

OPERATING GUIDE

# Relay Retrofit Program for REX 521

## Cutting Tool Operating Guide



# Copyright

This document and parts thereof must not be reproduced or copied without written permission from ABB, and the contents thereof must not be imparted to a third party, nor used for any unauthorized purpose.

The software or hardware described in this document is furnished under a license and may be used, copied, or disclosed only in accordance with the terms of such license.

## Trademarks

ABB and Relion are registered trademarks of the ABB Group. All other brand or product names mentioned in this document may be trademarks or registered trademarks of their respective holders.

## Warranty

Please inquire about the terms of warranty from your nearest ABB representative.

[www.abb.com/service](http://www.abb.com/service)

[www.abb.com/mediumvoltage](http://www.abb.com/mediumvoltage)

## Disclaimer

The data, examples and diagrams in this manual are included solely for the concept or product description and are not to be deemed as a statement of guaranteed properties. All persons responsible for applying the equipment addressed in this manual must satisfy themselves that each intended application is suitable and acceptable, including that any applicable safety or other operational requirements are complied with. In particular, any risks in applications where a system failure and/or product failure would create a risk for harm to property or persons (including but not limited to personal injuries or death) shall be the sole responsibility of the person or entity applying the equipment, and those so responsible are hereby requested to ensure that all measures are taken to exclude or mitigate such risks.

This product has been designed to be connected and communicate data and information via a network interface which should be connected to a secure network. It is the sole responsibility of the person or entity responsible for network administration to ensure a secure connection to the network and to take the necessary measures (such as, but not limited to, installation of firewalls, application of authentication measures, encryption of data, installation of anti virus programs, etc.) to protect the product and the network, its system and interface included, against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB is not liable for any such damages and/or losses.

This document has been carefully checked by ABB but deviations cannot be completely ruled out. In case any errors are detected, the reader is kindly requested to notify the manufacturer. Other than under explicit contractual commitments, in no event shall ABB be responsible or liable for any loss or damage resulting from the use of this manual or the application of the equipment.

## Conformity

This product complies with the directive of the Council of the European Communities on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive 2014/30/EU) and concerning electrical equipment for use within specified voltage limits (Low-voltage directive 2014/35/EU). This conformity is the result of tests conducted by ABB in accordance with the product standards of the IEC 60255 series.

# 1. Introduction

## 1.1 Document revision history

Document revision/date	History
A/2018-05-02	First release

## 1.2 Related documentation

Before taking the cutting tool into use, familiarize yourself with the applicable documents. Depending on the cutting tool, see the appropriate document.

Name of the document	Document ID
Relay Retrofit Program for REX 521 Product Guide	1MRS758962
Relay Retrofit Program for REX 521 Cutting Tool Safety Guide	1MRS758975

See the REX 521 and 615 series documentation for detailed technical information on the relays. Product series- and product-specific manuals can be downloaded from the ABB Website <http://www.abb.com/mediumvoltage>.

## 1.3 Symbols



The warning icon indicates the presence of a hazard which could result in personal injury.



The caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in corruption of software or damage to equipment or property.



The information icon alerts the reader of important facts and conditions.



The tip icon indicates advice on, for example, how to design your project or how to use a certain function.

Although warning hazards are related to personal injury, it is necessary to understand that under certain operational conditions, operation of damaged equipment may result in degraded process performance leading to personal injury or death. Therefore, comply fully with all warning and caution notices.

## 2. Panel cut-out dimensions



Figure 1: REX521RRP with REF615 replacement relay

There are two options to widen the existing cut-out: To the left or to the right depending of the switchgear lay-out (free space on it).

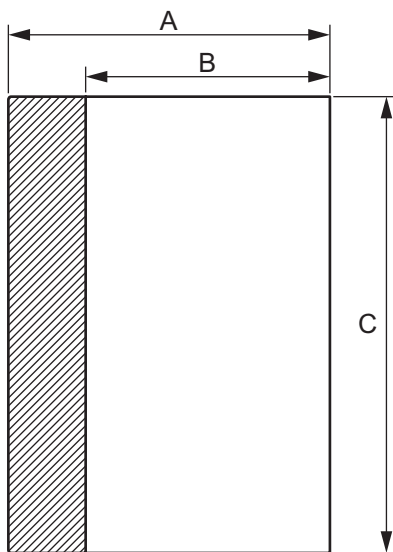


Figure 2: Left cutting

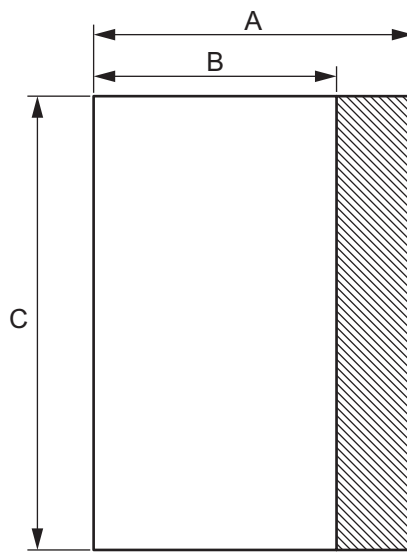


Figure 3: Right cutting

- A. 179 mm  $\pm$  1, new cut-out width
- B. 136 mm  $\pm$  1, old cut-out width
- C. 254 mm  $\pm$  1



### 3. Cutting order

Figure 4 illustrates the cutting order on the front side of the switchgear door when the cutout is widened to the right. The left side cutting is symmetrical but to the left.



Ensure the needed free space before starting the cutting procedure.

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

It is recommended to use the gatherer. Figure 4 illustrates the needed free space when the gatherer is in use.

If there is not enough free space for the gatherer (see Figure 5 and Figure 6), the cutting head can be used without the gatherer. However, safety concerns must be addressed. As the cutoffs may fly from the cutting head, make sure to pick up all the cutoffs and clean dust after the work is completed.

- A. 179 mm, new cut-out width
- B. 8 mm
- C. 254 mm
- D. 136 mm, old cut-out width
- E. 58 mm
- F. 18 mm
- G. 100 mm

- 1. Overlapping
- 2. Space required for gatherer  
(symmetrical when cutting left side)

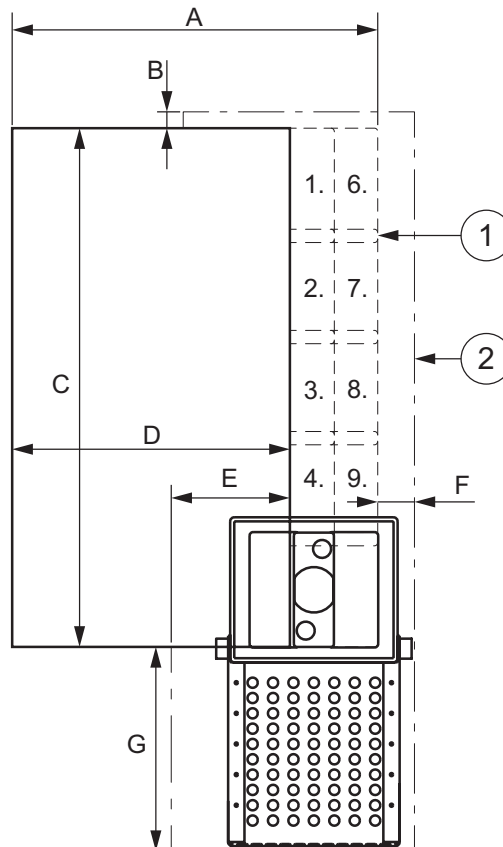


Figure 4: Cutting order on the front side of the switchgear door

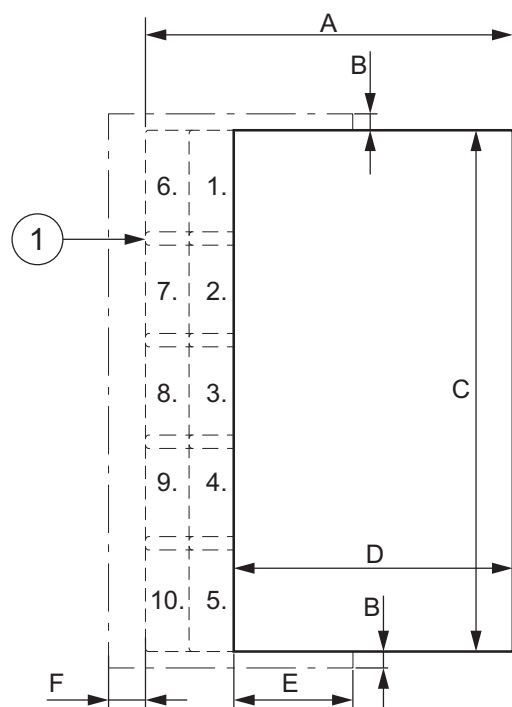


Figure 5: Cutting order to the left

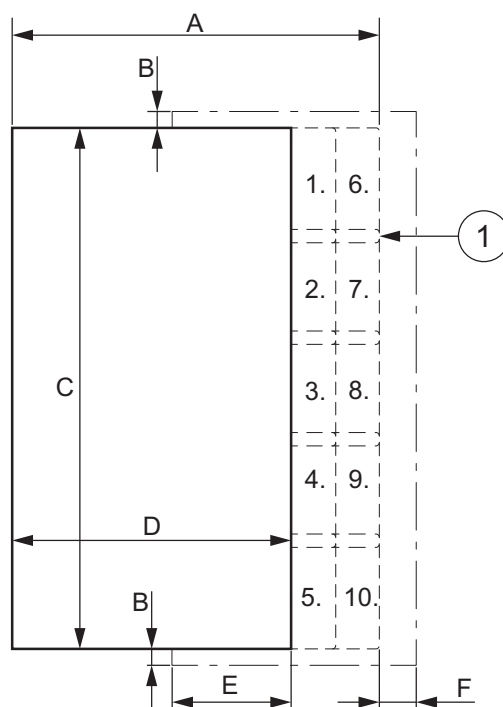


Figure 6: Cutting order to the right

## 4. Cutting tool overview



Figure 7: Cutting tool kit components

1. Cutting head
2. Offcut gatherer (part of the cutting head)
3. Vent lever
4. Operating switch
5. Power unit
6. Battery
7. Battery charger

A file (Figure 8) is needed for finishing the work before installing REX521RRP.  
Note! The file is not included in the cutting tool kit.

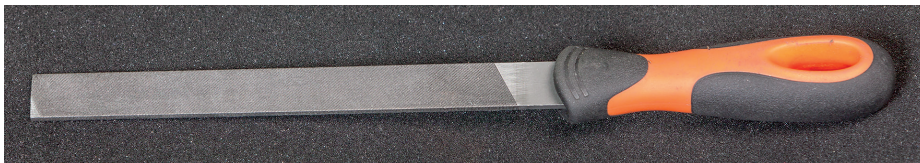


Figure 8: File

## 5. Assembling the cutting tool

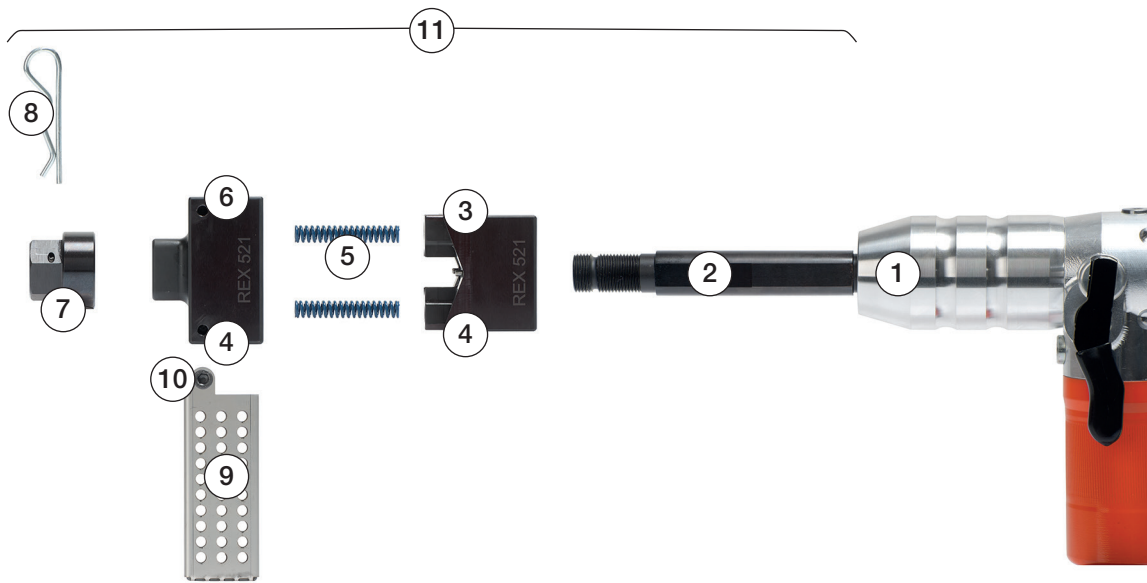


Figure 9: Assembling the cutting head

1. Power unit
2. Feed rod transmitting power to the punching head
3. Punch
4. Cutting head ID. When assembled correctly, the same text should appear in both the die and punch.
5. Coil springs (2 pcs). The punch moves backwards to the starting position when the vent lever is pressed.
6. Die
7. Nut holding the cutting head parts together
8. Lock pin for locking the nut
9. Gatherer for collecting offcuts
10. Gatherer fixing screws (2pcs).
11. Cutting head including eight parts



1. Install the feed rod (2) to the power unit (1).



Tighten the feed rod to the power unit so that all the feed rod threads are inside the power unit.



2. Install the punch (3) to the feed rod (2). Notice the position of the REX 521 marking on the punch.



The punch assembled to its place.



3. Install the two coil springs (5) to their slots in the punch (3).



4. Install the die (6) to the feed rod (2). Ensure the correct die position with the marking in the die.

Check that the coil springs (5) go to their slots in die.





5. Add the nut (7) to the feed rod (2).



6. Turn the nut so that the hole in the nut and the groove in the feed rod are aligned.

Add the lock pin (8) to the hole in the nut.



7. Ensure that the lock pin goes to its place.



8. Add the gatherer (9) to the die (6) part of the cutting head with M6 socket screws (10).

Use tightening torque of 4.2...5.2 Nm.

The cutting tool kit includes a socket screw key (ISO 2936-5) for the M6 screws.



9. Check and correct the gatherer alignment with the cutting head.



Ready installed cutting head with the gatherer.



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

# 6. Preparations

See the Safety Guide before using 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 replacement relay.

The instructions in this document are based on making the cut-out from the front. The low-voltage compartment must be de-energized during the hole cutting procedure and installation of the new replacement relay. Ensure that there is enough space to operate the cutting tool in all intended directions. Check the space required by the new replacement relay. The cutting tool operation needs space around the cut-out.



1. Remove the existing device.



2. Release the signal connectors (not their wires).



3. Release the wires from current/voltage connector.

The used current/voltage connector wires are reused (in specified connector poles) with the new replacing device.





4. Release the protective ground wire.

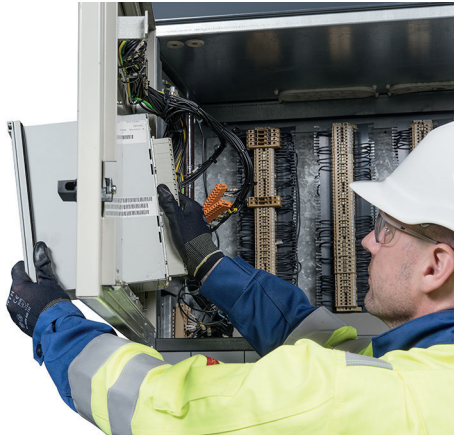


5. After the wires have been released, the whole device can be released. Remove the four fixing bracket screws.



6. Release the four fixing brackets.





7. After releasing all the four fixing brackets, remove the device.

## 7. Operating the cutting tool on the left/right side edges



1. Widen the existing cut-out to the left or to the right depending on the switchgear layout (free space).



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.



2. Check that the cutting head is correctly installed. The marking REX 521 should be on the same side on the punch and the die.





3. Start the cutting procedure by pushing the guiding faces of the cutting head to the cut-out edges: to the top edge and to the right edge side if the right edge widening/cutting is valid.



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



Beware of the sharp edges!



4. Push the operating switch as long as the sheet metal part has been cut off.



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



Do not push the operating switch too long as it may cause maximum pressure in the power unit and result in additional force with vent lever use.



5. Push the vent lever to ensure that the punch is released after each cut.



In some cases, additional force is needed to push the vent lever.



6. Make five cuts 1...5/6...10 one below the other (see figure 4).



Shake the cutting tool in between the cuttings 1...10 to arrange more space for the offcuts inside the gatherer.

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



The fourth cut.



7. For the fifth cut, push the cutting head, which is guiding the faces, firmly against the bottom side edge.

## 8. Finalizing the cutout

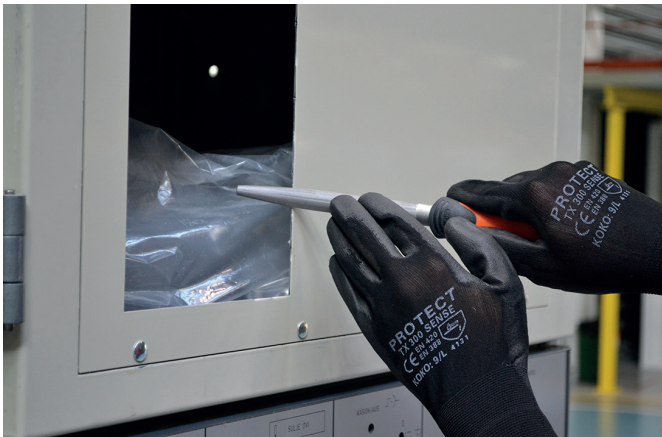



1. After each relay cut-out (ten separate cuttings), empty the offcut gatherer. For safety reasons remove the battery first.

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



2. Use a file to remove any sharp edges or burrs around the cut-out area.



 3. Cover the relay compartment to avoid spreading dust.



4. Clean dust and any remaining offcuts.



## 9. Finishing the work



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

Install the new replacement relay.



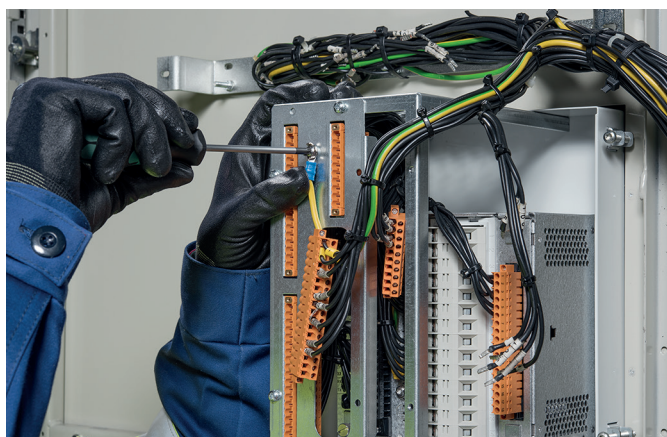
2. Push the new replacement relay firmly against the panel cut-out.



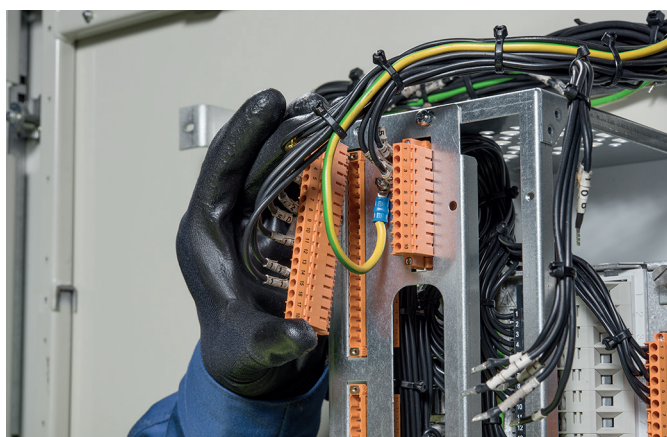
3. Add the four fixing brackets.



4. Tighten all the four fixing bracket screws step by step. Use tightening torque of 1.3...1.7 Nm.



5. Start the wiring work by connecting the safety ground wire.



6. Connect the signal wire connectors. Fix female side wire connectors with their fixing screws to the male side connectors. Use a type PH 0 or PZ 0 (ISO 8764/2) screwdriver. Use tightening torque of 0.2 Nm.



7. Install the current and voltage wires. Only use screwdriver and insert bits for Phillips (PH 1) cross-recessed screws (M3.5). Use tightening torque of 0.8...1.2 Nm.



8. Finish the work and close the door.





---

**ABB Oy Distribution Solutions  
EP Service**

P.O. Box 503  
FI-65101 VAASA, Finland

**[www.abb.com/service](http://www.abb.com/service)  
[www.abb.com/mediumvoltage](http://www.abb.com/mediumvoltage)**

**Additional information**

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB OY does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB OY.

© Copyright 2018 ABB. All rights reserved.  
Specifications subject to change without notice.