

NO.

ETAD-E3255-00

# PS4 Series Guidelins



**HRS**

## Purpose

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## **1. Foreword**

### **1-1 Purpose**

This document describes basic connector design information and specifications.

This manual will be revised at any time in accordance with changes in technology and manufacturing capabilities.

## 2. Product Information

### 2-1 Basic Specifications

- UL/cUL, TUV certification : Acquired
- Current rating : 150 A/300AUL, cUL, TUV acquisition value (depends on busbar thickness)  
Refer to 2-6 for current values depending on ambient temperature.
- Rated voltage :600V

This product is a single core, so you need to use more than one.

For details, please refer to 4-1-3.

- Number of insertions and removals : 50 times
- Insertion and extraction force : 50 N or less
- Heat resistance : 105°C 96 hours
- Operating temperature range : -40°C~+105°C
- storage temperature range : -40°C~+60°C

For details, refer to the specifications of each product.

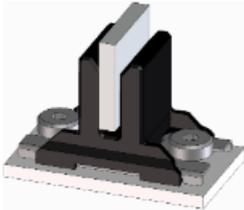
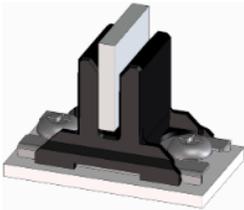
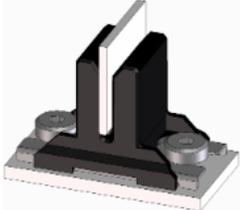
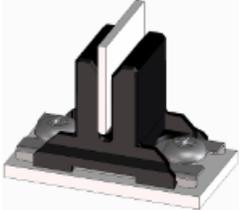
### 2-2 Product name structure

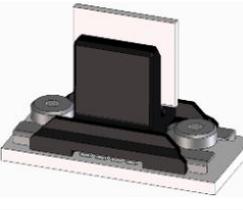
PS4 A-6.35T (01)

① ② ③ ④

① Series name	PS4	
② Busbar Connection Direction	No Symbol	Right Angle
	A	Horizontal
③ Busbar Thickness	6.35T	5.88~6.45mm
	3.175T	2.92~3.275mm
④ floating screw	no symbol	inch screws (hex)
	(01)	millimeter screws (screwdriver)

2-3 Function diagram

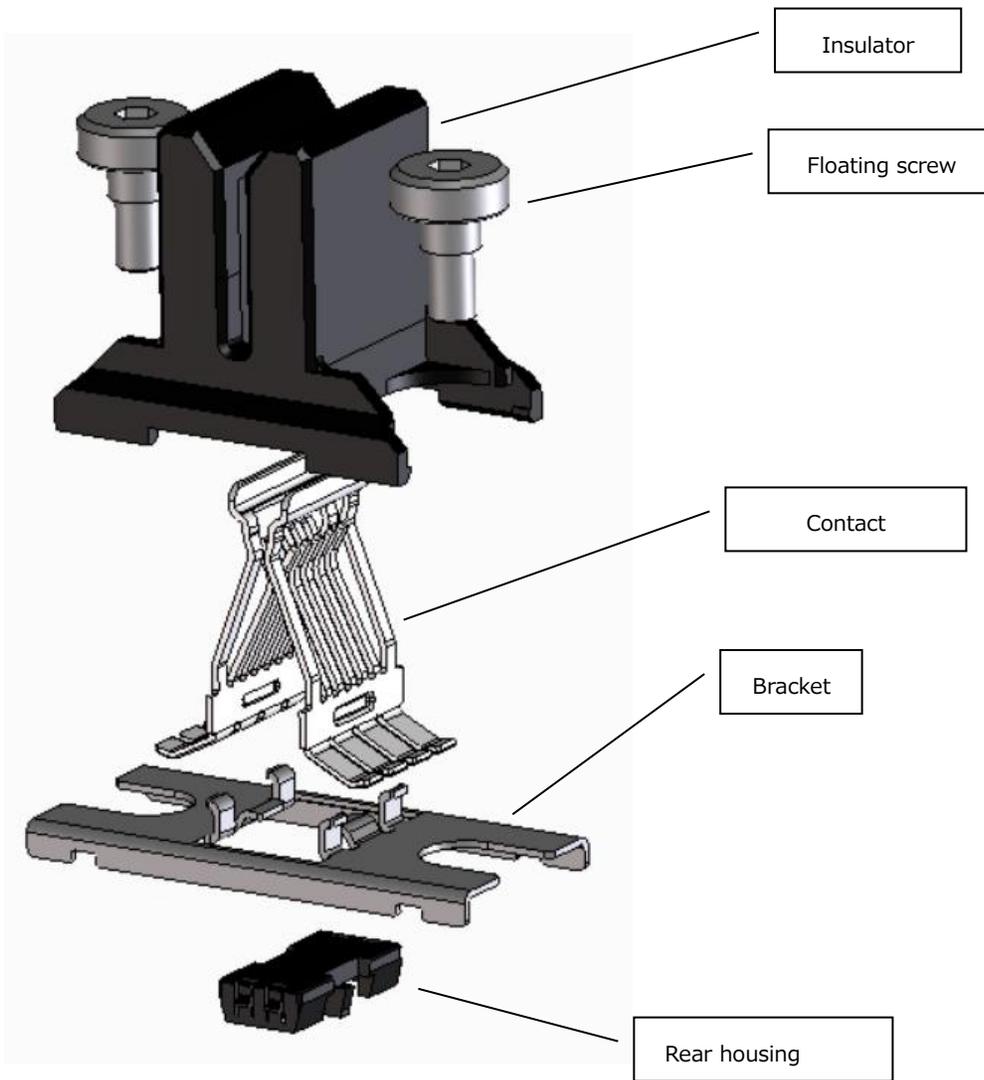
Bus bar connection direction	Right angle direction			
Busbar thickness	5.88~6.45		2.92~3.275	
floating screw	inch screw (hex)	millimeter screw (screwdriver)	inch screw (hex)	millimeter screw (screwdriver)
Product				
	PS4-6.35T	PS4-6.35T (01)	PS4-3.175T	PS4-3.175T (01)

Busbar Connection Direction	Horizontal Direction			
Busbar Thickness	5.88~6.45		2.92~3.275	
Floating Screw	Inch Screw (Hex)	Millimeter Screw (Screwdriver)	Hex Inch Screw	Screws (Screwdriver)
Product				
	PS4A-6.35T	PS4A-6.35T (01)	PS4A-3.175T	PS4A-3.175T (01)

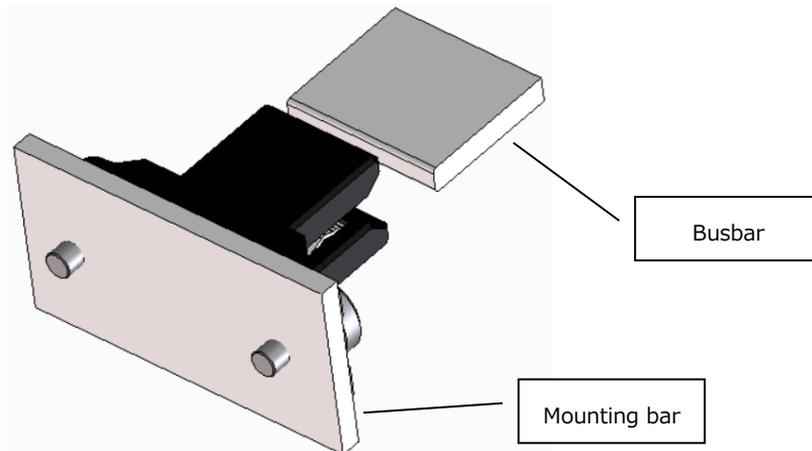
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### 2-4 Connector section names

The following figure shows the connector parts names.



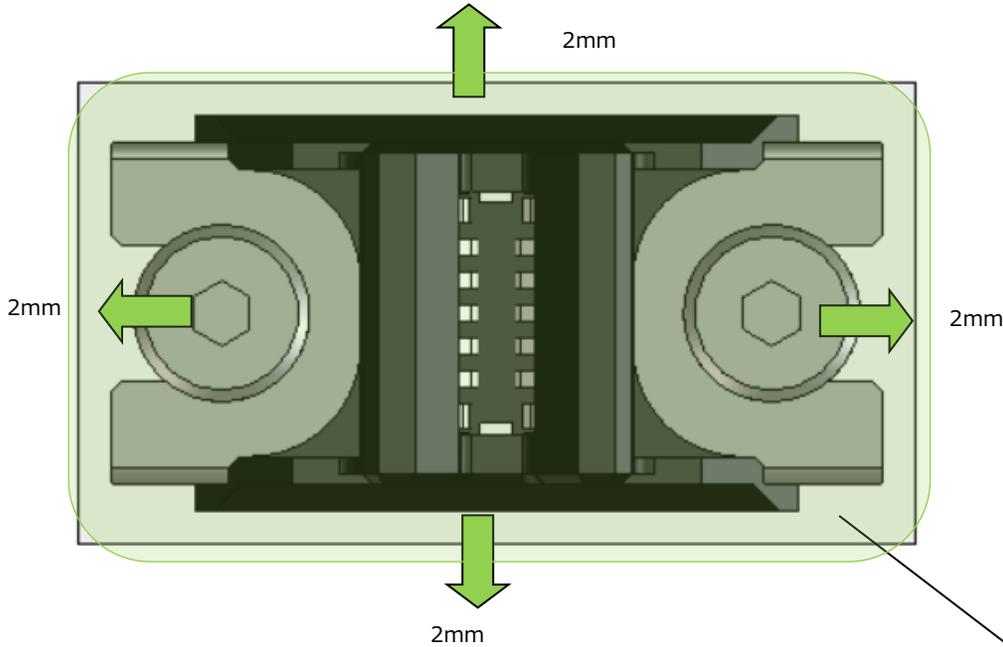
The following two components should be provided by customer.



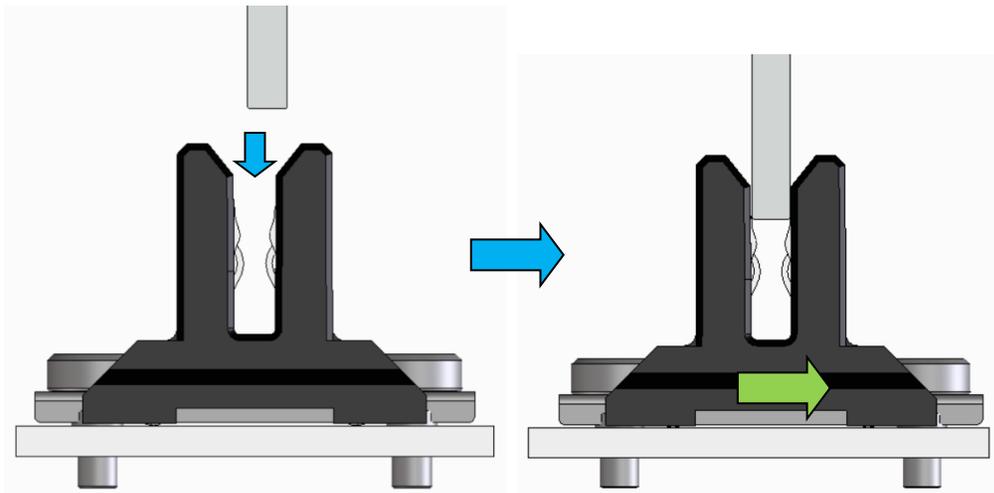
### 2-5 Floating and contact structures.

#### 2-5-1 Floating structure

As shown in the figure below, it moves 2 mm in the XY direction.  
This makes it easier to design equipment and work together in difficult places to access.  
(The light green area indicates the range of motion of the connector.)



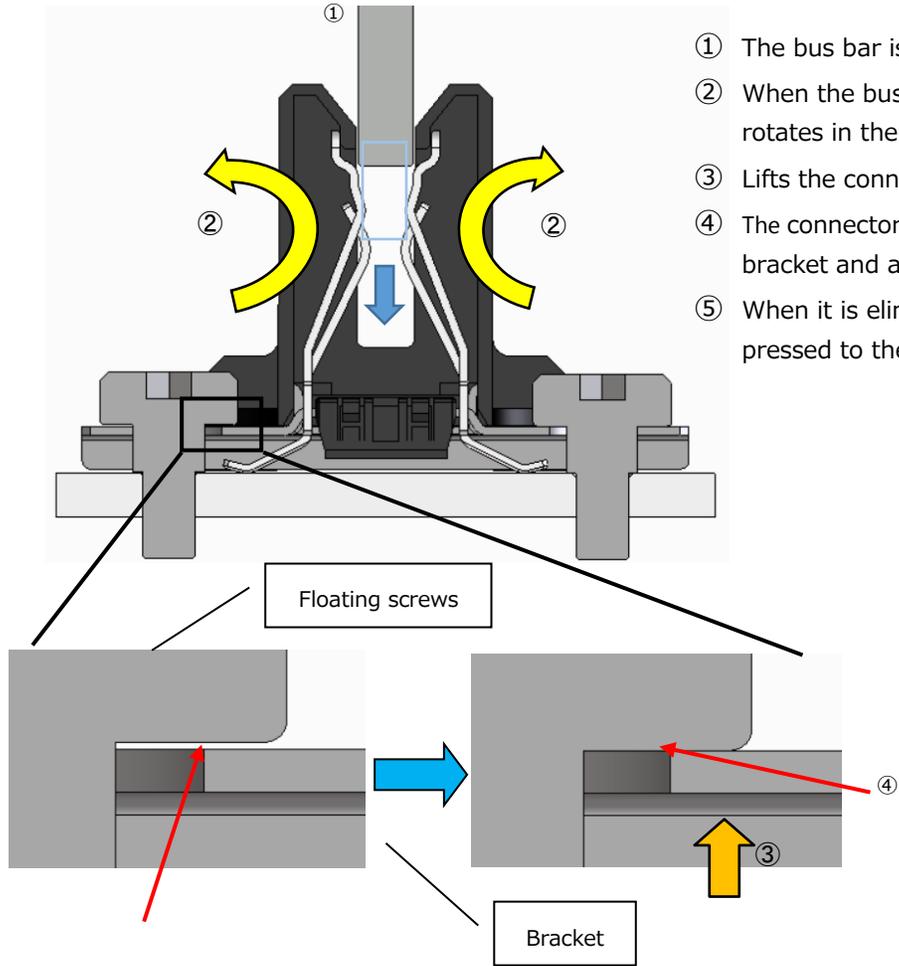
The connector should be in the center of the mounting screw pitch.



The connector moves and engages even when the busbar and connector are misaligned.

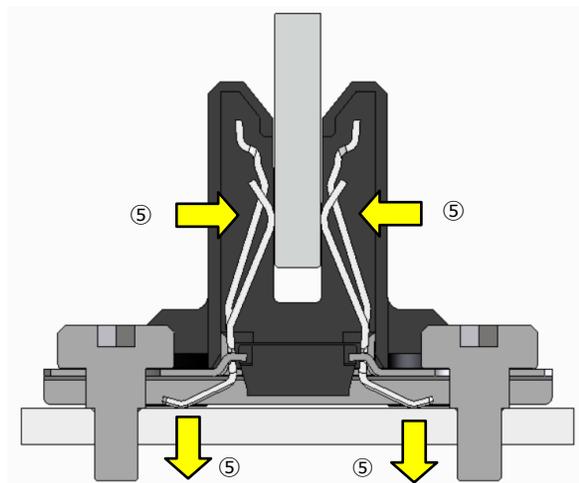
2-5-2 Contact structure

The contact structure of the PS4 series is shown below.



- ① The bus bar is inserted.
- ② When the bus bar hits the terminal, the terminal rotates in the direction indicated by the arrow.
- ③ Lifts the connector by rotating the terminal.
- ④ The connector is lifted until the no gap between the bracket and a floating screw.
- ⑤ When it is eliminated the gap, the terminal is pressed to the bus bar and the mounting bar.

There is the gap between the floating screw before the connector is lifted.



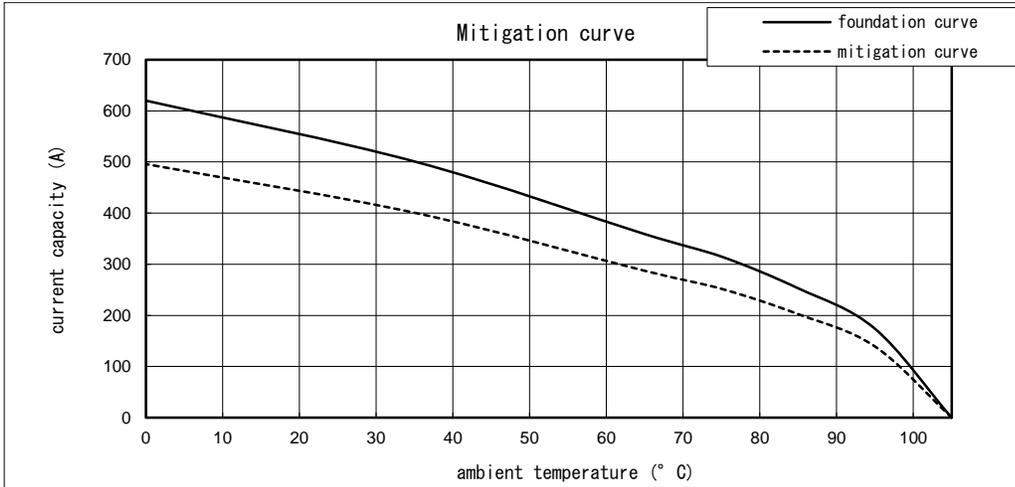
### 2-6 Current value

The current value varies depending on the thickness of the bus bar and the ambient temperature.

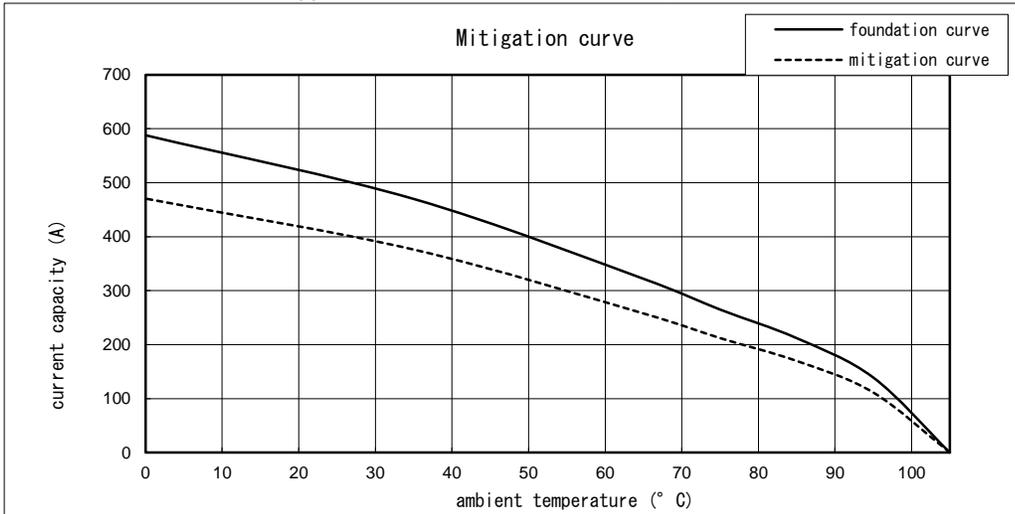
Use the current value below the mitigation curve shown below.

If the current value is above the mitigation curve, there is a **risk of fire**.

Applicable Products : PS4-6.35 T\*\*, PS4A-6.35T\*\*



Applicable Products: PS4-3.175 T\*\*, PS4A-3.175\*\*



### 3. Regarding bus bar and mounting bar

#### 3-1 Material of bus bar and mounting bar

Please use pure copper for the material of bus bar and mounting bar.

#### 3-2 Plating of bus bar and mounting bar

Please use silver plating for the bus bar and mounting bar.

(We recommend putting the plating more than 3 μm. Please evaluate yourself if you put the plating less than our recommendation.) In addition, tin plating and nickel plating cannot be used for the following reasons.

**Tin Plating:** When inserted or removed, oxide is formed on the bus bar, and the contact part of the terminal is formed on the oxide. The contact resistance becomes high when it is mounted on the bus bar, and if it is energized as it is, heat will be generated and there is a **risk of fire**.

**Nickel plating:** The contact resistance is high from the beginning, and it is not stable. Therefore, there is a **risk of fire** if energized.

#### 3-3 Bass Bar Dimensions

The specified dimensions of the bus bar are as shown below.

[Notes]

- Please use it with in our specified conditions. If the thickness of the bus bar is out of spec, the following problems will occur.

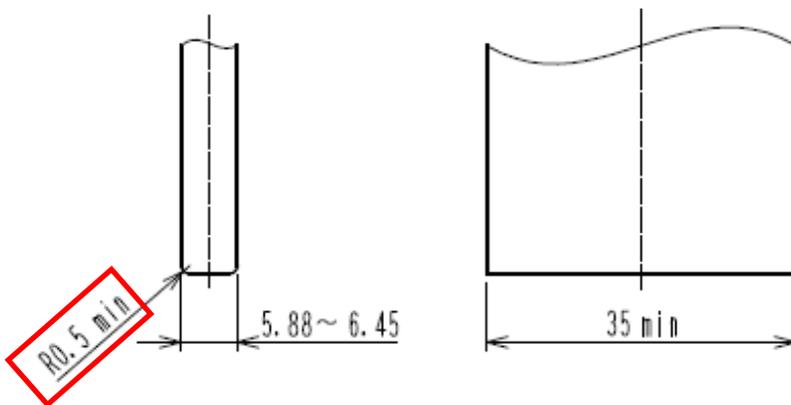
- Thick: It cannot be mated.

- Thin: The contact condition is not stable.

- Make round shape on the corner of the bus bar.

If there is no round shape on the corner of the bus bar as shown in Figure 1, the edge of the bus bar will be stuck by the terminal when the bus bar is inserted. There is a risk of buckling.

Applicable Product : PS4-6.35 T\*\*, PS4A-6.35T\*\*



Product : PS4-3.175 T\*\*, PS4A-3.175T\*\*

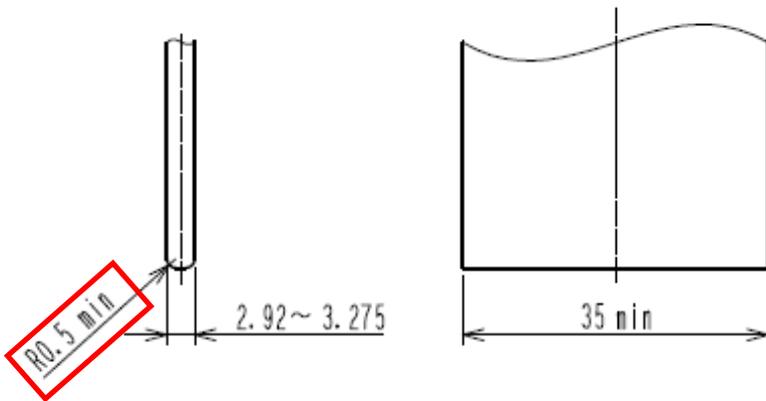
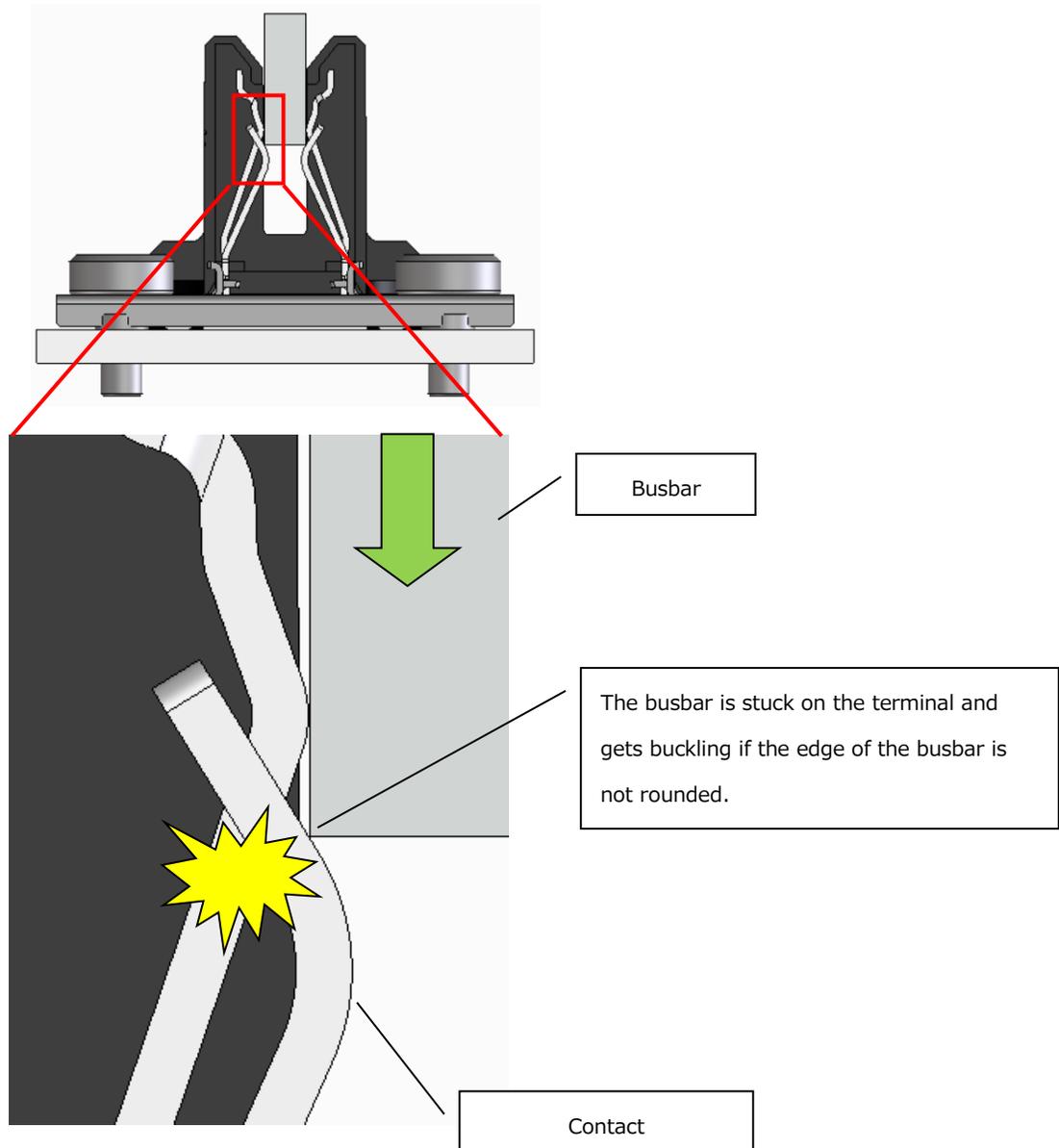


Figure 1



### 3-4 Mounting Bar Dimensions

The dimensions of the mounting bar are as shown below.

[Notes]

- If the external dimensions are smaller than specified, the terminals may be detached from the mounting bar and may not come into contact.

- Use a plate thickness of 5 mm min.

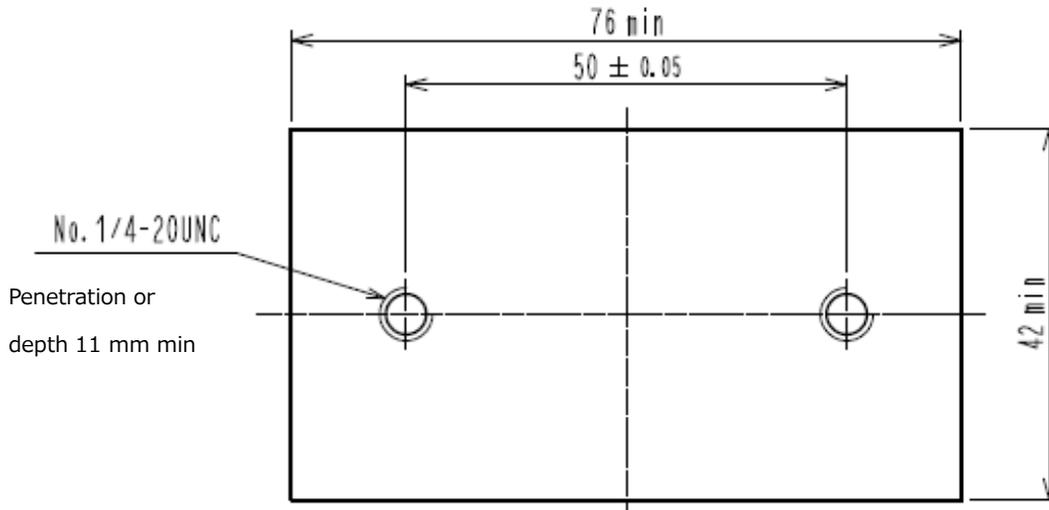
When the plate thickness is thin, it does not have space for 3 threads rotations.

- Please make 0.5mm+0/-0.1 chamfer in the inlet of the hole for the thread on the mounting surface.

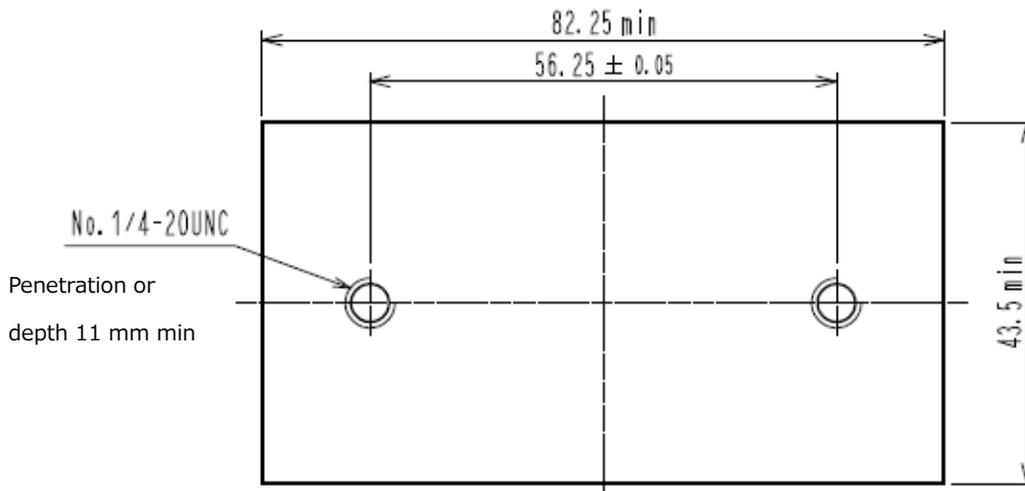
If the chamfer is less than or equal to the specified value: As shown in Figure 2, the incomplete thread portion hit the inlet of the hole edge on mounting bar and the gap between the mounting bar and floating screw makes larger than the spec. It may cause contact failure.

If the chamfer is greater than specified: As shown in Figure 3, the floating screw comes into the chamfer and interferes with the bracket, and the floating feature may not work.

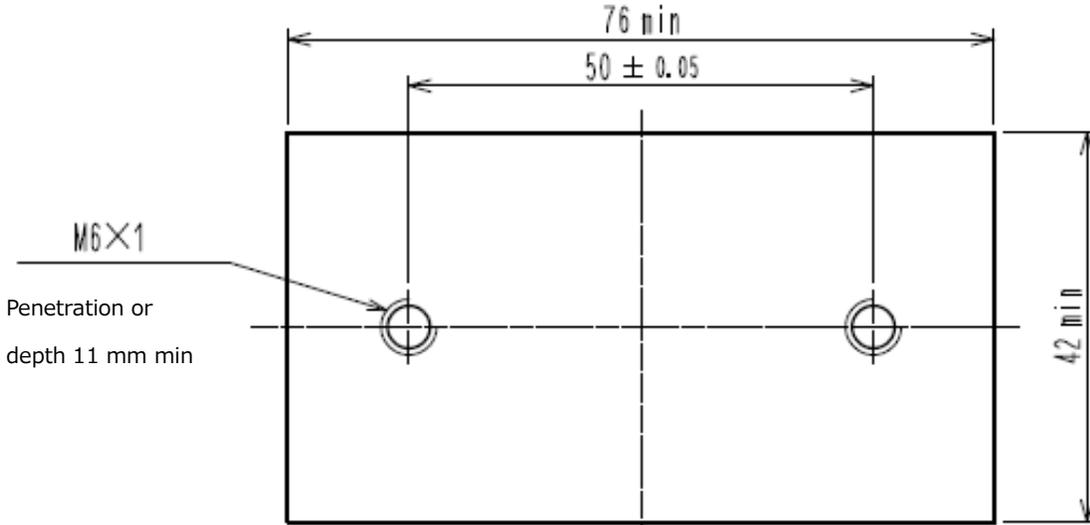
Applicable products: PS4-6.35 T, PS4-3.175 T



Applicable Products : PS4A-6.35 T, PS4A-3.175 T



Applicable products: PS4-6.35 T (01), PS4-3.175 T (01)



Applicable products: PS4A-6.35 T (01), PS4A-3.175 T (01)

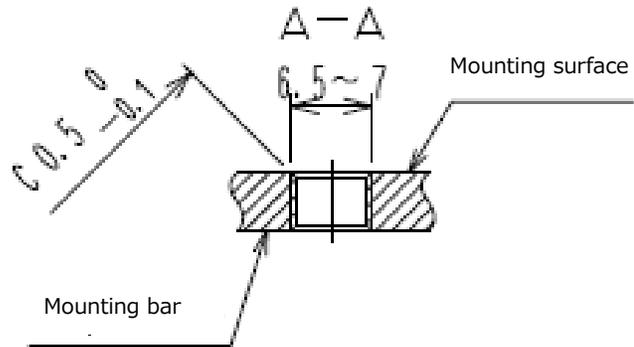
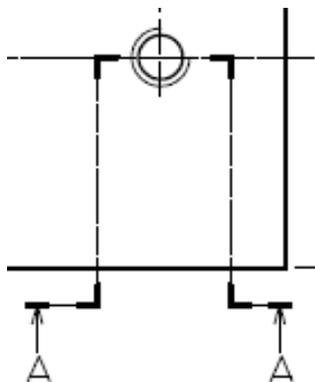
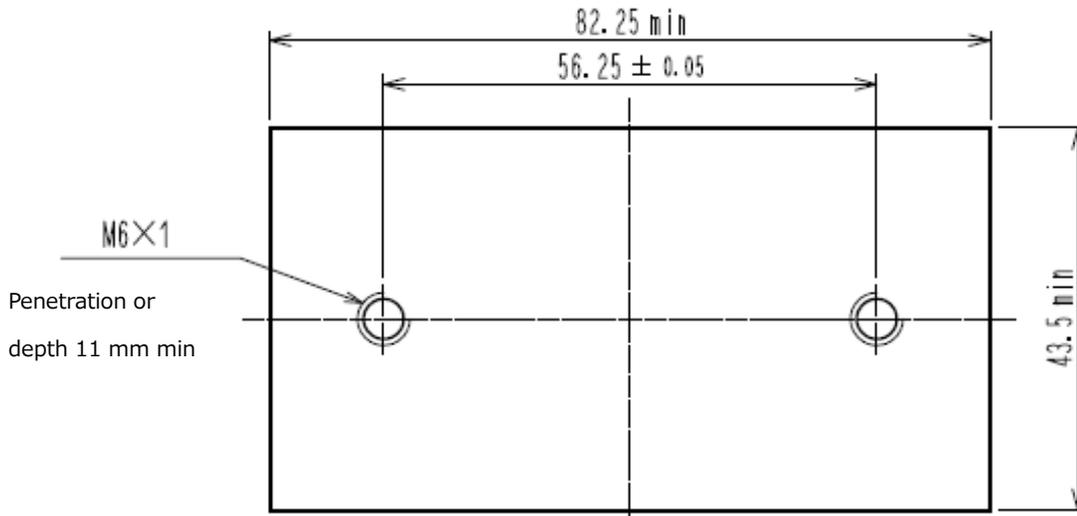
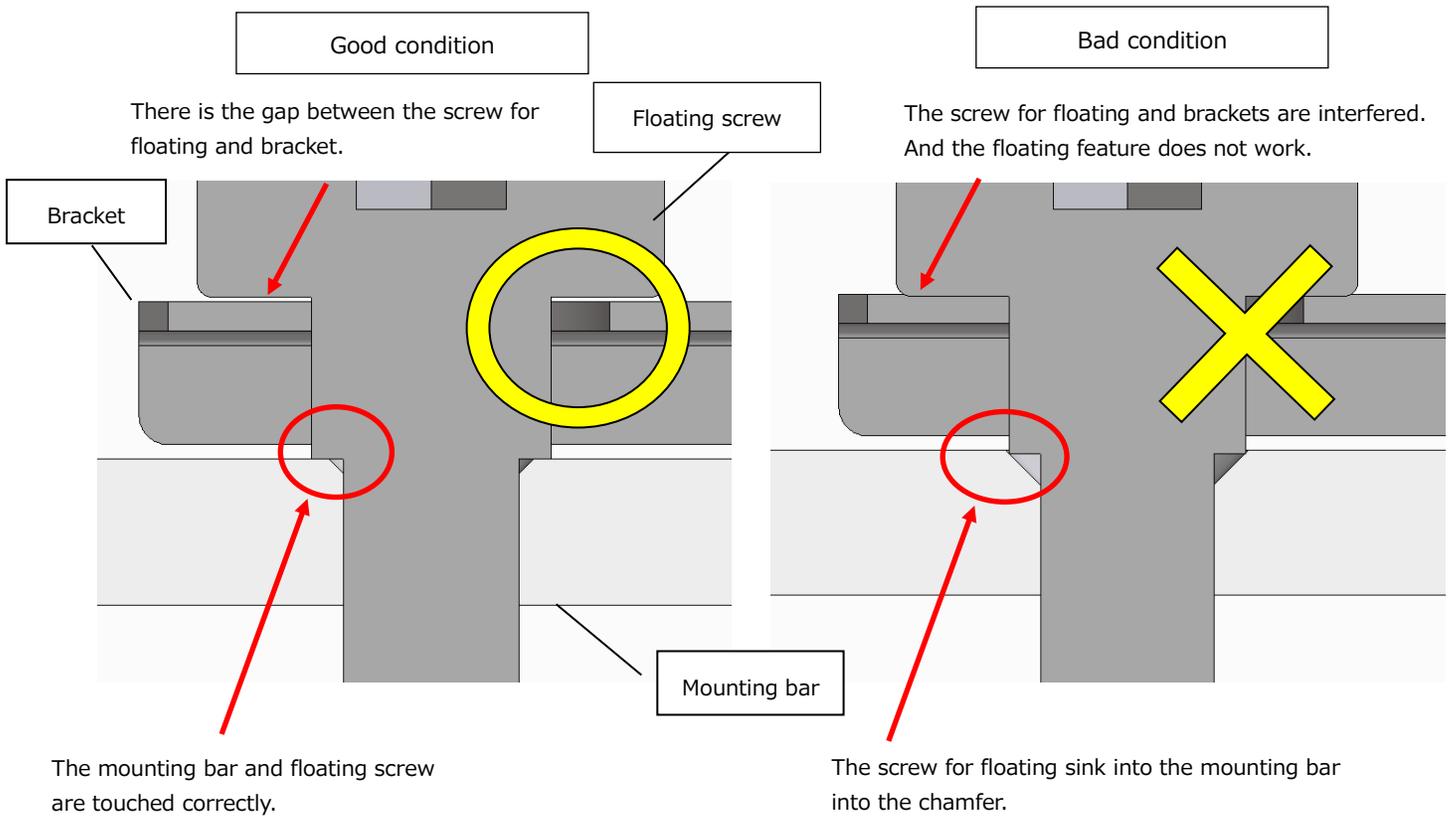


Figure 2

Incomplete screw section of floating screw is interfered, and floating screw cannot hit the bottom.



Figure 3



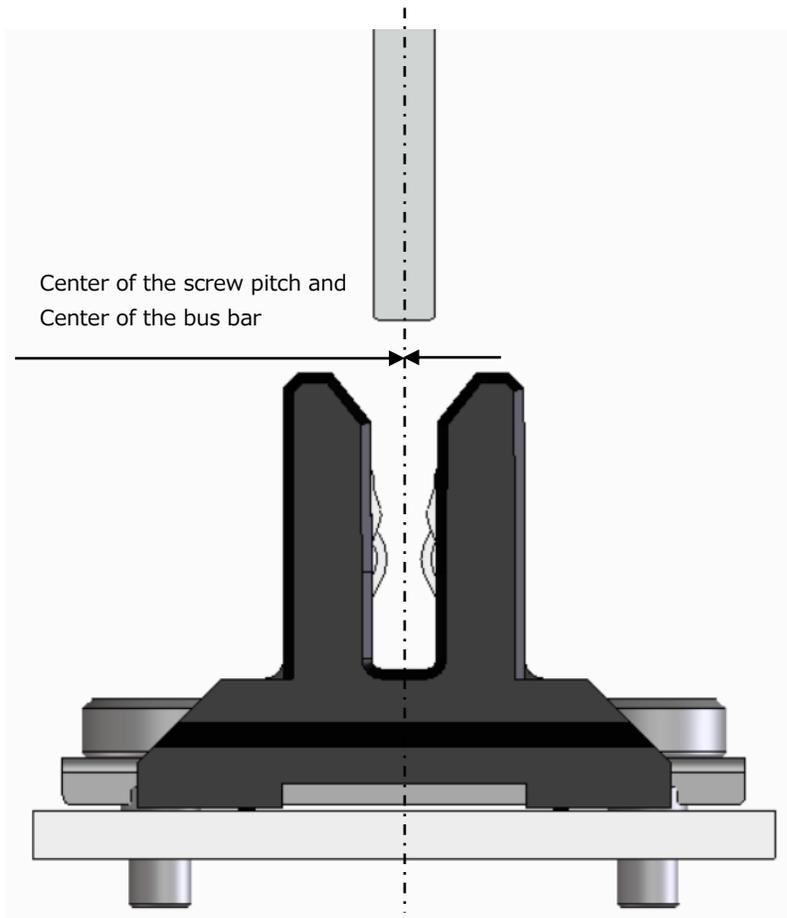
## 4. Notes for the design

### 4-1 Mounting position

#### 4-1-1 Mounting position of connector and bus bar

Align the center of screw pitch with the center of bus bar.

The tolerance of misalignment of each of the centers and the tolerance caused by machining and installation can be allowed up to 2 mm. Regarding the floating structure, please refer to 2-5.



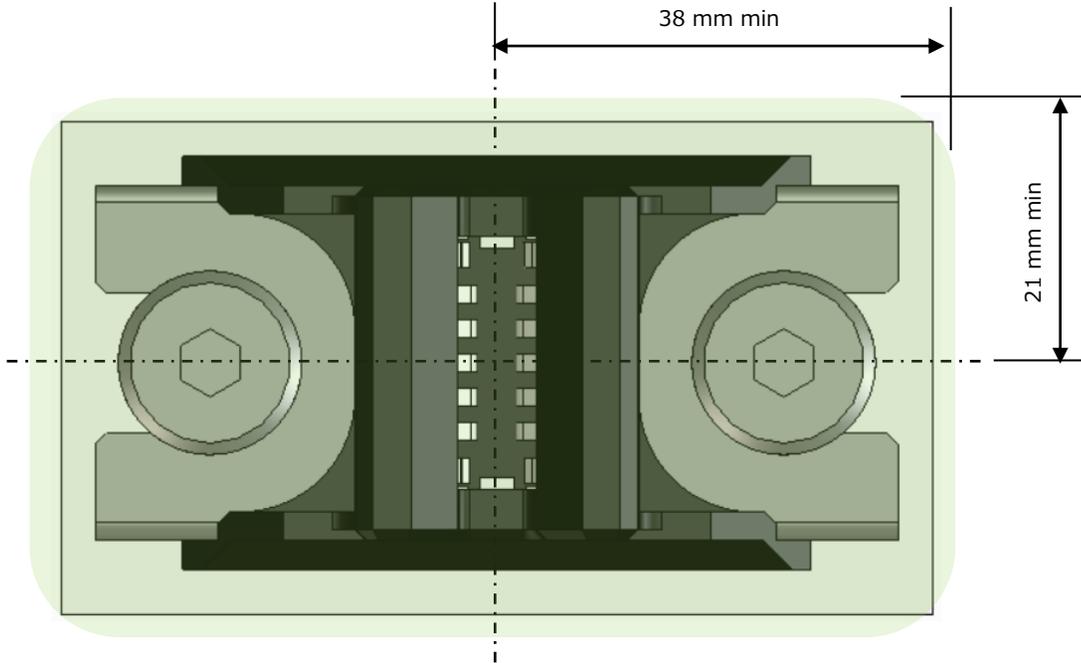
Center line is the center of the pitch of screws.

4-1-2 Mounting instruction around the connector

The layout dimensions of the parts used in the design of the equipment are shown below. (Keep out area is shown by light green area.)

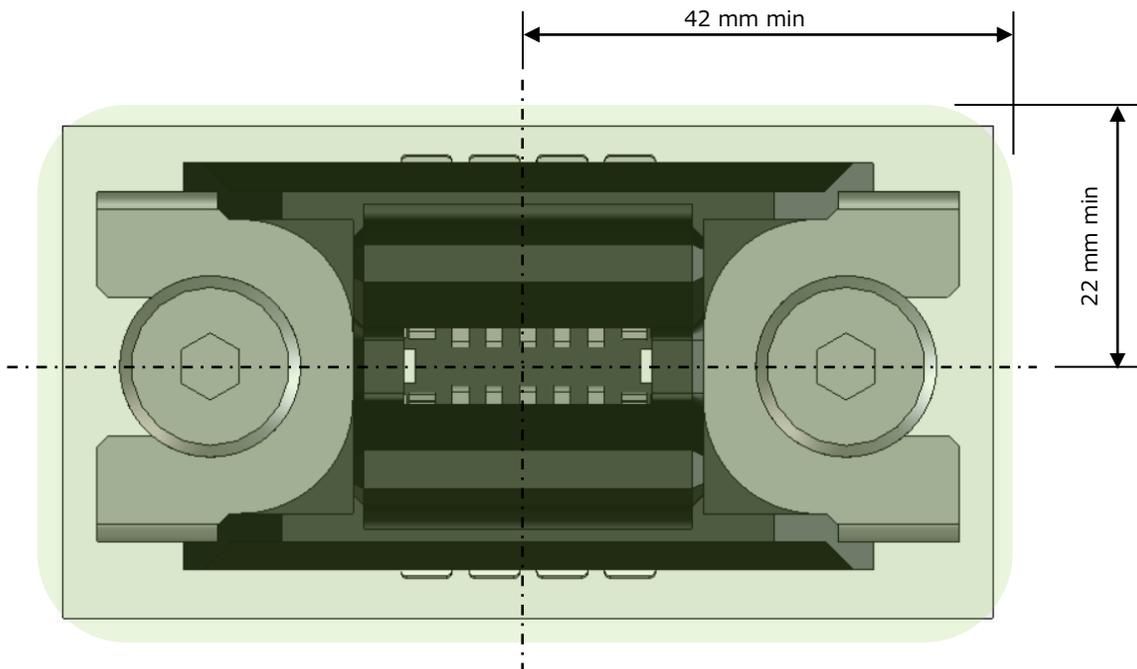
There is a risk of space conflict when the connector moves.

**Applicable products: PS4-6.35 T\*\*, PS4A-6.35T\*\***



The center line is the center of the screw

**Applicable products: PS4-3.175 T\*\*, PS4A-3.175T\*\***



The center line is the center of the screw pitch.

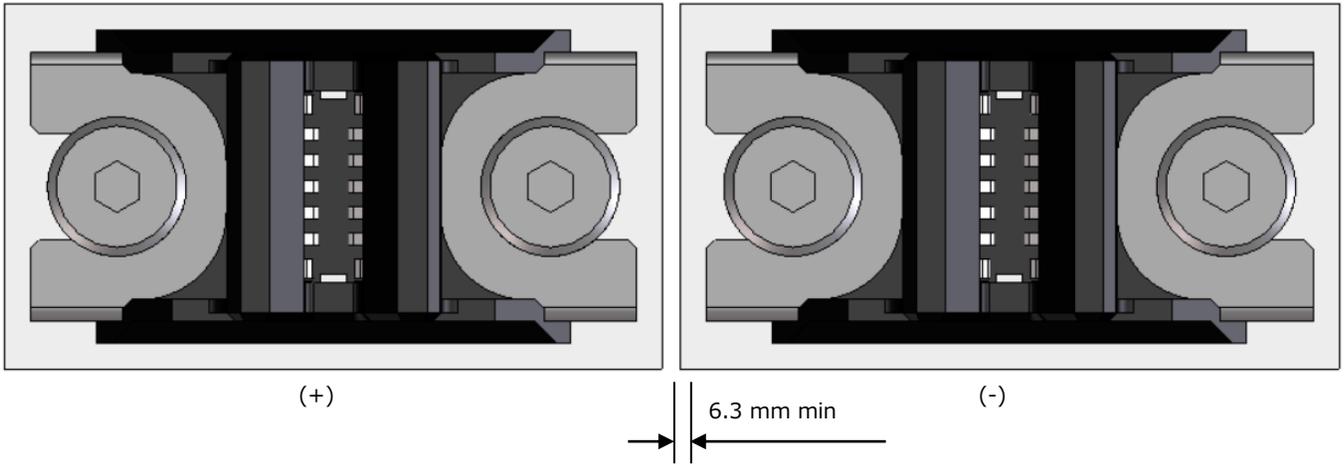
4-1-3 Mounting dimensions of the mounting bar

In order to satisfy the withstand voltage of 600 V, Keep the distance between the mounting bars when using positive, negative, etc.as shown below.

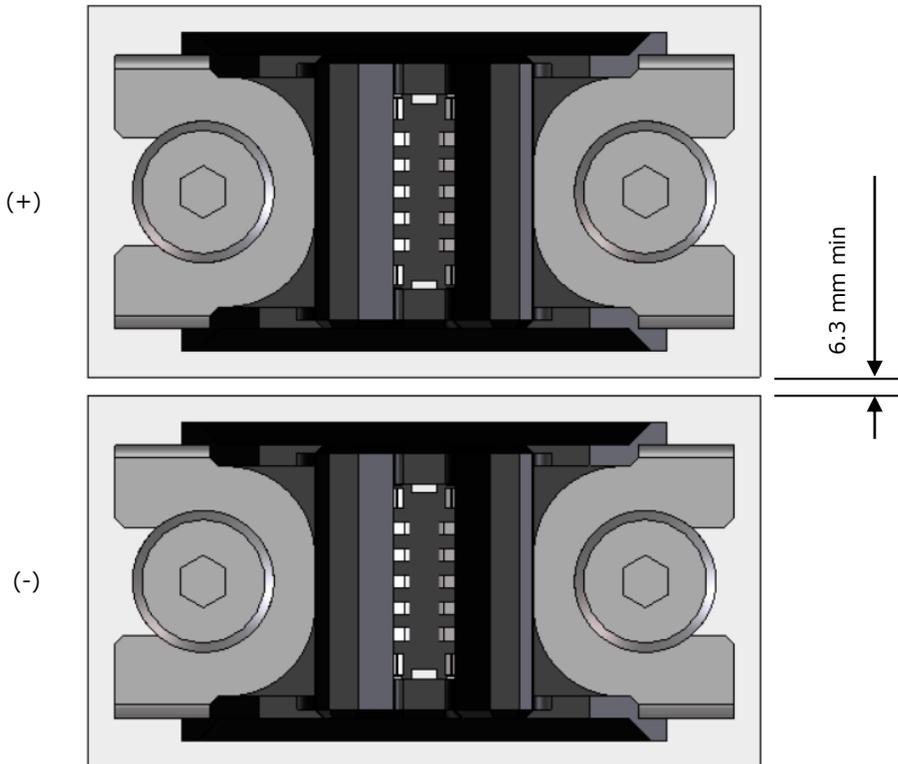
Subject to IEC (EN) 61984 Overcurrent Category IV.

**Applicable products: All products**

When it is installed horizontally



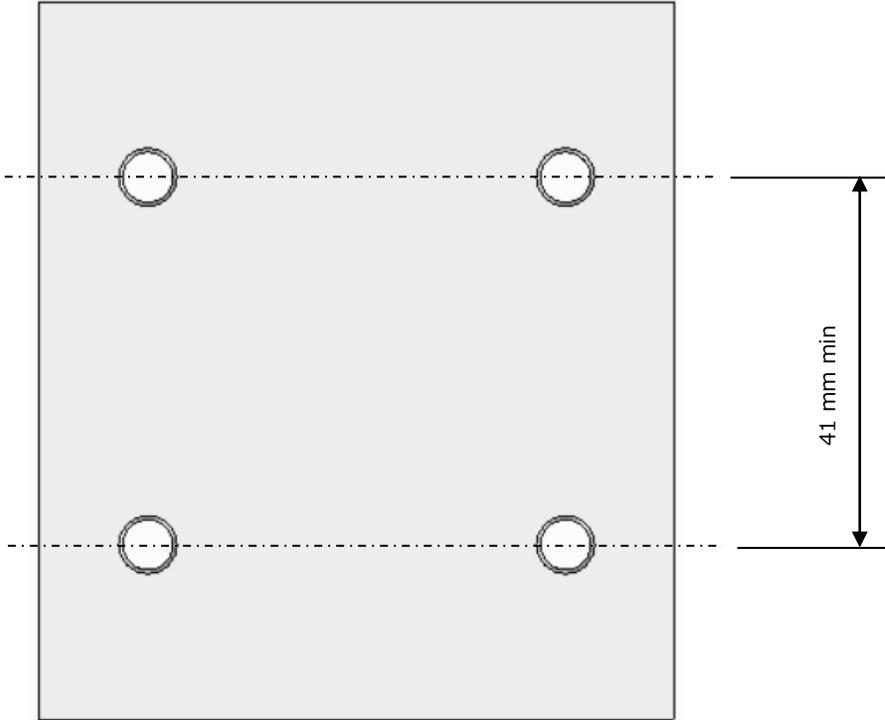
When it is installed vertically



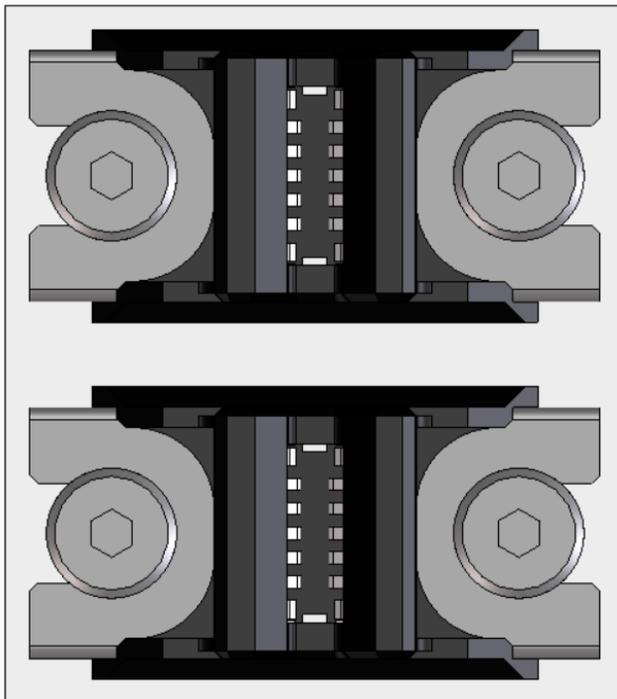
4-1-4 Dimensions when using multiple connectors for the same mounting bar.

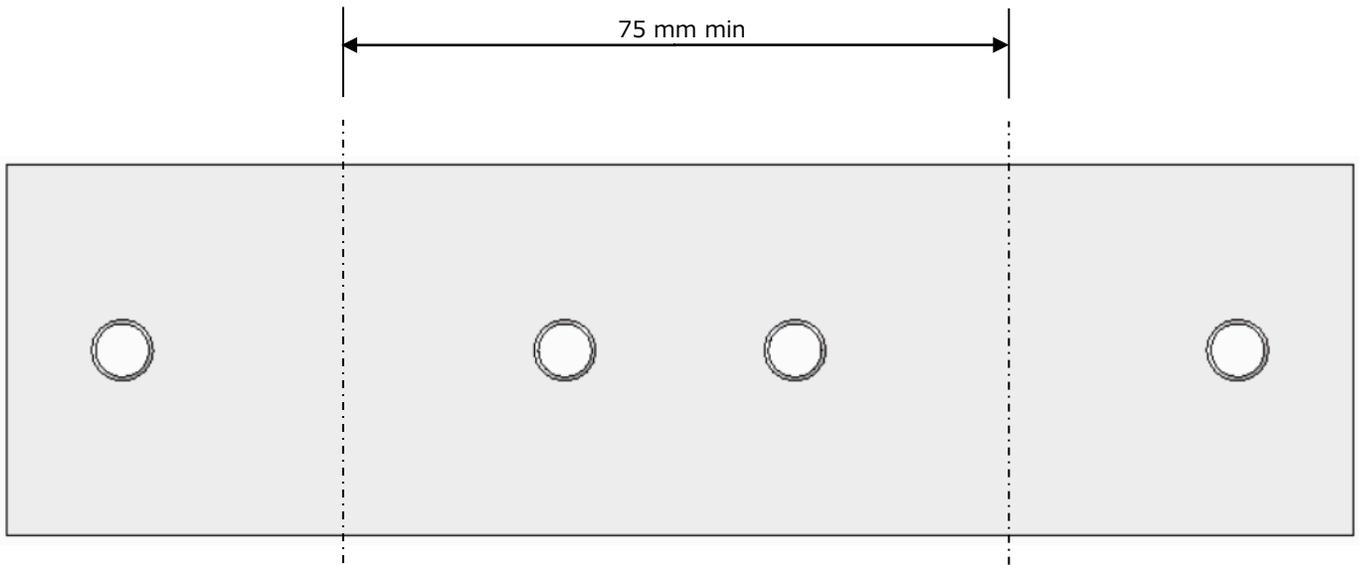
When using multiple connectors for the same mounting bar, use the dimensions shown below. If the pitch distance is less than below, the connectors may hit each other when it is floating, causing mating issue.

**Applicable products: PS4-6.35 T\*\*, PS4-3.175 T\*\***



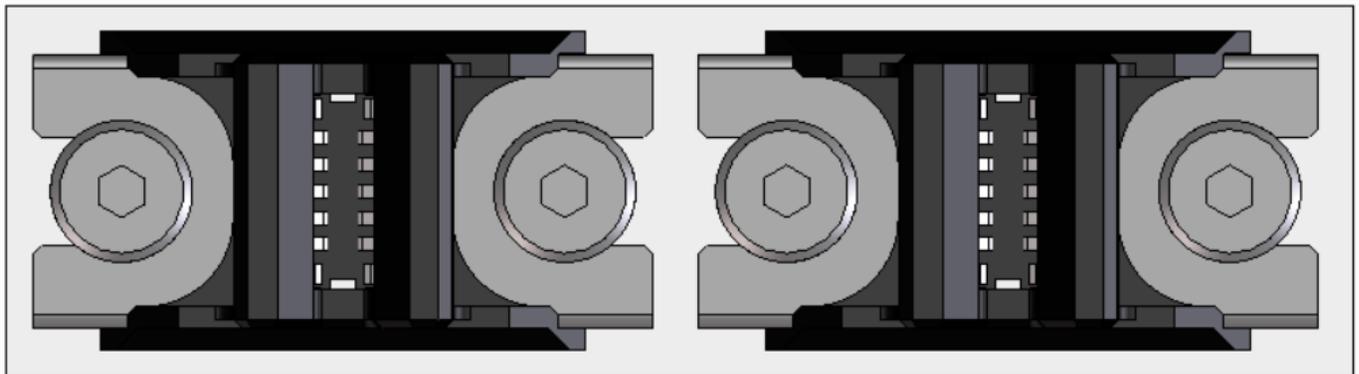
Connector mounting image.



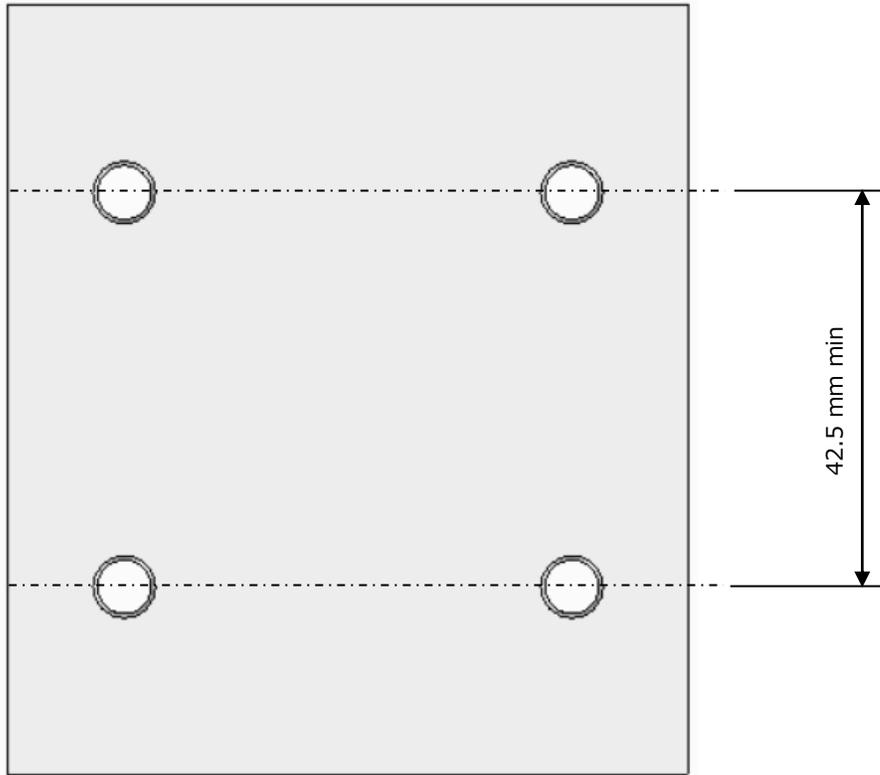


The center line is the center of the screw pitch.

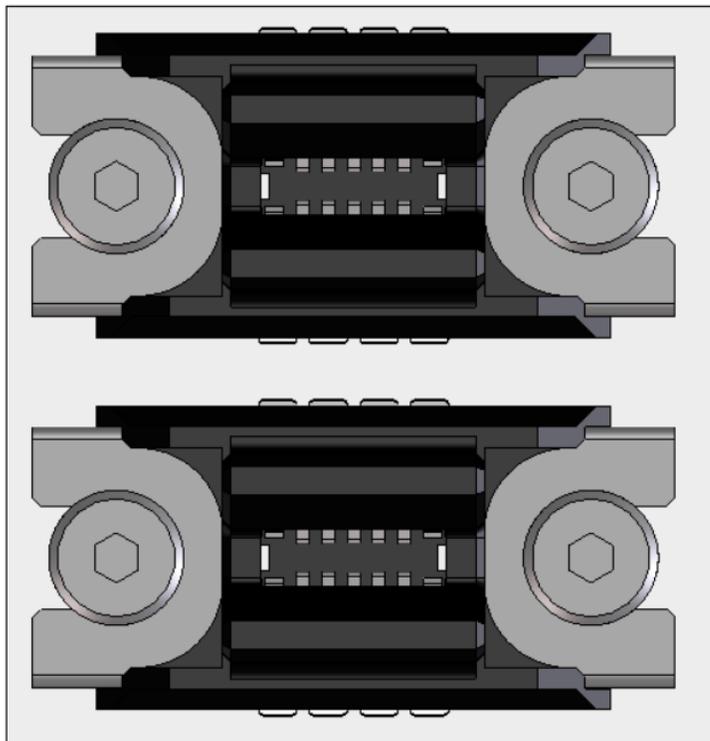
Connector instration

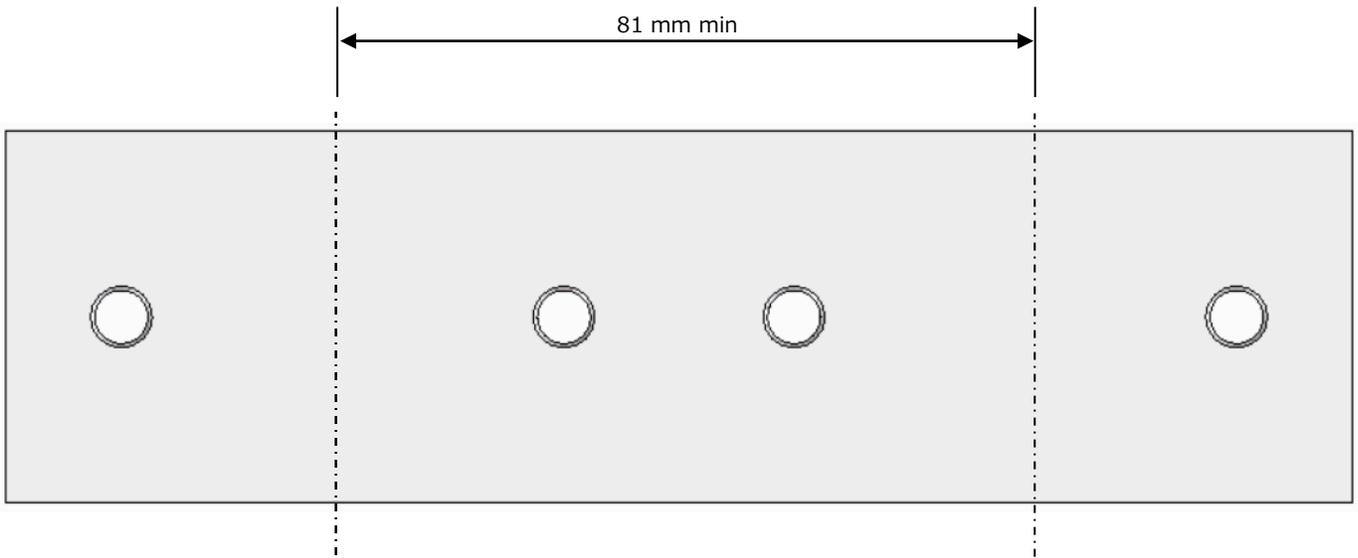


Applicable products: PS4A-6.35 T\*\*, PS4A-3.175\*\*



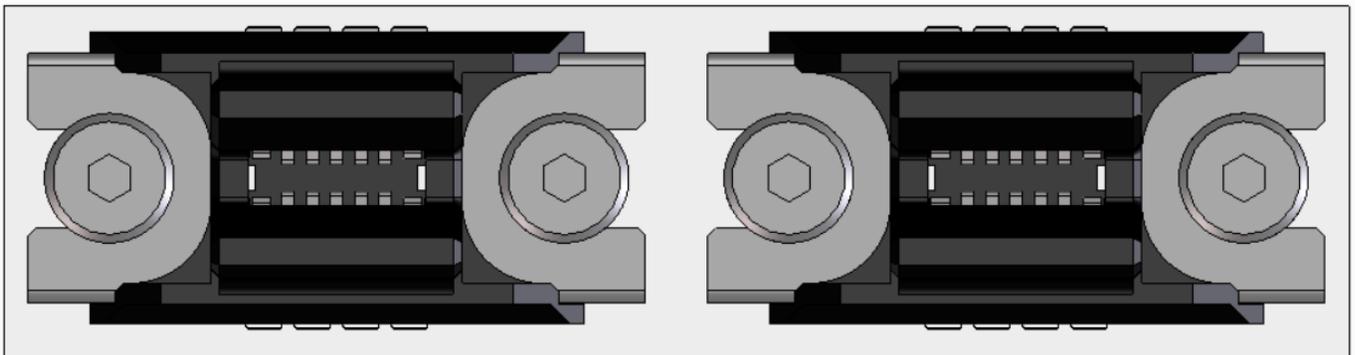
Connector mounting image.





The center line is the center of the screw pitch.

Connector mounting image.



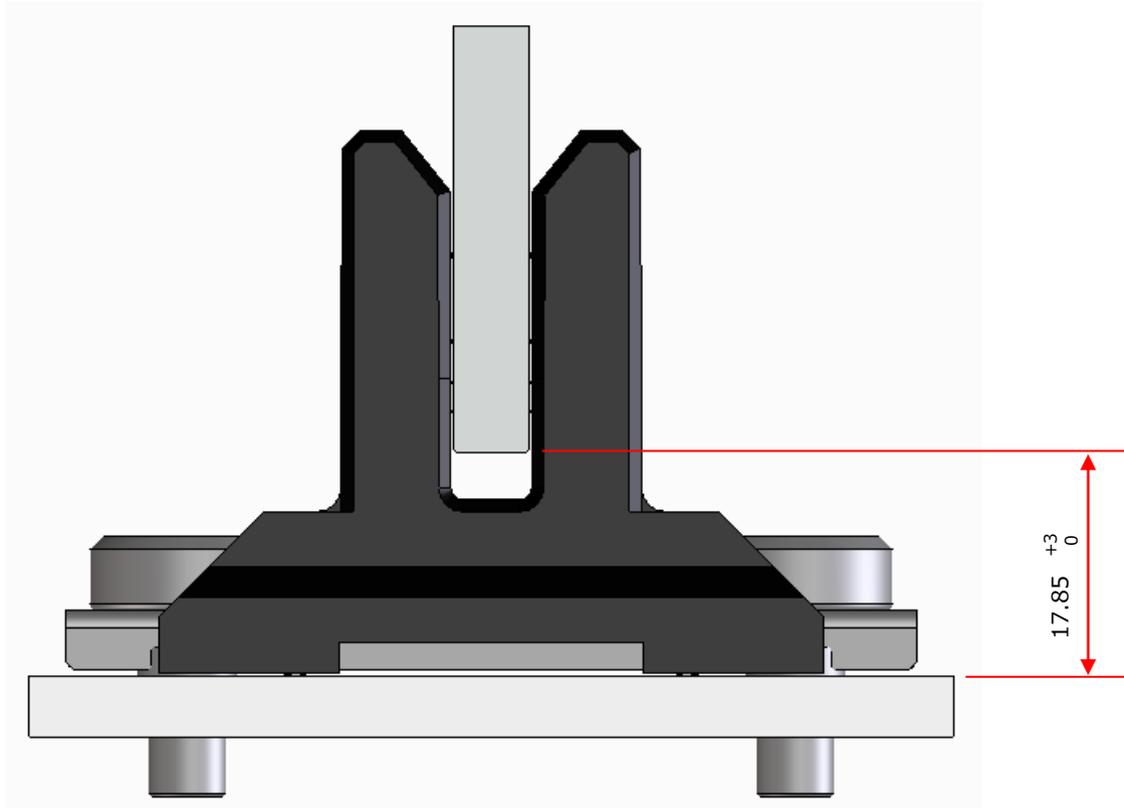
4-2 mating dimensions

The mating dimensions of the bus bar are shown below.

[Cautions]

Out of tolerance (more than upper limit) The effective length is shortened and contact problems may occur.

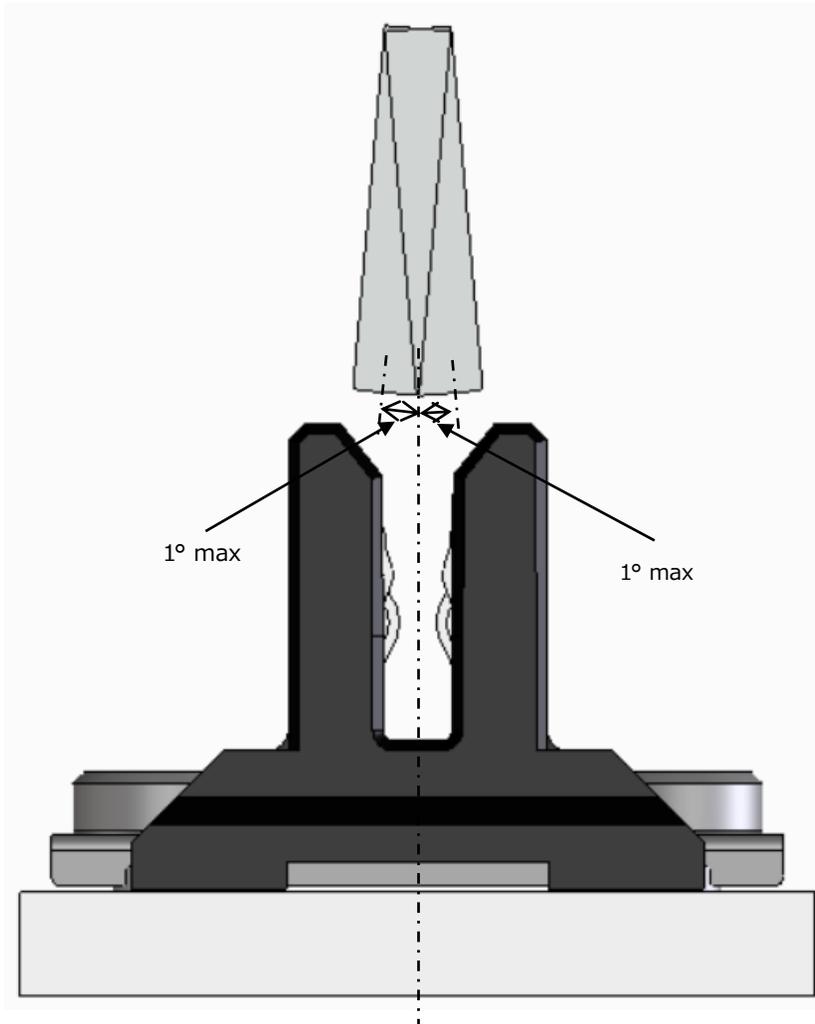
Out of tolerance (Less than lower limit) The bus bar may hit the bottom of the connector and get it damaged.



### 4-3 Busbar insertion angle

The busbar insertion angle should be 1° max against to the connector.

If the angle is 1° max, the busbar may hit the insulation case and it may get damaged.



## 5. Connector installation procedure

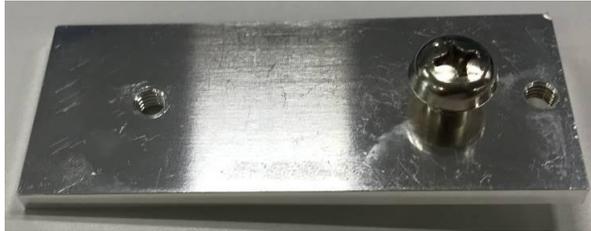
### 5-1 Connector installation method

Please follow the procedure as below.

#### 5-1-1 Installing the floating screw.

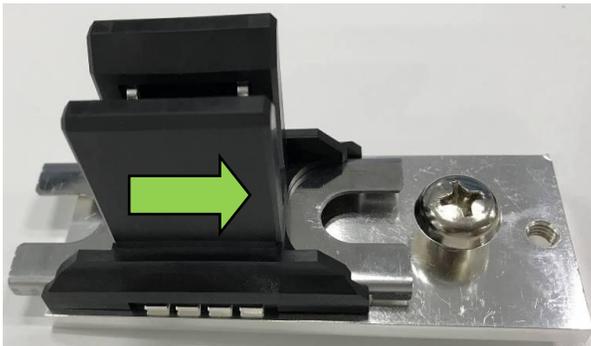
Tighten the floating screw on one side as shown in the figure below.

The tightening torque should be  $5 \text{ N} \cdot \text{m}$ . (This spec is for the bus bar which is pure copper material)



#### 5-1-2 Insert connector.

Slide the connector in as shown below.



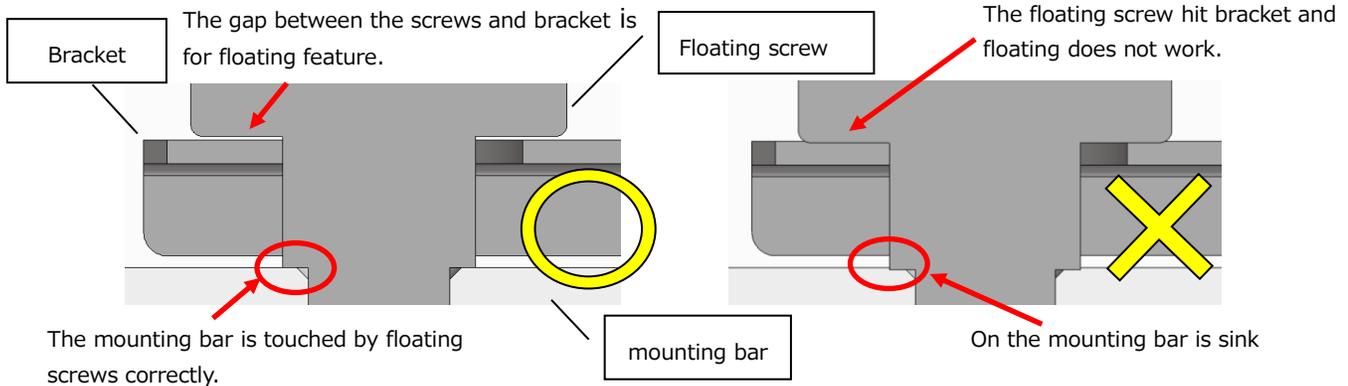
#### 5-1-3 Floating screw installation

Install the screw on the other side then it is completed.



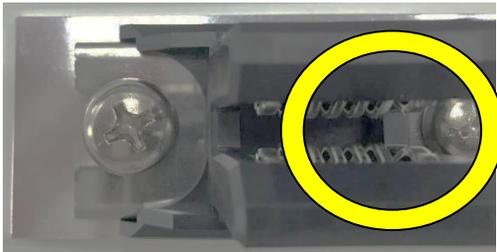
**5-2 Cautions**

When tightening the floating screw which is described at section 5-1-1, if you tighten the screw greater than the specified value, the floating screws may be sink into the mounting bar and the floating feature may not work correctly.

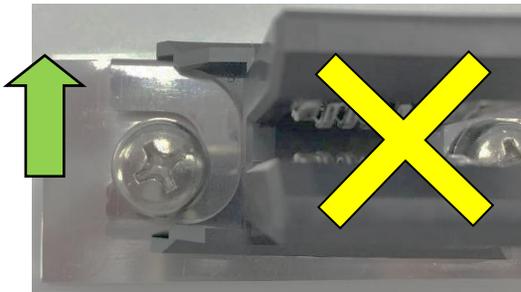


•When you tighten the floating screw on the other side of 5.1.3, if you place the connector to one side, the screw hit the bracket and it may be deformed. If the bracket is deformed, it does not float, the terminal is buckled when it is mated.

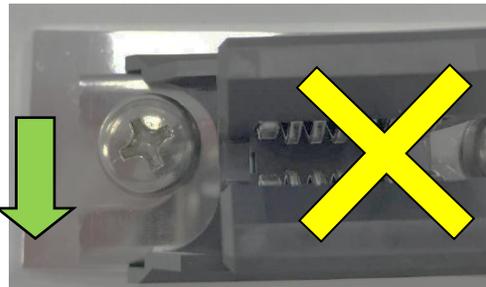
Connector is in the center.



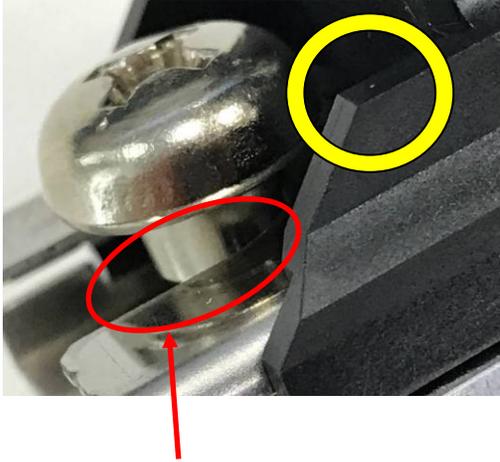
Connector is offset upside.



Connector is offset downside.

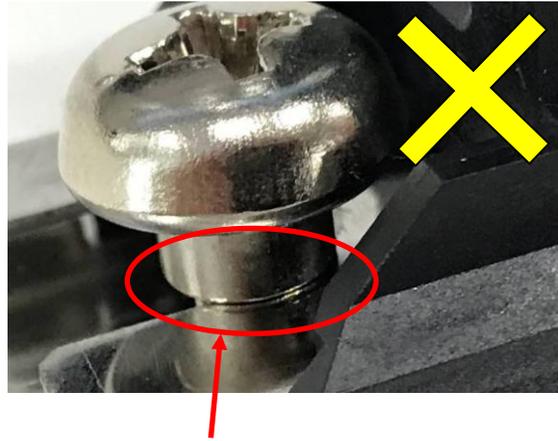


When the connector is in the center



The screw for floating is in the correct position.

When the connector is offset



The bracket may get deformed by screw.

## **6. Other**

### **6-1 Insertion/Removal with hot swapping**

As this product does not support hot swapping, it cannot be used for the purpose of shutting off the power. When hot swapping happens by insert/removal, the terminals may burn, fire, or melt.

### **6 Discoloration of the terminals**

Because the terminals are silver plated, they may react with atmospheric sulfide and turn a dark brown color. But it should not impact the connector performance.

Written	MO.SHIMOYAMA	20240402
Charged	MO.SHIMOYAMA	20240402
Checked	KG.OKITA	20240402
Approved	TU.TANIGUCHI	20240403

revision or revision history

Version No.	Description of revisions	Designed	Checked	Date
0				