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# REF42plus HMI Cutting Tool

## Operating Guide



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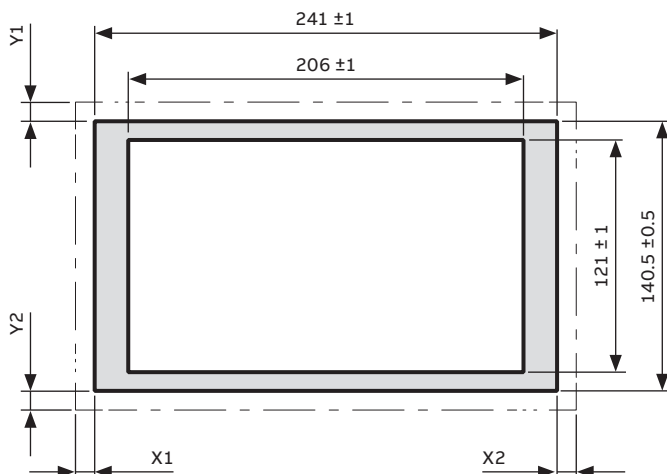
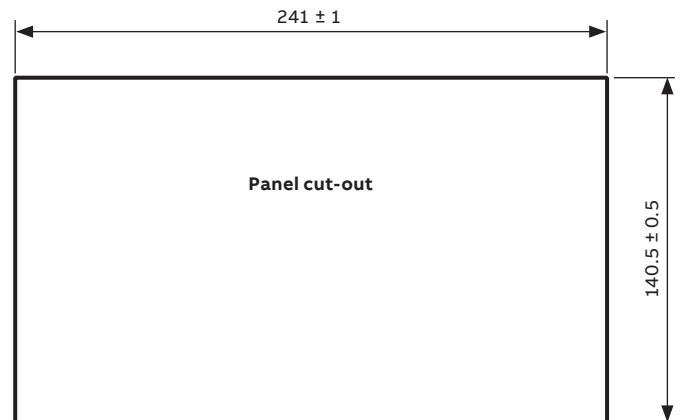
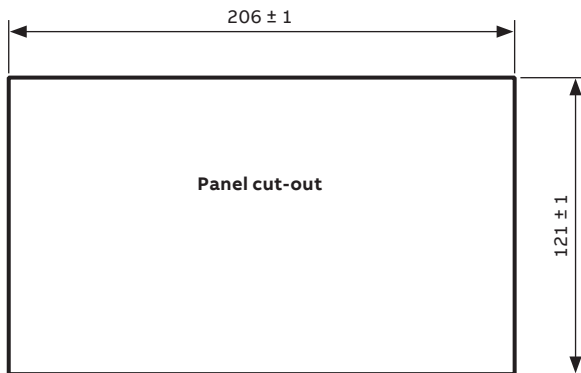
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# 1. Panel cut-out dimensions

The old v4 HMI



The new v5 HMI



Horizontal center line remains the same for existing and for the new HMI cut-out.

Minimum clearance required around the existing cut-out without offcut gatherer: 10 mm ( $Y1 = Y2 = X1 = X2$ ) as illustrated.

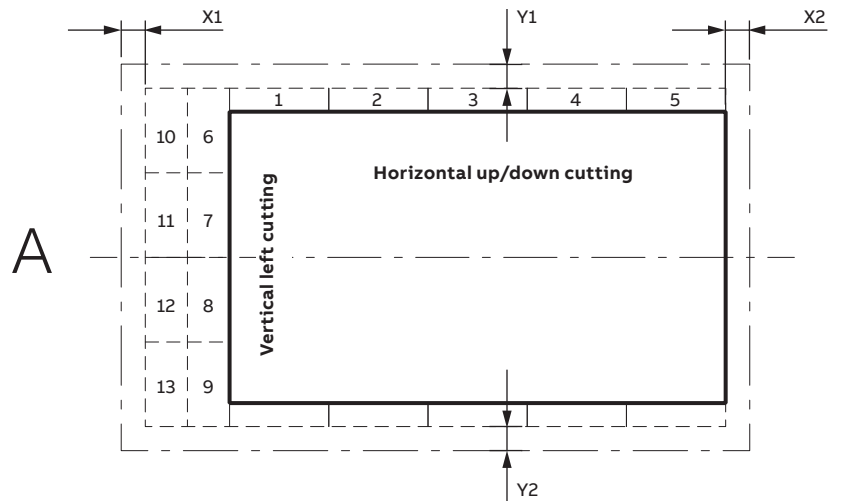
Note! Minimum clearance required around the existing cut-out with offcut gatherer is: 20 mm on both sides ( $X1, X2$ ) and top ( $Y1$ ) and 50 mm on the bottom ( $Y2$ ).

If offcut gatherer is not used, protect the personnel and the switchgear panel from flying offcuts.

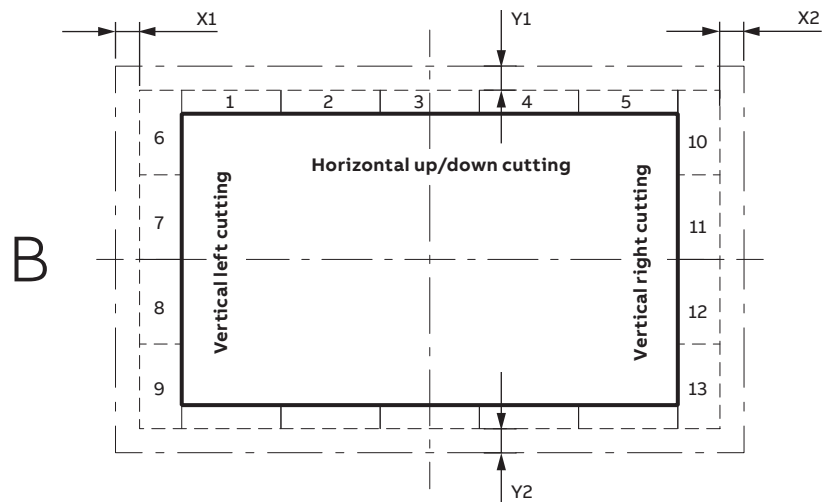
## 2. Cutting order

The cutting order illustrated here is from the HMI front. There are three different cutting order alternatives (A, B, C) depending on the space availability on the panel. Horizontal up/down cut-out is possible only as shown in the pictures as the cutting head makes parallel cut-outs.

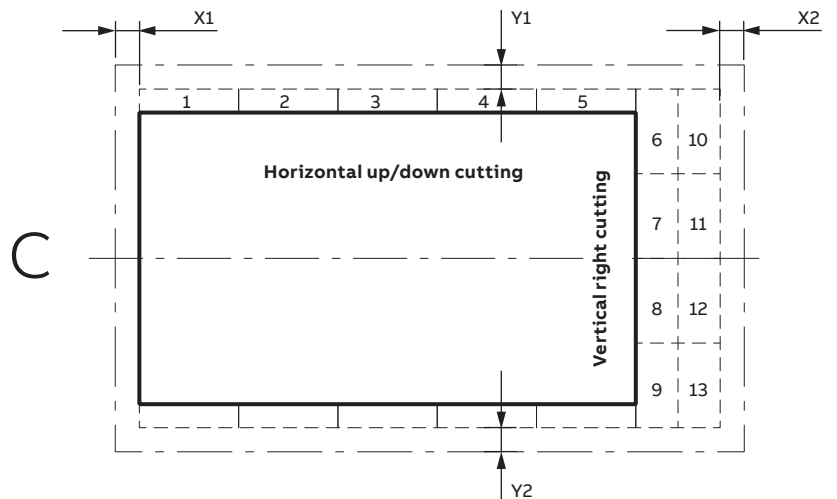
**Alternative A:** For vertical cut-out wherein extension is possible only on the left side.



**Alternative B:** For vertical cut-out wherein extension is possible on both sides.



**Alternative C:** For vertical cut-out wherein extension is possible only on the right side.



### 3. Cutting tool overview



- 1 Cutting head REF 542plus
- 2 Offcut gatherer
- 3 Feed rod
- 4 Die
- 5 Coil springs (4 pcs)
- 6 Punch
- 7 Power unit
- 8 Vent lever
- 9 Operating switch
- 10 Battery
- 11 Battery charger

A file (hand tool) is needed for finishing the work before a new HMI installation.

**Note!** The file is not included in the cutting tool kit.

## 4. Assembling the cutting tool



The cutting tool kit contains 4 pcs of coil springs.



Install the coil springs (4 pcs) between the die and the punch.



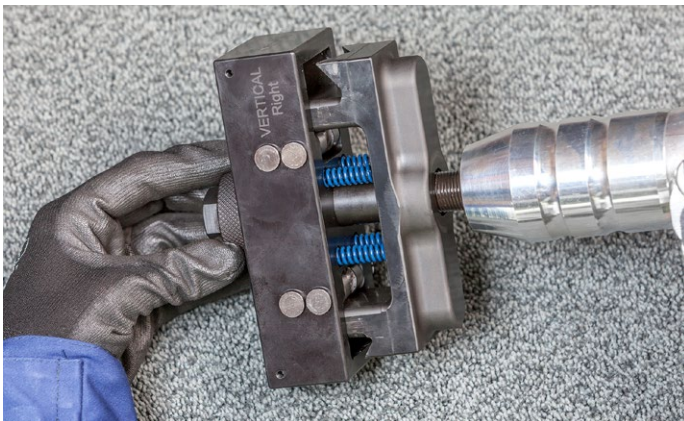
Ensure that the die and the punch have the same marking "REF 542plus" on the same side. This shows that the parts are correctly positioned.



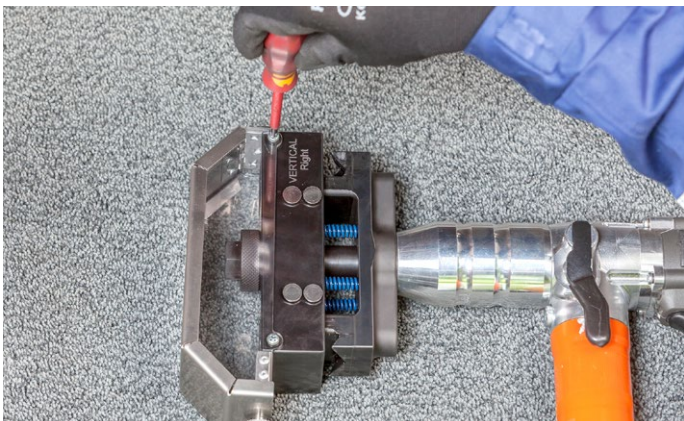
Press the die and the punch firmly together.



Insert the feed rod through the die and the punch assembly.



Tighten the feed rod to the power unit.



Add offcut gatherer by using screws (4 pcs).



After assembling the cutting head, insert the battery to the power unit. The battery can be inserted from either side.



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## 5. Preparations

Refer to safety instructions before starting any operations with the cutting tool.

The cutting can be performed from the front or the back of the panel door. It is recommended to make the cut-out from the front side of the door panel to avoid sharp edges and ensuring smooth installation of the new HMI.

The guidelines in this document are also based on making the cut-out from the front. The low-voltage compartment must be de-energized during installation.

Ensure that there is enough space to operate the cutting tool in all intended directions. Check the space required by the replacement HMI and for the wiring. The cutting tool operation needs space around the cut-out, as shown in section 1.



Start by removing the existing HMI.



For your safety, keep your hands on the power unit, never on the cutting head.

Beware of the sharp edges! Use safety gloves, protective glasses, hearing protectors and a hard hat.

## 6. Operating the cutting tool on a horizontal edge (up/down)



To set the cutting head for horizontal guiding: turn the cutting head to the “HORIZONTAL UP” position so that “HORIZONTAL UP” marking is visible at the top.

Use the “HORIZONTAL UP” position with cuttings (1-5) as shown in the section 2.

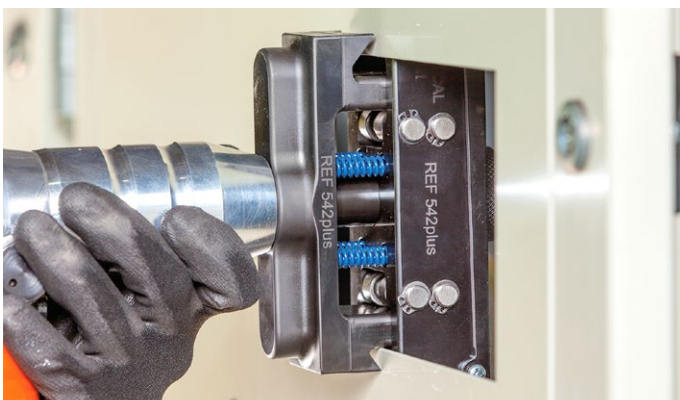
The cutting tool cuts horizontally from the top and the bottom at the same time.




To cut horizontally, swing the cutting head and place the cutting head guiding against the bottom and the left side of the opening.



Ensure that the cutting head is set in the correct position, facing “HORIZONTAL UP” at the top.



 Place the cutting head exactly on the cut-out edge so that it is resting against the bottom.



Push the cutting head firmly against the left side cut-out edge as shown in the picture.



Push the operating switch.

Be careful with the flinging offcuts, if offcut gatherer is not used.



Push the vent lever to ensure that the punch is released after each cut (1-5).



Make five cuts (1-5) side by side as shown in section 2 cutting order.



It is recommended to make overlapping cuts 1...3 mm to avoid sharp edges in between the cutting junction points.



For the last horizontal cut, push the cutting head firmly against the right side cut-out edge as shown in the picture.

## 7. Operating the cutting tool on a vertical edge



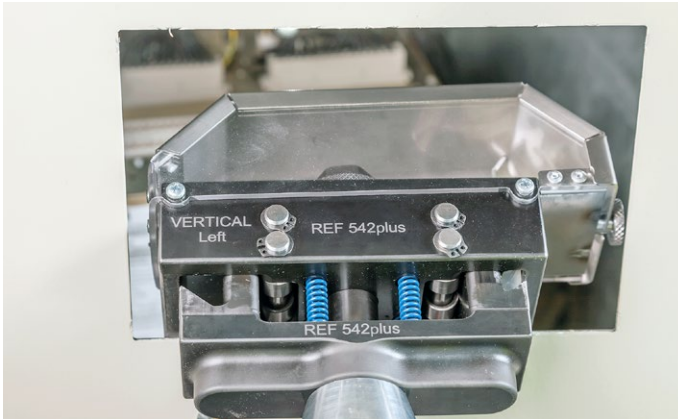
Rotate the cutting head to set the correct vertical cutting direction.



For your safety, keep your hands on the power unit, never on the cutting head.

Beware of the sharp edges!

## 7.1 Vertical cut Alternative A (left/left)



To set the cutting head for vertical left guiding: turn the cutting head so that the “VERTICAL Left” marking is at the top.

Use the “VERTICAL Left” position with cuttings (6-9) and (10-13) as shown in section 2 (alternative A).



Push the cutting head firmly against the left side cut-out edge starting from the top.



Make four cuts (6-9) below each other, starting from the top.

It is recommended to make overlapping cuts to avoid sharp edges in between the cutting junction points.



For the last vertical cut, push the cutting head firmly against the left side cut-out edge as shown in the picture.

Repeat the procedure for cuts 10-13, starting from the top.

## 7.2 Vertical cut Alternative B (left/right)

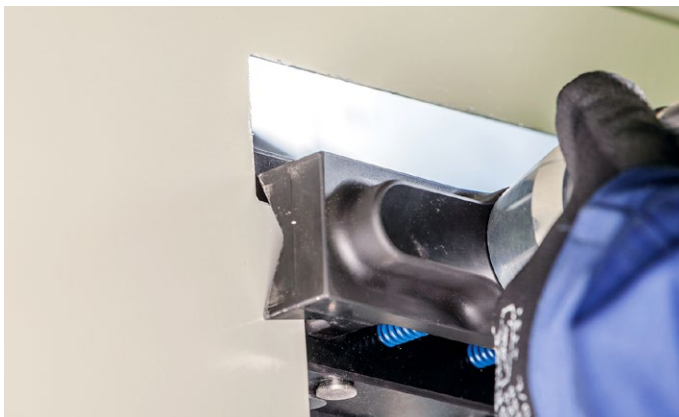


To set the cutting head for vertical left guiding: turn the cutting head so that the “VERTICAL Left” marking is at the top.

Use the “VERTICAL Left” position with cuttings (6-9) as shown in section 2 (alternative B).



Push the cutting head firmly against the left side cut-out edge starting from the top.

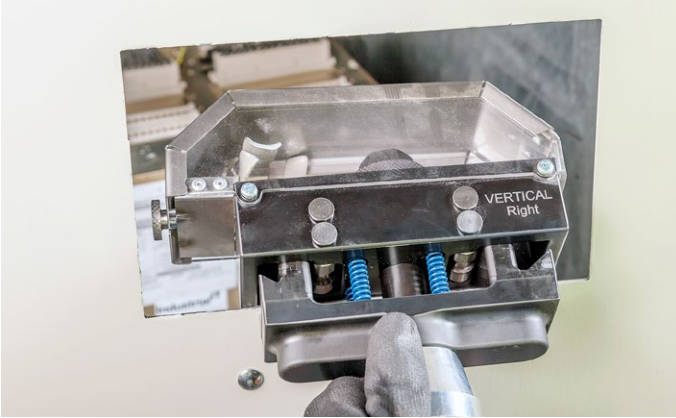


Make four cuts (6-9) below each other.

It is recommended to make overlapping cuts to avoid sharp edges in between the cutting junction points.



For the last vertical cut, push the cutting head firmly against the left side cut-out edge as shown in the picture.



Turn the cutting head to the “VERTICAL Right” position to make cuttings (10-13).



Push the cutting head firmly against the right side cut-out edge starting from the top.



Make four cuts (10-13) below each other, starting from the top.

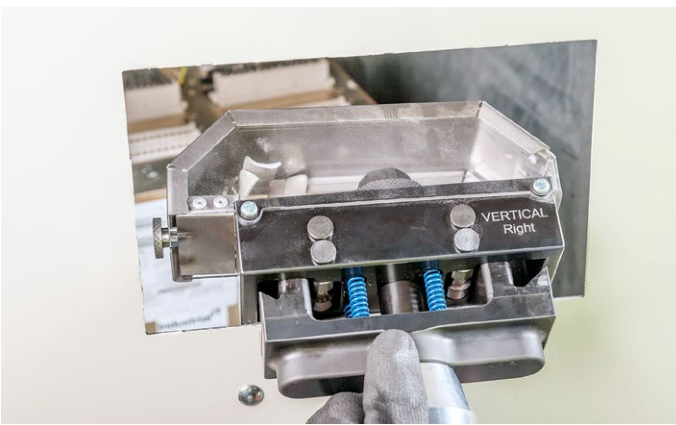
It is recommended to make overlapping cuts to avoid sharp edges in between the cutting junction points.



For the last vertical cut, push the cutting head firmly against the right side cut-out edge as shown in the picture.



## 7.3 Vertical cut Alternative C (right/right)



To set the cutting head for vertical guiding: turn the cutting head to the “VERTICAL Right” position facing up.

Use the “VERTICAL Right” position with cuttings (6-9) and (10-13) as shown in section 2 (alternative C).



Push the cutting head firmly against the right side cut-out edge starting from the top.



Make four cuts (6-9) below each other, starting from the top.

It is recommended to make overlapping cuts to avoid sharp edges in between the cutting junction points.



For the last vertical cut, push the cutting head firmly against the right side cut-out edge as shown in the picture.

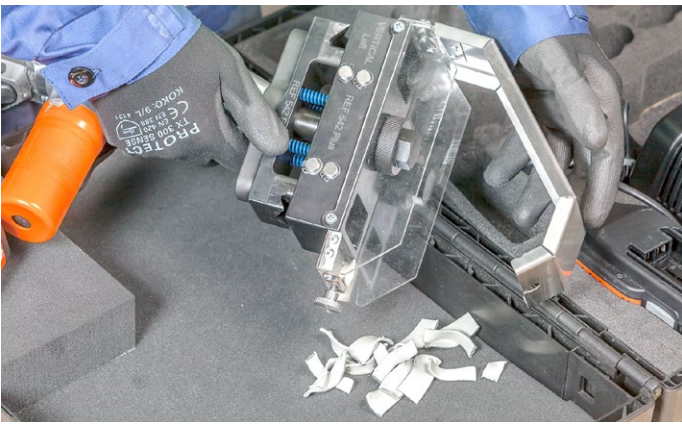
Repeat the procedure for cuts 10-13, starting from the top.

## 8. Finalizing your work



After each HMI cut-out, empty the offcut gatherer.

For safety reasons remove the battery first.




Ensure that no offcuts remain inside the switchgear if offcut gatherer was not used.



Use a file (hand tool) to remove any sharp edges or burrs around the cut-out area.



 Cover the relay compartment to avoid the spread of dust.



Make sure to pay special attention in filing snap-lock areas on the top and bottom of the cut-out. This makes new HMI installation easier.



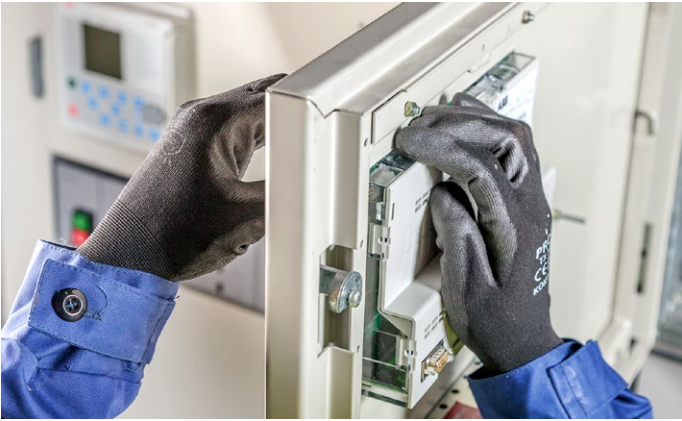
Clean dust and any offcuts if offcut gatherer was not used.

## 9. Finishing your work



It is advisable to coat bare surfaces, for example with cold galvanized compounds, in case of corrosive atmosphere.

Install the new v5 HMI.



Push the snap-locks for easier installation.



Push the HMI from the front.



Install the HMI EMC cover.



Finish your work and close the door.







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