

DISTRIBUTION SOLUTIONS

VD4-3AC

Addendum to VD4 installation and service instructions



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I. For your safety!

- Make sure that the installation room (available space, divisions and ambient) is suitable for the electrical apparatus.
- Check that all the installation, putting into service and maintenance operations are carried out by qualified personnel with sufficient knowledge of the apparatus.
- Make sure that the standards and laws in force are complied with when the apparatus is installed and put into service, and that the rules of good workmanship and safety in the workplace are applied.
- Check that the rated performance of the apparatus is not exceeded during service.
- Check that the personnel who operate the apparatus have this instruction manual to hand as well as all the information they need to operate correctly.
- Pay special attention to the danger notes indicated in the manual by the following symbol:



Responsible behavior safeguards your own and others' safety!
Please contact the ABB Assistance Service for any further requirements.

II. Introduction

This publication contains the information required to install medium voltage controlgear and switchgear for circuit-breakers, as well as instructions for putting them into service. Carefully read this document to ensure the product is used correctly.

This apparatus allows further technical-construction modifications (at the customer's request) to be made so as to adapt to special installation requirements. Consequently, the information given in this document may not contain instructions concerning special customized

configurations. Besides this manual, you must always consult the latest technical documentation (drawings, electrical circuit and wiring diagrams, assembly and installation drawings, applicable protection coordination studies, etc.), especially regarding any variants to the standard configurations that may be necessary. Only use original spare parts for maintenance operations. For further information, please also consult the technical catalog of the circuit-breaker and the spare parts catalog.

III. Environment Protection Scheme

VD4 circuit-breakers are manufactured in accordance with ISO 14000 Standards (Guidelines for environmental management). The manufacturing processes are implemented in accordance with the environmental protection standards when it comes to reducing energy consumption and the production of waste. All this is achieved thanks to the environmental management system adopted in the production facility.



All the installation, putting into service and maintenance operations must be performed by skilled personnel with in-depth knowledge of the equipment.

1. VD4 characteristics and applicability

1.1. VD4 Instructions

The VD4-3AC retrofit circuit-breaker is based on the fixed VD4 version. So much so, most of the information in the fixed VD4 instruction manual is also applicable to this retrofit version.

The contents of this supplement are also applicable to the following sections of the manual. Please refer to the instruction manual of the VD4 circuit-breaker (code 647654) for specific information.

- Section 1 – Packing and transport
- Section 2 – Checking on receipt
- Section 3 – Storage
- Section 4 – Handling
- Section 5 – Description
- Section 6 – Instructions for circuit-breaker operation
- Section 7 – Installation
- Section 8 – Putting into service
- Section 9 – Maintenance
- Section 10 – Application of the X-ray emission standard
- Section 11 – Spare parts and accessories
- Section 12 – Circuit diagrams
- Section 13 – Overall dimensions
- Section 14 – Quality of the products and environmental protection

Specific information about the VD4-3AC circuit-breaker retrofit apparatus is given in this addendum.

General description:

VD4 is a vacuum circuit-breaker for installation indoors. Consult installation and operating manual 674654 for the electrical specifications. Please contact ABB if special installation requirements are involved.

Regulatory framework

VD4 circuit-breakers conform to IEC 62271-100 Standards and to those in force in the major industrialized countries.

2. Handling

2.1 Packing and transport

The circuit-breaker is shipped in special packing, in the open position and with the spring discharged. Each device is protected by a plastic wrapper to prevent water from infiltrating during the loading and unloading operations, and to keep out the dust during storage.

2.2 Checking on receipt



Before proceeding with any operation, always make sure that the spring of the operating mechanism is discharged and that the apparatus is in the open position.

As soon as the equipment arrives, check the condition of the apparatus, that the packing is undamaged and that the nameplate data (see fig. 2) correspond to the information in the order confirmation and shipping note. Also make sure that all the materials described in the shipping note are included in the supply. If you discover any damage or discrepancy once the equipment has been unpacked, notify ABB (directly or through the agent or supplier) as soon as possible and in any case within five days of receipt. The apparatus is only supplied with the accessories specified at the time of ordering and validated in the order confirmation sent by ABB. The following documents accompany the apparatus when it is shipped:

- instruction manual (this document).
- test certificate
- identification label
- copy of the shipping documents
- circuit diagram.

Other documents, sent prior to shipment of the apparatus, are:

- order confirmation
- original shipping notification
- drawings or documents referring to special configurations/conditions (if applicable).

A

ABB

1	CIRCUIT-BREAKER	IEC 62271-100	2
	VD4-3AC		
3	CLASSIFICATION	CEI 17-1	
	SN	PR. YEAR	
	M WEIGHT	... kV	
	Ur		
4	CIRCUIT DIAGRAM		
	FIG.		
B OPERATING MECHANISM		
5	- MBO1 V		
	Made by ABB		

- Key
- A Circuit-breaker rating plate
 - B Operating mechanism rating plate
 - 1 Type of apparatus
 - 2 Symbols indicating compliance with standards
 - 3 Serial number
 - 4 Circuit-breaker characteristics.
 - 5 Characteristics of controls

Fig. 2

2.3 Storage

When the apparatus must be stored for a certain period of time, our workshops can (on request) provide packing to suit the specified storage conditions. On arrival, the apparatus must be carefully unpacked and checked as described in the Checking on receipt section (chap. 2.2). If the apparatus cannot be installed immediately, it must be re-packed in its original packing materials. Insert at least one standard packet of hygroscopic substance per piece of apparatus inside the packing. If the original packing is no longer available and the apparatus cannot be installed immediately, it should be stored indoors in a well-ventilated, dry, dust-free, non-corrosive place, well away from any easily flammable materials and at a temperature between -5 °C and +40 °C. Avoid accidental shocks or positions which stress the structure of the apparatus.

2.4 Handling



Before proceeding with any operation, always make sure that the spring of the operating mechanism is discharged and that the apparatus is in the open position. Handling operations must be carried out by suitably qualified personnel with indepth knowledge of the apparatus and goods handling.

Proceed as described below to lift and handle the circuit-breaker (fig. 3-4):

- use lifting equipment (not supplied) with ropes or chains (90° traction working) and safety hooks (fig. 3)
- insert the hooks into the eyebolts fixed to the frame of the circuit-breaker and lift (fig. 4).
- once the operation has terminated (and in any case before putting into service), release the lifting equipment and remove the eyebolts from the frame.

When handling the apparatus, take great care to prevent the insulating parts and terminals of the circuit-breaker from being stressed.



Fig. 3



Fig. 4

Before handling, make sure that the circuit-breaker is fastened by the relative plates (fig. 5)

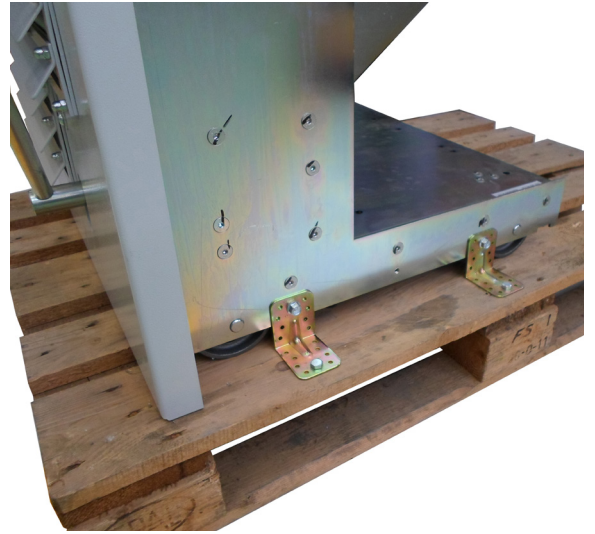


Fig. 5

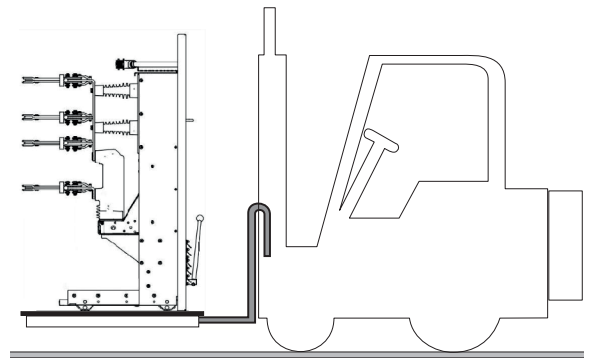


Fig. 6



Do not handle the apparatus by inserting lifting devices directly under it. If this method is unavoidable, place the circuit-breaker on a pallet or a sturdy supporting surface (see fig. 6). Whatever the case, always lift the apparatus by means of the eyebolts.

3. Installation and operation of the Retrofit solution



Safety indications

All VD4 circuit-breakers provide at least the IP2X degree of protection when installed in switchgear. In these conditions the operator is absolutely protected against accidental contact with live parts. Pay great attention to moving parts if the circuit-breaker is subjected to mechanical operations outside the switchgear. If the operations are obstructed in any way, do not force the mechanical interlocks and check that the operating sequence is correct.

The circuit-breaker must be racked in and out of the switchgear in a gradual way so as to avoid shocks that could deform the mechanical interlocks.

3.1. Preliminary operations

Clean the insulating parts with a clean, dry cloth. Make sure that the upper and lower terminals are clean and free from deformation caused by shocks received during transport or storage.

3.2. How to install VD4-3AC retrofit in the switchgear

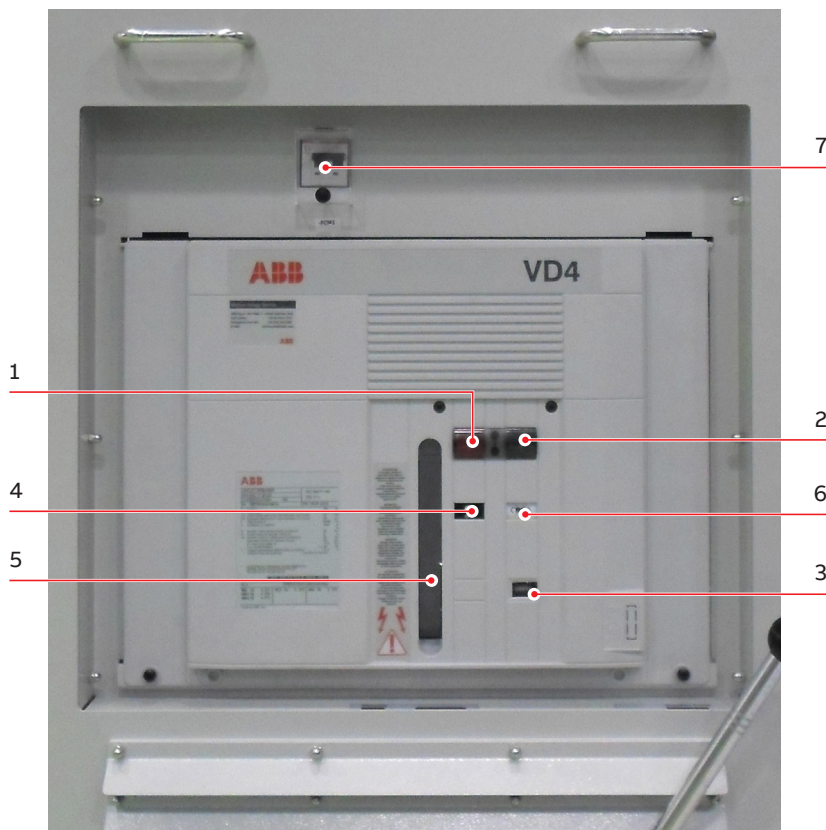
Consult the technical documentation of the switchgear for instructions about how to install the circuit-breaker.

When the circuit-breaker has reached the isolated for test position, the switchgear can be considered isolated.

Before putting into service, you are advised to load the breaker operating mechanisms in the manual mode so as to prevent the auxiliary supply circuit from being overloaded.

3.3. Controls and signaling devices of the VD4 breaker (see Figure 7)

Consult installation and operating manual 647654 (sect.6) for instructions about how to operate the circuit-breaker.



Key

- 1 Opening push-button
- 2 Closing push-button
3. Operation counter
- 4 Circuit-breaker Open / Closed signaling
- 5 Manual spring loader of closing spring
- 6 Signaling device for closing spring loaded/discharged
- 7 Spring-loading motor protection breaker

(*) Warning ! To activate the key lock: open circuit-breaker, press and hold opening push-button, then turn key and remove it. (Accessory available on request)

Fig. 7

Figures 8 and 9 illustrate the Siemens panel and ABB retrofit kit inside it.

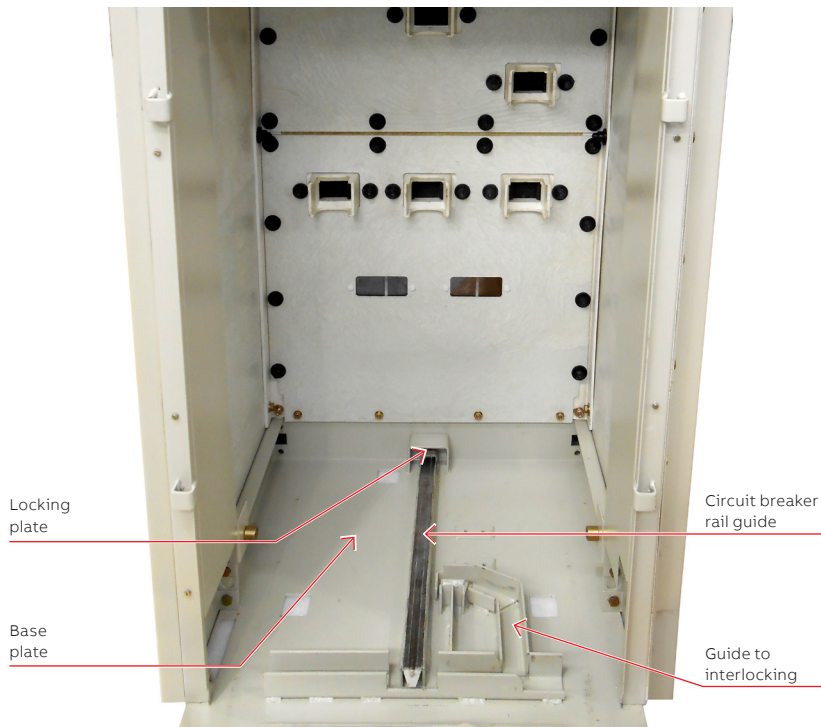


Fig. 8 View of circuit-breaker compartment

Figures 10 and 11 show a rendering of the ABB retrofit apparatus with the handle for manual operation.

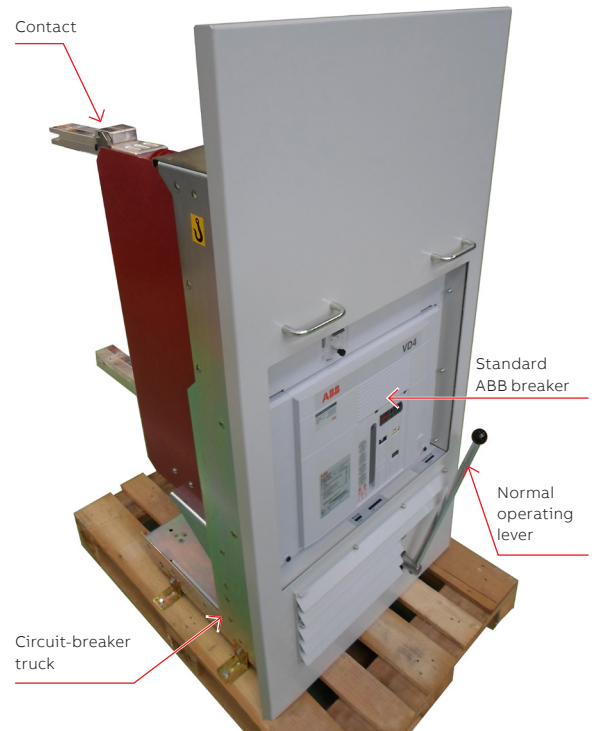


Fig. 10 Circuit-breaker for ABB VD4-3AC 17.12.25 retrofit - Front view

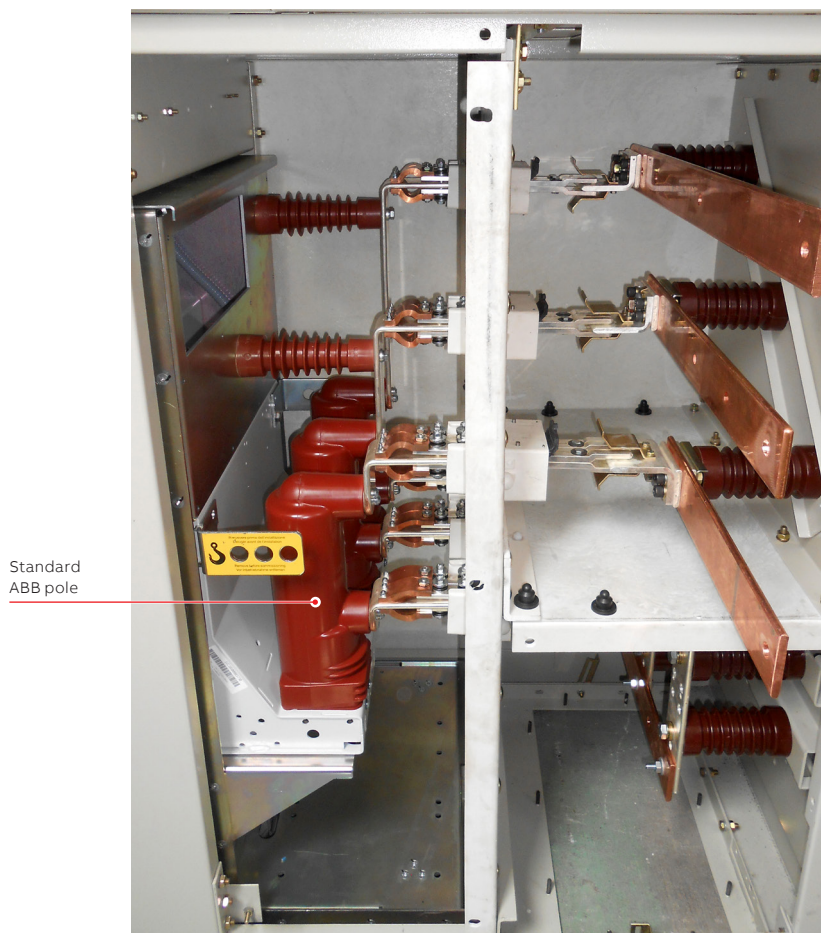


Fig. 9 Internal view of retrofit kit in Siemens switchgear

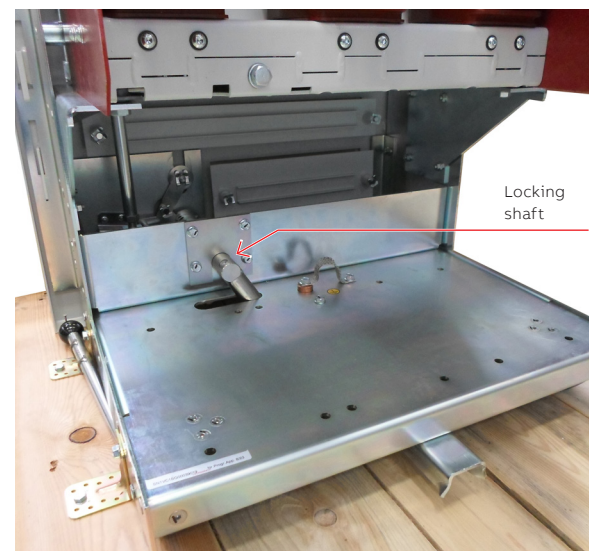


Fig. 11 Circuit-breaker for ABB VD4-3AC 17.12.25 retrofit - Rear view

3. Installation and operation of the retrofit

3.4 Racking-in and racking-out

The circuit-breaker truck slides on its wheels along the base plate in the circuit-breaker compartment. The truck slides along the centering slideways welded to the base plate.

The interlocking track and truck handle ensure that the truck slides up to the stop point in the service position, and isolated or test positions when it can be racked-in or racked-out.

The interlocking track interlocks the truck in these positions.

When it reaches the service position, the truck couples with the end of its centering guide under the stop plate, which locks it and prevents it from lifting.

The four positions of the locking shaft, which functions in conjunction with its interlocking track, are illustrated in the photos below.

This shaft is depicted by a blue line and is aligned with the handle for operation in the manual mode, as shown in figure 11.

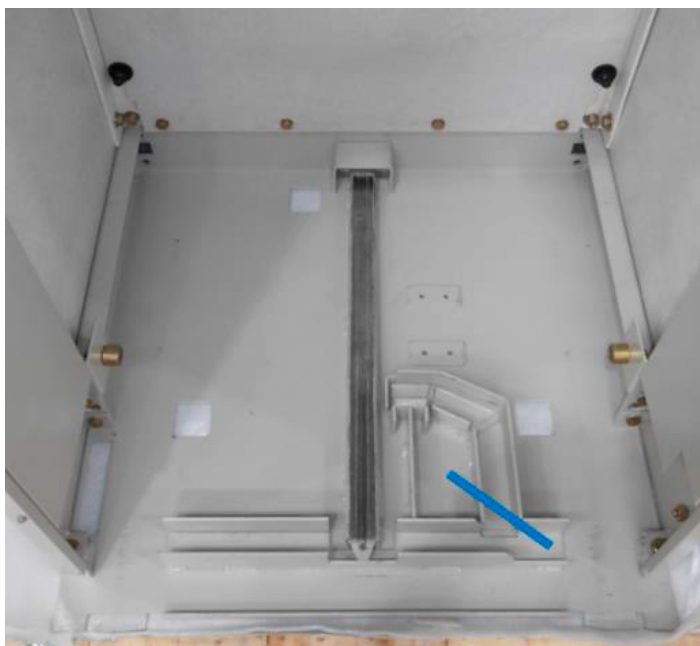


Fig. 12 Racking out of position



Fig. 14 Racking in position

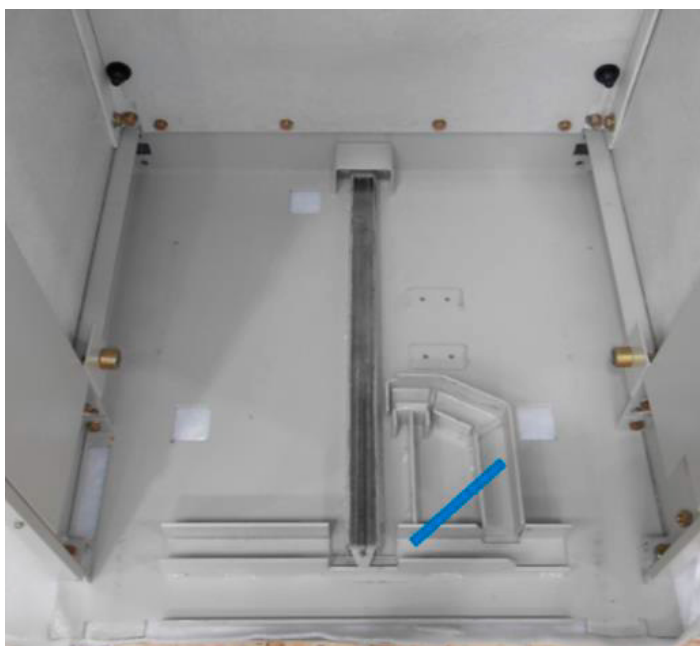


Fig. 13 Test or disconnected position

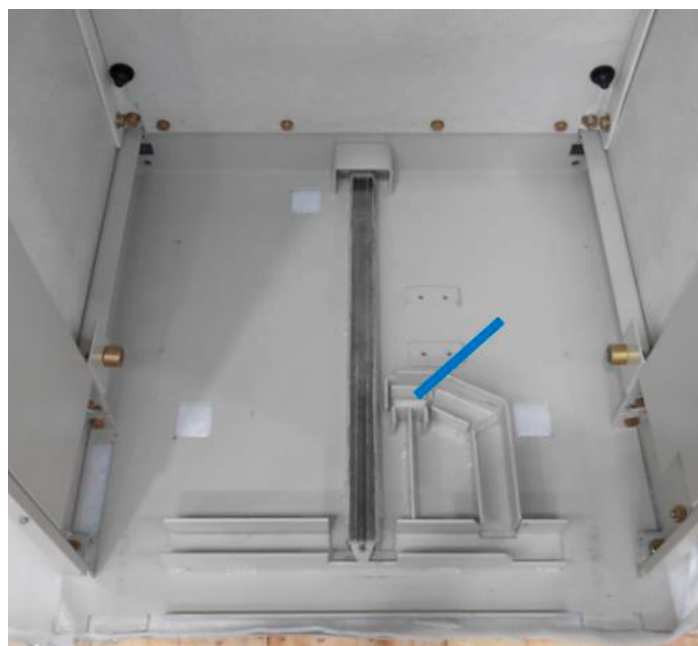


Fig. 15 Service position

3.5 Interlocks

ABB's VD4-3AC retrofit kit has safety interlocks to protect the personnel against the consequences of incorrect operations and to ensure that the apparatus functions reliably.

These safety interlocks are outlined in the table below:

Position	Interlock condition
1	Final position of retrofit apparatus must be defined
2	It must be impossible to remove retrofit apparatus if breaker is closed. There is an interlock that locks the shaft of the handle for manual mode operation.

Table 1. Interlock conditions in "Service position"

Position	Interlock condition
1	It must be impossible to close the circuit-breaker.

Table 2. Interlock conditions between "Service position" and "Test position" when retrofit apparatus is racked-out or in

Position	Interlock condition
1	Reaching "Test position" must be established by the interlock track stop when retrofit apparatus is racked-out
2	It must be impossible to rack-in the retrofit apparatus towards the "Service position" if the breaker is closed. There is an interlock that locks the shaft of the handle for manual mode operation.

Table 3. Interlock conditions in "Test position".

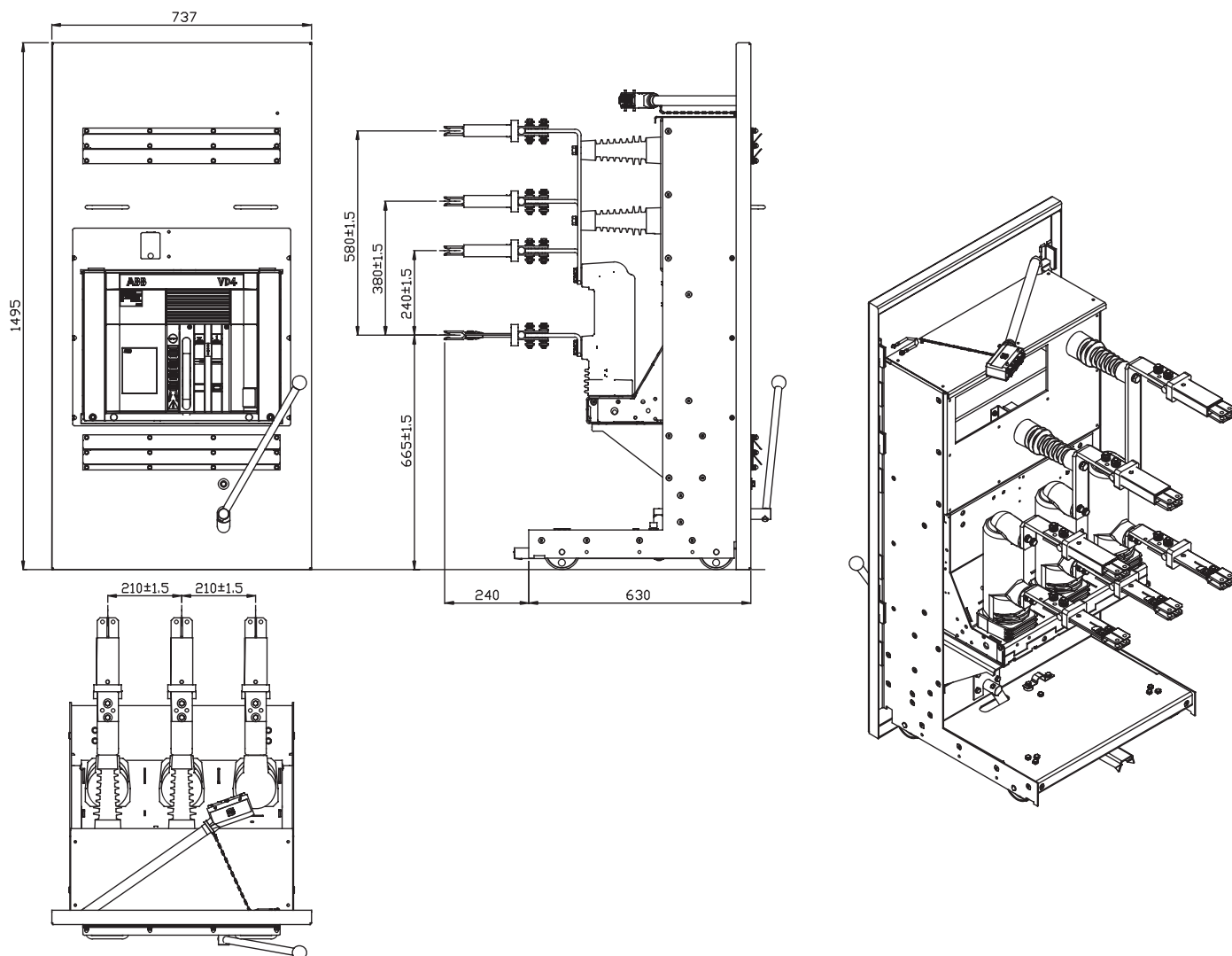
Table 3. Interlock conditions in "Test position"

Position	Interlock condition
1	It must be impossible to rack-in circuit-breaker towards "Service position"

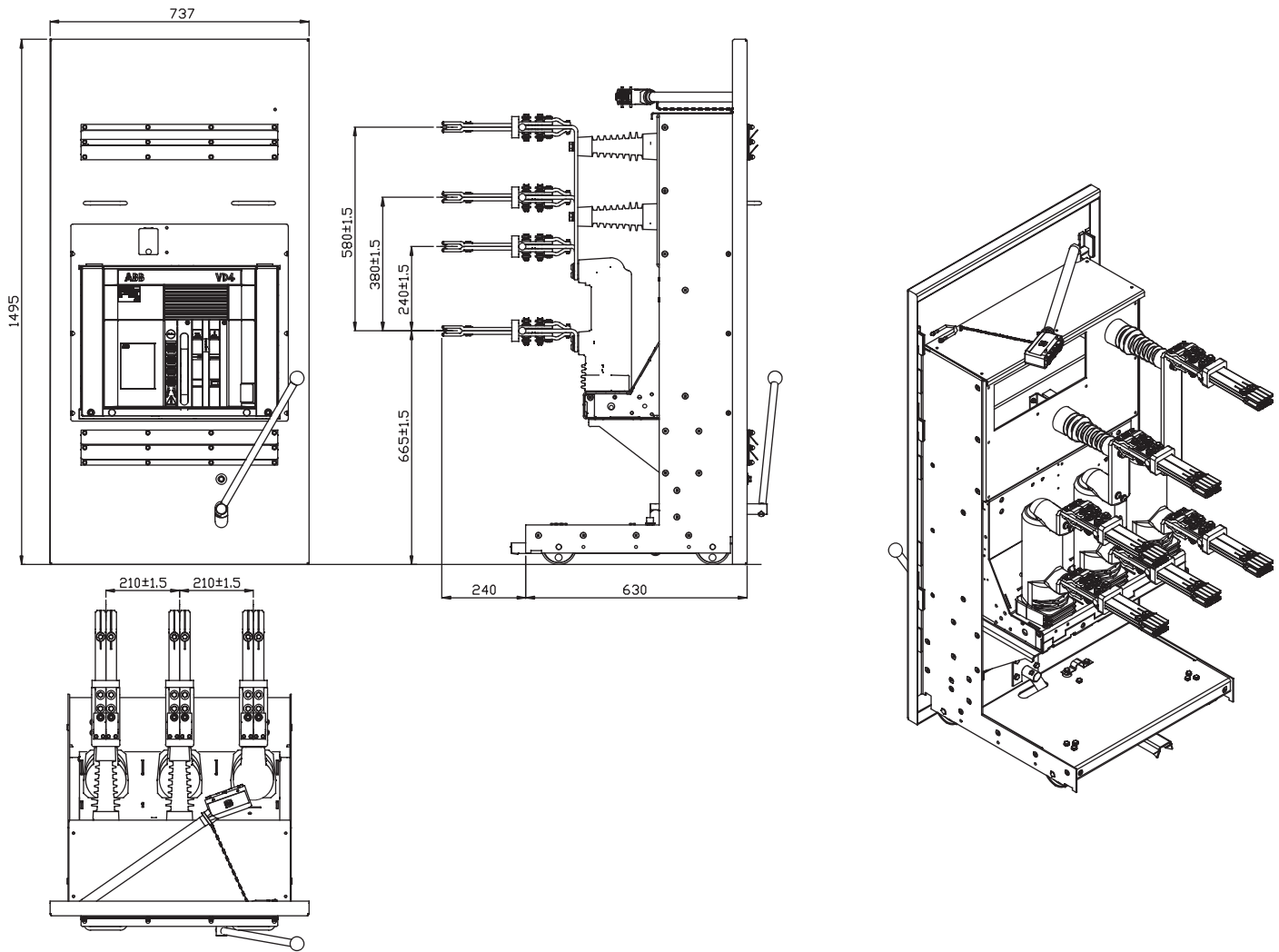
Table 4. Interlock conditions in "Isolated position"

Note. Consult SIEMENS 8BD catalog on page 111 (safety devices) for further details

4. Overall dimensions of VD4-3AC retrofit

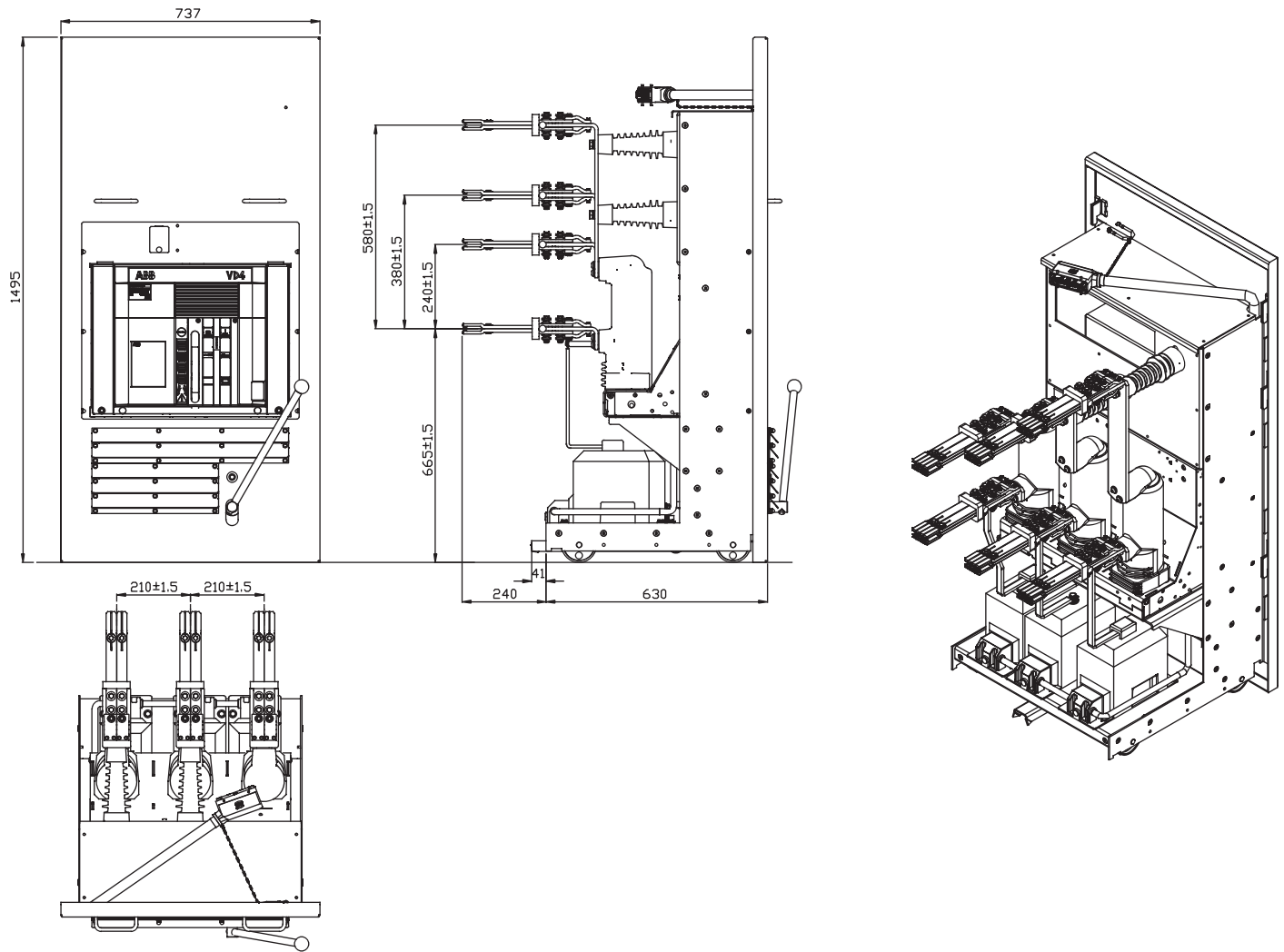


TN Retrofit overall dimensions:	1VCS010496
Retrofit assembly:	1VCS010045
Fixed TN overall dimensions:	TN7406
Circuit diagram:	1VCS010628
Fixed rating:	VD4 17.06.25 P210
Retrofit rating:	VD4-3AC 17.06.25 P.210
Switchgear:	SIEMENS 3BD
Racking-in:	Lever
Weight	200 Kg

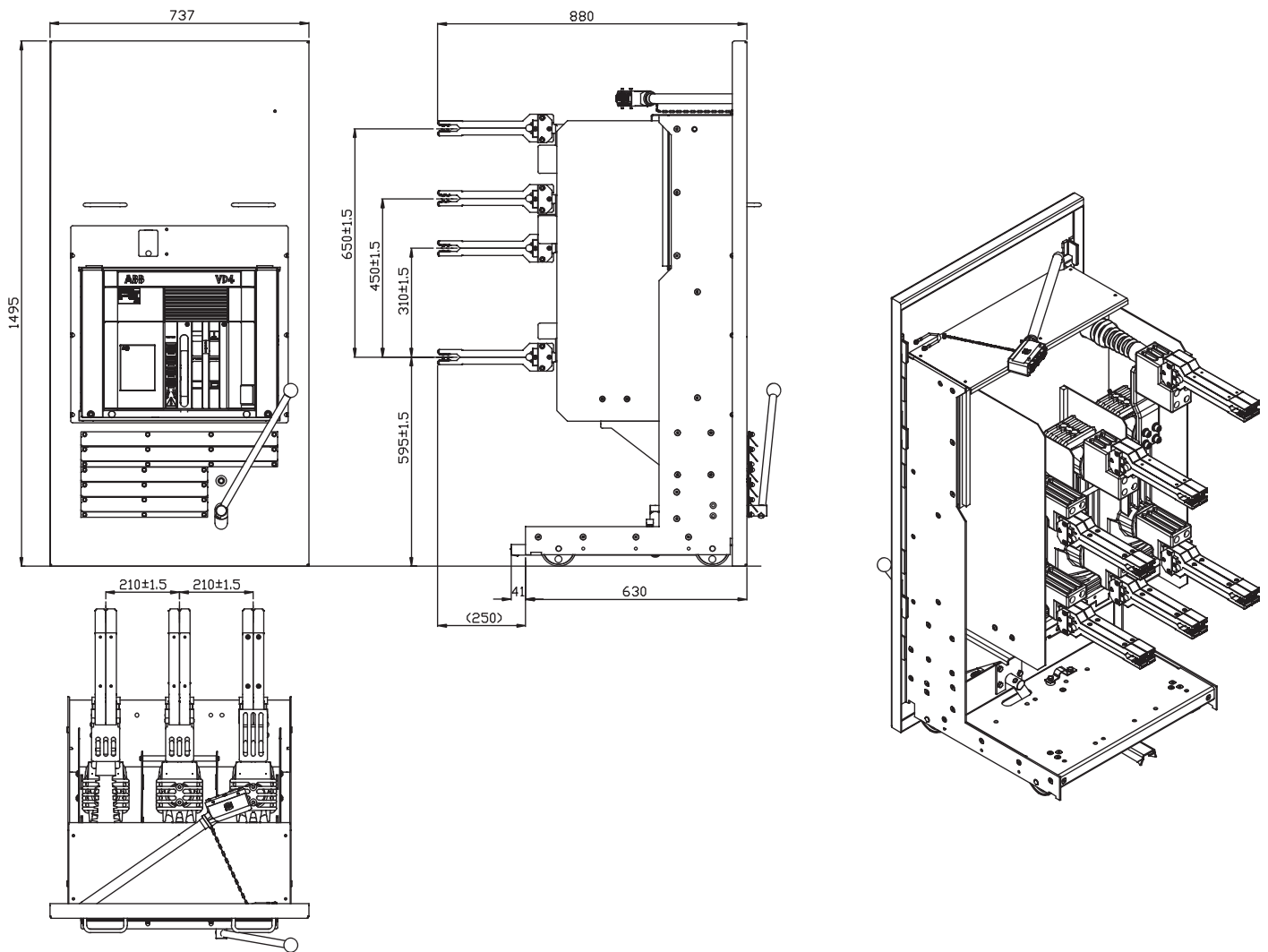


TN Retrofit overall dimensions:	1VCS010487
Retrofit assembly:	1VCS010045
Fixed TN overall dimensions:	TN7406
Circuit diagram:	1VCS010628
Fixed rating:	VD4 17.12.25 P210
Retrofit rating:	VD4-3AC 17.12.25 P.210
Switchgear:	SIEMENS 3BD
Racking-in:	Lever
Weight	215 Kg

4. Overall dimensions of VD4-3AC retrofit

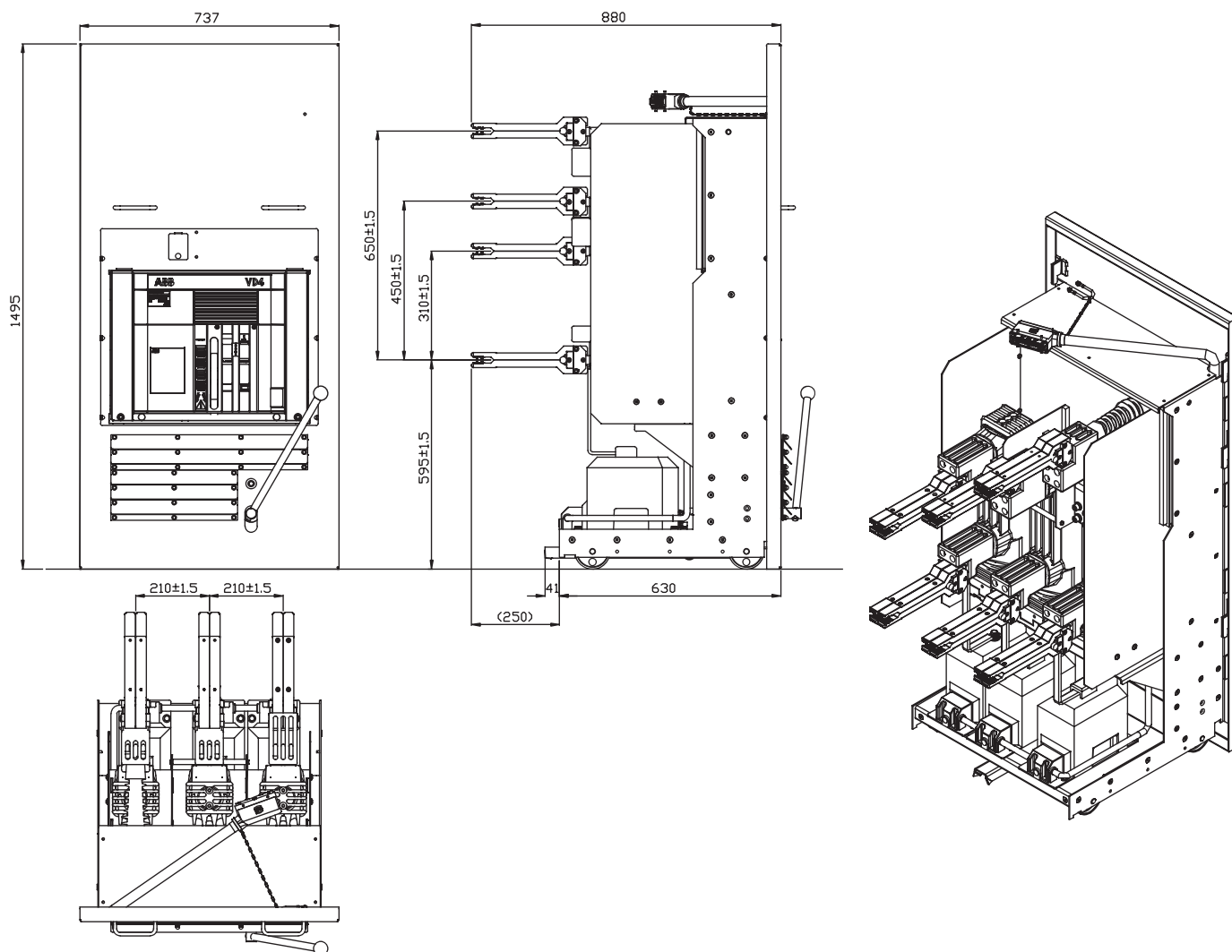


TN Retrofit overall dimensions:	1VCS010488
Retrofit assembly:	1VCS010045
Fixed TN overall dimensions:	TN7406
Circuit diagram:	1VCS010628
Fixed rating:	VD4 17.12.25 P210
Retrofit rating:	VD4-3AC 17.12.25 P.210 with voltage sensors on board
Switchgear:	SIEMENS 3BD
Racking-in:	Lever
Weight	300 Kg



TN Retrofit overall dimensions:	1VCS010489
Retrofit assembly:	1VCS010046
Fixed TN overall dimensions:	TN7407
Circuit diagram:	1VCS010628
Fixed rating:	VD4 17.25.25 P210
Retrofit rating:	VD4-3AC 17.25.25 P.210
Switchgear:	SIEMENS 3BD
Racking-in:	Lever
Weight	295 Kg

4. Overall dimensions of VD4-3AC retrofit



TN Retrofit overall dimensions:	1VCS010490
Retrofit assembly:	1VCS010046
Fixed TN overall dimensions:	TN7407
Circuit diagram:	1VCS010628
Fixed rating:	VD4 17.25.25 P210
Retrofit rating:	VD4-3AC 17.25.25 P.210 with voltage sensors on board
Switchgear:	SIEMENS 3BD
Racking-in:	Lever
Weight	360 Kg

5. Checking programme

Checking operation	Time interval	Criteria
1 Carry out five mechanical opening closing operations.	1 year.	The circuit-breaker must operate normally without stopping in intermediate positions
2 Visual inspection of the poles (parts in resin).	1 year or 5,000 operations.	The parts in resin must be free of any accumulation of dust, dirt, cracks, discharges or traces of surface discharges.
3 Visual inspection of the operating mechanism and transmission.	1 year or 5,000 operations.	The elements must be free of any deformation. Screws, nuts, bolts, etc. must be tight.
4 Visual inspection of the isolating contacts.	5 year or 5,000 operations.	The isolating contacts must be free of any deformation or erosion. Lubricate the contact elements with industrial vaseline greaseindustriale.
5 Measuring the insulation resistance.	5 year or 5,000 operations.	See standard apparatus manual.
6 Checking interlock operation.	5 year.	The interlocks provided must operate correctly.

After 10,000 operations or after 10 years, for installation in polluted and aggressive ambients, it is advisable to contact an ABB service center to have the circuit-breaker checked.



All the operations regarding putting into service must be carried out by ABB personnel or by suitably qualified customer personnel with in-depth knowledge of the apparatus and of the installation.
Should maintenance be carried out by the customer's personnel, responsibility for the interventions remains with the customer.

For more information please contact:



More product information:
abb.com/mediumvoltage
Your contact center:
abb.com/contactcenters
More service information:
abb.com/service

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