



## Installation Guide

### Frame 12 AFE Filter

All-in-one packaged Active front end filter for Frame 12 400 V and 575/690 V variable speed drives

Part number: 0478-0753-01



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# 1 Introduction

This installation is based on a Rittal VX25 cubicle (VX 8406.00). The dimensions are 2000 mm (Height), 600 mm (Depth), 400 mm (Width).

The Nidec Drives AFE filter fitting kit used in this Installation Guide is part number 6772-0022.

References are also made to Nidec Drives Ramp kit, part number 6500-0158, which is also used in the installation of the AFE filter.

**NOTE:** Enclosures wider than 400 mm can also be used with the AFE filter fitting kit, however an additional panel approximately equal to the distance in width between the larger cubicle and 400 mm will need to be installed at the top of the cubicle to ensure optimum air circulation.

## Example 1:

If the cubicle width is 600 mm, an additional panel  $600 \text{ mm} - 400 \text{ mm} = 200 \text{ mm}$  in width is needed. The length of this panel is approximately 540 mm and the thickness is 1 mm.

## Example 2:

If the cubicle width is 800 mm, an additional panel  $800 \text{ mm} - 400 \text{ mm} = 400 \text{ mm}$  in width is needed. The length of this panel is also approximately 540 mm and the thickness is 1 mm.

## AFE filter dividing kit

A filter divider kit, part number 6772-0020, should also be used to create a physical barrier between the drive and AFE. This barrier prevents heat transfer between the drive and the AFE filter and therefore allows the warm air to be channelled up and out of the top of the cubicle more efficiently.

The filter dividing kit installation guide contains all the necessary details and can be found under part number 0478-0724-01.

## **2 Safety information**

There are risks of injury when installing the AFE filter due to its size and weight. Please ensure that local health and safety laws are observed when installing this filter.

### **Personal Protective Equipment (PPE)**

Ensure that safety shoes/boots are worn when installing the AFE filter.

It is recommended that gloves are worn due to sharp edges on the installation accessories. Gloves will also provide improved grip when installing the AFE filter into the cubicle

The use of safety glasses is recommended.

### **Lifting and handling**

The AFE filter weighs 199 kg (438 lb). Ensure that 2 persons are used to transport and to push the AFE filter up the ramp. If lifting equipment is available to aid the lifting and transportation of the AFE filter, then it should be used.

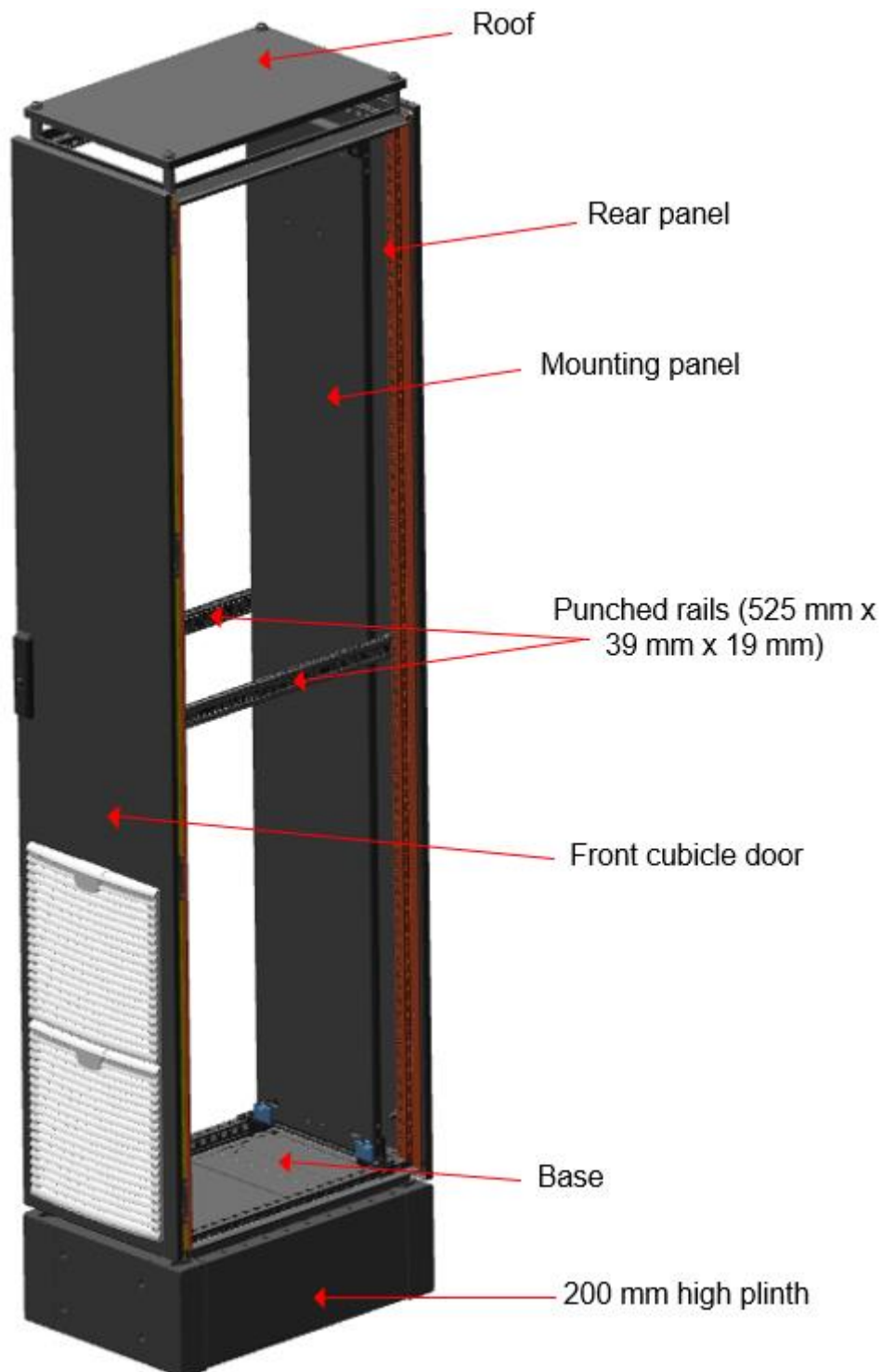
Ensure that the cubicle is supported adequately when the AFE filter being inserted.

Ensure that no other persons are in the installation area when lifting and handling the AFE filter.

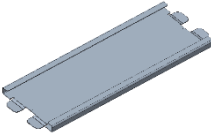

## 3 Parts

### 3.1 Rittal VX25 cubicle

RITTAL enclosure VX 8406.000 (2000 mm tall, 600 mm deep, and 400 mm wide) complete with two punched rails shown on sides, mounting panel, front door, rear panel, base, 200 mm plinth and roof.



### 3.2 Contents of fitting kit 6772-0022





Item	CT Part number	Description	Image	Quantity
1	6164-0003	M6 Two-lock nut		4
2	6165-6016	M6 x 16 Double SEM torx screw		6
3	6185-8020	M8 x 20 Double SEM torx screw		2
4	6192-0002	M10 x 20 hex head screw		2
5	6193-0003	M10 Two-lock nut		2
6	6521-0294	AFE filter foot stiffener		1
7	6521-0295	AFE filter top support VX25		1
8	6521-0296	AFE filter top lock TS8		1
9	6521-0297	AFE filter top support TS8		1
10	6521-0307	AFE filter rear baffle plate		1
11	6521-0311	AFE filter rail shim		2
12	6521-0313	AFE filter side baffle		2

Item	CT Part number	Description	Image	Quantity
13	6521-0321	AFE filter top lock		1
14	6521-0322	AFE filter bottom spacer VX		1
15	6521-0323	Uni M filter baffle shim		2
16	6521-0324	AFE filter corner spacer		2
17	6521-0325	AFE front baffle plate		1
18	6521-0327	AFE top baffle plate		1
19	6541-0313	AFE filter rail bracket		1
20	6541-0315	AFE filter castor rail		1
21	6541-0370	AFE filter mounting panel bracket		2

**NOTE:** Fitting kit 6772-0022 can also be used with Rittal TS cubicles but this installation guide covers the installation for Rittal VX enclosures only.

### 3.3 Additional Rittal parts required

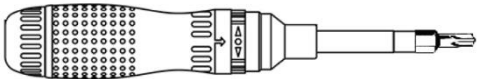
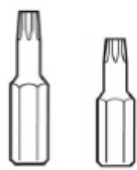
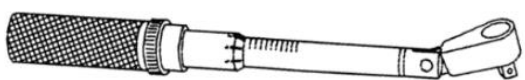

The list of items below are Rittal parts that are required but are not part of the fitting kit 6772-0022.

Item	Rittal part number	Description	Image	Quantity
1	8612.040 *	Punched section 375 x 73 x 17 (TS option)		1
2	8617.110 *	Punched section 325 x 64 x 23 (VX option)		1
3	2486.600	Metal multi tooth screw 5.5 x 13 mm		44
4	7967.000	Roof spacer (TS and VX options)		4

**NOTE:** Items 1 and 2 are only suitable for a 400 mm wide cubicle. If a wider cubicle is being used, the parts required are listed below:

Cubicle type	600 mm	800 mm	1000 mm
VX	8617.130	8617.140	8617.150
TS	8612.060	8612.080	8612.000

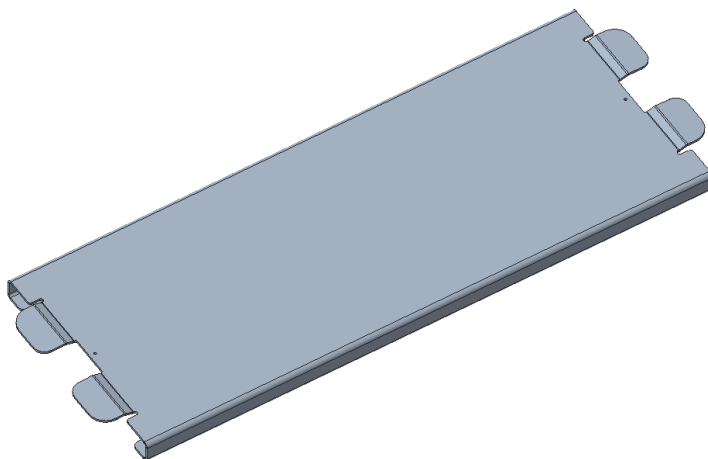
## 4 Tools required

	<div>T40 T30</div> 
	<div>17 mm (0.67 in) 13 mm (0.51 in) 10 mm (0.39 in)</div> 



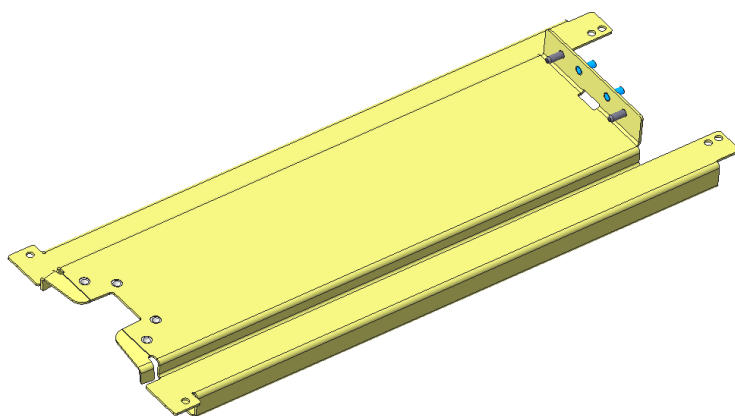
## 5 Installation instructions

Obtain part 6521-0294:

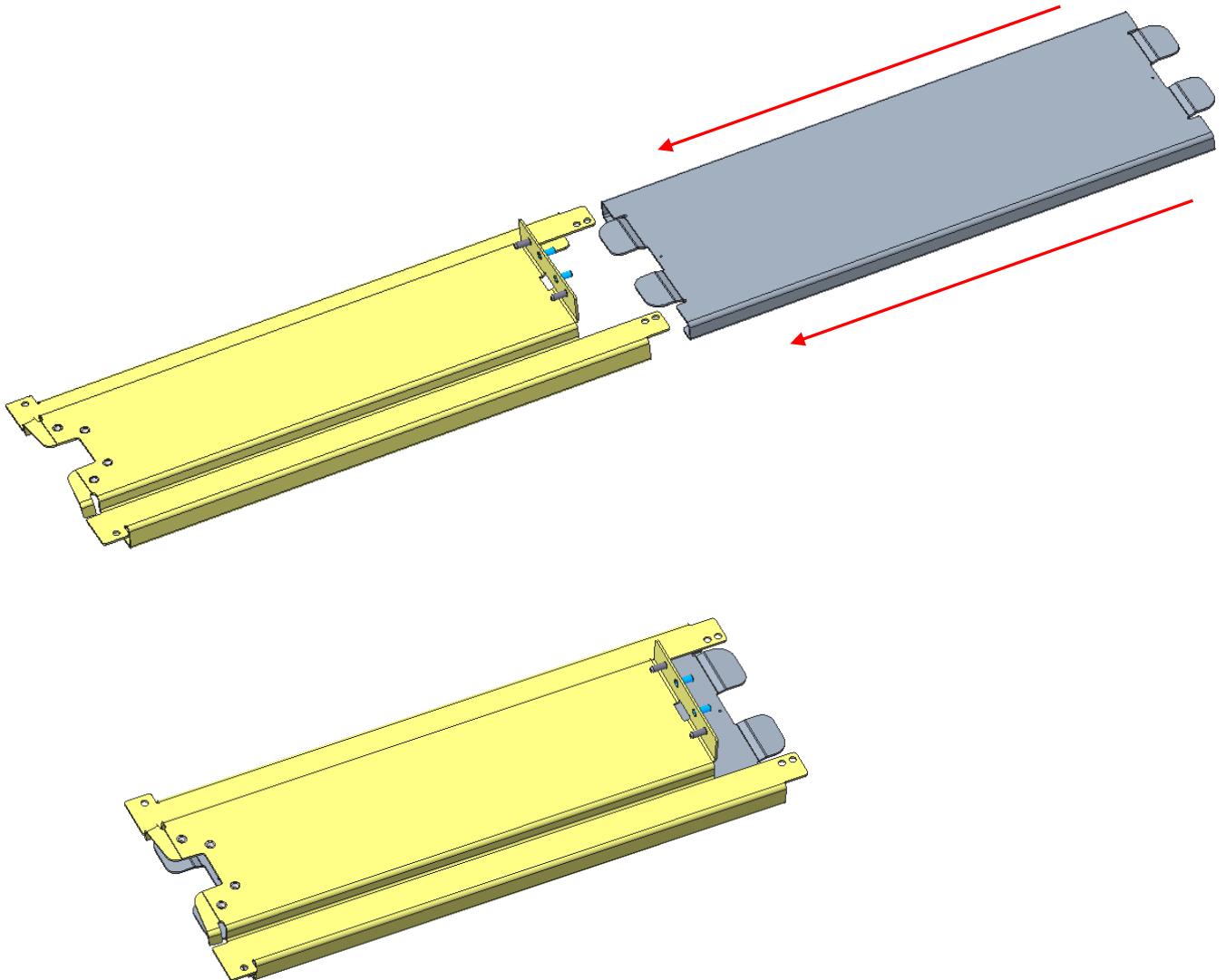


**NOTE:** Part is symmetrical

Obtain part 6541-0315



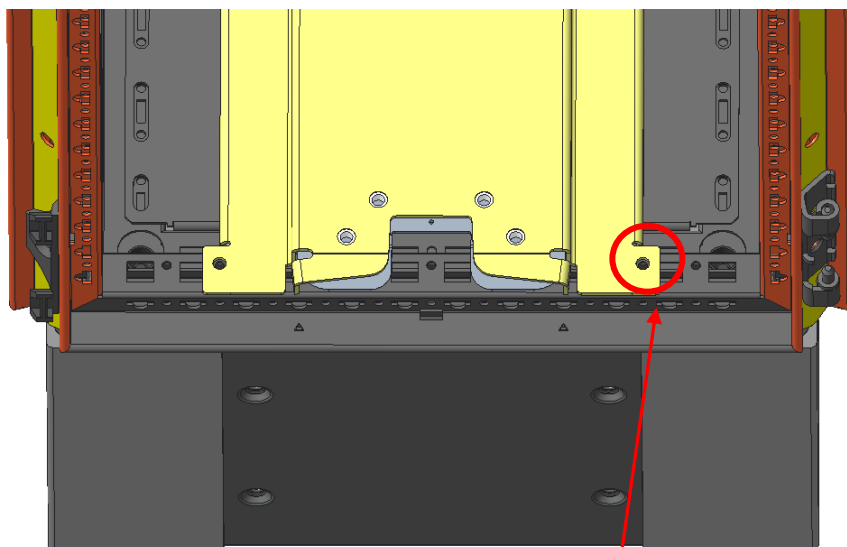
Slide part 6521-0294 into rear end of part 6541-0315 as shown below.



The footplate for the filter is now ready.

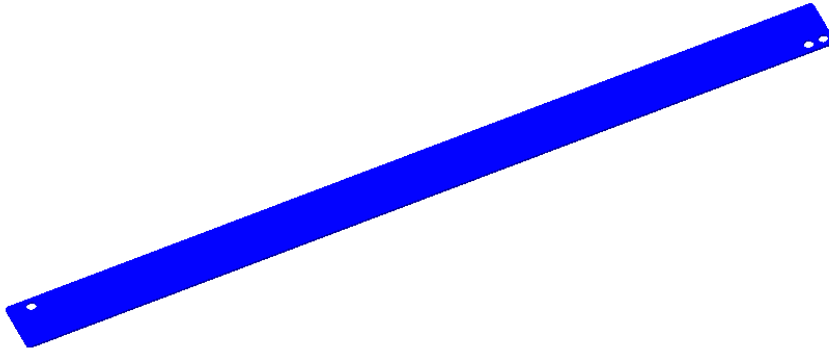


Foot for filter is fitted at the bottom of the cubicle frame as shown

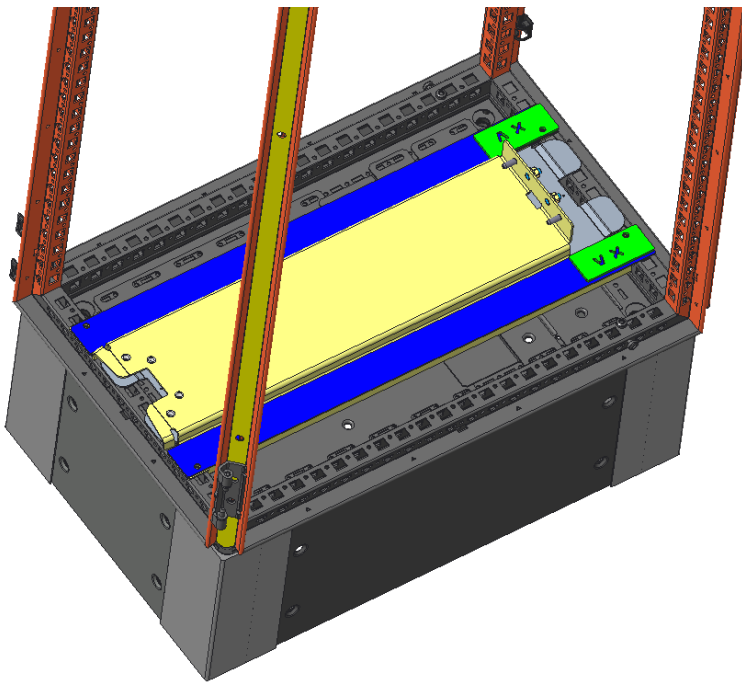
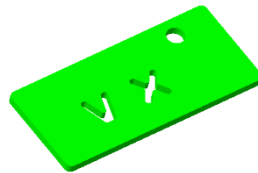


Hole on right side of foot is aligned with 2<sup>nd</sup> hole from right side of cubicle frame (front view), even if a wider cubicle is used.

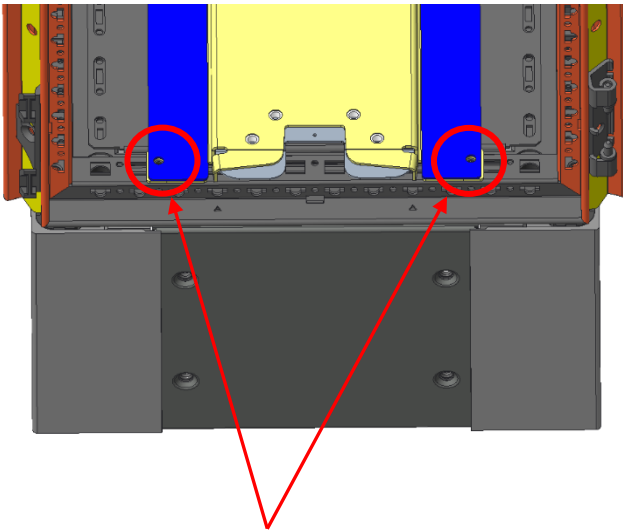
Obtain part 6521-0311



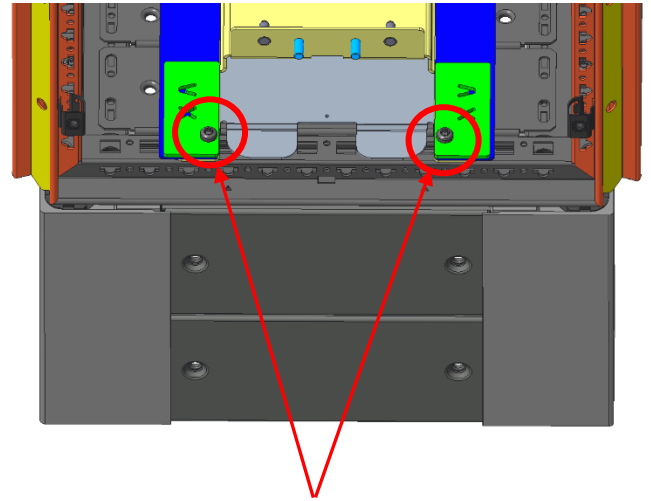
Obtain part 6521-0325



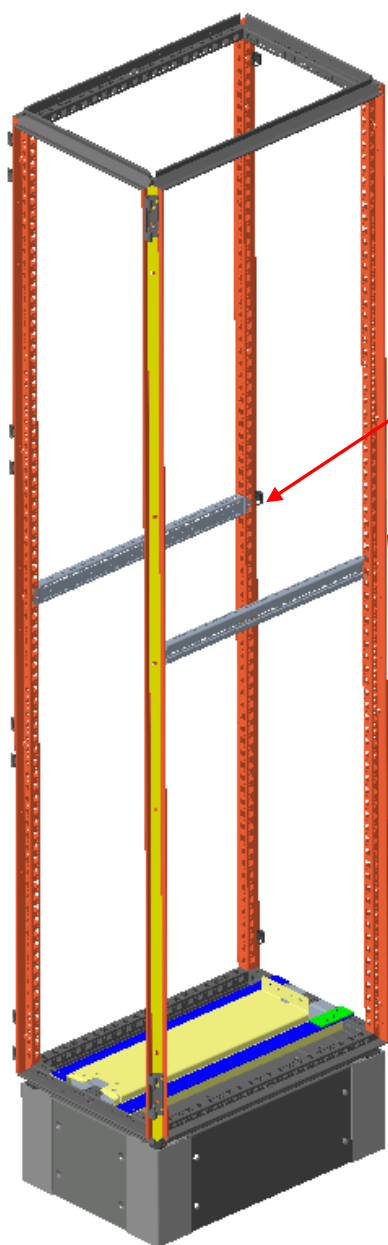
Place two shims 6521-0311 and two spacers 6521-0324 on foot as shown



Detail of holes on shims 6521-0311 aligned with holes on cubicle frame front end. Do not fit screws.



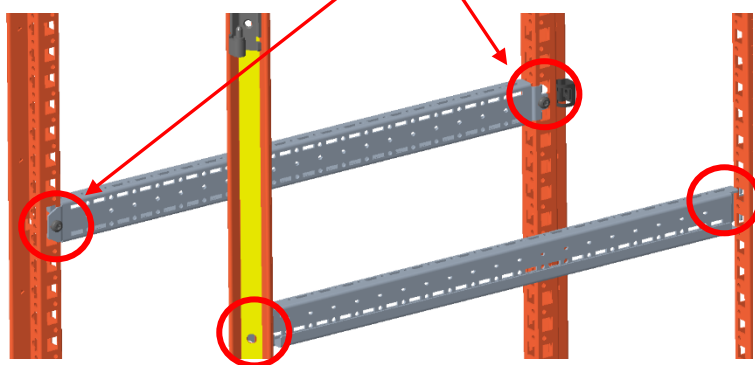
2 x Rittal screws 2486.600  
Torque: 5 Nm  
Use T30 torx bit  
(Rear end of cubicle)

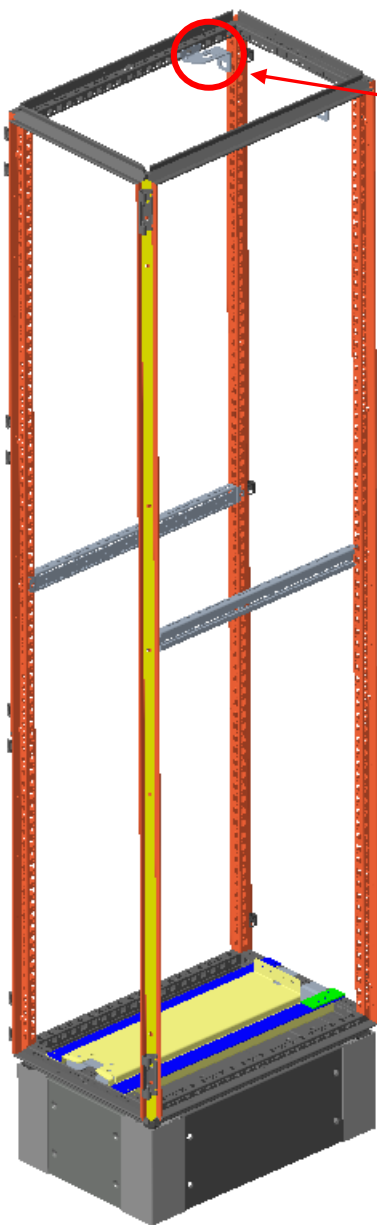


Fit 2 x Rittal punched rails provided  
with cubicle as shown.

Fit to:  
38<sup>th</sup> hole from top  
or 38<sup>th</sup> hole from bottom

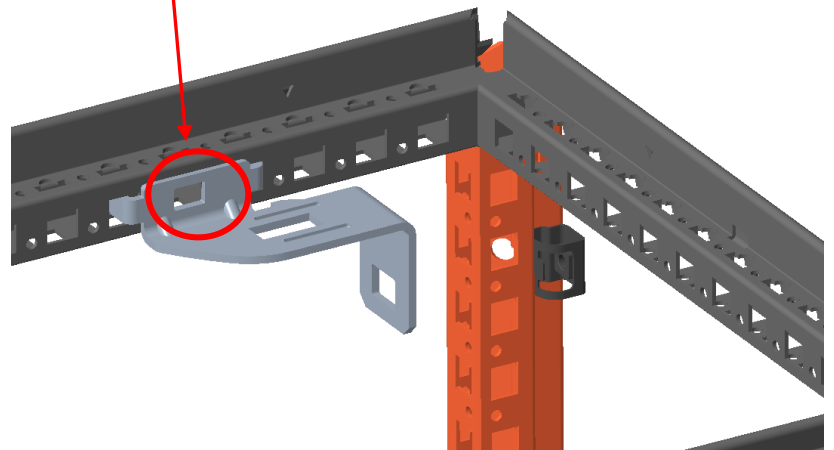
4 x Rittal screws  
2486.600  
Torque: 5 Nm  
Use T30 torx bit





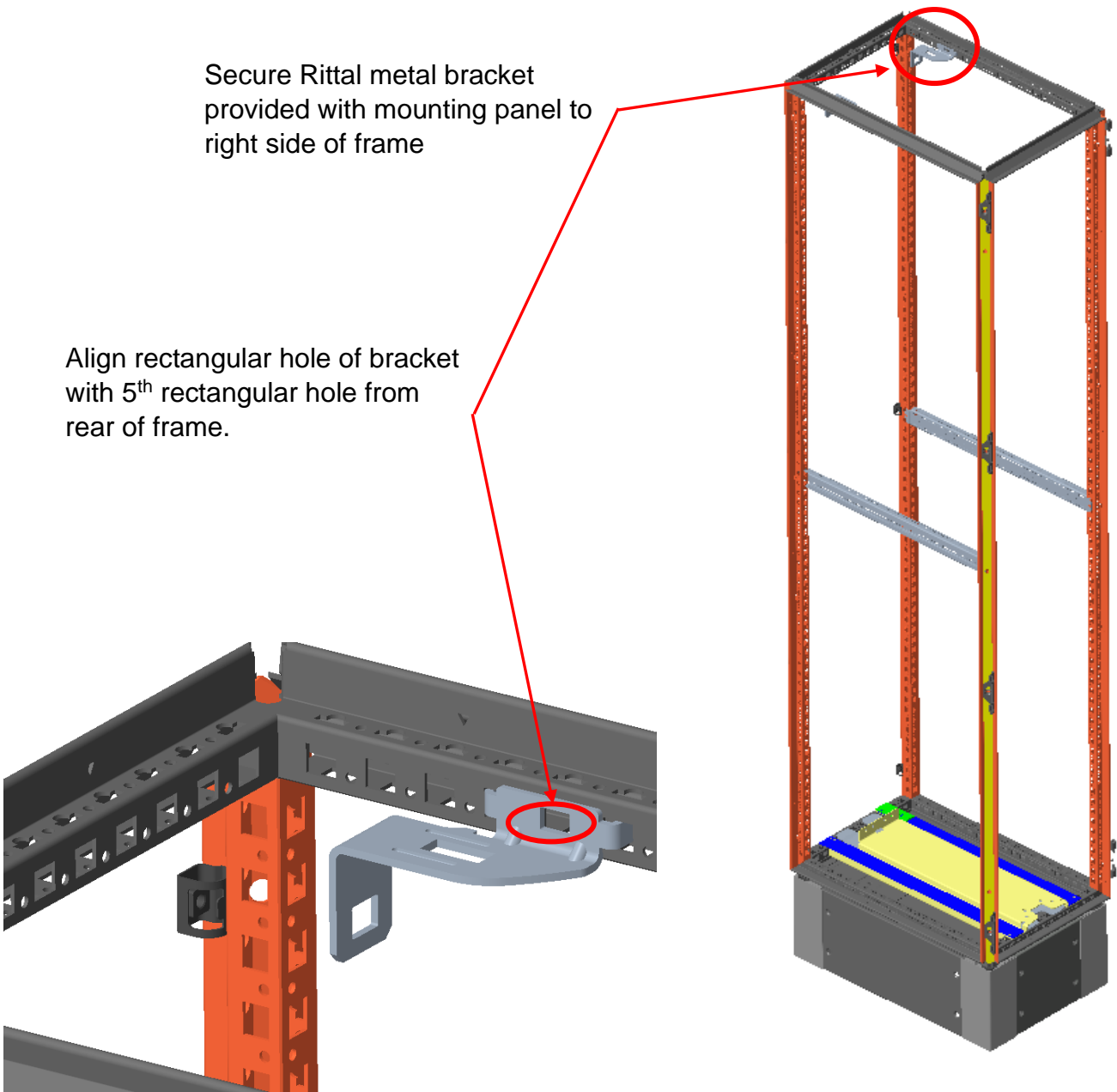
Secure Rittal metal bracket provided with mounting panel to left side of frame.

Align rectangular hole of bracket with 5<sup>th</sup> rectangular hole from rear of frame.

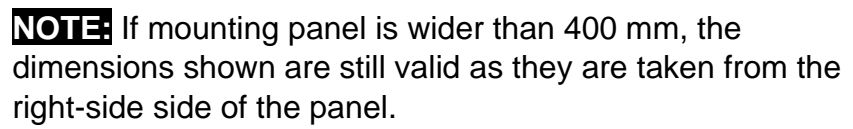


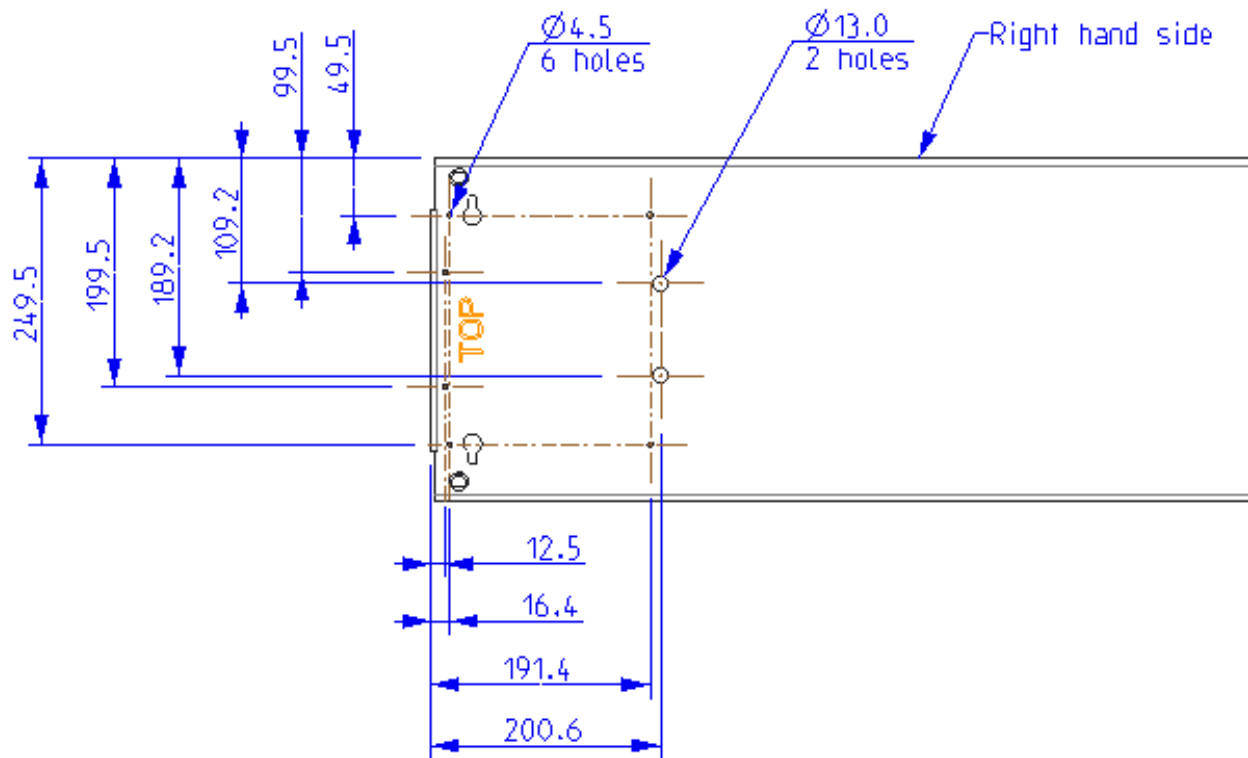
Secure Rittal metal bracket  
provided with mounting panel to  
right side of frame

Align rectangular hole of bracket  
with 5<sup>th</sup> rectangular hole from  
rear of frame.

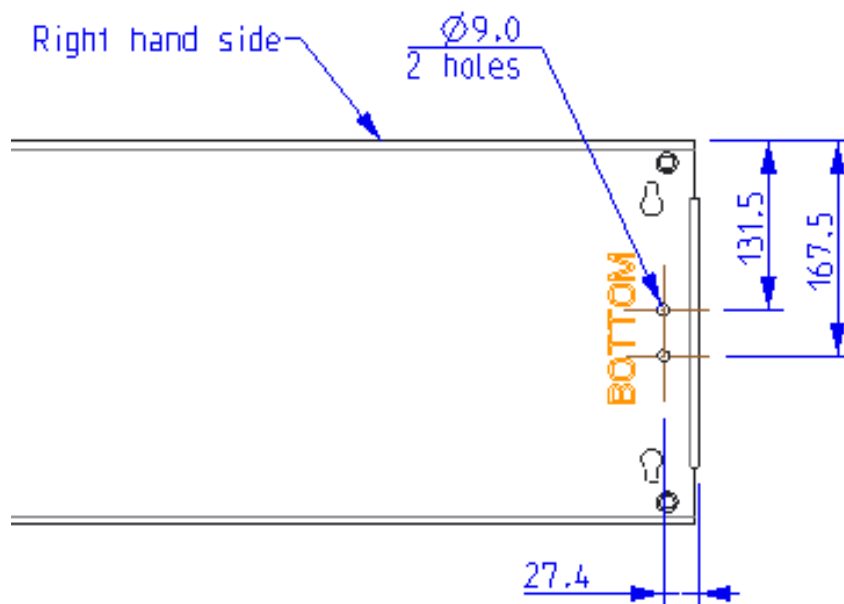




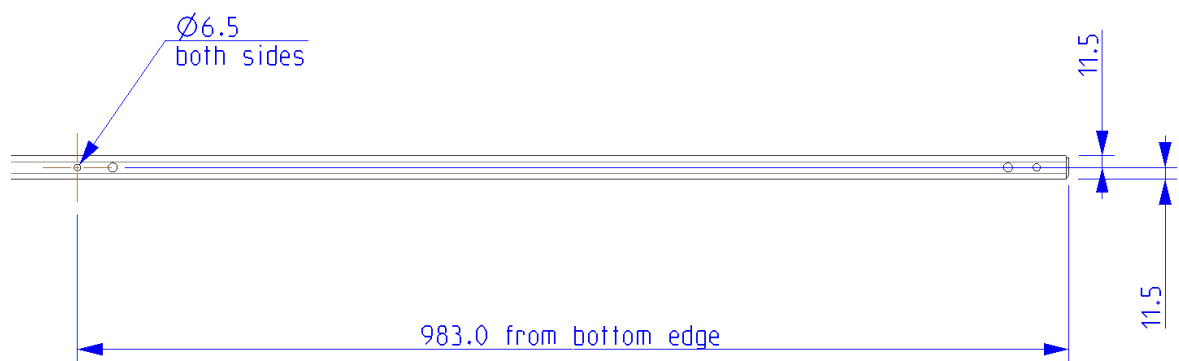
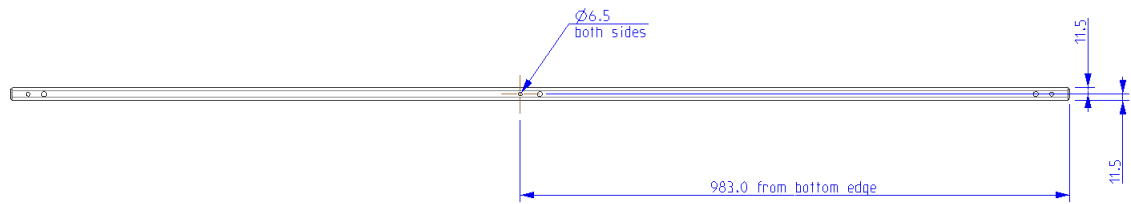




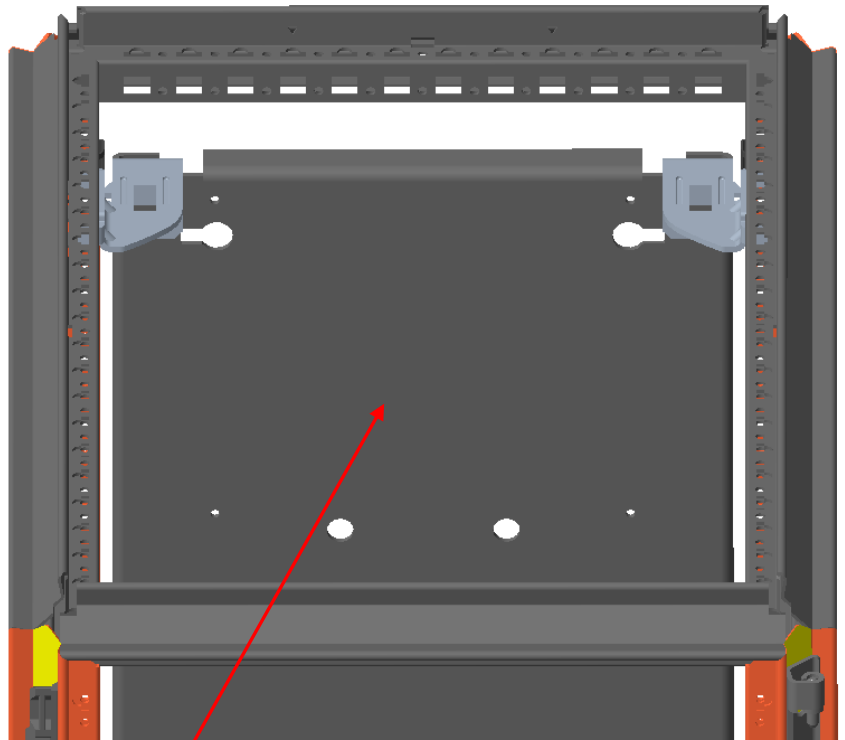
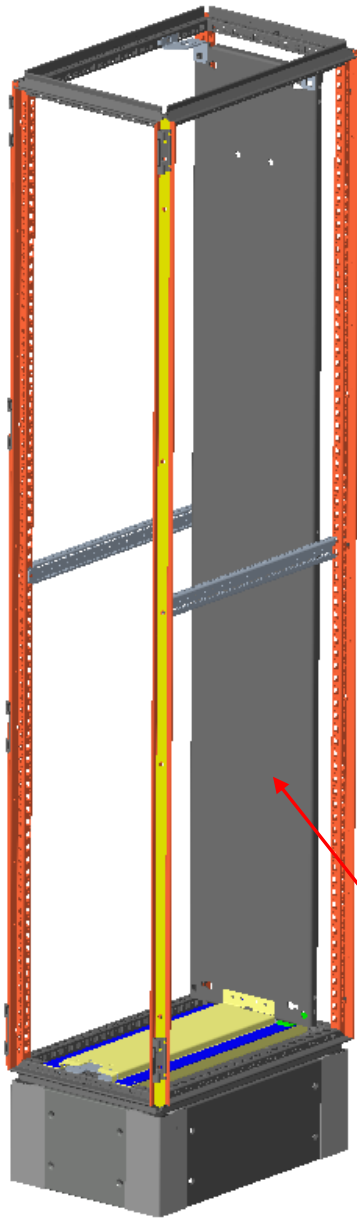
**NOTE:** If mounting panel is wider than 400 mm, the dimensions shown are still valid as they are taken from the right-side side of the panel.



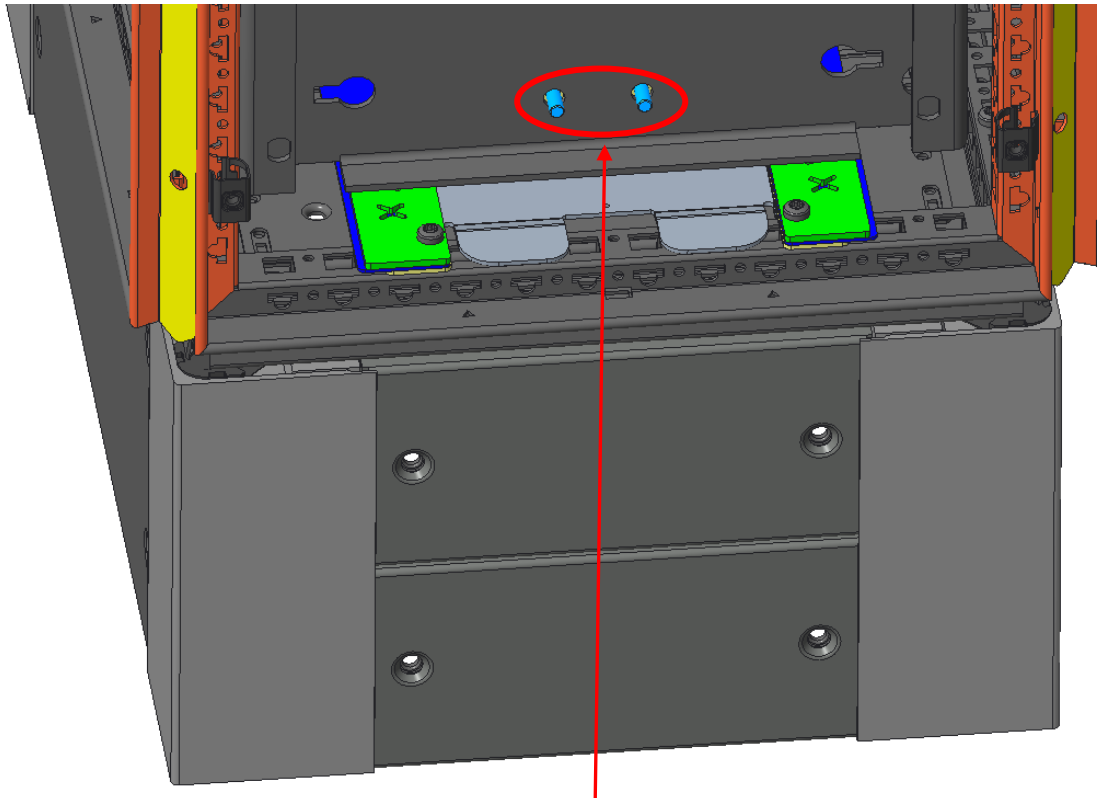
Drill holes in the mounting plate  
in the positions shown



Mounting panel of cubicle  
2000 mm x 400 mm

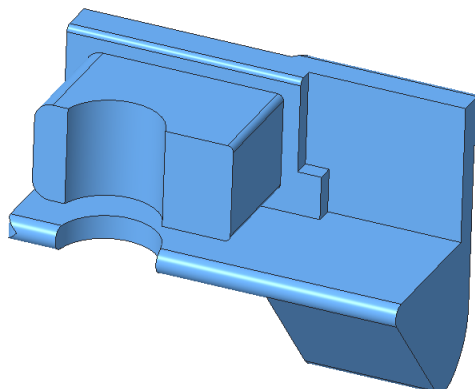


Secure Rittal mounting  
panel to frame using  
previously fitted brackets

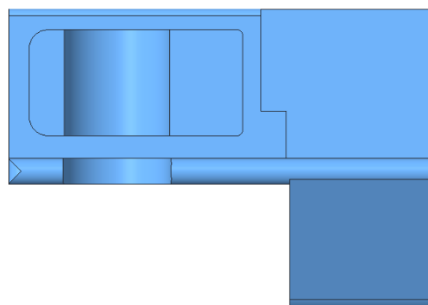


Studs from foot protrude  
through mounting panel holes

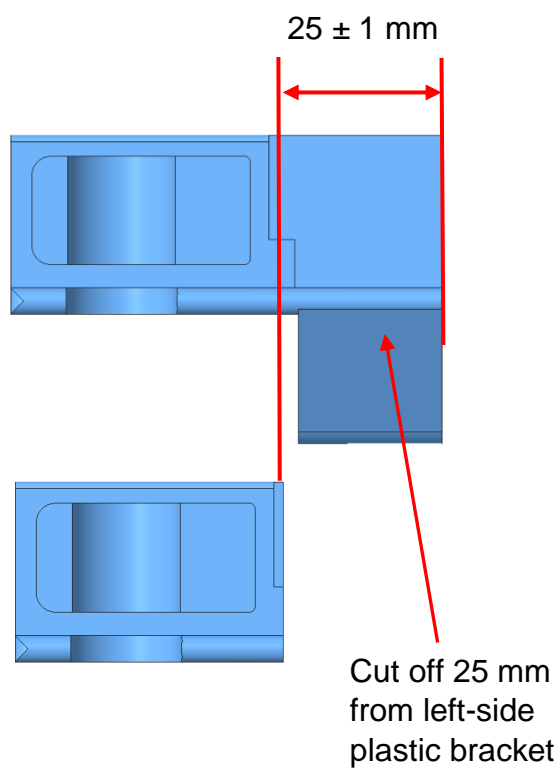
This bracket is supplied with the VX25 cubicle

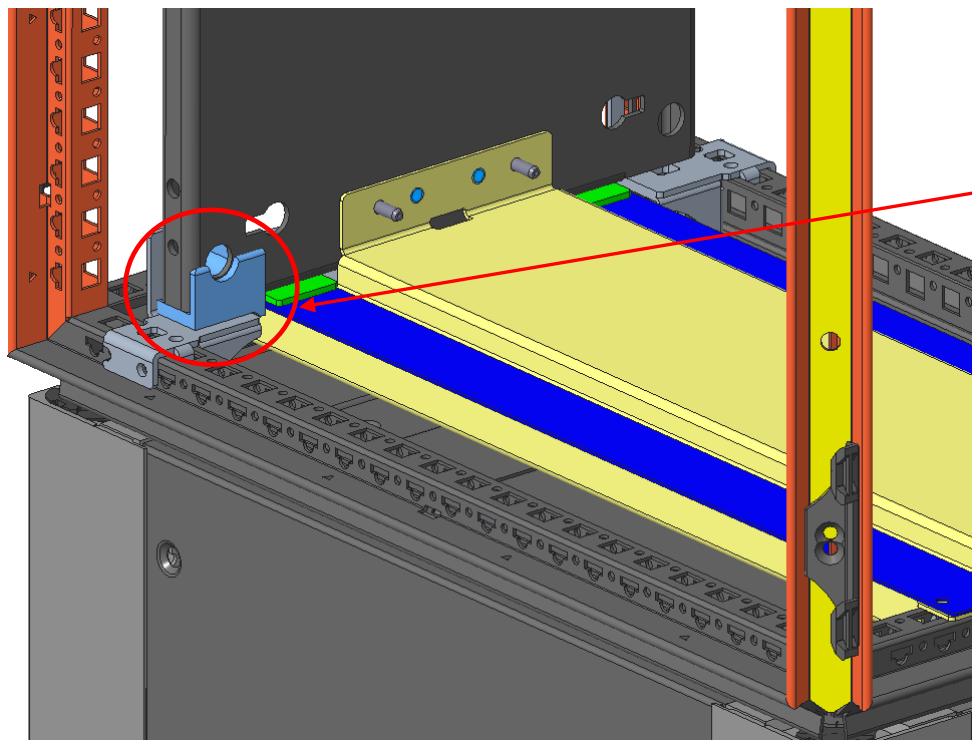


Left-side plastic bracket

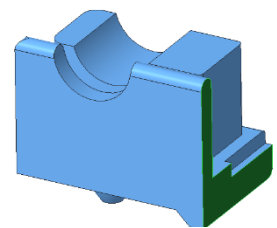


Left-side plastic bracket



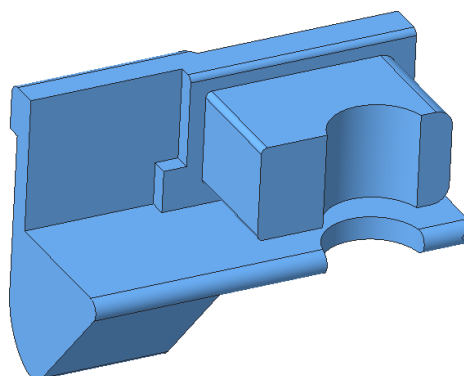


Secure Rittal  
plastic bracket  
provided with the  
mounting panel  
on left-side

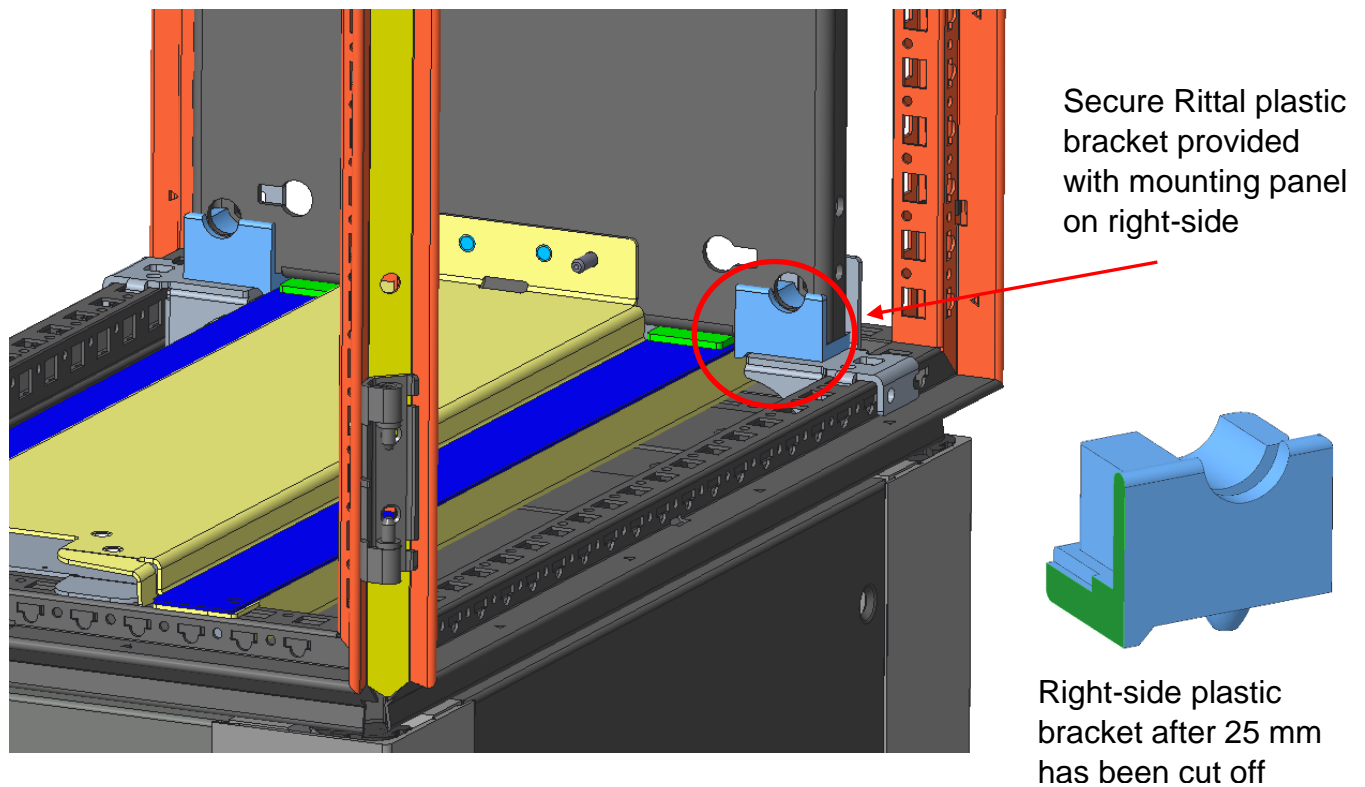
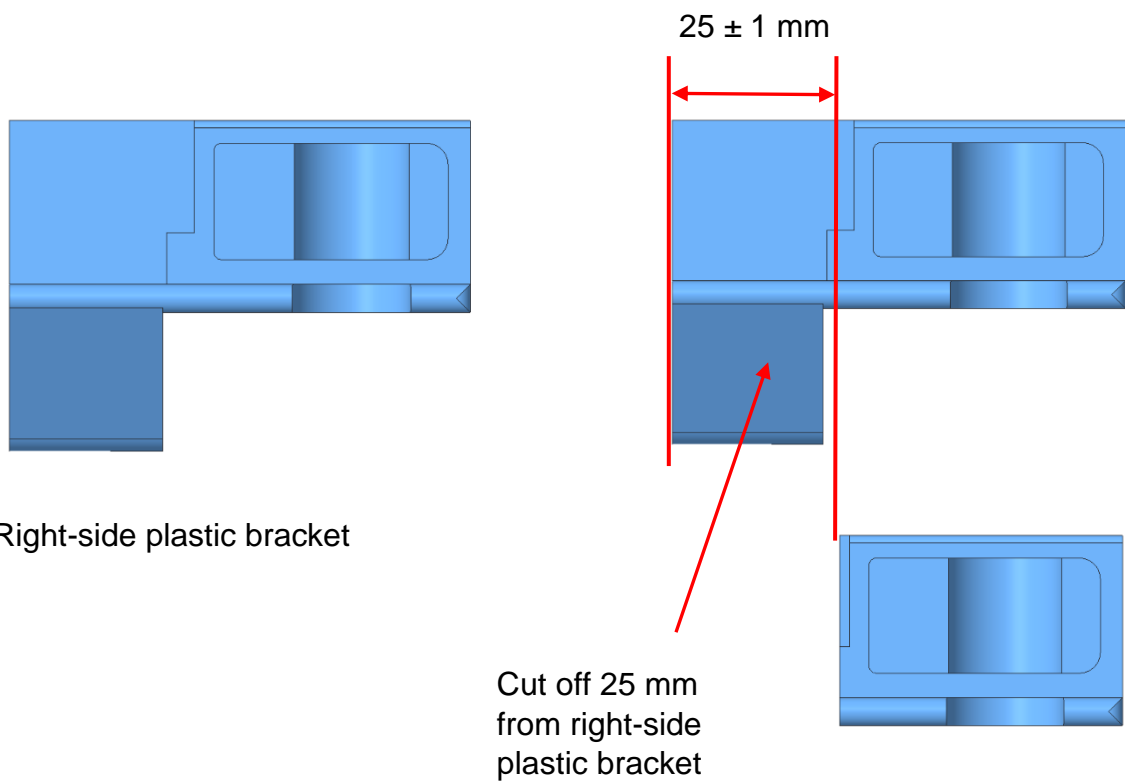


Left-side plastic  
bracket after 25 mm  
has been cut off

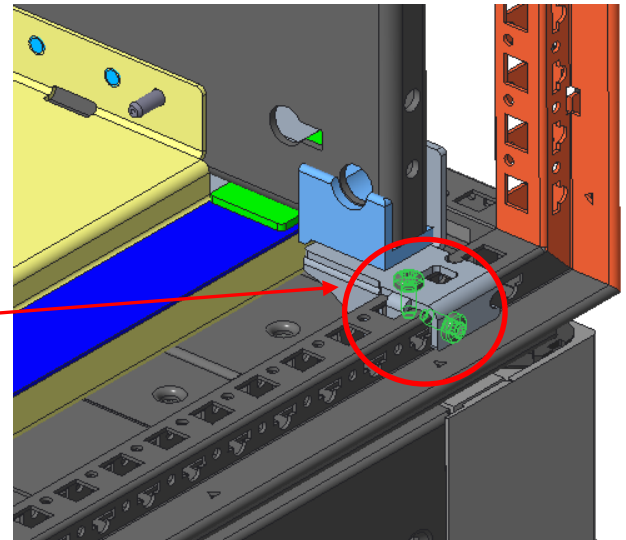
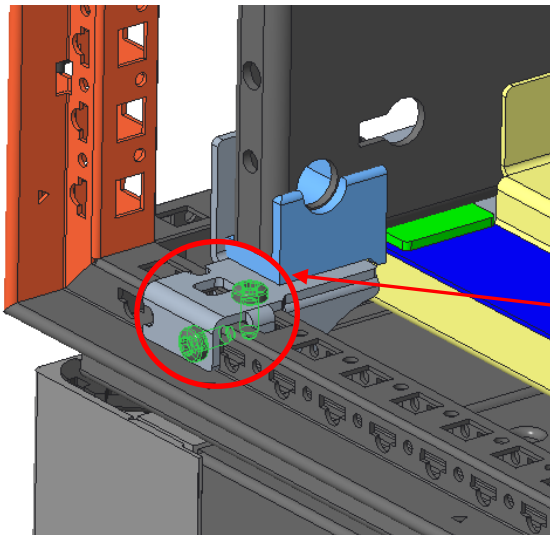
This bracket is supplied with the VX25 cubicle



Right-side plastic bracket

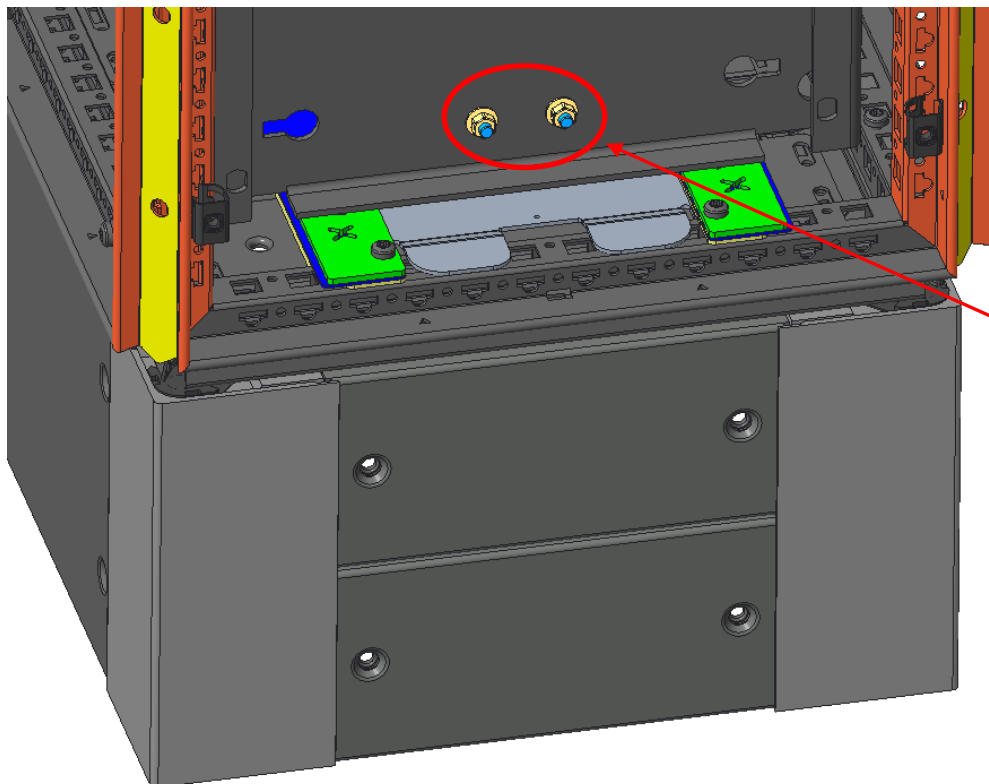






Secure Rittal metal brackets  
to mounting panel with:

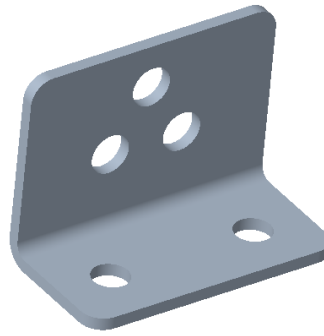
4 x Rittal screws 2486.600  
Torque: 5 Nm  
Use T30 torx bit



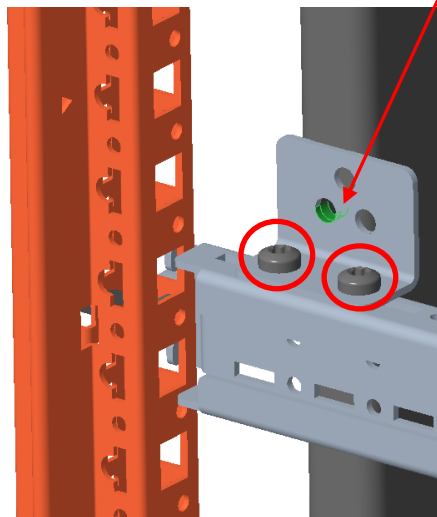
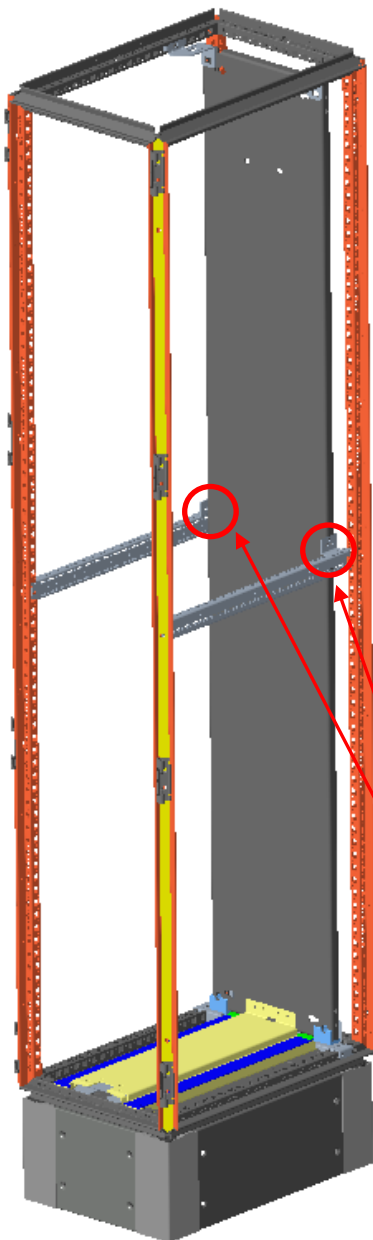
Secure 2 x M6 nuts  
6164-0003 from kit  
6772-0022 to back of  
mounting panel

Torque: 6 Nm  
Use 10 mm socket

Obtain bracket 6541-0370

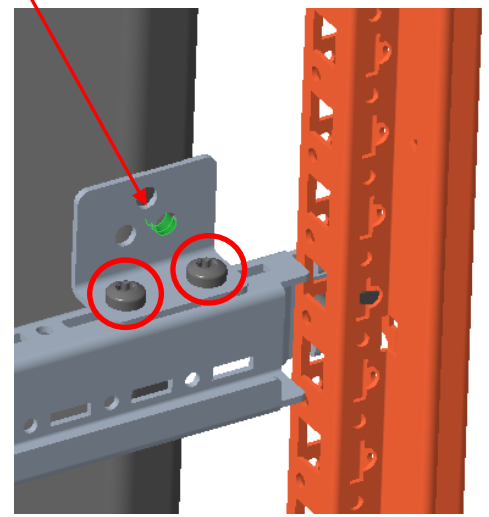


Ensure holes are aligned



Bracket on left-side  
secured with 2 x  
Rittal screws  
2486.600

Torque: 5 Nm  
Use T30 torx bit

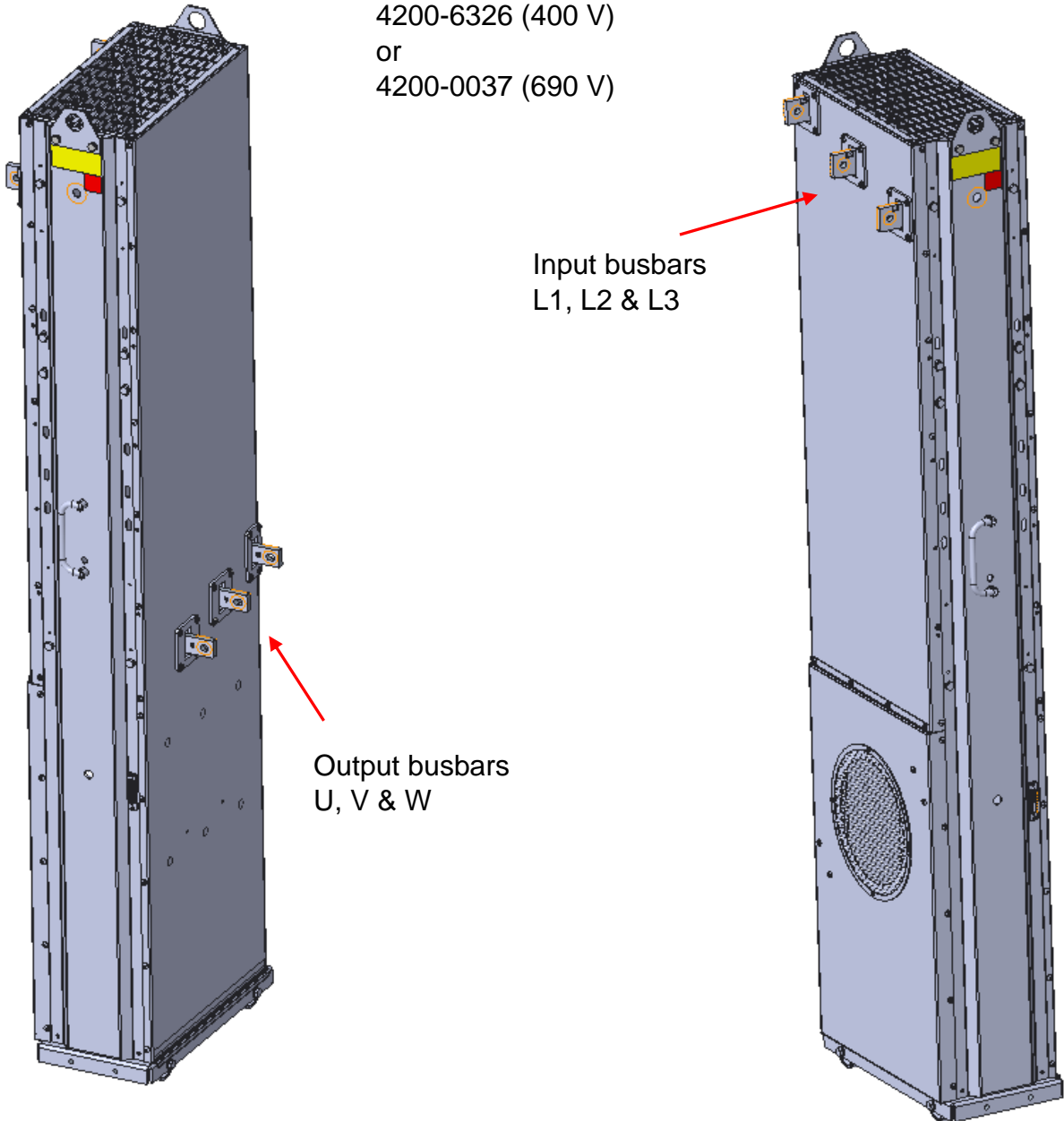


Bracket on right-side  
secured with 2 x  
Rittal screws  
2486.600

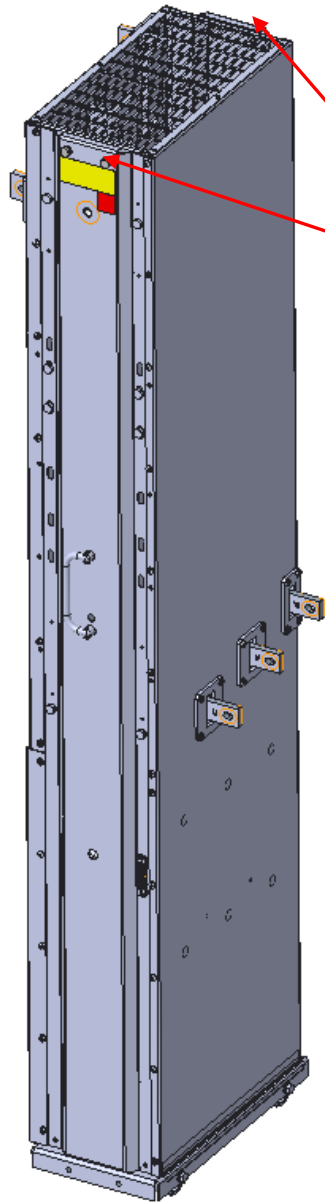
Torque: 5 Nm  
Use T30 torx bit

2 x brackets 6541-0370  
secured using previously  
drilled holes on mounting  
panel

**AFE filter:**  
4200-6326 (400 V)  
or  
4200-0037 (690 V)



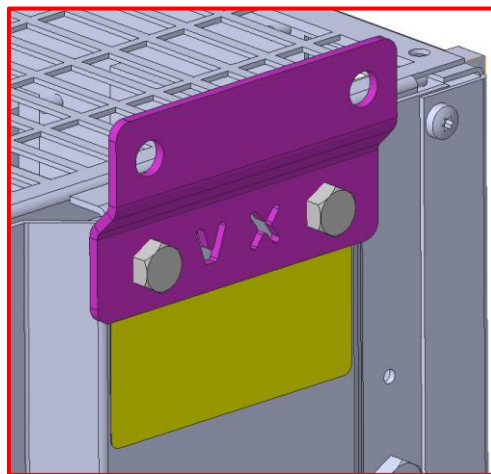
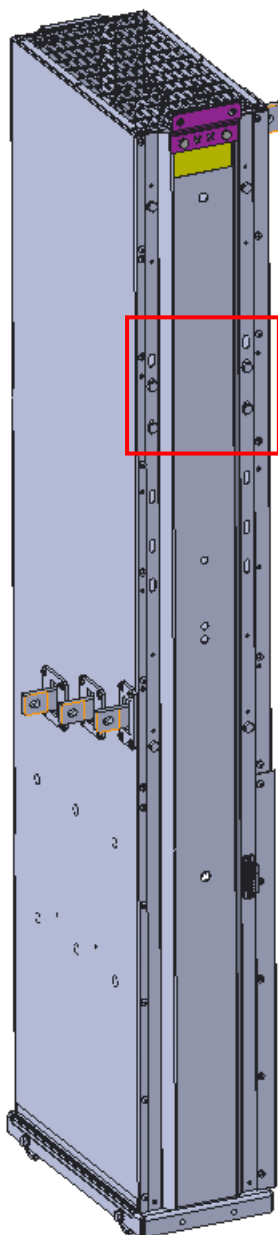
**NOTE:** Weight of AFE filter is 199 kg. It is recommended to use 2 persons when handling the AFE filter.



Detach the two lifting brackets by removing 4 x M8 bolts.

Use a 13 mm socket

**NOTE:** The 4 x M8 bolts will be used during installation of the AFE filter

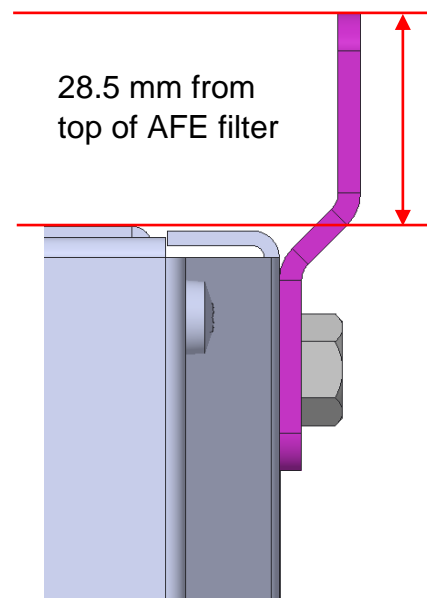


**NOTE:** The position and orientation of the bracket.

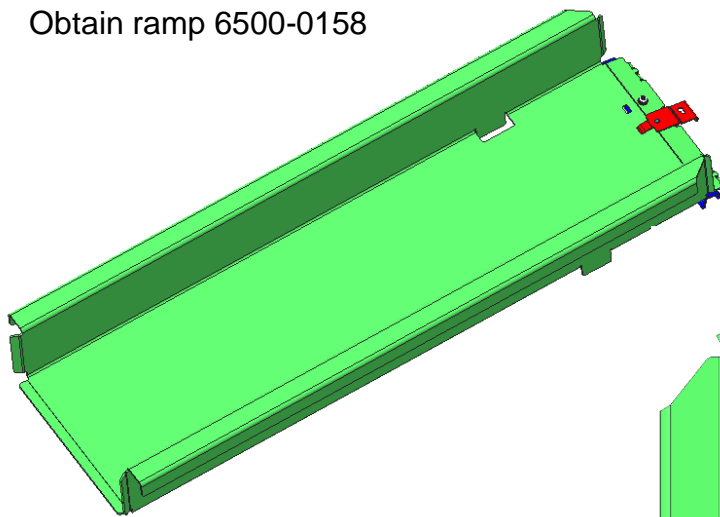
The top edge must be parallel to the top of the AFE filter

Secure bracket 6521-0321 from kit 6772-0022 to rear of AFE filter using bolts originally used to attach lifting bracket.

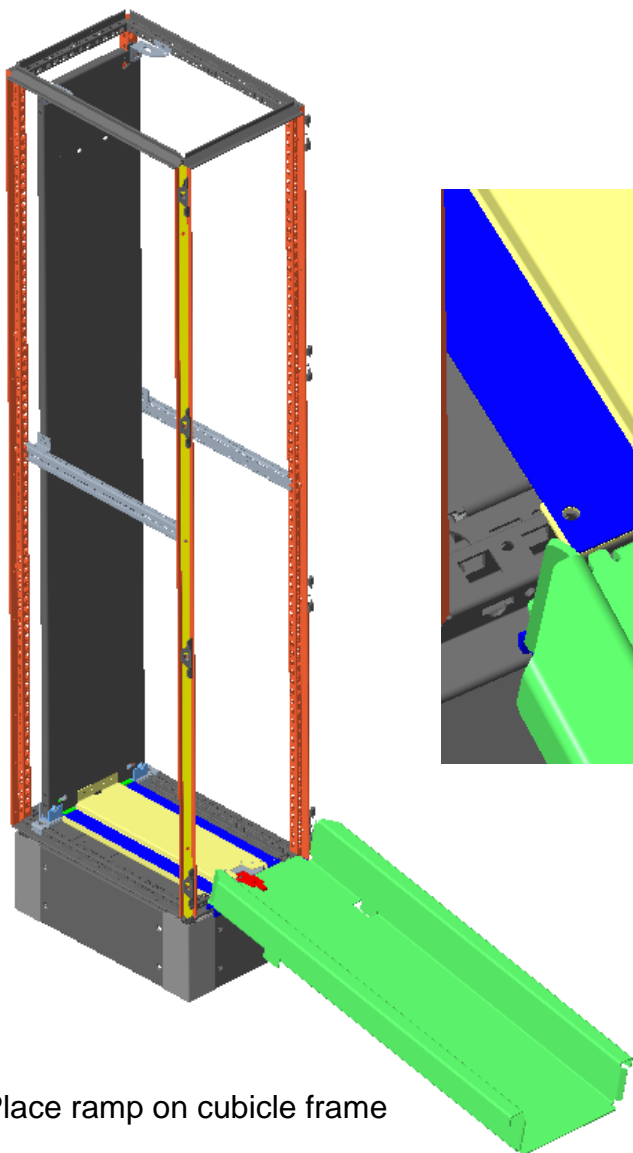
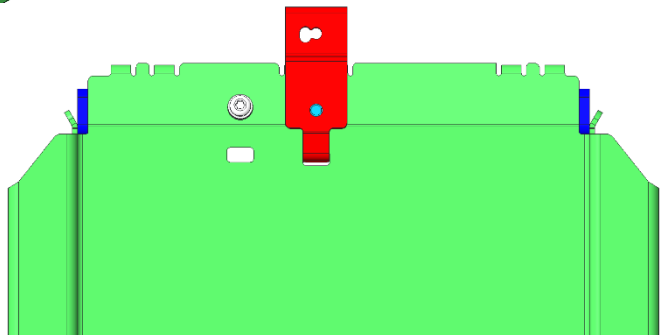
Torque 10 Nm  
Use 13 mm socket



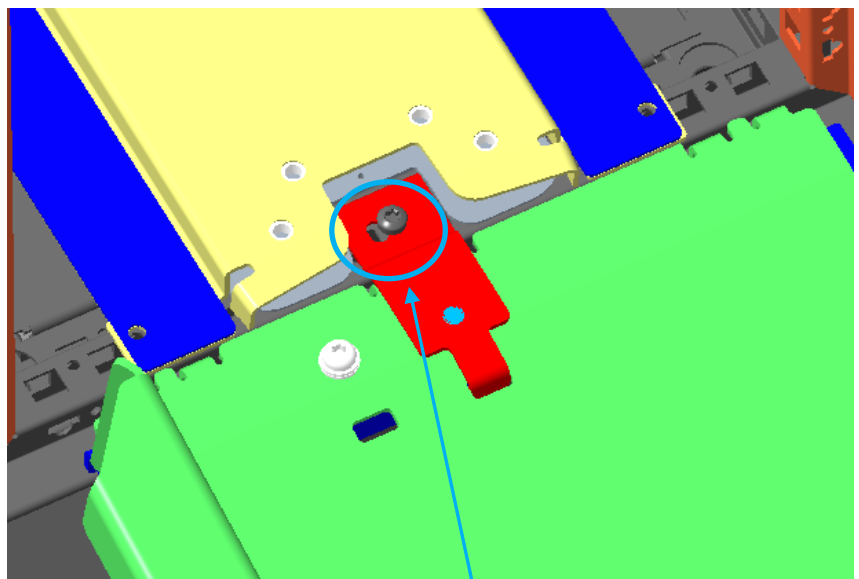
Obtain ramp 6500-0158



Note location of connecting bracket

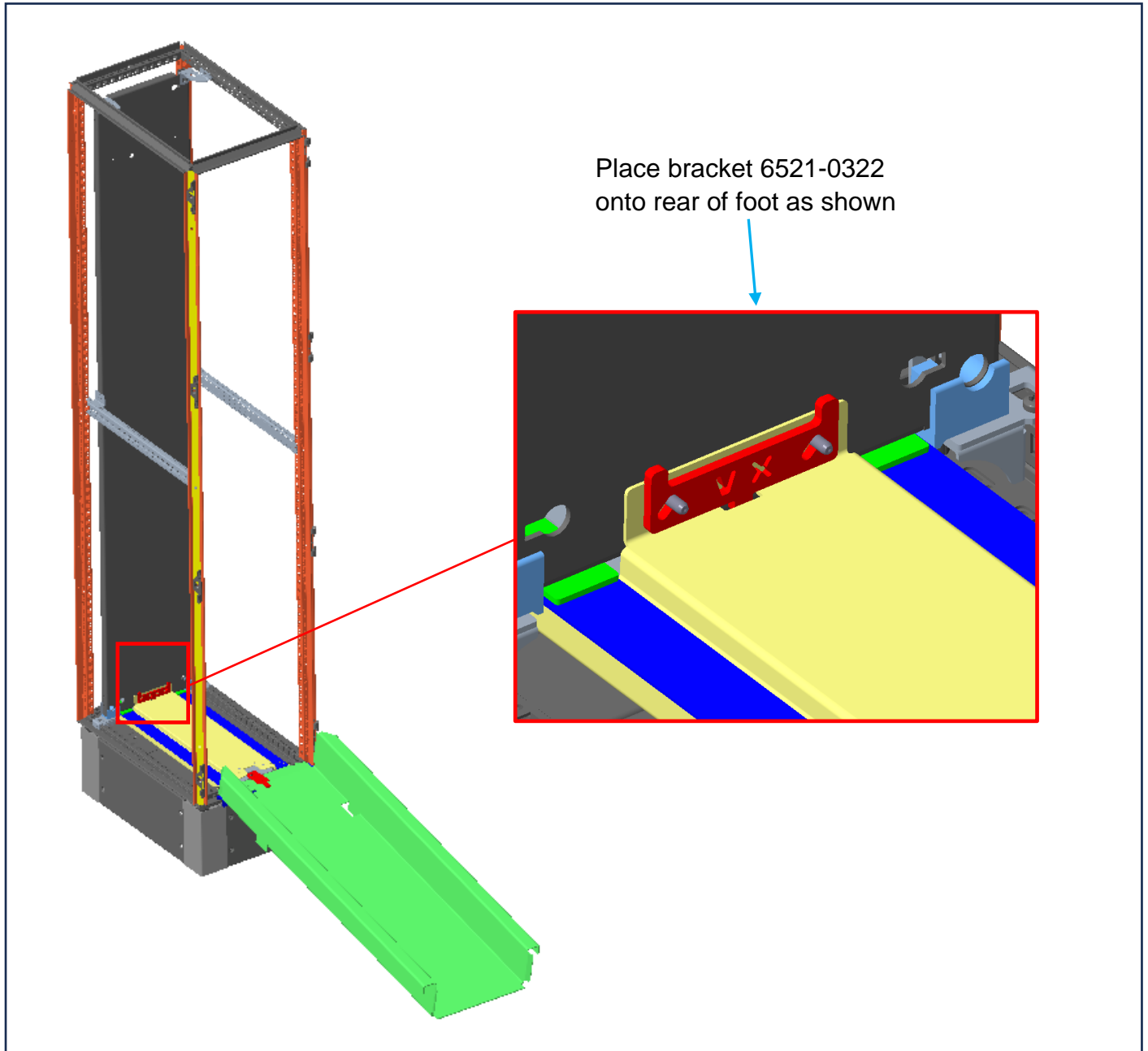


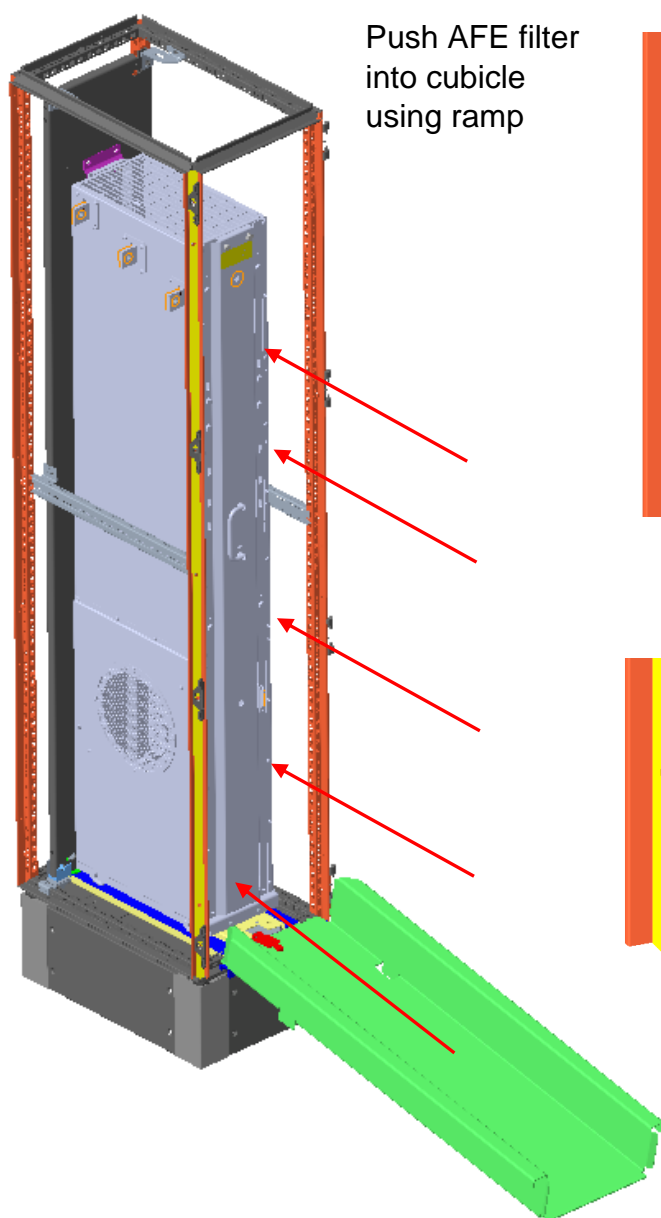
Place ramp on cubicle frame



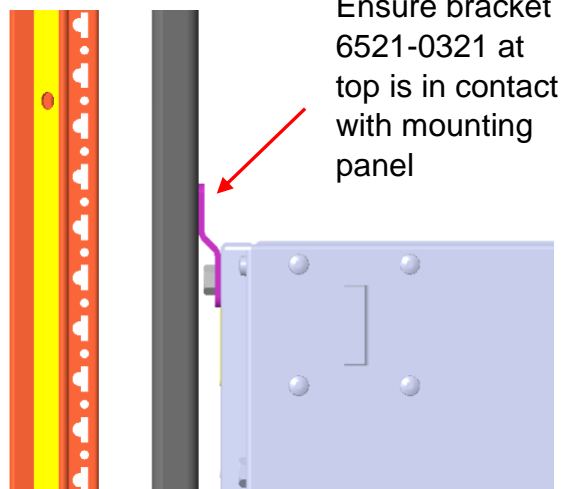
Connecting bracket secured  
with 1 x Rittal screw 2486.600

Torque: 5 Nm  
Use T30 torx bit

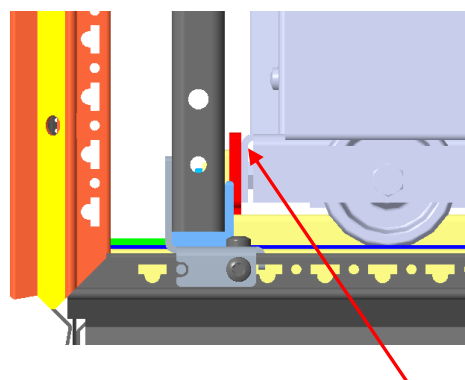




Push AFE filter into cubicle using ramp

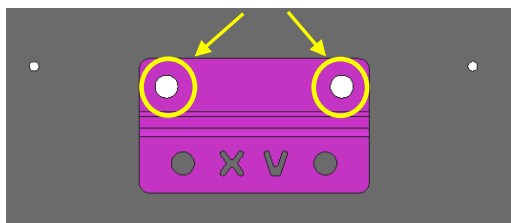


Ensure bracket 6521-0321 at top is in contact with mounting panel



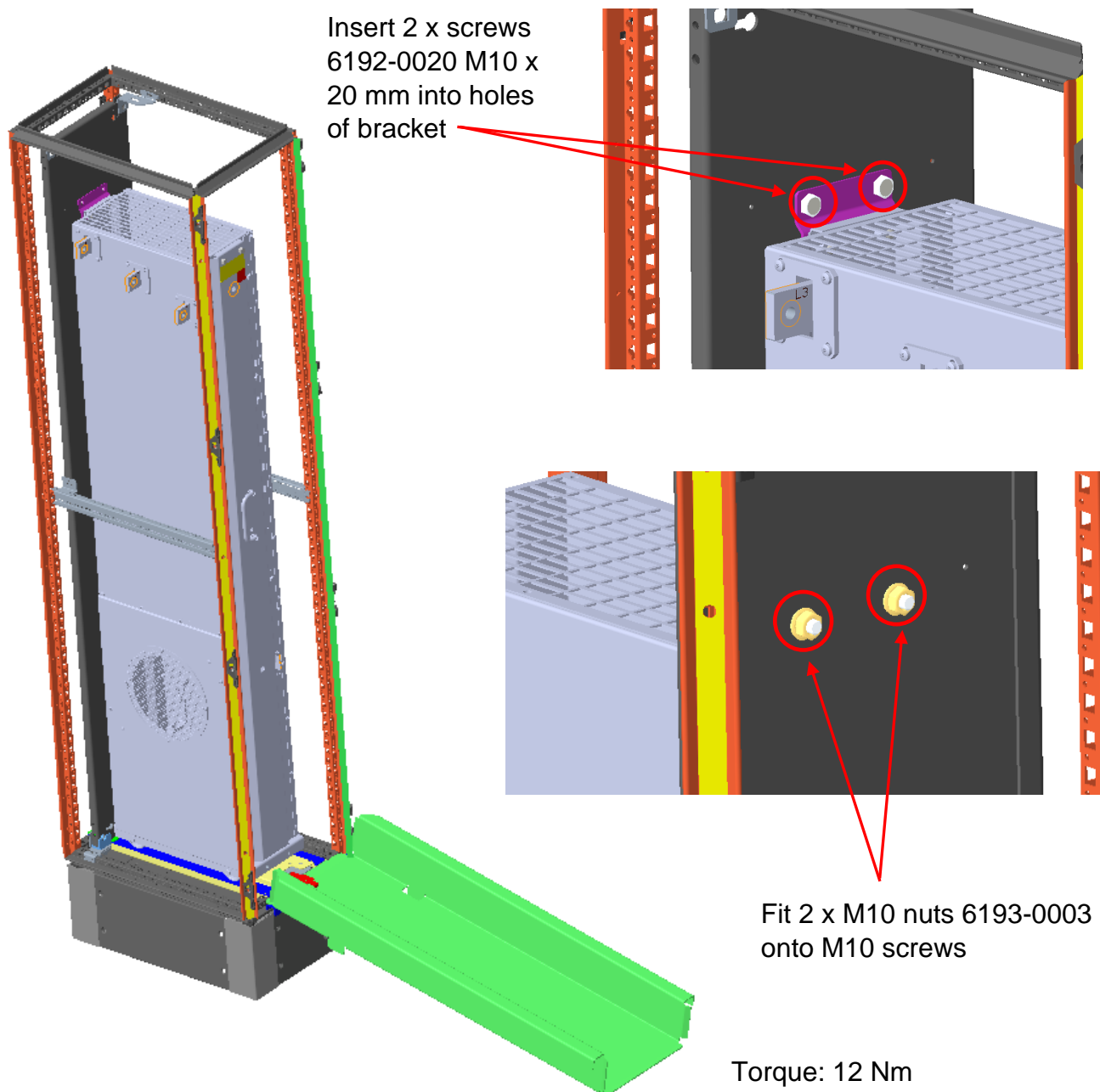
Ensure bottom of AFE filter is in contact with bracket 6521-0322

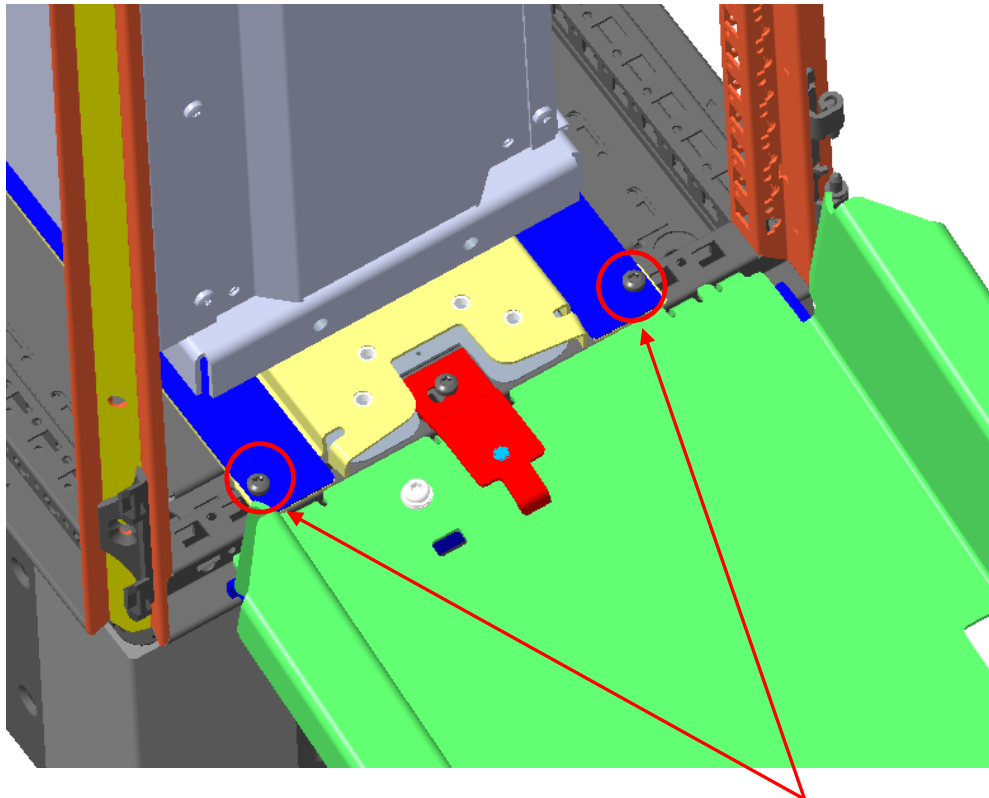
Check that holes of bracket are in line with holes in mounting panel. Adjust bracket position on AFE filter if necessary



**NOTE:** The AFE filter weighs 199 kg. Two persons must be used to insert the AFE filter into the cubicle

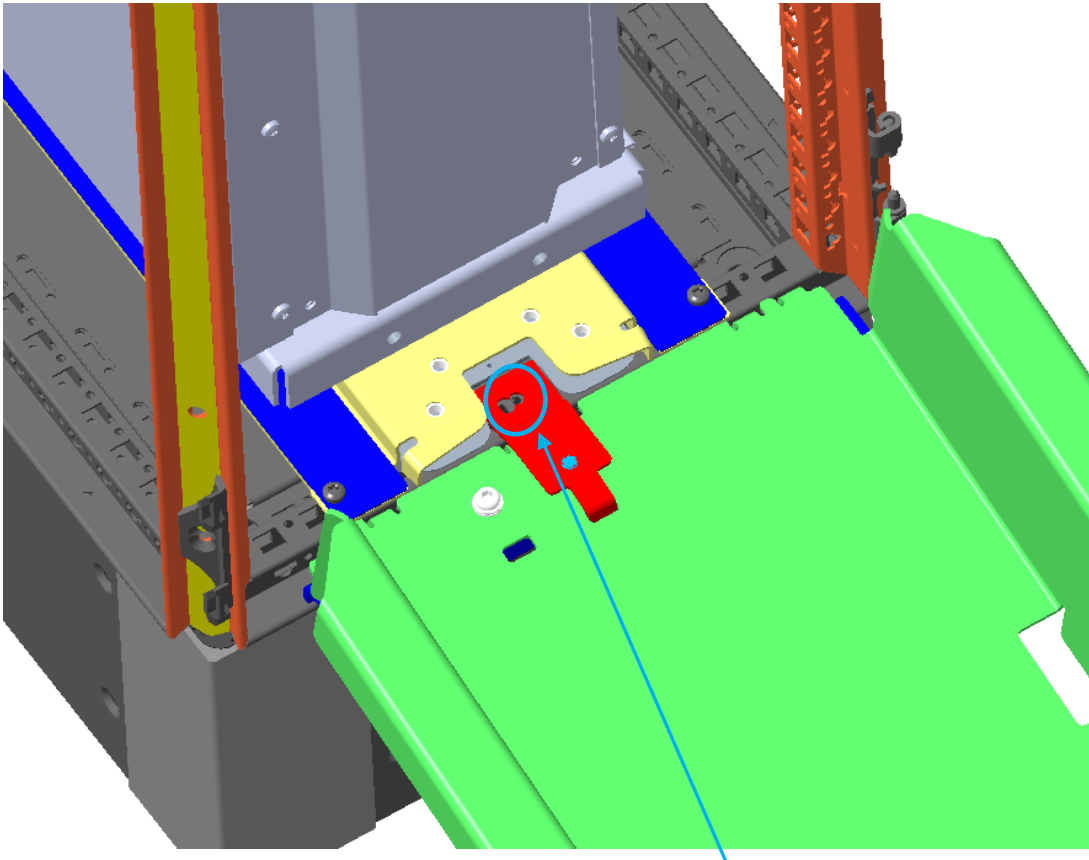




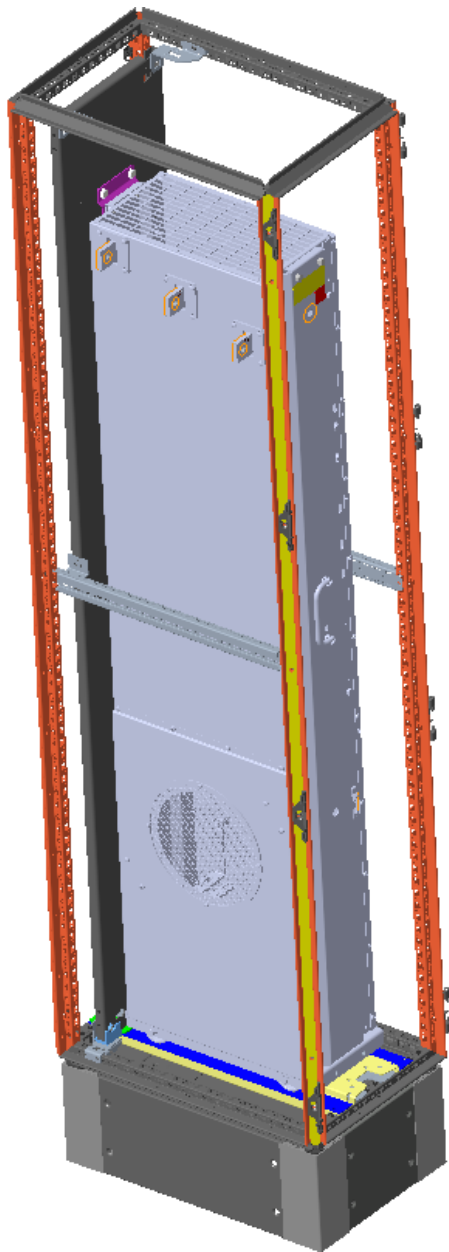


Insert 2 x Rittal screws  
2486.600 into holes as  
shown.

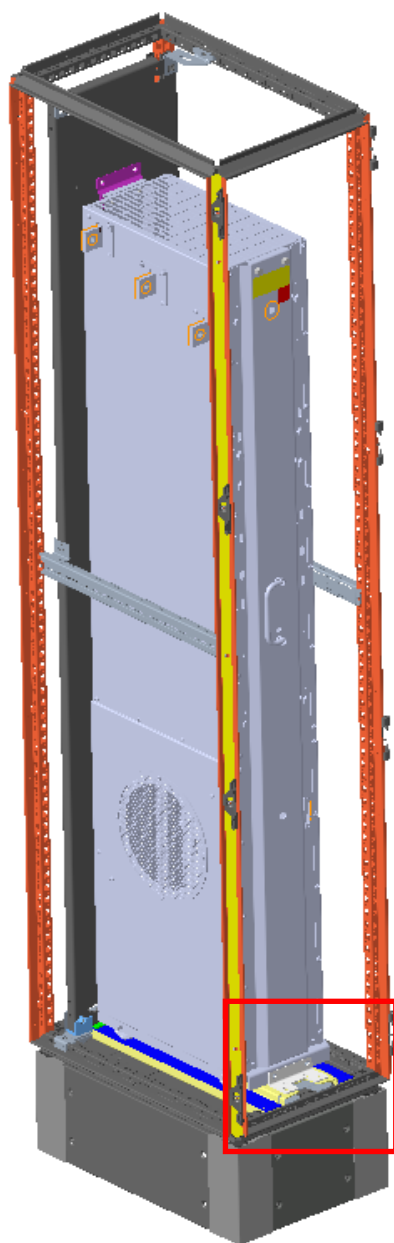
Torque: 5 Nm  
Use T30 torx bit



Remove Rittal screw 2486.600

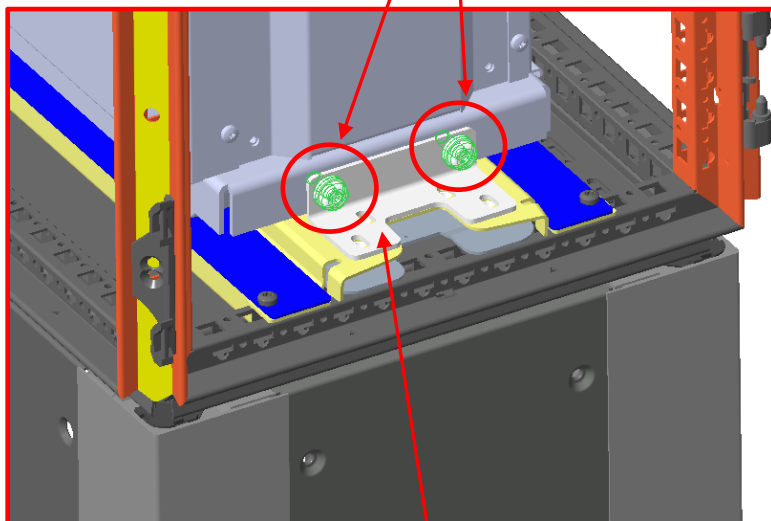


Remove ramp



Fit 2 x screws 6185-8020 M8 x 20 mm

Torque 10 Nm  
Use T40 torx bit

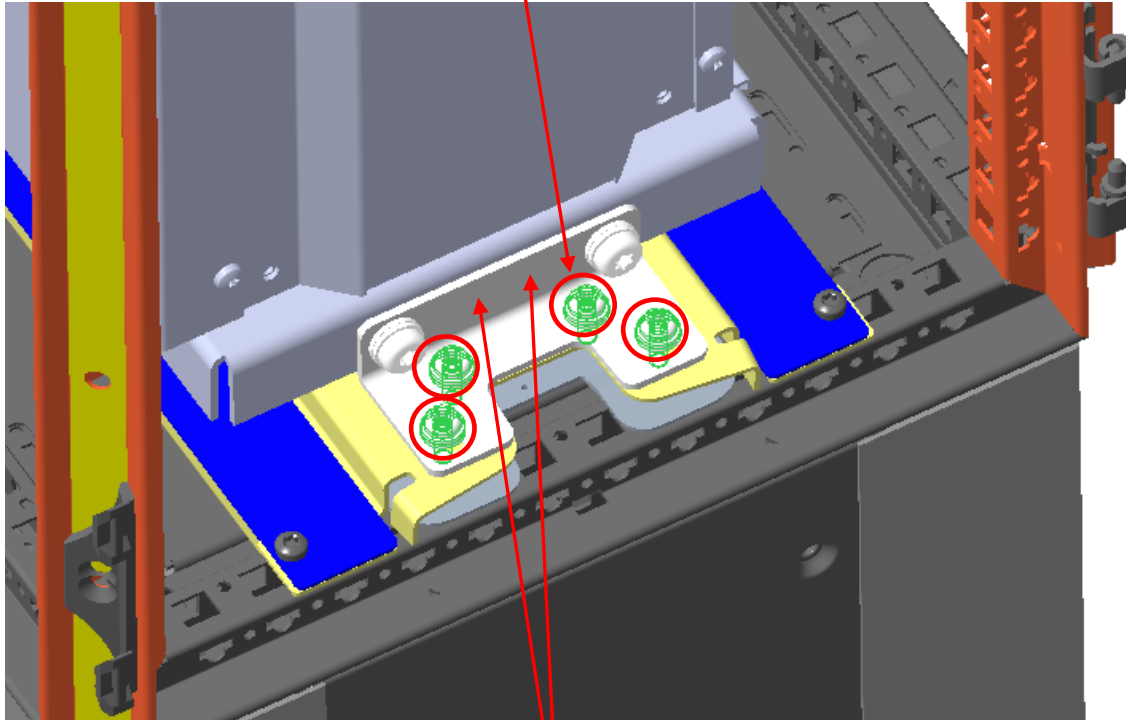


Place bracket 6541-0313 onto foot of AFE filter

Fit 4 x screws 6165-6016 M6 x 16 mm

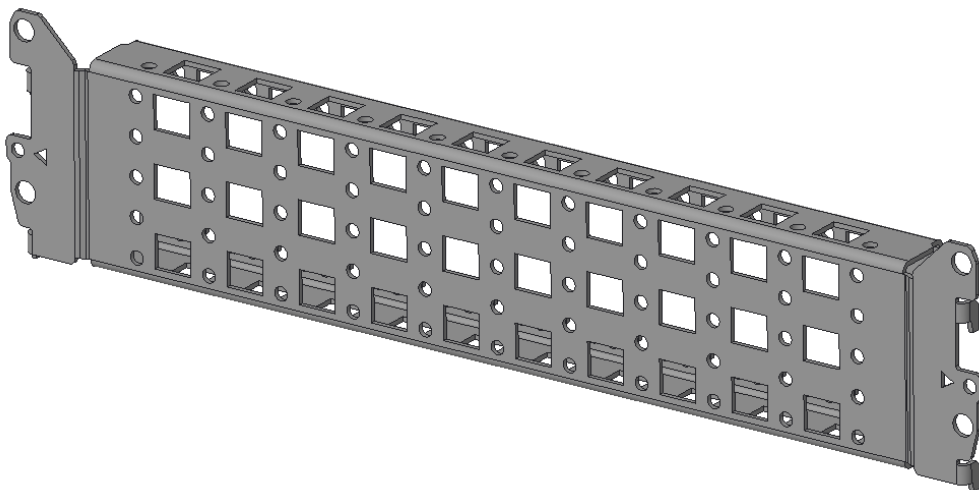
Torque: 6 Nm

Use T30 torx bit

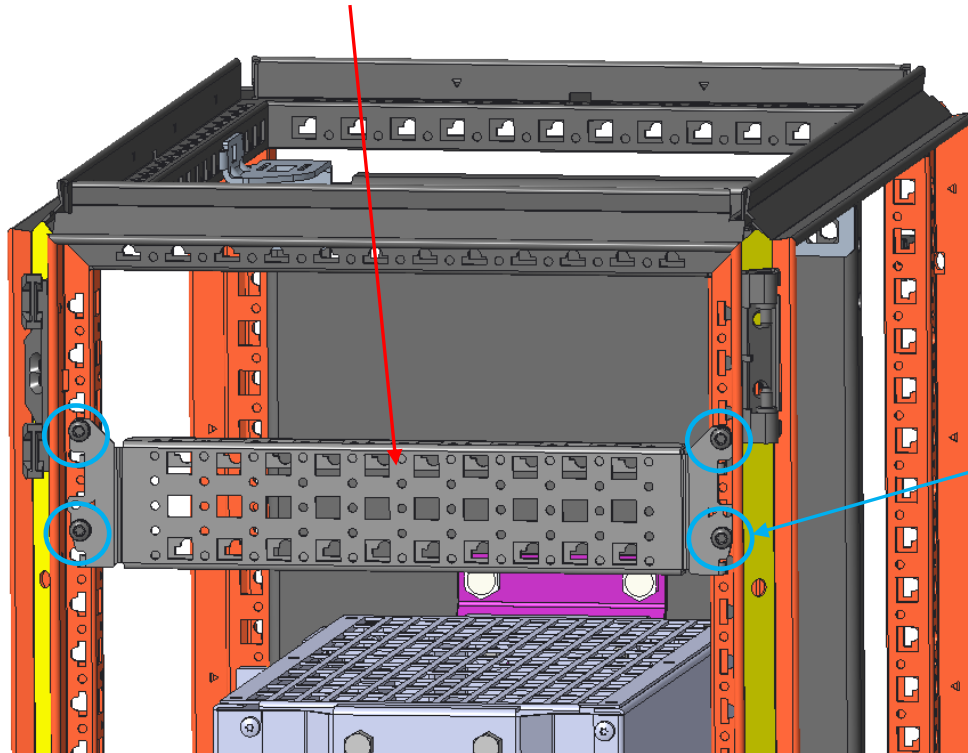


Push bracket towards filter while tightening screws

Obtain Rittal punched section 8617.110



Rittal punched section 8617.110



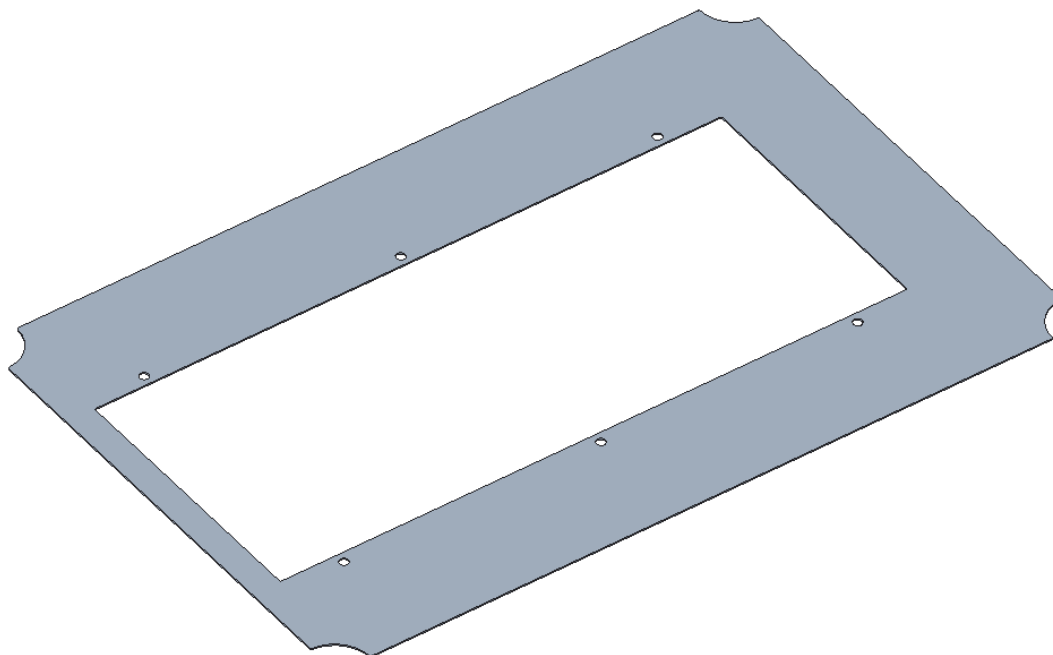
Secure Rittal punched section 8617.110 to 3<sup>rd</sup> and 5<sup>th</sup> holes from top of frame using 4 x Rittal screws 2486.600.

Note orientation

4 x Rittal screws 2486.600. Run down then torque to 5 Nm.

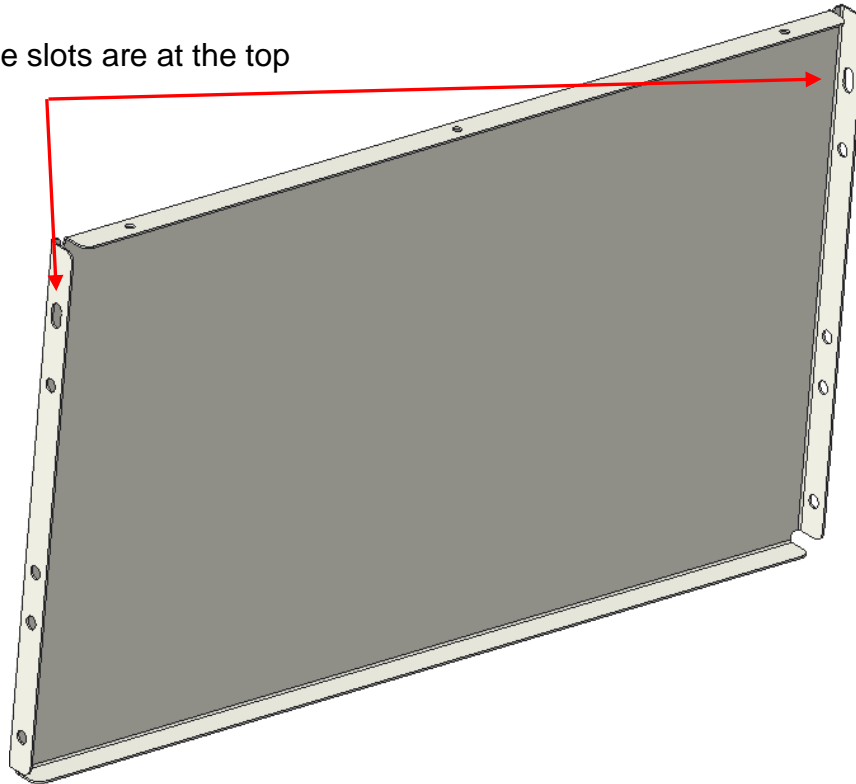
Use T30 torx bit

Obtain part 6521-0327



Obtain part 6521-0313

Ensure the slots are at the top

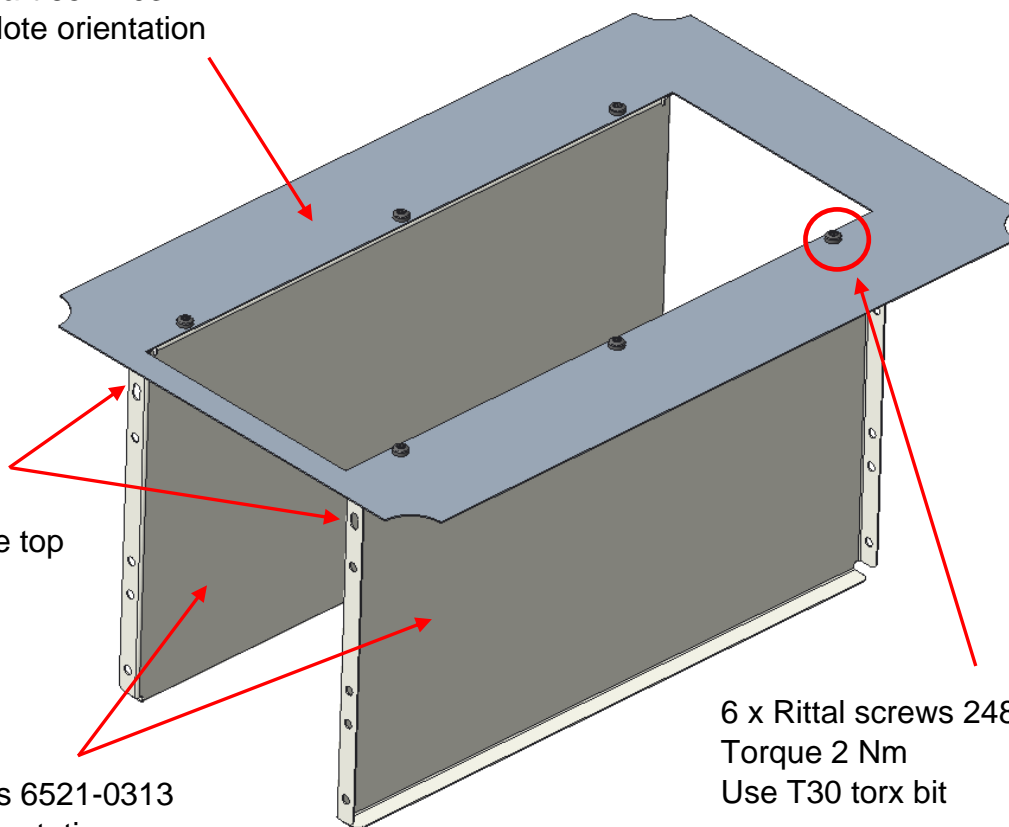


Part 6521-0327  
Note orientation

Slots are  
towards the top

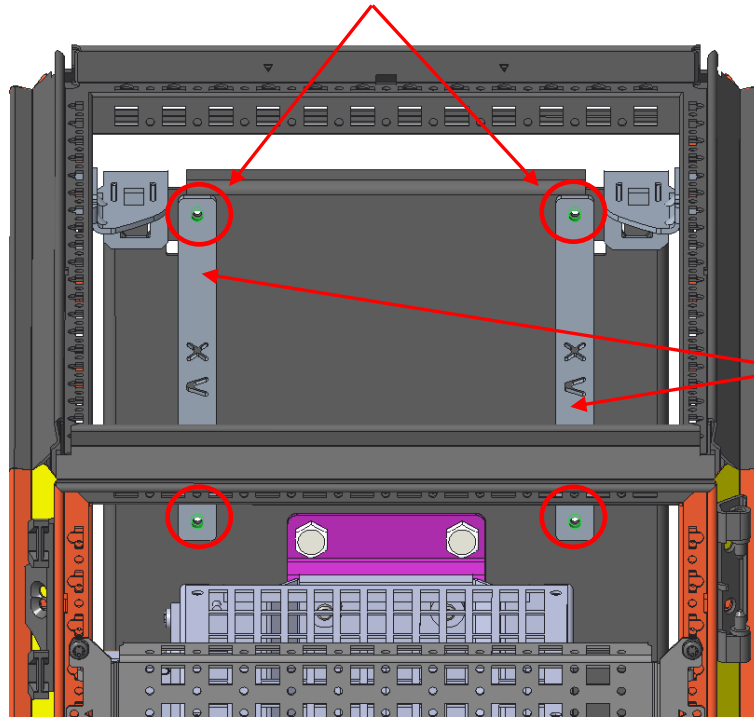
2 x parts 6521-0313  
Note orientation

6 x Rittal screws 2486.600  
Torque 2 Nm  
Use T30 torx bit

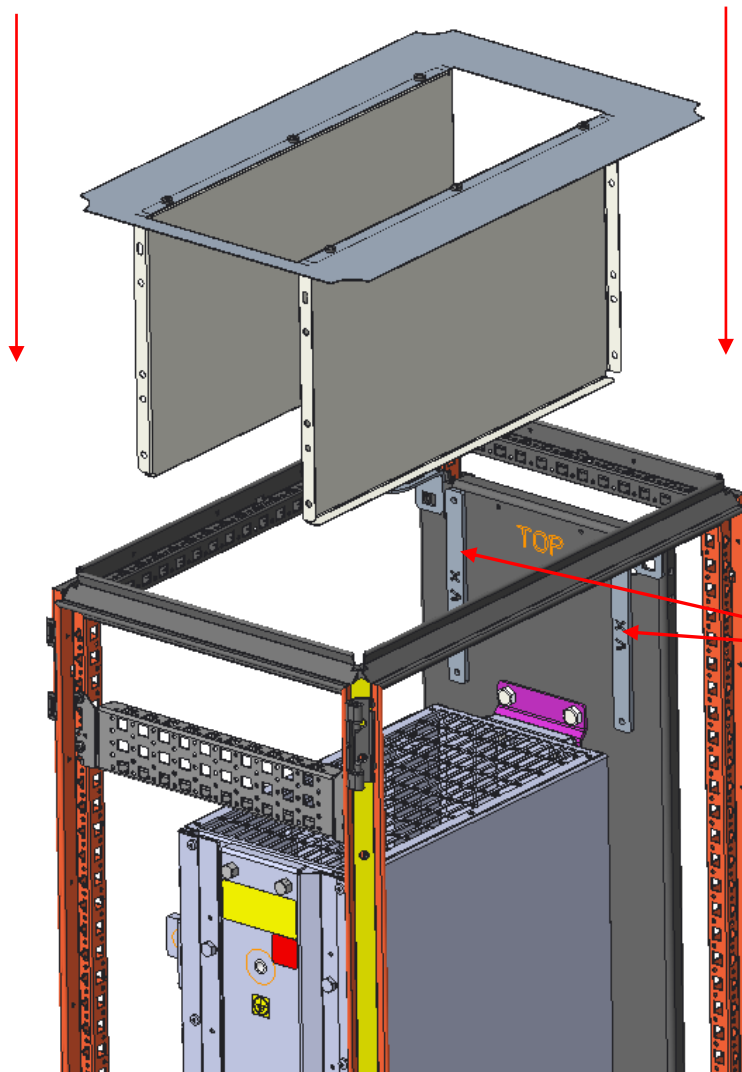




Align holes of brackets 6521-0323 with holes drilled in mounting panel

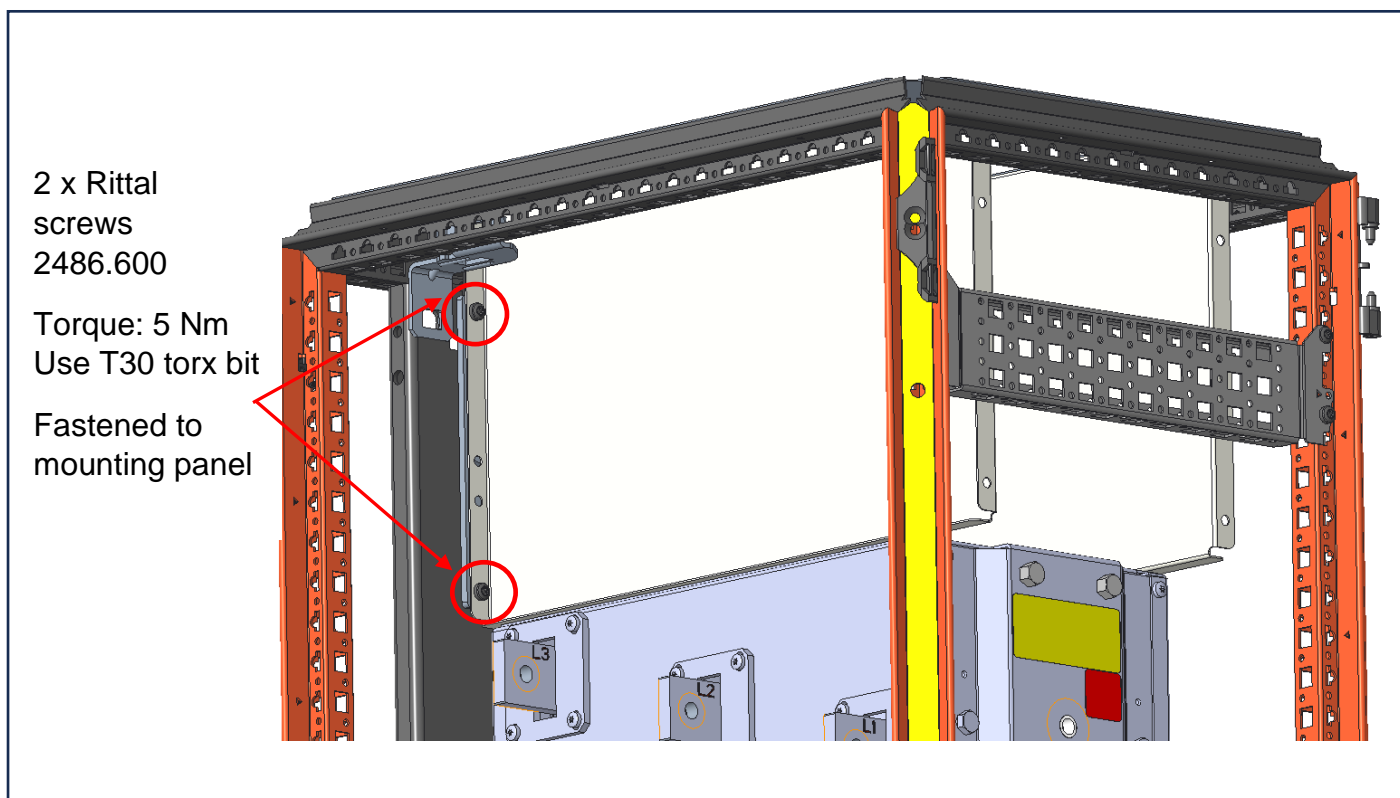
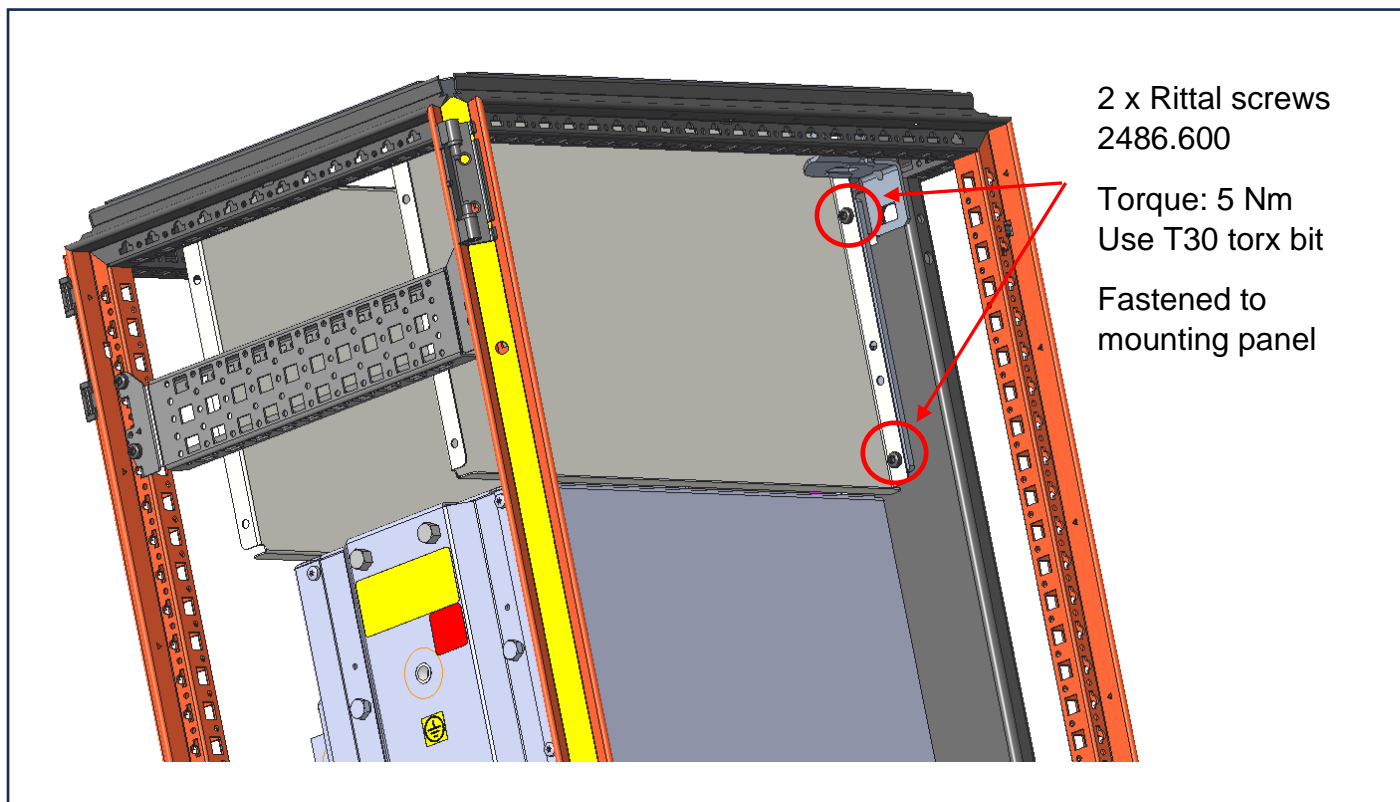


Note that brackets 6521-0323 may need to be lowered into place one at a time



Lower sub assembly of parts 6521-0313 and 6521-0327 onto AFE filter

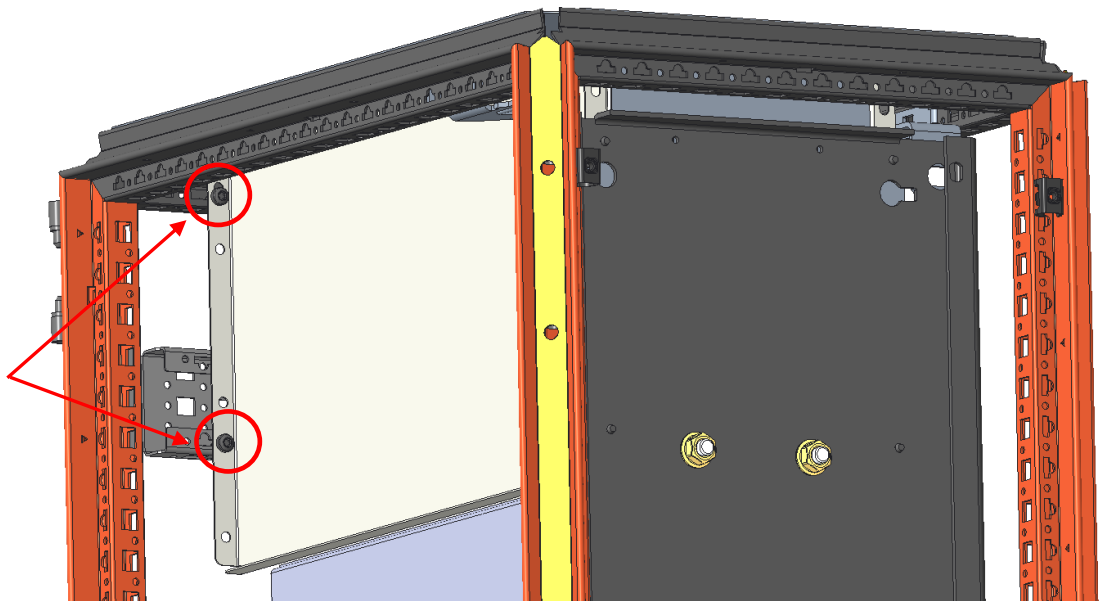
Note that brackets 6521-0323 may need to be lowered into place one at a time



2 x Rittal  
screws  
2486.600

Torque: 5 Nm  
Use T30 torx bit

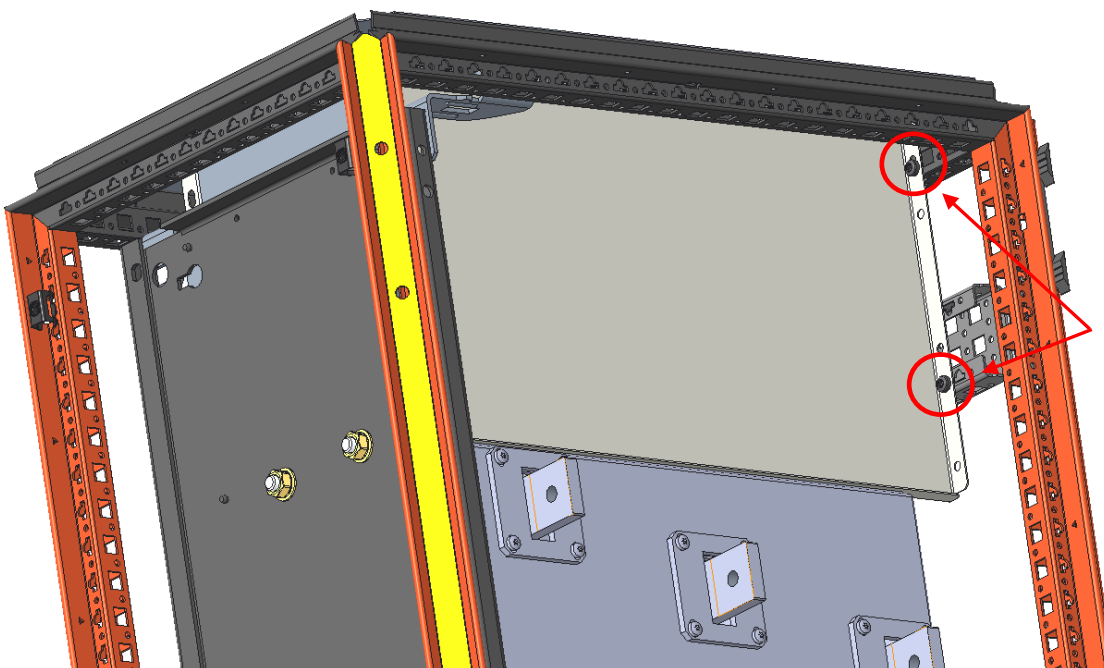
Fastened to  
**front right** side  
of mounting  
panel



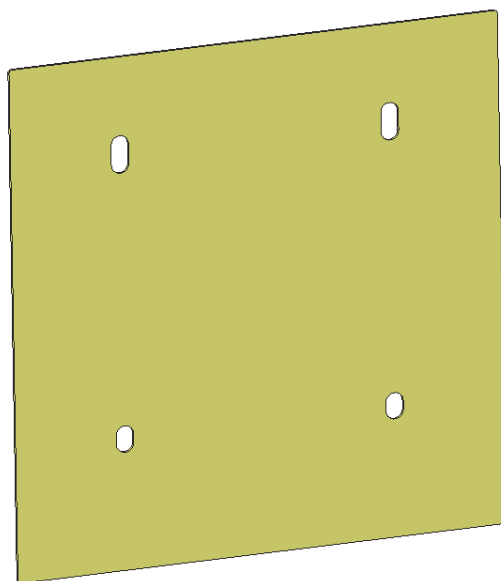
2 x Rittal  
screws  
2486.600

Torque: 5 Nm  
Use T30 torx bit

Fastened to  
**front left** side  
of mounting  
panel



Obtain part 6521-0325

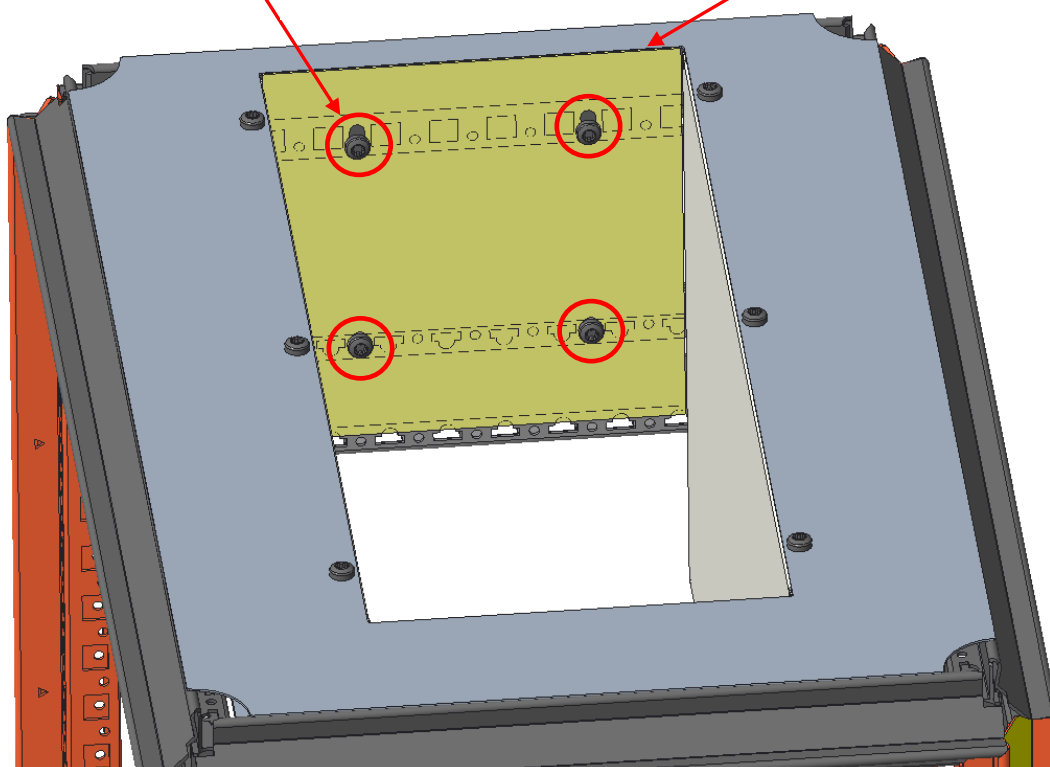


4 x Rittal screw 2486.600

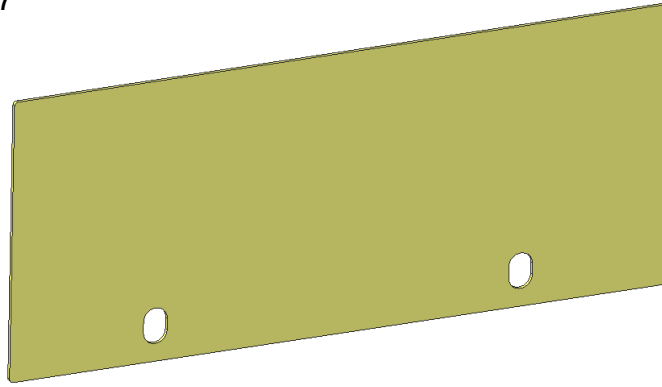
Torque: 5 Nm  
Use T30 torx bit

Edge of part 6521-0325 is  
flush with top surface of  
panel 6521-0327

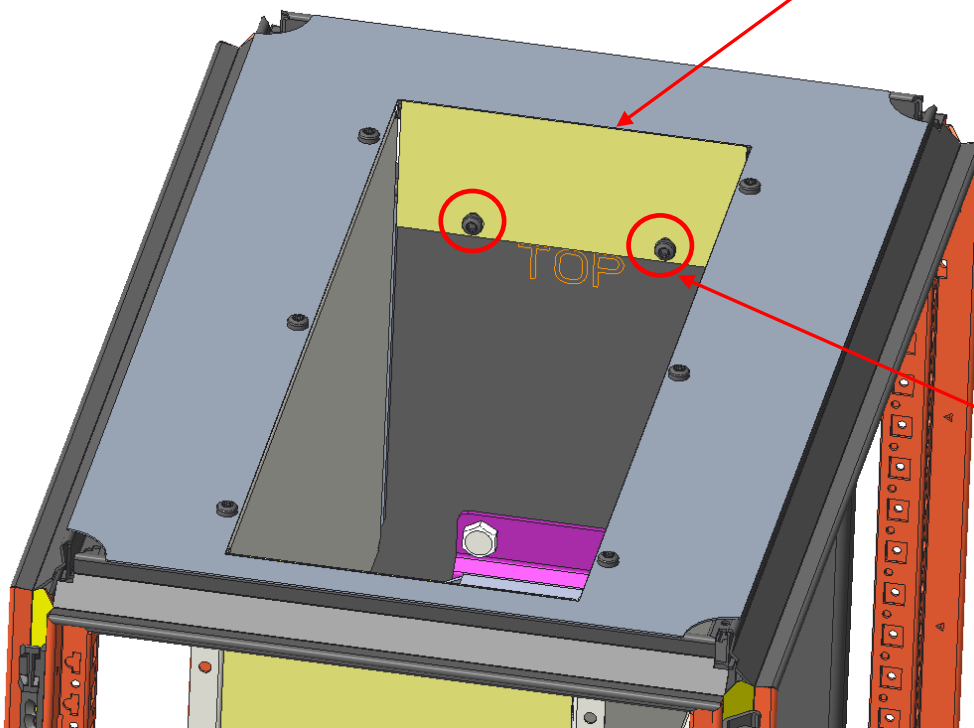
Fastened to punched  
section and frame at front  
of cubicle



Obtain part 6521-0307



Edge of part 6521-0307 is flush with the top surface of panel 6521-0327



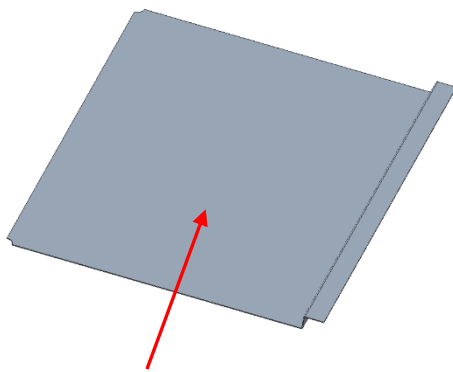
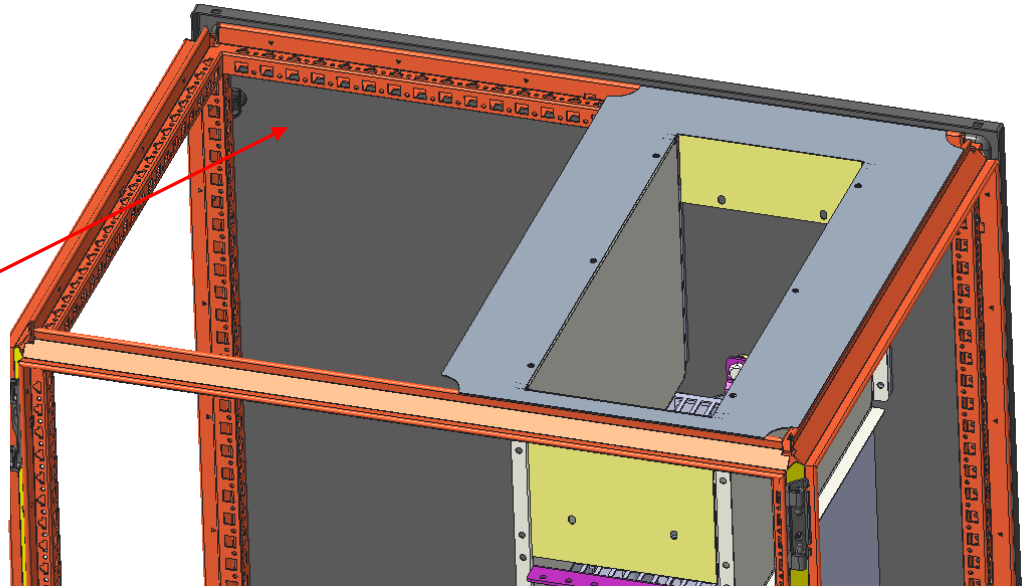
2 x Rittal  
screws  
2486.600

Torque: 5 Nm  
Use T30 torx bit

Fastened to  
mounting panel  
at rear of  
cubicle

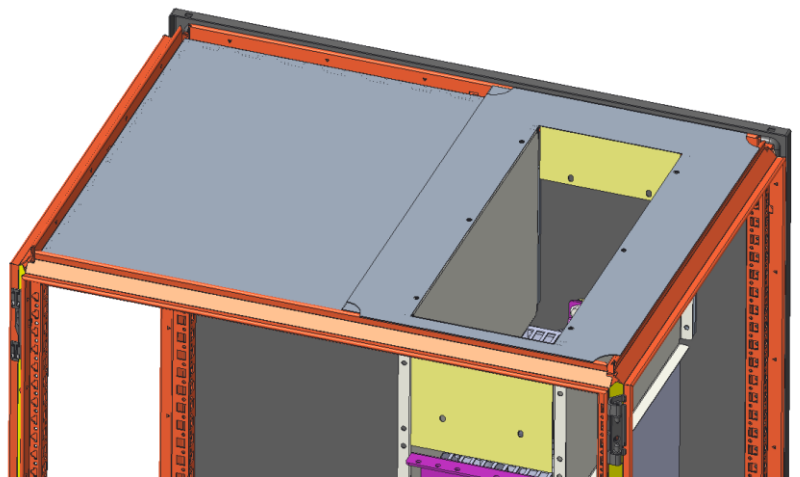
If the cubicle is wider than 400 mm, an additional panel is required close to this area.

Example 1, the cubicle is 800 mm wide, and 600 mm deep, hence additional panel is 402 mm wide, 539 mm long and 1 mm thick.

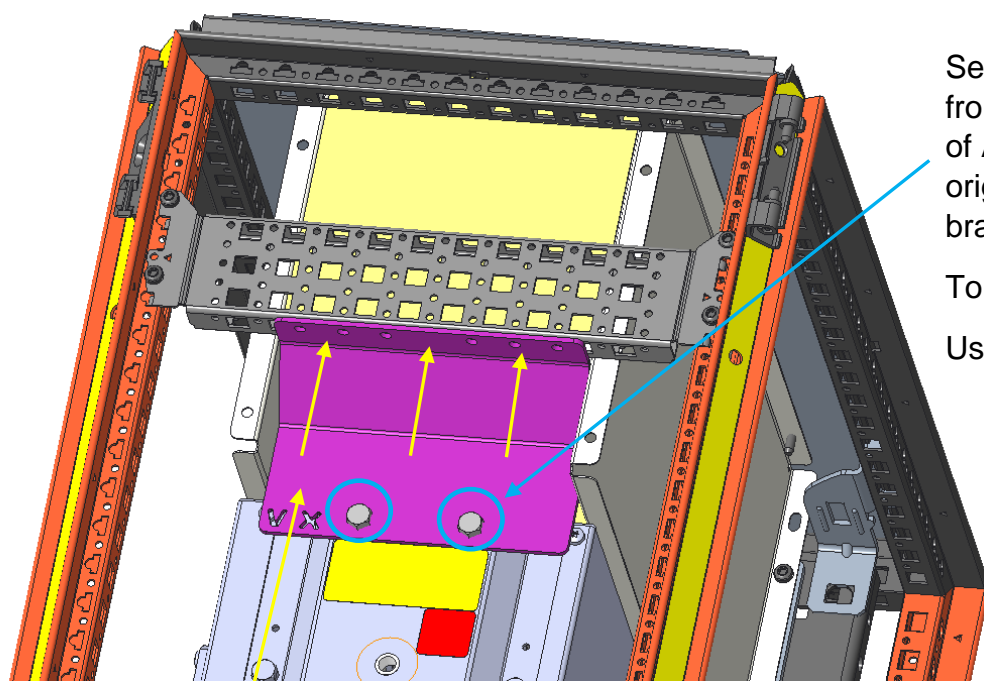
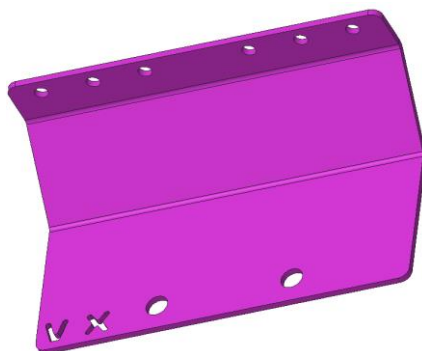


Example 2, the cubicle is 800 mm wide, and 600 mm deep, hence additional panel is 420 mm wide including folds, 539 mm long and 1 mm thick.

Depth of fold is 20 mm



Obtain part 6521-0295



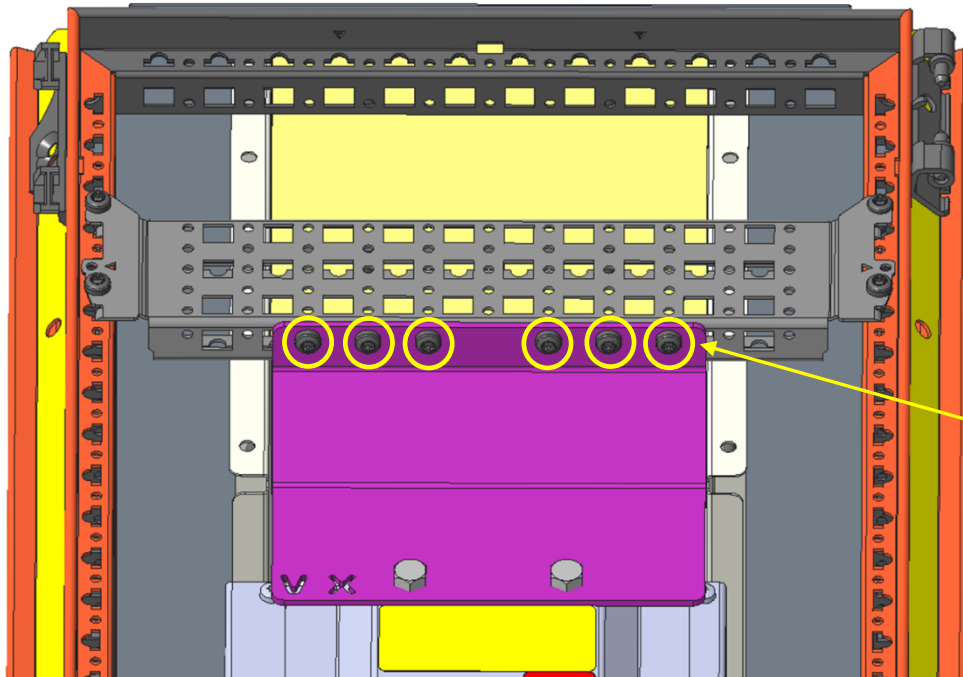
Secure bracket 6521-0295 from kit 6772-0022 to front of AFE filter using bolts originally used to fix bracket of filter.

Torque: 10 Nm

Use 13 mm socket

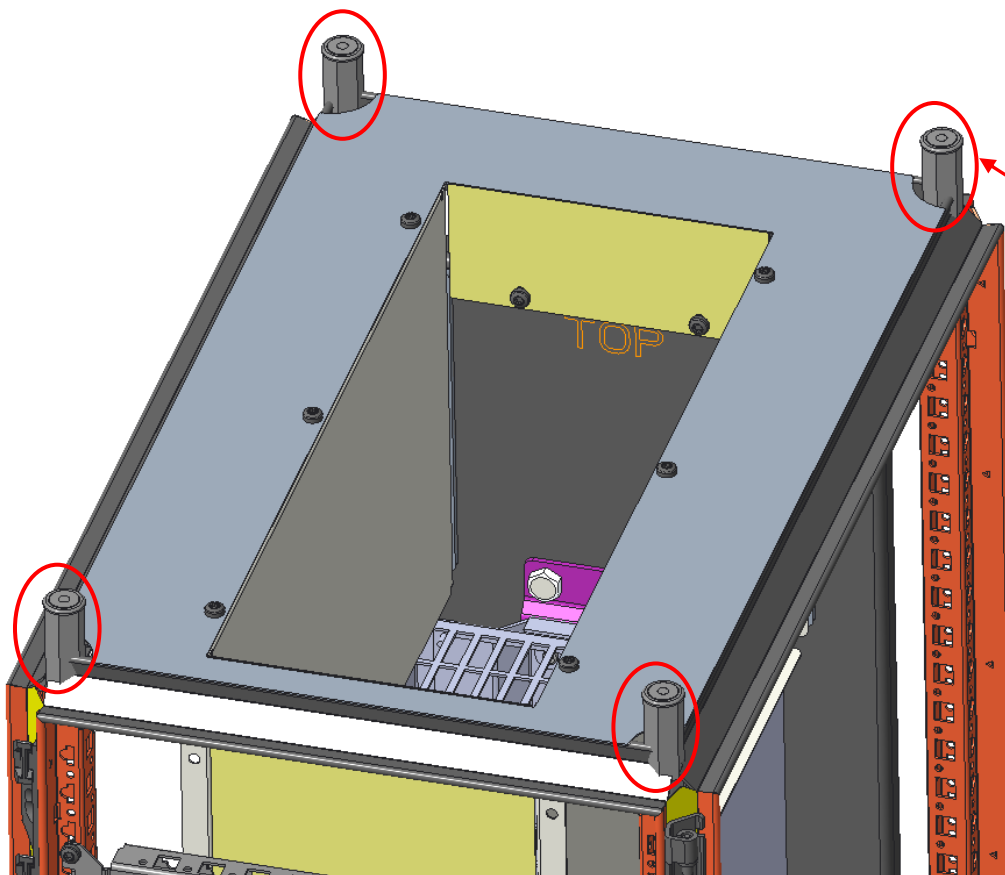
Part 6521-0295

**NOTE:** Push bracket 6521-0295 upwards while tightening the bolts



6 x Rittal screws  
2486.600

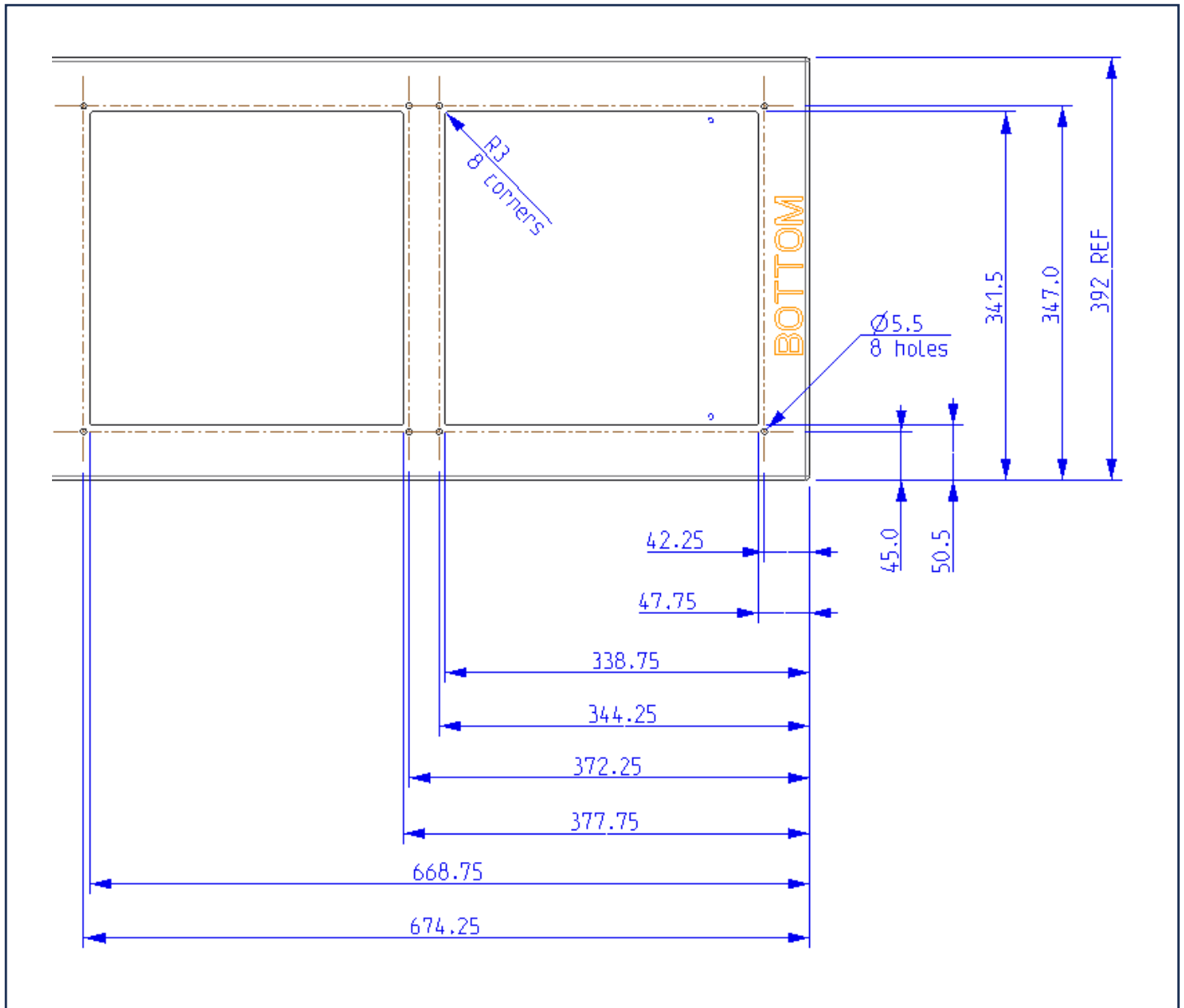
Torque: 5 Nm  
Use T30 torx bit



4 x Rittal spacers  
7967.000 fitted  
as per the Rittal  
instructions







The AFE filter installation is complete