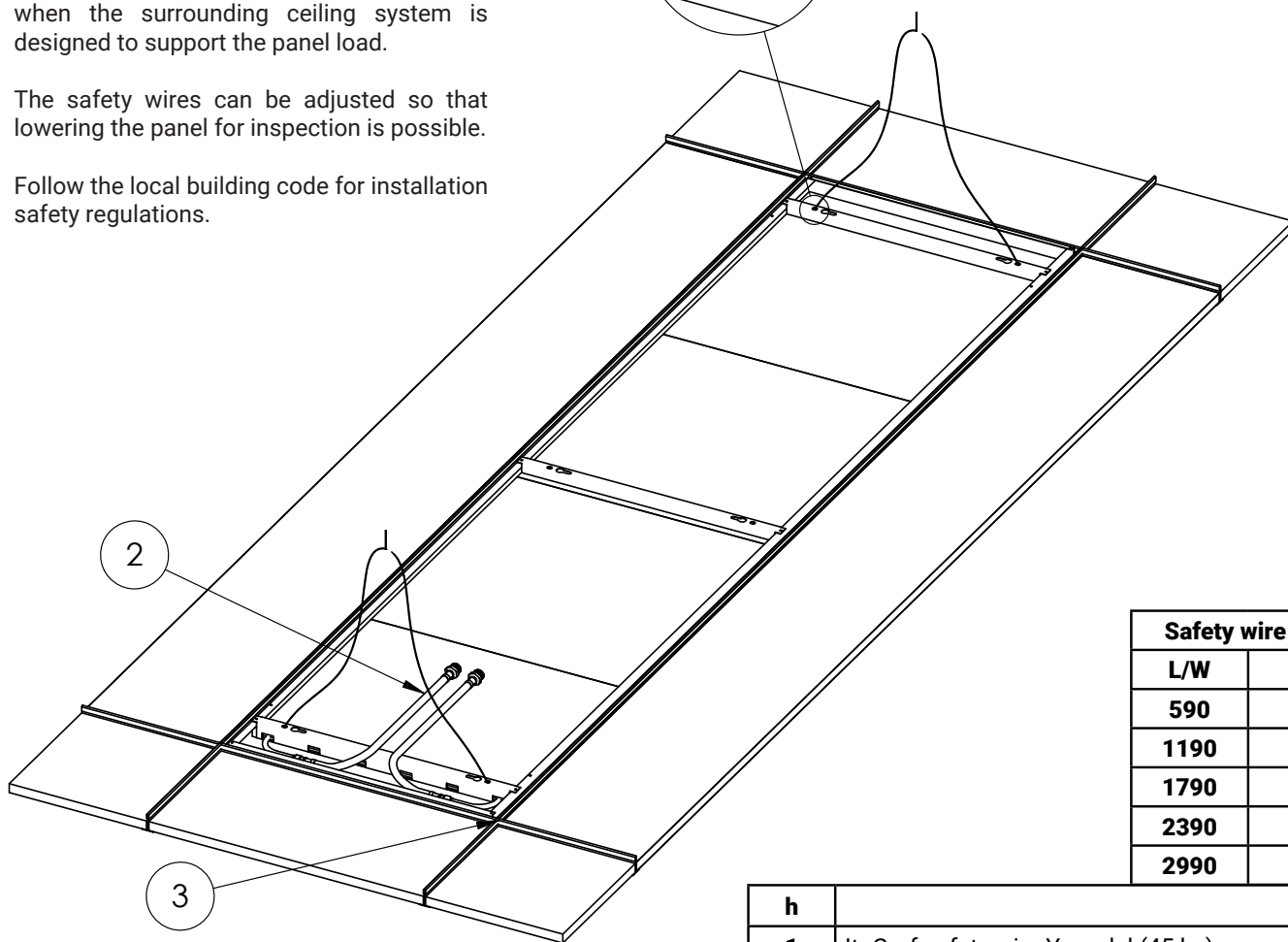
*Add one Y hanger on the middle bar when the length is 2990 mm



Safety wire installation method can be used when the surrounding ceiling system is designed to support the panel load.

The safety wires can be adjusted so that lowering the panel for inspection is possible.

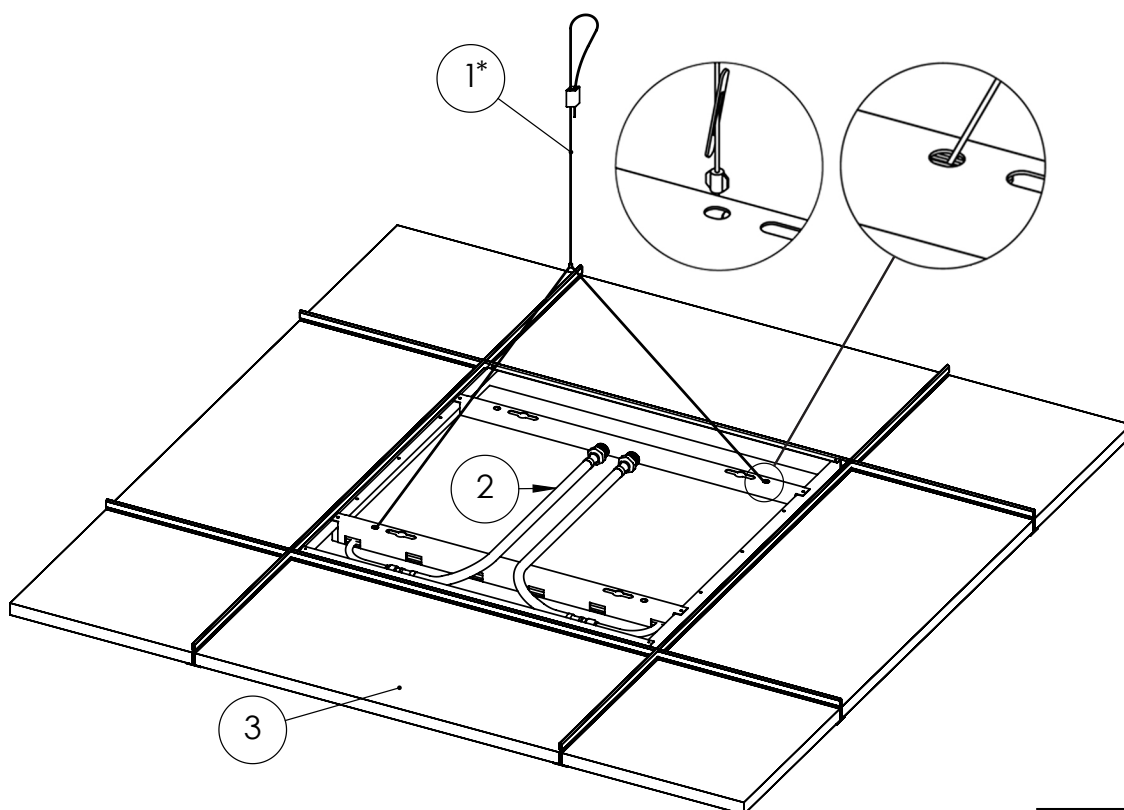
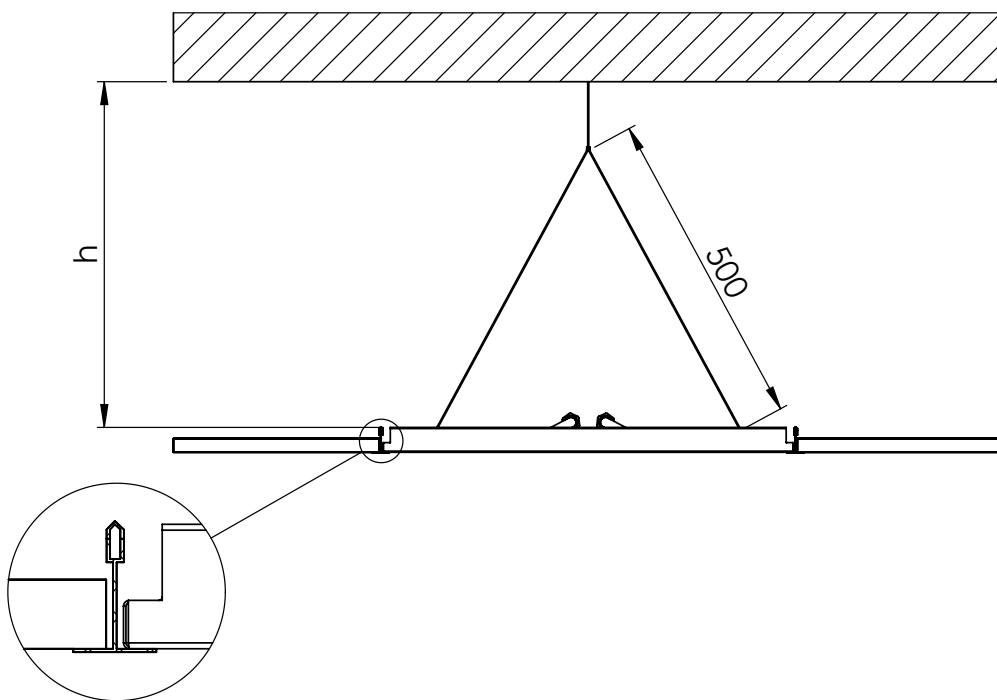
Follow the local building code for installation safety regulations.



Safety wire qty.	
L/W	595
590	1
1190	2
1790	2
2390	2
2990	3*

h	
1	ItuGraf safety wire Y-model (45 kg)
2	Flexible connection hose DN10 x 1/2" M
3	Suspended ceiling

*Add one Y hanger on the middle bar when the length is 2990 mm



Hanging wire qty.	
L/W	595
590	1

h	500 mm
1	ItuGraf hanging wire Y-model (45 kg)
2	Flexible connection hose DN10 x 1/2" M
3	Suspended ceiling

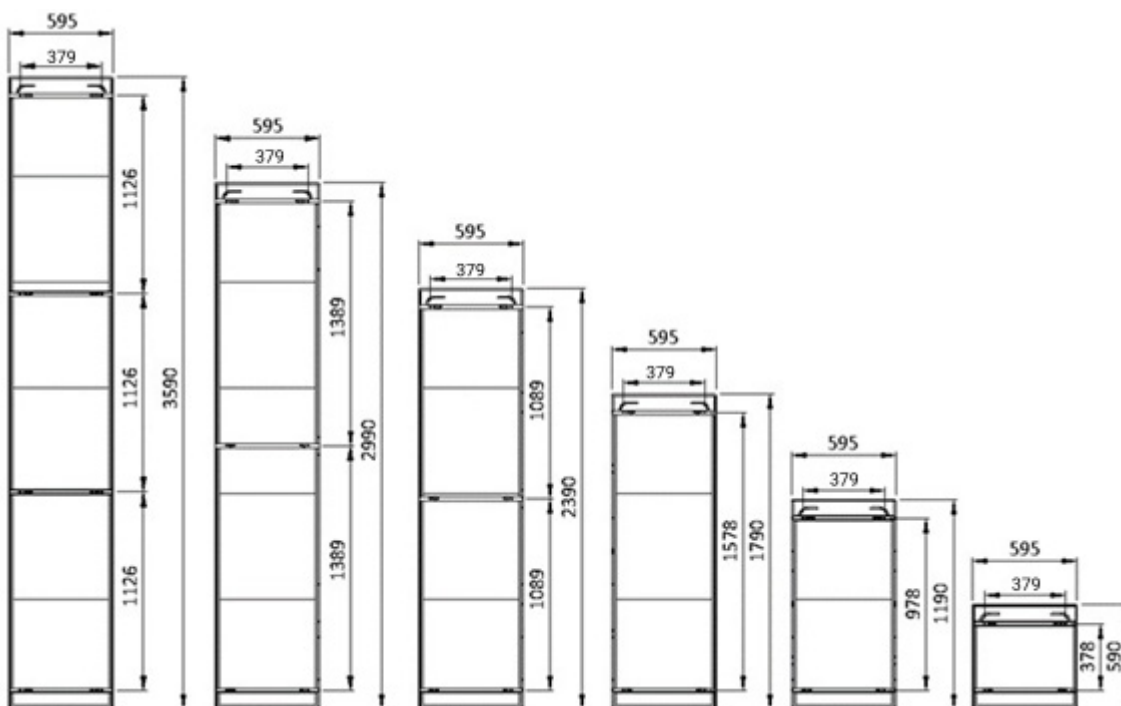
*Only for 600x600 modules.

Hanging with Threaded Rods

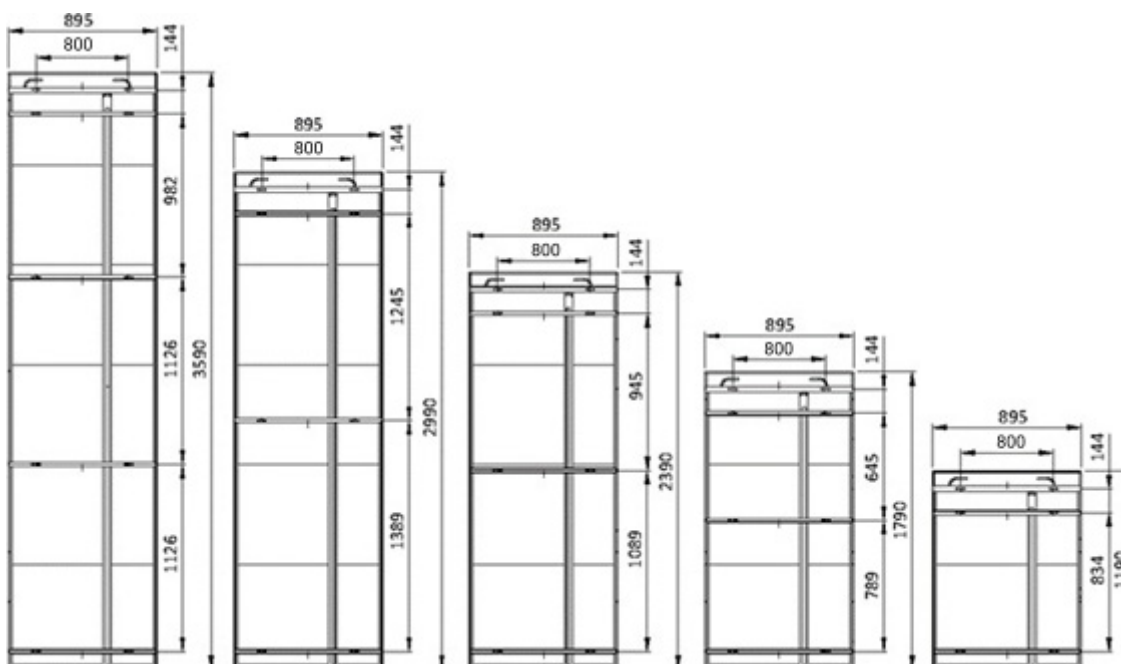
Fixing points of ItuGraf panels

The following figures and tables show the number and positioning of the fixing points for panels with widths of 595 mm, 895 mm and 1190 mm. Threaded rods can be used to fix the panels into the ceiling through holes located in the fixing cross bar.

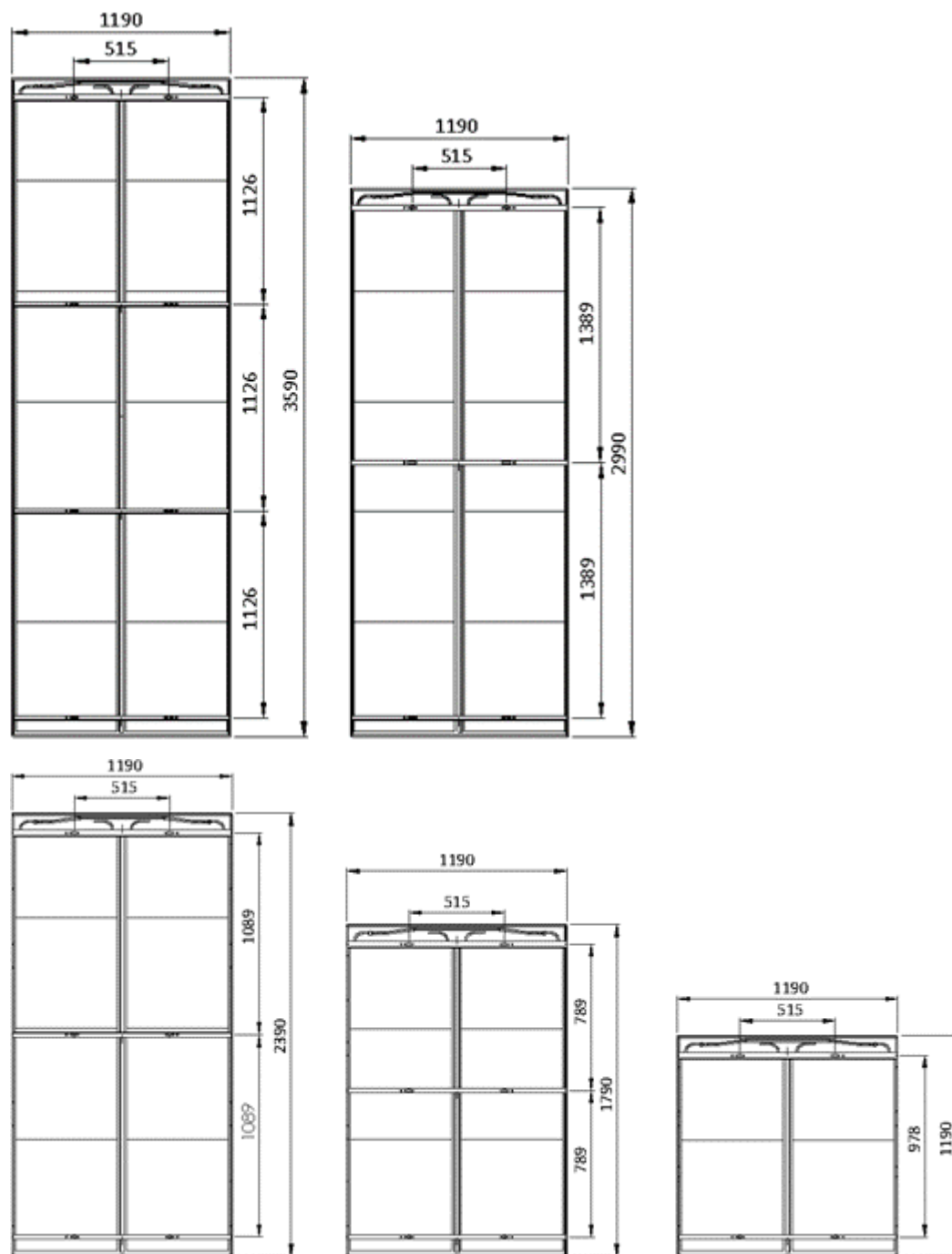
Panel width: 595mm



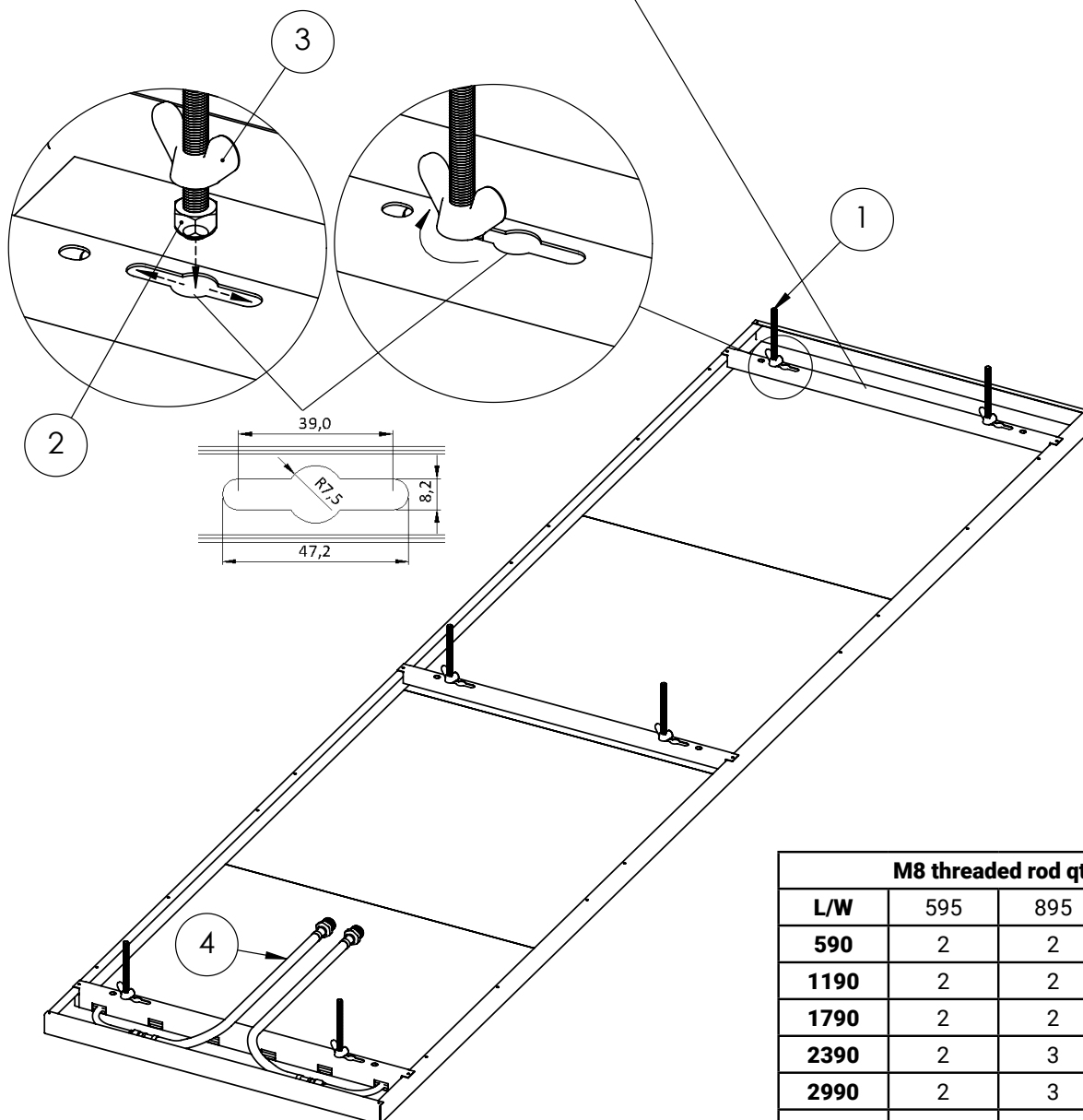
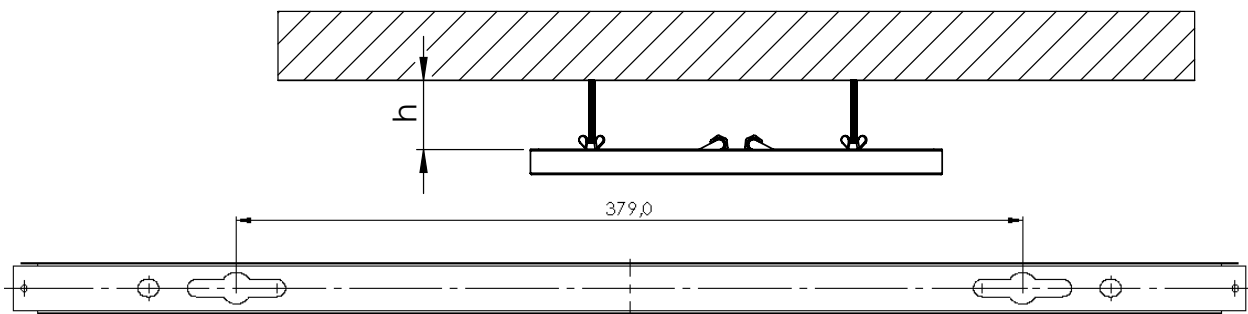
Panel width: 895mm



Panel width: 1190mm



Minimum installation height 100-150 mm (the tightening of wing nuts is still possible).



M8 threaded rod qty.			
L/W	595	895	1190
590	2	2	2
1190	2	2	2
1790	2	2	2
2390	2	3	3
2990	2	3	3
3590	3	4	4

h	
1	M8 threaded rod (not in our delivery)
2	M8 lock nut (not in our delivery)
3	M8 wing nut (not in our delivery)
4	Flexible connection hose DN10 x 1/2" M

NOTE: Threaded rod cannot be used to install the panels in suspended ceiling.

NOTE: Number of used fixing points depends on the accepted vertical deflection/sagging on site.

Hanging with Patented Surface Bracket

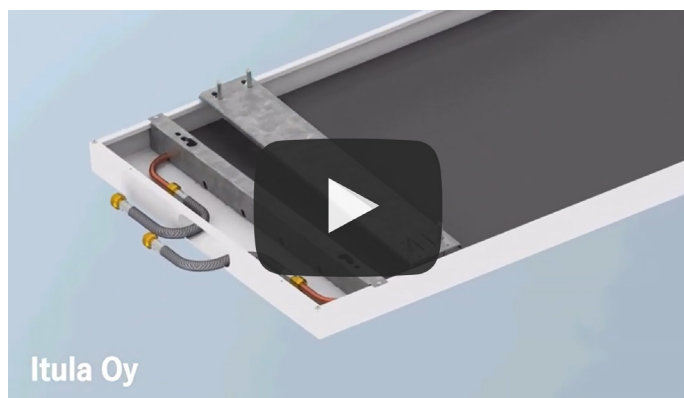
Hanging Details

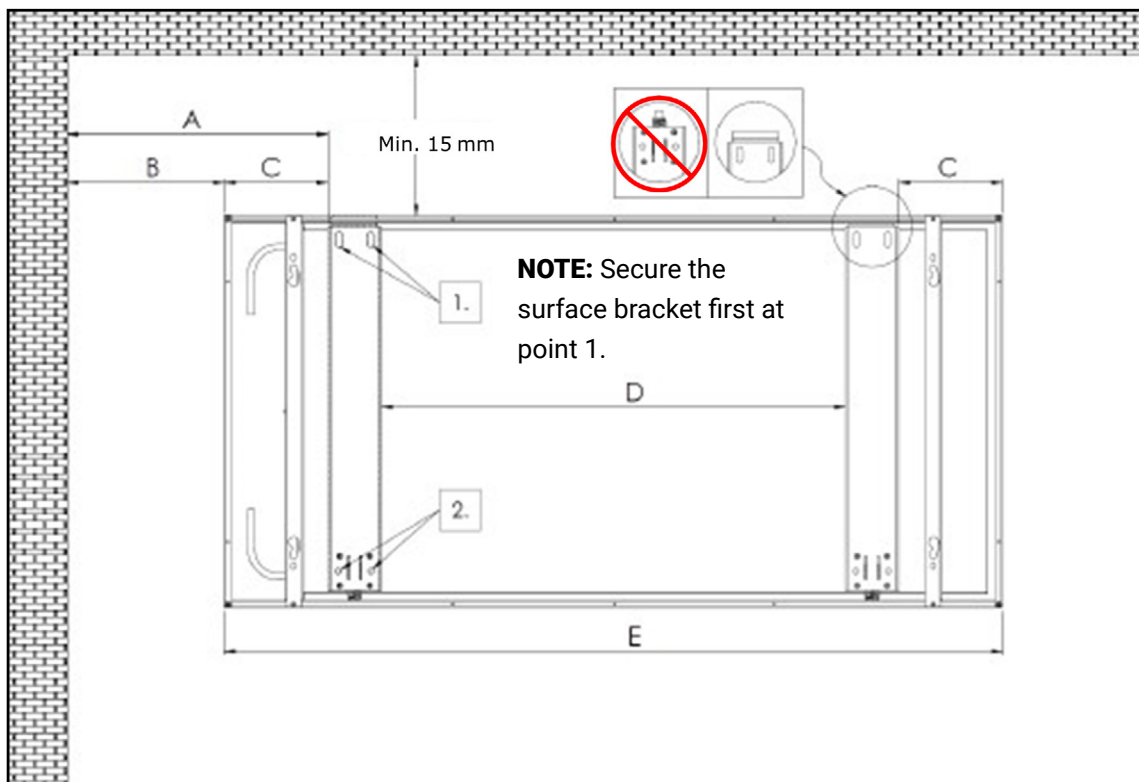
1. Measure the positions of the brackets panel placement design and fix them to the ceiling. When installing a panel next to a wall or window, install the bracket so that the side with the spring faces away from the wall/window. The minimum distance between a bracket and wall is 15 mm. The surface brackets contain multiple hole placements so that drilling into hard concrete reinforcement could be avoided. Use the closest hole placements to bracket ends whenever possible to minimize bending.
2. Use drywall board hoist to lift up the panel close to the brackets. Lift one side of the panel up and align it with the spring holder. Make sure before doing so that the installation side is facing the intended direction.
3. Push the side of the panel slowly against the spring so that the it compresses.
4. Lift the other side of the panel against the ceiling and release the spring loading. Both sides of the panel should now be supported by the bracket. Take care not to scratch the ceiling with the panel during installation.
5. After installation, you can slightly slide the panel vertically along the panel's long side to adjust the position of its end.

NOTE: *The larger panels might require two persons for installation. The ceiling needs to be straight so that twisting and bending does not occur in the larger panel sizes (length over 2390 mm).*

NOTE: *The panel type needs to be according to the water connection. See pages 24-25 for panel types.*

Video Instructions of the Patented Surface Bracket Installation





Dimensional drawing of ItuGraf surface bracket installation

SYMBOL	MEANING	VALUE (mm)
A	Distance between bracket and wall	B+C
B	Distance between panel end and wall	

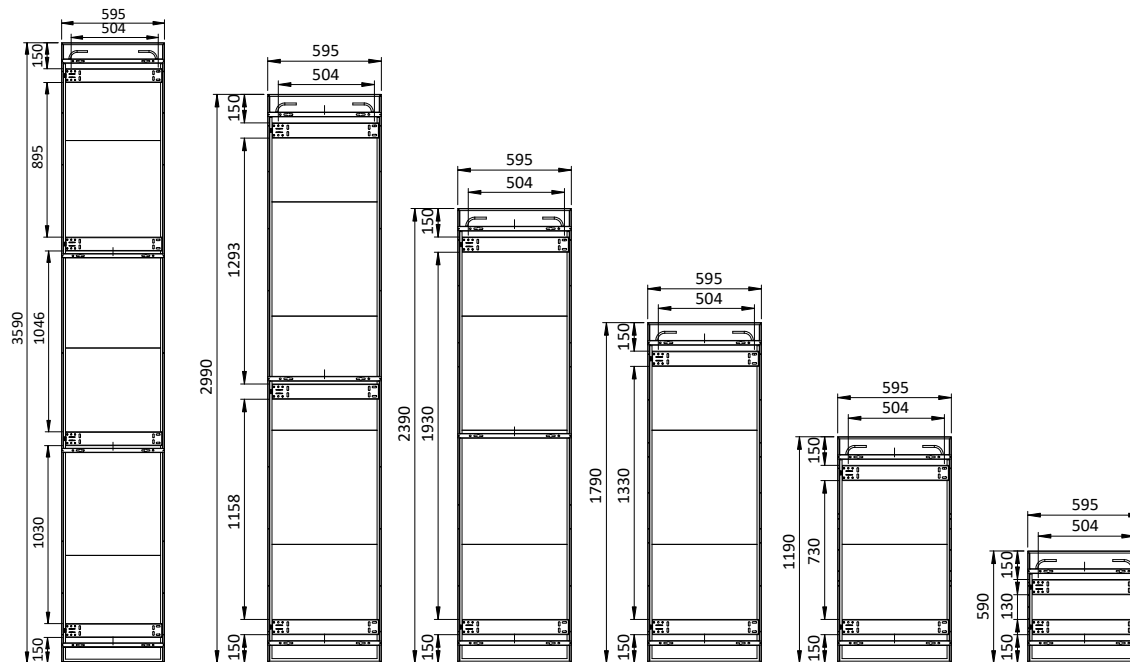
Length (mm)	Number of surface brackets Width 595 mm	Distance from the end of panel (mm) C = width 595mm	Number of surface brackets Width 895 mm	Distance from the end of panel (mm) C = width 895mm	Number of surface brackets Width 1190 mm	Distance from the end of panel (mm) C = width 1190mm
590	2	150	-	-	-	-
1190	2	150	2	300	2	300
1790	2	150	3	300	3	300
2390	2	150	3	300	3	300
2990	3	150	3	300	3	300
3590	4	150	-	-	-	-

Fixing Options with Patented Surface Bracket

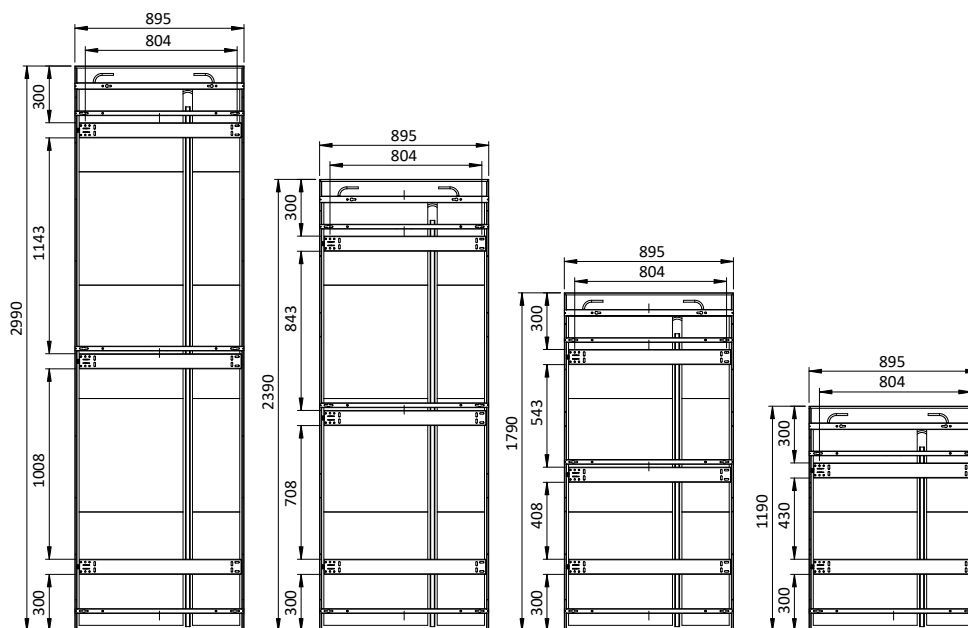
Fixing points of ItuGraf panels with patented surface brackets

The following figures and tables show the number and fixing points of panels with widths of 595 mm, 895 mm and 1190 mm.

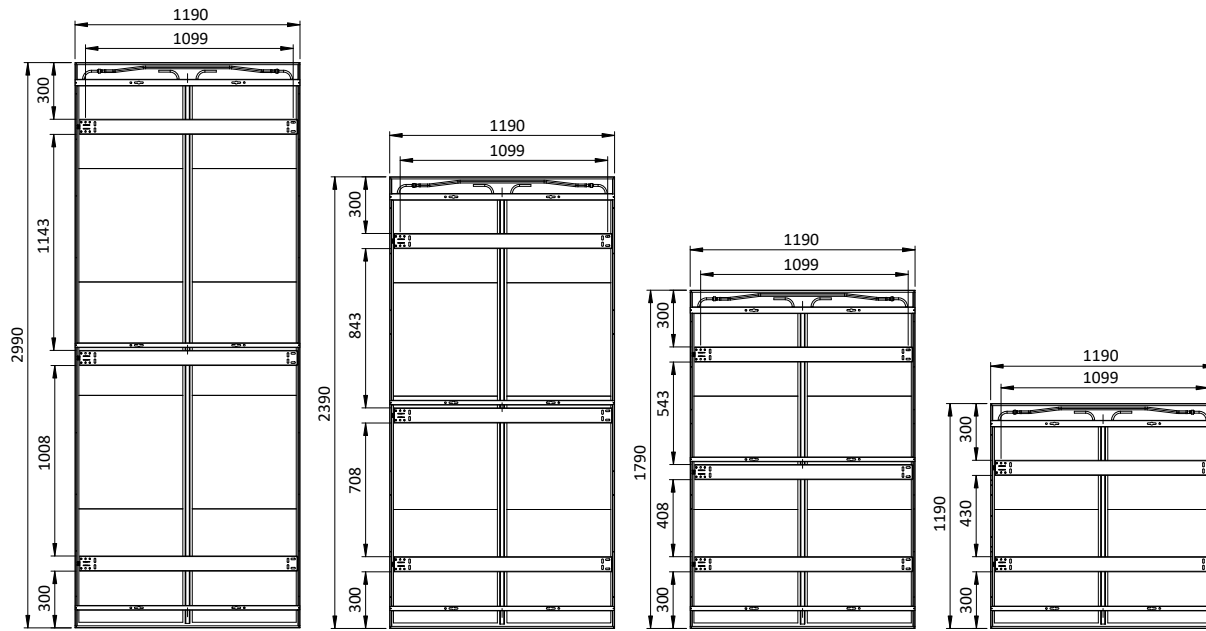
Panel width: 595mm



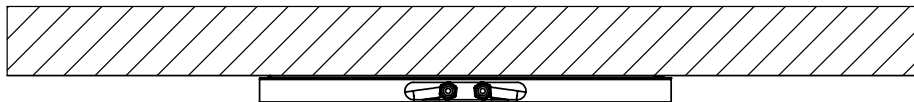
Panel width: 895mm



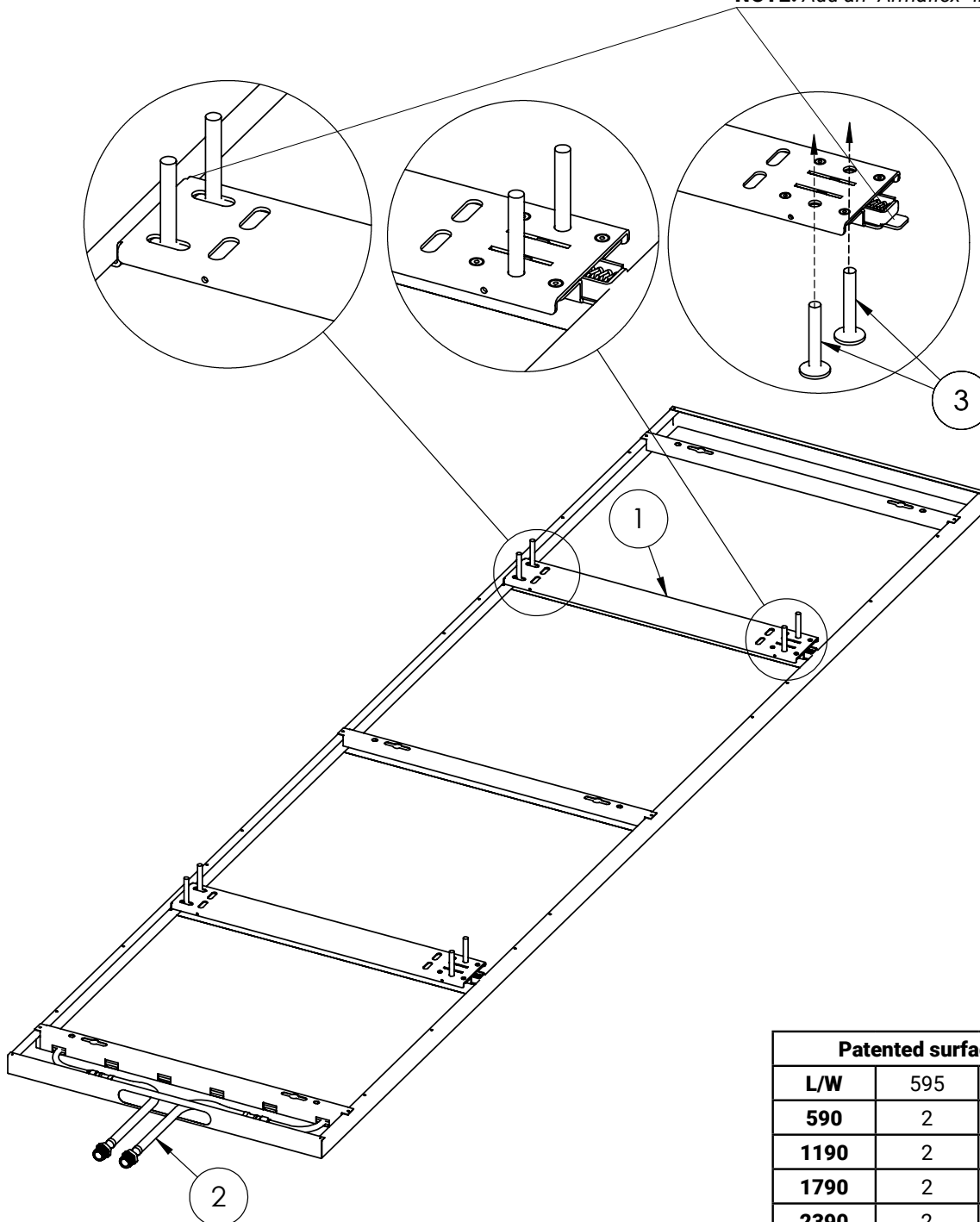
Panel width: 1190mm



NOTE: 35 mm height panels can be used when flexible hoses are fed through oblong holes in panel ends.



NOTE: Add an "Armaflex" insulation piece

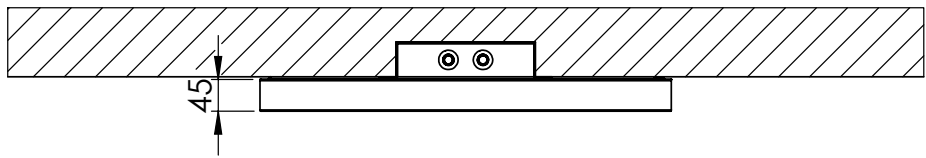


Patented surface bracket qty.			
L/W	595	895	1190
590	2	-	-
1190	2	2	2
1790	2	3	3
2390	2	3	3
2990	3	3	3
3590	4	-	-

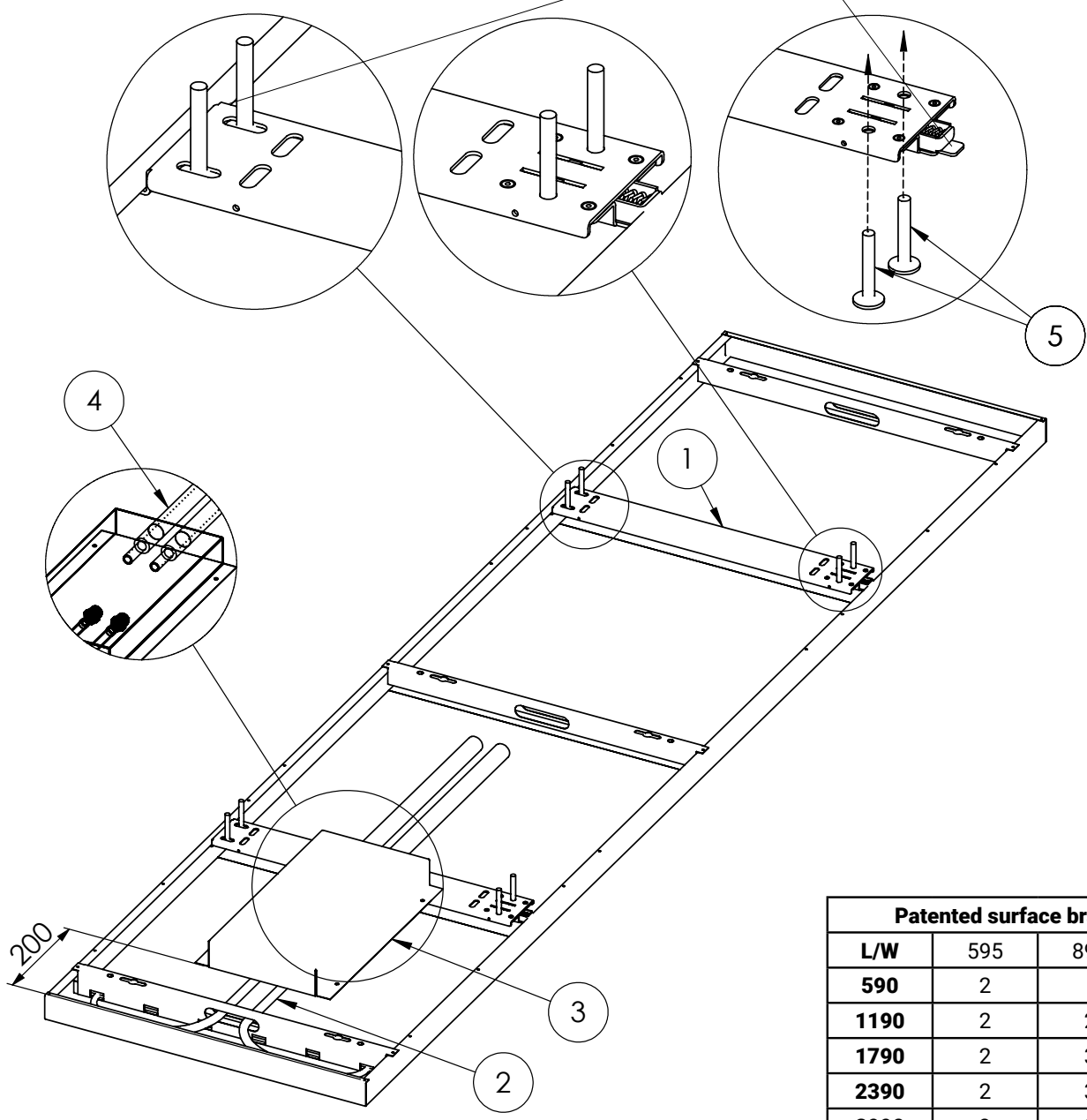
1	Patented surface bracket
2	*Flexible connection hose DN10 x 1/2" M
3	Screws and washers (not in our delivery)

*Flexible hoses need to be insulated to avoid noise due to expansion and/or pressure shocks.

NOTE: Panel height 45 mm must be used.



NOTE: Add an "Armaflex" insulation piece



Patented surface bracket qty.			
L/W	595	895	1190
590	2	-	-
1190	2	2	2
1790	2	3	3
2390	2	3	3
2990	3	3	3
3590	4	-	-

1	Patented surface bracket
2	*Flexible connection hose DN10 x 1/2" M
3	ItuGraf concrete casting box
4	Main pipes in concrete (not in our delivery)
5	Screws and washers (not in our delivery)

*Flexible hoses need to be insulated to avoid noise due to expansion and/or pressure shocks.

Legend for the Panel Product Codes

ItuGraf product codes are formed as shown below.

IG35-595-2990-1B-V-I2

- Panel height or ceiling model**
- 35
 - 45
 - A*
 - E*
 - LP*
 - DS*
 - DG*
 - Z*

- Panel width**
- 595 (35 / 45)
 - 895 (45)
 - 1190 (45)
 - 595 (A)
 - 590 (E)
 - 590 (LP)
 - 599 (DS)
 - 592 (DG)
 - 592 (Z)

- Panel width**
- 590
 - 1190
 - 1790
 - 2390
 - 2990
 - 3590
 - *2990 (A)
 - *2975 (E)
 - *2975 (LP)
 - *2999 (DS)
 - *2975 (DG)
 - *2999 (Z)

- Circuit**
- 1
 - 2
 - 0 (Dummy panel)

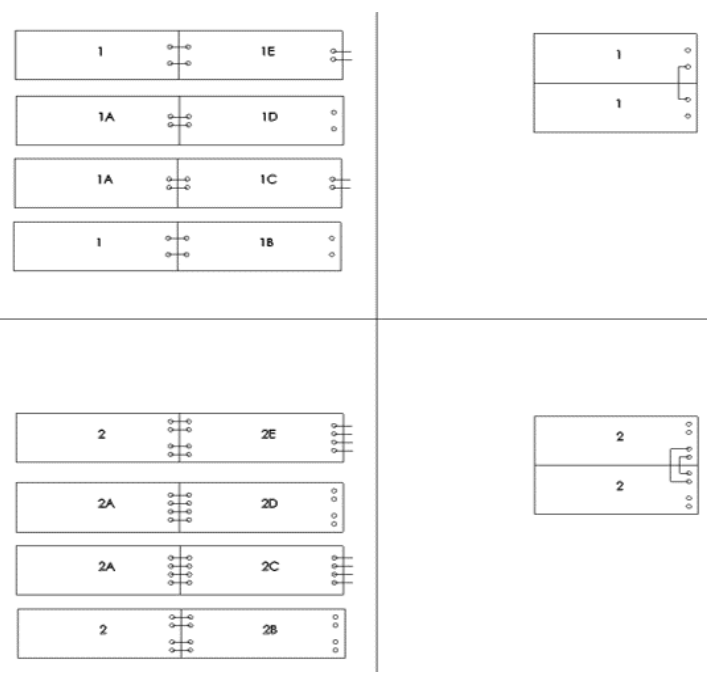
- Surface type and color**
- V (Smooth, standard color)
 - VE (Smooth, special color)
 - P (Standard perforation, standard color)
 - PE (Standard perforation, special color)
 - X (Special perforation, standard color)
 - XE (Special perforation, special color)

- Serial connection code**
- 1/2 (Standard, no hole)
 - A (CE* Hole)
 - B (Flow-through panel, no hole)
 - C (Flow-through panel, holes in both CE* and SCE*)
 - D (Flow-through panel SCE* Hole)
 - E (Flow-through panel, CE* Hole)
- *CE=Connection End
*SCE=Serial Connection End

- Insulation**
- I2 (Factory fitted insulation)
 - " " (Left empty means without insulation)

We recommend using 595x2990 panels in serial connections.

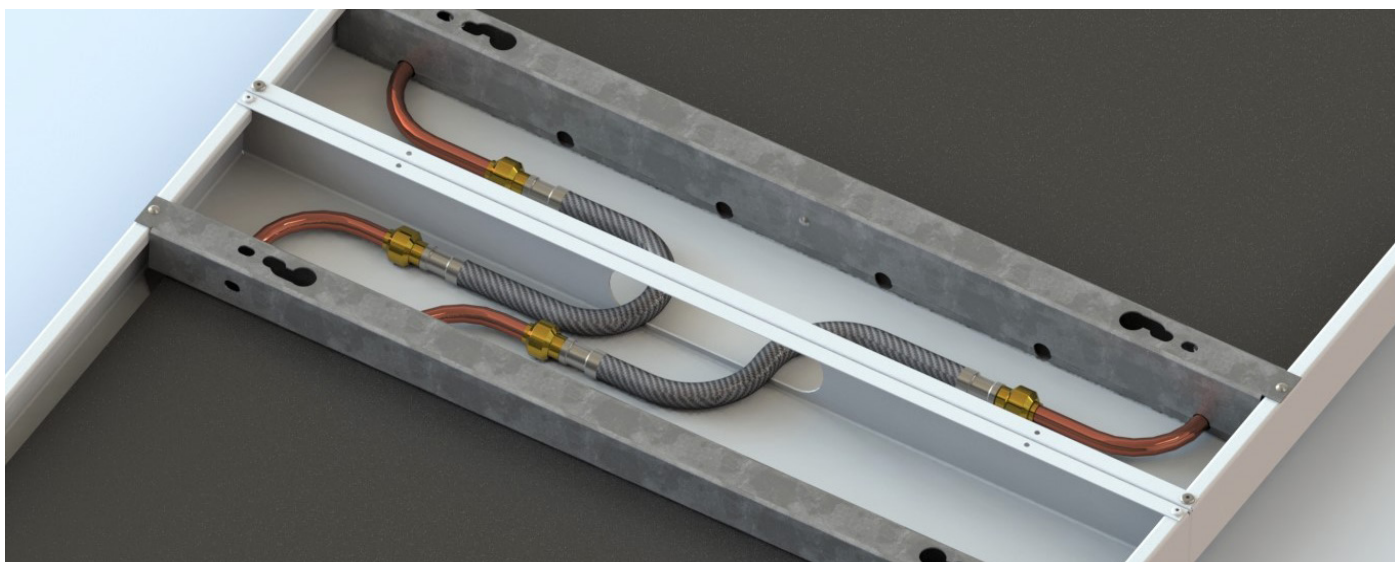
Serial Connection Code	Description: CE=Connection End SCE=Serial Connection End
1	1-Circuit, Standard No Hole
1A	1-Circuit CE Hole
1B	1-Circuit, Flow-through technology No Hole
1C	1-Circuit, Flow-through technology Holes in both CE and SCE
1D	1-Circuit, Flow-through technology SCE Hole
1E	1-Circuit, Flow-through technology CE Hole
2	2-Circuit, Standard No Hole
2A	2-Circuit CE Hole
2B	2-Circuit, Flow-through technology No Hole
2C	2-Circuit, Flow-through technology Holes in both CE and SCE
2D	2-Circuit, Flow-through technology SCE Hole
2E	2-Circuit, Flow-through technology CE Hole



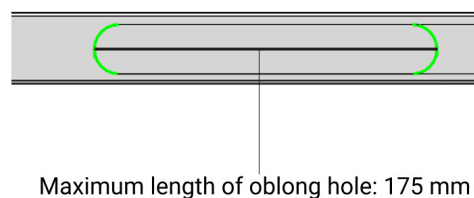
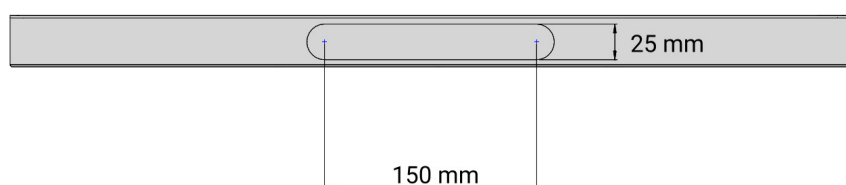
Serial & Parallel Panel Connections



ItuGraf panels can be connected in serie in according to room specifics. The used product type is influenced by the selected installation method. The standard panels can be used when they are hung with cable wires. When the patented surface bracket installation is used the panels should have holes in the ends for water connections. If the water supply is brought to the panel through the ceiling the panel height of 45 mm should be used so that the hoses fit through the crossbars see page 25.

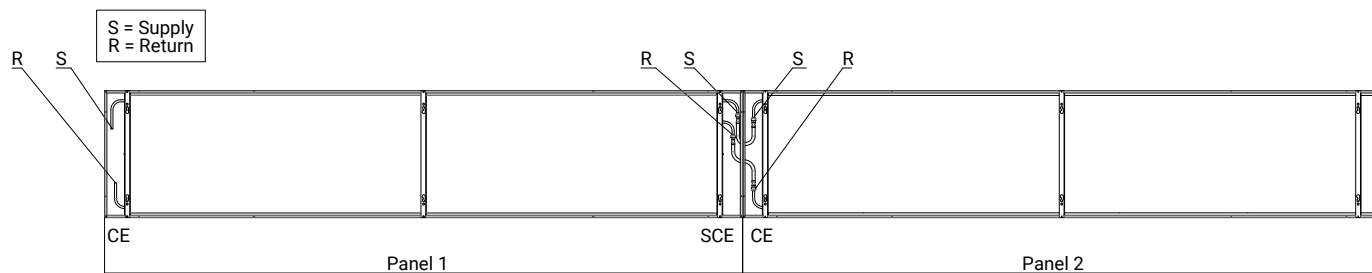


Section view of the connection end hole is seen below. The flexible hoses are installed through the holes connecting the panel pipes together.



Examples of ItuGraf Serial Panel Connections

1-Circuit - serial connection with two panels in line



Connection method		
Code	Connection end	Serial connection end (SCE)
1B	No hole	No hole
1D	No hole	Hole
1E	Hole	No hole
1C	Hole	Hole

Connection method	
Code	Connection end (CE)
1 (Standard)	No hole
1A	Hole

When the flexible connection hoses can be drawn over the panel edge

Connect the panel 1B or 1E (SCE no hole) to the panel 1 (Standard / no hole).

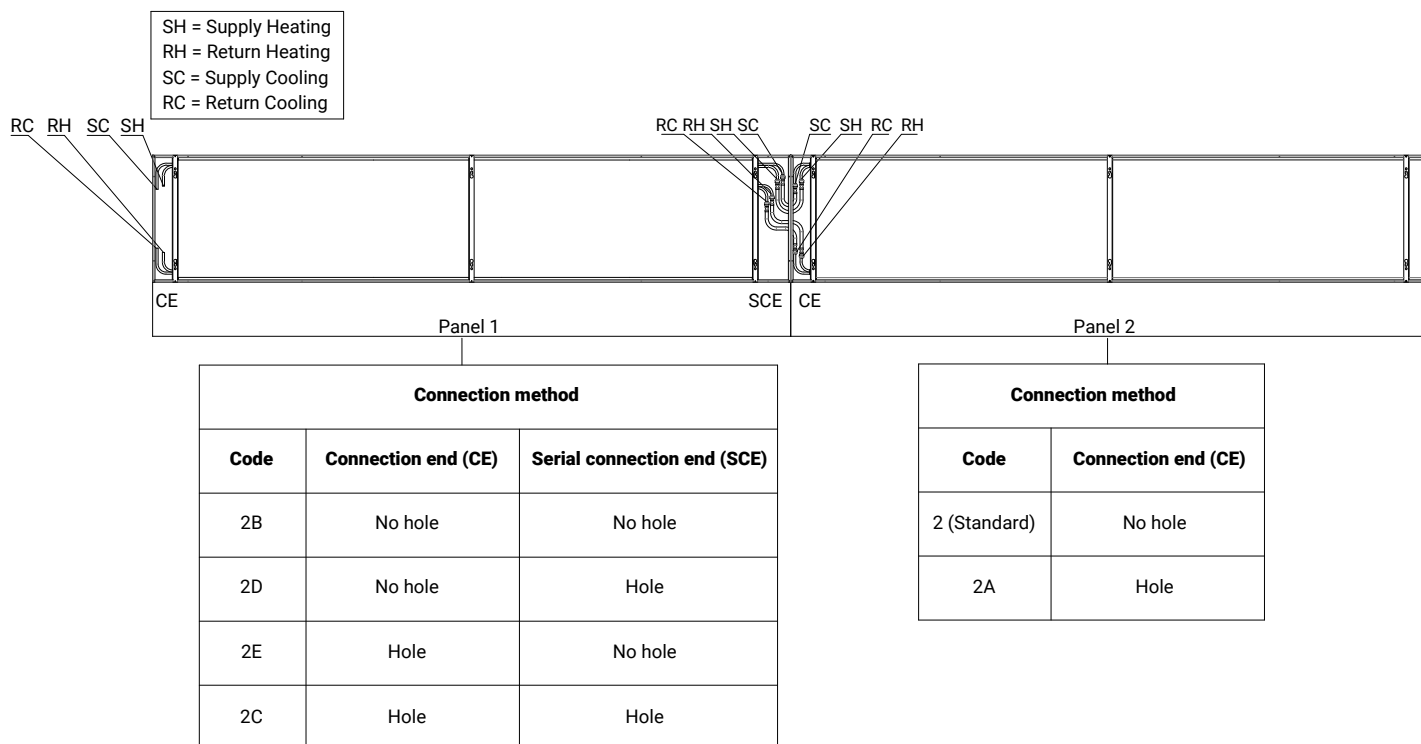
For example PANEL 1: IG35-595-2990-1B-V connected to the PANEL 2: IG35-595-2990-1-V

When the flexible connection hoses need to be drawn through the panel

Connect the panel 1D or 1C (SCE hole) to the panel 1A (CE hole).

For example PANEL 1: IG35-595-2990-1C-V connected to the PANEL 2: IG35-595-2990-1A-V

2 Circuits - serial connection with two panels in line



When the flexible connection hoses can be drawn over the panel edge

Connect the panel 2B or 2E (SCE no hole) to the panel 2 (Standard / no hole).

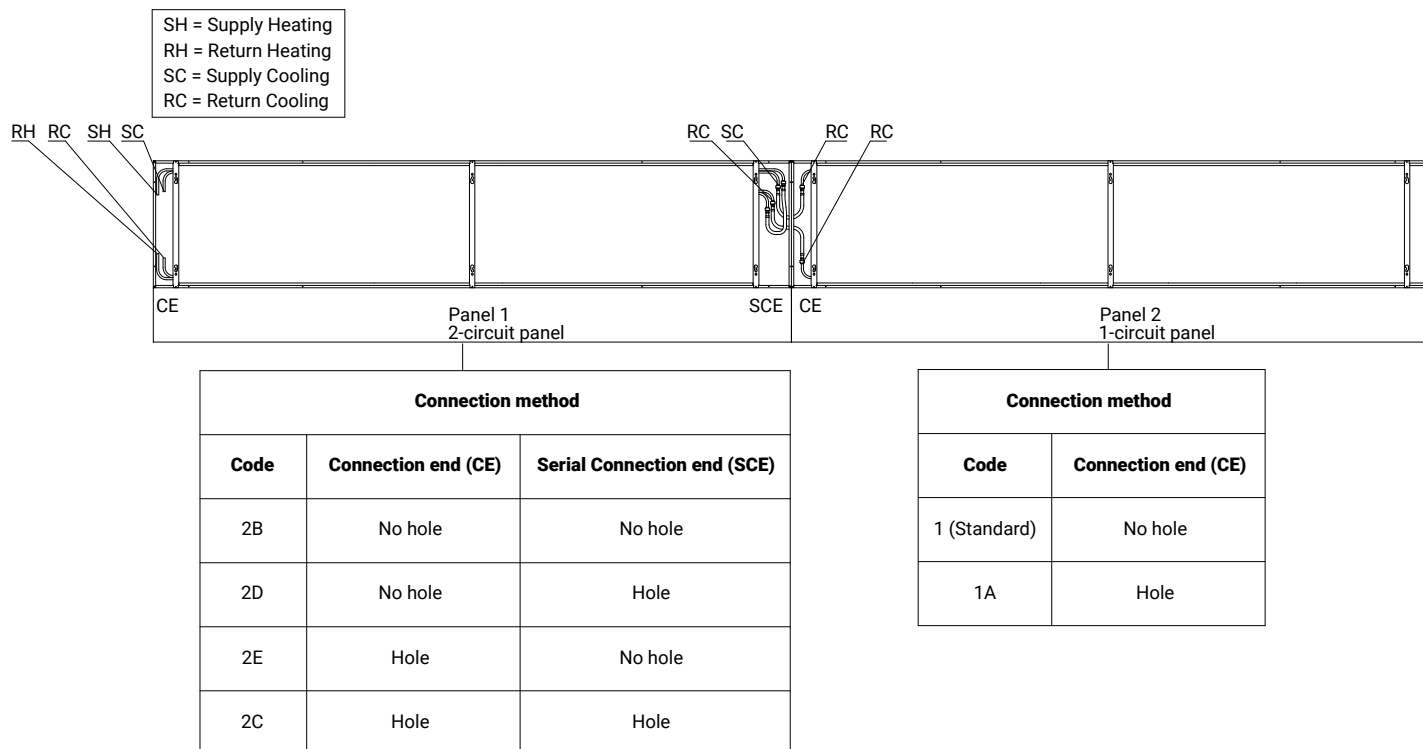
For example PANEL 1: IG35-595-2990-2B-V connected to the PANEL 2: IG35-595-2990-2-V

When the flexible connection hoses need to be drawn through the panel

Connect the panel 2D or 2C (SCE hole) to the panel 2A (CE hole).

For example PANEL1: IG35-595-2990-2C-V connected to the PANEL 2: IG35-595-2990-2A-V

1 & 2 Circuits combined - serial connection with two panels in line



First panel (on the left) with flow through technology for heating and for cooling with two meander pipes. Second panel (on the right) for extended cooling capacity with single meander pipe. First panel heating circuit will be short-cut closed at SCE (Serial Connection End) with a flexible hose.

When the flexible connection hoses can be drawn over the panel edge

Connect the panel 2B or 2E (SCE no hole) to the panel 1 (Standard / no hole).

For example PANEL 1: IG35-595-2990-2B-V connected to the PANEL 2: IG35-595-2990-1-V

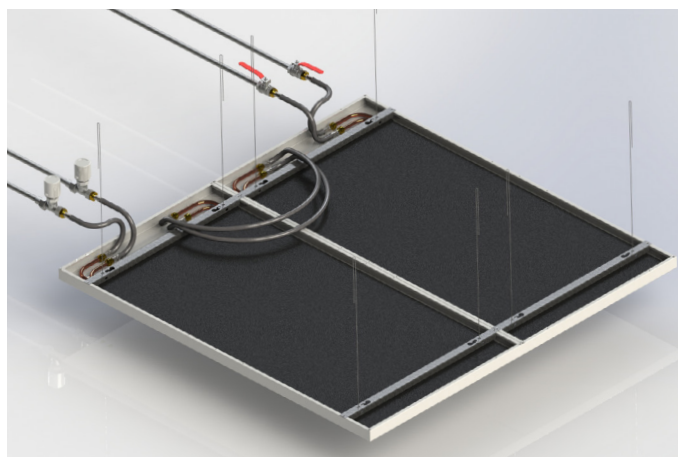
When the flexible connection hoses need to be drawn through the panel

Connect the panel 2D or 2C (SCE hole) to the panel 1A (CE hole).

For example PANEL 1: IG35-595-2990-2C-V connected to the PANEL 2: IG35-595-2990-1A-V

Pressure test

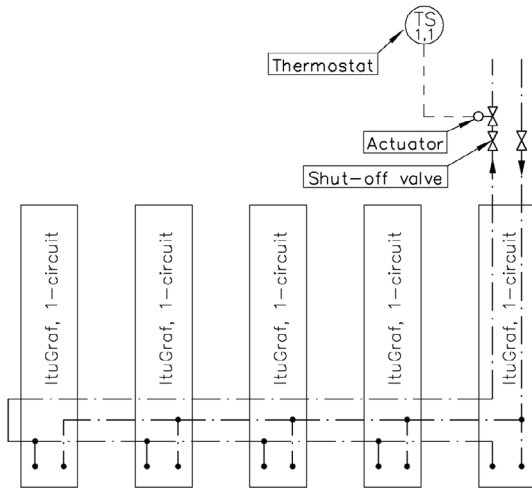
After the panels have been hung and levelled, they must be pressure tested in a controlled manner and the results documented. The water-circulating system must be tested first with air and then with water.



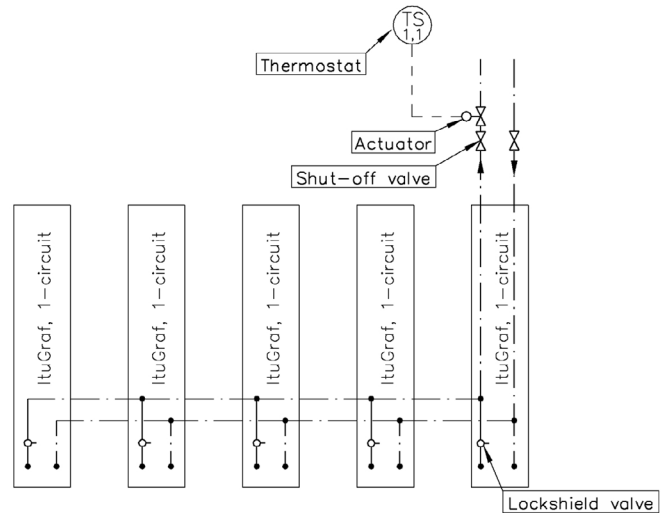
Examples of Controls for Various Panel Connections

Below are presented the most typical connections for ItuGraf panels.

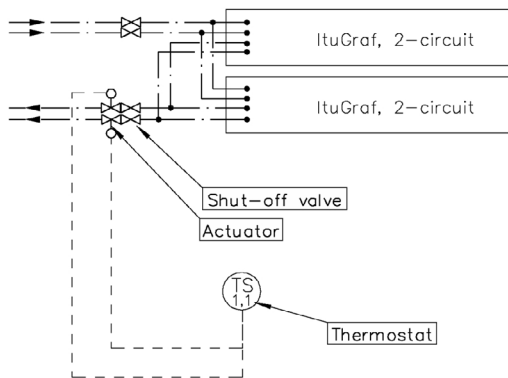
1-circuit panels
Parallel connection with reverse return
(Every panel are in balance)



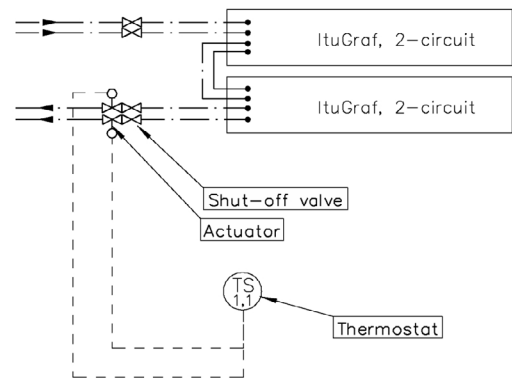
1-circuit panels
Parallel connection without reverse return
(Lockshield valves for balancing)



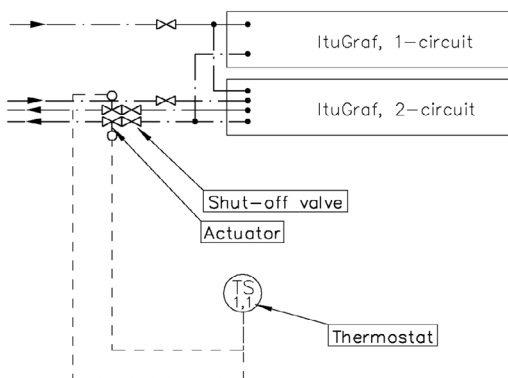
2-circuit panels
Parallel connection



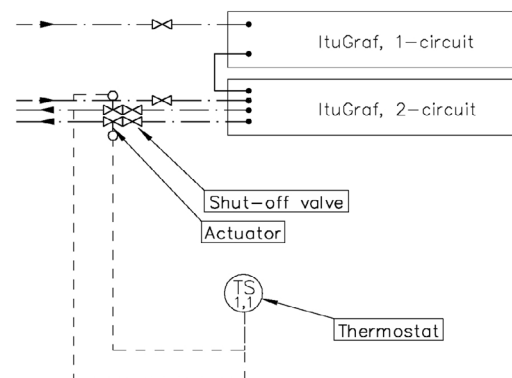
2-circuit panels
Serial connection



Optimized
1-circuit panel for heating
2-circuit panel for heating and cooling
Heating is with parallel connection



Optimized
1-circuit panel for heating
2-circuit panel for heating and cooling
Heating is with serial connection



Removing the protective wrapping from the panel

The radiant surface of the panel is covered with protective wrapping. Remove the wrapping after installation when any work that might stain the surface has been completed. During integrated installations, remove the wrapping from the panel edges during the installation stage. If the panels are used for construction site heating, the protective plastic must be removed before the heating is started.

NOTE: *The wrapping is designed to protect the panel from stains and small scratches. The wrapping will not protect the panel against impacts, and it is not waterproof.*

NOTE: *Do not remove the identification label on the inside of the panel.*

NOTE: *Small residues of graphite might be present on the protective foil.*

Cleaning the panels

Use a damp cloth to clean the metal surfaces of the panels. The pH of cleaning agents used with water must be between 5 and 9. The cleaning agent must not contain hydrogen peroxide, high concentrations of chlorine or phosphoric acid. Avoid using organic solvents and abrasives on surfaces. Follow the user instructions provided by the manufacturer of the cleaning agent and use the stated concentrations. The time in contact with the surface must not exceed 30 minutes. After cleaning, thoroughly wipe down the treated area to ensure that the cleaning agent is completely removed from the metal surface.

Possible repackaging

Follow the correct order of packaging and use cardboard sheets to protect the panel surfaces during transportation. The panels are placed into box one by one, and cardboard is placed between the panels to protect the radiant surfaces. The radiant surfaces are placed against one another in the box. The smooth surfaces are placed against one another in the box. A sheet of cardboard is placed between the panels so that it goes over the panel edge slightly. One box can hold a maximum of 25 panels side by side. Ensure that the panels cannot move inside the box using a material such as cardboard filler. Two people are needed to lift the panels into the box. Grab both ends of the panel and lower it carefully into the box.

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Warranty

If delivered Goods are defective in some part or a delivery is incomplete, the Buyer shall inform the Supplier of the defect promptly in writing and not later than within seven (7) days of the date of receiving the Goods. The Buyer shall conduct an additional inspection of a product according to normal procedure, before installing, fastening or using it. The Buyer shall inform the Supplier of the defect that would not have been possible to notice at the time of delivery within seven (7) day of the alleged defect occurring. The complaint has to be made in writing, and it has to include the detailed description of the defect(s) and pictures of the defect. Buyer shall deliver the defective product or defective part to the Supplier within thirty (30) days. In case the Buyer do not follow these notice and complaint periods, the Buyer shall lose its right to plead to the defects.

Warranty of all products remains valid for 24 months, starting from the delivery date from the Supplier. The Supplier is entitled, at its discretion, to either repair the defective Goods, to deliver replacement Goods or to grant a discount on the price of the Goods. The Buyer is entitled to any compensation only if it is agreed beforehand in writing by the Supplier. Any warranty liabilities cannot be more than the original value of the delivered goods. The replaced or compensated products are Supplier's property. The Supplier is not liable for defects caused by an error in installation, failure to follow installation instructions, normal wear and tear, inappropriate storage or use, faulty or inappropriate maintenance or negligence of the end user, or any other reasons that do not result from the Supplier. Any additional liabilities of Supplier, in particular with respect to further damages, loss of revenue, closing down of business, break-down of equipment, third party claims, or other direct or indirect, or consequential damages, are expressly excluded.

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