INSTRUCTION HANDBOOK

1SDH002300A1001 - ECN000285442

TMAX XT XT6 ELECTRONIC

Disassembly instructions

1. SCOPE

Scope of this document is to illustrate the step-by-step disassembly process of ABB SACE Tmax XT XT6 moulded case circuit breaker equipped with an electronic trip unit (type Ekip DIP LS/I).
Document is focused on Tmax XT XT6 3p IEC version, anyway it allows to cover other versions of Tmax XT XT6 circuit breaker equipped with an electronic trip unit with just few slight differences to be taken into account.

2. SAFETY NOTES

Before proceeding with any disassembly operation, it's mandatory to put the circuit breaker in open position.
Disassembly operations of circuit breakers must be performed by qualified and skilled personnel in the electrical field (IEV 195-04-01: person with relevant education and experience to enable him or her to perceive risks and to avoid hazards which electricity can create) and having a detailed knowledge of circuit breakers.
Disassembly activites must be performed in an ergonomic workspace able to ensure protection of persons demanded to perform disassembly activities.
Applicable national legislation and international standards in force at the time of disassembly of circuit breakers must be taken into account in addition to prescriptions illustrated in this document.
ABB declines any responsibility for injury to people or damage to property resulting from a failure to comply with the instructions set out in this document and with any applicable safety standard.

3. PERSONAL PROTECTIVE EQUIMENT (PPE)

When performing disassembly, following safety Personal Protective Equipment (PPE) must be worn:

Gloves

Glasses

Safety shoes

Protective clothes

4. TOOLS

Disassembly operations require the use of tools (e.g. screwdriver, torx key, pliers, …); tools to be used are specified inside each phase of the disassembly process (see Chapter 6).

5. SEPARATE TREATMENT

Table below lists parts requiring a separate treatment adding information about part location inside circuit breakers and related quantity.

Description	Position inside circuit breaker	Quantity
Cap kits	In correspondence of circuit breaker connection terminals	6
Plugs	In correspondence of circuit breaker upper connection terminals	3
AUE lever group	Mounted at the left of the toggle	1
Right base accessory	Mounted in the bottom right part of the circuit breaker cover	1
Trip test rod	Mounted on the right base accessory	1
Left base group	Mounted in the bottom left part of the circuit breaker cover	1
Toggle extention	Mounted on the toggle	1
Toggle protection	Mounted on the toggle	1
Toggle holder	Mounted on the toggle base	1
Dowels	Mounted in the bottom part of the breaking part	3
Mobile contacts assembly	Mounted in the middle of the breaking part	1
Sensors cover	Mounted in the trip unit	1
Trip coil	Mounted in the trip unit	1
Trip unit printed circuit board	Mounted in the trip unit	1
Sensors assembly	Mounted in the trip unit	1
Current sensors joints	Mounted on the sensors assembly	2

If disassembled parts require a separate treatment a specific indication is provided inside each phase with reason why for the separate treatment (see Chapter 6).

6. DISASSEMBLY PROCESS

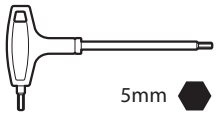
Circuit breakers disassembly process is constituted by a sequence of operations to be performed on products after their dismounting from original installation. For each phase following information are provided:

- Part/parts to be disassembled (title of the phase)
- Tools to be used
- Description of actions to be performed
- Pictures showing actions to be performed
- List, quantity and picture of disassembled parts with an indication about separate treatment (when applicable)
- In case of potential hazards signal below is reported

6.1 PHASE 1 – CAP KITS

Tools

Allen key

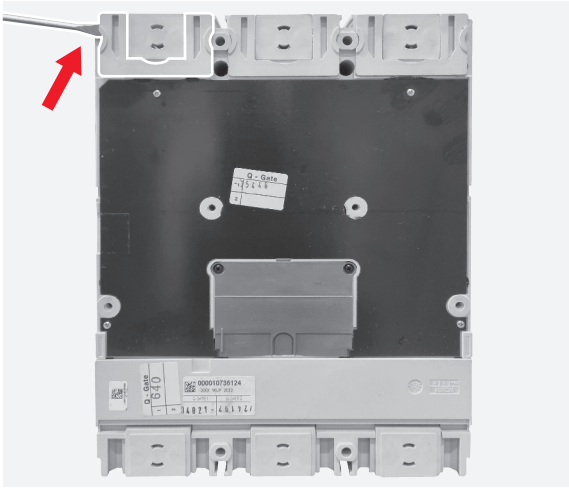


Flat screwdriver

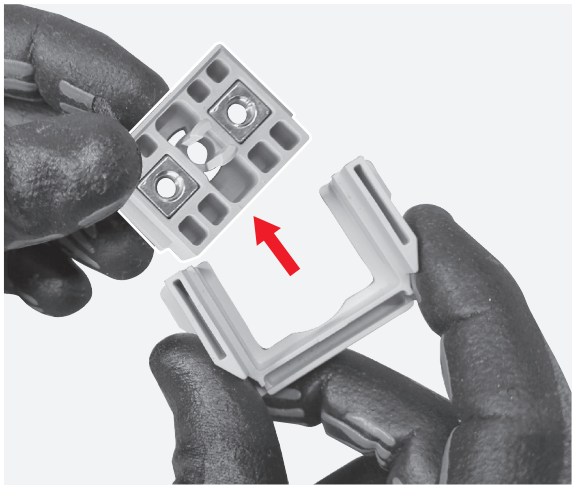
Actions to be performed

1
By means of the allen key remove the screws connected with the cap kits.

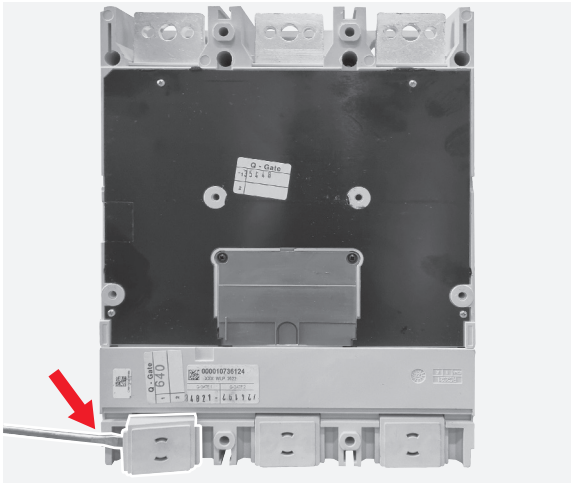
2
Insert the flat screwdriver as shown in the picture and unhook the cap kits and their plugs from the circuit breaker.



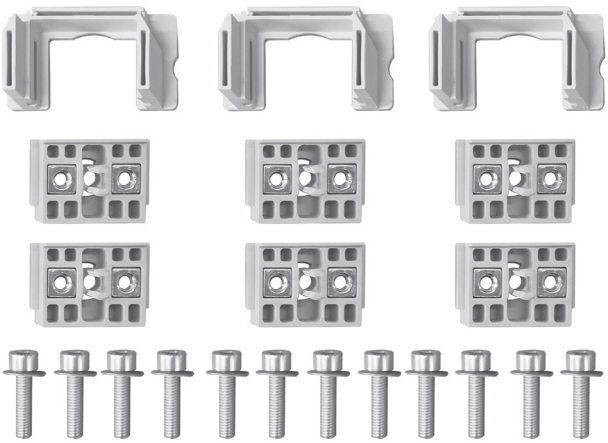
3
Manually separate the cap kits originally mounted in corresponce of the upper terminals from their plugs.



4
Insert the flat screwdriver as shown in the picture and unhook the cap kits from the circuit breaker.



Disassembled parts

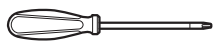


- 12 screws and related washers (Metal)
- 6 cap kits (Plastic and Metal) SEPARATE TREATMENT (Thermoplastics containing brominated flame retardants)
- 3 plugs (Plastic) SEPARATE TREATMENT (Thermoplastics containing brominated flame retardants)

6.2 PHASE 2 – FRONTAL

Tools

Cross screwdriver

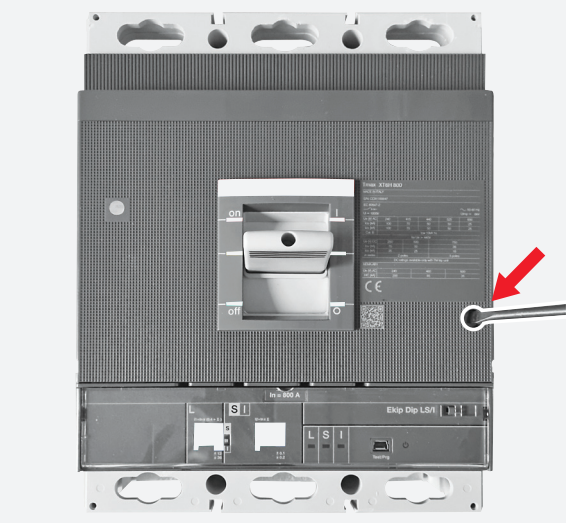


Flat screwdriver

Actions to be performed

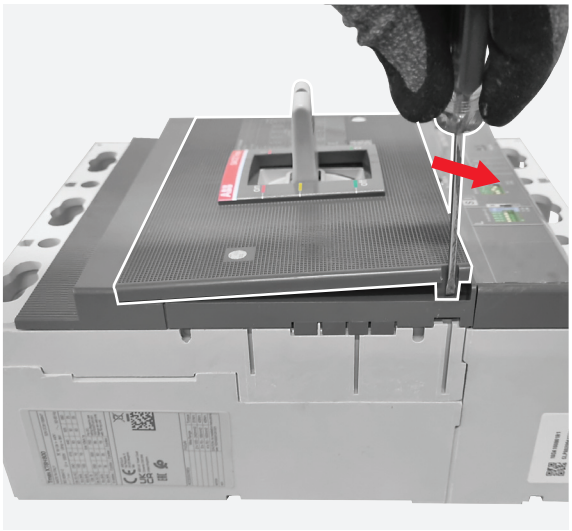
5

By means of the flat screwdriver push the test button in order to bring the circuit breaker in trip position.



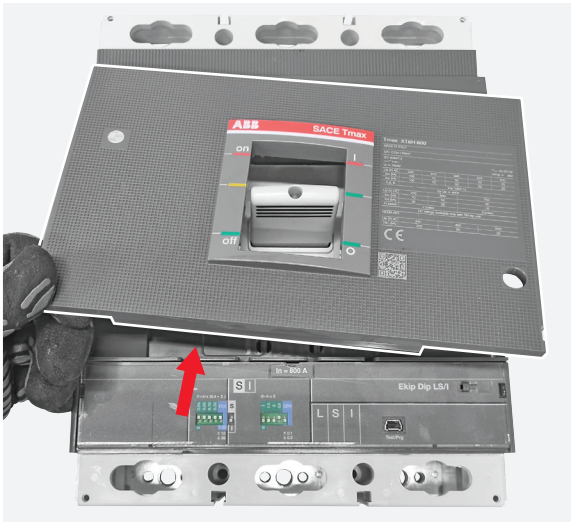
6

Insert the flat screwdriver as shown in the picture and slightly push the screwdriver as shown by the arrow in order to raise up and to unhook the aesthetic front cover from circuit breaker main structure; operation must be performed even on the other side of the circuit breaker.



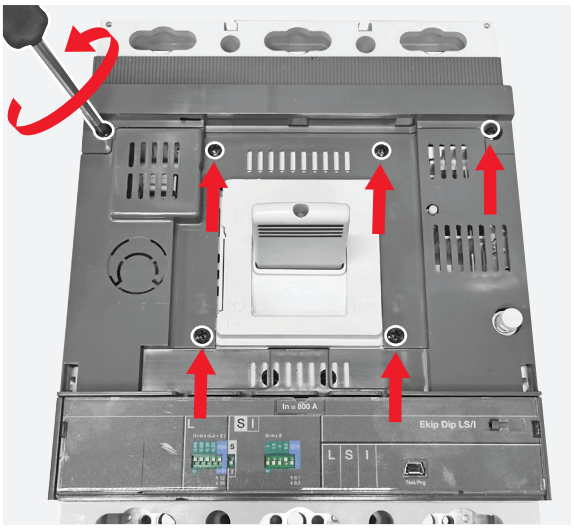
7

Manually remove the aesthetic front cover.

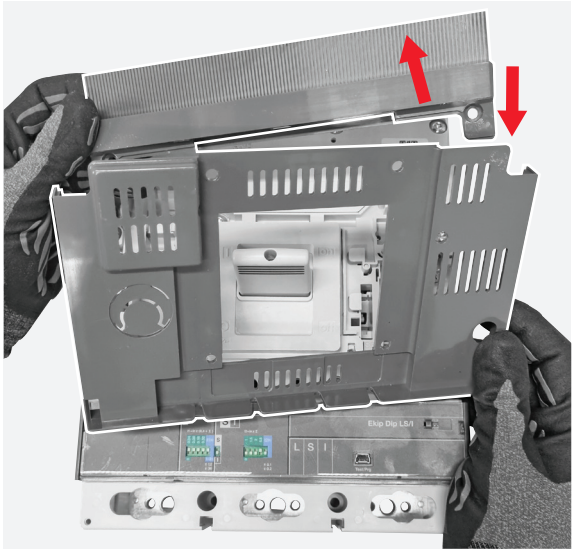


8

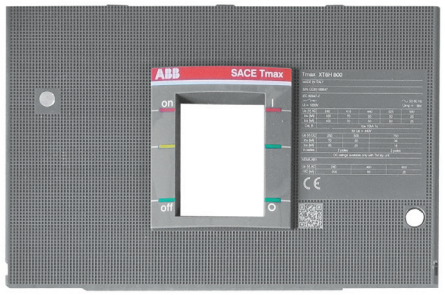
By means of the cross screwdriver unscrew the 6 screws fixing the upper and the lower front covers to the circuit breaker main structure.

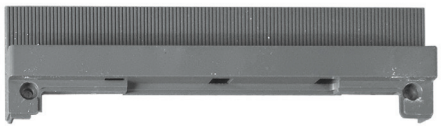


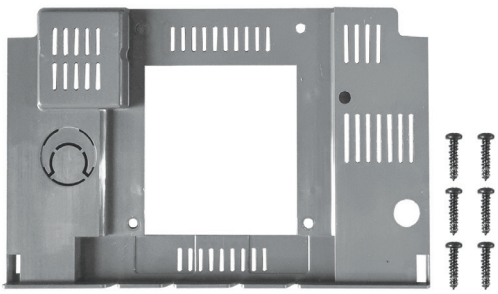
9
Manually remove the upper and the lower front covers.



Disassembled parts





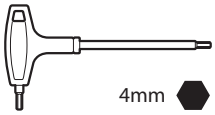


- 1 aesthetic front cover (Plastic)
- 6 screws (Metal)
- 1 upper front cover (Plastic)
- 1 lower front cover (Plastic)

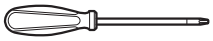
6.3 PHASE 3 – TRIP UNIT

Tools

Allen key



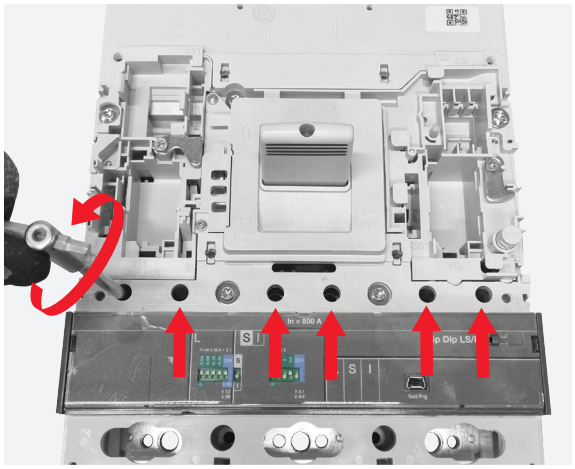
Cross screwdriver



Actions to be performed

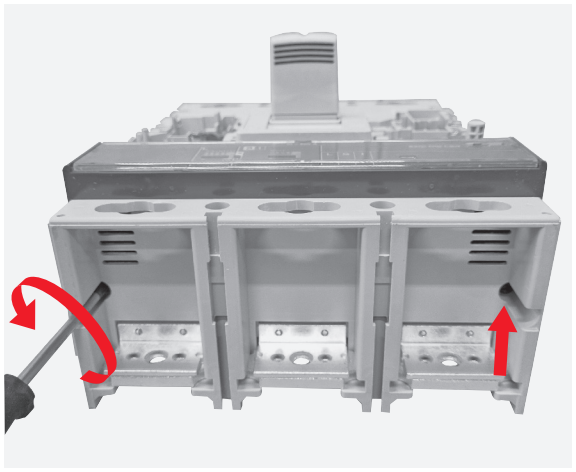
10

By means of the allen key unscrew the 6 screws fixing the trip unit to the breaking part.



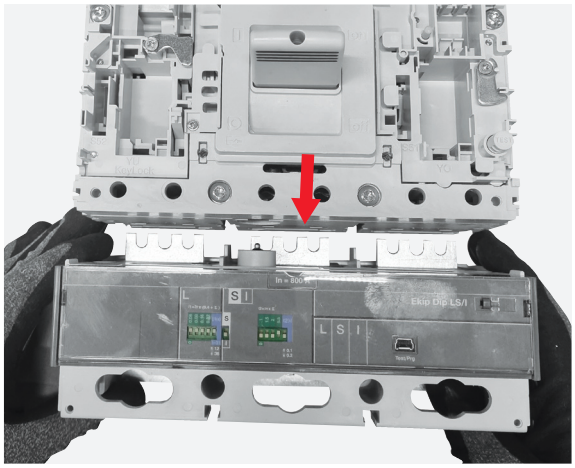
11

By means of the cross screwdriver unscrew the 2 screw located in the bottom part of the circuit breaker fixing the trip unit to the breaking part.

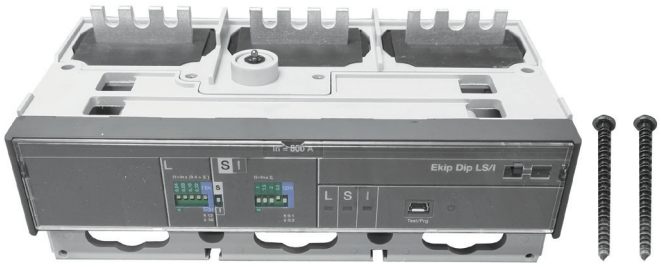


12

Manually remove the trip unit from the breaking part.



Disassembled parts



- 2 screws (Metal)
- 1 trip unit (Plastic, Metal and Electronic components) *

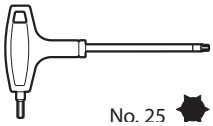
*Trip unit will be furtherly disassembled (see Phases 6.8 and 6.9)

6.4 PHASE 4 – BREAKING PART COVER

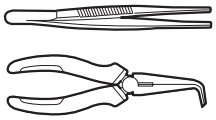
Tools

Cross screwdriver

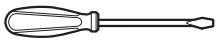
Torx key



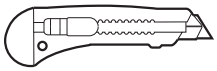
Pliers



Flat screwdriver

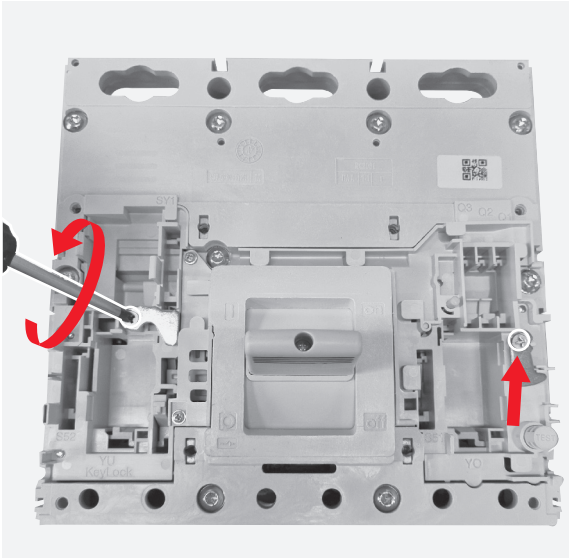


Cutter

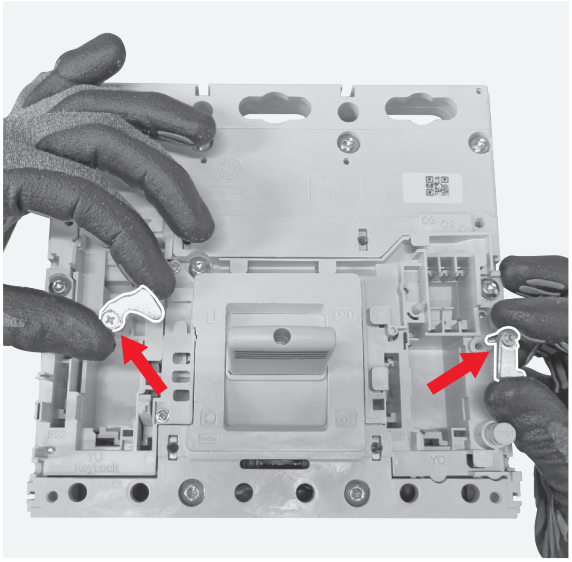


Actions to be performed

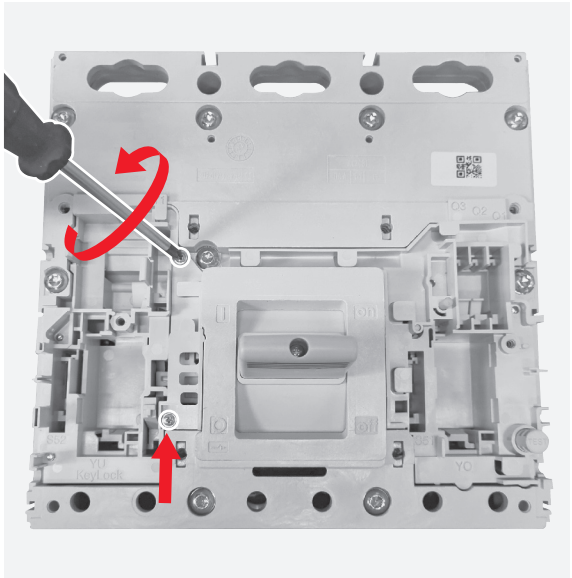
13
By means of the cross screwdriver unscrew the 2 screws fixing the left and the right YO and YU levers to the breaking part.



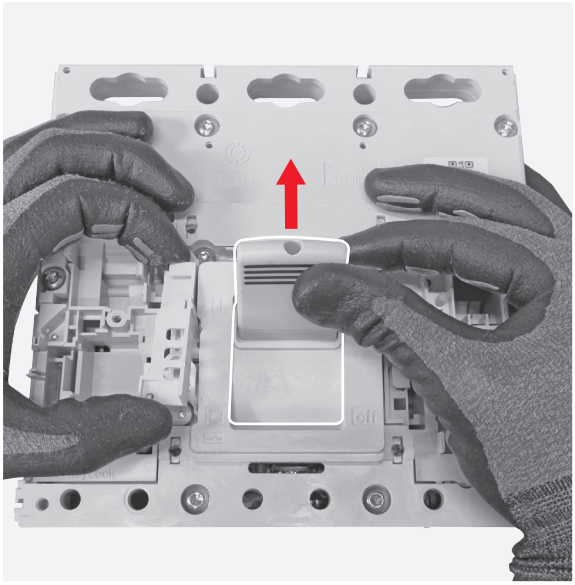
14
Manually remove the 2 screws and the left and the right YO and YU levers.



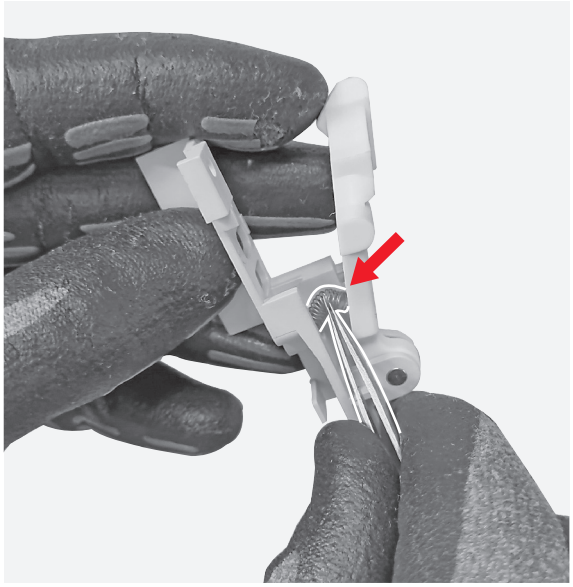
15
By means of the cross screwdriver unscrew the 2 screws fixing the AUE lever group to the breaking part.



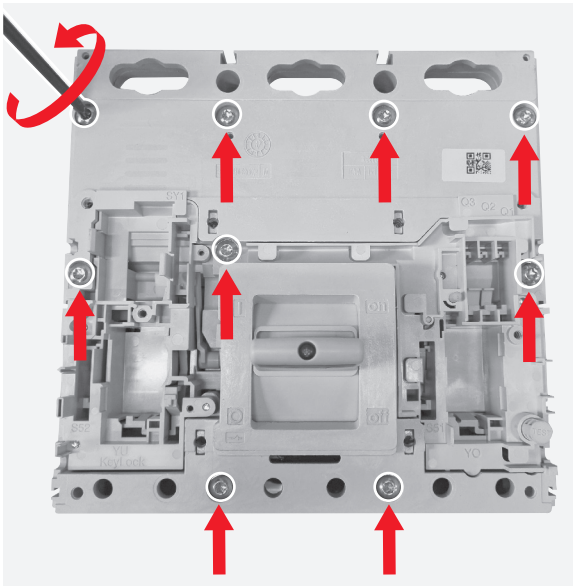
16
Manually slightly lift the AUE lever group and at the same time push the toggle in the direction indicated by the arrow; after manually remove the AUE lever group.



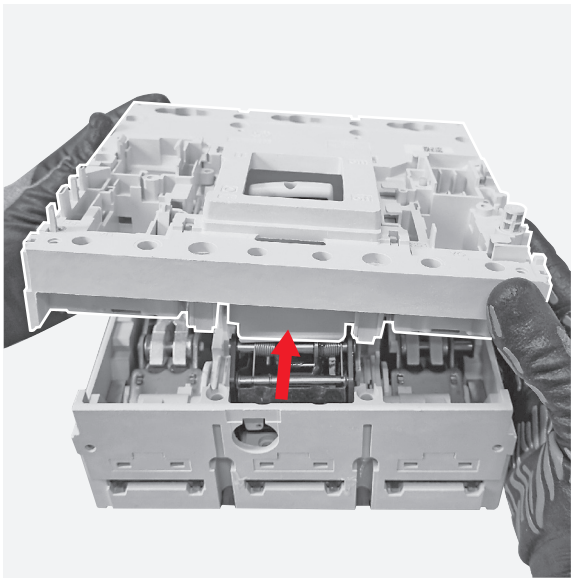
17
By means of the pliers remove the spring mounted inside the AUE lever group.



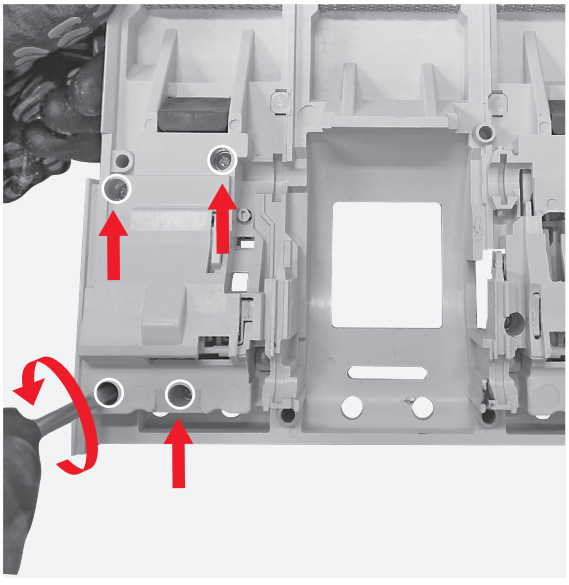
18
By means of the torx key unscrew the 9 screws fixing the breaking part cover to the breaking part main structure.



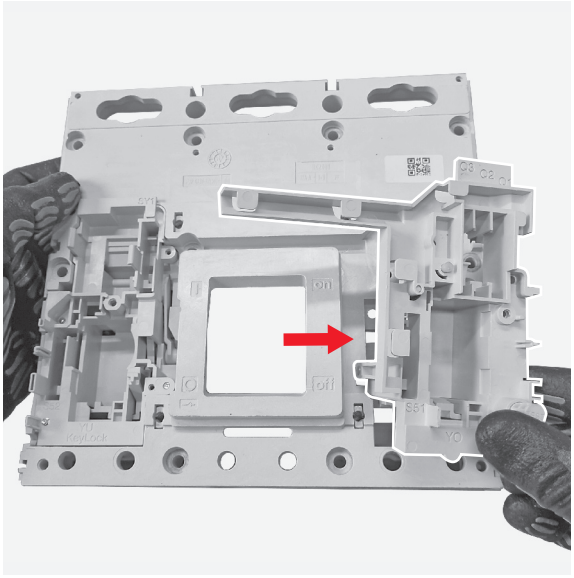
19
Manually remove the breaking part cover.



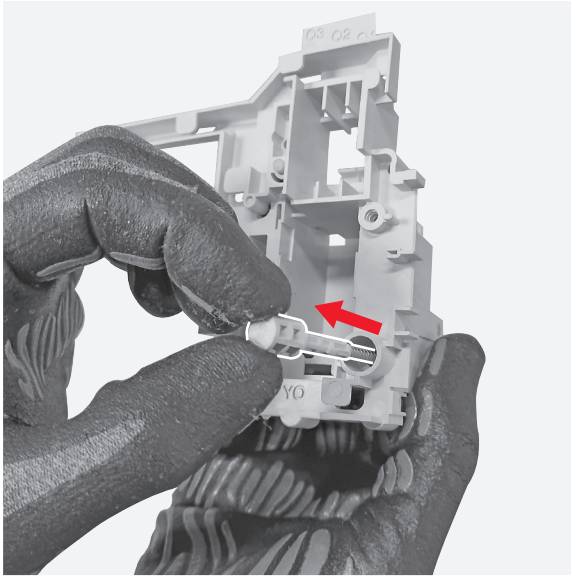
20
By means of the cross screwdriver unscrew the 4 screws fixing the right base accessory to the breaking part.



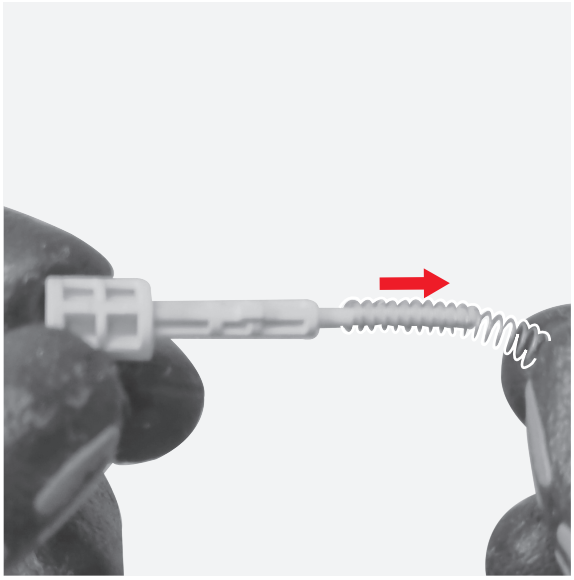
21
Manually remove the right base accessory.



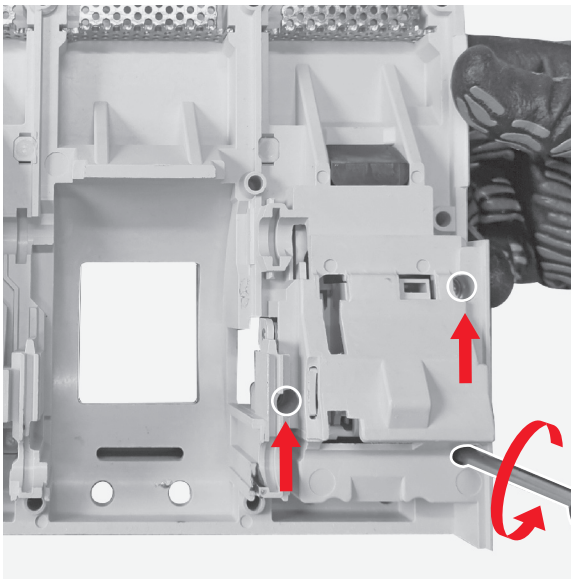
22
Manually bring the trip test rod and rotate it of 90° anticlockwise and the trip test button automatically will separate from the right base accessory.



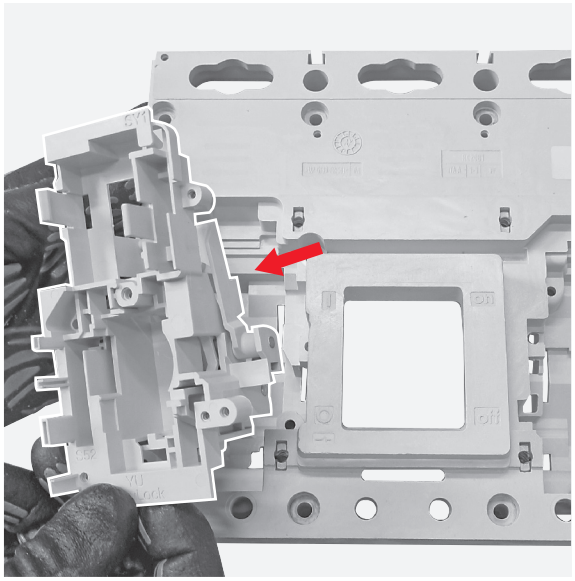
23
Manually separate the trip test rod from its spring.



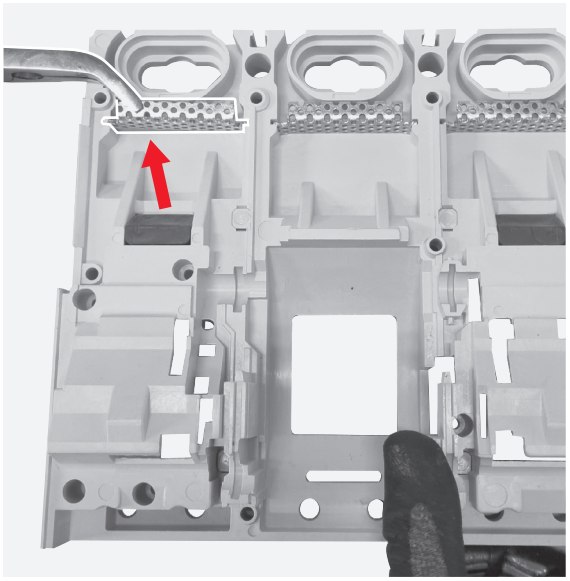
24
By means of the cross screwdriver unscrew the 3 screws fixing the left base group to the breaking part.



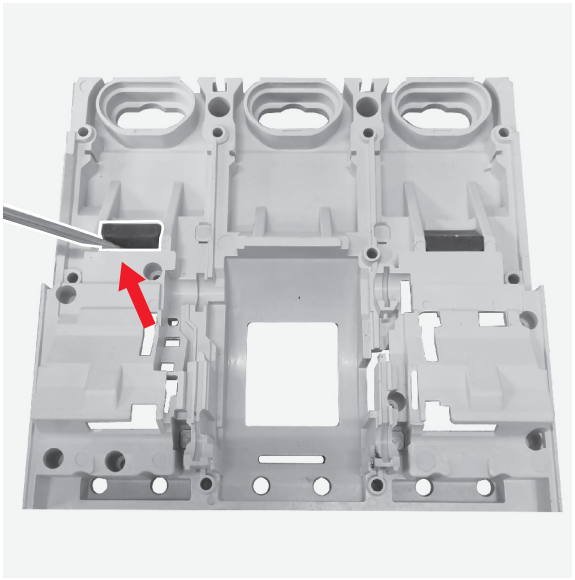
25
Manually remove the left base group.



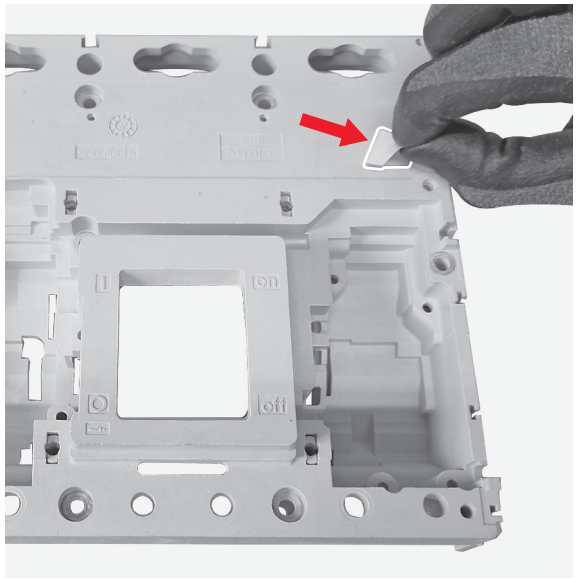
26
By means of the pliers remove the 3 grids located in the upper part of the breaking part cover.



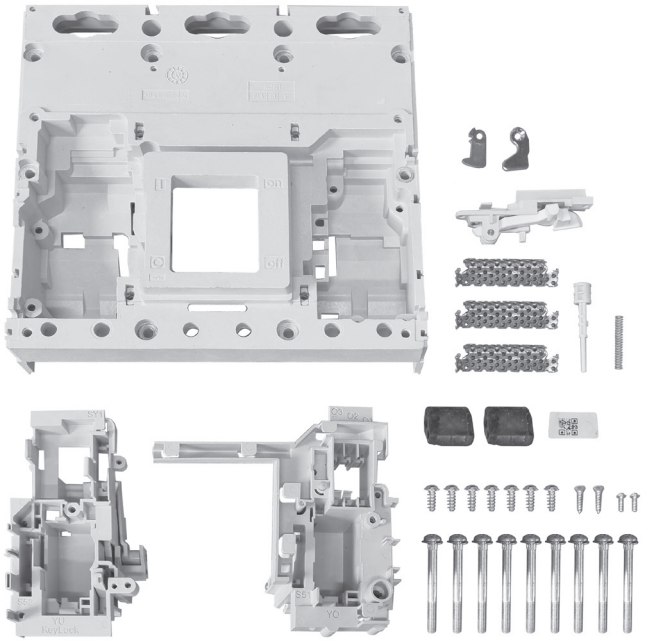
27
By means of the flat screwdriver remove the 2 shock absorbers located at both sides of the breaking part cover.



28
By means of the cutter start removing the label located on the breaking part cover and manually complete the operation



Disassembled parts



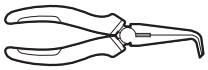
- 2 + 2 + 9 + 4 + 3 screws (Metal)
- 2 YO and YU levers (Metal)
- 1 AUE lever group (Plastic and Metal) SEPARATE TREATMENT (Thermoplastics containing brominated flame retardants)
- 1 + 1 springs (Metal)
- 1 right base accessory (Plastic and Metal) SEPARATE TREATMENT (Thermoplastics containing brominated flame retardants)
- 1 trip test rod (Plastic) SEPARATE TREATMENT (Thermoplastics containing brominated flame retardants)
- 1 left base group (Plastic and Metal) SEPARATE TREATMENT (Thermoplastics containing brominated flame retardants)
- 3 grids (Metal)
- 2 shock absorbers (Rubber)
- 1 label (Adhesive paper)
- 1 breaking part cover (Plastic)

6.5 PHASE 5 – TOGGLE AND ARCHING CHAMBERS

Tools

Cross screwdriver

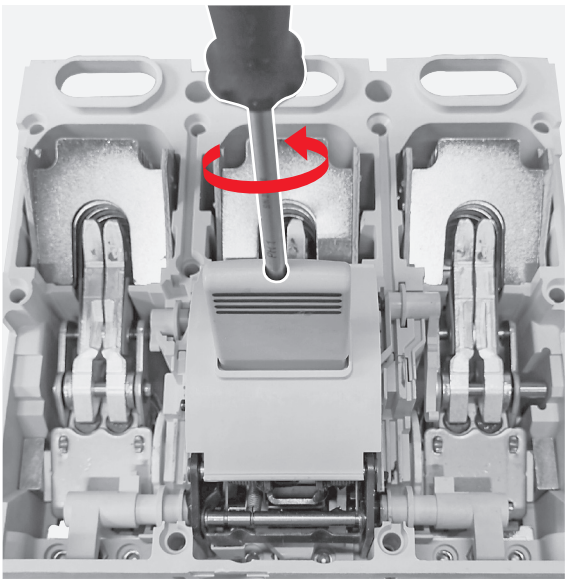
Pliers



Actions to be performed

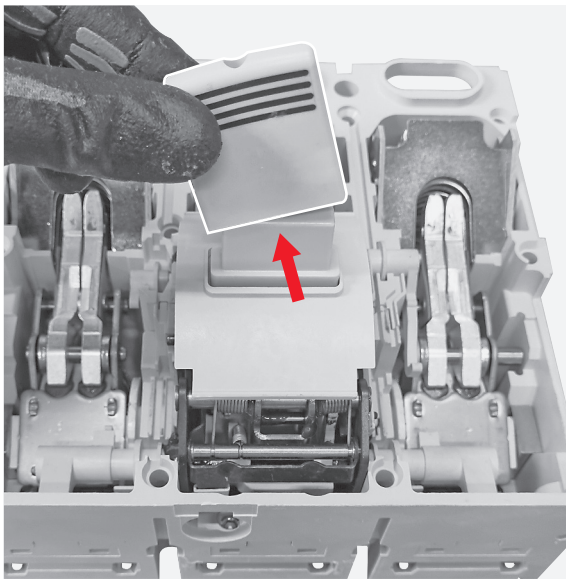
29

By means of the cross screwdriver unscrew the screw fixing the toggle extension to the toggle holder.



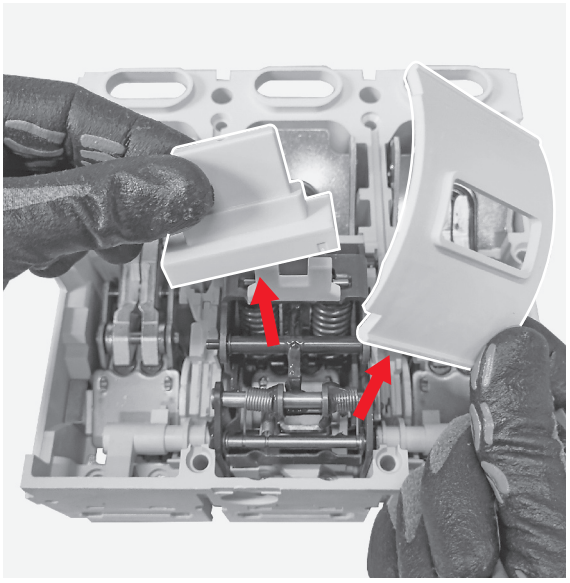
30

Manually remove the toggle extension.



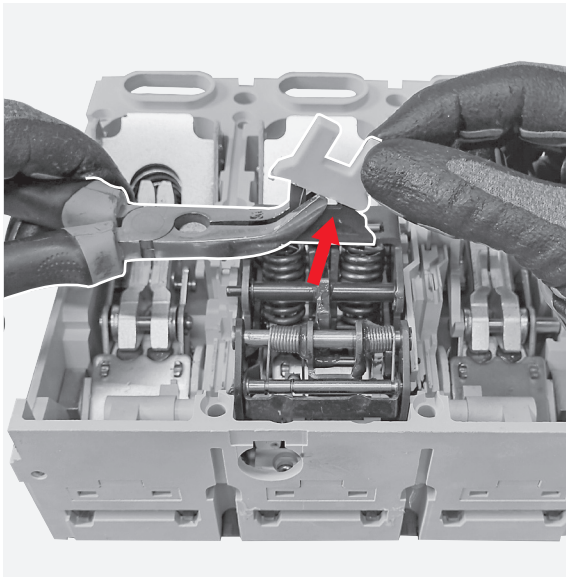
31

Manually remove the toggle protection and the toggle holder.



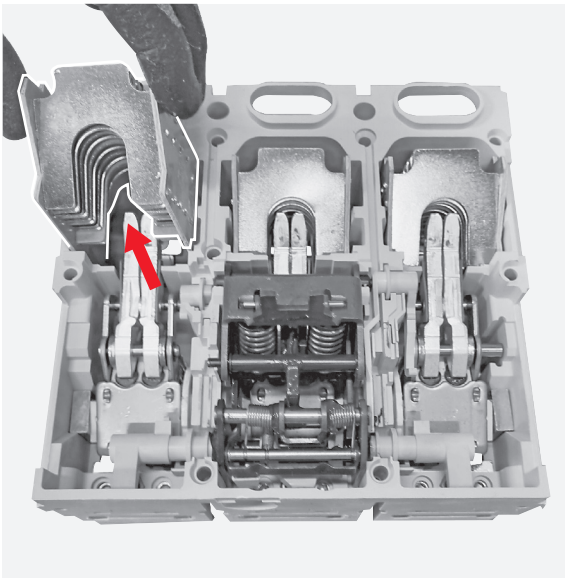
32

By means of the pliers remove the toggle base.

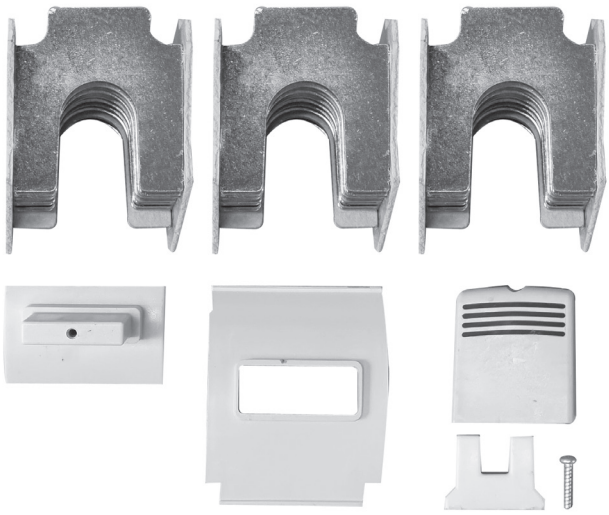


33

Manually remove the arching chambers.



Disassembled parts

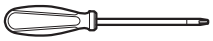


- 1 screw (Metal)
- 1 toggle extension (Plastic) SEPARATE TREATMENT (Thermoplastics containing brominated flame retardants)
- 1 toggle protection (Plastic) SEPARATE TREATMENT (Thermoplastics containing brominated flame retardants)
- 1 toggle holder (Plastic) SEPARATE TREATMENT (Thermoplastics containing brominated flame retardants)
- 1 toggle base (Plastic)
- 3 arching chambers (Metal and GP0-3)

6.6 PHASE 6 – MOBILE CONTACTS ASSEMBLY AND OPERATING MECHANISM

Tools

Cross screwdriver

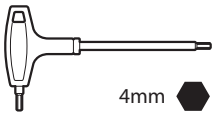


Flat screwdriver

Tube key

Pliers

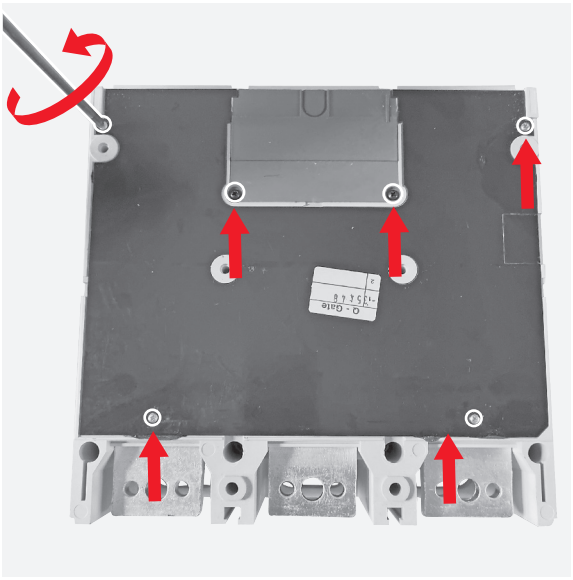
Allen key



Actions to be performed

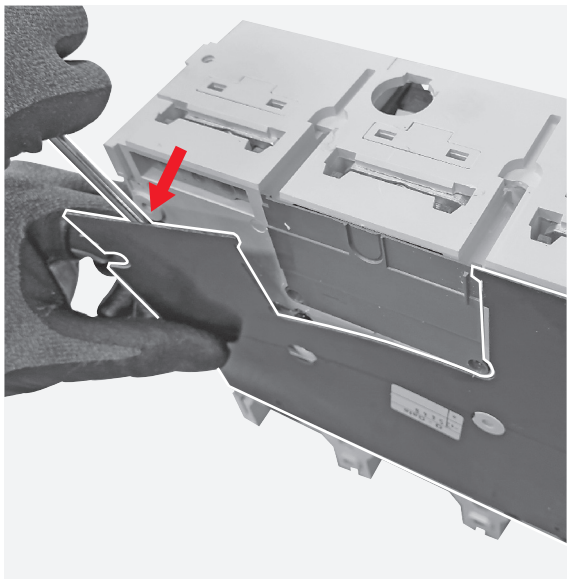
34

By means of the cross screwdriver unscrew the 6 screws fixing the upper rear plate and the lower rear plate to the breaking part main structure.



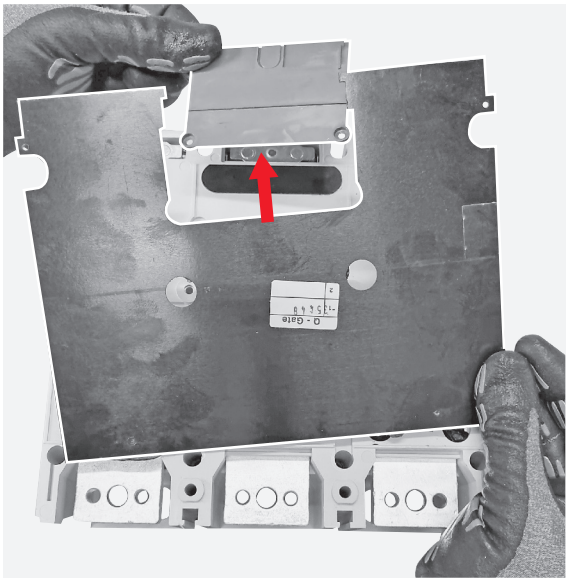
35

By means of the flat screwdriver separate the upper rear plate from the breaking part main structure.



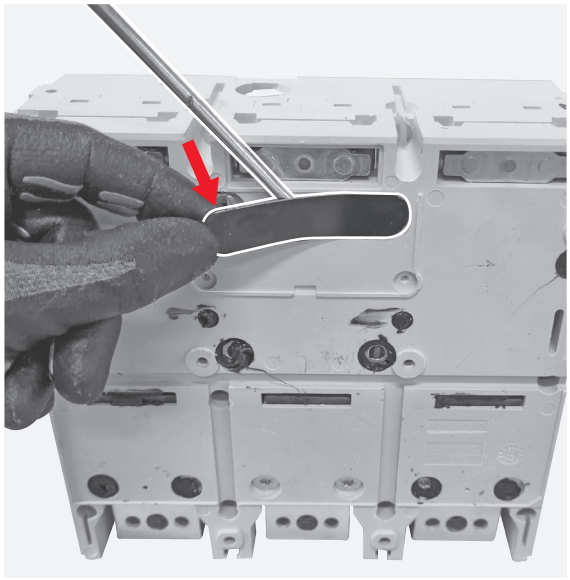
36

Manually remove the upper rear plate and the lower rear plate.



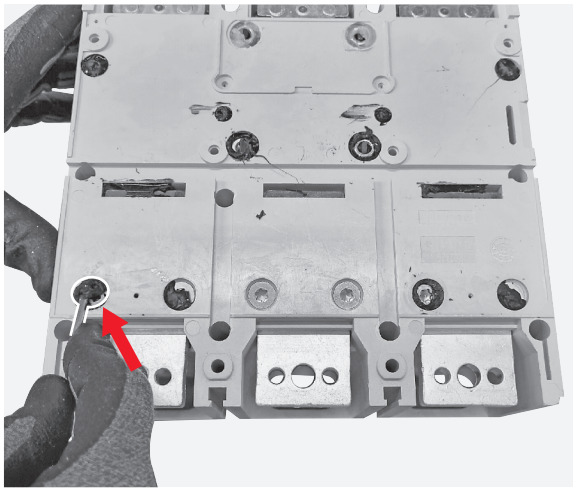
37

By means of the flat screwdriver separate the protection plate from the breaking part main structure and after manually remove the protection plate.



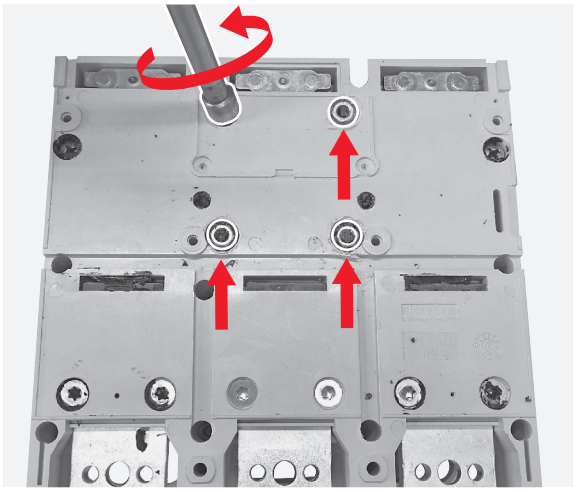
38

By means of the flat screwdriver clean from silicone rear part of the breaking part main structure.



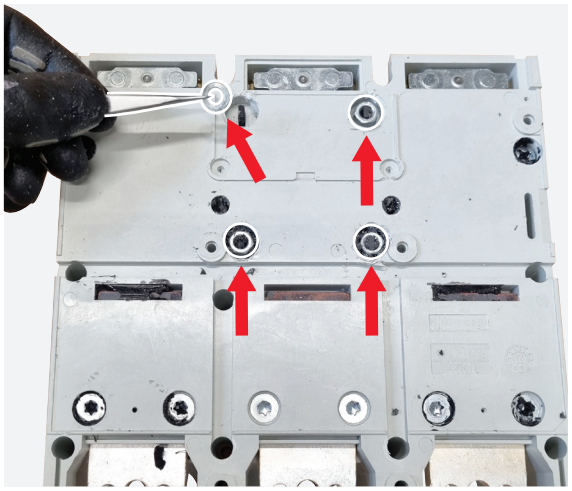
39

By means of the tube key unscrew the 4 nuts located in the rear part of the breaking part main structure.



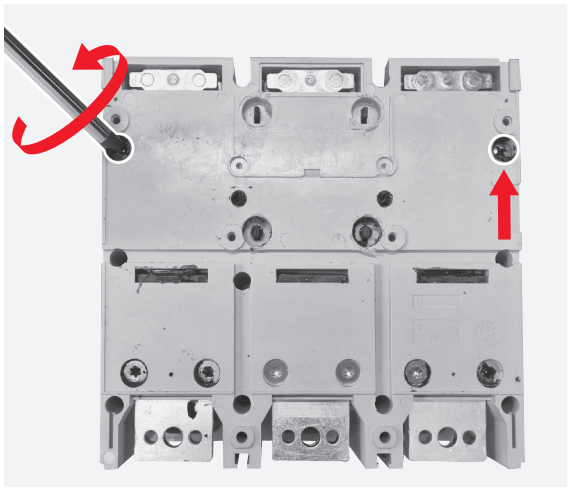
40

By means of pliers remove the washers located in housing of the nuts removed at previous step.



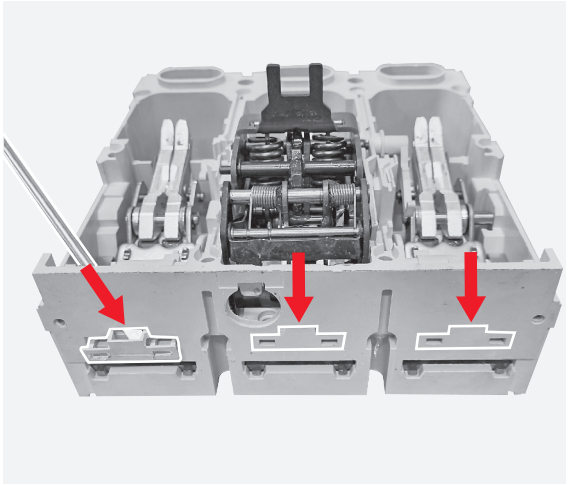
41

By means of the cross screwdriver unscrew the 2 screws located at both sides of rear part of the breaking part main structure.



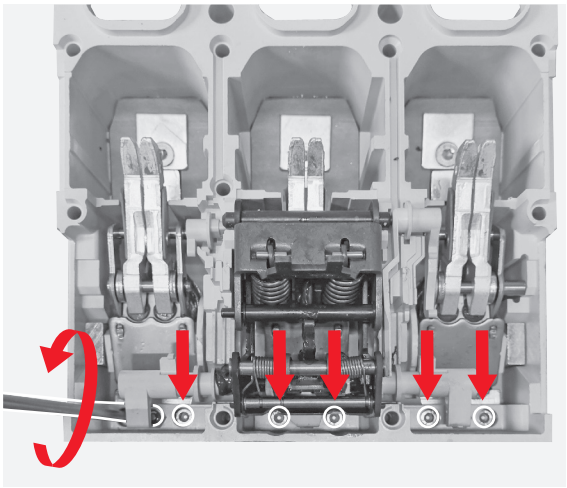
42

By means of the flat screwdriver push out from the breaking part main structure the 3 dowels.



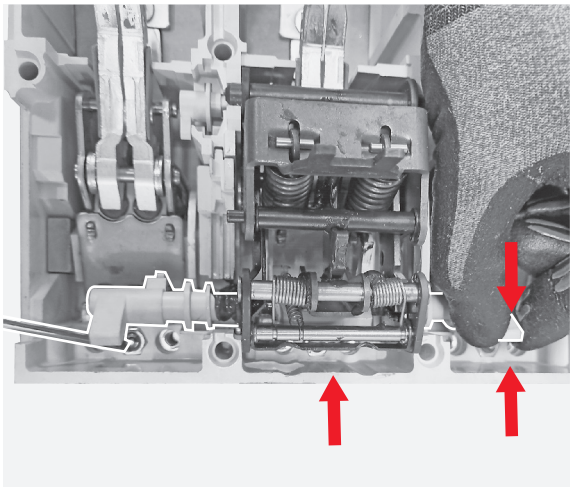
43

By means of the allex key unscrew the 6 screws located in the bottom part of the breaking part main structure.



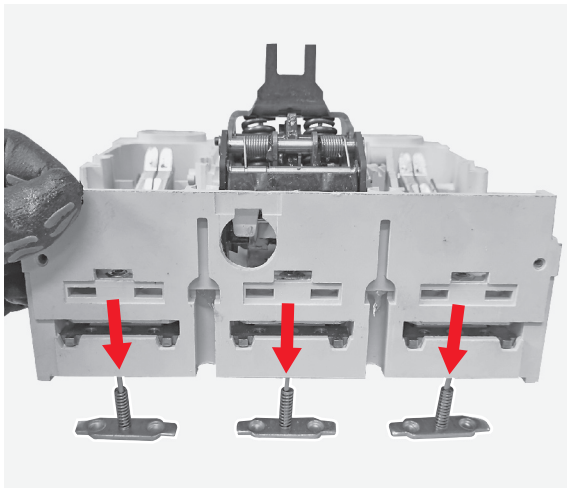
44

Manually pull the shaft as indicated by the arrow and by means of the flat screwdriver remove the 3 benzings.



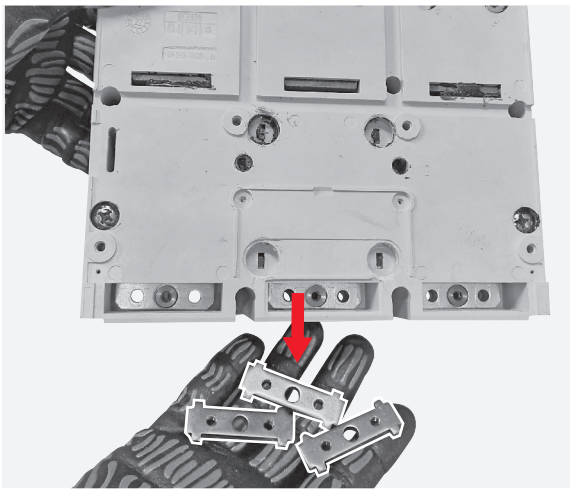
45

Lift the breaking part main structure and let the I3 assemblies separate from the breaking part main structure by gravity.



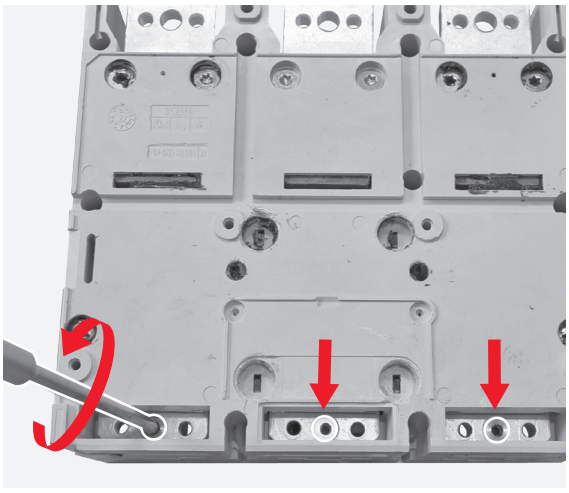
46

By gravity let the plates fall down from the breaking part main structure.



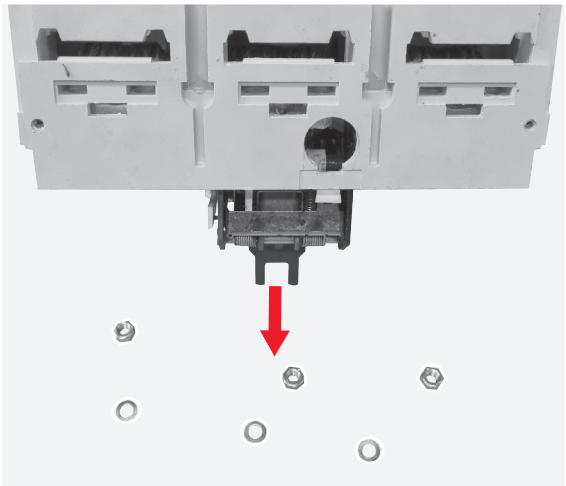
47

By means of the allen key unscrew the 3 screws located in the bottom part of the breaking part main structure.



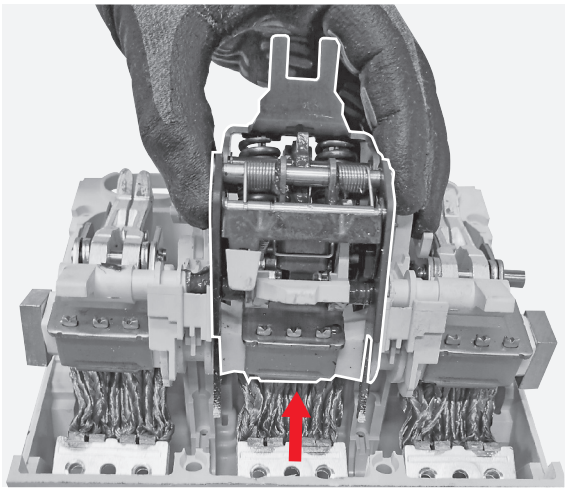
48

By gravity let the nuts and washers connected with screws removed at previous step fall down from the breaking part main structure.



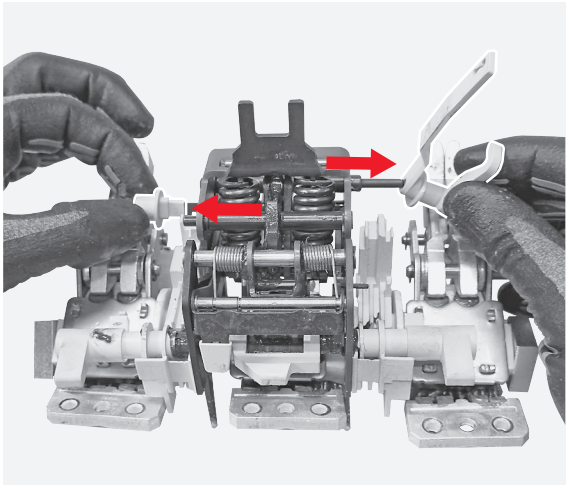
49

Manually lift the mobile contacts assembly and remove it.



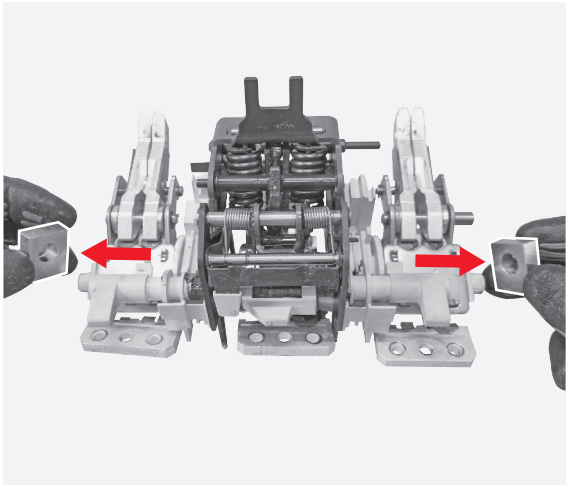
50

Manually remove the S51 and SR levers mounted on the mobile contacts assembly.

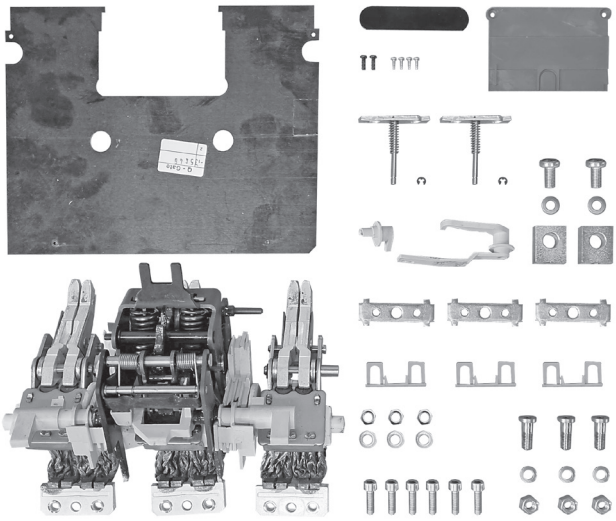


51

Manually remove the 2 supports mounted on the mobile contacts assembly.



Disassembled parts

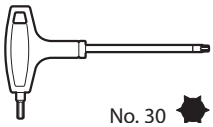


- 6 + 2 + 6 + 3 screws (Metal)
- 1 rear upper plate (Plastic)
- 1 rear lower plate (Plastic)
- 1 protection plate (Plastic)
- 4 + 3 nuts (Metal)
- 4 + 2 + 3 washers (Metal)
- 3 dowels (Plastic) SEPARATE TREATMENT (Thermoplastics containing brominated flame retardants)
- 3 benzings (Metal)
- 3 I3 assemblies (Metal)
- 3 plates (Metal)
- 1 mobile contacts assembly (Plastic and Metal) SEPARATE TREATMENT (Thermoplastics containing brominated flame retardants)
- 2 levers (Plastic)
- 2 supports (Metal)

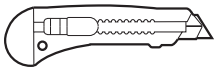
6.7 PHASE 7 – BREAKING PART CASE

Tools

Torx key



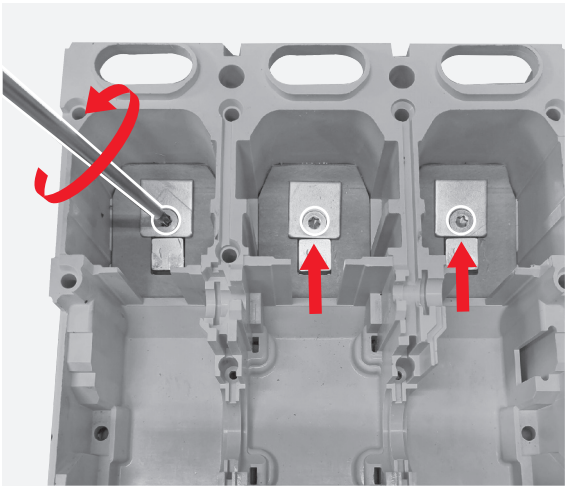
Cutter



Actions to be performed

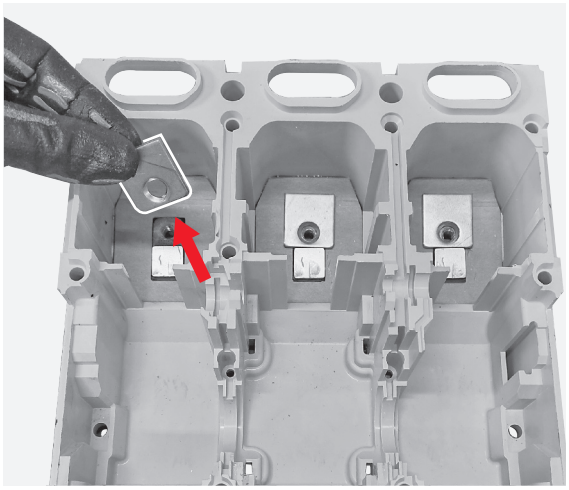
52

By means of the torx key unscrew the 3 screws fixing the arc runners to the breaking part case.



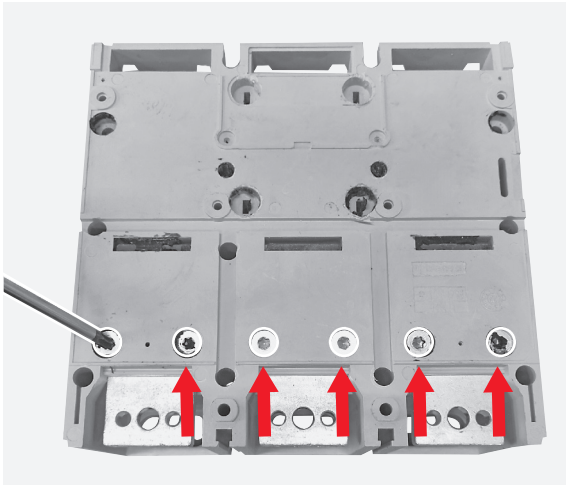
53

Manually remove the 3 arc runners.



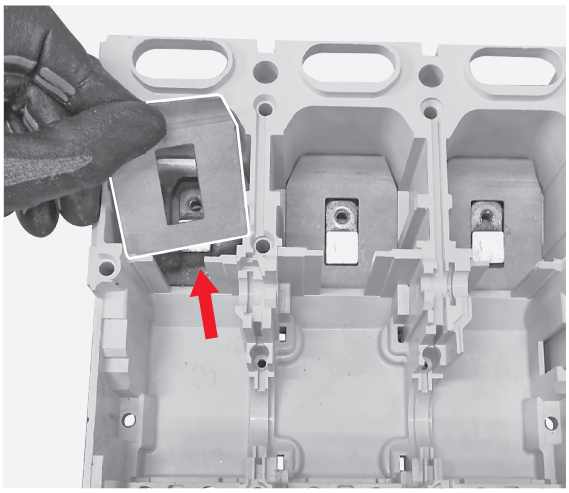
54

By means of the torx key unscrew the 6 screws located in the back part of the breaking part case.



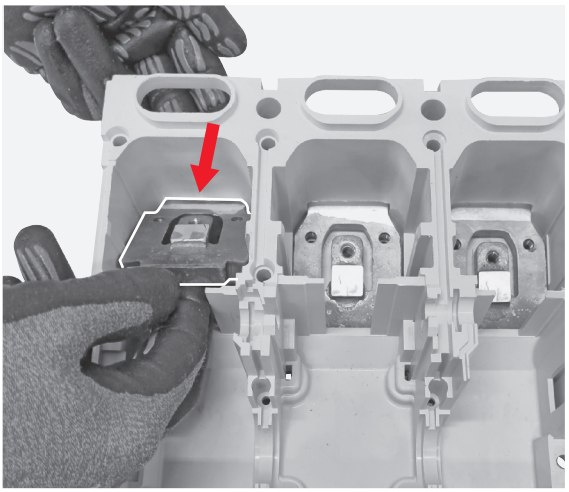
55

Manually remove the protections.



56

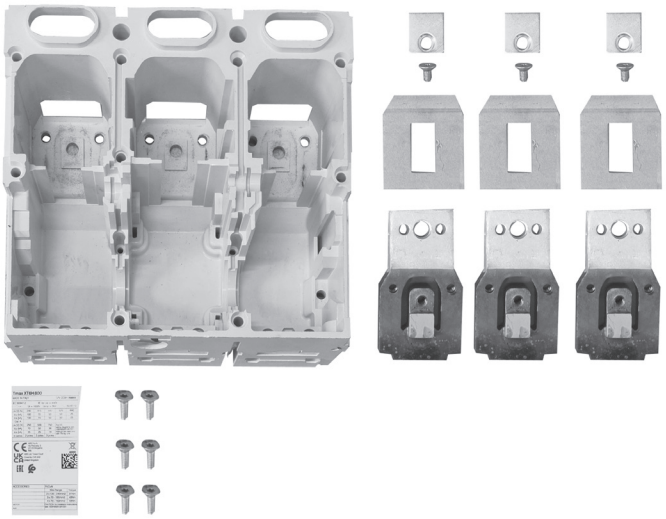
Manually pull the main fixed contacts as indicated by the arrow, slightly lift them and after manually complete the removal.



57

By means of the cutter start removing the label located on side of the circuit breaker case and manually complete the operation.

Disassembled parts

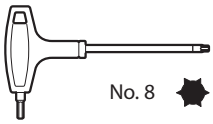


- 3 + 6 screws (Metal)
- 3 arc runners (Metal)
- 3 protections (Vulcanized fiber)
- 3 main fixed contacts (Metal)
- 1 label (Adehsive paper)
- 1 breaking part case (Plastic)

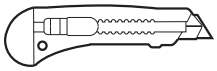
6.8 PHASE 8 – TRIP UNIT FRONTAL

Tools

Torx key



Cutter

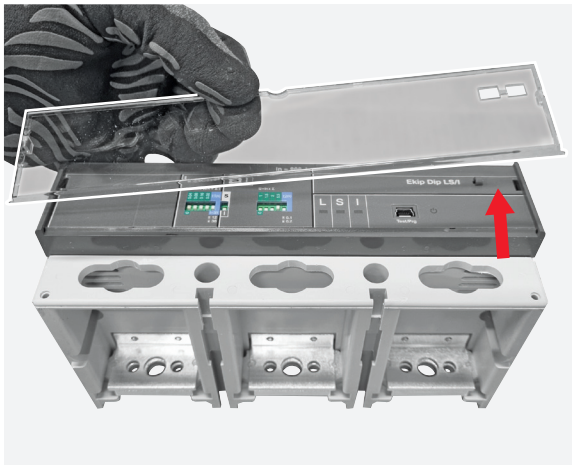


Pliers

Actions to be performed

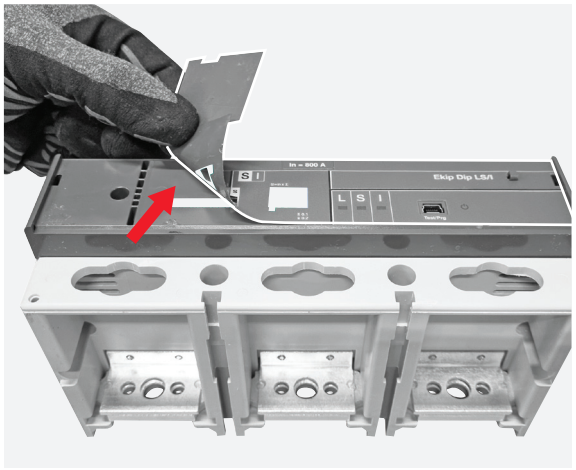
58

Manually disassemble the transparent protection from the trip unit frontal.



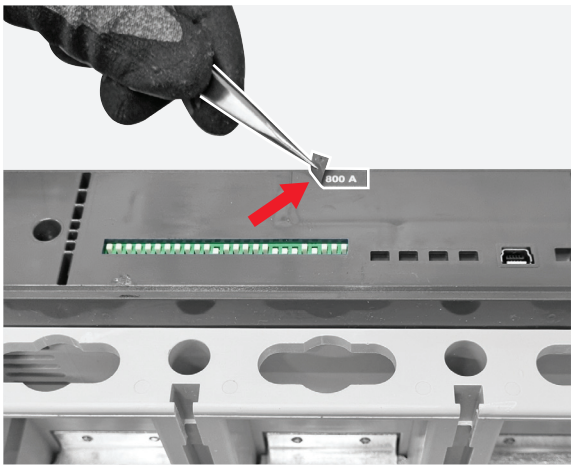
59

By means of the cutter start removing the label with protection functions settings located on the trip unit frontal and manually complete the operation.



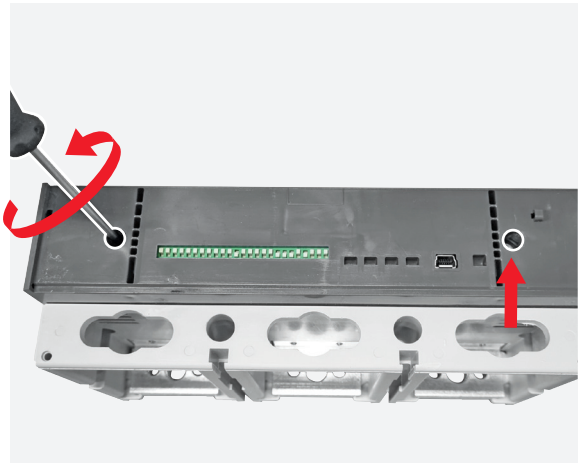
60

By means of the cutter start removing the label with In current value located on the trip unit frontal and by means of the pliers complete the operation.



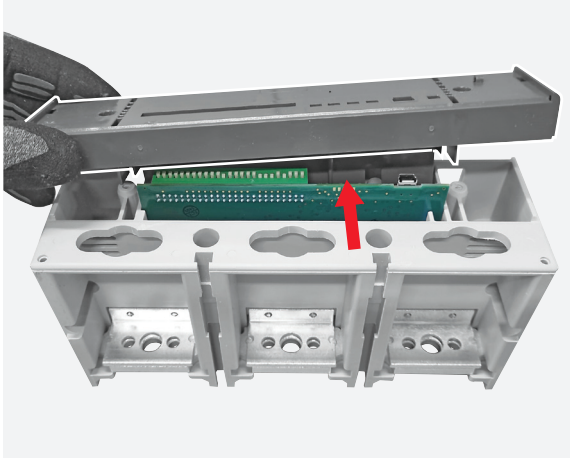
61

By means of the torx key unscrew the 2 screws fixing the trip unit frontal to the trip unit main structure.

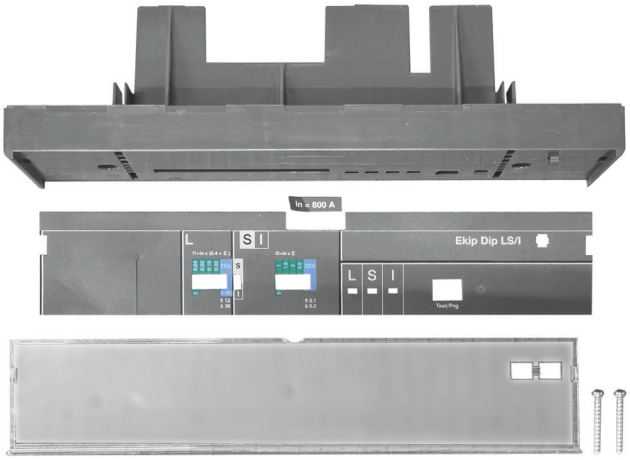


62

Manually remove the trip unit frontal.



Disassembled parts

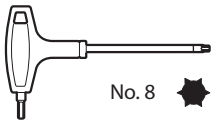


- 1 trip unit transparent protection (Plastic)
- 2 labels (Adhesive paper)
- 2 screws (Metal)
- 1 trip unit frontal (Plastic)

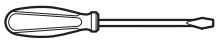
6.9 PHASE 9 – TRIP UNIT MAIN STRUCTURE

Tools

Torx key



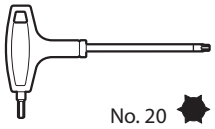
Flat screwdriver



Cross screwdriver

Pliers

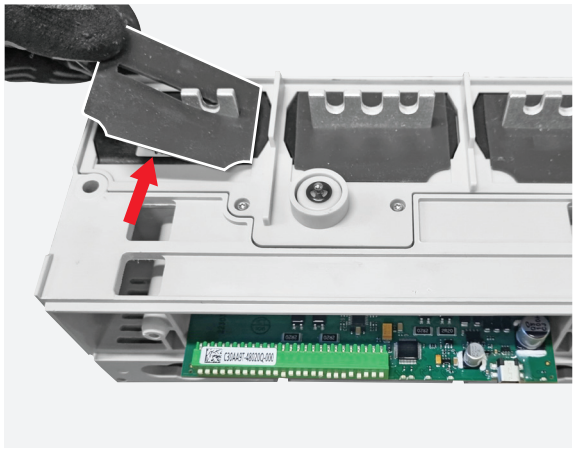
Torx key



Actions to be performed

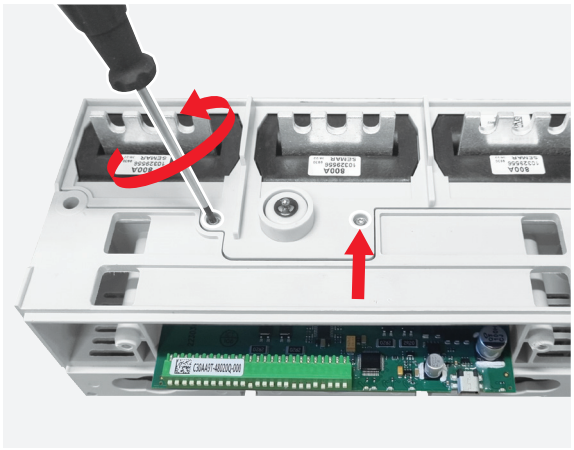
63

Manually remove the 3 covers mounted over the sensors.



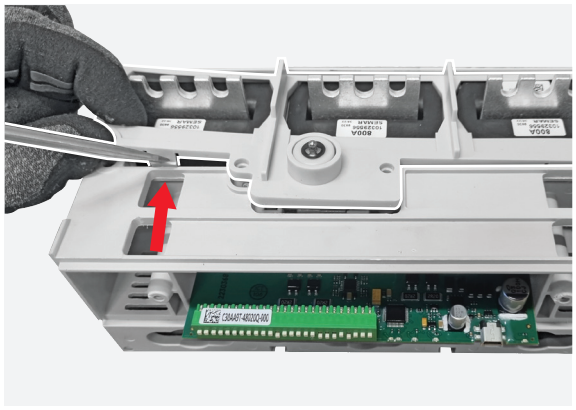
64

By means of the torx key (size 8) unscrew the 2 screws fixing the sensors cover to the trip unit main structure.



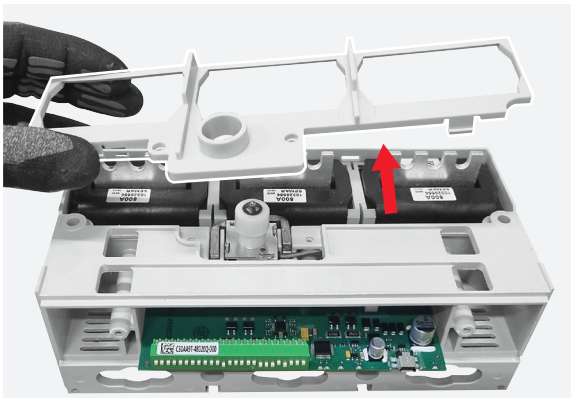
65

By means of the flat screwdriver unhook the sensors cover from the trip unit main structure.



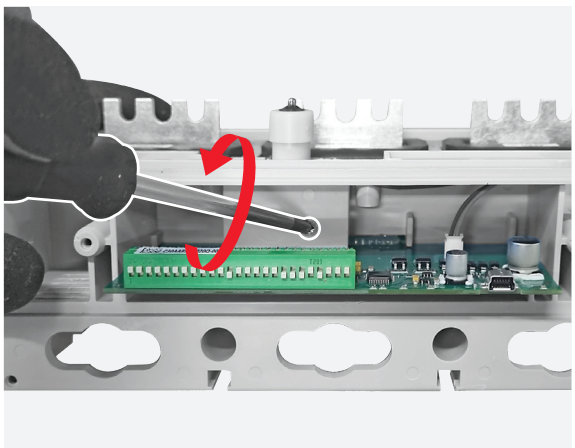
66

Manually remove the sensors cover.



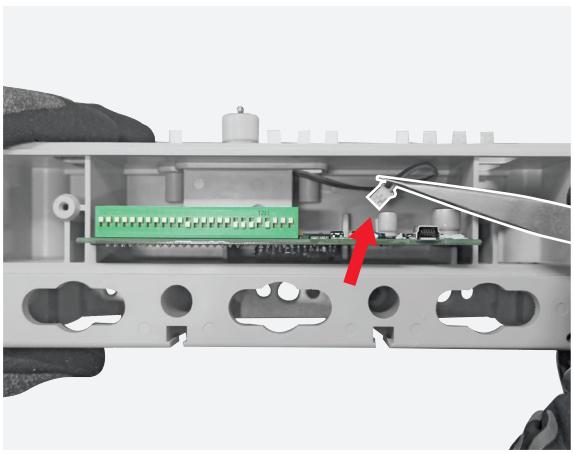
67

By means of the cross screwdriver unscrew the screw fixing the trip coil to the trip unit main structure.

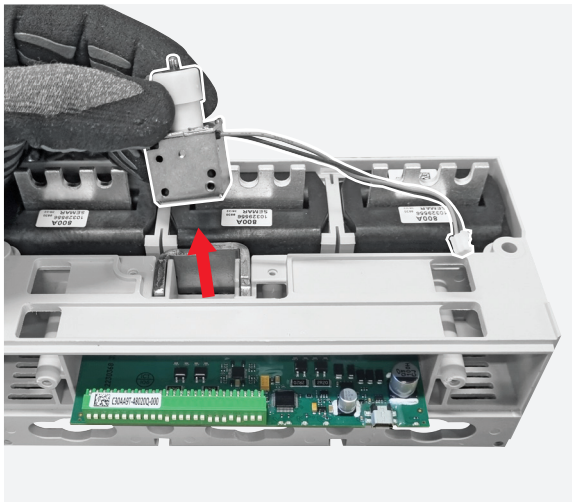


68

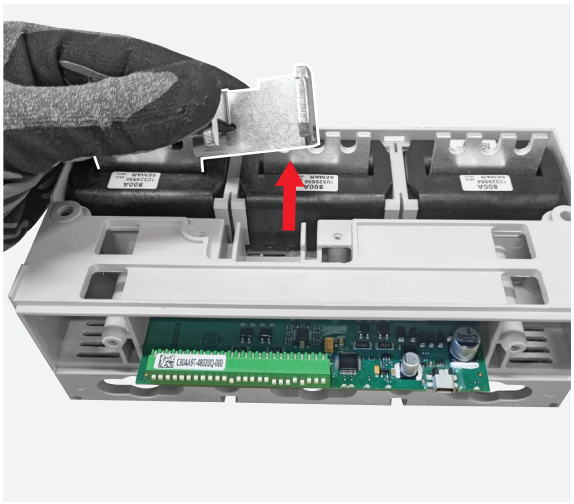
By means of the pliers unhook the connector connecting the trip coil to the trip unit printed circuit board.



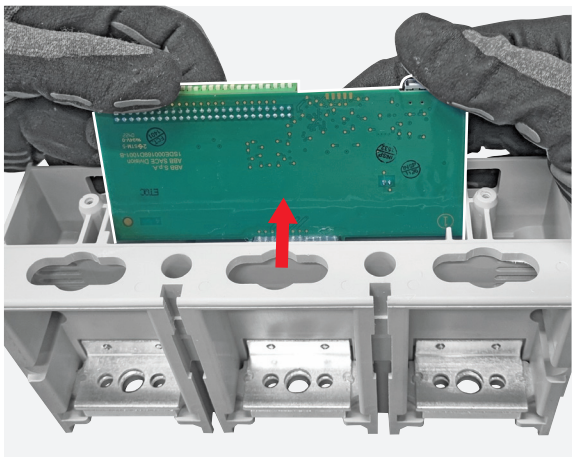
69
Manually remove the trip coil.



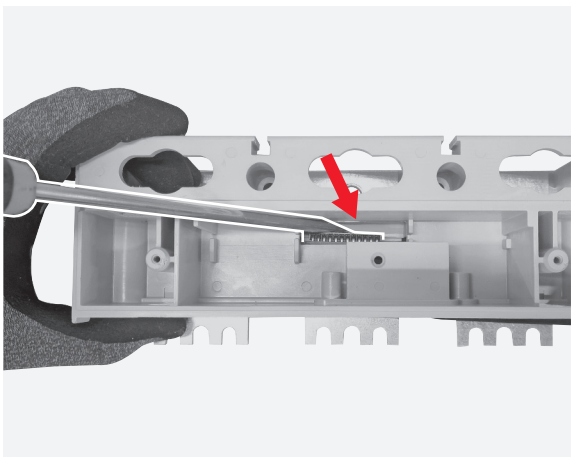
70
Manually remove the trip coil protection located in the trip coil housing.



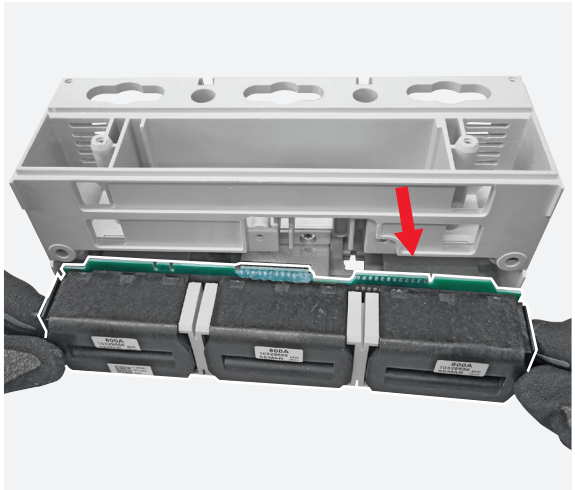
71
Manually pull and remove the printed circuit board mounted in the trip unit main structure.



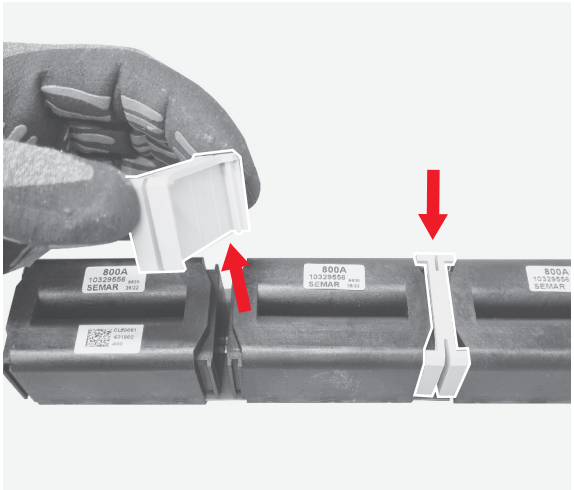
72
By means of the flat screwdriver slightly push the sensors assembly in order to remove them from their housing.



73
Manually remove the sensors assembly from the trip unit case.

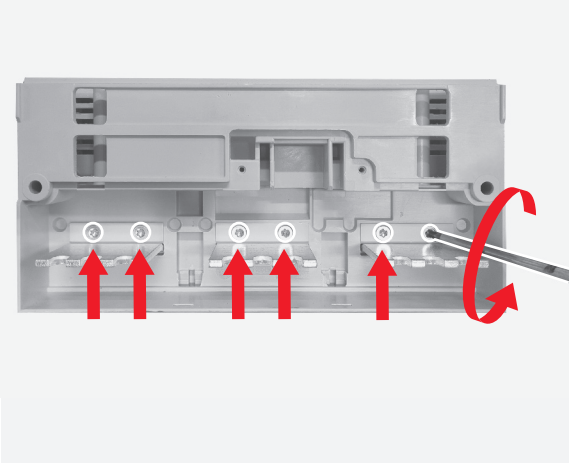


74
Manually remove the 2 sensors joints mounted on the sensors assembly.



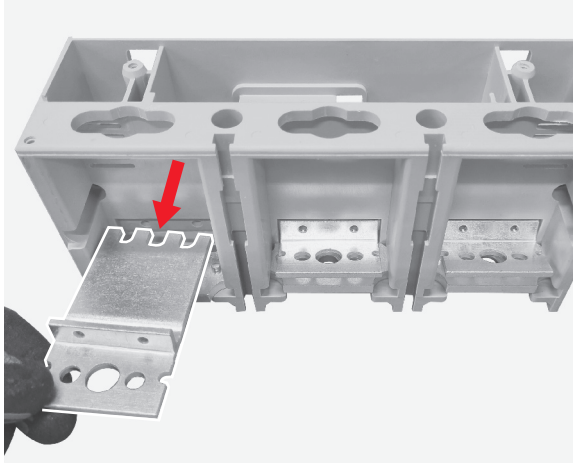
75

By means of the torx key (size 20) unscrew the 6 screws located in the bottom part of the trip unit main structure.



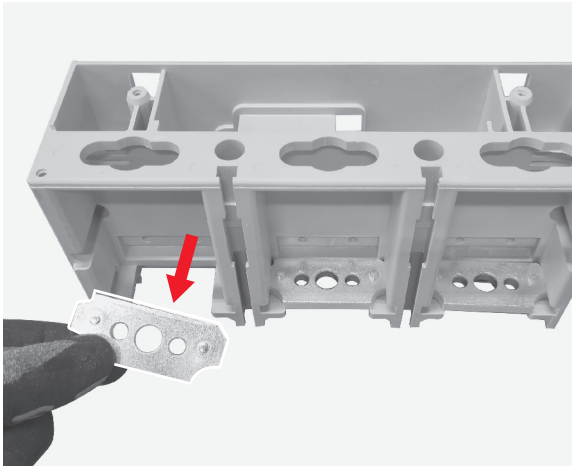
76

Manually remove the 3 lower fixed contacts.

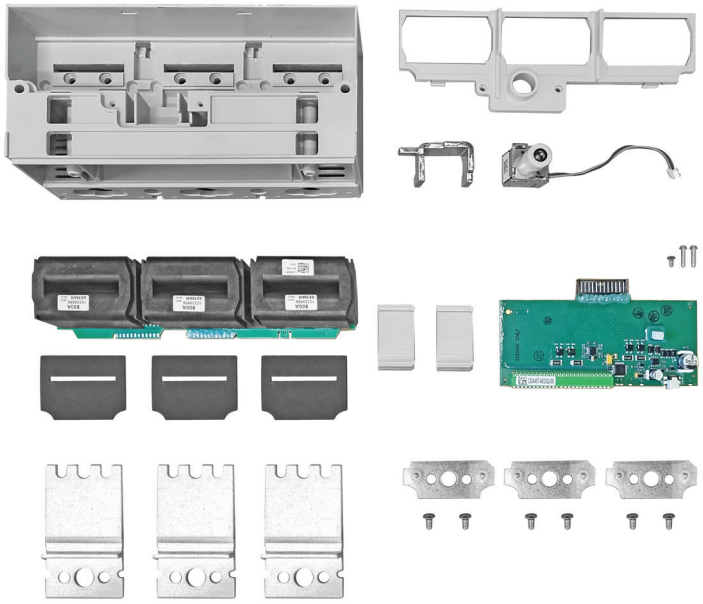


77

Manually remove the 3 plates.



Disassembled parts



- 3 covers (Silicone)
- 2 + 1 + 6 screws (Metal)
- 1 sensors cover (Plastic) SEPARATE TREATMENT (Thermoplastics containing brominated
- 1 trip coil (Plastic, Metal and Magnets) SEPARATE TREATMENT (Megnets)
- 1 trip coil protection (Metal)
- 1 printed circuit board (Plastic, Metal and Electronic components) SEPARATE TREATMENT (Printed circuit board)
- 1 sensors assembly (Plastic, Metal and Mixture) SEPARATE TREATMENT (Printed circuit board)
- 2 sensors joints (Plastic) SEPARATE TREATMENT (Thermoplastics containing brominated
- 3 fixed contacts (Metal)
- 3 plates (Metal)
- 1 trip unit case (Plastic)

7. ENERGY CONSUMPTION FOR CIRCUIT BREAKERS DISASSEMBLY

Since all disassembly operations illustrated in this document are manual, the CO_2 equivalent emissions can be considered null/negligible.

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