

SeT Series

SM AirSeT - 24 kV Modular Cubicles Operating DMVL-A / D / S Cubicles with EvoPacT Vacuum Circuit Breaker

Additive to NNZ1587001 Installation and Commissioning Guide and NNZ1586901 Operation and Maintenance Guide

This document completes the NNZ1587001 and NNZ1586901 guides with the description of operations on the DMVL-A / D / S cubicles.

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Foreword

Safety Information

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in death or serious injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in death or serious injury**.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in death or serious injury**.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in minor or moderate injury**.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and its installation and has received safety training to recognize and avoid the hazards involved.

Safety Precautions

Safety Rules

⚡⚠ DANGER
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH
<ul style="list-style-type: none">• Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.• This equipment must only be installed and serviced by qualified electrical personnel. Civil engineering work should be performed only after reading this entire set of instructions and checking the technical characteristics of the device.• Do not work alone.• Turn off all power supplies of the equipment before working on or inside equipment.• Respect the LOTO (Lock Out Tag Out) procedure.• Do not drill into the switchgear.• Always use a properly rated voltage sensing device to confirm that power is off.• Put all devices, doors, and covers back into place before turning on power to this equipment.• Beware of potential hazards, and carefully inspect the work area for tools and objects that may have been left inside the equipment.• Never go behind the cubicle when it is energized.
Failure to follow these instructions will result in death or serious injury.

Cleaning Instructions



⚡⚠ DANGER
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH
Do not use high-pressure cleaner for cleaning the equipment.
Failure to follow these instructions will result in death or serious injury.



⚠ CAUTION
HAZARD OF INAPPROPRIATE CLEANING
Do not use solvents or alcohol for cleaning the equipment.
Failure to follow these instructions can result in injury or equipment damage.

Disposal of the Equipment at End-of-Life

This equipment contains pressurized air and compressed springs.

▲ WARNING

HAZARD OF INCORRECT DISMANTLING OPERATION

- Apply appropriate protective equipment (PPE) and follow safe work practices.
- Do not carry out any dismantling operations unless authorized.
- Air pressure contained inside the tank must be released before any end-of-life treatment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

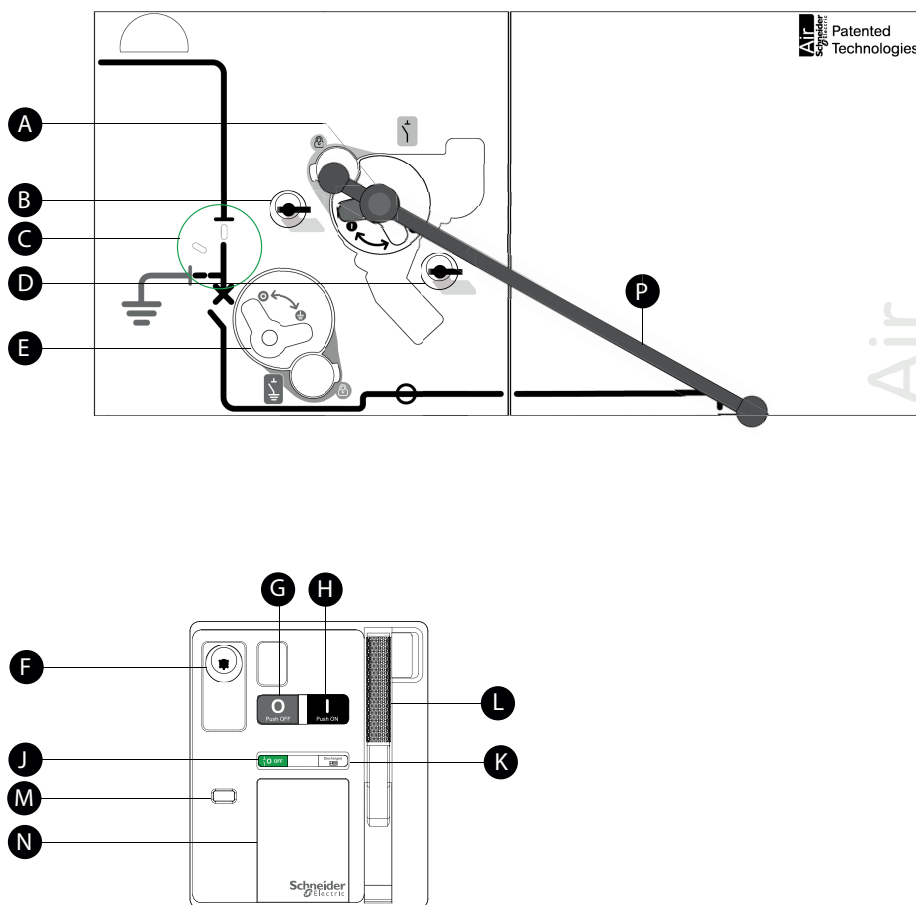
Description of the EvoPacT Circuit Breaker and the Operating Mechanism


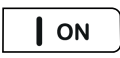



The DMVL-A / D / S are circuit breaker cubicles composed of one disconnecter and a vacuum circuit breaker.

The EvoPacT™ vacuum circuit breaker enables the device to switch and helps protect the distribution networks. When the EvoPacT vacuum circuit breaker is installed on a medium voltage cubicle, it helps to protect the downstream components from a short-circuit.

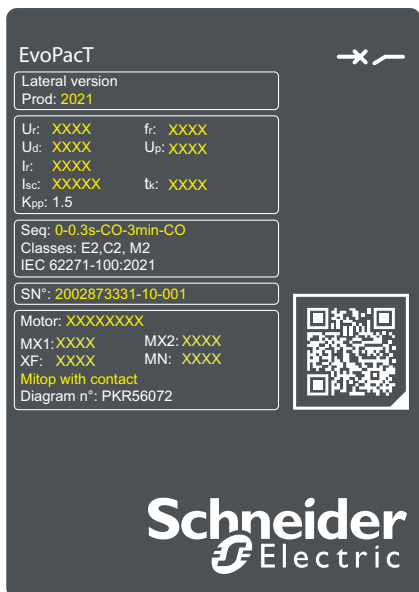
Description

NOTE: To facilitate the representation of the operations, only the DMVL-A front panel is shown as an example.



Part	ID	Item	Function	
Disconnecter	A	Line disconnecter command	Insert the lever to operate the disconnecter.	
	B	Open position lock	Lock the disconnecter in the open position.	
	C	Disconnecter position indicator (earth/open/closed)	Show the disconnecter position.	
	D	Closed position lock	Lock the disconnecter in the closed position.	
	E	Earthing disconnecter command	Insert the lever to operate the earthing disconnecter.	
EvoPacT vacuum circuit breaker, page 10	F	Circuit breaker lock	Lock the circuit breaker in the open position.	
	G	Push OFF button	Power off the circuit breaker.	
	H	Push ON button	Power on the circuit breaker.	
	J	Status OFF:  ON: 	Show the status of the circuit breaker: open or closed.	
	K	Charging status bar Charged:  Charged:  Discharged: 	Show the status of the charging operation. The mechanism closing spring is charged. The mechanism closing spring is charged. The mechanism closing spring is discharged.	
		L	Charging handle	Charge the circuit breaker.
		M	Operation counter	Count the open/close cycle.
N	Nameplate, page 10	Provide the circuit breaker characteristics.		
Accessories	P	Operating lever	Operate the disconnecter.	

EvoPacT Circuit Breaker Nameplate



The data in yellow depends on the product ordered.

Prod: year of production	
Ur: rated voltage	fr: rated frequency
Ud: rated short duration power frequency withstand voltage	Up: rated lightning impulse withstand voltage
Ir: rated normal current	—
Isc: rated short-circuit breaking current	—
Kpp: rated first pole-to-clear factor	tk: rated duration of short-circuit
Seq: rated operating sequence	
Classes: E2, C2, M2: classes of electrical endurance and of mechanical endurance	
IEC 62271-100:2021: standard with date of issue	
SN°: Serial Number	
Motor: motor type	-
MX1: first trip release	MX2: second trip release
XF: closing release	MN: undervoltage release
Mitop with contact: empty if no Mitop	
Diagram n°: PKR56072: Electrical diagram	

EvoPacT Circuit Breaker Combination of Indicators

Circuit breaker indicators		Electrical status	Status description
Main contact-position indicator	Charging status bar		
			The circuit breaker is open. The mechanism is discharged.
			The circuit breaker is open. The mechanism is charged. The circuit breaker cannot be closed.
			The circuit breaker is open. The mechanism is charged. The circuit breaker is ready to closed.
			The circuit breaker is closed. The mechanism is discharged.
			The circuit breaker is closed. The mechanism is charged.

Terminology

- **Captive key:** captive keys are only released after a specific sequence of actions. They are used to prevent the movement of mechanical parts and the operation of the device when not appropriate.
- **Free key:** free keys are released with a turn.

Note About the Keys

The disconnecter locks (B) and (D), and the circuit breaker lock (F) are identical and use the same key.

Operating the Lever

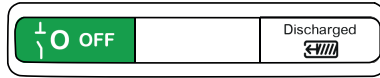
For more information about operating the lever, please refer to the section *Operating the Equipment (Manual Operation of the Earthing Switch and Switch-Disconnecter with CDT and CDTS)* in the guides:

- NNZ1587001 Installation and Commissioning Guide
- NNZ1586901 Operating and Maintenance Guide

Energizing DMVL-A / D / S Cubicles

Initial state:

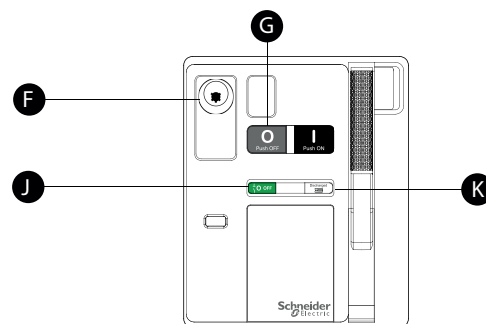
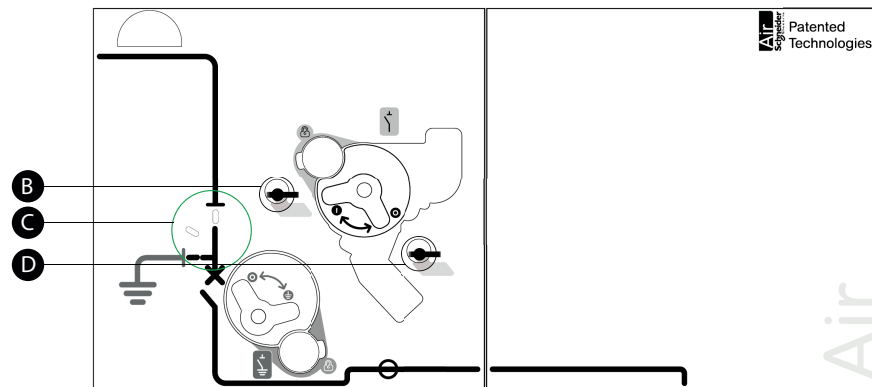
- The disconnecter position indicator (C) is in earth position.
- The circuit breaker is open (J) and discharged (K).



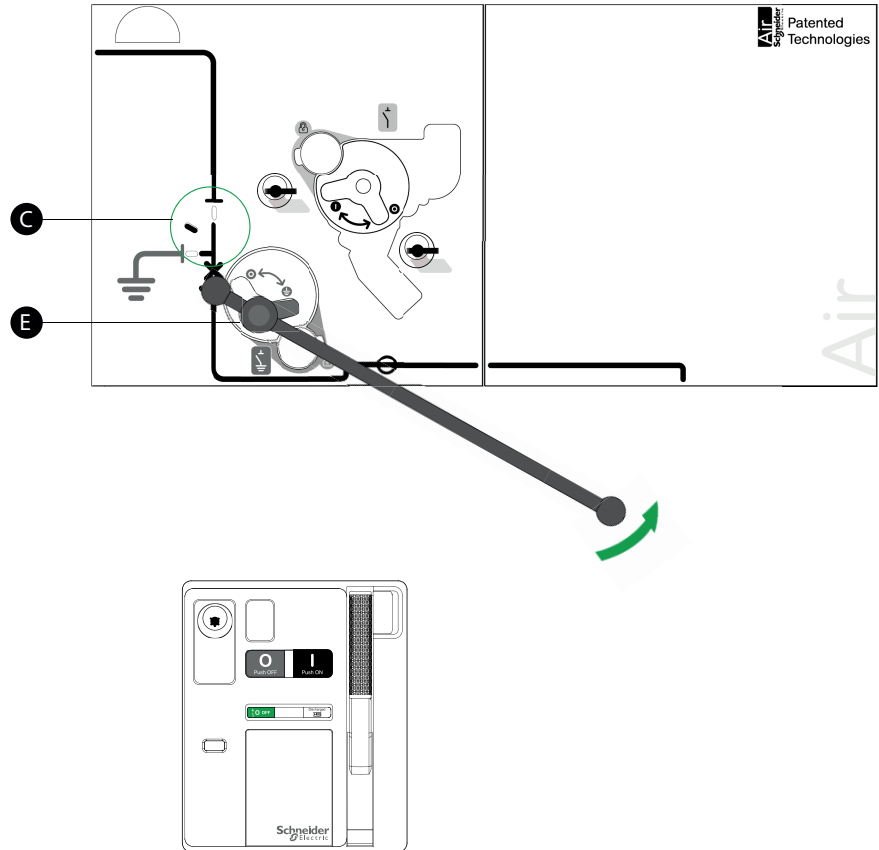
- The captive key is in lock (D).
- The free key is in lock (B).

NOTE: If the free key is not in (B), the key is in (F). To release the key from (F):

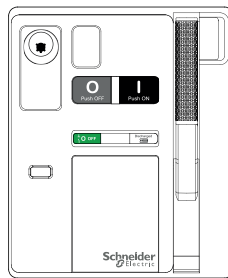
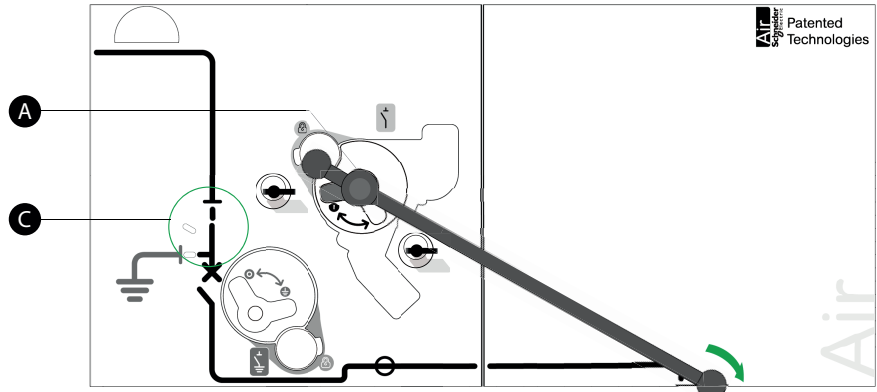
If	Then
The circuit breaker is open and discharged	Remove the key from (F) directly or with 1/4 turn anti-clockwise. Insert the key in (B).
The circuit breaker is closed and discharged	<ol style="list-style-type: none"> 1. Press the circuit breaker Push OFF button (G). 2. Turn the key in (F) 1/4 turn anti-clockwise. 3. Remove the key and insert the key in (B).
The circuit breaker is closed and charged	<ol style="list-style-type: none"> 1. Press the circuit breaker Push OFF button (G). 2. Press the circuit breaker Push ON button (H). 3. Press the circuit breaker Push OFF button (G). 4. Turn the key in (F) 1/4 turn anti-clockwise. 5. Remove the key and insert the key in (B).



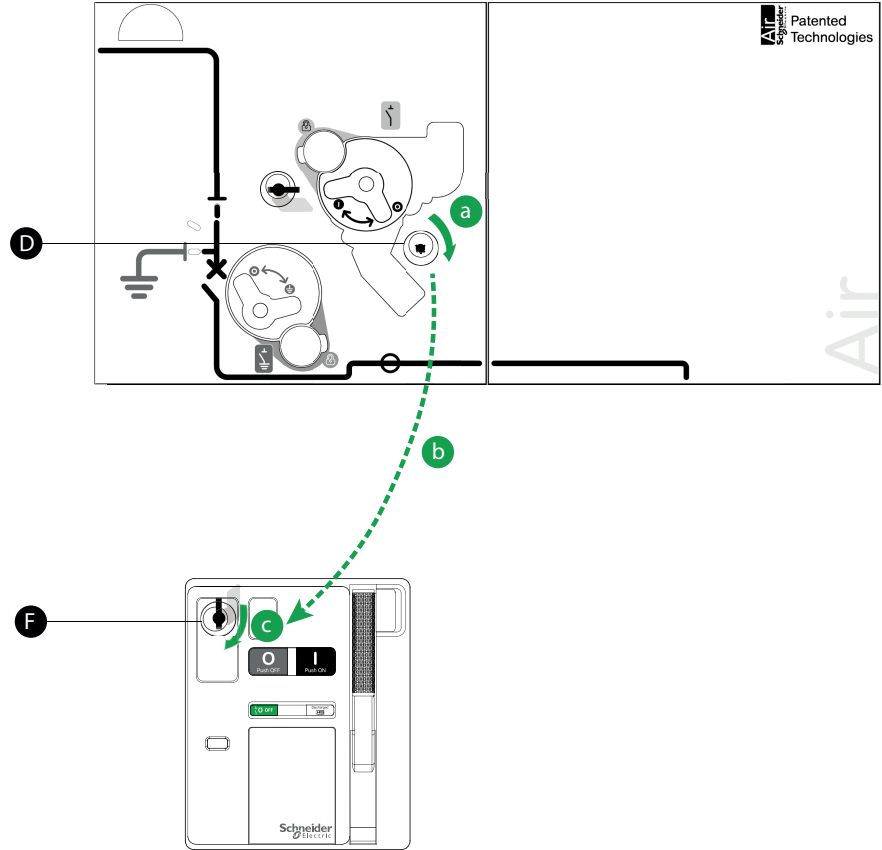
1. Open the disconnecter as follows:
 - a. Insert the operating lever in the earthing disconnecter command (**E**).
 - b. Turn anti-clockwise.
 - c. Check that the disconnecter position indicator (**C**) shows the open position.



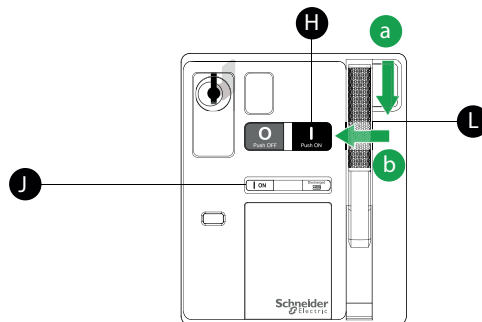
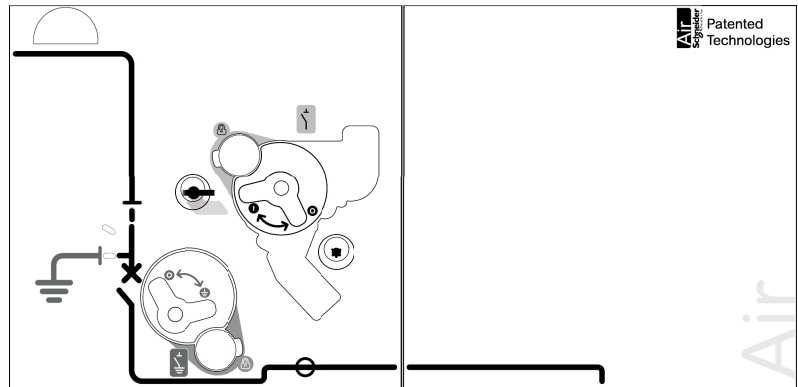
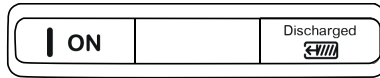
2. Close the disconnect as follows:
 - a. Insert the operating lever in the line disconnect command (**A**).
 - b. Turn clockwise.
 - c. Check that the disconnect position indicator (**C**) shows the closed position.



3. Move the key to the circuit breaker as follows:
 - a. Release the key from lock (D) with 1/4 turn clockwise.
 - b. Insert the key horizontally in the circuit breaker lock (F).
 - c. Make a 1/4 turn clockwise to lock it.



4. Close the circuit breaker as follows:
 - a. Pull down the charging handle (L) several times until the lever stops being maneuverable.
 - b. Press the circuit breaker **Push ON** button (H).
 - c. Check that the circuit breaker status bar (J) shows the closed position.



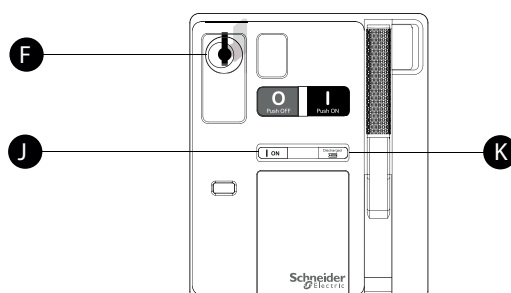
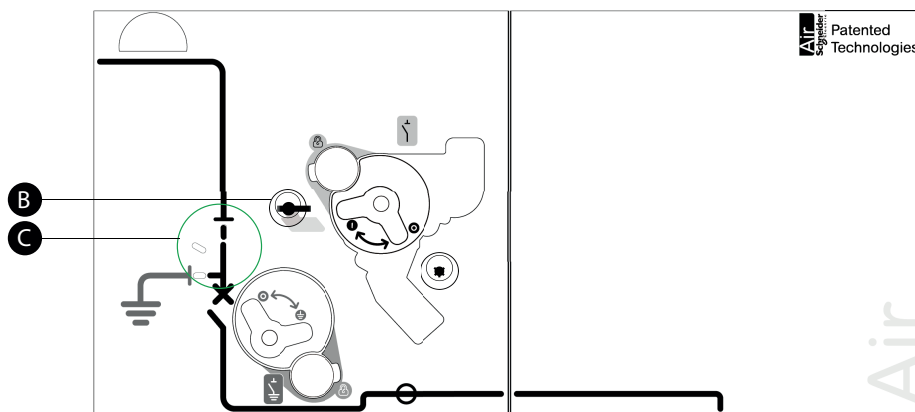
Final state:

- The disconnecter position indicator (C) is in closed position.
- The circuit breaker is closed (J) and discharged (K).
- The 2 keys are captive in lock (B) and in circuit breaker lock (F).

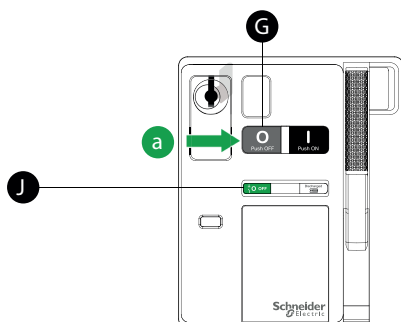
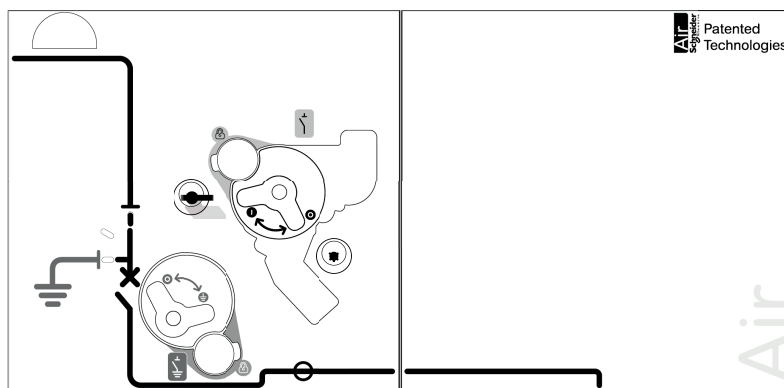
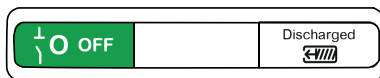
De-Energizing DMVL-A / D / S Cubicles

Initial state:

- The disconnector position indicator (**C**) is in closed position.
- The circuit breaker is closed (**J**) and discharged (**K**).
- The 2 keys are captive in lock (**B**) and circuit breaker lock (**F**).

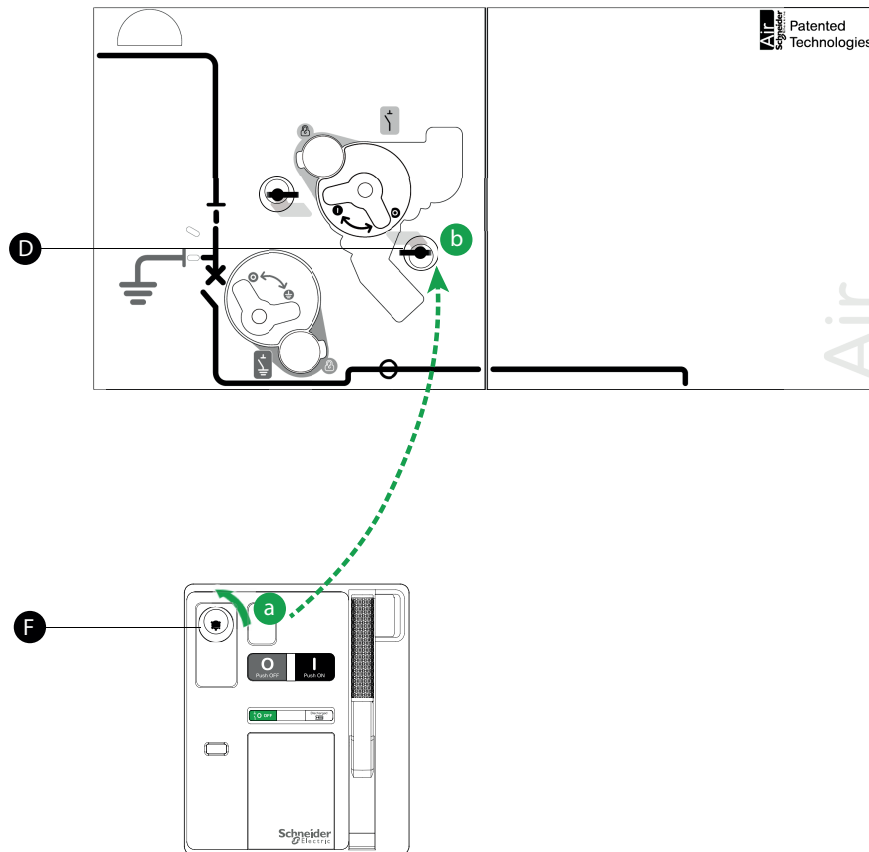


1. Open the circuit breaker as follows:
 - a. Open the circuit breaker by pressing the circuit breaker **Push OFF** button (G)
 - b. Check that the circuit breaker charging status bar (J) shows the open position.

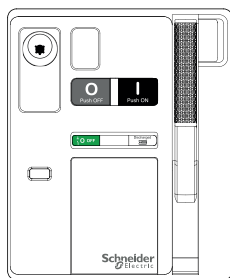
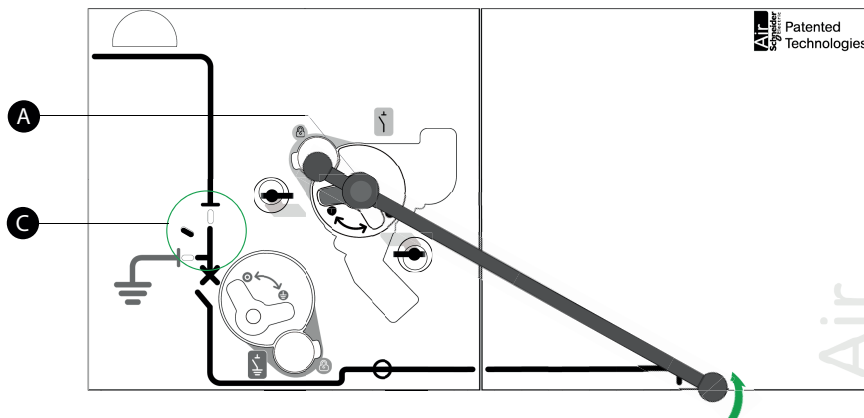


2. Move the key from the circuit breaker to the disconnect as follows:

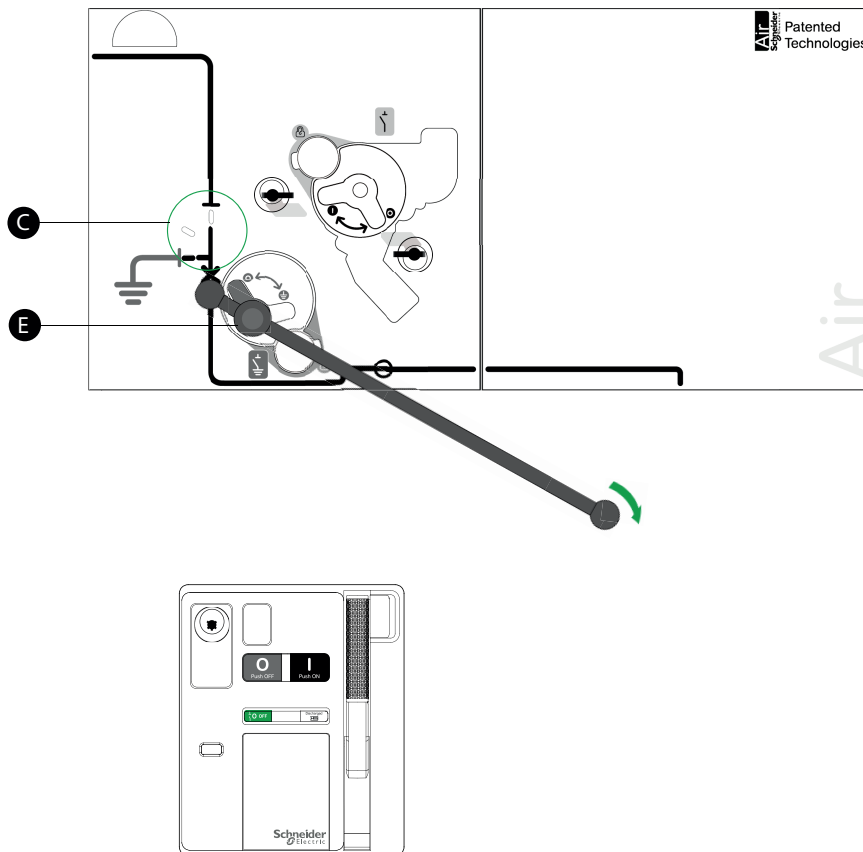
- a. Release the key from circuit breaker lock (**F**) with a 1/4 turn anti-clockwise.
- b. Insert the key vertically in lock (**D**). The key automatically makes a 1/4 turn anti-clockwise.



3. Open the disconnect as follows:
 - a. Insert the operating lever in the line disconnect command (**A**).
 - b. Turn anti-clockwise.
 - c. Check that the disconnect position indicator (**C**) shows the open position.



4. Earth the disconnector as follows:
 - a. Insert the operating lever in the earthing disconnector command (**E**).
 - b. Turn clockwise.
 - c. Check that the disconnector position indicator (**C**) shows the earth position.



Final state:

- The disconnector position indicator (**C**) is in earth position.
- The circuit breaker is open (**J**) and discharged (**K**).
- The captive key is in lock (**D**).
- The free key is in lock (**B**).

The door can be open.

⚠ CAUTION

HAZARD OF INAPPROPRIATE HANDLING

When the door is open:

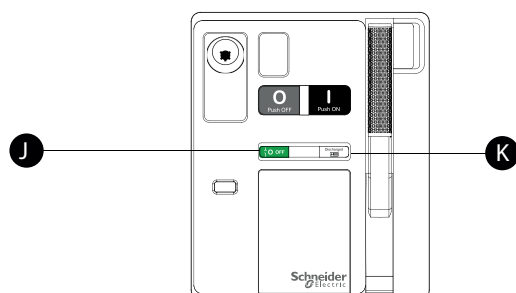
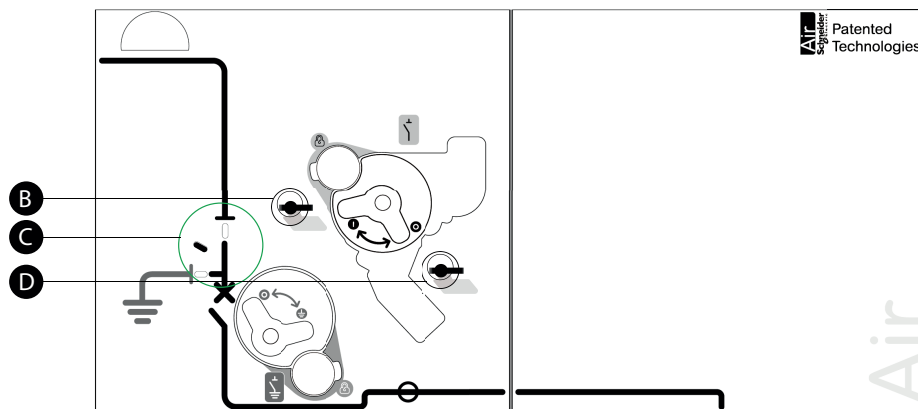
- Wear the appropriate personal protective equipment (PPE).
- Do not touch the circuit breaker mechanism.

Failure to follow these instructions can result in injury or equipment damage.

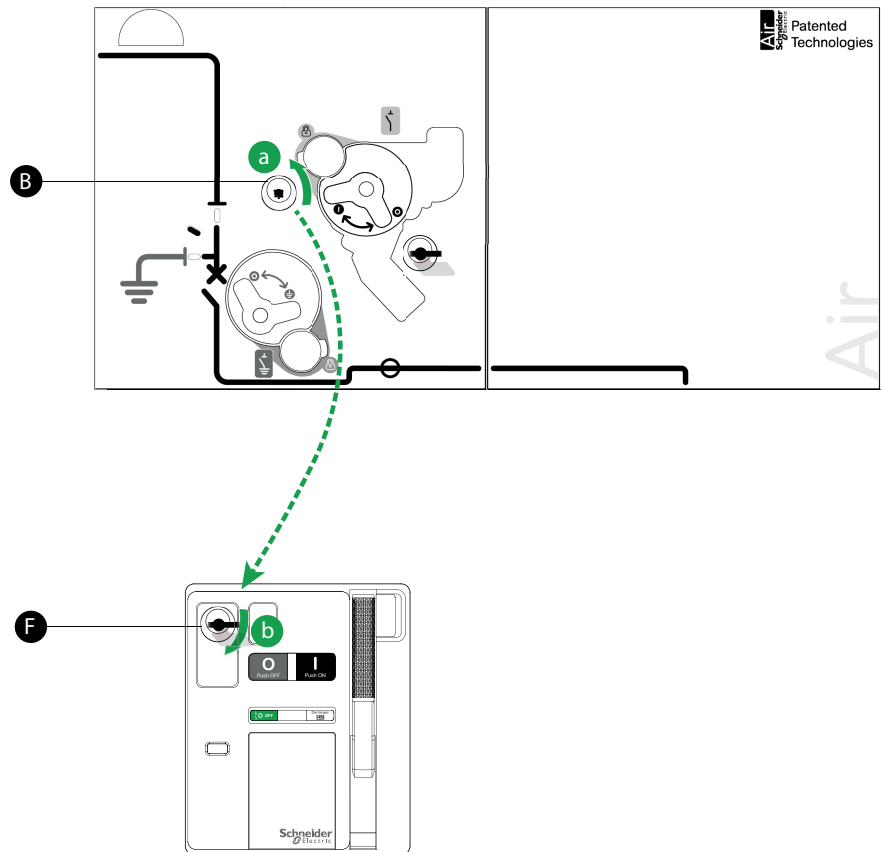
Off-Load Operations for DMVL-A / D / S Cubicles

Initial state:

- The disconnecter position indicator (**C**) is in earth or open position.
- The circuit breaker is open (**J**) and discharged (**K**).
- The captive key is in lock (**D**).
- The free key is in lock (**B**).



1. Move the key from the disconnecter to the circuit breaker as follows:
 - a. Release the key from lock (B) with 1/4 turn anti-clockwise.
 - b. Insert the key horizontally in the circuit breaker lock (F). Make 1/4 turn clockwise.



2. Operate the circuit breaker as follows:
 - a. Pull down the charging handle (L) several times until the lever stops being maneuverable.
 - b. Press the circuit breaker **Push ON** button (H) to close it. Refer to Step 4, page 16
 - c. Press the circuit breaker **Push OFF** button (G) to open it. Refer to Step 1, page 18

⚠ CAUTION

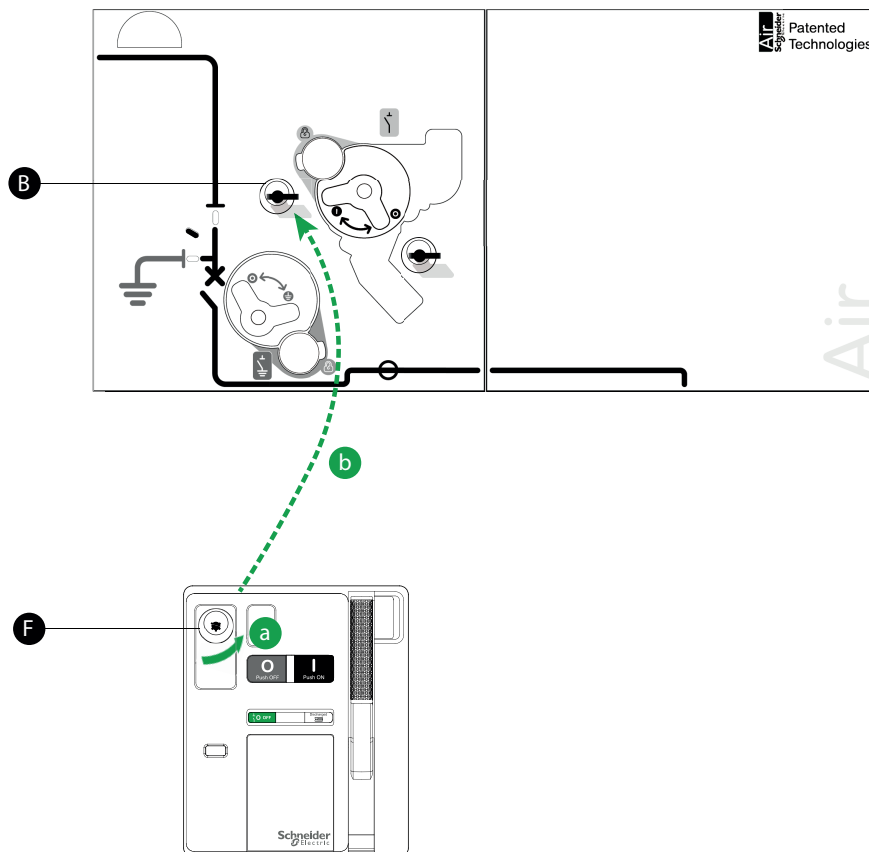
HAZARD OF INAPPROPRIATE HANDLING

If the door is open:

- Wear the appropriate personal protective equipment (PPE).
- Do not touch the circuit breaker mechanism.

Failure to follow these instructions can result in injury or equipment damage.

3. Move the key from the circuit breaker to the disconnect as follows:
 - a. Release the key from lock (F) with 1/4 turn anti-clockwise.
 - b. Insert the key in the lock (B). The key automatically makes a 1/4 turn clockwise.



Maintenance and Troubleshooting

For more information about maintenance and troubleshooting, refer to NNZ1586901 Operating and Maintenance Guide.

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