

Low voltage electrical distribution

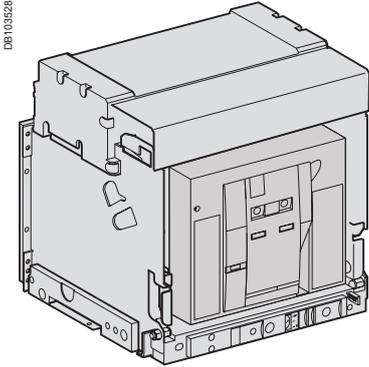
Masterpact NW

Circuit breakers and switch-disconnectors
NAVY from 800 to 4000 A

User manual
06/2009



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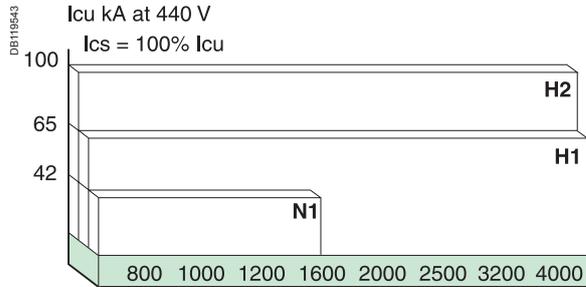


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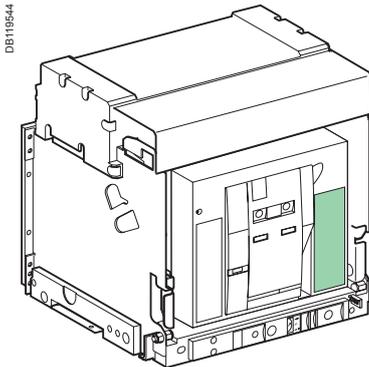
The Masterpact NW NAVY range of circuit breakers and switch-disconnectors offer current ratings from 800 A to 4000 A.

Different performance levels are available:

- N1: standard with total discrimination
- H1: high performance with total discrimination
- H2: a compromise between current limiting and discrimination.



Rating plate



DB119544

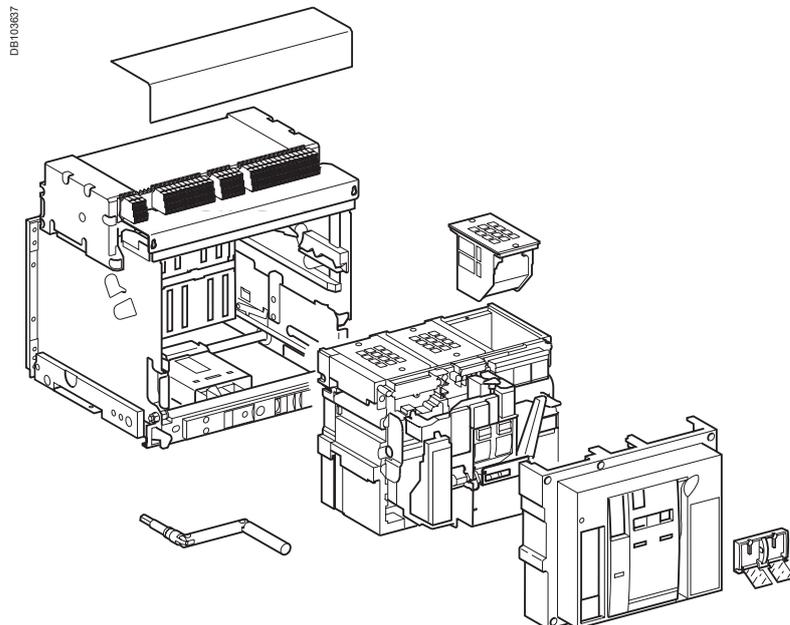
DB119546

Masterpact NAVY		
NW25 H1		
Ui 1000V	Uimp 12kV	
Ue (V)	Icu (kA)	
220/440 ~	65	
480/690 ~	65	
Ics = 100% Icu		
Icw 65kA/1s	cat.B	
IEC 60947-2 50/60Hz		
UTE VDE BS CEI UNE AS NEMA		
	Ue (V)	Ie (A)
AC23A	690	2500
IEC 60947-3 50/60Hz		

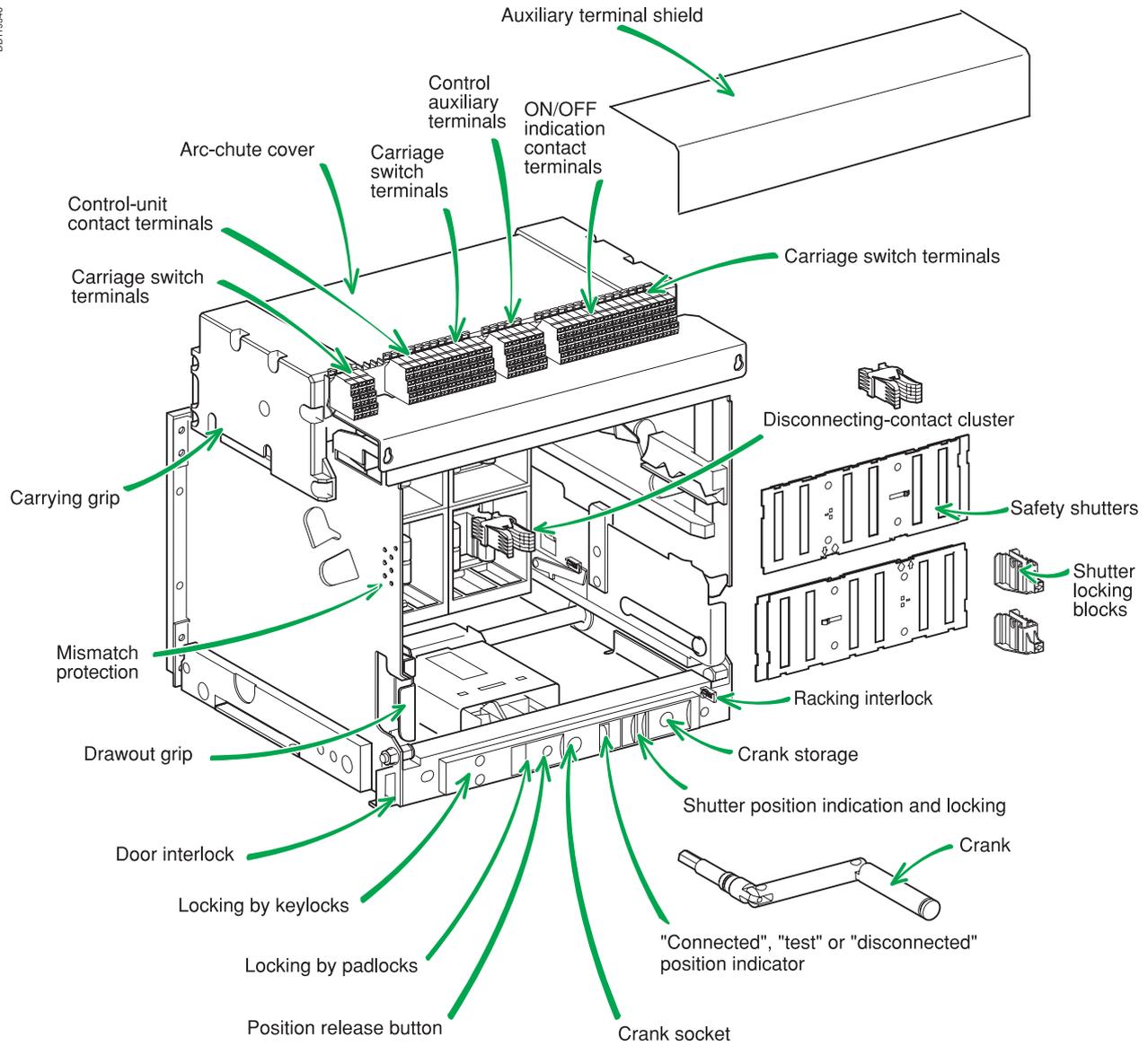
- Rated current x 100 A
- Performance level
- Suitability for isolation
- Type of device: circuit breaker or switch-disconnector
- Rated insulation level
- Impulse withstand voltage
- Ultimate breaking capacity
- Rated operational voltage
- Ics: rated service breaking capacity
- Icu: ultimate breaking capacity
- Rated short-time withstand current
- Frequency
- Standards

Masterpact NAVY circuit breaker is available in drawout version.

Drawout version

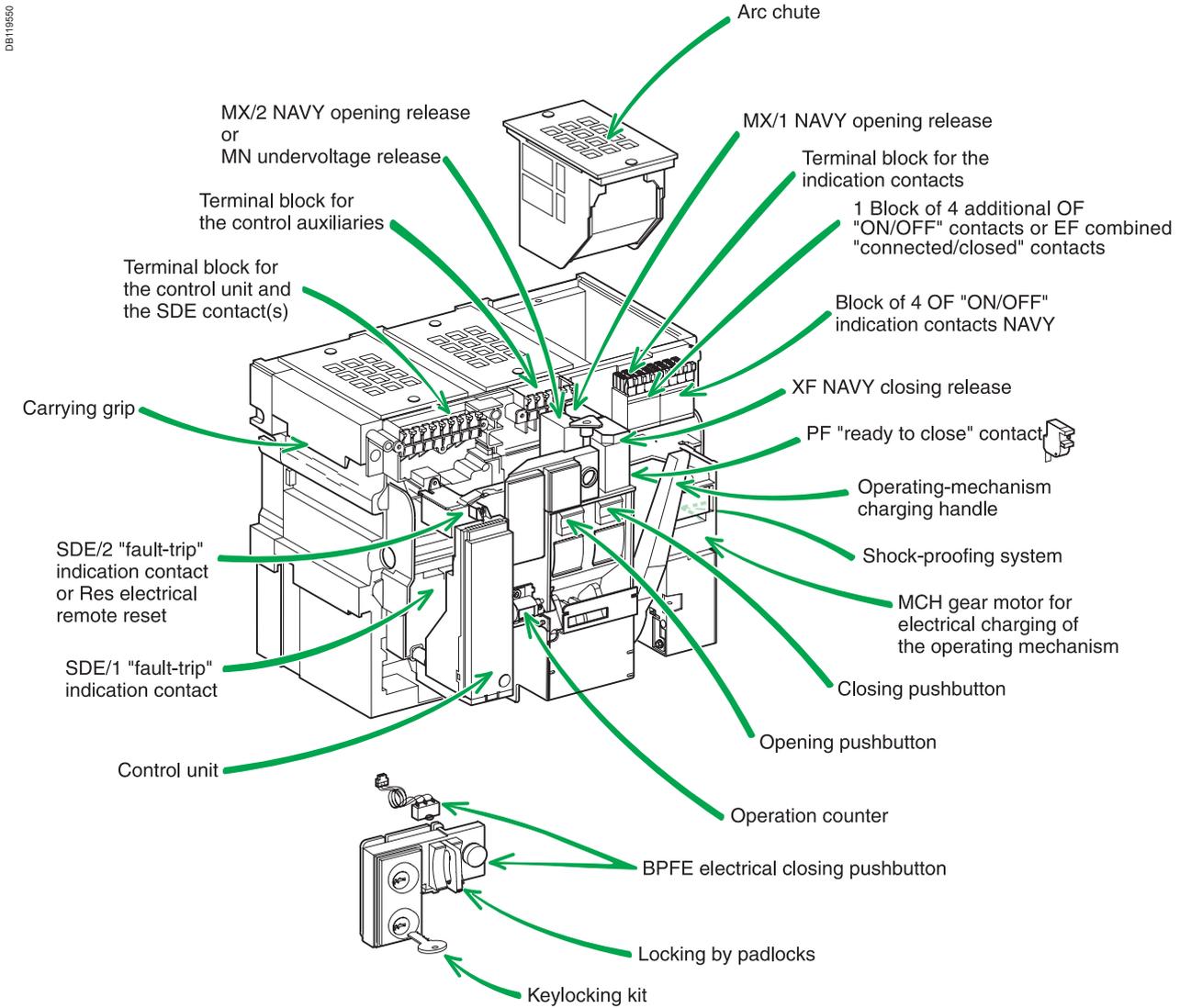


Chassis NAVY



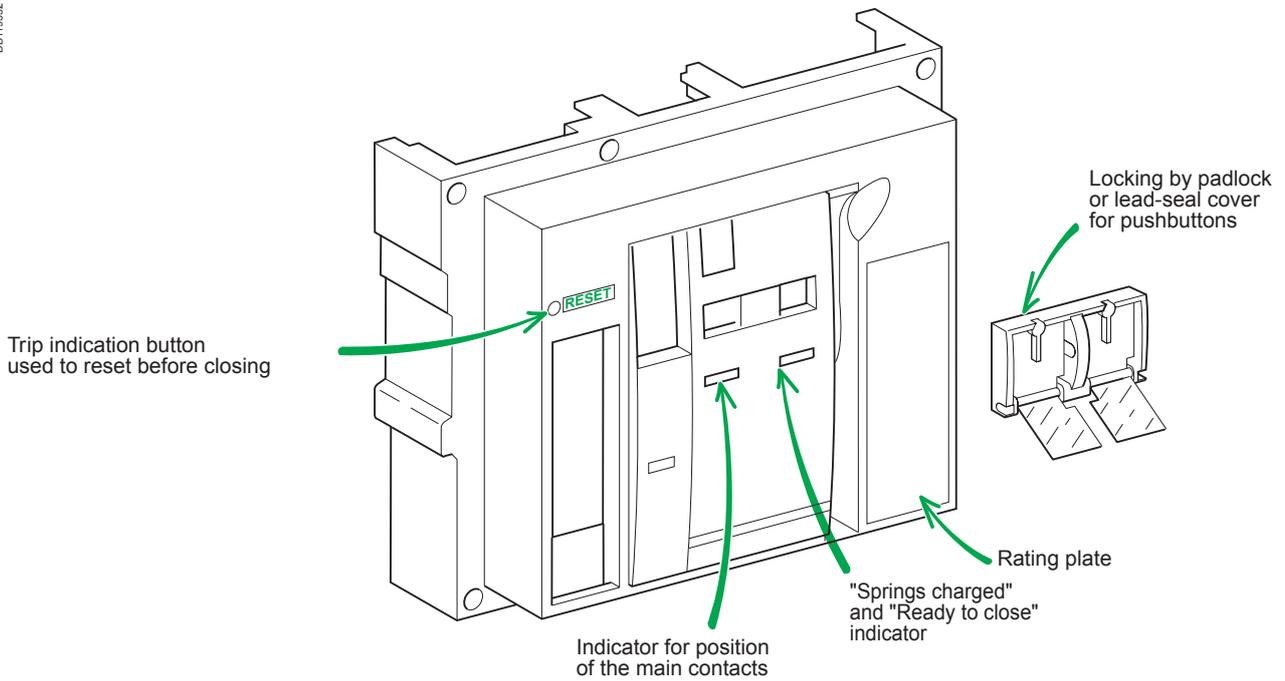
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Circuit breaker / switch-disconnector

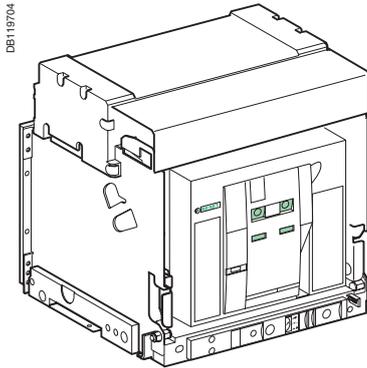


Front

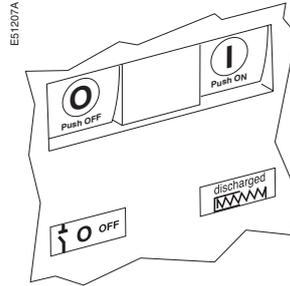
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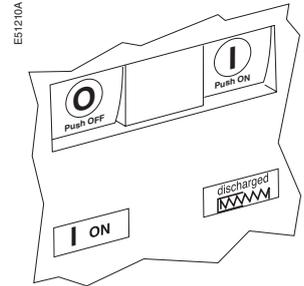
Understanding the controls and indications



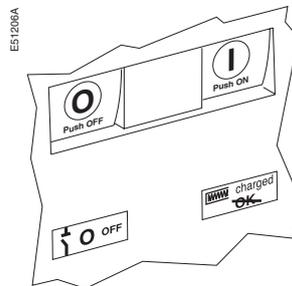
Circuit breaker open and discharged



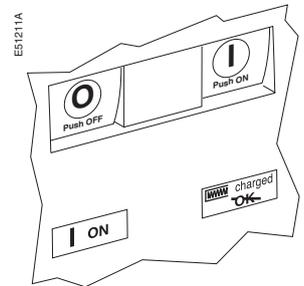
Circuit breaker closed and discharged



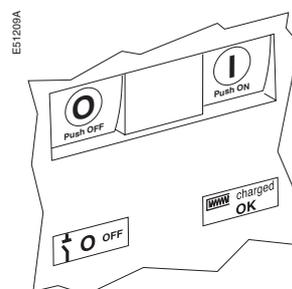
Circuit breaker open, charged and not "ready to close"



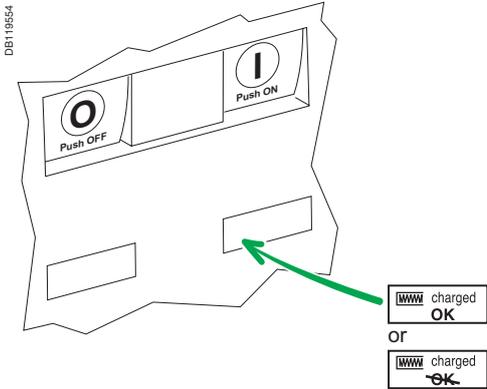
Circuit breaker closed, charged and not "ready to close"



Circuit breaker open, charged and "ready to close"

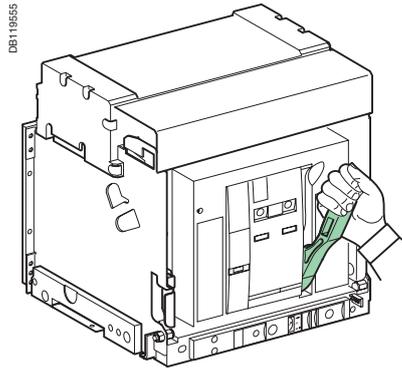


The charge status is indicated as follows.

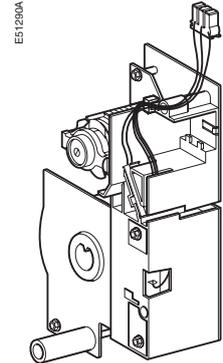


The springs in the circuit breaker operating mechanism must be charged to store the energy required to close the main contacts. The springs may be charged manually using the charging handle or the optional MCH gear motor.

Manual charging:
Pull the handle down seven times until you hear a "click".



Automatic charging:
If the MCH gear motor is installed, the spring is automatically recharged after each closing.



Device "ready to close"



Device not "ready to close"



Closing conditions

Closing (i.e. turning the circuit ON) is possible only if the circuit breaker is "ready to close".

The prerequisites are the following:

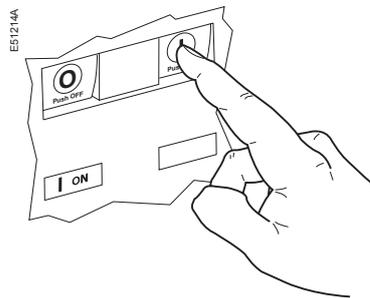
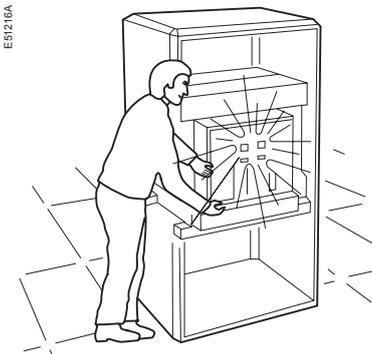
- device open (OFF)
- springs charged
- no opening order present.

If the circuit breaker is not "ready to close" when the order is given, stop the order and start again when the circuit breaker is "ready to close".

Closing the circuit breaker

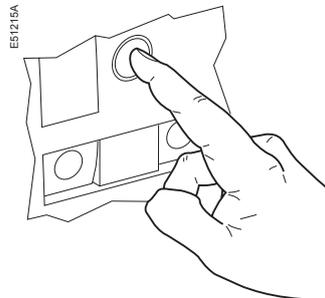
Locally (mechanical)

Press the mechanical ON pushbutton.

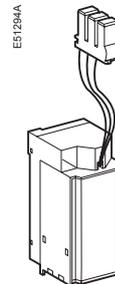


Locally (electrical)

BPFE



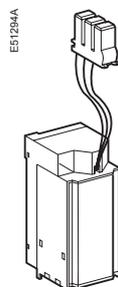
XF



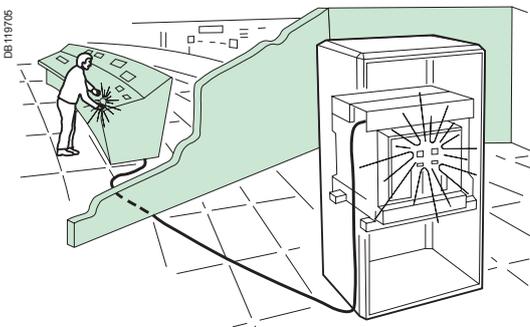
Press the electrical closing pushbutton. By adding an XF closing release, the circuit breaker can be closed remotely.

Remotely

XF



When connected to a remote control panel, the XF closing release (0.85 to 1.1 Un) can be used to close the circuit breaker remotely.

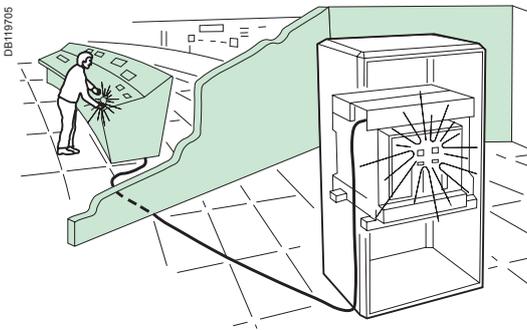
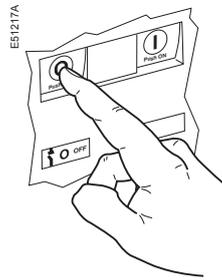
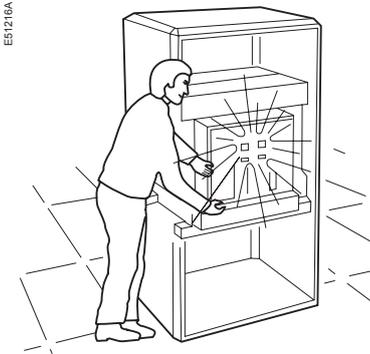


Enabling or disabling the anti-pumping function

The purpose of the mechanical anti-pumping function is to ensure that a circuit breaker receiving simultaneous opening and closing orders does not open and close indefinitely.

If there is a continuous closing order, after opening the circuit breaker remains open until the closing order is discontinued. A new closing order then closes the circuit breaker. This function can be disabled by wiring the closing release in series with the PF "ready to close" contact.

Locally
Press the OFF pushbutton.



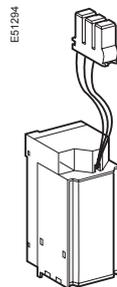
Remotely

Use one of the following solutions:

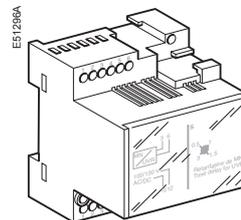
- one or two MX opening releases (MX1 and MX2, 0.7 to 1.1 Un)
- one MN undervoltage release (0.35 to 0.7 Un)
- one MN undervoltage release (0.35 to 0.7 Un) with a delay unit (R or Rr).

When connected to a remote control panel, these releases can be used to open the circuit breaker remotely.

MX1, MX2, MN



Delay unit

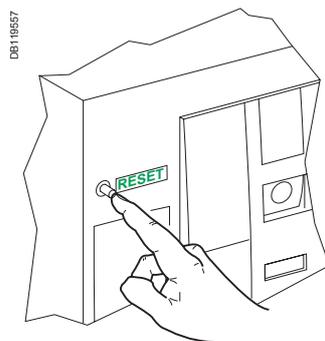
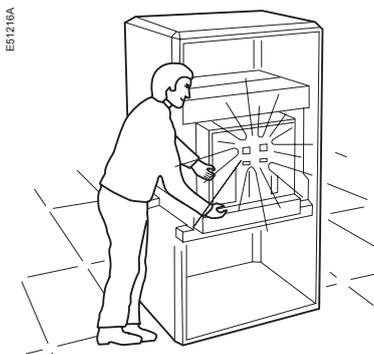


The circuit breaker signals a fault by:

- a mechanical indicator on the front panel
- one or two SDE "fault-trip" indication contacts (SDE/2 is optional).

Locally

If the circuit breaker is not equipped with the automatic reset option, reset it manually.

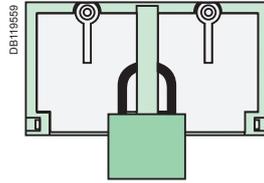


Locking the controls

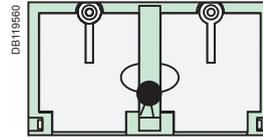
Disabling circuit-breaker
local closing and opening

Pushbutton locking using a padlock (shackle diameter 5 to 8 mm), a lead seal or screws.

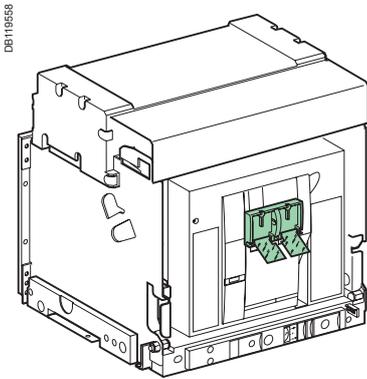
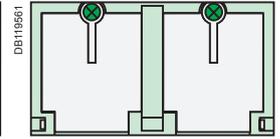
Padlock



Lead seal

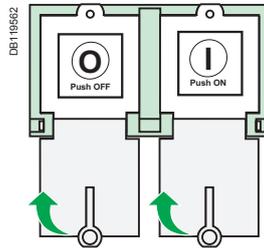


Screws

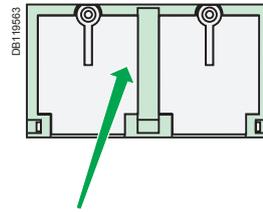


Locking

Close the covers.

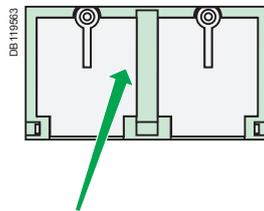


Insert the padlock shackle, lead seal or screws.

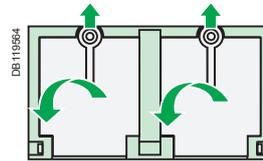


Unlocking

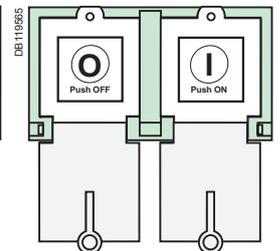
Remove the padlock, lead seal or screws.



Lift the covers and swing them down.



The pushbuttons are no longer locked.



Locking the controls

Disabling local and remote closing

Combination of locking systems

To disable circuit-breaker closing using the pushbuttons or remotely, use as needed:

- a padlock
- one or two keylocks
- a combination of the two locking systems.

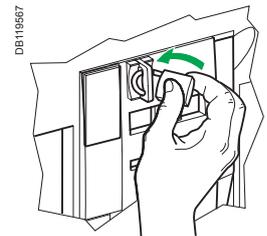
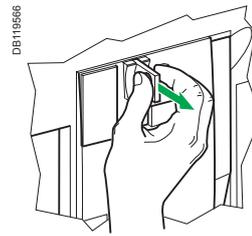
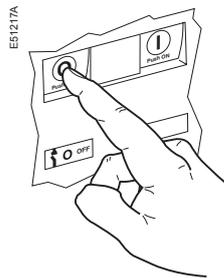
Install a padlock (maximum shackle diameter 5 to 8 mm)

Locking

Open the circuit breaker.

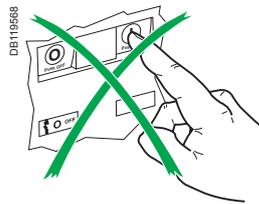
Pull out the tab.

Insert the padlock shackle.



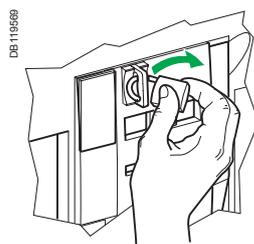
Check

The controls are inoperative.



Unlocking

Remove the padlock.



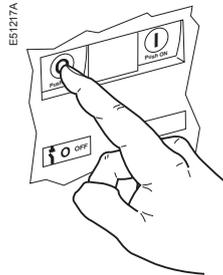
Locking the controls

Disabling local and remote closing

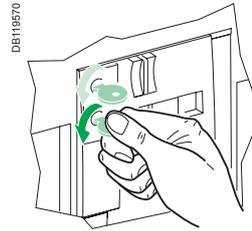
Locking the controls with one or two keylocks

Locking

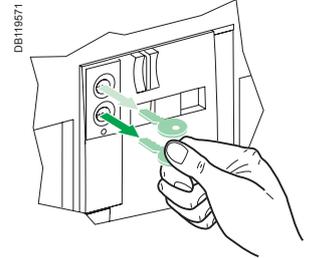
Open the circuit breaker.



Turn the key(s).

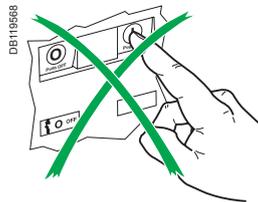


Remove the key(s).



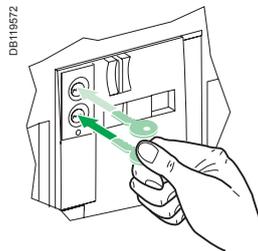
Check

The controls are inoperative.

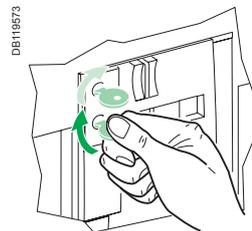


Unlocking

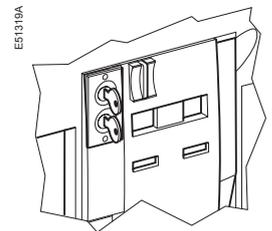
Insert the key(s).



Turn the key(s).

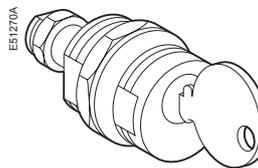


The key(s) cannot be removed.

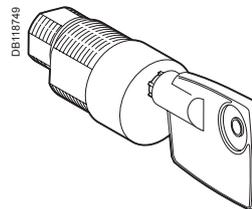


Four types of keylocks are available

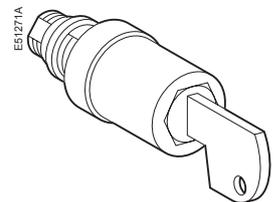
RONIS



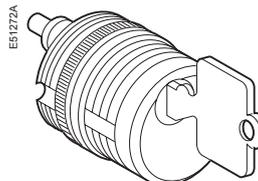
PROFALUX



CASTELL

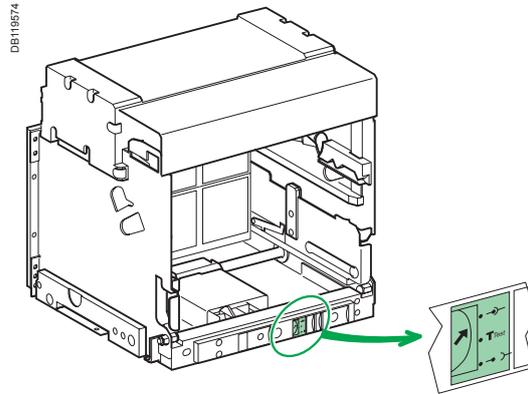


KIRK

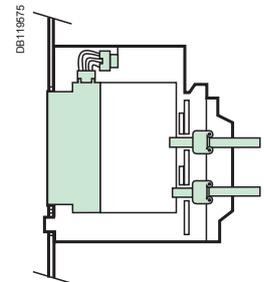
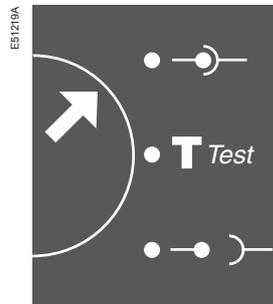


Identifying the circuit breaker positions

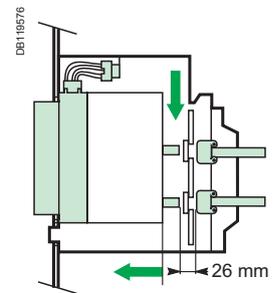
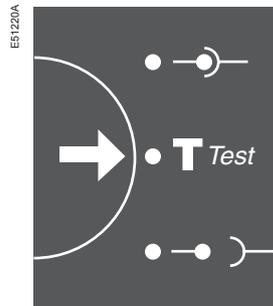
The indicator on the front signals the position of the circuit breaker in the chassis.



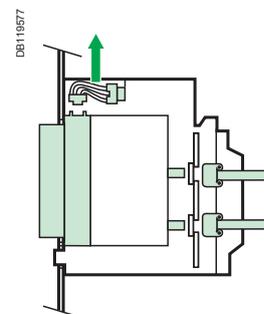
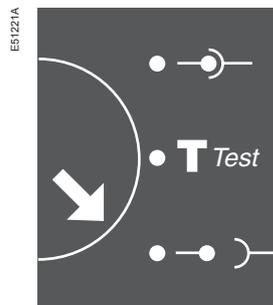
■ "connected" position



■ "test" position



■ "disconnected" position

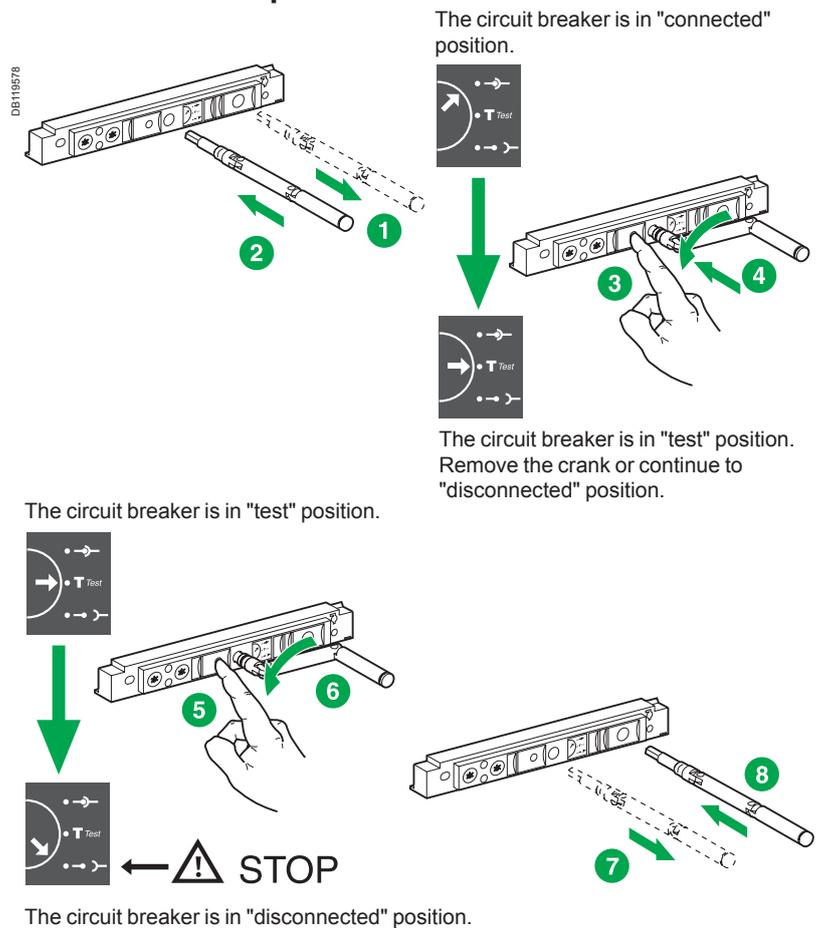


These operations require that all chassis-locking functions be disabled (see page 21).

Prerequisites

To connect and disconnect Masterpact, the crank must be used. The locking systems, padlocks and the racking interlock all inhibit use of the crank.

Withdrawing the circuit breaker from the "connected" to "test" position, then to "disconnected" position

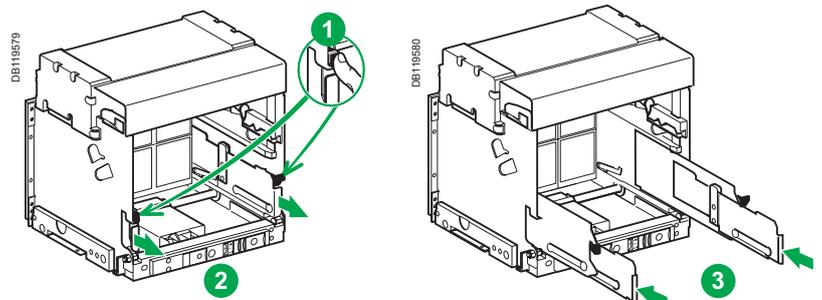


Caution. The right-hand rail cannot be removed if the crank has not been removed or if the circuit breaker is not fully disconnected.

Removing the rails

Press the release tabs and pull the rails out.

To put the rails back in, press the release tabs and push the rails in.



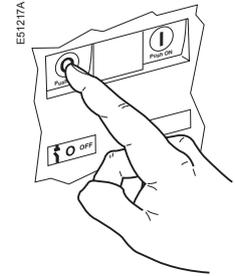
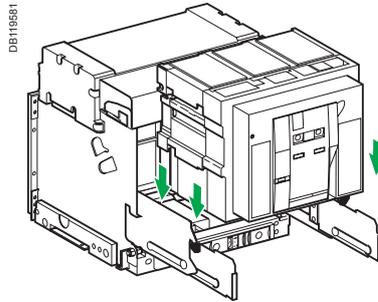
For complete information on Masterpact handling and mounting, see the installation manual(s).

Before mounting the circuit breaker, make sure it matches the chassis.

Inserting Masterpact

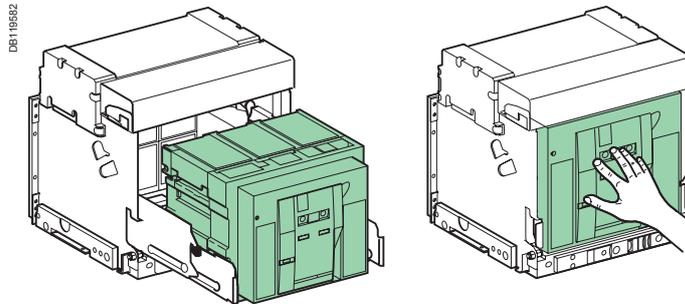
Position the circuit breaker on the rails. Check that it rests on all four supports.

Open the circuit breaker (in any case, it opens automatically during connection).

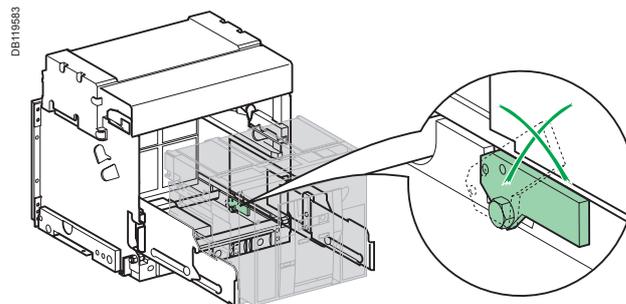


Push the circuit breaker into the chassis, taking care not to push on the control unit.

If you cannot insert the circuit breaker in the chassis, check that the mismatch protection on the chassis corresponds to that on the circuit breaker.



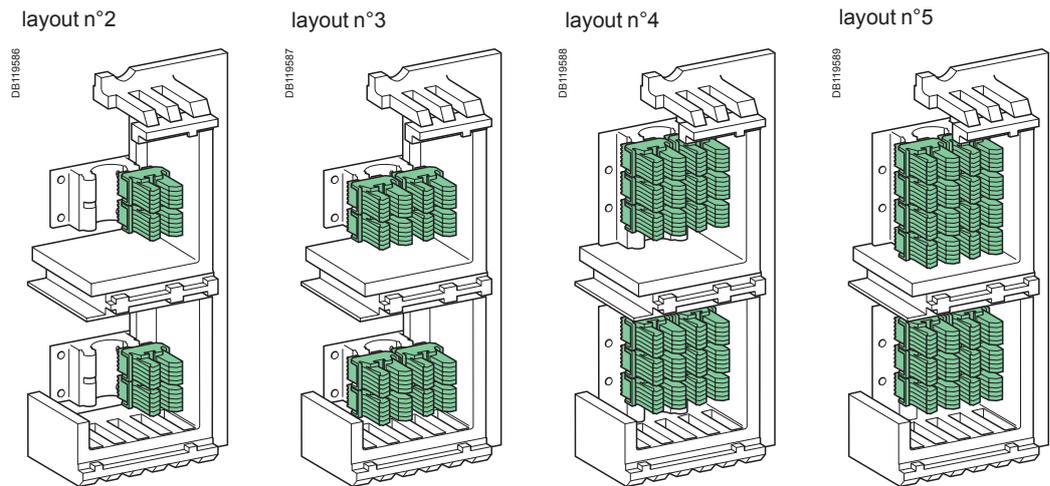
If you cannot insert the circuit breaker in the chassis, check that the chassis cams are not raised.



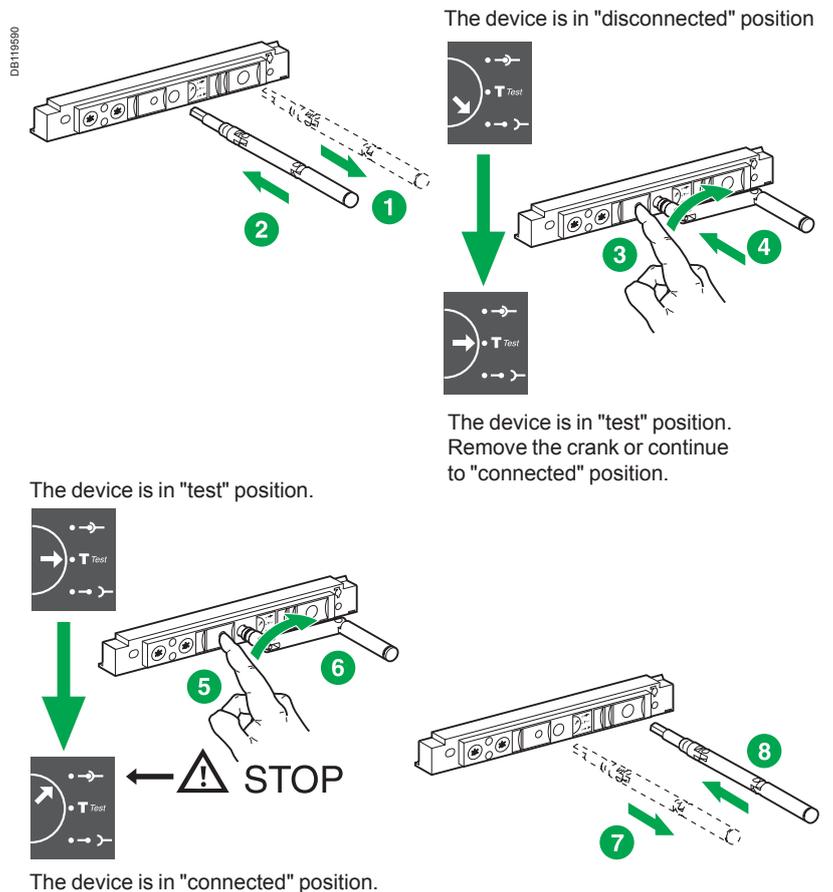
Matching a Masterpact circuit breaker with its chassis

Contact clusters dispariting

Rating Type	NW08	NW10 NW12	NW16	NW20	NW25	NW32	NW40
N1	layout n°2 4 clusters / pole						
H1				layout n°3 8 clusters / pole		layout n°4 12 clusters / pole	layout n°5 14 clusters / pole
H2							



Racking the circuit breaker from the "disconnected" to "test" position, then to "connected" position



Locking the circuit breaker in position

Padlocks and keylocks may be used together.

Combination of locking systems

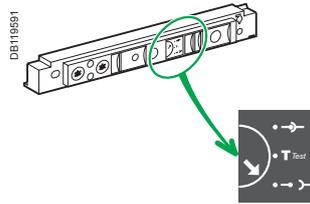
To disable local or remote opening or closing of the circuit breaker, use as needed:

- one to three padlocks
- one or two keylocks
- a combination of the two locking systems.

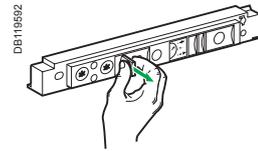
Disabling connection when the circuit breaker is in "disconnected" position, using one to three padlocks (maximum shackle diameter 5 to 8 mm)

Locking

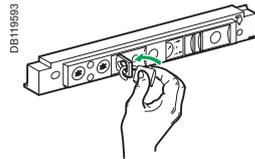
Circuit breaker in "disconnected" position.



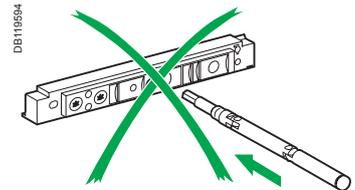
Pull out the tab.



Insert the shackle (max. diameter 5 to 8 mm) of the padlock(s).

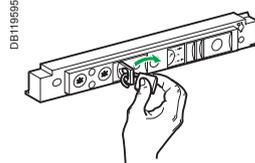


The crank cannot be inserted.

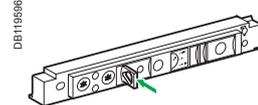


Unlocking.

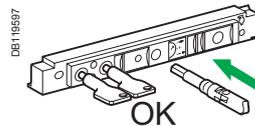
Remove the padlock(s).



Release the tab.



The crank can be inserted.



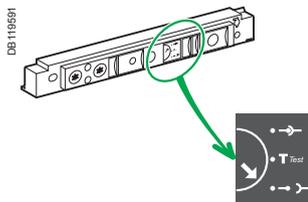
Locking the circuit breaker in position

Padlocks and keylocks may be used together.

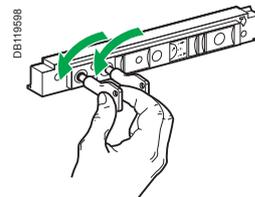
Disabling connection when the circuit breaker is in "disconnected" position, using one or two keylocks.

Locking

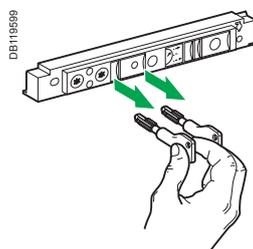
Circuit breaker in "disconnected" position.



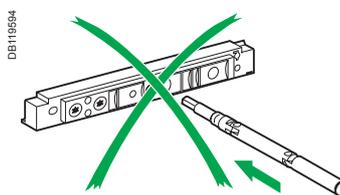
Turn the key(s).



Remove the key(s).

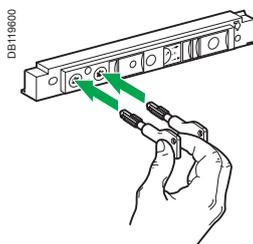


The crank cannot be inserted.

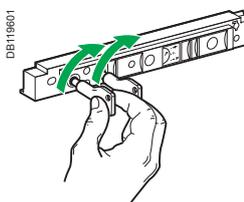


Unlocking

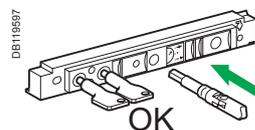
Insert the key(s).



Turn the key(s).

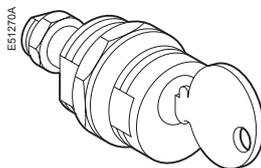


The crank can be inserted.

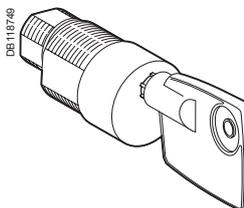


Four types of keylocks are available

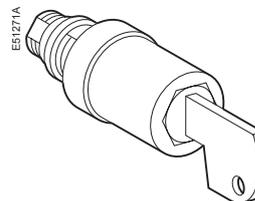
RONIS



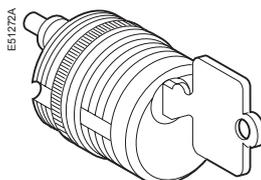
PROFALUX



CASTELL



KIRK



Locking the circuit breaker in position

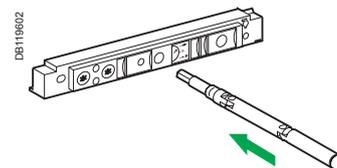
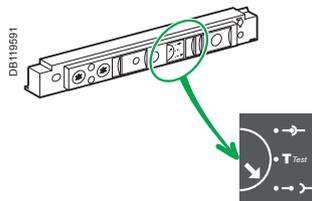
For this operation, the circuit breaker must be removed from the chassis.

Disabling use of the crank in all positions

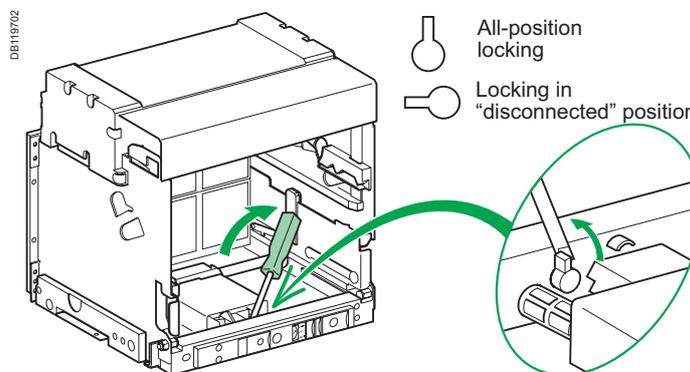
It is possible to modify the padlock and keylock locking function. Instead of locking only in "disconnected" position, it is possible to lock the circuit breaker in all positions.

Set the circuit breaker to "disconnected" position. Remove the circuit breaker from the chassis.

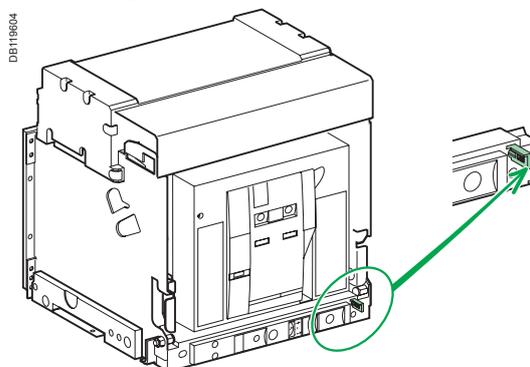
Insert the crank.



Turn the catch to the right. The circuit breaker can now be locked in all positions.

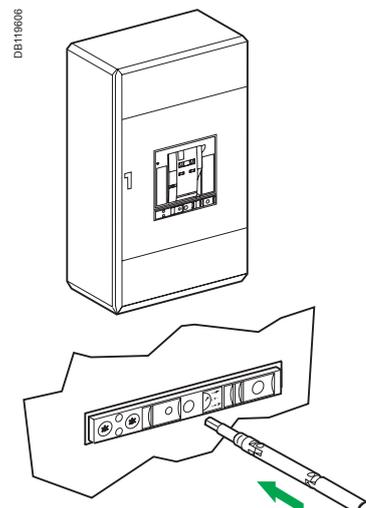
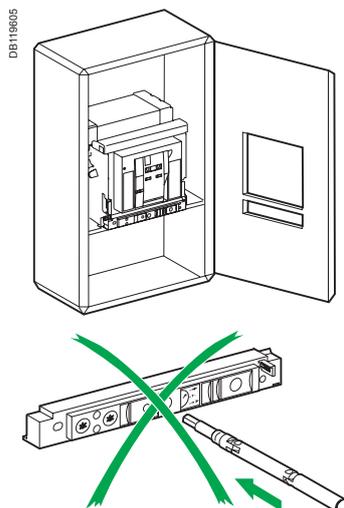


Locking the circuit breaker when the door is open



When the door is open, the crank cannot be inserted.

When the door is closed, the crank can be inserted.



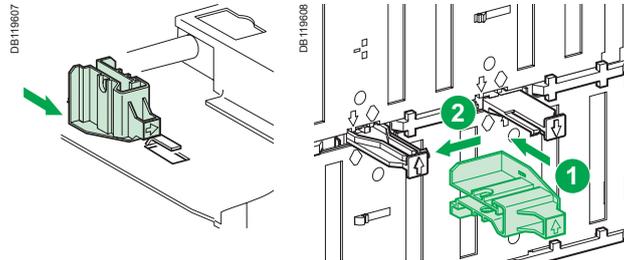
Locking the safety shutters

Padlocking inside the chassis

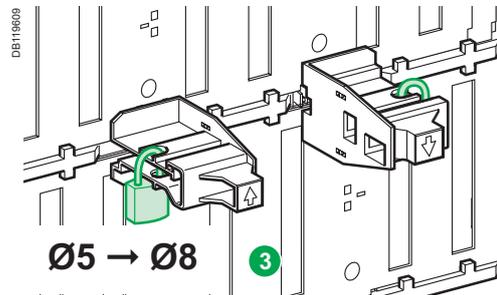
Using the shutter locking blocks

Remove the block(s) from their storage position.

Position the block(s) on the guide(s).



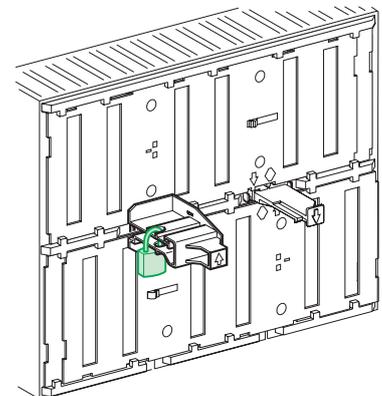
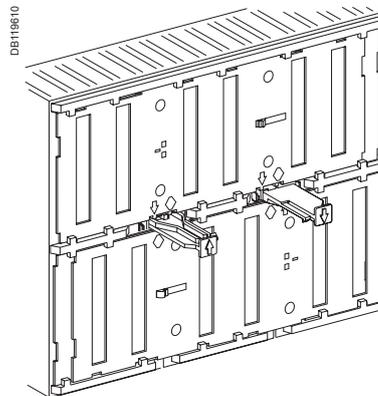
Lock the block(s) using a padlock.



Four locking possibilities

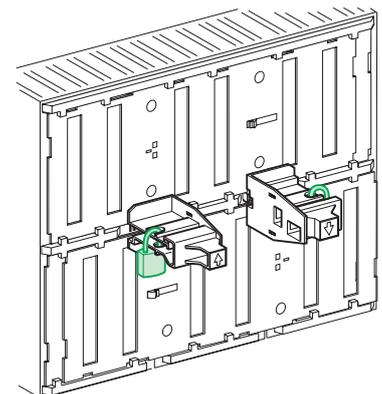
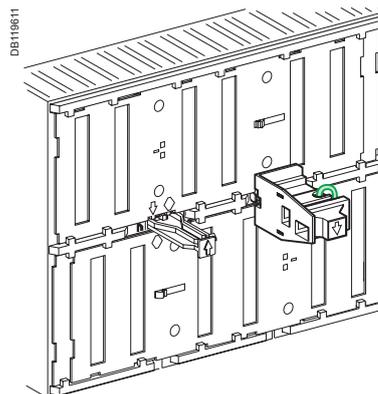
Top and bottom shutters not locked.

Top shutter locked,
Bottom shutter not locked.



Top shutter not locked,
Bottom shutter locked.

Top and bottom shutters
locked.

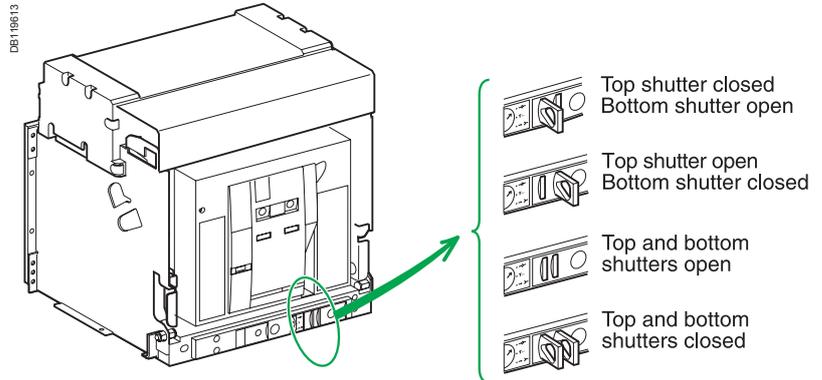


Locking the safety shutters

Padlocking or position indication on the front

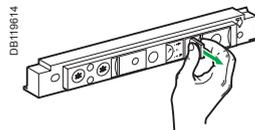
This system offers two functions:

- padlocking of the top or bottom shutters
- indication of the position of each shutter:
 - shutter open
 - shutter closed.

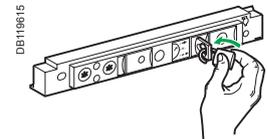


Locking

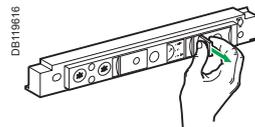
Pull out the left-hand tab to lock the top shutter.



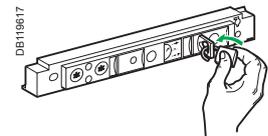
Insert a padlock (shackle 5 to 8 mm).



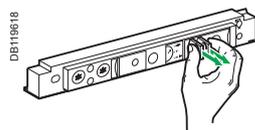
Pull out the right-hand tab to lock the bottom shutter.



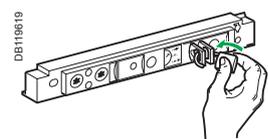
Insert a padlock (shackle 5 to 8 mm).



Pull out both tabs to lock both shutters.

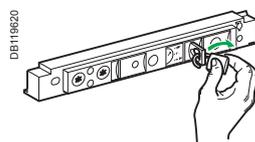


Insert a padlock (shackle 5 to 8 mm).

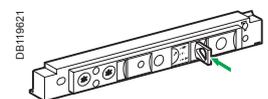


Unlocking

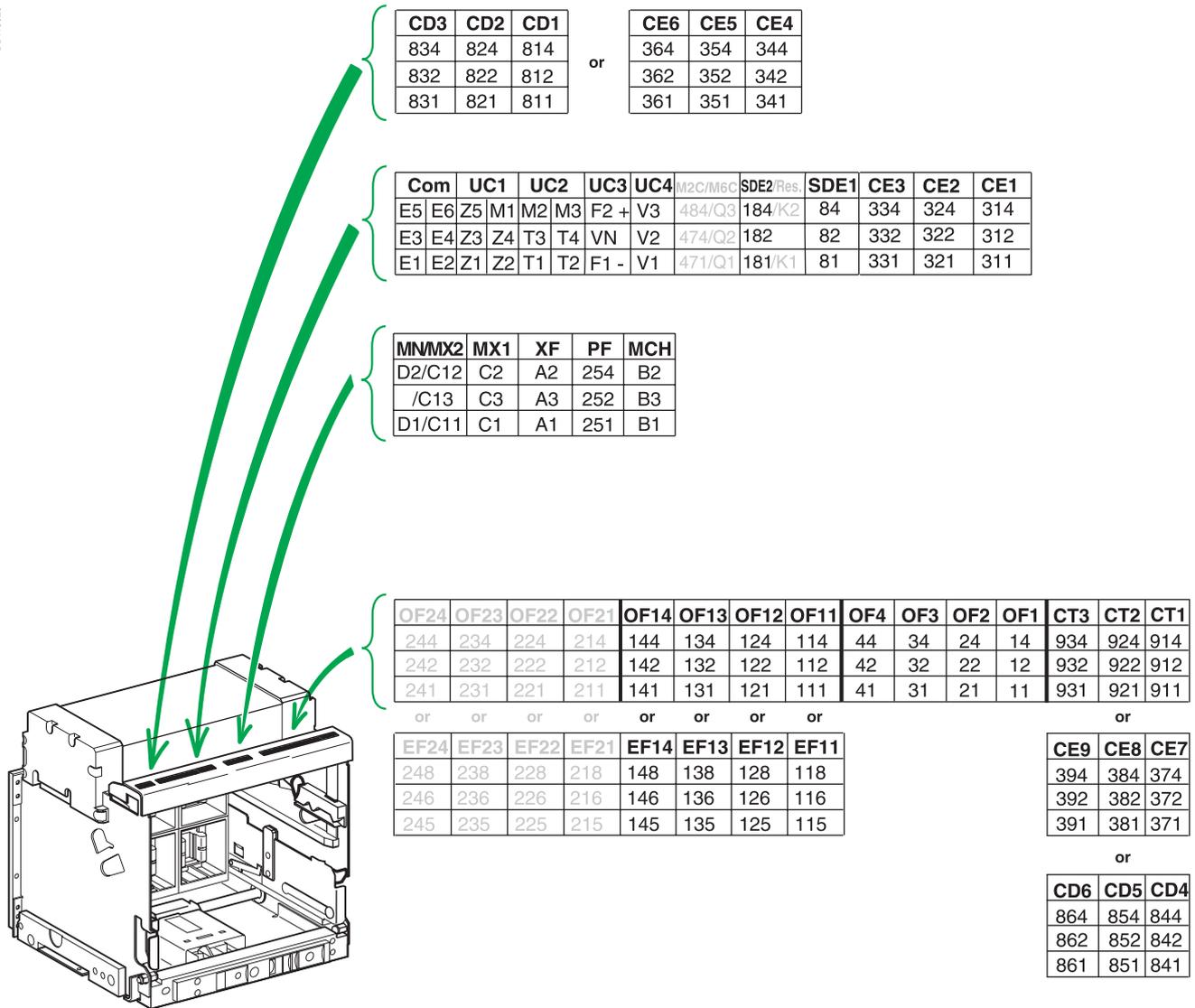
Remove the padlock.



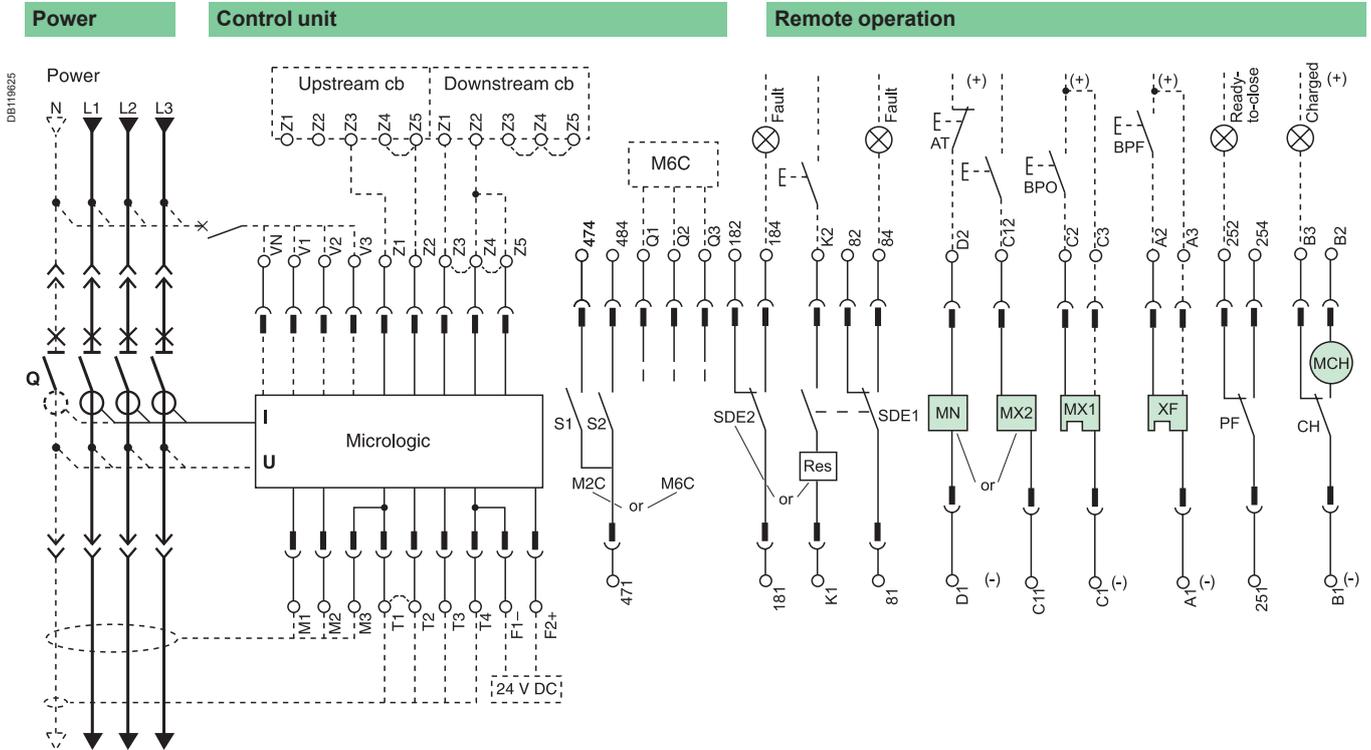
Release the tab(s).



DB119623



The diagram is shown with circuits de-energised, all devices open, connected and charged and relays in normal position.



Control unit					
Com	UC1	UC2	UC3	UC4	
○ E5	○ Z5	○ M1	○ M2	○ M3	○ F2+
○ E6	○ Z1	○ M2	○ M3	○ M3	○ V3
○ E3	○ Z3	○ Z4	○ T3	○ T4	○ VN
○ E4	○ Z4	○ Z4	○ T3	○ T4	○ V2
○ E1	○ Z1	○ Z2	○ T1	○ T2	○ F1-
○ E2	○ Z2	○ Z2	○ T1	○ T2	○ V1

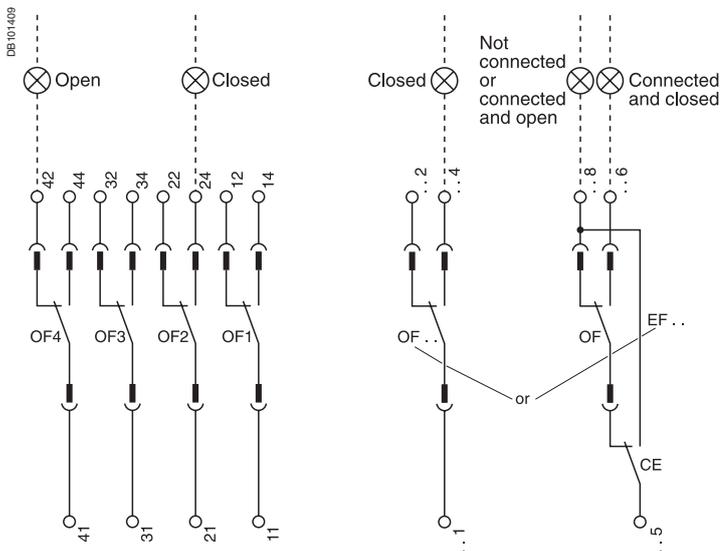
Remote operation						
SDE2	SDE1	MN / MX2	MX1	XF	PF	MCH
○ 184	○ 84	○ D2 / C12	○ C2	○ A2	○ 254	○ B2
○ 182	○ 82	○ D2 / C12	○ C3	○ A3	○ 252	○ B3
○ 181	○ 81	○ D1 / C11	○ C1	○ A1	○ 251	○ B1

A	P	H	Control unit	Remote operation
■	■	■	Com : E1-E6 communication	SDE2 : Fault-trip indication contact
■	■	■	UC1 : Z1-Z5 zone selective interlocking; Z1 = ZSI OUT SOURCE Z2 = ZSI OUT; Z3 = ZSI IN SOURCE Z4 = ZSI IN ST (short time) Z5 = ZSI IN GF (earth fault) M1 = Vigi module input (Micrologic 7)	SDE1 : Fault-trip indication contact (supplied as standard)
■	■	■	UC2 : T1, T2, T3, T4 = external neutral; M2, M3 = Vigi module input (Micrologic 7)	MN : Undervoltage release or MX2 : Shunt release
■	■	■	UC3 : F2+, F1- external 24 V DC power supply VN external voltage connector	MX1 : Shunt release (standard or communicating)
■	■	■	UC4 : V1, V2, V3 optional external voltage protector	XF : Closing release (standard or communicating)
				PF : "Ready to close" contact
				MCH : Gear motor.

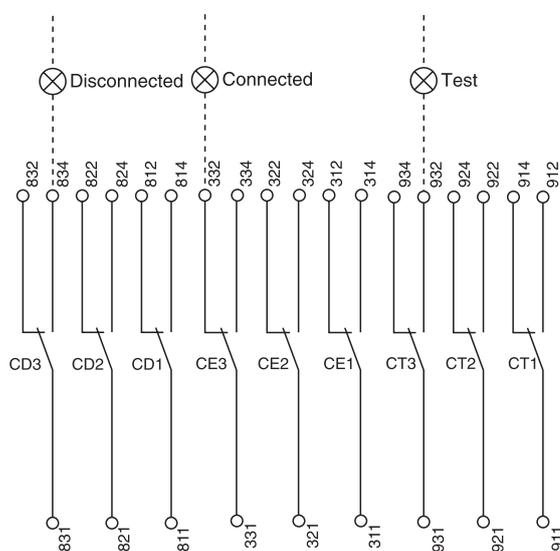
Note:
when communicating MX or XF releases are used, the third wire (C3, A3) must be connected even if the communications module is not installed.

A : Digital ammeter
P : A + power meter + programmable protection
H : P + harmonics

Indication contacts



Chassis contacts



Indication contacts

OF4	OF3	OF2	OF1
44	34	24	14
42	32	22	12
41	31	21	11

OF14	OF13	OF12	OF11
144	134	124	114
142	132	122	112
141	131	121	111

or or or or

EF14	EF13	EF12	EF11
148	138	128	118
146	136	126	116
145	135	125	115

Chassis contacts

CD3	CD2	CD1	CE3	CE2	CE1	CT3	CT2	CT1
834	824	814	334	324	314	934	924	914
832	822	812	332	322	312	932	922	912
831	821	811	331	321	311	931	921	911

CE6	CE5	CE4
364	354	344
362	352	342
361	351	341

CE9	CE8	CE7
394	384	374
392	382	372
391	381	371

Indication contacts

OF4: ON/OFF
OF3 indication
OF2 contacts
OF1

OF 14 or EF 14 ON/OFF indication contacts
Combined "connected/closed" indication contacts

OF 13 or EF 13

OF 12 or EF 12

OF 11 or EF 11

Chassis contacts

CD3: Disconnected -position contacts
CD2 -position contacts
CD1 contacts
CE3: Connected -position contacts
CE2 -position contacts
CE1 contacts
CT3: Test-position contacts
CT2 contacts
CT1 contacts

or

CE6: Connected position contacts
CE5 position contacts
CE4 contacts

or

CE9: Connected position contacts
CE8 position contacts
CE7 contacts

or

CD6: Disconnected -position contacts
CD5 -position contacts
CD4 contacts

Key:

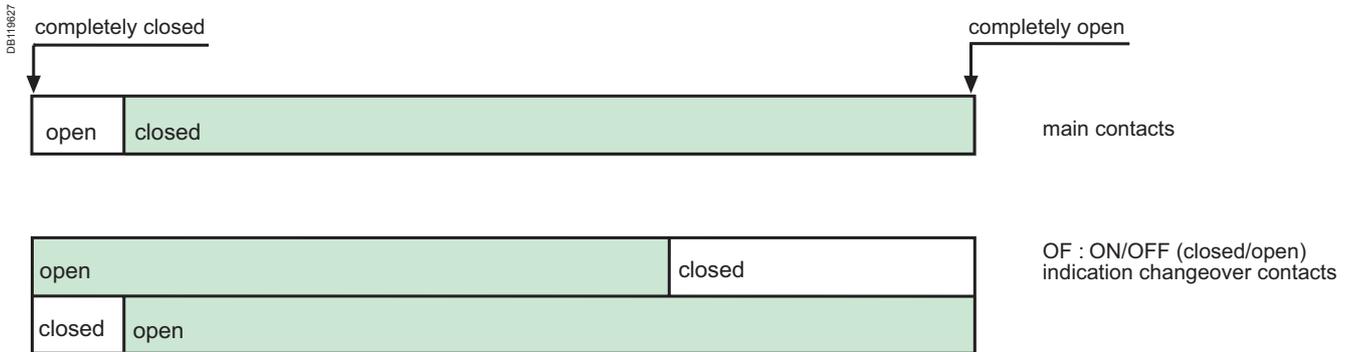
Drawout device only

SDE1, OF1, OF2, OF3, OF4 supplied as standard

Interconnected connections (only one wire per connection point)

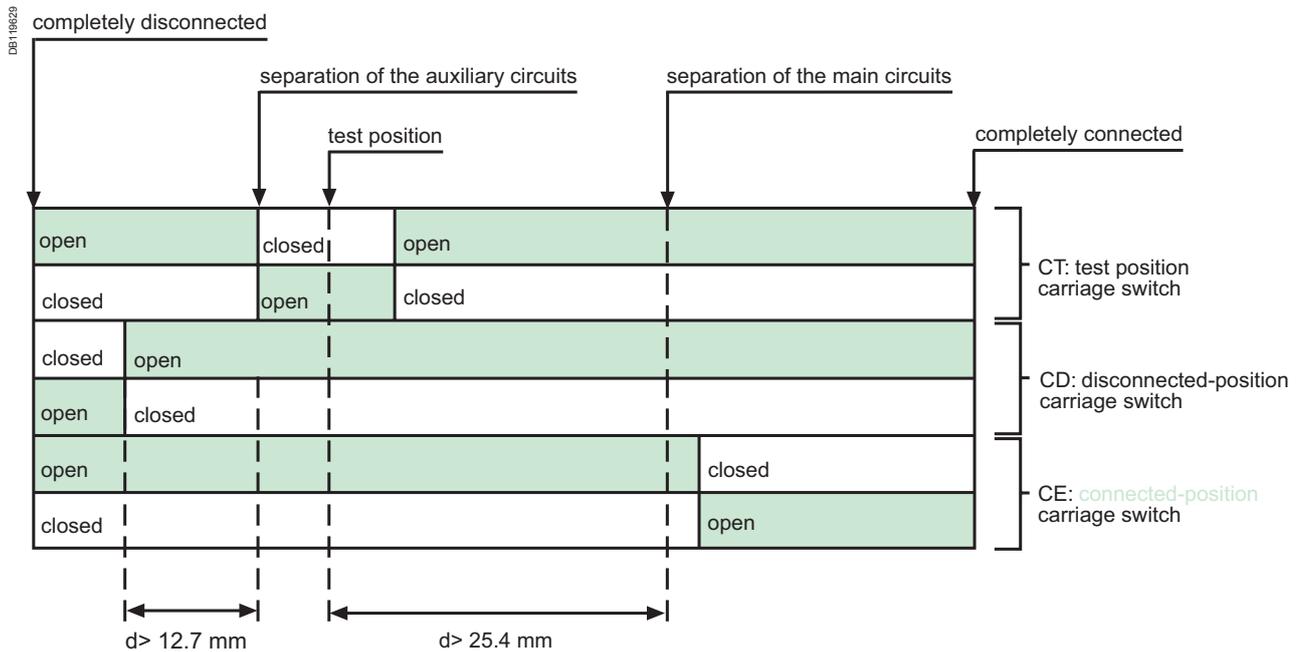
The ON/OFF indication contacts signal the status of the device main contacts.

Circuit breaker



The carriage switches indicate the "connected", "test" and "disconnected" positions.

Chassis



These operations must be carried out in particular before using a Masterpact device for the first time.

A general check of the circuit breaker takes only a few minutes and avoids any risk of mistakes due to errors or negligence.

A general check must be carried out:

- prior to initial use
- following an extended period during which the circuit breaker is not used.

A check must be carried out with the entire switchboard de-energised.

In switchboards with compartments, only those compartments that may be accessed by the operators must be de-energised.

Electrical tests

Insulation and dielectric-withstand tests must be carried out immediately after delivery of the switchboard. These tests are precisely defined by international standards and must be directed and carried out by a qualified expert.

Prior to running the tests, it is absolutely necessary to:

- disconnect all the electrical auxiliaries of the circuit breaker (MCH, MX, XF, MN, Res electrical remote reset)
- remove the long-time rating plug on the 5.0 P, 5.0 H control units. Removal of the rating plug disconnects the voltage measurement input.

Switchboard inspection

Check that the circuit breakers are installed in a clean environment, free of any installation scrap or items (tools, electrical wires, broken parts or shreds, metal objects, etc.).

Conformity with the installation diagram

Check that the devices conform with the installation diagram:

- breaking capacities indicated on the rating plates
- identification of the control unit (type, rating)
- presence of any optional functions (remote ON/OFF with motor mechanism, auxiliaries, measurement and indication modules, etc.)
- protection settings (long time, short time, instantaneous, earth fault)
- identification of the protected circuit marked on the front of each circuit breaker.

Condition of connections and auxiliaries

Check device mounting in the switchboard and the tightness of power connections.

Check that all auxiliaries and accessories are correctly installed:

- electrical auxiliaries
- terminal blocks
- connections of auxiliary circuits.

Operation

Check the mechanical operation of the circuit breakers:

- opening of contacts
- closing of contacts.

Check on the control unit

Check the control unit of each circuit breaker using the respective user manuals.

What to do when the circuit breaker trips?

Note the fault

Faults are signalled locally and remotely by the indicators and auxiliary contacts installed on circuit breakers (depending on each configuration).

Identify the cause of tripping

A circuit must never be reclosed (locally or remotely) before the cause of the fault has been identified and cleared.

A fault may have a number of causes:

- depending on the type of control unit, fault diagnostics are available. See the user manual for the control unit.
- depending on the type of fault and the criticality of the loads, a number of precautionary measures must be taken, in particular the insulation and dielectric tests on a part of or the entire installation. These checks and test must be directed and carried out by qualified personnel.

Inspect the circuit breaker following a short-circuit

- Check the arc chutes.
- Check the contacts.
- Check the tightness of connections (see the device installation manual).
- Check the disconnecting-contact clusters.

Reset the circuit breaker

The circuit breaker can be reset locally or remotely.

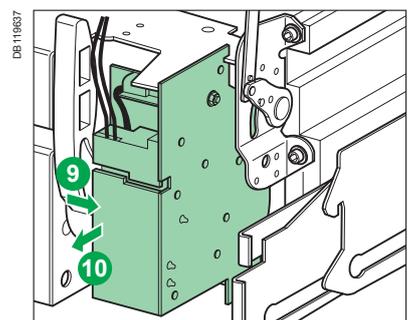
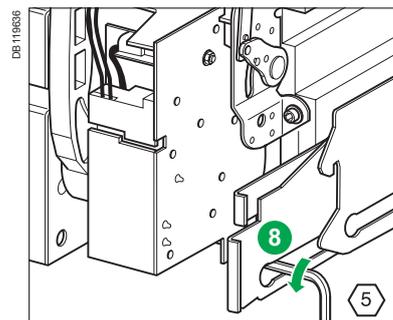
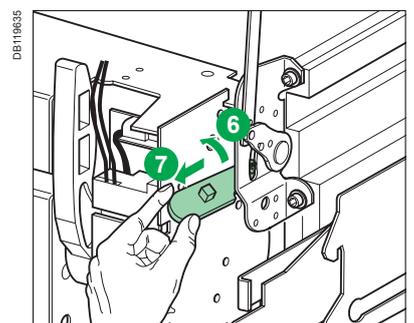
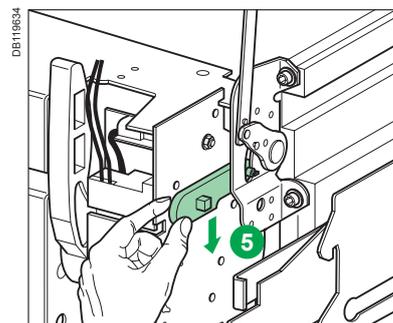
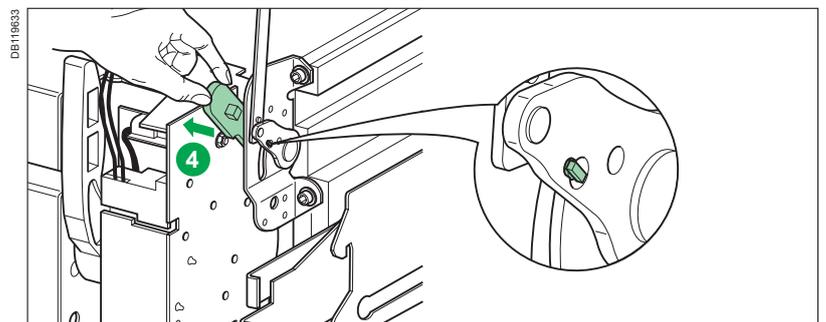
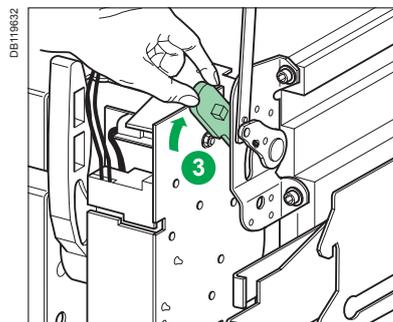
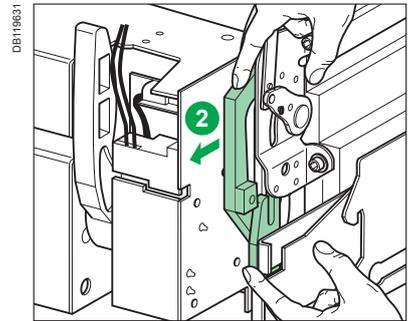
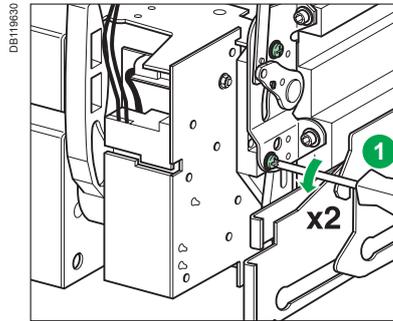
Maintenance for normal operating conditions, i.e. normal ambient temperature (-5 °C to +55 °C) and normal atmosphere.

Type of circuit breaker	Max. number of cycles	Parts requiring replacement, depending on the number of cycles at rated load			
		Arc chutes	Main contacts	MCH rod springs	MX/XF/MN releases
NW08 to NW16 types N1/H1/H2	25000	10000	10000	12500	12500
NW20 to NW25 types H1/H2	20000	440 V: 8000 690 V: 6000	440 V: 8000 690 V: 6000	10000	12500
NW32 to NW40 types H1/H2	20000	440 V: 5000 690 V: 2500	440 V: 5000 690 V: 2500	10000	12500

Precautions to take:
discharge the stored energy mechanism and open the
breaker

Shock-proofing

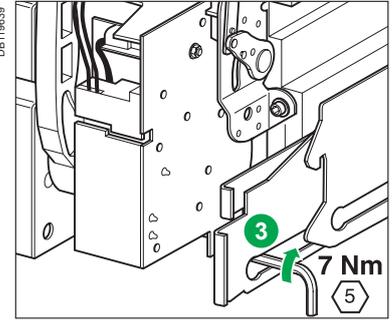
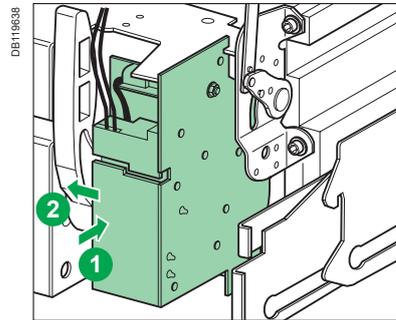
■ Remove the shock-proofing system before removing the MCH.



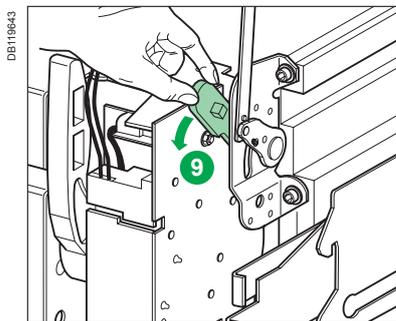
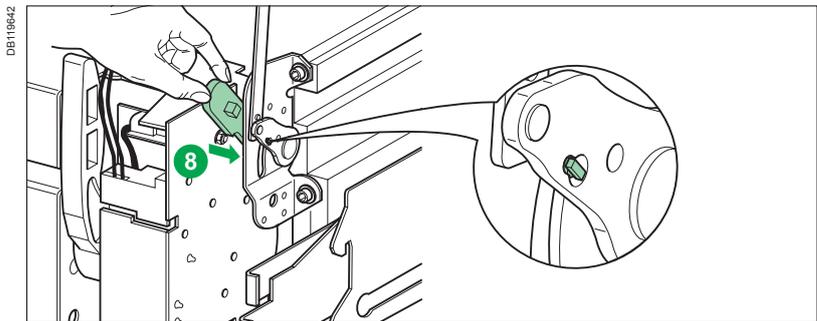
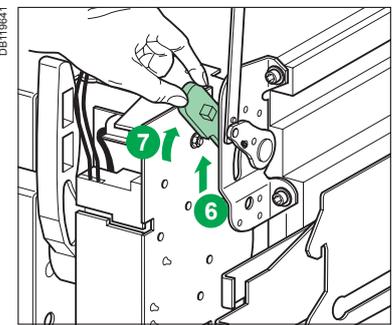
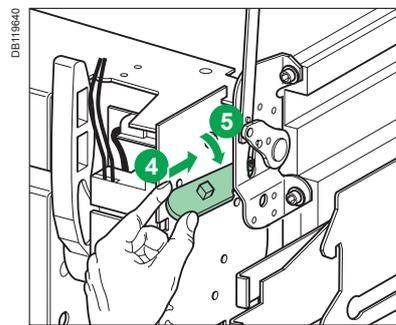
■ See MCH manual

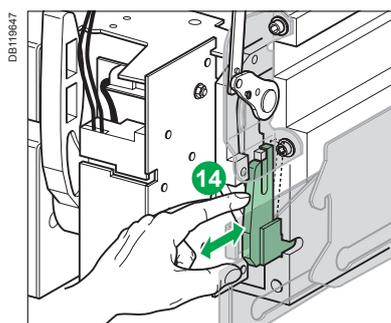
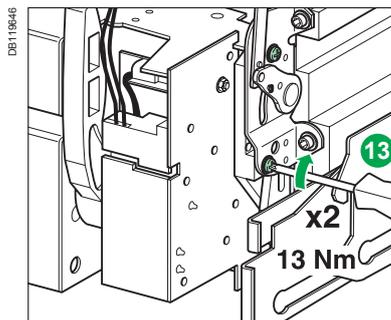
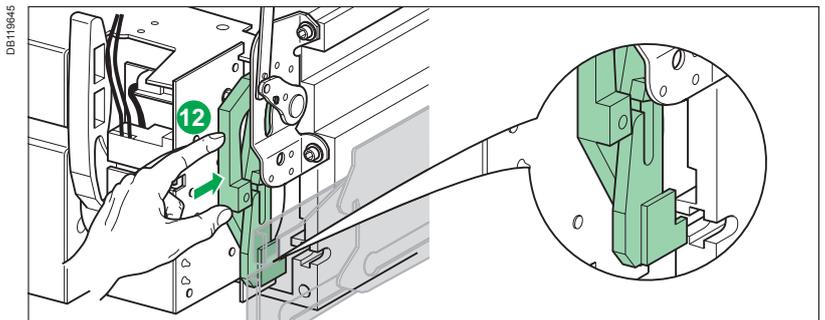
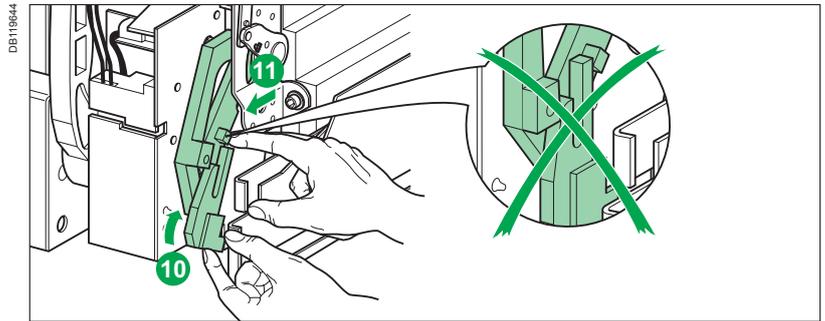
NAVY specific part refit

■ Refit the MCH (see MCH manual)



■ Refit the shock-proofing system

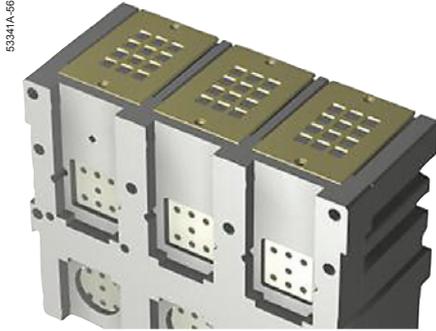




- Check that the shock-proofing system works correctly

Masterpact NW NAVY

What must be maintained and why?



53341A-65

The case

The case is an essential element in the circuit breaker. First of all, it ensures a number of safety functions:

- functional insulation between the phases themselves and between the phases and the exposed conductive parts in order to resist transient overvoltages caused by the distribution system
- a barrier avoiding direct user contact with live parts
- protection against the effects of electrical arcs and overpressures caused by short-circuits.

Secondly, it serves to support the entire pole operating mechanism as well as the mechanical and electrical accessories of the circuit breaker.

On the case, there should be:

- no traces of grime (grease), excessive dust or condensation which all reduce insulation
- no signs of burns or cracks which would reduce the mechanical solidity of the case and thus its capacity to withstand short-circuits.

Preventive maintenance for cases consists of a visual inspection of its condition and cleaning with a dry cloth or a vacuum cleaner.

All cleaning products with solvents are strictly forbidden. It is advised to measure the insulation every five years and following trips due to a short-circuit.

The case must be replaced if there are signs of burns or cracks.



PIC00002A-40

Arc chutes

During a short-circuit, the arc chute serves to extinguish the arc and to absorb the high level of energy along the entire path of the short-circuit. It also contributes to arc extinction under rated current conditions. An arc chute that is not in good condition may not be capable of fully clearing the short-circuit and ultimately result in the destruction of the circuit breaker. The arc chutes must be regularly checked. The fins of the arc chutes may be blackened (due to the gases produced at I_n) but must not be significantly damaged. What is more, the filters must not be blocked to avoid internal overpressures. It is advised to use a vacuum cleaner rather than a cloth to remove dust from the outside of the arc chutes.



DB1104447A

Main contacts

The contacts make and break the current under normal conditions (rated current for the installation) and under exceptional conditions (overloads and short-circuits). The contacts are eroded by the many opening and closing cycles and can be particularly deteriorated by short-circuit currents.

Worn contacts may result in abnormal temperature rise and accelerate device ageing.

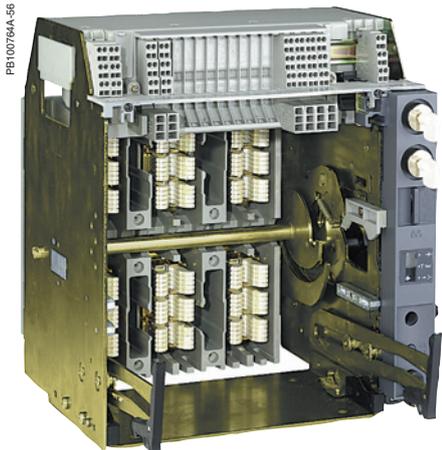
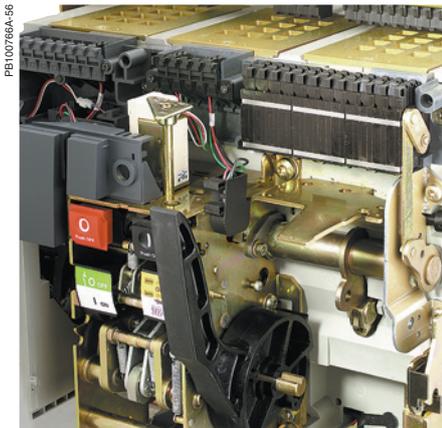
It is imperative to remove the arc chutes and visually check contact wear at least once a year and following each short-circuit.

The contact-wear indicators constitute an absolute minimum value that must not be overrun.

To plan and reduce the number of shutdowns, an electronic wear counter is available with the Micrologic P and H. A visual check is required when the counter reaches 100. When the counter reaches 300, the contacts must be replaced.

Masterpact NW NAVY

What must be maintained and why?



Device and chassis mechanisms

Mechanical operation of the circuit breaker may be hindered by dust, knocks, aggressive atmospheres, no greasing or excessive greasing. Operating safety is ensured by dusting and general cleaning, proper greasing and regular opening and closing of the circuit breaker.

■ Dusting

Dusting is best carried out using a vacuum cleaner.

■ Cleaning

Cleaning should be carried out using a cloth or brush that is perfectly clean and dry, without using any solvents, avoiding greased parts except for grease on electrical contacts.

Application of products under pressure or containing solvents (trichloroethane, trichloroethylene) is strictly forbidden (e.g. WD40).

The main problems of products under pressure are the following:

- it may be impossible to regrease inaccessible lubrication points (greased for the life of the product)
- corrosion of points that are not regreased
- damage caused by the pressure of the product
- risk of temperature rise due to the presence of an insulating solvent in the contact zones
- elimination of special protection
- deterioration of plastic materials.

■ Greasing

This operation is carried out after cleaning on certain mechanical parts as described in the maintenance procedures, using the various greases recommended by Schneider Electric. Grease must not be over applied because the excess, if mixed with dust, may result in mechanism malfunctions.

Generally speaking, under normal operating conditions, the pole-operating mechanism does not require any greasing (greased for the life of the product).

- the clusters and disconnecting-contacts must be greased according to the defined intervals using the greases indicated by Schneider Electric.
- the main contacts must not be greased.

■ Operating cycles

The imperative need to ensure continuity of service in an installation generally means that power circuit breakers are rarely operated. If, on the one hand, an excessive number of operating cycles accelerates device ageing, it is also true that a lack of operation over a long period can result in mechanical malfunctions. Regular operation is required to maintain the normal performance level of each part involved in the opening and closing cycles.

In installations where power circuit breakers are used in source changeover systems, it is advised to periodically operate the circuit breaker for the alternate source.

Masterpact NW NAVY

What must be maintained and why?

056421NA-29



Auxiliary circuits

■ Control auxiliaries

MX and XF shunt releases are respectively used to remotely open and close the circuit breaker using an electrical order or by a supervisor via a communication network.

The MN undervoltage release is used to break the power circuit if the distribution-system voltage drops or fails in order to protect life (emergency off) or property. Communicating MX and XF releases and MN releases are continuously supplied and the internal electronic components may suffer accelerated ageing if there is temperature rise in the circuit breaker.

Preventive maintenance consists in periodically checking operation at minimum values. Depending on the operating and environment conditions, it is advised to estimate their service life using the "service life" software ⁽¹⁾ and to replace them if necessary to avoid any risk of non-operation when they are needed.

056455NA-37



■ Auxiliary wiring

Auxiliary wiring is used to transmit orders to the various control devices and to transmit status-condition information. Incorrect connections or damaged insulation may result in either non-operation of the circuit breaker or nuisance tripping.

Auxiliary wiring must be regularly checked and replaced as needed, particularly if there are vibrations, high ambient temperatures or corrosive atmospheres.

056419NA-30



■ Indication contacts

The contacts indicating the status of the circuit-breaker (ON / OFF), of the chassis (CE, CD, CT), a trip due to an electrical fault (SDE) or that the circuit breaker is ready to close (PF) provide the operator with the status information required to react correspondingly. Any incorrect indications may result in erroneous device operation that could endanger life and property. Contact failure (wear, loose connections) may result from vibrations, corrosion or abnormal temperature rise and preventive maintenance must ensure that contacts correctly conduct or isolate according to their positions.

056420NA-29



■ Gear motor

The gear motor (MCH) automatically recharges the operating-mechanism springs as soon as the circuit breaker is closed. The gear motor makes it possible to instantaneously reclose the device following an opening. This function may be indispensable for safety reasons. The charging lever serves simply as a backup means if the auxiliary voltage fails.

Given the mechanical forces exerted to charge the mechanism, the gear motor wears quickly. Periodic checks on gear-motor operation and the charging time are required to ensure the device closing function.

⁽¹⁾ For more information, contact your Schneider Electric after-sales support department.

Masterpact NW NAVY

What must be maintained and why?

056490A-68



Electronic trip unit

If an electric fault occurs in the installation, the electronic trip unit detects the fault and orders the circuit breaker to open and thus protect life and property. Electronic components and circuit boards are sensitive to the environment (ambient temperature, humid and corrosive atmospheres) and to severe operating conditions (magnetic fields, vibrations, etc.). To ensure correct operation, it is necessary to periodically check:

- the chain of action resulting in a trip
- the response time as a function of the level of the fault current.
- depending on the operating and environment conditions, it is advised to estimate their service life using the "service life" software ⁽¹⁾ and to replace them if necessary to avoid any risk of non-operation when they are needed.

PB 100802A-24



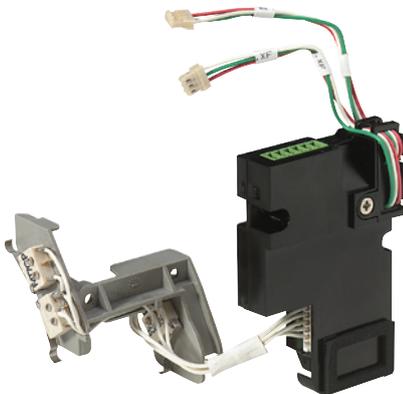
Communication module and accessories

Via the communication bus, the communication option transmits data to a remote site for use by various departments (maintenance, management, production, etc.). A break in the transmission of data can result in:

- production losses due to unawareness concerning the status of a circuit breaker
- financial losses due to incorrect system management
- diagnostic errors
- etc.

Periodic checks on the orders (read, write, commands) transmitted by the communication bus are required to maintain a high degree of reliability and confidence in the communication system.

056461NA-56



⁽¹⁾ For more information, contact your Schneider Electric after-sales support department.

Masterpact NW NAVY

What must be maintained and why?

Connections

The connections between the various distribution systems in a switchboard (busbars, cables) and the switchgear are a major source of heat loss. Incorrect tightening may lead to thermal runaway which in turn can provoke damage to the device, the cable insulation and even result in a short-circuit and/or a fire. This type of malfunction is often due to disregard for installation requirements during switchboard assembly.

Note: connections must never use different materials (copper / aluminium).

■ Sliding connections (chassis)

They are made up of two parts, the clusters and disconnecting contacts. This type of connection is critical and requires periodic cleaning in compliance with the described procedures. The grease facilitates the connection between the clusters and the disconnecting contacts and avoids damaging the silver-coated surface by reducing the racking-in friction.

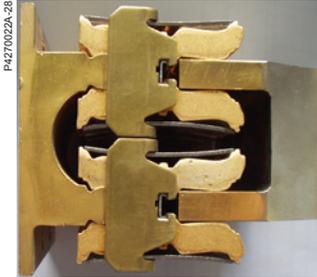
In sulphurous (corrosive) atmospheres (H₂S / SO₂), it is necessary to implement the cleaning procedure using the Thiourea solution, with mandatory regreasing using the specified fluorinated grease. This type of grease protects the silver and copper-coated contacts against sulphuration. Because silver or copper sulphide being insulating it provokes an increase in the contact resistance and thus greater temperature rise.

The grease breaks down over time and it is therefore necessary to replace it regularly.

■ fixed connections

Connections using lugs or bars.

When made in compliance with Schneider Electric recommendations (tightening torque, 8.8 hardware and contact washer), this type of connection does not require any particular maintenance. Otherwise, regularly check the temperature-rise points (change in colour of copper or tinning), dismantle the connections, clean and scrape the contact surfaces, then reassemble the connections using new hardware. Check the terminals.



Recommended preventive maintenance and time intervals

The maintenance guide that must be carried out every one, two or five years on Masterpact NW NAVY subassemblies and the level of competence required on the part of service agents are described in the tables after.

At the end of each five year period, the maintenance guide must be systematically repeated.

These maintenance operations apply for normal operating and environment conditions as defined below.

Normal operating and environment conditions

Temperature	Average annual temperature < 30 °C outside the switchboard (Ta)
Percent load	≤ 80 % of In at 70 % of the time
Harmonics	Harmonic current per phase < 10 % of In
Relative humidity	< 85 %
Corrosive atmosphere	Device installed in environment category 3C1
Salt environment	Permanent salt mist
Dust	Low in operation, and strong during maintenance operation Device are not protected in cubicle
Vibration	Permanent vibration < 0.5 g, < 100 Hz

Level II preventative maintenance recommended every year

Level II

Minor preventive-maintenance operations such as greasing and operating checks, as well as repairs by standard exchange of certain assemblies, carried out by a certified customer employee according to the manufacturer maintenance instructions.

Check	Year					Tool	Procedure number	Duration
	1	2	3	4	5			
Device								
Check the general condition of the device (escutcheon, control unit, case, chassis, connections)	■	■	■	■	■	None	device NII_1_1.pdf	5 min
Mechanism								
Open/close device manually and electrically	■	■	■	■	■	None	mechanism NII_1_1.pdf	1 min
Charge device electrically	■	■	■	■	■	None	mechanism NII_1_2.pdf	1 min
Check complete closing of device's poles	■	■	■	■	■	None	mechanism NII_1_3.pdf	1 min
Check number of device operating cycles	■	■	■	■	■	Operation counter	mechanism NII_1_4.pdf	1 min
Breaking unit (arc chutes + contacts)								
Check the filters cleanlines and the fixing of the arc-chute chambers	■	■	■	■	■	Dynamometric crank	breaking unit NII_1_1.pdf	3 min
Control auxiliaries								
Check auxiliary wiring and insulation	■	■	■	■	■	None	auxiliaries NII_1_1.pdf	5 min
Control unit								
Trip control unit using test tool and check operation of contacts SDE1 and SDE2	■	■	■	■	■	HHTK or FFTK	control unit NII_1_1.pdf	5 min
Device locking								
Open and close keylocks installed on device	■	■	■	■	■	None	device locking NII_1_1.pdf	1 min
Open and close padlocking system installed on device	■	■	■	■	■	None	device locking NII_1_2.pdf	1 min
Chassis (optional)								
Remove device from chassis and put it back	■	■	■	■	■	None	chassis NII_1_1.pdf	3 min
Check operation of position contacts (CE, CT, CD, EF)	■	■	■	■	■	None	chassis NII_1_2.pdf	3 min
Chassis locking								
Open and close keylocks installed on chassis	■	■	■	■	■	None	chassis locking NII_1_1.pdf	1 min
Operate padlocking system	■	■	■	■	■	None	chassis locking NII_1_2.pdf	1 min
							Estimated time ⁽¹⁾	32 min

(1) Duration are given with testing device available.

Level III preventive maintenance recommended every 2 years

Level III

General preventive-maintenance operations such as general adjustments, troubleshooting and diagnosis of breakdowns, repairs by exchange of components or functional parts, minor mechanical repairs, carried out by a qualified customer technician using the tools and measurement/setting devices specified in the manufacturer maintenance instructions.

Check	Year					Tool	Procedure number	Duration
	1	2	3	4	5			
Mechanism								
Check gear-motor charging time at 0,85 Un						■ Stop-watch + external power supply	mechanism NIII_2_1.pdf	10 min
Check general condition of mechanism		■		■		■ Screwdriver	mechanism NIII_2_2.pdf	5 min
Breaking unit (arc chutes + contacts)								
Check condition of breaking unit			■		■	■ Screwdriver	breaking unit NIII_2_1.pdf	5 min
Control auxiliaries								
Check operation of indication contacts (OF /PF/MCH)						■ Ohmmeter	auxiliaries NIII_2_1.pdf	20 min
Check closing operation of control auxiliary XF at 0.85 Un						■ External power supply	auxiliaries NIII_2_2.pdf	10 min
Check opening operation of control auxiliary MX at 0.70 Un						■ External power supply	auxiliaries NIII_2_3.pdf	10 min
Check operation of control auxiliary MN/MNR between 0.35 and 0.7 Un						■ External power supply	auxiliaries NIII_2_4.pdf	10 min
Check delay of MNR devices at 0.35 and 0.7 Un						■ External power supply	auxiliaries NIII_2_5.pdf	10 min
Check MX tripping time						■ Tester	auxiliaries NIII_2_6.pdf	10 min
Control unit								
Check tripping curves using test tool, signalling LED (tripped, overload) Save results on PC			■		■	■ FFTK FFTK report generator software	control unit NIII_2_1.pdf	15 min
Check the operation of M2C or M6C relays with Micrologic P or H						■ None	control unit NIII_2_2.pdf	
Check the operation of ZSI function (if wired)						■ FFTK	control unit NIII_2_3.pdf	
Chassis (optional)								
Dust and regrease chassis			■		■	■ Mobilith SCH100	chassis NIII_2_1.pdf	15 min
Check the operation of the safety shutters			■		■	■ None	chassis NII_1_3.pdf	1 min
Regrease disconnecting-contact clusters (specific case of corrosive atmospheres)			■		■	■ Mobilith SCH100	chassis NIII_2_2.pdf	30 min
Power connections								
Check and tighten loose connections					Only after a visual inspection	Dynamometric crank NIII_2_1.pdf	showing overheating marks	
							Estimated time ⁽¹⁾	2 h 30 min

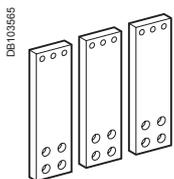
(1) Duration are given with testing device available.

Level IV manufacturer diagnostic and replacement of components recommended every 5 years

Level IV

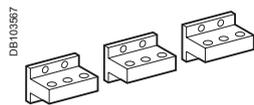
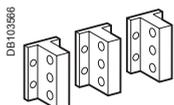
All the major preventive and corrective-maintenance work ensured by the Schneider Electric after-sales support department.

Contact your Schneider Electric after sales services, if you wish to have a device diagnostic as recommended every 5 years.



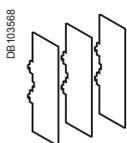
Front connections

- 6 per device.



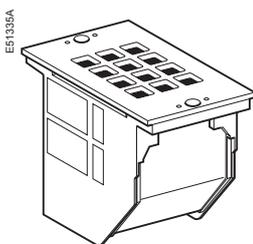
Rear connections

- 6 per device:
 - vertical
 - horizontal



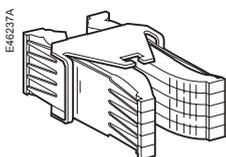
Interphase barriers

- Supplied in sets of 3.



Arc chutes

- One chute per pole:
NW08 to NW40 types N1, H1 and H2.

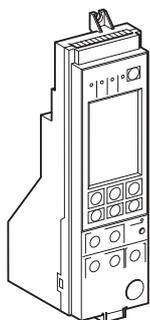


Disconnecting-contact clusters

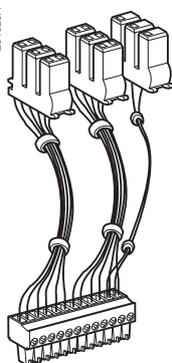
- Quantities per device:
see table on page 19.

For more in-depth information, see the control-unit user manual

E46108A



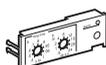
E61328A



Micrologic control units

- Standard equipment, one per device
 - Long-time rating plug and connection cables not included, see below:
 - Micrologic 2.0
 - Micrologic 5.0
 - Micrologic 2.0 A
 - Micrologic 5.0 A
 - Micrologic 5.0 P
 - Micrologic 5.0 H
 - Connection cables for drawout device.
- Depending on the model, control units offer in addition:
 - fault indications
 - measurement of electrical parameters (current, voltage, power, etc.)
 - harmonic analysis
 - communication.

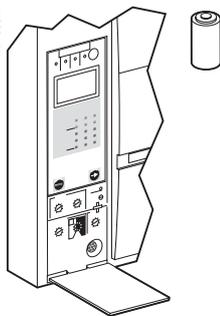
DE103515



Long-time rating plugs

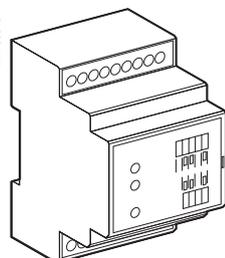
- Standard equipment, one per control unit:
 - 0.4 to 1 x I_r setting
 - 0.4 to 0.8 x I_r setting
 - 0.8 to 1 x I_r setting
 - Off (no long-time protection).
- The plugs determine the setting range for the Long-time protection.

DB103514



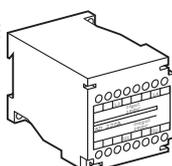
Replacement battery - Lead-sealed cover

DB103516



"Châssis" communication module

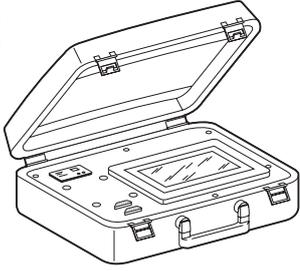
DB103517



External power-supply module

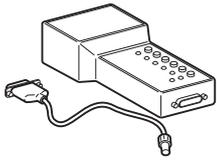
Battery module

DB103518



Portable test kit

DB103630

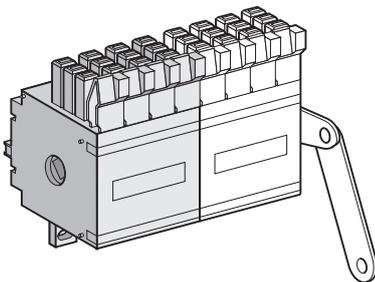


Mini test kit

ON/OFF indication contacts (OF) NAVY

- Standard equipment:
4 OF per device.
- OF contacts indicate the position of main contacts
- They trip when the minimum isolation distance between the main contacts is reached
- 4 changeover contacts
- Rated current: 10 A
- Breaking capacity 50/60 Hz for AC power (AC12 as per 60947-5-1):
 - 480 V: 10 A (rms)
 - 600 V: 6 A (rms)
- Breaking capacity for DC power (DC12 as per 60947-5-1): 250 V: 3 A.

DB103536



Additional ON/OFF indication contacts (OF) NAVY

- Optional equipment, two blocks of 4 OF contacts per device connection cables for drawout device
- OF contacts indicate the position of the main contacts
- They trip when the minimum isolation distance between the main contacts is reached
- Changeover contacts
- Rated current: 10 A
- Breaking capacity 50/60 Hz for AC power (AC12 as per 60947-5-1):
 - 480 V: 10 A (rms)
 - 600 V: 6 A (rms)
- Breaking capacity for DC power (DC12 as per 60947-5-1): 250 V: 3 A.

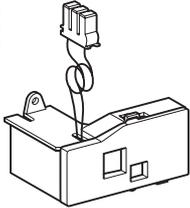
Combined "connected/closed" contacts (EF)

- Optional equipment, 4 EF contacts per device
- Each contact is mounted in place of the connector of an additional OF contact
- The contact combines the "device connected" and the "device closed" information to produce the "circuit closed" information
- Changeover contacts
- Rated current: 10 A
- Breaking capacity 50/60 Hz for AC power (AC12 as per 60947-5-1):
 - 240 V: 10 A (rms)
 - 380 V: 10 A (rms)
 - 480 V: 10 A (rms)
 - 600 V: 6 A (rms)
- Breaking capacity for DC power (DC12 as per 60947-5-1):
 - 48 V: 2.5 A
 - 130 V: 0.8 A
 - 250 V: 0.3 A.

"Fault-trip" indication contact (SDE/1)

- Standard equipment on circuit breakers, one SDE/1 contact per device
- Not available for switch-disconnector versions
- The contact provides a remote indication of device opening due to an electrical fault
- Changeover contact
- Rated current: 10 A
- Breaking capacity 50/60 Hz for AC power (AC12 as per 60947-5-1):
 - 240 V: 10 A (rms)
 - 380 V: 5 A (rms)
 - 480 V: 5 A (rms)
 - 600 V: 3 A (rms)
- Breaking capacity for DC power (DC12 as per 60947-5-1):
 - 48 V: 3 A
 - 125 V: 0.3 A
 - 250 V: 0.15 A.

E51298B



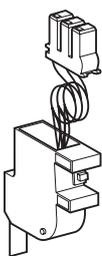
Additional "fault-trip" indication contact (SDE/2)

- Optional equipment for circuit breakers, one additional SDE/2 contact per device
- Not available for switch-disconnector versions connection cables for drawout device
- The contact remotely indicates device opening due to an electrical fault
- Changeover contact
- Rated current: 10 A
- Breaking capacity 50/60 Hz for AC power (AC12 as per 60947-5-1):
 - 240 V: 10 A (rms)
 - 380 V: 5 A (rms)
 - 480 V: 5 A (rms)
 - 600 V: 3 A (rms)
- Breaking capacity for DC power (DC12 as per 60947-5-1):
 - 48 V: 3 A
 - 125 V: 0.3 A
 - 250 V: 0.15 A.

"Springs charged" limit switch contact (CH)

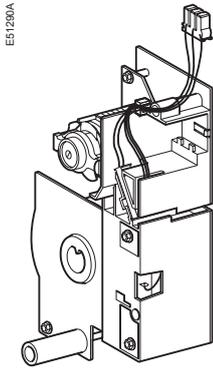
- Standard equipment, one CH contact per device
- The contact indicates the "charged" status of the operating mechanism (springs charged)
- Changeover contact
- Rated current: 10 A
- Breaking capacity 50/60 Hz for AC power (AC12 as per 60947-5-1):
 - 240 V: 10 A (rms)
 - 380 V: 5 A (rms)
 - 480 V: 5 A (rms)
 - 600 V: 3 A (rms)
- Breaking capacity for DC power (DC12 as per 60947-5-1):
 - 48 V: 3 A
 - 125 V: 0.3 A
 - 250 V: 0.25 A.

E51332A



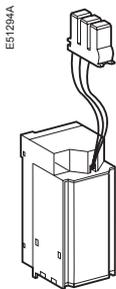
"Ready to close" contact (PF)

- Optional equipment, one PF contact per device connection cables for drawout device.
- The contact indicates that the device may be closed because all the following are valid:
 - circuit breaker is open
 - spring mechanism is charged
 - a maintained closing order is not present
 - a maintained opening order is not present
- Changeover contact
- Rated current: 10 A
- Breaking capacity 50/60 Hz for AC power (AC12 as per 60947-5-1):
 - 240 V: 10 A (rms)
 - 380 V: 5 A (rms)
- Breaking capacity for DC power (DC12 as per 60947-5-1):
 - 48 V: 3 A
 - 125 V: 0.3 A
 - 250 V: 0.15 A.



Gear motor (MCH)

- Optional equipment, one MCH gear motor per device
- Connection cables not included, see below:
 - 100/130 V AC
 - 200/240 V AC
 - 380/415 V AC
 - 400/440 V AC
 - 24/30 V DC
- Connection cables for drawout device
- The gear motor automatically charges and recharges the spring mechanism
- Charging time: 4 seconds max.
- Consumption:
 - 180 VA AC
 - 180 W DC
- Inrush current: 2 to 3 In for 0.1 second
- Operating rate: maximum 3 cycles per minute.



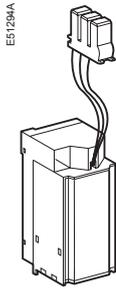
Opening releases MX/1 NAVY and MX/2 NAVY, closing release XF

- Optional equipment, 1 or 2 MX releases per device, 1 XF per device
- The function (MX or XF) is determined by where the coil is installed
- NAVY and NAVY communicating versions :
 - 28 V DC
 - 115 V AC 50/60 Hz
 - 220 V AC 50/60 Hz
 - 380/440 V AC 50/60 Hz
- connection cable for drawout device
- The MX release instantaneously opens the circuit breaker when energised
- The XF release instantaneously closes the circuit breaker when energised, if the device is "ready to close"
- Device response time:
 - MX: 50 ms ±10
 - XF: 70 ms +10 / -15
 - > 3200 A: 80 ms ±10
- Operating threshold:
 - MX: 0.7 to 1.1 x Un
 - XF: 0.85 to 1.1 x Un
- The supply can be maintained
- Consumption:
 - pick-up (80 ms): 200 VA
 - hold: 4.5 VA.

Wiring of control auxiliaries

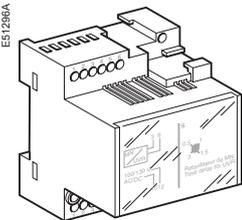
Under pick-up conditions, the level of consumption is approximately 150 to 200 VA. Consequently, for low supply voltages (12, 24, 48 V), cables must not exceed a maximum length determined by the supply voltage and the cross-section of the cables.

- The voltage measured across the MX/XF terminals must not be less than:
 - 80.5 V for MX 115 V AC
 - 154 V for MX 220 V AC
 - 266 V for MX 340-440 V AC
 - 18 V for MX 28 DC



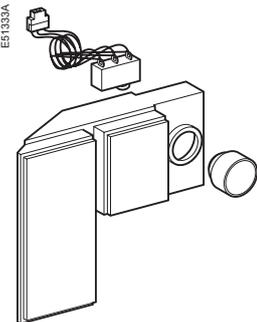
Instantaneous undervoltage releases (MN)

- Optional equipment, 1 MN per device
- Not compatible with the MX/2 opening release:
 - 100/130 V AC 50/60 Hz
 - 200/250 V AC 50/60 Hz
 - 380/480 V AC 50/60 Hz
- connection cable for drawout device
- The MN release instantaneously opens the circuit breaker when its supply voltage drops
- Device response time: 90 ms ±5
- Operating threshold:
 - opening: 0.35 to 0.7 x Un
 - closing: 0.85 x Un
- Consumption:
 - pick-up (80 ms): 200 VA
 - hold: 4.5 VA



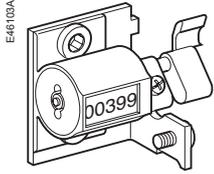
Delay unit for MN releases

- Optional equipment, 1 MN with delay unit per device.
- Delay-unit (must be ordered in addition to the MN):
 - 100/130 V AC 50/60 Hz
 - 200/250 V AC 50/60 Hz
 - 380/480 V AC 50/60 Hz.
- The unit delays operation of the MN release to eliminate circuit-breaker nuisance tripping during short voltage dips
- The unit is wired in series with the MN and must be installed outside the circuit breaker
- Device response time: 0.5, 1, 1.5, 3 seconds
- Operating threshold:
 - opening: 0.35 to 0.7 x Un
 - closing: 0.85 x Un
- Consumption:
 - pick-up (80 ms): 200 VA
 - hold: 4.5 VA



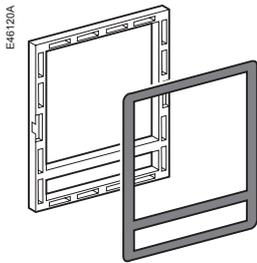
Electrical closing pushbutton (BPFE)

- Optional equipment, 1 BPFE per device connection cables for drawout device
- Located on the front face of the device, this pushbutton carries out electrical closing of the circuit breaker via the XF release, taking into account all the safety functions that are part of the control/monitoring system of the installation.



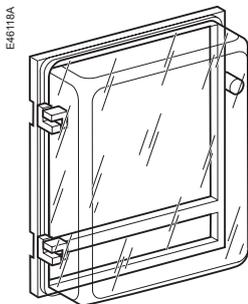
Operation counter (CDM)

- Optional equipment, one CDM per device
- The operation counter sums the number of operating cycles.



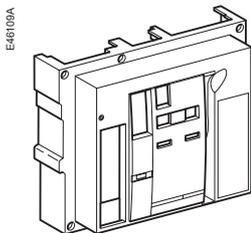
Escutcheon (CDP)

- Optional equipment, one CDP per device for drawout device
- The CDP increases the degree of protection to IP40 and IK07.



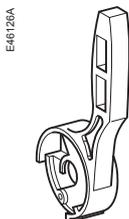
Transparent cover (CCP)

- Optional equipment, one CP per device equipped with a CDP.
- Mounted with a CDP, the CP increases the degree of protection to IP55 and IK10.



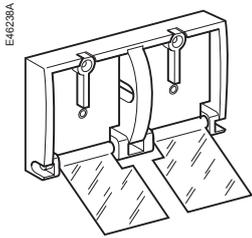
Front

- 1 front for devices.



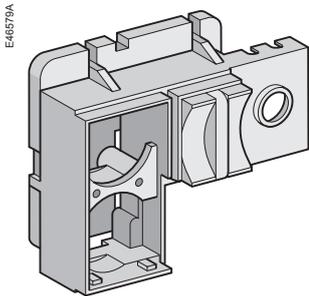
Charging handle

- 1 handle per device.



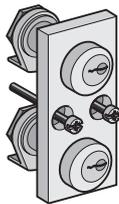
Transparent cover for pushbutton locking using a padlock, lead seal or screws

- Optional equipment, one locking cover per device
- The transparent cover blocks access (together or separately) to the pushbuttons used to open and close the device
- Locking requires a padlock, a lead seal or two screws.



Device locking in the OFF position using a padlock

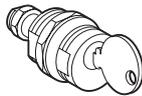
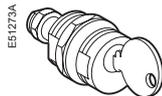
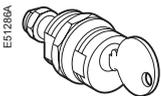
- Optional equipment, one locking system per device
- The unit inhibits local or remote closing of the device
- Up to three padlocks may be used for locking.



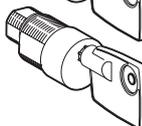
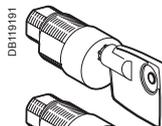
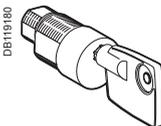
Device OFF position locking kit for keylocks

- Optional equipment, one locking kit per device:
 - for Profalux keylocks
 - for Ronis keylocks
 - for Castell keylocks
 - for Kirk keylocks
- The kit inhibits local or remote closing of the device.

Ronis



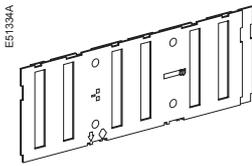
Profalux



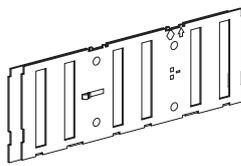
Keylocks required for the device locking kit

- One or two keylocks per locking kit:
 - Ronis
 - Profalux

Top shutter closed



Bottom shutter closed

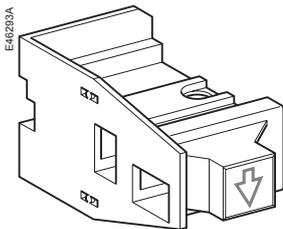


Safety shutters

■ Optional equipment (set of shutters for top and bottom): NW08/ NW40 3 poles

■ Mounted on the chassis, the safety shutters automatically block access to the disconnecting contact cluster when the device is in the "disconnected" or "test" positions.

■ IP20.

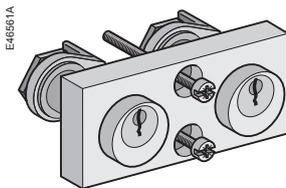


Shutter locking blocks

■ Optional equipment: 2 blocks for chassis.

■ The block may be padlocked. It:

- prevents connection of the device
- locks the shutters in the closed position
- locks the shutters in the opened position.



Circuit breaker locking in "disconnected" position

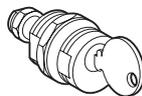
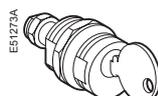
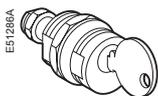
■ Optional equipment, one locking system per device:

- for Profalux keylocks
- for Ronis keylocks
- for Castell keylocks
- for Kirk keylocks (keylocks not included)

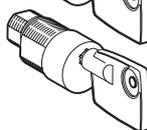
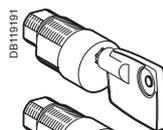
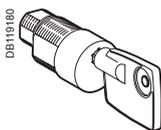
■ Mounted on the chassis and accessible with the door closed, this system locks the circuit breaker in "disconnected" position using one or two keylocks

■ The "disconnected" position locking system may be modified to lock the circuit breaker in all three positions.

Ronis



Profalux

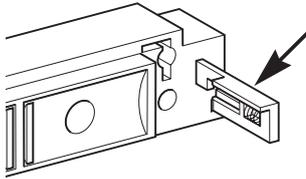


Keylocks required with the "disconnected" position locking system

■ One or two keylocks per locking system:

- Ronis
- Profalux

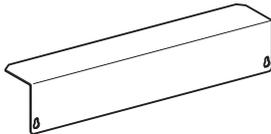
E46124A



Racking interlock

- Optional equipment, one racking interlock per chassis
- This device prevents insertion of the racking handle when the cubicle door is open
- It is mounted on the right-hand side of the chassis

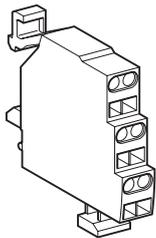
E51351A



Auxiliary terminal shield (CB)

- Optional equipment, one CB shield per chassis: 3 poles
- The shield prevents access to the terminal block of the electrical auxiliaries.

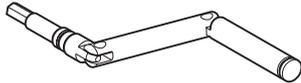
E44005A



"Connected", "disconnected" and "test" position carriage switches (CE, CD, CT)

- Optional equipment, one to nine carriage switches
- Standard configuration, 0 to 3 CE, 0 to 3 CD, 0 to 3 CT
- Other configurations (by ordering additional actuators):
 - 0 to 9 CE, 0 CD, 0 CT
 - 0 to 6 CE, 0 to 3 CD, 0 CT
 - 0 to 6 CE, 0 CD, 0 to 3 CT
 - 1 carriage switch
 - 1 set of actuators for additional carriage switches
- Connection cables (per carriage switch)
- The carriage switches indicate the three positions:
 - CE: connected position
 - CD: disconnected position (when the minimum isolation distance between the main contacts and the auxiliary contacts is reached)
 - CT: test position
- Changeover contact
- Rated current: 10 A
- Breaking capacity 50/60 Hz for AC power (AC12 as per 60947-5-1):
 - 240 V: 10 A (rms)
 - 380 V: 5 A (rms)
- Breaking capacity for DC power (DC12 as per 60947-5-1): 250 V: 0.3 A.

E51338A

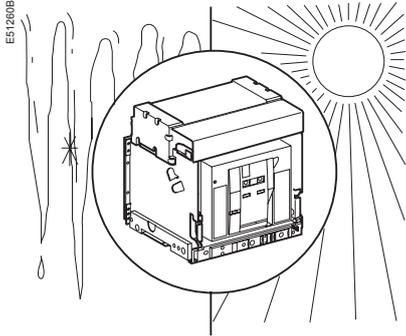


Crank

- 1 crank per device.

Problem	Probable causes	Solutions
Circuit breaker cannot be closed locally or remotely	<ul style="list-style-type: none"> ■ Circuit breaker padlocked or keylocked in the "open" position ■ Circuit breaker interlocked mechanically in a source changeover system ■ Circuit breaker not completely connected ■ The reset button signalling a fault trip has not been reset ■ Stored energy mechanism not charged ■ MX opening shunt release permanently supplied with power ■ MN undervoltage release not supplied with power ■ XF closing release continuously supplied with power, but circuit breaker not "ready to close" (XF not wired in series with PF contact) ■ Permanent trip order in the presence of a Micrologic P or H control unit with minimum voltage and minimum frequency protection in Trip mode and the control unit powered 	<ul style="list-style-type: none"> □ disable the locking fonction □ check the position of the other circuit breaker in the changeover system □ modify the situation to release the interlock □ terminate racking in (connection) of the circuit breaker □ clear the fault □ push the reset button on the front of the circuit breaker □ charge the mechanism manually □ if it is equipped with a an MCH gear motor, check the supply of power to the motor. If the problem persists, replace the gear motor (MCH) □ there is an opening order. Determine the origin of the order. The order must be cancelled before the circuit breaker can be closed □ there is an opening order. Determine the origin of the order. □ check the voltage and the supply circuit ($U > 0.85 U_n$). If the problem persists, replace the release □ cut the supply of power to the XF closing release, then send the closing order again via the XF, but only if the circuit breaker is "ready to close" □ Disable these protection functions on the Micrologic P or H control unit
Circuit breaker cannot be closed remotely but can be opened locally using the closing pushbutton	<ul style="list-style-type: none"> ■ Closing order not executed by the XF closing release 	<ul style="list-style-type: none"> □ check the voltage and the supply circuit ($0.85 - 1.1 U_n$). If the problem persists, replace the XF release
Unexpected tripping without activation of the reset button signalling a fault trip	<ul style="list-style-type: none"> ■ MN undervoltage release supply voltage too low ■ Load-shedding order sent to the MX opening release by another device ■ Unnecessary opening order from the MX opening release 	<ul style="list-style-type: none"> □ check the voltage and the supply circuit ($U > 0.85 U_n$) □ check the overall load on the distribution system □ if necessary, modify the settings of devices in the installation □ determine the origin of the order
Unexpected tripping with activation of the reset button signalling a fault trip	<p>a fault is present :</p> <ul style="list-style-type: none"> ■ overload ■ earth fault ■ short-circuit detected by the control unit 	<ul style="list-style-type: none"> □ determine and clear the causes of the fault □ check the condition of the circuit breaker before putting it back into service
Instantaneous opening after each attempt to close the circuit breaker with activation of the reset button signalling a fault trip	<ul style="list-style-type: none"> ■ Thermal memory ■ Transient overcurrent when closing ■ Closing on a short-circuit 	<ul style="list-style-type: none"> □ see the user manual of the control unit □ press the reset button □ modify the distribution system or the control-unit settings □ check the condition of the circuit breaker before putting it back into service □ press the reset button □ clear the fault □ check the condition of the circuit breaker before putting it back into service □ press the reset button

Problem	Probable causes	Solutions
Circuit breaker cannot be opened remotely, but can be opened locally	<ul style="list-style-type: none"> ■ Opening order not executed by the MX opening release ■ Opening order not executed by the MN undervoltage release 	<ul style="list-style-type: none"> □ check the voltage and the supply circuit (0.7 - 1.1 Un). If the problem persists, replace the MX release □ drop in voltage insufficient or residual voltage (> 0.35 Un) across the terminals of the undervoltage release. If the problem persists, replace the MN release
Circuit breaker cannot be opened locally	<ul style="list-style-type: none"> ■ Operating mechanism malfunction or welded contacts 	<ul style="list-style-type: none"> □ contact a Schneider service centre
Circuit breaker cannot be reset locally but not remotely	<ul style="list-style-type: none"> ■ Insufficient supply voltage for the MCH gear motor 	<ul style="list-style-type: none"> □ check the voltage and the supply circuit (0.7 - 1.1 Un). If the problem persists, replace the MCH release
Nuisance tripping of the circuit breaker with activation of the reset button signalling a fault trip	<ul style="list-style-type: none"> ■ Reset button not pushed-in completely 	<ul style="list-style-type: none"> □ push the reset button in completely
Impossible to insert the crank in connected, test or disconnected position	<ul style="list-style-type: none"> ■ A padlock or keylock is present on the chassis or a door interlock is present 	<ul style="list-style-type: none"> □ disable the locking function
Impossible to turn the crank	<ul style="list-style-type: none"> ■ The reset button has not been pressed 	<ul style="list-style-type: none"> □ press the reset button
Circuit breaker cannot be removed from chassis	<ul style="list-style-type: none"> ■ Circuit breaker not in disconnected position 	<ul style="list-style-type: none"> □ turn the crank until the circuit breaker is in disconnected position and the reset button out
Circuit breaker cannot be connected (racked in)	<ul style="list-style-type: none"> ■ The rails are not completely out ■ Cradle/circuit breaker mismatch protection ■ The safety shutters are locked ■ The disconnecting-contact clusters are incorrectly positioned ■ Cradle locked in disconnected position ■ The reset button has not been pressed, preventing rotation of the crank ■ The circuit breaker has not been sufficiently inserted in the cradle 	<ul style="list-style-type: none"> □ pull the rails all the way out □ check that the cradle corresponds with the circuit breaker □ remove the lock(s) □ reposition the clusters □ disable the cradle locking function □ press the reset button □ insert the circuit breaker completely so that it is engaged in the racking mechanism
Circuit breaker cannot be locked in disconnected position	<ul style="list-style-type: none"> ■ The circuit breaker is not in the right position ■ The crank is still in the cradle 	<ul style="list-style-type: none"> □ check the circuit breaker position by making sure the reset button is out □ remove the crank and store it
Circuit breaker cannot be locked in connected, test or disconnected position	<ul style="list-style-type: none"> ■ Check that locking in any position is enabled ■ The circuit breaker is not in the right position ■ The crank is still in the cradle 	<ul style="list-style-type: none"> □ contact a Schneider Electric service centre □ check the circuit breaker position by making sure the reset button is out □ remove the crank and store it
The crank cannot be inserted to connect or disconnected the circuit breaker	<ul style="list-style-type: none"> ■ The rails are not completely in 	<ul style="list-style-type: none"> □ push the rails all the way in
The right-hand rail (chassis alone) or the circuit breaker cannot be drawn out	<ul style="list-style-type: none"> ■ The crank is still in the chassis 	<ul style="list-style-type: none"> □ remove the crank and store it

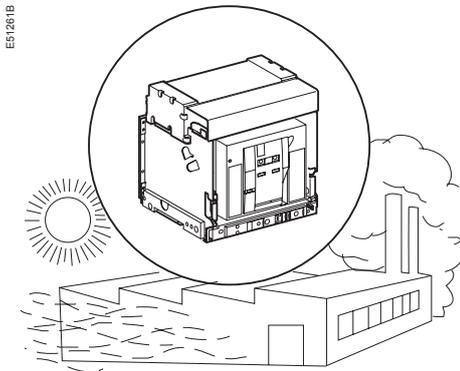


E51269B

Ambient temperature

Masterpact NW NAVY devices can operate under the following temperature conditions:

- the electrical and mechanical characteristics are stipulated for an ambient temperature of -5 °C to $+70\text{ °C}$
- circuit-breaker closing is guaranteed down to -35 °C
- masterpact NW NAVY (without the control unit) can be stored in an ambient temperature of -40 °C to $+85\text{ °C}$
- the control unit can be stored in an ambient temperature of -25 °C to $+85\text{ °C}$.



E51261B

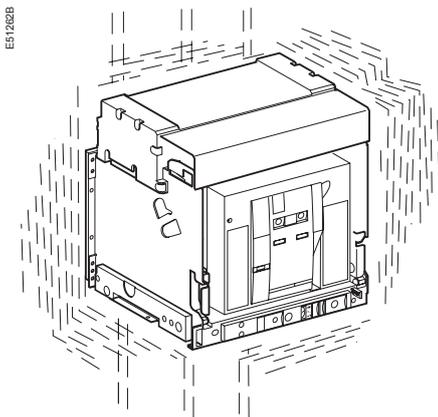
Extreme atmospheric conditions

Masterpact NW NAVY devices have successfully passed the tests defined by the following standards for extreme atmospheric conditions:

- IEC 60068-2-1: dry cold at -55 °C
- IEC 60068-2-2: dry heat at $+85\text{ °C}$
- IEC 60068-2-30: damp heat (temperature $+55\text{ °C}$, relative humidity 95%)
- IEC 60068-2-52 level 2: salt mist.

Masterpact NW NAVY devices can operate in the industrial environments defined by standard IEC 60947 (pollution degree up to 4).

It is nonetheless advised to check that the devices are installed in suitably cooled switchboards without excessive dust.



E51262B

Vibrations

Masterpact NW NAVY devices resist electromagnetic or mechanical vibrations.

Tests are carried out in compliance with standard IEC 60068-2-6 for the levels required by merchant-marine inspection organisations (Veritas, Lloyd's, etc.):

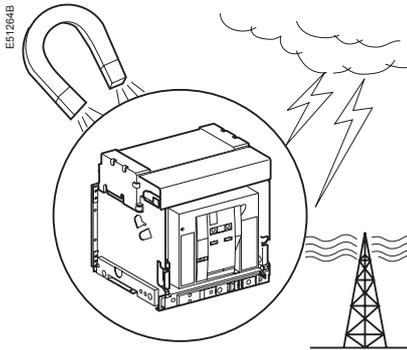
- 5 to 22 Hz: amplitude $\pm 1\text{ mm}$
- 22 to 50 Hz: constant acceleration 2 g
- 5 to 60 Hz: constant acceleration 2 g

Excessive vibration may cause tripping, breaks in connections or damage to mechanical parts.

Mechanical shock

Masterpact NW NAVY devices are guaranteed to withstand mechanical shock levels. These are carried out in compliance with IEC 60068-2-27:

- 18 g 11 ms half-sine pulse.



Electromagnetic disturbances

Masterpact NW NAVY devices are protected against:

- overvoltages caused by devices that generate electromagnetic disturbances
- overvoltages caused by atmospheric disturbances or by a distribution-system outage (e.g. failure of a lighting system)
- devices emitting radio waves (radios, walkie-talkies, radar, etc.)
- electrostatic discharges produced by users.

Masterpact NW NAVY devices have successfully passed the electromagnetic-compatibility tests (EMC) defined by the following international standards:

- IEC 60947-2, appendix F.

The above tests guarantee that:

- no nuisance tripping occurs
- tripping times are respected.

Cleaning

- Non-metallic parts:

never use solvent, soap or any other cleaning product. Clean with a dry cloth only

- Metal parts:

clean with a dry cloth whenever possible. If solvent, soap or any other cleaning product must be used, make sure that it does not come into contact with non-metallic parts.

Notes

Notes

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