Medium Voltage Distribution

FLUVAC

Vacuum Circuit Breaker
Up to 24 kV – 630 A – 21 kA

Operation Maintenance Instructions

Schneider Electric

Contents

Introduction

Operations and maintenance may only be carried out by personnel who have received suitable authorisation for the operations and manœuvres they are responsible for performing.

If this is not the case, please refer to our Service Unit or Training Centre.

All locking−out operations must be performed according to the safety regulations currently being in force.

Our Service Unit: our specialists, and suitably adapted services

KJA0145

- Guarantee extension contracts in relation to the selling of new equipment,
- Supervision of circuit breaker installation,
- Technical advice, diagnoses of the facilities, expertise,
- Maintenance contracts adapted to operational constraints,
- Systematic or conditional preventive maintenance,
- Corrective maintenance in case of partial or complete failure,
- Supply of spare parts.

For diagnosis and advice please contact the Schneider Electric Customer Service Department:
Phone: +39 0377 4173517 (office hours)
Fax: +39 0377 451133

Overview

Responsibilities

Our devices are quality controlled and tested at the factory in accordance with the standards and the regulations currently in force. Apparatus efficiency and apparatus life depend on the compliance with the installation, commissioning and operation instructions described in this user manual. Non respect of these instructions is likely to invalidate any guarantee. Local requirements especially about safety and which are in accordance with the indications given in this document, must be observed. Schneider Electric declines any responsibility for the consequences:

- due to the non respect of the recommendations in this manual which make reference to the international regulations in force.
- due to the non respect of the instructions by the suppliers of cables and connection accessories during installation and fitting operations,
- of any possible aggressive climatic conditions (humidity, pollution, etc.) acting in the immediate environment of the materials that are neither suitably adapted nor protected for these effects.

This user manual does not list the locking−out procedures that must be applied. The interventions described are carried out on de−energized equipment (in the course of being installed) or locked out (non operational).

Particular instructions for operations and interventions on energized equipment

When commissioning and operating the equipment under normal conditions, the General safety instructions for electrical applications must be respected, (protective gloves, insulating stool, etc.), in addition to standard operating instructions.

All manipulations must be completed once started.

The durations (for completing the operations mentioned) given in the maintenance tables are purely an indication and depend on on−site conditions.

Other technical notices to be consulted

- -

Tools (not supplied) required for the operations described in this user manual

- Flat, thin screwdriver (4) + medium
- Leather gloves

Symbols & conventions

Code for a product recommended and marketed by Schneider Electric

Tightening torque value
Example: 1.6 daN.m

Mark corresponding to a key

CAUTION! Remain vigilant!
Precautions to be taken in order to avoid accidents or injury

FORBIDDEN! Do not do it!
Compliance with this indication is compulsory, non compliance with this stipulation may damage the equipment

INFORMATION − ADVICE
Your attention is drawn to a specific point or operation

Functional interlocks

Functional mechanical interlocks

The FLUVAC circuit breaker is equipped with internal mechanical interlocks, called ”functional”, intended to avoid any kind of operating error.

It is necessary to know these interlocks in order to operate the switchgear correctly.

Interlocks for function CB

Position		Circuit breaker	Disconnector
Circuit breaker (*)	Closed	-	Locked
	Open / Earth	-	Free
Disconnector	Closed	Free (**)	-
	Open / Earth	Free	-

(*) During the disconnector operations, the circuit breaker is locked open.

(**) Also available version – Disconnector closed, circuit breaker open locked.

Operating accessories

Reminder for Manual Operations

All movements of the lever must be frank and complete.

Operating accessories

KJA0003

Operating lever

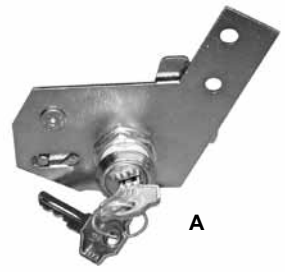
KJA0028

Signal lamp

Key locks (optional)

They are used to prevent any possible wrong operations during the FLUVAC circuit breaker.

KJA0146

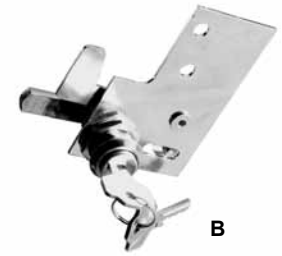


A

It is used for the following function:

- Open line free key

KJA0147



B

It is used for the following function:

- Open line/earth free key

KJA0148

C

It is used for the following function:

- Open line/earth free key

Use of the CB function

Opening the disconnector

KJA0082

- Act on the interlock, by shifting it in the left position and insert the operating lever into the disconnector control.

KJA0083

- Grasp the lever with both hands

KJA0084

- Turn the lever clockwise, up to reach the end of stroke. The mimic diagram indicator will turn from the closed line/earth position to the opened line/earth position .
- Extract the operating lever.

Closing the disconnector

KJA0085

Before closing the disconnector, ensure there is no voltage across the voltage presence signal lamp.

- Act on the interlock, by shifting it in the left position and insert the operating lever into the disconnector control.

KJA0086

- Grasp the lever with both hands

KJA0087

- Turn the lever counter-clockwise, up to reach the end of stroke. The mimic diagram indicator will turn from the opened line/earth position to the closed line/earth position .
- Extract the operating lever.

Use of the CB function (contd.)

KJA0088

Closing the circuit breaker

The spring loading operations must not be performed if the unit is motorized.

- Insert the operating lever into the closing spring loading control.
- Grasp the lever with both hands.

KJA0089

KJA0090

- Turn the lever counter-clockwise, up to reach the end of stroke. The closing spring loading indicator will turn from the unloaded spring position (↑ up arrow) to the loaded spring position (↓ down arrow).
- Extract the operating lever.

KJA0091

- Close the circuit breaker, by pressing the closing pushbutton (I). The mimic diagram indicator will turn from the opened line position (O) to the closed line position (I). The closing spring loading indicator will turn from the loaded spring position (↓ down arrow) to the unloaded spring position (↑ up arrow).

KJA0092

Opening the circuit breaker

- Open the circuit breaker, by pressing the opening pushbutton (O).

KJA0093

- The mimic diagram indicator will turn from the closed line position (I) to the opened line position (O).

Maintenance

Levels of maintenance

Description	Levels
Operations recommended in the instructions manual “installation - operation - maintenance”, carried out by suitably qualified personnel having received training allowing them to intervene whilst respecting the safety rules.	1
Complex operations, requiring specific expertise and the implementation of support equipment in accordance with Schneider Electric’s procedures. These must be carried out by Schneider Electric or by a specialised technician trained by Schneider Electric when starting the procedures, with the appropriate specific equipment.	2
All preventive and corrective maintenance, all renovation and reconstruction work is carried out by Schneider Electric.	3

Preventive maintenance

Preventive maintenance	Frequency	Levels		
Recommended operations	**6 years**	**1**	**2**	**3**
Verification of the presence and condition of accessories (levers, etc.)	■	■	■	■
Visual inspection of the exterior (cleanliness, absence of oxidation, etc.)	■	■	■	■
Cleaning of external elements, with a clean, dry cloth	■	■	■	■
Verification of the positioning of the status indicators (open and closed)	■	■	■	■
Verification of the functioning of the mechanical control mechanism by making several manoeuvres	■	■	■	■
Visual surveillance of the general appearance of connections	■	■	■	■

Corrective maintenance

Corrective maintenance	Levels		
Replacements or modifications	**1**	**2**	**3**
Replacement of a signal lamp assembly	■	■	■

Replacement of a signal lamp assembly

Locking out the Functional Unit	Tools required:	Parts required:
■ Not required	■ No tools required	■ Signal lamp assembly

KJA0094

Before proceeding to carry out the removal/installation operations of the parts composing the FLUVAC circuit breaker, be sure that the voltage was cut off both to the primary circuit and to the auxiliary one.

■ To remove the signal lamp assembly take it by two hands and detach it from the switchgear. To install the new signal lamp assembly fit the terminals to the proper holes of the apparatus and press till complete insertion

Spare parts

The spare part

Describes a part that is designed to replace a corresponding one with a view to re-establishing the original function.

The replacement of these parts can only be carried out by a person who is suitably qualified and trained for this operation.

For an explanation of the levels of maintenance, please refer to page 9.

Non-Programmed replacement	Denomination	Levels		
		1	2	3
Describes spare parts whose replacement intervenes in the course of corrective maintenance.	Signal lamp assembly	■	■	■

Exceptional replacement	Denomination	Levels		
		1	2	3
Describes the spare parts or assemblies whose foreseeable service life is at least equal to that of the equipment. Use: Spare parts or sub-assemblies conserved in a safety stock.	Operation counter	■	■	■
	Undervoltage release (UVR)	■	■	■
	Undervoltage release control card	■	■	■
	Loaded or unloaded closing springs signalling contact	■	■	■
	Shunt closing release	■	■	■
	Shunt opening release	■	■	■
	Demagnetisation opening solenoid	■	■	■
	Geared motor for loading springs	■	■	■
	Geared motor controller card	■	■	■
	Auxiliary contacts	■	■	■
	Voltage presence signal lamp	■	■	■
	Key locks	■	■	■

Identification of materials

For all orders for spare parts, it is necessary to enclose the equipment characteristics form.

Storage conditions

The components should be stored away from dust, humidity or the sun. In order to facilitate the search, they must be marked by the Schneider Electricreference number.
Certain components are fragile, they should preferably be stored in their original packaging.

Characteristics and Volumes of SF_6 gas

General characteristics

Type of Insulating Gas:
Sulphur Hexafluoride (SF6) – IEC 60376.

Each switchgear comprises a tank, filled with SF6 gas, designed as a pressurised, sealed-unit system in accordance with the requirements of IEC.

During the expected operating life and under normal operating conditions the gas should not need topping up.

The GWP (Global Warming Poten-tial) of the SF6 gas is 22.200.


Never pierce the pressurised tank!


Never attempt to open the tank.

Filling pressure

At 20°C the filling pressure is 0.030 MPa.

At the end of the equipment operational life

Safety instructions

Do not dismantle the mechanical control mechanism springs without releasing the device.

Never attempt to open the sealed-tank of a Functional Unit.

Dismantling of the equipment service

Consult Schneider Electric for all decommissioning services.

- Remove all electrical equipment (coils, motors, etc.).
- On disassembly, the materials must be sorted and sent on via the appropriate recycling channels.

Notes

Notes

Notes

Schneider Electric
35, rue Joseph Monier
CS 30323
92506 Rueil-Malmaison Cedex, France

RCS Nanterre 954 503 439
Capital social 896 313 776 €
www.schneider-electric.com

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