Medium Voltage Distribution

FLUORC

Up to 24 kV – 630 A – 20 kA

Operation Maintenance Instructions

Schneider Electric

Contents

- **Introduction** **3**
  - Our Service Unit: our specialists, and suitably adapted services 3
- **Overview** **4**
  - Responsibilities 4
  - Particular instructions for operations and interventions on energized equipment 4
  - Other technical notices to be consulted 4
  - Tools (not supplied) required for the operations described in this user manual 4
  - Symbols & conventions 4
- **Functional Interlocks** **5**
  - Functional mechanical interlocks 5
  - Interlocks of FLUORC for functions C and T1 5
- **Operating accessories** **6**
  - Reminder for Manual Operations 6
  - Key locks (optional) 6
- **Use of the C function (manual version)** **7**
  - Opening the earthing switch 7
  - Closing the earthing switch 7
  - Closing the switch disconnector 8
  - Opening the switch disconnector 8
- **Use of the C function (motorized version)** **9**
  - Opening the earthing switch 9
  - Closing the earthing switch 9
  - Closing the switch disconnector 9
  - Opening the switch disconnector 10
- **Use of the T1 function (manual version)** **11**
  - Opening the earthing switch 11
  - Closing the earthing switch 11
  - Closing the switch disconnector 12
  - Opening the switch disconnector 13
- **Use of the T1 function (motorized version)** **14**
  - Opening the earthing switch 14
  - Closing the earthing switch 14
  - Closing the switch disconnector 14
  - Opening the switch disconnector 14
- **Maintenance** **15**
  - Levels of maintenance 15
  - Preventive maintenance 15
  - Corrective maintenance 15
  - Replacement of the three fuses 15
    - Replacement of a fuse 16
  - Replacement of a signal lamp assembly 18
- **Spare parts** **19**
  - The spare part 19
  - Identification of materials 19
  - Storage conditions 19
- **Characteristics and Volumes of SF6 gas** **20**
  - General characteristics 20
  - Filling pressure 20
- **At the end of the equipment operational life** **21**
  - Safety instructions 21
  - Dismantling of the equipment service 21
- **Notes** **22**

Introduction

Operations and maintenance may only be carried out by personnel who have received suitable authorisation for the operations and manoeuvres 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

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- Guarantee extension contracts in relation to the selling of new equipment
- Supervision of switch disconnector 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.

Contact the Schneider Electric Service Unit for diagnoses and advice:
Phone No: +39 0377 417 351 (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 nstructions 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 FLUORC 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 of FLUORC for functions C and T1

Position		Switch disconnector	Earthing switch
Switch disconnector	Closed	–	Locked open
	Open	–	Free
Earthing switch	Closed	Locked open	–
	Open	Free	–

Operating accessories

Reminder for Manual Operations

All movements of the lever must be frank and complete.

KJA0096

Operating lever

KJA0028

Signal lamp

Key locks (optional)

They are used to prevent any possible wrong operations during the FLUORC switch disconnector.

It is used for the following functions:

- Open line free key
- Close line free key
- Open earth free key

KJA0097

It is used only for the function of:

- Close earth free key

KJA0098

Use of the C function manual version

KJA0099

Opening the earthing switch

- Insert the operating lever into the earthing switch control.

KJA0100

- Grasp the lever with both hands.

KJA0101

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

Closing the earthing switch

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

KJA0102

- Insert the operating lever into the earthing switch control.

KJA0103

- Grasp the lever with both hands.

KJA0104

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

Use of the C function manual version (contd.)

Closing the switch disconnector

KJA0105

- Insert the operating lever into the switch disconnector control.

KJA0106

- Grasp the lever with both hands.

KJA0107

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

Opening the switch disconnector

KJA0108

- Insert the operating lever into the switch disconnector control.

KJA0109

- Grasp the lever with both hands.

KJA0110

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

Use of the C function motorized version

Opening the earthing switch

Refer to Opening the earthing switch of C function (mannual version) on page 7

Closing the earthing switch

Refer to Closing the earthing switch of C function (mannual version) on page 7

Closing the switch disconnector

KJA0112

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

KJA0113

- Grasp the lever with both hands.

KJA0114

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

Use of the C function motorized version (contd.)

Opening the switch disconnector

KJA0115

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

KJA0116

- Grasp the lever with both hands.

KJA0117

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

Use of the T1 function manual version

Opening the earthing switch

KJA0156

- Insert the operating lever into the earthing switch control.

KJA0157

- Grasp the lever with both hands.

KJA0158

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

Closing the earthing switch

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

KJA0159

- Insert the operating lever into the earthing switch control.

Use of the T1 function manual version (contd.)

KJA0160

- Grasp the lever with both hands.

KJA0161

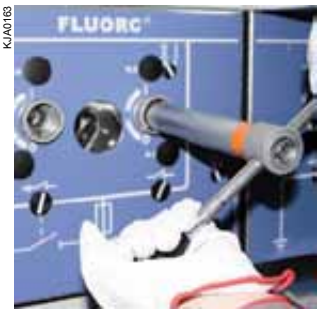
- Turn the lever counter clockwise, up to reach the end of stroke. The mimic diagram indicator will turn from the opened earth position to the.closed earth position
- Extract the operating lever.

Closing the switch disconnector

KJA0162

- Act on the interlock, by shifting it upwards then insert the operating lever into the earthing switch control.

KJA0163



- Grasp the lever with both hands

Use of the T1 function manual version (contd.)

KJA0164

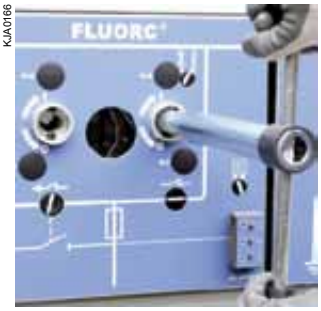
- Turn the lever clockwise, up to reach the end of stroke.The mimic diagram line indicator will turn from the opened line position to the closed line position .
The mimic diagram spring indicator will turn from the discharged position to the charged position .
- Extract the operating lever.

Opening the switch disconnector

KJA0165

- Insert the operating lever into the switch disconnector control.

KJA0166



- Grasp the lever with both hands.

KJA0167

- Turn the lever counterclockwise, up to reach the end of stroke. The mimic diagram line indicator will turn from the closed line position to the opened line position .
The mimic diagram spring indicator will turn from the charged position to the discharged position .
- Extract the operating lever.

Use of the T1 function motorized version

Opening the earthing switch

Refer to Opening the earthing switch of T1 function (mannual version) on page 11.

Closing the earthing switch

Refer to Closing the earthing switch of T1 function (mannual version) on page 11 -12.

Closing the switch disconnector

Refer to Closing the switch disconnector switch of T1 function (mannual version) on page 12 - 13

Before the operating lever insertion, act on the interlock, by shifting it in the upper position (for the interlock identification refer to Closing the switch disconnector switch of C function (motorized version) on page 9).

Opening the switch disconnector

Refer to Opening the switch disconnectorg switch of T1 function (mannual version) on page 13.

Before the operating lever insertion, act on the interlock, by shifting it in the upper position (for the interlock identification refer to Opening the switch disconnector switch of C function (motorized version) on page 10).

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	**3 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 the three fuses	■	■	■
Replacement of a signal lamp assembly	■	■	■

Replacement of the three fuses

Intervention	Busbar	Cables	Circuit breaker	Earthing switch (if present)
Normal	de-energized	de-energized	open	closed
Possible	energized	de-energized	open	closed

Locking out the Functional Unit

All locking out operations must be performed according to the particular rules for the network concerned.

Tools required:
- leather gloves
- Compartment key

Parts required:
- 3 fuses with the same reference (verify values in accordance with the transformer power)

Maintenance (contd.)

Before proceeding to carry out the operations for removing/installing the parts composing the FLUORC switch disconnector, be sure that the voltage was cut out to the primary circuit and to the auxiliary one.

See the corresponding chapter in the Installation Manual for the characteristics of the fuses.

The T1 function meets the IEC 6224-105 requirements; particularly, when whatever fuse intervenes the switch disconnector automatically opens. In this situation it is not possible to reclose it until the blown fuse is replaced. For reliability reasons, replacement of all of the three fuses is recommended.

Replacement of a fuse

For an apparently single phase fault, it is imperative that all 3 fuses be replaced.

The body of a fuse can become very hot following a short circuit. Take standard precautions (leather gloves) before starting work.

Whenever changing or fitting a fuse, close the compartment immediately afterwards to avoid letting dust and humidity enter.

KJA0170

- Activation of one or more fuses leads to three situations:
  - automatically opens the circuit breaker. The relative mimic diagram indicator will turn from the closed line position to the open line position .
  - moreover, automatically relieves the closing control spring. The relative mimic diagram indicator will turn from the charged spring position to the discharged spring position .
  - the fuses mimic diagram indicator will turn from the closed line position to the opened line position .

KJA0171

- The fuse intervention do not move automatically the circuit breaker control in the opened position. The following reset procedure must be performed:
  - insert the operating lever into the circuit breaker control with the centered pin upwards.

KJA0172

- Grasp the lever with both hands.
- Turn the lever counterclockwise, up to reach the end of stroke.
- Extract the operating lever.

Maintenance (contd.)

KJA0173

- Ensure that the disconnector is closed. Only in this condition it will be possible to remove the fuses compartment access panel.
- Insert the operating lever.

KJA0174

- Grasp the lever with both hands.
- Turn the lever counterclockwise, up to reach the end of stroke. The relative mimic diagram indicator will turn from the opened line/earth position to the closed line/earth position .

KJA0175

- Lift the fuses compartment access panel so that to uncouple it from the side hooks.

KJA0176

- Remove the fuses from their seats.

KJA0177

- Insert the new fuses, taking care to install every fuse with the striker pointing upwards.
- Close the fuses compartment access panel so that to couple it in the side hooks.

Maintenance (contd.)

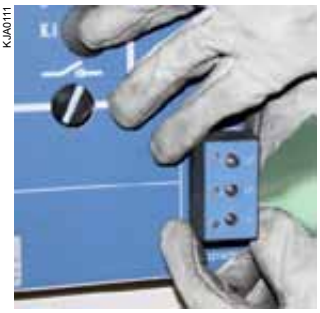
Replacement of a signal lamp assembly

Locking out the Functional Unit
Not required

Tools required:
- No tools required.

Parts required:
- Signal lamp assembly.

KJA0111



Before proceeding to carry out the removal/installation operations of the parts composing the FLUORC switch disconnector, 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 operations.

For an explanation of the levels of maintenance, please refer to see Levels of maintenance.

Programmed replacement	Denomination	Replacement every	Levels		
			1	2	3
This concerns wearing parts, designed to be replaced after a predetermined number of uses. Use: Maintenance stock, necessary for optimum maintenance procedures every 6 years.	Fuses (by 3)	20 years	■	■	■

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.	Undervoltage release (UVR)	■	■	■
	Undervoltage release control card	■	■	■
	Loaded or unloaded closing springs signalling contact	■	■	■
	Shunt closing release	■	■	■
	Shunt open release	■	■	■
	Demagnetisation opening solenoid	■	■	■
	Geared motor for loading springs	■	■	■
	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 Electric reference 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 (SF_6) – IEC 60376.

Each switchgear comprises a tank, filled with SF_6 gas, designed as a pressurised, sealed-unit system in accordance with the requirements of IEC 60694.

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

The GWP (Global Warming Potential) of the SF_6 gas is 22,200.

Never pierce the pressurised tank!

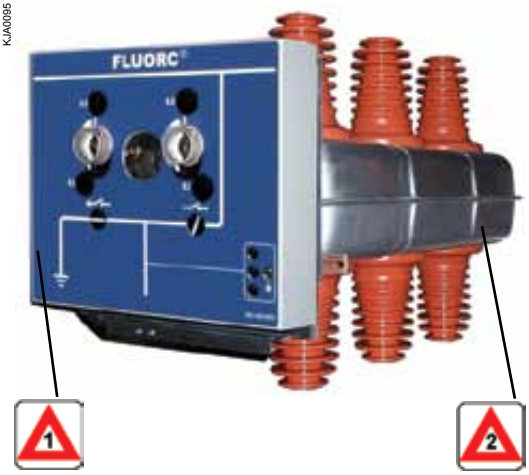
Never attempt to open the tank.

Filling pressure

At 20°C the filling pressure is 0.030 MPa.

At the end of the equipment operational life

KJA0095



Safety instructions

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

2 Never attempt to open the sealedtank 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

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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