Instruction manual

Vacuum contactor

Addendum to VSC installation and service instructions 7.2/12 kV - 400 A

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For your safety!

- Make sure that the installation room (spaces, 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 suitable knowledge of the apparatus
- Make sure that the standard and legal prescriptions are complied with during installation, operation and maintenance, so that installations according to the rules of good working practice and safety in the work place are constructed
- Strictly follow the information given in this instruction manual
- Check that the rated performance of the apparatus is not exceeded during service
- Check that the personal operating the apparatus have this instruction manual to hand as well as the necessary information for correct intervention
- Pay special attention to the danger notes indicated in the manual by the following symbol

Responsible behaviour safeguards your own and others' safety!
For any requests, please contact the ABB Assistance service.

I Introduction

This publication contains the information needed to install medium voltage VSC vacuum contactors and put them into service.

For correct use of the product, please read it carefully.

This VSC retrofit solution is designed for installation in the 800 mm width ABB UniGear ZS1 or similar designed panel (check of compatibility of VSC 800 mm width in third–part panels shall be done).

However, this apparatus allows further technical-construction modifications (at the customer's request) to adapt to special installation requirements.

Consequently, the information given below may sometimes not contain instructions concerning special configurations.

Apart from this manual, it is therefore always necessary to consult the latest technical documentation (electric circuit and wiring diagrams, assembly and installation drawings, any protection coordination studies, etc.), especially regarding any variants requested in relation to the standardized configurations.

Only use original spare parts for maintenance operations.

For further information, please also see the technical catalogue of VSC vacuum contactors and the spare parts.

II Environmental protection program

These VSC contactors are manufactured in accordance with the ISO 14000 Standards (Guidelines for environmental management).

The production processes are carried out in compliance with the Standards for environmental protection in terms of reduction in energy consumption as well as in raw materials and production of waste materials.

All this is thanks to the environmental management system of the medium voltage apparatus manufacturing facility.

1 Applicability of VSC instructions

This VSC retrofit is based on the VSC fixed version.

For this reason most of the information contained in the VSC Instruction Manual are effective also for this retrofit.

In details, with reference to the VSC Installation Manual (1VCD600943), the following section are in common and for this reason are not contained in this addendum. Please refer to the VSC Instruction Manual:

- Section 1- Description
  - Section 1.1 - “MAC” magnetic driver
  - Section 1.3 - Characteristics
  - Section 1.5 - Performances
  - Section 1.6 - Contactor auxiliary contacts
  - Section 1.7 - Compliance with Standards
  - Section 1.8 - Protection against short-circuit
- Section 2 - Checking on receipt
- Section 4 - Storage
- Section 5 - Installation
  - Section - 5.3 Normal conditions
  - Section - 5.4 Special conditions
  - Section - 5.6 Assembly and making the connections
  - Section - 5.7 Description of the closing and opening operations
  - Section - 5.8 manual emergency opening operation
- Section 6 - Putting into service
- Section 7 - Maintenance
- Section 8 - Spare parts and accessories
- Section 9 - Product quality and environmental protection

2 Specific VSC instruction

Handling
Handling using a lifting or fork-lift truck.
The contactor can be lifted using a lifting truck or a fork-lift truck.

The following precautions must be taken during contactor handling:
1. Keep the contactor in the upright position.
2. Make sure that the load is balanced on the truck or on the transport plate/pallet.
3. Interpose protective material between the contactor and the truck to avoid any damage or scratches.
4. Fix the contactor onto the truck or onto the transport plate/pallet to prevent it moving or tilting over.
5. Avoid excessive speed, sudden starts and stops or sharp changes in direction during contactor handling.
6. Only lift the contactor enough to avoid any obstacles on the floor.
7. Take care to avoid any impacts with structures, other apparatus or with personnel when handling the contactor.
8. Never lift a contactor over an area where there are people.
9. During handling of the apparatus, do not stress the insulating parts and the contactor terminals.

Handling and lifting using a hook.
To lift and handle VSC vacuum contactors with special lifting accessory.
- To lift and handle VSC vacuum contactors, using the hooks (fig.1b)
- Insert the special lifting accessory (fig.1c)
- Put the hooks in the holes in the lifting accessory
- On completion (and in any case before putting into service) of the operation unhook the lifting accessory

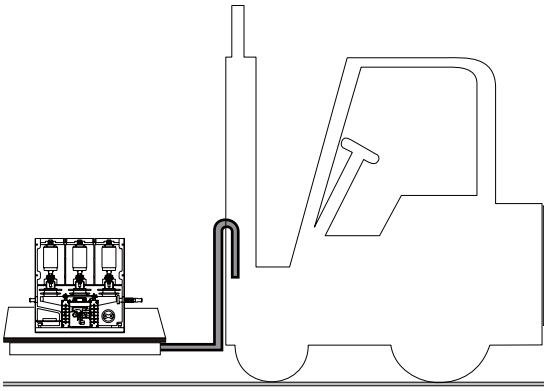


Fig.1a Handing using a fork-lift truck

Fig.1b

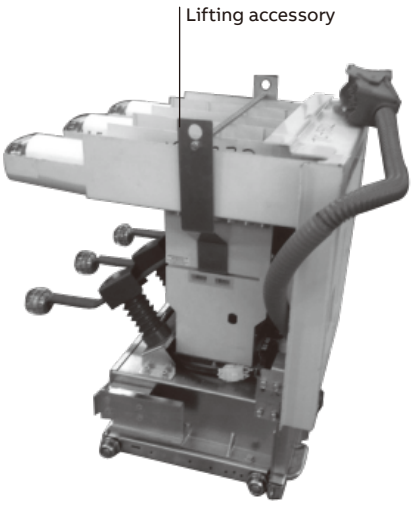


Fig.1c

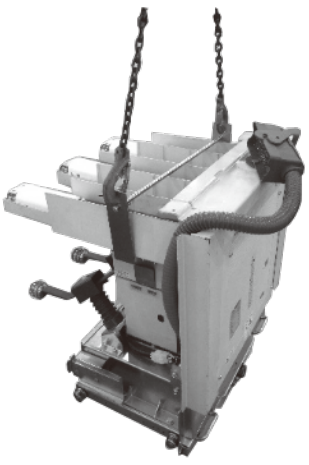


Fig.1d

2 Specific VSC instruction

Description

General

The VSC series of contactors are pieces of apparatus under vacuum for indoor installation. For the electrical performances, please refer to the corresponding technical catalogue code 1VCD600943.

For special installation requirements, please contact ABB.

The following versions are available:
Distance between upper and lower terminals
205 mm
275 mm
310 mm

Reference Standards

This vacuum contactor conform to the IEC 62271-106 and GB14808 Standards and those of major industrialized countries.

Overview of main interlocks

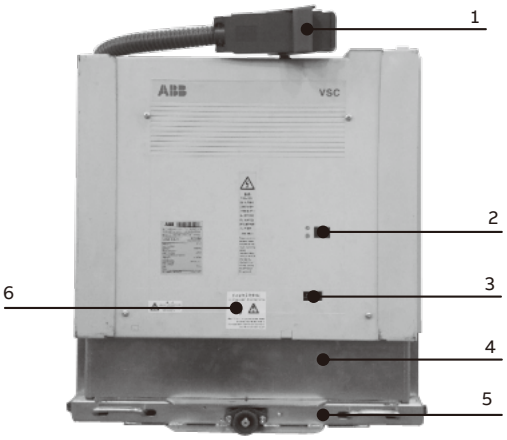


Fig. 2a

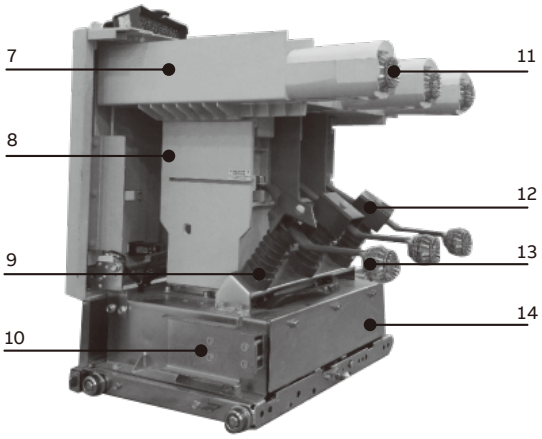


Fig. 2b

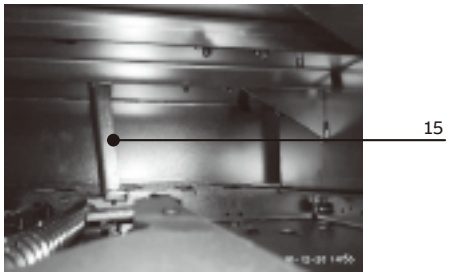


Fig. 2c

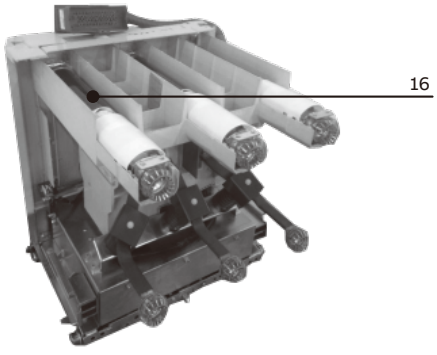


Fig. 2d

1 Secondary wiring plug
2 Signaling device for open/close
3 Operation counter
4 Steel basement
5 Truck
6 Emergency operating device
7 Fuse holder
8 Fixed version VSC
9 Insulator
10 Actuator elements
11 Upper side contact system
12 Insulating cover
13 Lower side contact system
14 Steel cover
15 Interlock for racking-in/out and open/close operation
16 Fuse[1)]

1) On request

Installation
Preliminary operations.
- Clean the insulating parts with clean dry cloths
- Check that the top and bottom terminals are clean and free of any deformation caused by shocks received during transport or storage

Installation of VSC in 800 mm width switchgear.
This withdrawable VSC vacuum contactors are preset for insertion in the corresponding 800 mm width switchgear. Insertion and racking-out of the contactor must be gradual to avoid any shocks which could deform the mechanical interlocks. If the operations are prevented, do not force the interlocks and check that the operating sequence is correct. Please also refer to the technical documentation of the switchgear for the vacuum contactor installation operations.

CAUTION!
The racking-in and racking-out operations must always be carried out with the contactor open.

The VSC is preset for use in 800mm width UniGear and similar designed panels. For switchgear racking-in/racking-out, fully insert the lever in the appropriate seat and work it clockwise for racking-in, and anti-clockwise for racking-out, until the limit switch positions are reached.

The racking-in/-out must be carried out gradually to avoid shocks which may deform the mechanical interlocks and the limit switches.

If operations are prevented or difficult, do not force them and check that the operating sequence is correct.

When the contactor has reached the isolated for test/isolated position, it can be considered racked into the switchgear.

For the contactor installation operations, also refer to the technical documentation of the above-mentioned switchgear.

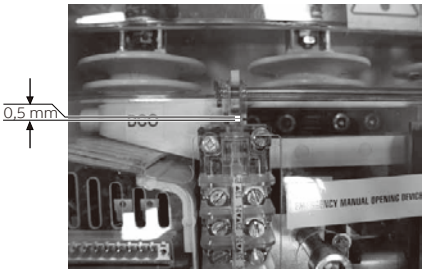
Putting into service
General procedures:

All the operations regarding putting into service must be carried out by ABB personnel or personnel who are suitably qualified and have in-depth knowledge of the apparatus and installation. If the operations are prevented, do not force the mechanical interlocks, but check that the operation sequence is correct.

Before putting the contactors into service, carry out the following operations:
- Check the tightness of the power connections on the contactor terminals
- Check that the value of the supply voltage for the auxiliary circuits is within 85% and 110% of the rated voltage of the electrical devices
- Check that no foreign body, such as packaging, has got into the moving parts
- Check that air circulation at the contactor installation site is adequate so that there is no danger of overheating
- Carry out the checks indicated in the Table 1

Table. 1

Item inspected	Procedure	Positive check
1. Insulation resistance	Medium voltage circuit use lower letter, with and not Width With a 2500 V megger, measure the insulation resistance between the phases and the exposed conductive part of the circuit.	The insulation resistance should be at least 50 Mohm.
2. Drive open/closed indicator, operation counter (if provided)	Carry out a few closing and opening operations of the contactor.	Operations and signals normal.
3. Auxiliary circuits	Check that the connections to the control circuits are correct: proceed with the relative power supply.	Operations and signals normal.
	With the contactor open, check that the thickness between the body of the contact and the stem is 0.5 mm.	Tighten the fixing screws.



2 Specific VSC instruction

Maintenance

Maintenance must only be carried out by ABB personnel or in any case by suitably qualified personnel who have in-depth knowledge of the apparatus (IEC62271-106). Should the maintenance be carried out by non-ABB personnel, they are responsible for the interventions.

Replacement of any parts not included in the “List of spare parts/accessories” must only be carried out by ABB personnel.

In particular:
- Vacuum interrupter assembly
- MAC-R2 electronic card
- Actuator assembly
- Auxiliary contacts
- Capacitor

Spare parts

All assembly operations of spare parts and accessories must be carried out by ABB personnel or by suitably qualified customer personnel with in-depth knowledge of the apparatus, following the instructions enclosed with the spare parts, (IEC62271-106) and all the Standards aimed at carrying out these interventions in safe conditions. Should maintenance be carried out by the customer’s personnel, responsibility for the interventions lies with the customer. Before carrying out any operation, always make sure that the contactor is open and that it is not energized (medium voltage circuit and auxiliary circuits).

To order contactor spare parts/accessories, refer to the ordering sales codes listed in the technical catalogue.

For availability and to order spare parts, please contact our service office.

List of spare parts
- Vacuum interrupter assembly (replacement to be carried out by ABB)
- MAC-R2 electronic card
- Auxiliary contacts (5 normally open and/or 5 normally closed)
- Capacitor
- Actuator assembly (replacement to be carried out by ABB)
- Operation counter
- Fuses
- Adapters for fuses
- Fuse-holders (replacement to be carried out by ABB)
- Tulip and jaw-type isolating contacts
- Insulator (Fig2.b 9)
- Insulating cover (Fig2.b 12)
- Locking magnet in the truck
- Interlock in the truck (Fig2.c 15)
- Microswitches

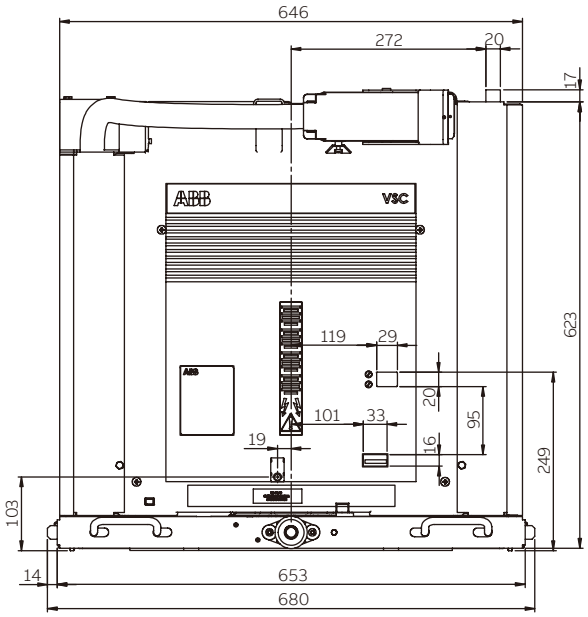
Electrical diagram

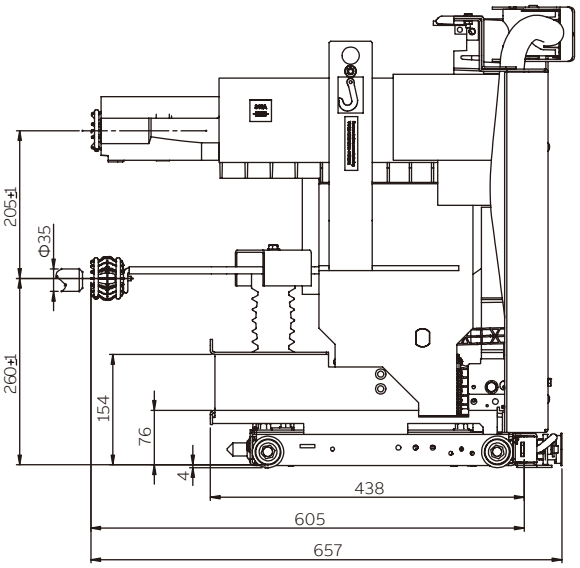
The standard VSC for 800 mm width panel electrical circuit diagram is as follows:
- 1YHA000099: VSC electrical diagram

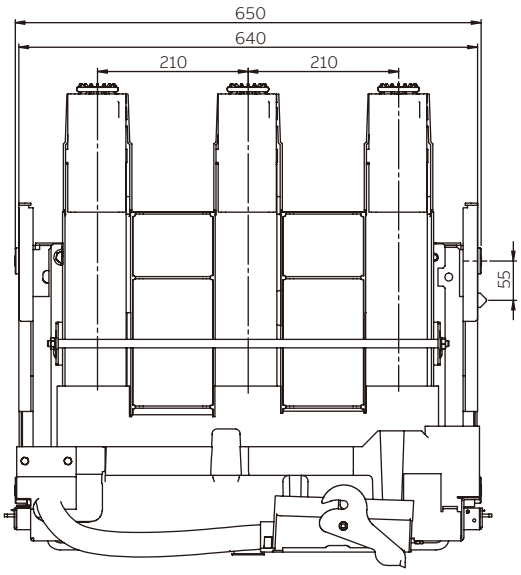
Each contactor is always provided with the standard electrical diagram or with a specific diagram in the case of a vacuum contactor with non-standard cabling.

3 Overall dimension

VSC P210 H205 withdrawable vacuum contactor

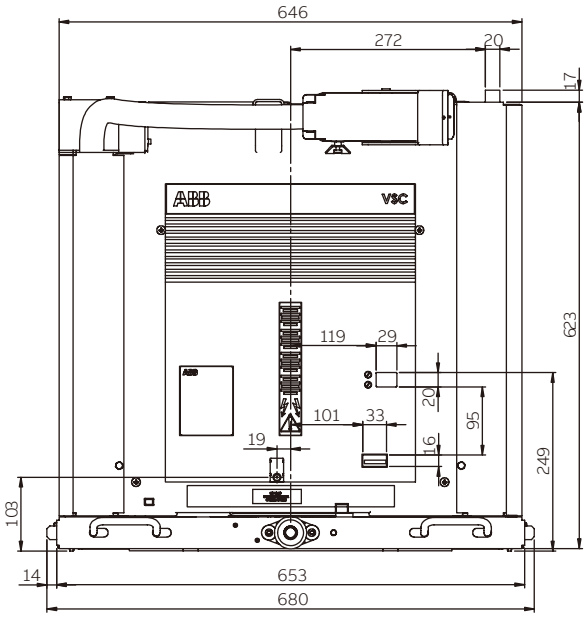


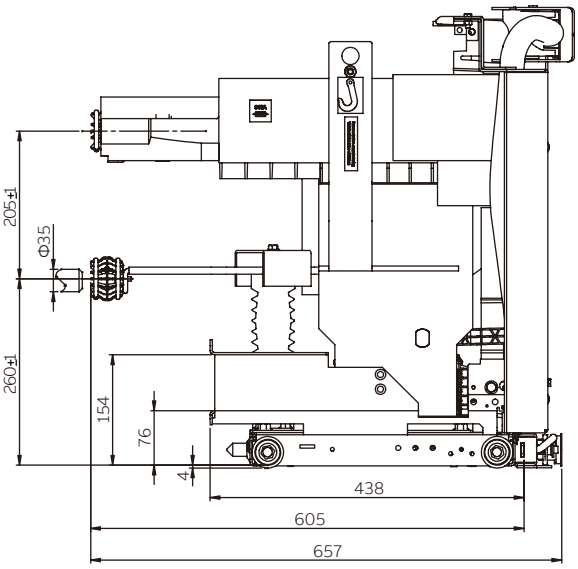


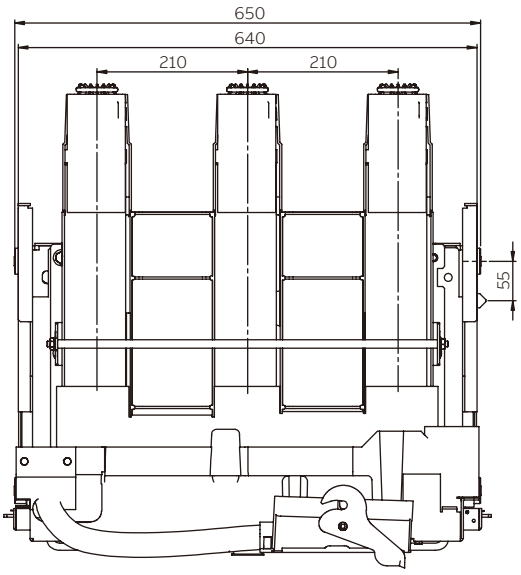


3 Overall dimension

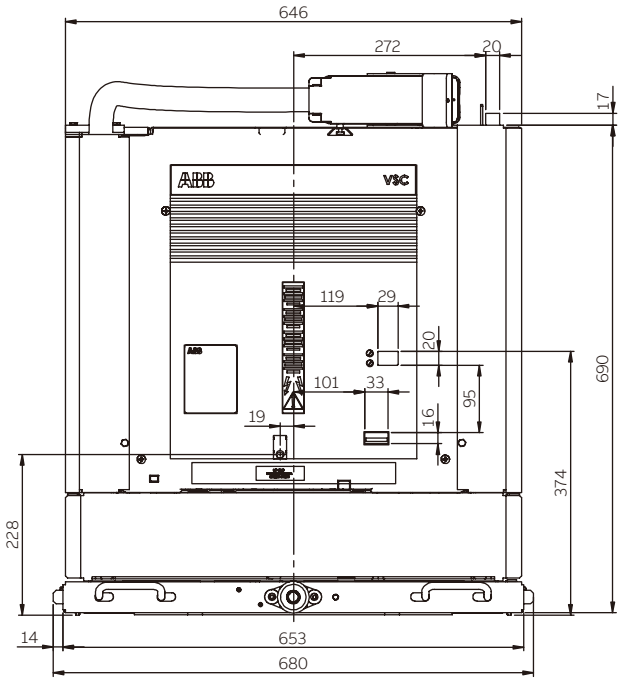
VSC P210 H205 withdrawable vacuum contactor

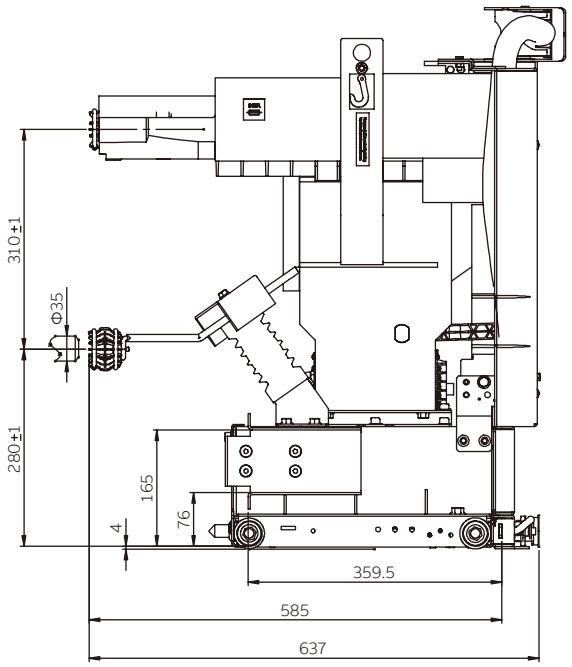


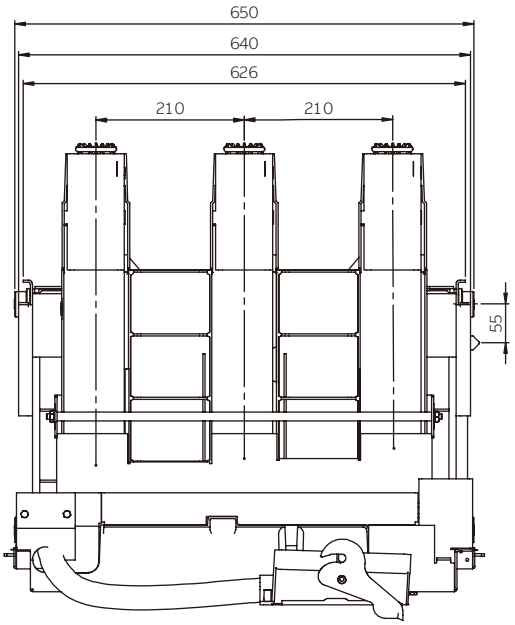




VSC P210 H310 withdrawable vacuum contactor







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We reserve the right to make changes in the course of technical development.