

Low voltage electrical distribution

Masterpact NT and NW NAVY

LV power circuit breakers
and switch-disconnectors

Catalogue
2009





The original Masterpact has set a new standard for power circuit breakers around the world.

Today, Schneider Electric continues to innovate with the NAVY version of Masterpact made up of the following products:

- > Masterpact NT NAVY
- > Masterpact NW NAVY

The design of this NAVY version is based on the outstanding features developed for the industrial version including:

- > the breaking principle
- > modular design using composite materials.

Schneider Electric has added anti-shock and anti-vibration systems to these circuit breakers to meet the severe requirements of naval applications.

Masterpact NT and NW NAVY devices incorporate the latest technology to enhance both performance and safety. Easy to install, with user-friendly, intuitive operation and environment-friendly design, they are, quite simply, circuit breakers of their time.

Masterpact NAVY, levels of performance



High shock and vibration resistance certified by inspection organisations (Veritas, Lloyd's)

Mechanical shocks

Masterpact NAVY devices are guaranteed to withstand mechanical shocks:

> 18 g - 11 ms - 1/2 sine shock pulse.

Tests are carried out in compliance with standard IEC 60068-2-7.

They are carried out in 3 directions, with the circuit breaker open and closed.

Vibrations

Masterpact NAVY devices are guaranteed to withstand electromagnetic or mechanical vibrations:

> 5 to 22 Hz: ± 1 mm displacement amplitude

> 5 to 60 Hz: 2 g acceleration.

Tests are carried out in compliance with standard IEC 60068-2-6.

They are carried out in 3 directions, with the circuit breaker open and closed.

Four performance levels

N1: for standard applications with low short-circuit levels.

H1: for vessels with high short-circuit levels or installations with two parallel-connected transformers.

H2: high-performance circuit breaker for very high short-circuits.

L1: current-limiting circuit breaker (Masterpact NT NAVY only).

Intended for the protection of cable-type feeders.

Also used to protect a limited-performance switchboard when the transformer power rating is increased.

Integration in a communication network

Masterpact NAVY can be integrated in a general supervision system to optimise installation operation and maintenance. The communication architecture is open, and may be upgraded for interfacing with any protocol.

Switch-disconnector versions (only NW NAVY)

The switch-disconnectors are derived directly from the circuit breakers and offer the same features and performance levels.



2 frame sizes, 2 families

The range of power circuit breakers includes two families:

- > Masterpact NT NAVY, the world's smallest true power circuit breaker, with ratings from 630 to 1600 A
- > Masterpact NW NAVY from 800 to 4000 A.

Masterpact NT NAVY 630 to 1600 A

PB1018A20_SE



DB108086A

L1 150 kA									
H2 50 kA									
H1 42 kA									
	NT	NT	NT	NT	NT				
	06	08	10	12	16				

Masterpact NW NAVY 800 to 4000 A

PB1018A40_SE



DB108805A

H2 100 kA									
H1 65 kA									
N1 42 kA									
	NW	NW	NW	NW	NW	NW	NW	NW	NW
	08	10	12	16	20	25	32	40	

Optimised volumes

PB101616A20_SE



The smallest circuit breaker in the world

Masterpact NT NAVY innovates by offering all the performance of a power circuit breaker in an extremely small volume. The 70 mm pole pitch means a three-pole drawout circuit breaker can be installed in a switchboard section 400 mm wide and 400 mm deep.

PB101546A30_SE



Practical installation solutions

The range improves upon all the installation solutions which have already made Masterpact NAVY a success. It has been designed to standardise switchboards, optimise volumes and simplify installation:

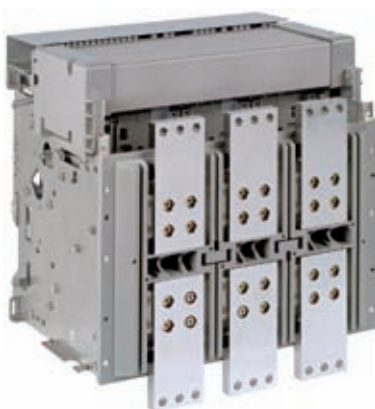
- > incoming connection to top or bottom terminals
- > no safety clearance required
- > connection:
 - horizontal or vertical rear connection
 - front connection with minimum extra space
 - mixed front and rear connections
- > 115 mm pole pitch on all versions
- > no derating up to 55 °C and 4000 A.

Optimised volumes

Up to 4000 A, Masterpact NW NAVY circuit breakers are all the same size, the same as the old M08 to 32 range.

Ease of installation

PB101280A50_SE



Front connection of a drawout Masterpact NW NAVY.

With optimised sizes, the Masterpact NT and NW NAVY ranges simplify the design of switchboards and standardise the installation of devices:

- > a single connection layout for Masterpact NT NAVY
- > two connection layouts for Masterpact NW NAVY:
 - one from 800 to 3200 A
 - one for 4000 A
- > identical connection terminals from 800 to 4000 A (Masterpact NW NAVY)
- > front connection requires little space because the connectors do not increase the depth of the device
- > rear connection to vertical or horizontal busbars simply by turning the connectors 90°.

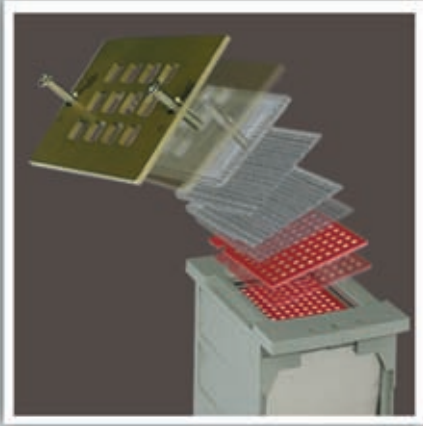
PB101280A50_SE



Vertical and horizontal rear connection of a drawout Masterpact NW NAVY.

Innovation

PB100740A-64



Filtered breaking.

Greater dependability... Filtered breaking

patented

The patented new design of the arc chutes includes stainless-steel filters. The chutes absorb the energy released during breaking, thus limiting the stresses exerted on the installation. They filter and cool the gases produced, reducing effects perceptible from the outside.

Automatic unlatching

patented

The automatic unlatching of the circuit breaker operating mechanism for high short-circuits extends performance up to 150 kA. It produces ultra-fast tripping for all short-circuits higher than 37 kA (L1). For lower short-circuits, the system does not react so that the control unit can provide total discrimination with downstream devices.

More intelligent trip units...

Today, with the high speed of calculation, the small size of memories and advances in miniaturisation, trip units have become circuit breaker control units offering increasingly powerful functions. They accurately measure system parameters, instantly calculate values, store data, log events, signal alarms, communicate, take action, etc. The Masterpact NAVY ranges, equipped with Micrologic control units, constitute both an extremely reliable protective device and an accurate measurement instrument.

PB100739A-64



Navigation buttons on a Micrologic P control unit.

User friendly... Intuitive use...

Micrologic control units are equipped with a digital LCD display used in conjunction with simple navigation buttons. Users can directly access parameters and settings. Navigation between screens is intuitive and the immediate display of values greatly simplifies settings. Text is displayed in the desired language.

patented

... backed by incomparable security

Protection functions are separate from the measurement functions and are managed by an ASIC electronic component. This independence guarantees immunity from conducted or radiated disturbances and ensures a high degree of reliability.

A patented "double setting" system for protection functions establishes:

- > a maximum threshold set using the control-unit dials
- > fine adjustments via the keypad or remotely. The fine adjustments for thresholds (to within one ampere) and tripping delays (to within a fraction of a second) are displayed directly on the screen.

The control unit cover can be lead-sealed to prevent uncontrolled access to the dials and protect the settings.

Ready for the future

Compliance with environmental requirements

Schneider Electric fully takes into account environmental requirements, starting right from the design phase of every product through to the end of its service life:

- > the materials used for Masterpact NAVY are not potentially dangerous to the environment
- > the production facilities are non-polluting in compliance with the ISO 14001 standard
- > filtered breaking eliminates pollution in the switchboard
- > the energy dissipated per pole is low, making energy losses insignificant
- > the materials are marked to facilitate sorting for recycling at the end of product service life.

Simple upgrading of installations

Installations change, power levels increase, new equipment is required and switchboards must be extended. Masterpact NAVY is designed to adapt to these changes:

- > all control units are interchangeable
- > communication with a supervision system is an option that may be added at any time
- > a reserve chassis can be pre-addressed so that system parameters do not have to be modified when a drawout device is installed at a later date
- > any future changes to the products will be designed to ensure continuity with the current ranges, thus simplifying installation upgrades.

Presentation	1
Functions and characteristics	A-1
Installation recommendations	B-1
Dimensions and connection	C-1
Electrical diagrams	D-1
Additional characteristics	E-1
Catalogue numbers and order form	F-1

schneider-electric.com

This international site allows you to access all the Schneider Electric products in just 2 clicks via comprehensive range data-sheets, with direct links to:

- complete library: technical documents, catalogs, FAQs, brochures...
- selection guides from the e-catalog.
- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts...



The technical guide

These technical guides help you comply with installation standards and rules i.e.: the electrical installation guide, the protection guide, the switchboard implementation guide, the technical booklets and the co-ordination tables all form genuine reference tools for the design of high performance electrical installations. For example, the LV protection co-ordination guide - discrimination and cascading - optimises choice of protection and connection devices while also increasing markedly continuity of supply in the installations.



<i>Presentation</i>	1
General overview	A-2
Detailed contents	A-2
Circuit breakers and switch-disconnectors	A-5
NT06 to NT16 NAVY and NW08 to NW40 NAVY	A-5
NT06 to NT16 NAVY	A-6
NW08 to NW40 NAVY	A-8
Micrologic control units	A-10
Overview of functions	A-10
Micrologic A “ammeter”	A-12
Micrologic P “power”	A-14
Micrologic H “harmonics”	A-18
Accessories and test equipment	A-20
Portable data acquisition	A-22
Masterpact and GetnSet	A-22
Communication	A-24
COM option in Masterpact	A-24
Overview of functions	A-25
Masterpact in a communication network	A-26
Connections	A-28
Overview of solutions	A-28
Accessories	A-29
Locking	A-31
On the device	A-31
On the chassis	A-32
Indication contacts	A-33
Remote operation	A-35
Remote ON / OFF	A-35
Remote tripping	A-38
Accessories	A-39
<i>Installation recommendations</i>	<i>B-1</i>
<i>Dimensions and connections</i>	<i>C-1</i>
<i>Electrical diagrams</i>	<i>D-1</i>
<i>Additional characteristics</i>	<i>E-1</i>
<i>Catalogue numbers and order form</i>	<i>F-1</i>

This chapter describes all the functions offered by Masterpact NT and NW devices. The two product families have identical functions implemented using the same or different components depending on the case.



Circuit breakers and switch-disconnectors page A-5

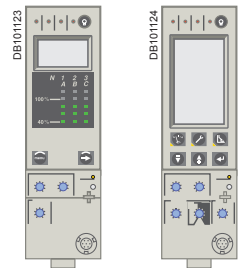
- Ratings:
 - Masterpact NT NAVY 630 to 1600 A
 - Masterpact NW NAVY 800 to 4000 A
- Circuit breakers type N1, H1, H2, L1
- Switch-disconnectors type HA (only NW NAVY)
- 3 poles
- Drawout versions
- Protection derating.

Micrologic control units page A-10

- Ammeter A**
2.0 basic protection
5.0 selective protection

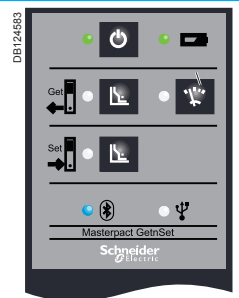
- Power meter P**
5.0 selective protection

- Harmonic meter H**
5.0 H selective protection
- Setting options (long-time rating plug):
 - low setting 0.4 to 0.8 x I_r
 - high setting 0.8 to 1 x I_r
 - without long-time protection
 - External power-supply module
 - Battery module.



Portable data acquisition page A-22

- Masterpact and GetnSet.

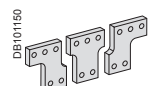
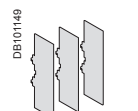
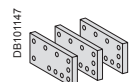
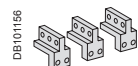


Communication page A-24

- COM option in Masterpact NAVY
- Masterpact NAVY in a communication network.

Connections page A-28

- Rear connection (horizontal or vertical)
- Front connection
- Mixed connections
- Optional accessories
 - bare-cable connectors and connector shields
 - terminal shields
 - vertical-connection adapters
 - cable-lug adapters
 - interphase barriers
 - spreaders
 - safety shutters, shutter locking blocks.



PB101941A55_SE

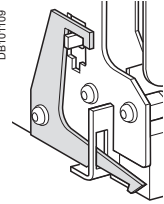


Locking

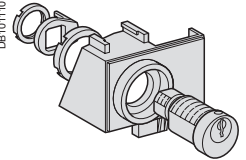
- Pushbutton locking by padlockable transparent cover
- OFF-position locking by padlock or keylock
- Chassis locking in disconnected position by keylock
- Chassis locking in connected, disconnected and test positions
- Racking interlock (inhibits racking with door open).

page A-31

DB101109



DB101110

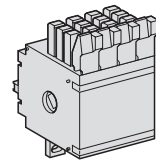


page A-33

Indication contacts

- Standard or low-level contacts:
 - ON/OFF indication OF
 - "fault trip" indication SDE
 - carriage switches for connected CE disconnected CD and test CT positions.

DB101112



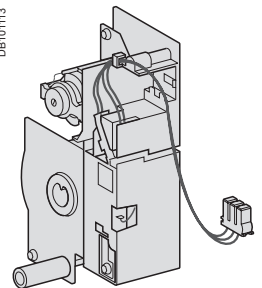
OF contact.

page A-35

Remote operation

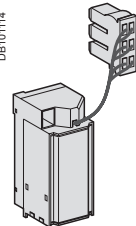
- Remote ON/OFF:
 - gear motor MCH
 - XF closing or MX opening voltage releases
 - PF ready-to-close contact
 - options: RAR automatic remote reset
 - BPFE electrical closing pushbutton
- Remote tripping function:
 - MN voltage release
 - standard
 - adjustable or non-adjustable delay
 - or second MX voltage release.

DB101113



Gear motor.

DB101114



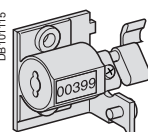
MX, XF and MN voltage releases.

page A-39

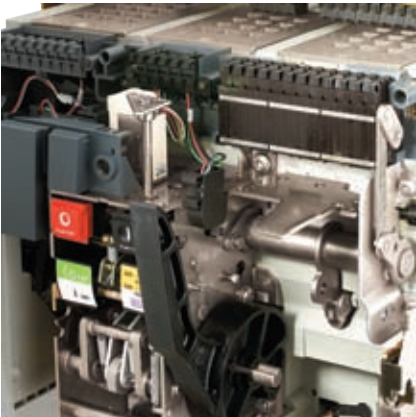
Accessories

- Auxiliary terminal shield CB
- Operation counter CDM
- Escutcheon CDP
- Transparent cover for escutcheon CP
- Escutcheon blanking plate OP.

DB101115



PB104332A55



PB104349A55



Circuit breakers and switch-disconnectors

NT06 to NT16 NAVY and NW08 to NW40 NAVY

NT and NW NAVY selection criteria

	Masterpact NT NAVY			Masterpact NW NAVY		
	NAVY applications			NAVY applications		
	NT06 to NT16 H1	NT06 to NT16 H2	NT06 to NT10 L1	NW08 to NW16 N1	NW08 to NW40 H1	NW08 to NW40 H2
Type of application	Standard applications with low short-circuit currents	Applications with medium-level short-circuit currents	Limiting circuit breaker for protection of cable-type feeders or upgraded transformer ratings	Standard applications with low short-circuit currents	Circuit breaker for industrial sites with high short-circuit currents	High-performance circuit breaker for heavy industry with high short-circuit currents
Icu/Ics at 440 V	42 kA	50 kA	130 kA	42 kA	65 kA	100 kA
Icu/Ics at 1000 V	-	-	-	-	-	-
Icu/Ics at 500 V DC L/R < 15 ms	-	-	-	-	-	-
Drawout	D	D	D	D	D	D
Switch-disconnector version	No	No	No	Yes	Yes	Yes
Front connection	Yes	Yes	Yes	Yes	Yes up to 3200 A	Yes up to 3200 A
Rear connection	Yes	Yes	Yes	Yes	Yes	Yes
Type of Micrologic control unit	A, P, H	A, P, H	A, P, H	A, P, H	A, P, H	A, P, H

Masterpact NT06 to NT16 NAVY installation characteristics

Circuit breaker		NT06, NT08, NT10			NT12, NT16	
Type		H1	H2	L1	H1	H2
Connection						
Drawout	FC	■	■	■	■	■
	RC	■	■	■	■	■
Dimensions (mm) H x W x D						
Drawout	3P	322 x 288 x 277				
Weight (kg) (approximate)						
Drawout	3P	30				

Masterpact NW08 to NW40 NAVY installation characteristics

Circuit breaker		NW08, NW10, NW12, NW16			NW20		NW25, NW32, NW40	
Type		N1	H1	H2	H1	H2	H1	H2
Connection								
Drawout	FC	■	■	■	■	■	■ ⁽¹⁾	■ ⁽¹⁾
	RC	■	■	■	■	■	■	■
Dimensions (mm) H x W x D								
Drawout	3P	439 x 441 x 395						
Weight (kg) (approximate)								
Drawout	3P	90						

(1) Except 4000 A.


Circuit breakers and switch-disconnectors

NT06 to NT16 NAVY

PB101616A46_SE



Common characteristics

Number of poles	3
Rated insulation voltage (V)	Ui 1000
Impulse withstand voltage (kV)	Uimp 12
Rated operational voltage (V AC 50/60 Hz)	Ue 690
Suitability for isolation	IEC 60947-2 
Degree of pollution	IEC 60664-1 3

Circuit-breaker characteristics as per IEC 60947-2

Rated current (A)	In	at 40 °C/50 °C ⁽¹⁾
Sensor ratings (A)		
Type of circuit breaker		
Ultimate breaking capacity (kA rms) V AC 50/60 Hz	Icu	220/415 V 440 V 525 V 690 V
Rated service breaking capacity (kA rms)	Ics	% Icu
Utilisation category		
Rated short-time withstand current (kA rms) V AC 50/60 Hz	Icw	0.5 s 1 s 3 s
Integrated instantaneous protection (kA peak ±10 %)		
Rated making capacity (kA peak) V AC 50/60 Hz	Icm	220/415 V 440 V 525 V 690 V
Break time (ms) between tripping order and arc extinction		
Closing time (ms)		

Circuit-breaker characteristics as per NEMA AB1

Breaking capacity (kA) V AC 50/60 Hz	240 V 480 V 600 V
---	-------------------------

Mechanical and electrical durability as per IEC 60947-2/3 at In/Ie

Service life	Mechanical	without maintenance	
C/O cycles x 1000			
Type of circuit breaker			
Rated current		In (A)	
C/O cycles x 1000	Electrical	without maintenance	440 V ⁽⁴⁾ 690 V
IEC 60947-2			
Type of circuit breaker			
Rated operational current		Ie (A)	AC23A
C/O cycles x 1000	Electrical	without maintenance	440 V ⁽⁴⁾ 690V
IEC 60947-3			
Type of circuit breaker			
Rated operational current		Ie (A)	AC3⁽⁵⁾
Motor power			380/415 V (kW) 440 V (kW)
C/O cycles x 1000	Electrical	without maintenance	440 V ⁽⁴⁾ 690 V
IEC 60947-3 Annex M/IEC 60947-4-1			

(1) 50 °C: rear vertical connected. Refer to temperature derating tables for other connection types.

(2) See the current-limiting curves in the "additional characteristics" section.

(3) SELLIM system.

(4) Available for 480 V NEMA.

(5) Suitable for motor control (direct-on-line starting).

Sensor selection

Sensor rating (A)	400	630	800	1000	1250	1600
Ir threshold setting(A)	160 to 400	250 to 630	320 to 800	400 to 1000	500 to 1250	640 to 1600

NT06			NT08			NT10			NT12		NT16	
630			800			1000			1250		1600	
400 to 630			400 to 800			400 to 1000			630 to 1250		800 to 1600	
H1	H2	L1 ⁽²⁾							H1	H2		
42	50	150							42	50		
42	50	130							42	50		
42	42	100							42	42		
42	42	25							42	42		
100 %									100 %			
B	B	A							B	B		
42	36	10							42	36		
42	36	-							42	36		
24	20	-							24	20		
-	90	10 x In ⁽³⁾							-	90		
88	105	330							88	105		
88	105	286							88	105		
88	88	220							88	88		
88	88	52							88	88		
25	25	9							25	25		
< 50									< 50			
42 50 150									42 50			
42 50 100									42 50			
42 42 25									42 42			
12,5												
H1	H2	L1	H1	H2	L1	H1	H2	L1	H1/H2	H1/H2		
630			800			1000			1250		1600	
6	6	3	6	6	3	6	6	3	6	3		
3	3	2	3	3	2	3	3	2	3	1		
H1/H2									H1/H2	H1/H2		
630			800			1000			1250		1600	
6			6			6			6		6	
3			3			3			3		3	
H1/H2									H1/H2	H1/H2		
500			630			800			1000		1000	
≤ 250			250 to 335			335 to 450			450 to 560		450 to 560	
≤ 300			300 to 400			400 to 500			500 to 630		500 to 630	
6												
-												


Circuit breakers and switch-disconnectors

NW08 to NW40 NAVY

PB101676A00_SE



Common characteristics

Number of poles	3
Rated insulation voltage (V)	Ui 1000
Impulse withstand voltage (kV)	Uimp 12
Rated operational voltage (V AC 50/60 Hz)	Ue 690
Suitability for isolation	IEC 60947-2 
Degree of pollution	IEC 60664-1 4 (1000 V) / 3 (1250 V)

Circuit-breaker characteristics as per IEC 60947-2

Rated current (A)	at 40 °C / 50 °C ⁽¹⁾
Sensor ratings (A)	

Type of circuit breaker

Ultimate breaking capacity (kA rms) V AC 50/60 Hz	Icu	220/415/440 V 525 V 690 V
Rated service breaking capacity (kA rms)	Ics	% Icu
Utilisation category		
Rated short-time withstand current (kA rms) V AC 50/60 Hz	Icw	1 s 3 s
Integrated instantaneous protection (kA peak ±10 %)		
Rated making capacity (kA peak) V AC 50/60 Hz	Icm	220/415/440 V 525 V 690 V

Break time (ms) between tripping order and arc extinction

Closing time (ms)

Circuit-breaker characteristics as per NEMA AB1

Breaking capacity (kA) V AC 50/60 Hz	240/480 V 600 V
---	--------------------

Unprotected circuit-breaker characteristics:

Tripping by shunt trip as per IEC 60947-2

Type of circuit breaker

Ultimate breaking capacity (kA rms) V AC 50/60 Hz	Icu	220...690 V
Rated service breaking capacity (kA rms)	Ics	% Icu
Rated short-time withstand current (kA rms)	Icw	1 s 3 s

Overload and short-circuit protection

External protection relay: short-circuit protection, maximum delay: 350 ms ⁽²⁾

Rated making capacity (kA peak) V AC 50/60 Hz	Icm	220...690 V
---	------------	-------------

Switch-disconnector characteristics as per IEC 60947-3 and Annex A

Type of switch-disconnector

Rated making capacity (kA peak) AC23A/AC3 category V AC 50/60 Hz	Icm	220...690 V
Rated short-time withstand current (kA rms) AC23A/AC3 category V AC 50/60 Hz	Icw	1 s 3 s

Mechanical and electrical durability as per IEC 60947-2/3 at In/Ie

Service life	Mechanical	with maintenance	
C/O cycles x 1000		without maintenance	

Type of circuit breaker

Rated current		In (A)	
C/O cycles x 1000	Electrical	without maintenance	440 V ⁽³⁾
IEC 60947-2			690 V

Type of circuit breaker or switch-disconnector

Rated operational current		Ie (A)	AC23A
C/O cycles x 1000	Electrical	without maintenance	440 V ⁽³⁾
IEC 60947-3			690 V

Type of circuit breaker or switch-disconnector

Rated operational current		Ie (A)	AC3 ⁽⁴⁾
Motor power			380/415 V (kW) 440 V ⁽³⁾ (kW) 690 V (kW)
C/O cycles x 1000	Electrical	without maintenance	440/690 V ⁽³⁾
IEC 60947-3 Annex M/IEC 60947-4-1			

⁽¹⁾ 50 °C: rear vertical connected. Refer to temperature derating tables for other connection types.

⁽²⁾ External protection must comply with permissible thermal constraints of the circuit breaker (please consult us). No fault-trip indication by the SDE or the reset button.

⁽³⁾ Available for 480 V NEMA.

⁽⁴⁾ Suitable for motor control (direct-on-line starting).

Sensor selection

Sensor rating (A)	400	630	800	1000	1250	1600	2000	2500	3200	4000
Ir threshold setting(A)	160 to 400	250 to 630	320 to 800	400 to 1000	500 to 1250	630 to 1600	800 to 2000	1000 to 2500	1250 to 3200	1600 to 4000

NW08	NW10	NW12	NW16	NW20	NW25	NW32	NW40
800	1000	1250	1600	2000	2500	3200	4000
400 to 800	400 to 1000	630 to 1250	800 to 1600	1000 to 2000	1250 to 2500	1600 to 3200	2000 to 4000
N1	H1	H2		H1	H2	H1	H2
42	65	100		65	100	65	100
42	65	85		65	85	65	85
42	65	85		65	85	65	85
100 %				100 %		100 %	
B				B		B	
42	65	85		65	85	65	85
22	36	50		36	75	65	75
-	-	190		-	190	-	190
88	143	220		143	220	143	220
88	143	187		143	187	143	187
88	143	187		143	187	143	187
25	25	25		25	25	25	25
< 70				< 70		< 70	

42	65	100	65	100	65	100
42	65	85	65	85	65	85

HA	HA	HA
50	50	55
100 %	100 %	100 %
50	50	55
36	36	55
-	-	-
105	105	121

NW08/NW10/NW12	NW16	NW20	NW25/NW32/NW40
HA	HA	HA	HA
105	105	105	121
-	-	-	-
50	50	50	55
36	36	36	55

25	20
12,5	10
N1/H1/H2	H1/H2
800/1000/1250/1600	2000
10	8
10	6
H1/H2/HA	H1/H2/HA
800/1000/1250/1600	2000
10	8
10	6
H1/H2/HA	H1/H2/HA
800	1000
335 to 450	450 to 560
400 to 500	500 to 630
≤ 800	800 to 1000
1250	1600
560 to 670	670 to 900
500 to 800	800 to 1000
1000 to 1250	1250 to 1600
2000	2500/3200/4000
900 to 1150	5
1000 to 1300	2.5
1600 to 2000	2.5
6	

All Masterpact NAVY circuit breakers are equipped with a Micrologic control unit. Control units are designed to protect Power circuits and loads. Alarms may be programmed for remote indications. Measurements of current, voltage, frequency, power and power quality optimise continuity of service and energy management.

Dependability

Integration of protection functions in an ASIC electronic component used in all Micrologic control units guarantees a high degree of reliability and immunity to conducted or radiated disturbances. On Micrologic A, P and H control units, advanced functions are managed by an independent microprocessor.

Accessories

Certain functions require the addition of Micrologic control unit accessories, described on page page A-20. The rules governing the various possible combinations can be found in the electronic catalogue (E-catalogue) accessible via the Products menu of the www.schneider-electric.com web site.

Micrologic name codes



X: type of protection

- 2 for basic protection
- 5 for selective protection.

Y: control-unit generation

Identification of the control-unit generation. "0" signifies the first generation.

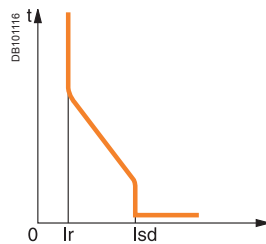
Z: type of measurement

- A for "ammeter"
- P for "power meter"
- H for "harmonic meter".



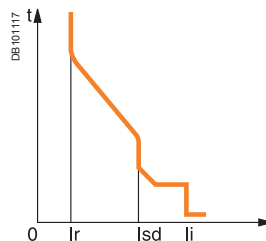
Current protection

Micrologic 2: basic protection



Protection:
long time
+ instantaneous

Micrologic 5: basic protection



Protection:
long time
+ short time
+ instantaneous

Measurements and programmable protection

A: ammeter

- $I_1, I_2, I_3, I_N, I_{\text{earth-fault}}, I_{\text{earth-leakage}}$ and maximeter for these measurements
- Fault indications
- Settings in amperes and in seconds.

P: A + power meter + programmable protection

- Measurements of V, A, W, VAR, VA, Wh, VARh, VAh, Hz, $V_{\text{peak}}, A_{\text{peak}}$, power factor and maximeters and minimeters
- IDMTL long-time protection, minimum and maximum voltage and frequency, voltage and current imbalance, phase sequence, reverse power
- Load shedding and reconnection depending on power or current
- Measurements of interrupted currents, differentiated fault indications, maintenance indications, event histories and time-stamping, etc.

H: P + harmonics

- Power quality: fundamentals, distortion, amplitude and phase of harmonics up to the 31st order
- Waveform capture after fault, alarm or on request
- Enhanced alarm programming: thresholds and actions.

2.0 A



5.0 A



5.0 P



5.0 H



Micrologic A control units protect power circuits. They also offer measurements, display, communication and current maximeters

“Ammeter” measurements

Micrologic A control units measure the true rms value of currents. They provide continuous current measurements from 0.2 to 20 I_n and are accurate to within 1.5% (including the sensors). A digital LCD screen continuously displays the most heavily loaded phase (I_{max}) or displays the $I_1, I_2, I_3, I_N, I_g, I_{\Delta n}$ stored-current (maximeter) and setting values by successively pressing the navigation button. The optional external power supply makes it possible to display currents < 20 % I_n . Below 0.05 I_n , measurements are not significant. Between 0.05 and 0.2 I_n , accuracy is to within 0.5% I_n + 1.5% of the reading.

Communication option

In conjunction with the COM communication option, the control unit transmits the following:

- setting values
- all “ammeter” measurements
- tripping causes
- maximeter reset.

Protection settings

Protection thresholds and delays are set using the adjustment dials. The selected values are momentarily displayed in amperes and in seconds.

Overload protection

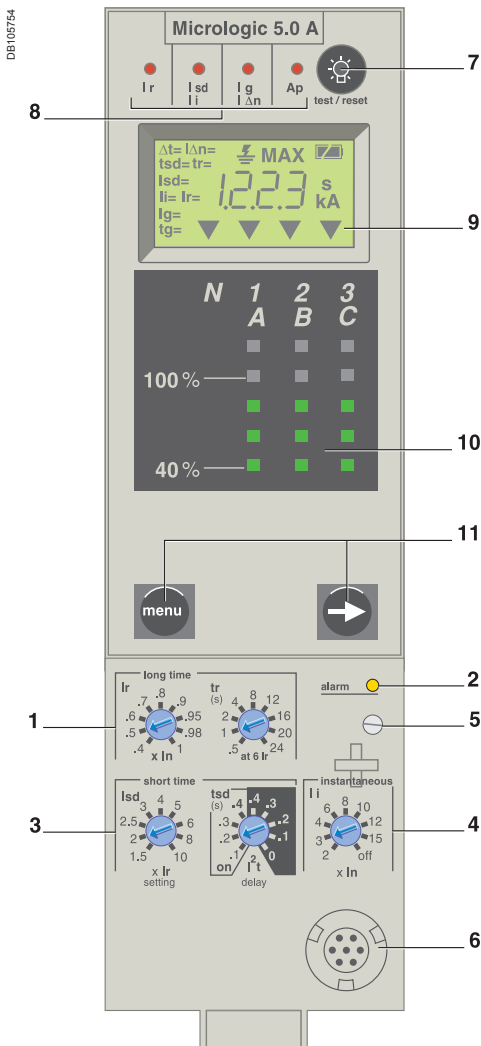
True rms long-time protection. Thermal memory: thermal image before and after tripping. Setting accuracy may be enhanced by limiting the setting range using a different long-time rating plug. The long-time rating plug “OFF” enables to cancel the overload protection.

Short-circuit protection

Short-time (rms) and instantaneous protection. Selection of I^2t type (ON or OFF) for short-time delay.

Zone selective interlocking (ZSI)

A ZSI terminal block may be used to interconnect a number of control units to provide total discrimination for short-time and earth-fault protection, without a delay before tripping.



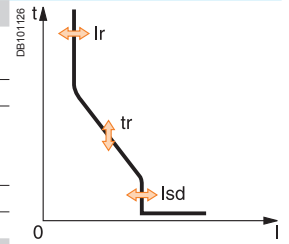
- 1 Long-time current setting and tripping delay.
- 2 Overload signal (LED) at 1.125 I_r .
- 3 Short-time pick-up and tripping delay.
- 4 Instantaneous pick-up.
- 5 Long-time rating plug screw.
- 6 Test connector.
- 7 Lamp test, reset and battery test.
- 8 Indication of tripping cause.
- 9 Digital display.
- 10 Three-phase bargraph and ammeter.
- 11 Navigation buttons.

Note: Micrologic A control units come with a transparent lead-seal cover as standard.



Protection Micrologic 2.0 A

Long time		Micrologic 2.0 A									
Current setting (A)	$I_r = I_n \times \dots$	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1	
Tripping between 1.05 and 1.20 x I_r		Other ranges or disable by changing long-time rating plug									
Time setting		tr (s)	0.5	1	2	4	8	12	16	20	24
Time delay (s)	Accuracy: 0 to -30 %	1.5 x I_r	12.5	25	50	100	200	300	400	500	600
	Accuracy: 0 to -20 %	6 x I_r	0.7 ⁽¹⁾	1	2	4	8	12	16	20	24
	Accuracy: 0 to -20 %	7.2 x I_r	0.7 ⁽²⁾	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6
Thermal memory		20 minutes before and after tripping									
(1) 0 to -40 % - (2) 0 to -60 %											
Instantaneous		Micrologic 2.0 A									
Pick-up (A)	$I_{sd} = I_r \times \dots$	1.5	2	2.5	3	4	5	6	8	10	
Accuracy: $\pm 10\%$											
Time delay		Max resettable time: 20 ms Max break time: 80 ms									



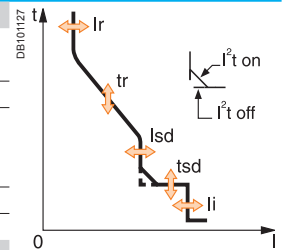
Ammeter Micrologic 2.0 A

Continuous current measurements		Micrologic 2.0 A			
Display from 20 to 200 % of I_n		I1	I2	I3	IN
Accuracy: 1.5 % (including sensors)		No auxiliary source (where $I > 20\% I_n$)			
Maximeters		I1 max	I2 max	I3 max	IN max



Protection Micrologic 5.0 A

Long time		Micrologic 5.0 / 6.0 / 7.0 A										
Current setting (A)	$I_r = I_n \times \dots$	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1		
Tripping between 1.05 and 1.20 x I_r		Other ranges or disable by changing long-time rating plug										
Time setting		tr (s)	0.5	1	2	4	8	12	16	20	24	
Time delay (s)	Accuracy: 0 to -30 %	1.5 x I_r	12.5	25	50	100	200	300	400	500	600	
	Accuracy: 0 to -20 %	6 x I_r	0.7 ⁽¹⁾	1	2	4	8	12	16	20	24	
	Accuracy: 0 to -20 %	7.2 x I_r	0.7 ⁽²⁾	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6	
Thermal memory		20 minutes before and after tripping										
(1) 0 to -40 % - (2) 0 to -60 %												
Short time		Micrologic 5.0 A										
Pick-up (A)	$I_{sd} = I_r \times \dots$	1.5	2	2.5	3	4	5	6	8	10		
Accuracy: $\pm 10\%$												
Time setting tsd (s)	Settings	I^2t Off	0	0.1	0.2	0.3	0.4					
		I^2t On	-	0.1	0.2	0.3	0.4					
Time delay (ms) at 10 x I_r (I^2t Off or I^2t On)	tsd (max resettable time)	20	80	140	230	350						
	tsd (max break time)	80	140	200	320	500						
Instantaneous		Micrologic 5.0 A										
Pick-up (A)	$I_i = I_n \times \dots$	2	3	4	6	8	10	12	15	off		
Accuracy: $\pm 10\%$												
Time delay		Max resettable time: 20 ms Max break time: 50 ms										

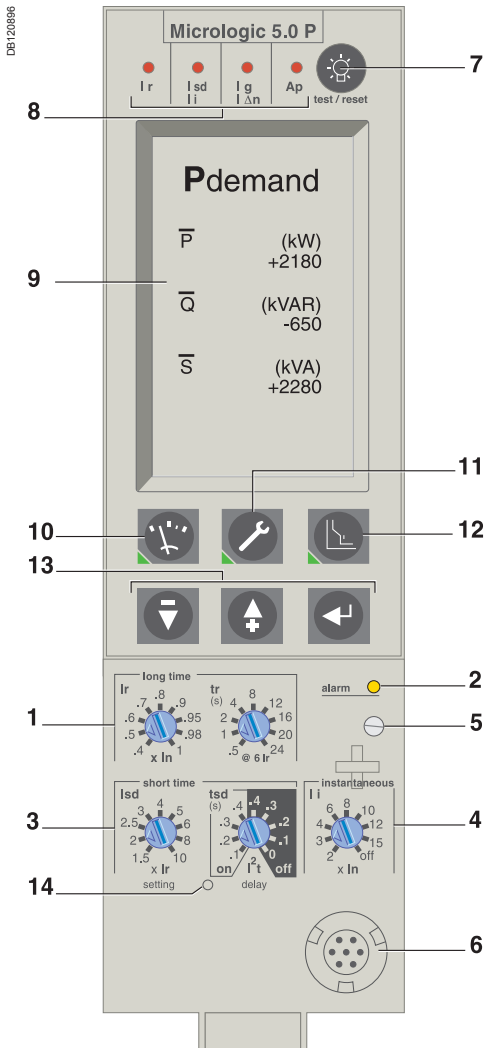


Ammeter Micrologic 5.0 A

Continuous current measurements		Micrologic 5.0 A					
Display from 20 to 200 % of I_n		I1	I2	I3	IN	Ig	$I\Delta n$
Accuracy: 1.5 % (including sensors)		No auxiliary source (where $I > 20\% I_n$)					
Maximeters		I1 max	I2 max	I3 max	IN max	Ig max	$I\Delta n$ max

Note: All current-based protection functions require no auxiliary source.
The test / reset button resets maximeters, clears the tripping indication and tests the battery.

Micrologic P control units include all the functions offered by Micrologic A.
In addition, they measure voltages and calculate power and energy values.



- 1 Long-time current setting and tripping delay.
- 2 Overload signal (LED).
- 3 Short-time pick-up and tripping delay.
- 4 Instantaneous pick-up.
- 5 Long-time rating plug screw.
- 6 Test connector.
- 7 Lamp + battery test and indications reset.
- 8 Indication of tripping cause.
- 9 High-resolution screen.
- 10 Measurement display.
- 11 Maintenance indicators.
- 12 Protection settings.
- 13 Navigation buttons.
- 14 Hole for settings lockout pin on cover.

Protection..... +

Protection settings

The adjustable protection functions are identical to those of Micrologic A overloads, short-circuits.

Fine adjustment

Within the range determined by the adjustment dial, fine adjustment of thresholds (to within one ampere) and time delays (to within one second) is possible on the keypad or remotely using the COM option.

IDMTL (Inverse Definite Minimum Time lag) setting

Coordination with fuse-type or medium-voltage protection systems is optimised by adjusting the slope of the overload-protection curve. This setting also ensures better operation of this protection function with certain loads.

Programmable alarms and other protection

Depending on the thresholds and time delays set using the keypad or remotely using the COM option, the Micrologic P control unit monitors currents and voltage, power, frequency and the phase sequence. Each threshold overrun is signalled remotely via the COM option. Each threshold overrun may be combined with tripping (protection).

Load shedding and reconnection

Load shedding and reconnection parameters may be set according to the power or the current flowing through the circuit breaker. Load shedding is carried out by a supervisor via the COM option.

Communication option (COM)

The communication option may be used to:

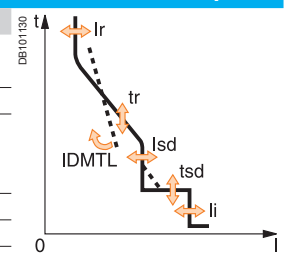
- remotely read and set parameters for the protection functions
- transmit all the calculated indicators and measurements
- signal the causes of tripping and alarms
- consult the history files and the maintenance-indicator register
- maximeter reset.

An event log and a maintenance register, stored in control-unit memory but not available locally, may be accessed in addition via the COM option.

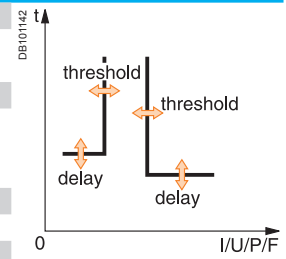
Note: Micrologic P control units come with a non-transparent lead-seal cover as standard.



Protection		Micrologic 5.0									
Long time (rms)		Micrologic 5.0 P									
Current setting (A)	$I_r = I_n \times \dots$	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1	
Tripping between 1.05 and 1.20 x I_r		Other ranges or disable by changing long-time rating plug									
Time setting		tr (s)	0.5	1	2	4	8	12	16	20	24
Time delay (s)	Accuracy: 0 to -30 %	1.5 x I_r	12.5	25	50	100	200	300	400	500	600
	Accuracy: 0 to -20 %	6 x I_r	0.7 ⁽¹⁾	1	2	4	8	12	16	20	24
	Accuracy: 0 to -20 %	7.2 x I_r	0.7 ⁽²⁾	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6
IDMTL setting	Curve slope		SIT	VIT	EIT	HVFuse	DT				
Thermal memory			20 minutes before and after tripping								
(1) 0 to -40 % - (2) 0 to -60 %											
Short time (rms)											
Pick-up (A)	$I_{sd} = I_r \times \dots$	1.5	2	2.5	3	4	5	6	8	10	
Accuracy: ±10 %											
Time setting t_{sd} (s)	Settings	I^2t Off	0	0.1	0.2	0.3	0.4				
		I^2t On	-	0.1	0.2	0.3	0.4				
Time delay (ms) at 10 I_r	t_{sd} (max resettable time)	20	80	140	230	350					
(I^2t Off or I^2t On)	t_{sd} (max break time)	80	140	200	320	500					
Instantaneous											
Pick-up (A)	$I_i = I_n \times \dots$	2	3	4	6	8	10	12	15	off	
Accuracy: ±10 %											
Time delay		Max resettable time: 20 ms Max break time: 50 ms									

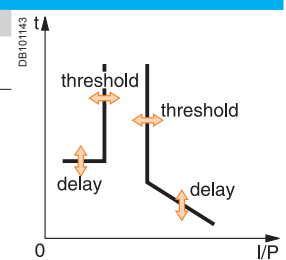


Alarms and other protection		Micrologic 5.0 P	
Current		Threshold	Delay
Current unbalance	$I_{unbalance}$	0.05 to 0.6 Iaverage	1 to 40 s
Maximum average current	I_{max demand} : I1, I2, I3, IN	0.2 In to In	15 to 1500 s
Voltage			
Voltage unbalance	$U_{unbalance}$	2 to 30 % x Uaverage	1 to 40 s
Minimum voltage	U_{min}	100 to U _{max}	1.2 to 10 s
Maximum voltage ⁽³⁾	U_{max}	U _{min} to 1200	1.2 to 10 s
Power			
Reverse power	rP	5 to 500 kW	0.2 to 20 s
Frequency			
Minimum frequency	F_{min}	45 to F _{max}	1.2 to 5 s
Maximum frequency	F_{max}	F _{min} to 440 Hz	1.2 to 5 s
Phase sequence			
Sequense (alarm)	$\Delta\emptyset$	$\emptyset 1/2/3$ or $\emptyset 1/3/2$	0.3 s

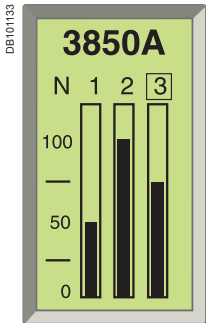


Load shedding and reconnection		Micrologic 5.0 P	
Measured value		Threshold	Delay
Current	I	0.5 to 1 I_r per phases	20 % tr to 80 % tr
Power	P	200 kW to 10 MW	10 to 3600 s

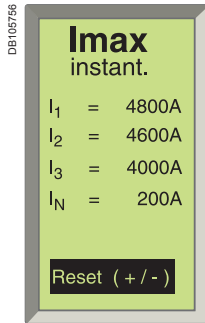
(3) For 690 V applications, a step-down transformer must be used if the voltage exceeds the nominal value of 690 V by more than 10 %.



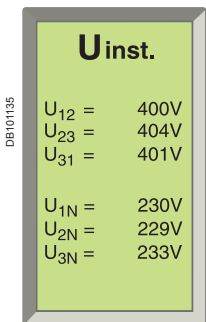
Note: all current-based protection functions require no auxiliary source.
Voltage-based protection functions are connected to AC power via a voltage measurement input built into the circuit breaker.



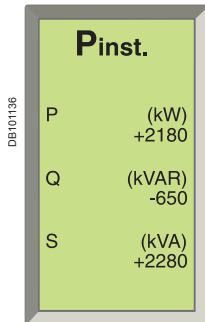
Default display.



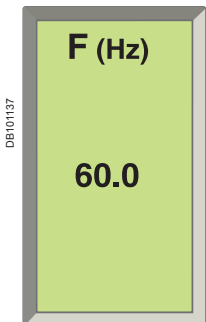
Display of a maximum current.



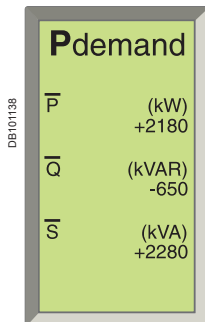
Display of a voltage.



Display of a power.



Display of a frequency.



Display of a demand power.



Power View software.

Measurements

The Micrologic P control unit calculates in real time all the electrical values (V, A, W, VAR, VA, Wh, VARh, VAh, Hz), power factors and $\cos \phi$ factors.

The Micrologic P control unit also calculates demand current and demand power over an adjustable time period. Each measurement is associated with a minimeter and a maximeter.

In the event of tripping on a fault, the interrupted current is stored. The optional external power supply makes it possible to display the value with the circuit breaker open or not supplied.

Instantaneous values

The value displayed on the screen is refreshed every second.

Minimum and maximum values of measurements are stored in memory (minimeters and maximeters).minimètres).

Currents				
I rms	A	1	2	3
I max rms	A	1	2	3
Voltages				
U rms	V	12	23	31
V rms	V	1N	2N	3N
U average rms	V	(U12 + U23 + U31) / 3		
U unbalance	%			
Power, energy				
P active, Q reactive, S apparent	W, Var, VA	Totals		
E active, E reactive, E apparent	Wh, VARh, VAh	Totals consumed - supplied		
		Totals consumed		
		Totals supplied		
Power factor	PF	Total		
Frequencies				
F	Hz			

Demand metering

The demand is calculated over a fixed or sliding time window that may be programmed from 5 to 60 minutes. According to the contract signed with the power supplier, an indicator associated with a load shedding function makes it possible to avoid or minimise the costs of overrunning the subscribed power. Maximum demand values are systematically stored and time stamped (maximeter).

Currents				
I demand	A	1	2	3
I max demand	A	1	2	3
Power				
P, Q, S demand	W, Var, VA	Totals		
P, Q, S max demand	W, Var, VA	Totals		

Minimeters and maximeters

Only the current and power maximeters may be displayed on the screen.

Time-stamping

Time-stamping is activated as soon as time is set manually or by a supervisor. No external power supply module is required (max. drift of 1 hour per year).

Reset

An individual reset, via the keypad or remotely, acts on alarms, minimum and maximum data, peak values, the counters and the indicators.

Additional measurements accessible with the COM option

Some measured or calculated values are only accessible with the COM communication option:

- $I_{peak} / \sqrt{2}$, $(I_1 + I_2 + I_3) / 3$, I unbalance
- load level in % I_r
- total power factor.

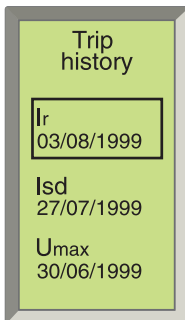
The maximeters and minimeters are available only via the COM option for use with a supervisor.

Additional info

Accuracy of measurements (including sensors):

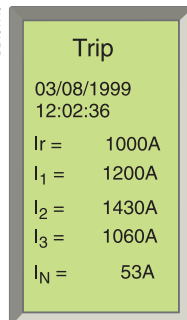
- voltage (V) 0.5 %
- current (A) 1.5 %
- frequency (Hz) 0.1 %
- power (W) and energy (Wh) 2 %.

DB101139



Display of a tripping history.

DB101140



Display after tripping.

Histories and maintenance indicators

The last ten trips and alarms are recorded in two separate history files that may be displayed on the screen:

- tripping history:
 - type of fault
 - date and time
 - values measured at the time of tripping (interrupted current, etc.)
- alarm history:
 - type of alarm
 - date and time
 - values measured at the time of the alarm.

All the other events are recorded in a third history file which is only accessible through the communication network.

- Event log history (only accessible through the communication network)
 - modifications to settings and parameters
 - counter resets
 - system faults:
 - fallback position
 - thermal self-protection
 - loss of time
 - overrun of wear indicators
 - test-kit connections
 - etc.

Note:

All the events are time stamped: time-stamping is activated as soon as time is set manually or by a supervisor. No external power supply module is required (max. drift of 1 hour per year).

Maintenance indicators (with COM option)

A number of maintenance indicators may be called up on the screen to better plan for device maintenance:

- contact wear
- operation counter:
 - cumulative total
 - total since last reset.

Additional maintenance indicators are also available through the COM network, and can be used as an aid in troubleshooting:

- highest current measured
- number of test-kit connections
- number of trips in operating mode and in test mode.

Additional technical characteristics

Safety

Measurement functions are independent of the protection functions. The high-accuracy measurement module operates independently of the protection module.

Simplicity and multi-language

Navigation from one display to another is intuitive. The six buttons on the keypad provide access to the menus and easy selection of values. When the setting cover is closed, the keypad may no longer be used to access the protection settings, but still provides access to the displays for measurements, histories, indicators, etc. Micrologic is also multi-language, including the following languages: English, Spanish, Portuguese, Russian, Chinese, French, German...

Intelligent measurement

Measurement-calculation mode:

- energies are calculated on the basis of the instantaneous power values, in two manners:
 - the traditional mode where only positive (consumed) energies are considered
 - the signed mode where the positive (consumed) and negative (supplied) energies are considered separately
- measurement functions implement the new “zero blind time” concept which consists in continuously measuring signals at a high sampling rate. The traditional “blind window” used to process samples no longer exists. This method ensures accurate energy calculations even for highly variable loads (welding machines, robots, etc.).

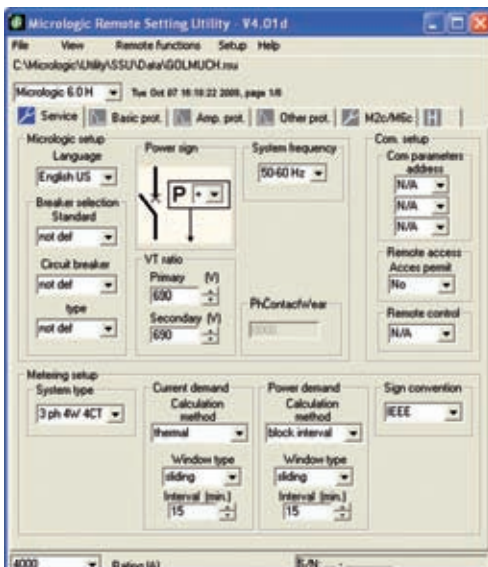
Always powered

All current-based protection functions require no auxiliary source. Voltage-based protection functions are connected to AC power via a voltage measurement input built into the circuit breaker.

Stored information

The fine setting adjustments, the last 100 events and the maintenance register remain in the control-unit memory even when power is lost.

DB120570A



RSU configuration screen for a Micrologic.

Micrologic H control units include all the functions offered by Micrologic P. Integrating significantly enhanced calculation and memory functions, the Micrologic H control unit offers in-depth analysis of power quality and detailed event diagnostics. It is intended for operation with a supervisor.

In addition to the Micrologic P functions, the Micrologic H control unit offers:

- in-depth analysis of power quality including calculation of harmonics and the fundamentals
- diagnostics aid and event analysis through waveform capture
- enhanced alarm programming to analyse and track down a disturbance on the AC power system.

Measurements

The Micrologic H control unit offers all the measurements carried out by Micrologic P, with in addition:

- phase by phase measurements of:
 - power, energy
 - power factors
- calculation of:
 - current and voltage total harmonic distortion (THD)
 - current, voltage and power fundamentals
 - current and voltage harmonics up to the 31st order.

Instantaneous values displayed on the screen

Currents							
I rms	A	1	2	3			
I max rms	A	1	2	3			
Voltages							
U rms	V	12	23	31			
V rms	V	1N	2N	3N			
U average rms	V	(U12 + U23 + U31) / 3					
U unbalance	%						
Power, energy							
P active, Q reactive, S apparent	W, Var, VA	Totals	1	2	3		
E active, E reactive, E apparent	Wh, VARh, VAh	Totals consumed - supplied					
		Totals consumed					
		Totals supplied					
Power factor	PF	Total	1	2	3		
Frequencies							
F	Hz						
Power-quality indicators							
Total fundamentals		U	I	P	Q	S	
THD	%	U	I				
U and I harmonics	Amplitude	3	5	7	9	11	13

Harmonics 3, 5, 7, 9, 11 and 13, monitored by electrical utilities, are displayed on the screen.

Demand measurements

Similar to the Micrologic P control unit, the demand values are calculated over a fixed or sliding time window that may be set from 5 to 60 minutes.

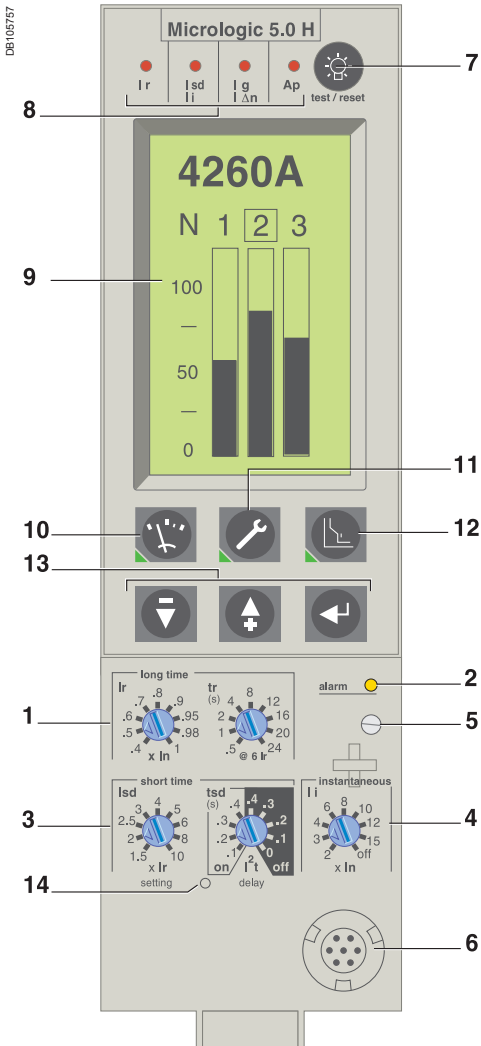
Currents				
I demand	A	1	2	3
I max demand	A	1	2	3
Power				
P, Q, S demand	W, Var, VA	Totals		
P, Q, S max demand	W, Var, VA	Totals		

Maximeters

Only the current maximeters may be displayed on the screen.

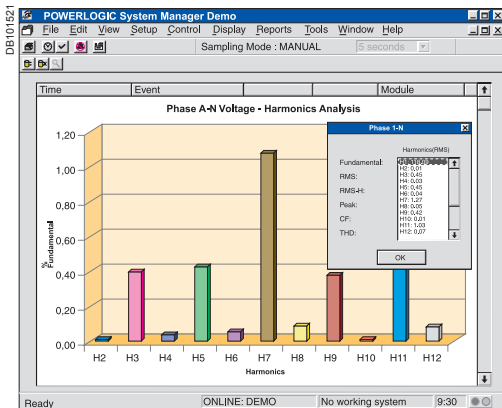
Histories and maintenance indicators

These functions are identical to those of the Micrologic P.

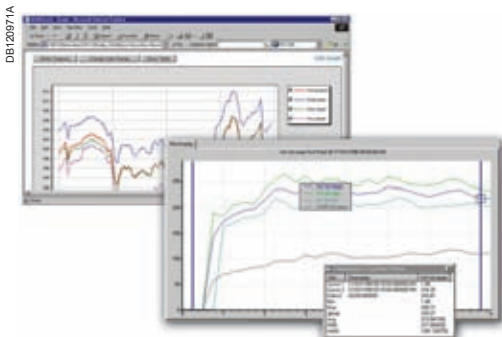


- 1 Long-time current setting and tripping delay.
- 2 Overload signal (LED).
- 3 Short-time pick-up and tripping delay.
- 4 Instantaneous pick-up.
- 5 Long-time rating plug screw.
- 6 Test connector.
- 7 Lamp + battery test and indications reset.
- 8 Indication of tripping cause.
- 9 High-resolution screen.
- 10 Measurement display.
- 11 Maintenance indicators.
- 12 Protection settings.
- 13 Navigation buttons.
- 14 Hole for settings lockout pin on cover.

Note: Micrologic H control units come with a non-transparent lead-seal cover as standard.



Display of harmonics up to 12 th order.



Label	N°	Stat	Pu. val	Unit	Pu. city	Do. val	Unit	Do. city	Log
Over Current Phase A	1	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Current Phase B	2	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Current Phase C	3	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Neutral Current	4	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Ground Current	5	Off	N/A	A	N/A	N/A	A	N/A	Off
Under Current Phase A	6	Off	N/A	A	N/A	N/A	A	N/A	Off
Under Current Phase B	7	Off	N/A	A	N/A	N/A	A	N/A	Off
Under Current Phase C	8	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Current Unbalan.	9	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Current Unbalan.	10	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Current Unbalan.	11	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Voltage Phase A	12	Off	N/A	V	N/A	N/A	V	N/A	Off
Over Voltage Phase B	13	Off	N/A	V	N/A	N/A	V	N/A	Off
Over Voltage Phase C	14	Off	N/A	V	N/A	N/A	V	N/A	Off
Under Voltage Phase A	15	Off	N/A	V	N/A	N/A	V	N/A	Off
Under Voltage Phase B	16	Off	N/A	V	N/A	N/A	V	N/A	Off
Under Voltage Phase C	17	Off	N/A	V	N/A	N/A	V	N/A	Off
Over Voltage Unbalan.	18	Off	N/A	%	N/A	N/A	%	N/A	Off
Over Voltage Unbalan.	19	Off	N/A	%	N/A	N/A	%	N/A	Off
Over Voltage Unbalan.	20	Off	N/A	%	N/A	N/A	%	N/A	Off
Over kVA 3ph Total	21	Off	N/A	kVA	N/A	N/A	kVA	N/A	Off
Over kW Into the Load	22	Off	N/A	kW	N/A	N/A	kW	N/A	Off
Over kW Out of the Load	23	Off	N/A	kW	N/A	N/A	kW	N/A	Off

Log.

With the communication option

Additional measurements, maximeters and minimeters

Certain measured or calculated values are only accessible with the COM communication option:

- $I_{peak} / \sqrt{2} (I_1 + I_2 + I_3) / 3, I_{unbalance}$
 - load level in % Ir
 - power factor (total and per phase)
 - voltage and current THD
 - K factors of currents and average K factor
 - crest factors of currents and voltages
 - all the fundamentals per phase
 - fundamental current and voltage phase displacement
 - distortion power and distortion factor phase by phase
 - amplitude and displacement of current and voltage harmonics 3 to 31.
- The maximeters and minimeters are available only via the COM option for use with a supervisor.

Waveform capture

The Micrologic H control unit stores the last 4 cycles of each instantaneous current or voltage measurement. On request or automatically on programmed events, the control unit stores the waveforms. The waveforms may be displayed in the form of oscillograms by a supervisor via the COM option. Definition is 64 points per cycle.

Pre-defined analogue alarms (1 to 53)

Each alarm can be compared to user-set high and low thresholds. Overrun of a threshold generates an alarm. An alarm or combinations of alarms can be linked to programmable action such as selective recording of measurements in a log, waveform capture, etc.

Event log and maintenance registers

The Micrologic H offers the same event log and maintenance register functions as the Micrologic P. In addition, it produces a log of the minimums and maximums for each "real-time" value.

Additional technical characteristics

Setting the display language

System messages may be displayed in six different languages. The desired language is selected via the keypad.

Protection functions

All current-based protection functions require no auxiliary source. Voltage-based protection functions are connected to AC power via a voltage measurement input built into the circuit breaker.

Measurement functions

Measurement functions are independent of the protection functions.

The high-accuracy measurement module operates independently of the protection module, while remaining synchronised with protection events.

Measurement-calculation mode

An analogue calculation function dedicated to measurements enhances the accuracy of harmonic calculations and the power-quality indicators. The Micrologic H control unit calculates electrical magnitudes using 1.5 x In dynamics (20 x In for Micrologic P).

Measurement functions implement the new "zero blind time" concept

Energies are calculated on the basis of the instantaneous power values, in the traditional and signed modes.

Harmonic components are calculated using the discrete Fourier transform (DFT).

Accuracy of measurements (including sensors)

- voltage (V) 0.5 %
- current (A) 1.5 %
- frequency (Hz) 0.1 %
- power (W) and energy (Wh) 2 %
- total harmonic distortion 1 %.

Stored information

The fine-setting adjustments, the last 100 events and the maintenance register remain in the control-unit memory even when power is lost.

Time-stamping

Time-stamping is activated as soon as time is set manually or by a supervisor no external power supply module is required (max. drift of 1 hour per year).

Reset

An individual reset, via the keypad or remotely, acts on alarms, minimum and maximum data, peak values, the counters and the indicators.



External sensors

Voltage measurement inputs

Voltage measurement inputs are required for power measurements (Micrologic P or H). As standard, the control unit is supplied by internal voltage measurement inputs placed downstream of the pole for voltages between 220 and 690 V AC. On request, it is possible to replace the internal voltage measurement inputs by an external voltage input (PTE option) which enables the control unit to draw power directly from the distribution system upstream of the circuit breaker. An 3 m cable with ferrite comes with this PTE option.

Long-time rating plug

Four interchangeable plugs may be used to limit the long-time threshold setting range for higher accuracy.

The time delay settings indicated on the plugs are for an overload of 6 Ir.

As standard, control units are equipped with the 0.4 to 1 plug.

Setting ranges										
Standard	$I_r = I_n \times \dots$	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1
Low-setting option	$I_r = I_n \times \dots$	0.4	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.8
High-setting option	$I_r = I_n \times \dots$	0.80	0.82	0.85	0.88	0.90	0.92	0.95	0.98	1
Off plug		No long-time protection ($I_r = I_n$ for lsd setting)								

Important: long-time rating plugs must always be removed before carrying out insulation or dielectric withstand tests.

External 24 V DC power-supply module

The external power-supply module makes it possible to use the display even if the circuit breaker is open or not supplied (for the exact conditions of use, see the “electrical diagrams” part of this catalogue).

This module powers both the control unit (100 mA).

If the COM communication option is used, the communication bus requires its own 24 V DC power supply, independent with respect to that of the Micrologic control unit. With the Micrologic A control unit, this module makes it possible to display currents of less than 20 % of I_n .

With the Micrologic P and H, it can be used to display fault currents after tripping.

Characteristics

- Power supply:
 - 110/130, 200/240, 380/415 V AC (+ 10 % - 15 %)
 - 24/30, 48/60, 100/125 V DC (+20 % -20 %)
- output voltage: 24 V DC \pm 5%, 200 mA.
- Ripple < 1 %
- Dielectric withstand : 3.5 kV rms between input/output, for 1 minute
- Overvoltage category: as per IEC 60947-1 cat. 4.

Battery module

The battery module maintains display operation and communication with the supervisor if the power supply to the Micrologic control unit is interrupted. It is installed in series between the Micrologic control unit and the AD module.

Characteristics

- Battery run-time: 4 hours (approximately)
- Mounted on vertical backplate or symmetrical rail.

PB10075A-32



Lead-seal cover.

Spare parts

Lead-seal covers

A lead-seal cover controls access to the adjustment dials.

When the cover is closed:

- it is impossible to modify settings using the keypad unless the settings lockout pin on the cover is removed
- the test connector remains accessible
- the test button for the earth-fault and earth-leakage protection function remains accessible.

Characteristics

- Transparent cover for basic Micrologic and Micrologic A control units
- Non-transparent cover for Micrologic P and H control units.

Spare battery

A battery supplies power to the LEDs identifying the tripping causes. Battery service life is approximately ten years.

A test button on the front of the control unit is used to check the battery condition.

The battery may be replaced on site when discharged.

Test equipment

Hand-held test kit

The hand-held mini test kit may be used to:

- check operation of the control unit and the tripping and pole-opening system by sending a signal simulating a short-circuit
- supply power to the control units for settings via the keypad when the circuit-breaker is open (Micrologic P and H control units).

Power source: standard LR6-AA battery.

Full function test kit

The test kit can be used alone or with a supporting personal computer.

The test kit without PC may be used to check:

- the mechanical operation of the circuit breaker
- the electrical continuity of the connection between the circuit breaker and the control unit
- operation of the control unit:
 - display of settings
 - automatic and manual tests on protection functions
 - test on the zone-selective interlocking (ZSI) function
 - inhibition of the earth-fault protection
 - inhibition of the thermal memory.

The test kit with PC offers in addition:

- the test report (software available on request).

PB100837A-68



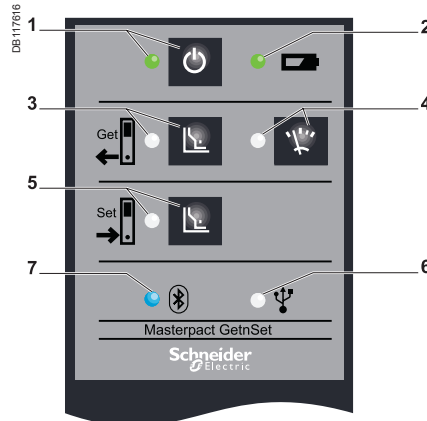
Portable test kit.

GetnSet is a portable data acquisition and storage accessory that connects directly to the Micrologic control units of Masterpact circuit breakers to read important electrical installation operating data and Masterpact protection settings. This information is stored in the GetnSet internal memory and can be transferred to a PC via USB or Bluetooth for monitoring and analysis.

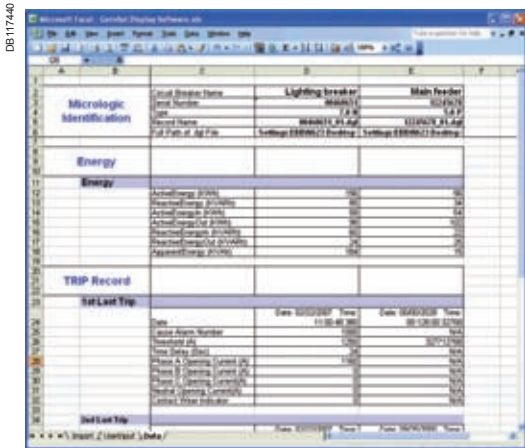
Overview of Masterpact GetnSet functions

GetnSet⁽¹⁾ is a portable data acquisition and storage device that works like a USB drive, letting users manually transfer data to and from a Masterpact circuit breaker or PC. GetnSet can download operating data from Masterpact and download or upload settings. Downloadable operating data include measurements, the last 3 trip history records and contact wear status. Accessible settings include protection thresholds, external relay assignment modes and pre-defined alarm configurations if applicable.

(1) See page F-2 for catalogue numbers.



- 1 On/Off
- 2 batterie indicator
- 3 Download settings
- 4 Download operating parameters
- 5 Upload settings
- 6 USB indicator
- 7 Bluetooth indicator



Operating data functions

Electrical installation information such as energy measurements and contact wear status is increasingly important to help reduce operating expenses and increase the availability of electrical power. Such data is often available from devices within the installation, but needs to be gathered and aggregated to allow analysis and determine effective improvement actions.

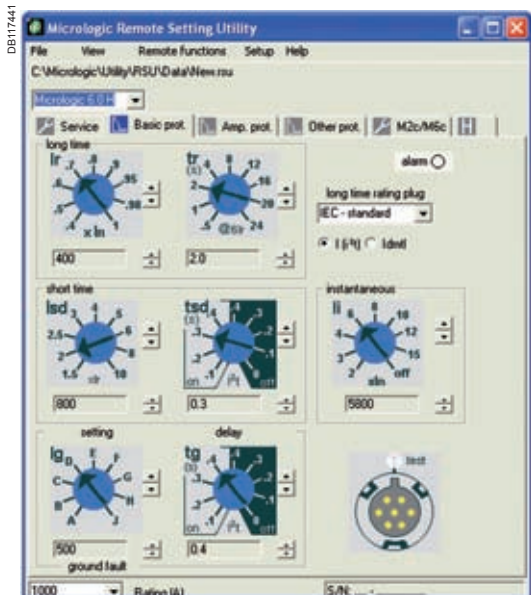
With GetnSet, this operating data can be easily read and stored as .dgl files in the internal memory. It can then be transferred to a PC via a USB or Bluetooth link and imported in an Excel spreadsheet.

The provided Excel spreadsheet can be used to display the operating data from several breakers in order to:

- analyse changes in parameters such as energy, power factor and contact wear
- compare the values of parameters between circuit breakers
- create graphics and reports using standard Excel tools

GetnSet data accessible in the Excel spreadsheet

Type of data	Micrologic		
	A	P	H
Current	A	P	H
Energy, voltages, frequency, power, power factor		P	H
Power quality: fundamental, harmonics			H
Trip history		P	H
Contact wear		P	H



Protection setting functions

GetnSet can also be used to back up circuit breaker settings and restore them on the same device or, under certain conditions, copy them to any Masterpact circuit breaker equipped with the same type of Micrologic control unit. This concerns only advanced settings, as other parameters must be set manually using the dials on the Micrologic control unit.

- When commissioning the installation, safeguard the configuration parameters of your electrical distribution system by creating a back-up of circuit breaker settings so that they can be restored at any time.
- The settings read by GetnSet can be transferred to a PC and are compatible with RSU software (Remote Setting Utility). Protection configurations can also be created on a PC using this software, copied to GetnSet's internal memory and uploaded to a Masterpact circuit breaker with a compatible Micrologic trip unit and dial settings.

Operating procedure

The procedure includes several steps.

- Plug GetnSet into the receptacle on the front of the Micrologic control unit of a Masterpact circuit breaker.
- On the keypad, select the type of data (operating data or settings) and the transfer direction (download or upload). This operation can be done as many times as required for the entire set of Masterpact circuit breakers.
- Downloaded data is transferred to the GetnSet internal memory and a file is created for each Masterpact device (either an .rsu file for settings or a .dgl file for operating data).
- Data can be transferred between GetnSet and a PC via a USB or Bluetooth connection.
- Operating data can be imported in an Excel spreadsheet and protection settings can be read with RSU (remote setting utility) software.

Features

- Battery-powered to power a Micrologic control unit even if the breaker has been opened or tripped. This battery provides power for an average of 1 hour of use, enough for more than 100 download operations.
- Can be used on Masterpact circuit breakers equipped or not equipped with a Modbus "device" communication module.
- Portable, standalone accessory eliminating the need for a PC to connect to a Masterpact circuit breaker.
- No driver or software required for GetnSet connection to a PC.
- Can be used with many circuit breakers, one after the other.
- Embedded memory sized to hold data from more than 5000 circuit breakers.
- Supplied with its battery, a cable for connection to Micrologic trip units, a USB cable for connection to a PC and a battery charger.

Compatibility

- Micrologic control units A, P, H
- PC with USB port or Bluetooth link and Excel software

Technical characteristics

Charger power supply	100 – 240 V; ~1A; 50 – 60 Hz
Charger power consumption	Max 100 W
Battery	3.3 V DC; 9mAh; Li-Ion
Operating temperature	-20 to +60 °C
GetnSet dimensions	95 x 60 x 35 mm

The COM option is required for integration of the circuit breaker or switch-disconnector in a supervision system.

Masterpact NAVY uses the Modbus communications protocol for full compatibility with the supervision systems.

An external gateway is available for communication on other networks:

- Ion Enterprise (power management system)
- Ethernet gateway (MPS100/EGX)
- Ethernet
- Profibus

Eco COM is limited to the transmission of metering data and does not allow the control of the circuit breaker.

The COM option is made up of a “device” communication module, installed behind the Micrologic control unit and supplied with its set of sensors (OF, SDE, PF and CH micro-contacts) and its kit for connection to XF and MX communicating voltage release a “chassis” communication module supplied separately with its set of sensors (CE, CD and CT contacts).

Status indication by the COM option is independent of the device indication contacts. These contacts remain available for conventional uses.

Modbus “Device” communication module

This module is independent of the control unit. It receives and transmits information on the communication network. An infra-red link transmits data between the control unit and the communication module.

Consumption: 30 mA, 24 V.

Modbus “chassis” communication module

This module is independent of the control unit. With Modbus “chassis” communication module, this module makes it possible to address the chassis and to maintain the address when the circuit breaker is in the disconnected position.

Consumption: 30 mA, 24 V.

XF and MX1 communicating voltage releases

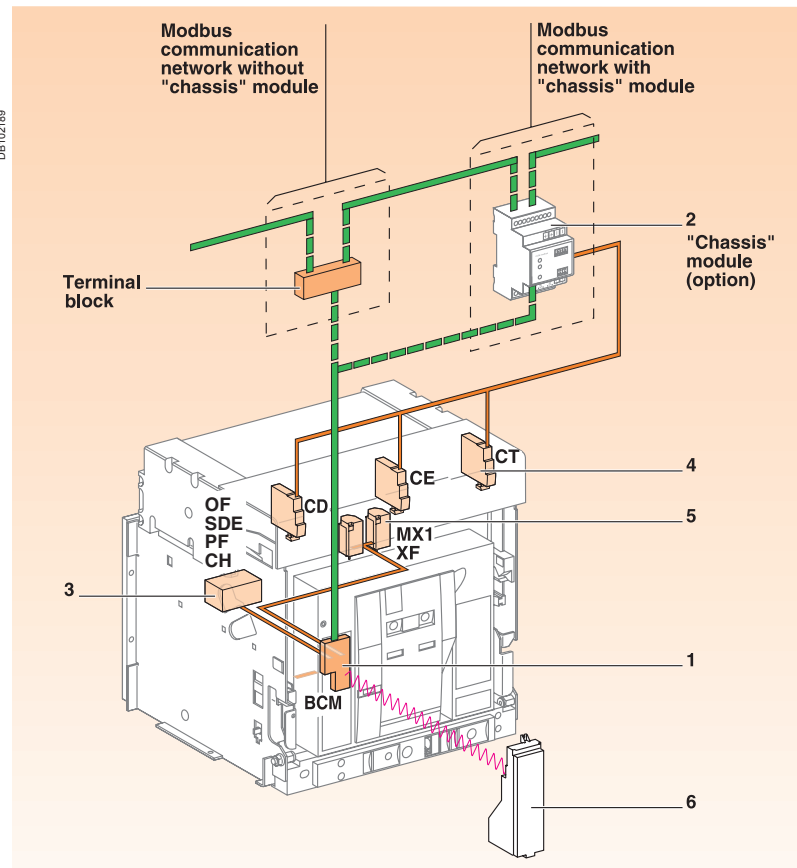
The XF and MX1 communicating voltage releases are equipped for connection to the “device” communication module.

The remote-tripping function (second MX2 or MN) are independent of the communication option. They are not equipped for connection to the “device” communication module.



Modbus “device” communication module.

Modbus “chassis” communication module.



- 1 “Device” communication module.
- 2 “Chassis” communication module (option).
- 3 OF, SDE, PF and CH communicating “device” sensors.
- 4 CE, CD and CT communicating “chassis” sensors.
- 5 MX1 and XF communicating release.
- 6 Control unit.

— : Hard wire.
— : Communication bus.

Overview of functions

056484N-80



The Masterpact NAVY circuit breakers and switch-disconnectors are compatible with the Modbus COM option.

The COM option may be used to:

- identify the device
- indicate status conditions
- control the device.

Depending on the different types of Micrologic (A, P, H) control units, the COM option also offers:

- setting of the protection and alarms functions
- analysis of the AC-power parameters for operating-assistance and maintenance purposes.

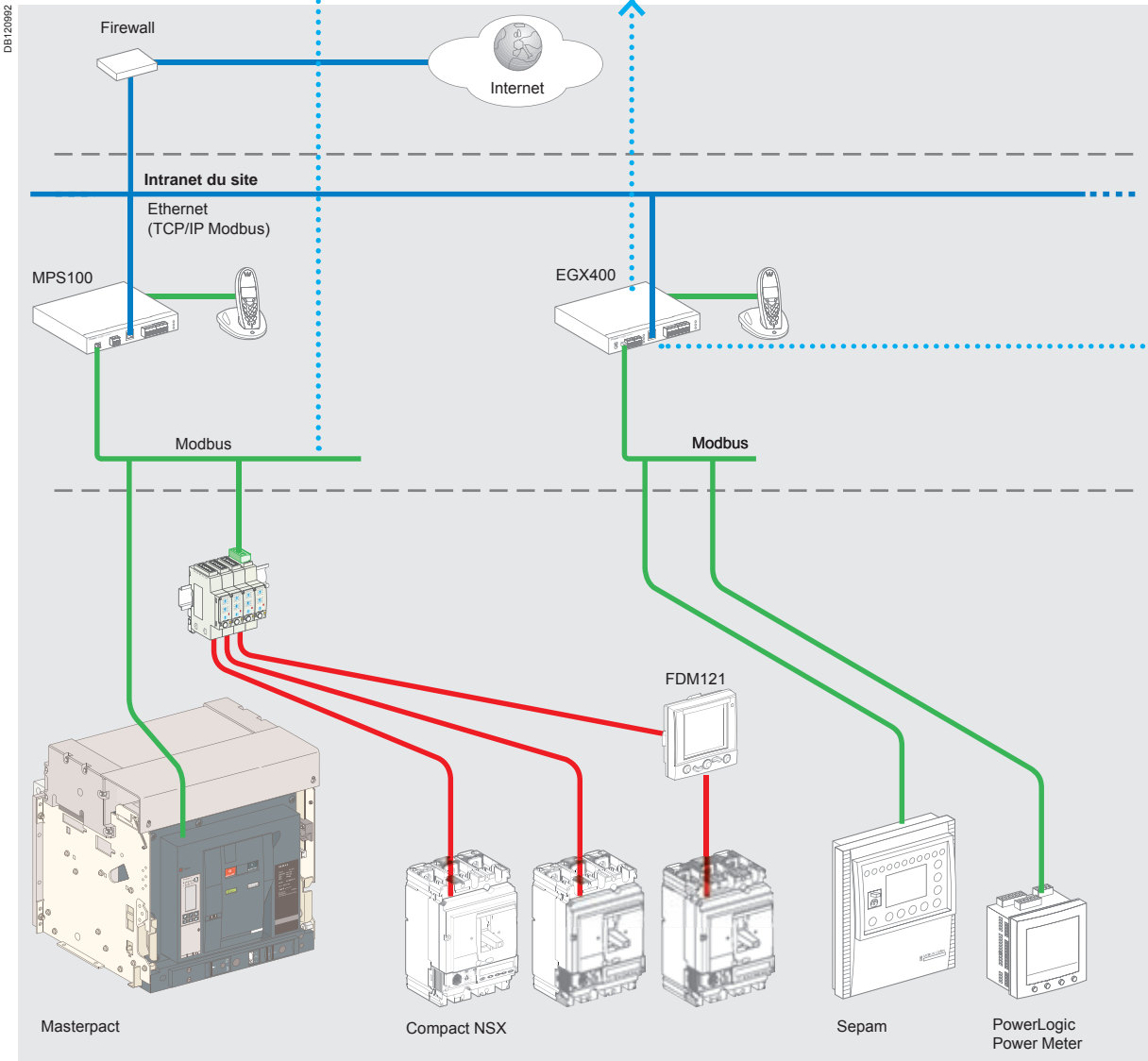
	Switch-disconnector with communication bus Modbus	Circuit breaker with communication bus Modbus
Device identification		
Address	■	A P H
Rating	-	A P H
Type of device	-	P H
Type of control unit	-	A P H
Type of long-time rating plug	-	A P H
Status indications		
ON/OFF OF	■	A P H
Spring charged CH	■	A P H
Ready to close PF	(1)	A P H
Fault-trip SDE	■	A P H
Connected/disconnected/test position CE/CD/CT	■	A P H
Controls		
ON/OFF MX/XF	■	A P H
Spring charging	-	
Reset of the mechanical indicator	-	
Protections and alarms settings		
Reading of protections settings		A P H
Writing of fine settings in the range imposed by the adjustment dials		P H
Reading/writing of alarms (load shedding and reconnect, etc.)		P H
Reading/writing of custom alarms		H
Operating and maintenance aids		
Measurement		
Current		A P H
Voltages, frequency, power, etc.		P H
Power quality: fundamental, harmonics		H
Programming of demand metering		P H
Fault readings		
Type of fault		A P H
Interrupted current		P H
Waveform capture		
On faults		H
On demand or programmed		H
Histories and logs		
Trip history		P H
Alarm history		P H
Event logs		P H
Indicators		
Counter operation		A P H
Contact wear		P H
Maintenance register		P H

Note: see the description of the Micrologic control units for further details on protection and alarms, measurements, waveform capture, histories, logs and maintenance indicators.

(1) With Modbus it is possible to monitor the PF status please use the instruction bulletin COMBT32AK at page 51/Register 661 documentation.

Modbus

- Modbus is the most widely used communication protocol in industrial networks.
- Masterpact, Compact NSX, PowerLogic and Sepam products all operate with this protocol. A Modbus network is generally implemented on an LV or MV switchboard scale.



Gateway

A Modbus TCP gateway can be used to connect the Modbus network to ethernet.

The gateway has the two main functions:

- access to the company intranet (Ethernet) by converting Modbus frames to the TCP/IP Modbus protocol,
 - optional web-page server for the information from the devices.
- Examples include MPS100, EGX400 and EGX100.

MPS100

■ Plug and play device. It comes loaded with a web-page application for graphic display of currents and voltages and viewing of circuit-breaker status and power and energy values.

To use the application, simply declare the Modbus addresses of the connected slaves. Automatically recognised devices include all Masterpact and Compact NSX Micrologic trip units and the PM500/700/800 and PM9c power monitoring units.

- Can be used for automatic alarm notification via a messaging server available on the site intranet or via mobile phones (e-mail converted into SMS).
- Can be used for logging of data that can be automatically sent as e-mail attachments, e.g. a weekly consumption report.



Web page.

Modbus bus

The Modbus (RS 485) system is an open bus on which communicating Modbus devices (Masterpact NAVY with Modbus COM, Sepam, VigiloHM...) are installed. All types of PLCs and microcomputers may be connected to the bus.

Addresses

The Modbus parameters (address, baud rate, parity) are entered using the keypad on the Micrologic A, P or H. For a switch-disconnector, it is necessary to use the RSU (Remote Setting Utility) Micrologic utility.

The software layer of the Modbus protocol can manage up to 255 addresses (1 to 255).

The "device" communication module comprises three addresses linked to:

- circuit-breaker manager
- measurement manager
- protection manager

The "chassis" communication module comprises one address linked to the chassis manager.

The division of the system into four managers secures data exchange with the supervision system and the circuit-breaker actuators.

The manager addresses are automatically derived from the circuit-breaker address @xx entered via the Micrologic control unit (the default address is 47).

Logic addresses

@ xx	Circuit-breaker manager	(1 to 47)
@ xx + 50	Chassis manager	(51 to 97)
@ xx + 200	Measurement managers	(201 to 247)
@ xx + 100	Protection manager	(101 to 147)

Number of devices

The maximum number of devices that may be connected to the Modbus bus depends on the type of device (Masterpact NAVY with Modbus COM, PM500, Sepam, VigiloHM, etc.), the baud rate (19200 is recommended), the volume of data exchanged and the desired response time. The RS485 physical layer offers up to 32 connection points on the bus (1 master, 31 slaves).

A fixed device requires only one connection point (communication module on the device).

A drawout device uses two connection points (communication modules on the device and on the chassis).

The number must never exceed 15 drawout devices.

Length of bus

The maximum recommended length for the Modbus bus is 1200 meters.

Bus power source

A 24 V DC power supply is required (less than 20 % ripple, insulation class II).

Communication interface

The Modbus bus may be connected to the central processing device in any of three manners:

- direct link to a PLC. The communication interface is not required if the PLC is equipped with a Modbus port
- direct link to a computer. The Modbus (RS485) / Serial port (RS232) communication interface is required
- connection to a TCP/IP (Ethernet) network. The Modbus (RS485) / TCP/IP (Ethernet) communication interface is required.

Software

To make use of the information provided by the communicating devices, software with a Modbus driver must be used.

Micrologic utilities

This is a set of software that may be used with a PC to:

- display the variables (I, U, P, E, etc.) with the RDU (Remote Display Utility)
- read/write the settings with the RSU (Remote Setting Utility)
- remotely control (ON / OFF) the device with the RCU (Remote Control Utility).

Micrologic utilities are available upon request

SMS (System Manager Software)

SMS is a software to monitor LV and/or MV electrical energy.

The SMS family includes a software range depending on the application and function, from single product monitoring to the management of a multiple building:

- Power Meter and Circuit Monitor units
- LV devices
- Sepam units.

- Three types of connection are available:
- vertical or horizontal rear connection
 - front connection
 - mixed connection.

Rear connection

Horizontal

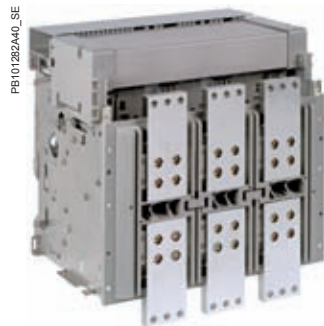


Vertical



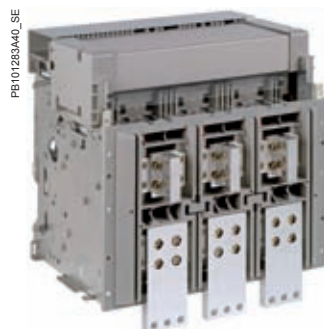
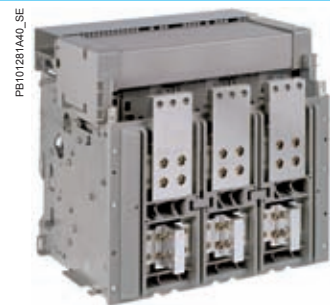
Simply turn a horizontal rear connector 90° to make it a vertical connector.

Front connection



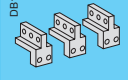
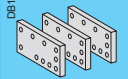
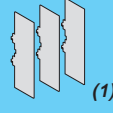
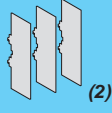
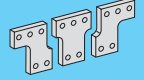
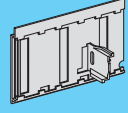
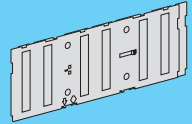
Front connection is available up to 3200 A.

Mixed connection



Note: Masterpact NAVY circuit breakers can be connected indifferently with bare-copper, tinned-copper and tinned-aluminium conductors, requiring no particular treatment.

Accessories

Type of accessory	Masterpact NT06 to NT16 NAVY		Masterpact NW08 to NW40 NAVY	
	Drawout Front connection	Drawout Rear connection	Drawout Front connection	Drawout Rear connection
Vertical connection adapters	DB101156 			
Cable lug adapters	DB101147 			
Interphase barriers		DB101149  (1)		DB101149  (2)
Spreaders	DB101150 			
Safety shutters with padlocking	DB101152  standard		DB101153  standard	

(1) Mandatory for voltages > 500 V.

(2) Except for an NW40 equipped for horizontal rear connection.

DB106806A



Vertical-connection adapters (option)

Mounted on front-connected chassis, the adapters facilitate connection to a set of vertical busbars.

DB106807A



Cable-lug adapters (option)

Cable-lug adapters are used in conjunction with vertical-connection adapters. They can be used to connect a number of cables fitted with lugs.

To ensure adequate mechanical strength, the connectors must be secured together via spacers (catalogue number 07251).

PB104350A33



Interphase barriers (option)

These barriers are flexible insulated partitions used to reinforce isolation of connection points in installations with busbars, whether insulated or not.

For Masterpact NT/NW NAVY devices, they are installed vertically between rear connection terminals. They are mandatory for NT NAVY devices at voltages > 500 V.

DB106808A



Spreaders (option)

Mounted on the front or rear connectors, spreaders are used to increase the distance between bars in certain installation configurations.

PB104364A48



Safety shutters Vo (standard)

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 (degree of protection IP 20) When the device is removed from its chassis, no live parts are accessible.

The shutter-locking system is made up of a moving block that can be padlocked (padlock not supplied). The block:

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

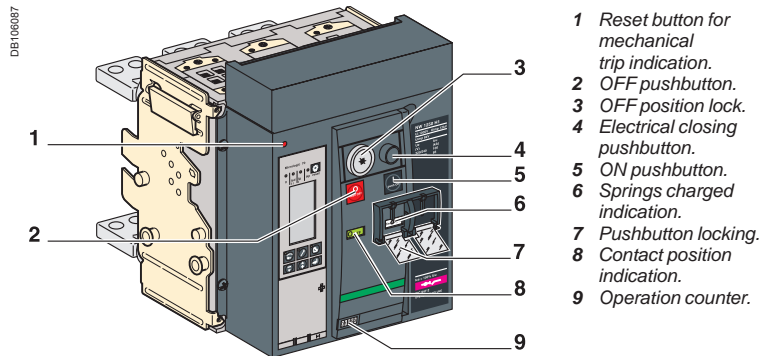
For Masterpact NW08 to NW40 NAVY

A support at the back of the chassis is used to store the blocks when they are not used:

- 2 blocks for NW08 to NW40 NAVY.

Locking

On the device



Access to pushbuttons protected by transparent cover.



Pushbutton locking using a padlock.



OFF position locking using a padlock.



OFF position locking using a keylock.

Pushbutton locking VBP

The transparent cover blocks access to the pushbuttons used to open and close the device.

It is possible to independently lock the opening button and the closing button. The locking device is often combined with a remote operating mechanism.

The pushbuttons may be locked using either:

- three padlocks (not supplied)
- lead seal
- two screws.

Device locking in the OFF position

By padlocks (VCPO option) - By keylocks (VSP0 option)

The circuit breaker is locked in the OFF position by physically maintaining the opening pushbutton pressed down:

- using padlocks (one to three padlocks, not supplied)
- using keylocks (one or two different keylocks, supplied).

Keys may be removed only when locking is effective (Profalux or Ronis type locks).

The keylocks are available in any of the following configurations:

- one keylock
- one keylock mounted on the device + one identical keylock supplied separately for interlocking with another device
- two different key locks for double locking.

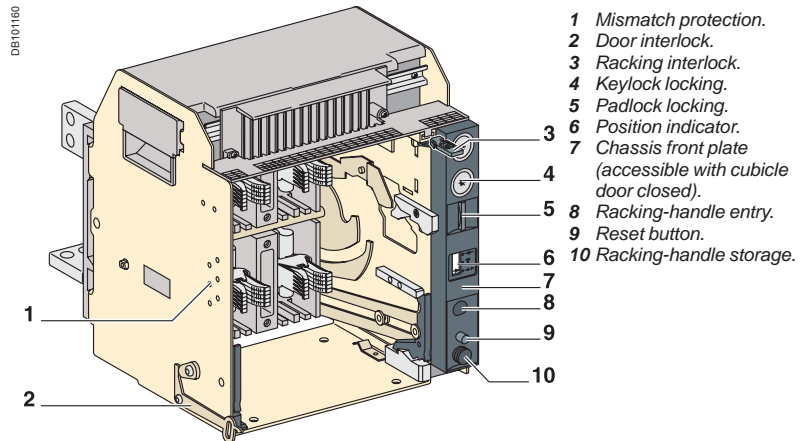
Profalux and Ronis keylocks are compatible with each other.

A locking kit (without locks) is available for installation of one or two keylocks (Ronis, Profalux, Kirk or Castell).

Accessory-compatibility

For Masterpact NT NAVY: 3 padlocks or 1 keylock.

For Masterpact NW NAVY: 3 padlocks and/or 2 keylocks.



"Disconnected" position locking by padlocks.



"Disconnected" position locking by keylocks.

"Disconnected" position locking By padlocks (standard) or keylocks (VSPD option)

Mounted on the chassis and accessible with the door closed, these devices lock the circuit breaker in the "disconnected" position in two manners:

- using padlocks (standard), up to three padlocks (not supplied)
- using keylocks (optional), one or two different keylocks are available.

Profalux and Ronis keylocks are available in different options:

- one keylock
- two different keylocks for double locking
- one (or two) keylocks mounted on the device + one (or two) identical keylocks supplied separately for interlocking with another device.

A locking kit (without locks) is available for installation of one or two keylocks (Ronis, Profalux, Kirk or Castell).

"Connected", "disconnected" and "test" position locking

The "connected", "disconnected" and "test" positions are shown by an indicator and are mechanically indexed. The exact position is obtained when the racking handle blocks. A release button is used to free it.

As standard, the circuit breaker can be locked only in "disconnected" position.

On request, the locking system may be modified to lock the circuit breaker in any of the three positions: "connected", "disconnected" or "test".

Racking interlock VPOC

This device prevents insertion of the racking handle when the cubicle door is open.

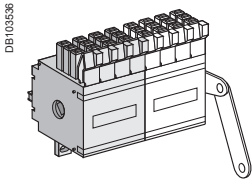


Racking interlock.

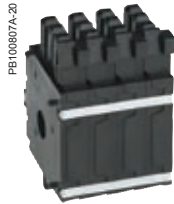
Indication contacts

Indication contacts are available:

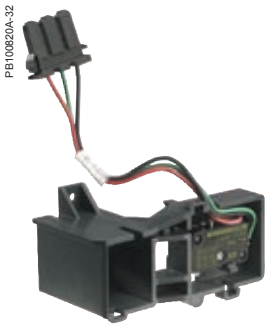
- in the standard version for relay applications
- in a low-level version for control of PLCs and electronic circuits.



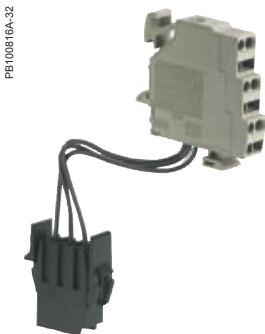
ON/OFF indication contacts (OF) (microswitch type).



ON/OFF indication contacts (OF) (rotary type).



Additional "fault-trip" indication contacts (SDE).



Combined contacts.

ON/OFF indication contacts (OF)

Two types of contacts indicate the ON or OFF position of the circuit breaker:

- microswitch type changeover contacts for Masterpact NT NAVY
- rotary type changeover contacts directly driven by the mechanism for Masterpact NW NAVY. These contacts trip when the minimum isolation distance between the main circuit-breaker contacts is reached.

OF		NT NAVY	NW NAVY
Supplied as standard		4	4
Maximum number		4	8
Breaking capacity (A)	Standard	Minimum load: 100 mA/24 V	
p.f.: 0.3	V AC	240/380	6
AC12/DC12		480	6
		690	6
	V DC	24/48	2,5
		125	0,5
		250	0,3
	Low-level	Minimum load: 2 mA/15 V	
	V AC	24/48	5
		240	5
		380	5
	V DC	24/48	5/2,5
		125	0,5
		250	0,3

(1) Standard contacts: 10 A; optional contacts: 6 A.

"Fault-trip" indication contacts SDE

Circuit-breaker tripping due to a fault is signalled by:

- a red mechanical fault indicator (reset)
- one changeover contact SDE.

Following tripping, the mechanical indicator must be reset before the circuit breaker may be closed. One SDE is supplied as standard. An optimal SDE may be added. This latter is incompatible with the electrical reset after fault-trip option (Res).

SDE		NT/NW NAVY	
Supplied as standard		1	
Maximum number		2	
Breaking capacity (A)	Standard	Minimum load: 100 mA/24 V	
p.f.: 0.3	V AC	240/380	5
AC12/DC12		480	5
		690	3
	V DC	24/48	3
		125	0.3
		250	0.15
	Low-level	Minimum load: 2 mA/15 V	
	V AC	24/48	3
		240	3
		380	3
	V DC	24/48	3
		125	0.3
		250	0.15

Combined "connected/closed" contacts (EF)

The contact combines the "device connected" and the "device closed" information to produce the "circuit closed" information. Supplied as an option for Masterpact NW NAVY, it is mounted in place of the connector of an additional OF contact.

EF		NW NAVY	
Maximum number		4	
Breaking capacity (A)	Standard	Minimum load: 100 mA/24 V	
p.f.: 0.3	V AC	240/380	6
AC12/DC12		480	6
		690	6
	V DC	24/48	2.5
		125	0.8
		250	0.3
	Low-level	Minimum load: 2 mA/15 V	
	V AC	24/48	5
		240	5
		380	5
	V DC	24/48	2.5
		125	0.8
		250	0.3

PE100817A-32



CCE, CD and CT "connected/disconnected/test" position carriage switches.

"Connected", "disconnected" and "test" position carriage switches

Three series of optional auxiliary contacts are available for the chassis:

- changeover contacts to indicate the "connected" position CE
- changeover contacts to indicate the "disconnected" position CD. This position is indicated when the required clearance for isolation of the power and auxiliary circuits is reached
- changeover contacts to indicate the "test" position CT. In this position, the power circuits are disconnected and the auxiliary circuits are connected.

Additional actuators

A set of additional actuators may be installed on the chassis to change the functions of the carriage switches.

Contacts		NT NAVY			NW NAVY		
		CE/CD/CT			CE/CD/CT		
Maximum number	Standard	3	2	1	3	3	3
	with additional actuators				9	0	0
					6	3	0
					6	0	3
Breaking capacity (A) p.f.: 0.3 AC12/DC12	Standard	Minimum load: 100 mA/24 V					
		V AC	240	8	8		
	380		8	8			
	480		8	8			
	690		6	6			
	V DC	24/48	2.5	2.5			
		125	0.8	0.8			
		250	0.3	0.3			
		Low-level					
	V AC	24/48	5	5			
		240	5	5			
		380	5	5			
	V DC	24/48	2.5	2.5			
		125	0.8	0.8			
250		0.3	0.3				

Remote operation

Remote ON / OFF

Two solutions are available for remote operation of Masterpact NAVY devices:

- a point-to-point solution
- a bus solution with the COM communication option.



Note: an opening order always takes priority over a closing order.

If opening and closing orders occur simultaneously, the mechanism discharges without any movement of the main contacts. The circuit breaker remains in the open position (OFF).

In the event of maintained opening and closing orders, the standard mechanism provides an anti-pumping function by blocking the main contacts in open position.

Anti-pumping function. After fault tripping or intentional opening using the manual or electrical controls, the closing order must first be discontinued, then reactivated to close the circuit breaker.

When the automatic reset after fault trip (RAR) option is installed, to avoid pumping following a fault trip, the automatic control system must take into account the information supplied by the circuit breaker before issuing a new closing order or blocking the circuit breaker in the open position (information on the type of fault, e.g. overload, short-time fault, earth fault, earth leakage, short-circuit, etc.).

Note: MX1 communicating releases are of the impulse type only and cannot be used to lock a circuit breaker in OFF position. For locking in OFF position, use the remote tripping function (MX2 or MN).

When MX1 or XF communicating releases are used, the third wire (C3, A3) must be connected even if the communication module is not installed. When the control voltage (C3-C1 or A3-A1) is applied to the MX1 or XF releases, it is necessary to wait 1.5 seconds before issuing an order. Consequently, it is advised to use standard MX1 or XF releases for applications such as source-changeover systems.

The remote ON / OFF function is used to remotely open and close the circuit breaker. It is made up of:

- an electric motor MCH equipped with a "springs charged" limit switch contact CH
- two voltage releases:
 - a closing release XF
 - an opening release MX1.

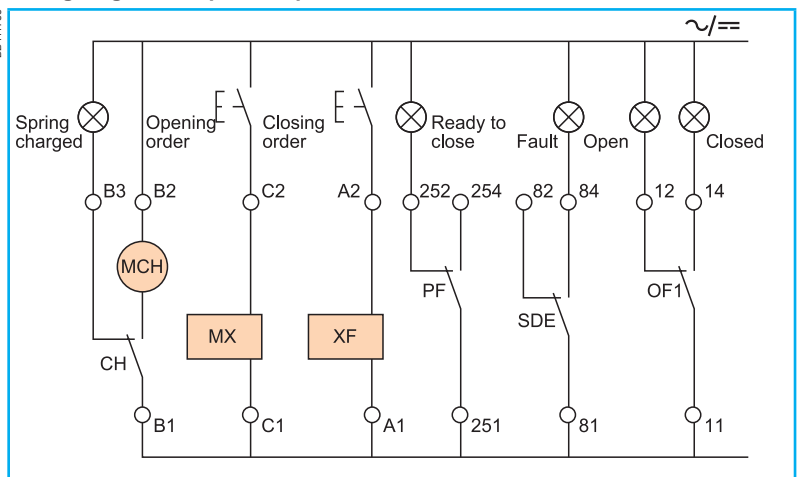
Optionally, other functions may be added:

- a "ready to close" contact PF
- an electrical closing pushbutton BPFE
- remote RES following a fault.

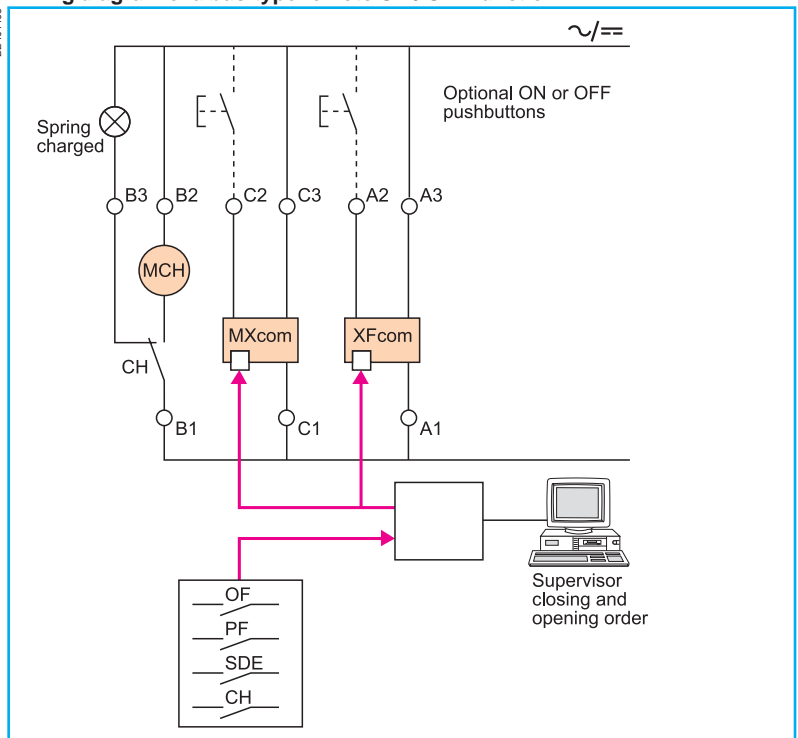
A remote-operation function is generally combined with:

- device ON / OFF indication OF
- "fault-trip" indication SDE.

Wiring diagram of a point-to-point remote ON / OFF function



Wiring diagram of a bus-type remote ON / OFF function



PB100797A-23



Electric motor (MCH) for Masterpact NT NAVY.

PB100808A-32



Electric motor (MCH) for Masterpact NW NAVY.

Electric motor MCH

The electric motor automatically charges and recharges the spring mechanism when the circuit breaker is closed. Instantaneous reclosing of the breaker is thus possible following opening. The spring-mechanism charging handle is used only as a backup if auxiliary power is absent.

The electric motor (MCH) is equipped as standard with a limit switch contact (CH) that signals the “charged” position of the mechanism (springs charged).

Characteristics

Power supply	V AC 50/60 Hz	100/130 - 200/240 - 250/277 (NW only) - 380/415 - 400/440
Operating threshold		0.85 to 1.1 Un
Consumption (VA or W)		180
Motor overcurrent		2 to 3 In for 0.1 s
Charging time		maximum 3 s for Masterpact NT NAVY maximum 4 s for Masterpact NW NAVY
Operating frequency		maximum 3 cycles per minute
CH contact		10 A at 240 V

Voltage releases XF and MX1

Their supply can be maintained or automatically disconnected.

Closing release XF

The XF release remotely closes the circuit breaker if the spring mechanism is charged.

Opening release MX1

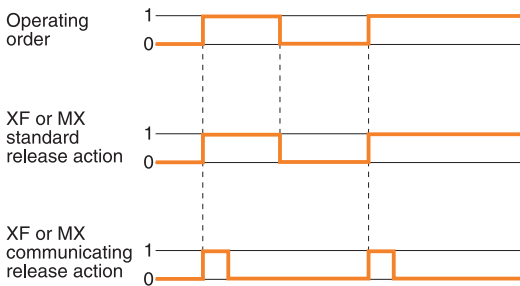
The MX release instantaneously opens the circuit breaker when energised. It locks the circuit breaker in OFF position if the order is maintained (except for MX1 “communicating” releases).

Note: whether the operating order is maintained or automatically disconnected (pulse-type), XF or MX1 “communicating” releases (“bus” solution with “COM” communication option) always have an impulse-type action (see diagram).

Characteristics

	XF	MX1
Power supply	V AC 50/60 Hz	115 - 220 - 380/440
Operating threshold	0.85 to 1.1 Un	0.7 to 1.1 Un
Consumption (VA or W)	Hold: 4.5 Pick-up: 200 (200 ms)	Hold: 4.5 Pick-up: 200 (200 ms)
Circuit-breaker response time at Un	55 ms ±10 (Masterpact NT NAVY) 70 ms ±10 (NW ≤ 4000A) 80 ms ±10 (NW > 4000A)	50 ms ±10

DE 101179



PB100809A-16



XF and MX voltage releases.

“Ready to close” contact PF

The “ready to close” position of the circuit breaker is indicated by a mechanical indicator and a PF changeover contact. This signal indicates that all the following are valid:

- the circuit breaker is in the OFF position
- the spring mechanism is charged
- a maintained opening order is not present:
- MX1 energised
- fault trip
- remote tripping (MX2 or MN)
- device not completely racked in
- device locked in OFF position
- device interlocked with a second device.

Characteristics

	NT/NW NAVY	
Maximum number	1	
Breaking capacity (A)	Standard	Minimum load: 100 mA/24 V
p.f.: 0.3	V AC	240/380
AC12/DC12		480
		690
	V DC	24/48
		125
		250
	Low-level	Minimum load: 2 mA/15 V
	V AC	24/48
		240
		380
	V DC	24/48
		125
		250

PB100818A-16



“Ready to close” contacts (PF).



Electrical closing pushbutton (BPFE).

Electrical closing pushbutton BPFE

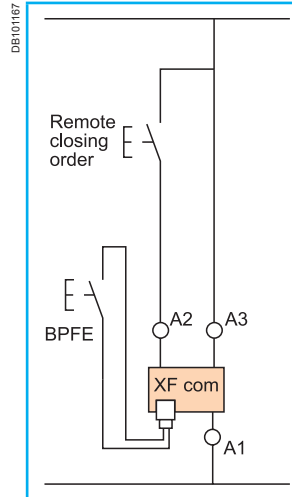
Located on the front panel, this pushbutton carries out electrical closing of the circuit breaker. It is generally associated with the transparent cover that protects access to the closing pushbutton.

Electrical closing via the BPFE pushbutton takes into account all the safety functions that are part of the control/monitoring system of the installation.

The BPFE connects to the closing release (XF com) in place of the COM module.

The COM module is incompatible with this option.

Different types of voltage exist and the XF electromagnet is compulsory if the BPFE option is selected.

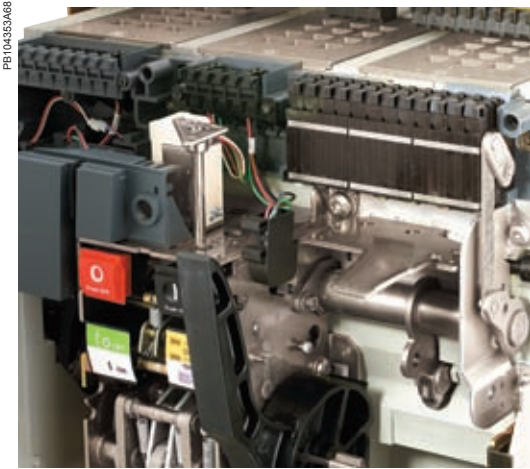


Automatic reset after fault trip RAR

Following tripping, a reset of the mechanical indicator (reset button) is no longer required to enable circuit-breaker closing. The mechanical (reset button) and electrical SDE indications remain in fault position until the reset button is pressed. The use of XF closing release is compulsory with this option.

Remote operation

Remote tripping



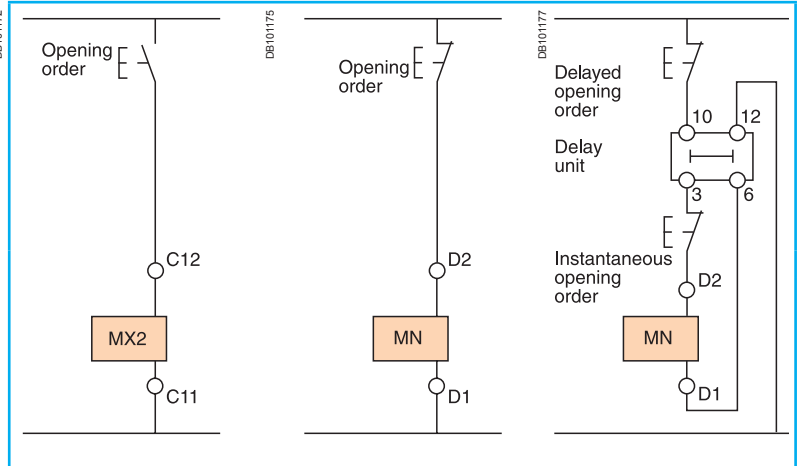
MX or MN voltage release.

This function opens the circuit breaker via an electrical order. It is made up of:

- a shunt release MX2
- or an undervoltage release MN
- or a delayed undervoltage release (MN + delay unit).

These releases (MX2 or MN) cannot be operated by the communication bus. The delay unit, installed outside the circuit breaker, may be disabled by an emergency OFF button to obtain instantaneous opening of the circuit breaker.

Wiring diagram for the remote-tripping function



Voltage releases MX2

When energised, the MX2 voltage release instantaneously opens the circuit breaker. A continuous supply of power to the second MX2 locks the circuit breaker in the OFF position.

Characteristics

Power supply	V AC 50/60Hz	115 - 220 - 380/440
Operating threshold		0.7 to 1.1 Un
Permanent locking function		0.85 to 1.1 Un
Consumption (VA or W)		Pick-up: 200 (80 ms) Hold: 4.5
Circuit-breaker response time at Un		50 ms ±10

Instantaneous voltage releases MN

The MN release instantaneously opens the circuit breaker when its supply voltage drops to a value between 35 % and 70 % of its rated voltage. If there is no supply on the release, it is impossible to close the circuit breaker, either manually or electrically. Any attempt to close the circuit breaker has no effect on the main contacts. Circuit-breaker closing is enabled again when the supply voltage of the release returns to 85 % of its rated value.

Characteristics

Power supply	V AC 50/60 Hz	100/130 - 200/250 - 380/480
Operating threshold	Opening	0.35 to 0.7 Un
	Closing	0.85 Un
Consumption (VA or W)		Pick-up: 200 (200 ms) Hold: 4.5
MN consumption with delay unit (VA or W)		Pick-up: 200 (200 ms) Hold: 4.5
Circuit-breaker response time at Un		40 ms ±5 for NT 90 ms ±5 for NW

MN delay units

To eliminate circuit-breaker nuisance tripping during short voltage dips, operation of the MN release can be delayed. This function is achieved by adding an external delay unit in the MN voltage-release circuit. Two versions are available, adjustable and non-adjustable.

Characteristics

Power supply	Non-adjustable	100/130 - 200/250
V AC 50-60 Hz / DC	Adjustable	100/130 - 200/250 - 380/480
Operating threshold	Opening	0.35 to 0.7 Un
	Closing	0.85 Un
Delay unit consumption		Pick-up: 200 (200 ms) Hold: 4.5
Circuit-breaker response time at Un	Non-adjustable	0.25 s
	Adjustable	0.5 s - 0.9 s - 1.5 s - 3 s

Accessories

PB104740



Auxiliary terminal shield CB

Optional equipment mounted on the chassis, the shield prevents access to the terminal block of the electrical auxiliaries.

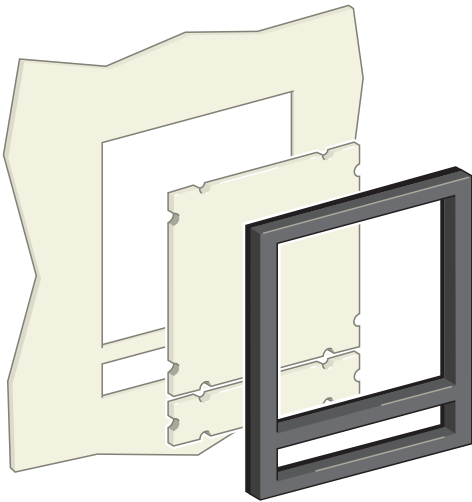
PB104982A32



Operation counter CDM

The operation counter sums the number of operating cycles and is visible on the front panel. It is compatible with manual and electrical control functions.

DB101173



Escutcheon CDP

Optional equipment mounted on the door of the cubicle, the escutcheon increases the degree of protection to IP 40 (circuit breaker installed free standing: IP30).

Blanking plate OP for escutcheon

Used with the escutcheon, this option closes off the door cut-out of a cubicle not yet equipped with a device.

Transparent cover CCP for escutcheon

Optional equipment mounted on the escutcheon, the cover is hinged and secured by a screw. It increases the degree of protection to IP54, IK10.

Escutcheon CDP with blanking plate.

PB100776A-42



Transparent cover CCP for escutcheon.

schneider-electric.com

This international site allows you to access all the Schneider Electric products in just 2 clicks via comprehensive range data-sheets, with direct links to:

- complete library: technical documents, catalogs, FAQs, brochures...
- selection guides from the e-catalog.
- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts...

CAD software and tools

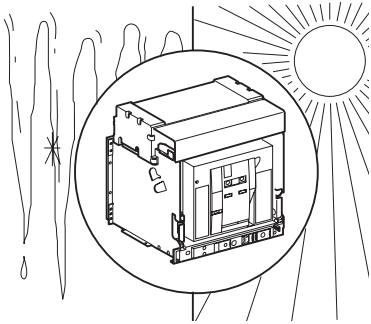
The CAD software and tools enhance productivity and safety. They help you create your installations by simplifying product choice through easy browsing in the Schneider Electric offers.

Last but not least, they optimise use of our products while also complying with standards and proper procedures.



<i>Presentation</i>	1
<i>Functions and characteristics</i>	A-1
Operating conditions	B-2
Installation in switchboard	B-3
Control wiring	B-5
Power connection	B-6
Recommended busbars drilling	B-8
Masterpact NT06 to NT16 NAVY	B-8
Masterpact NW08 to NW40 NAVY	B-9
Busbar sizing	B-10
Temperature derating Power dissipation and input / output resistance	B-12
Derating in switchboards	B-13
<i>Dimensions and connections</i>	C-1
<i>Electrical diagrams</i>	D-1
<i>Additional characteristics</i>	E-1
<i>Catalogue numbers and order form</i>	F-1

DB101422



Ambient temperature

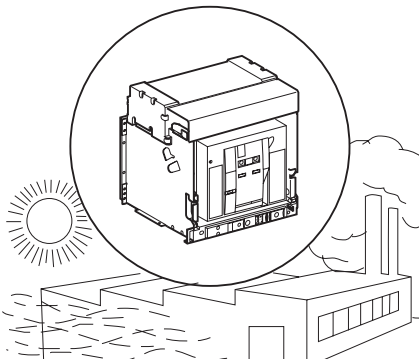
Masterpact NAVY devices can operate under the following temperature conditions:

- the electrical and mechanical characteristics are stipulated for an ambient temperature of -5 °C to +70 °C
- circuit-breaker closing is guaranteed down to -35 °C.

Storage conditions are as follows:

- -40 °C to +85 °C for a Masterpact NAVY device without its control unit
- -25 °C to +85 °C for the control unit.

DB101423



Extreme atmospheric conditions

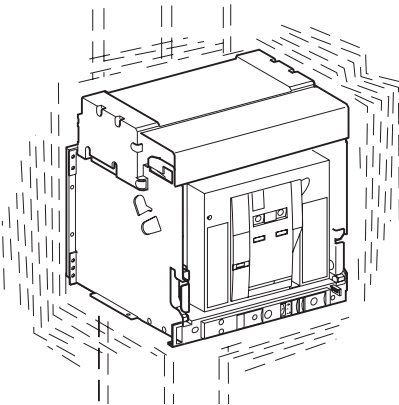
Masterpact NAVY devices have successfully passed the tests defined by the following standards for extreme atmospheric conditions:

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

Masterpact NAVY devices can operate in the industrial environments defined by standard IEC 947 (pollution degree up to 4).

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

DB101424



Vibrations

Masterpact NAVY devices are guaranteed to withstand electromagnetic or mechanical vibrations:

- 5 to 22 Hz: ± 1 mm displacement amplitude
- 5 to 60 Hz: 2 g acceleration.

Tests are carried out in compliance with standard IEC 60068-2-6.

They are carried out in 3 directions, with the circuit breaker open and closed.

Mechanical shocks

Masterpact NAVY devices are guaranteed to withstand mechanical shocks:

- 15 g - 11 ms - 1/2 sine shock pulse under the following conditions:
 - required clearance maintained between open main contacts
 - no opening or closing of auxiliary contacts exceeding 3 ms.
- 18 g - 11 ms - 1/2 sine shock pulse under the following conditions:
 - required clearance maintained between open main contacts.

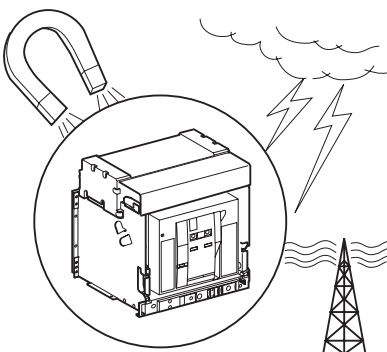
Tests are carried out in compliance with standard IEC 60068-2-7.

They are carried out in 3 directions, with the circuit breaker open and closed.

List and trim

- Masterpact Navy devices have passed tests for operation under ± 45° list and trim conditions.

DB101425



Electromagnetic disturbances

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

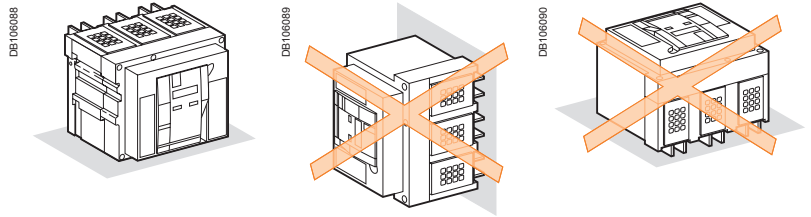
- IEC 60947-2, appendix F
- IEC 60947-2, appendix B (trip units with earth-leakage function).

The above tests guarantee that:

- no nuisance tripping occurs
- tripping times are respected.

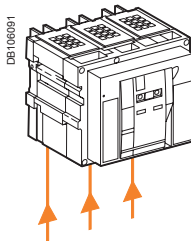
Installation in switchboard

Possible positions



Power supply

Masterpact NAVY devices can be supplied either from the top or from the bottom without reduction in performance, in order to facilitate connection when installed in a switchboard.

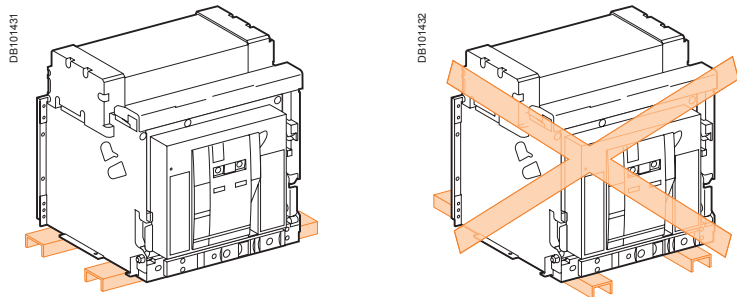


Mounting the circuit-breaker

It is important to distribute the weight of the device uniformly over a rigid mounting surface such as rails or a base plate.

This mounting plane should be perfectly flat (tolerance on support flatness: 2 mm). This eliminates any risk of deformation which could interfere with correct operation of the circuit breaker.

Masterpact NAVY devices can also be mounted on a vertical plane using the special brackets.

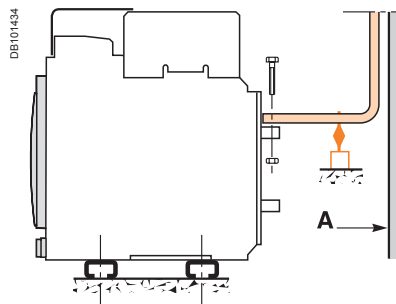


Mounting on rails.

Partitions

Sufficient openings must be provided in partitions to ensure good air circulation around the circuit breaker; Any partition between upstream and downstream connections of the device must be made of non-magnetic material.

For high currents, of 2500 A and upwards, the metal supports or barriers in the immediate vicinity of a conductor must be made of non-magnetic material **A**. Metal barriers through which a conductor passes must not form a magnetic loop.

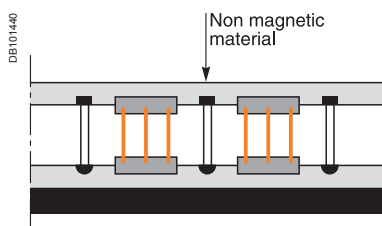


A : non magnetic material.



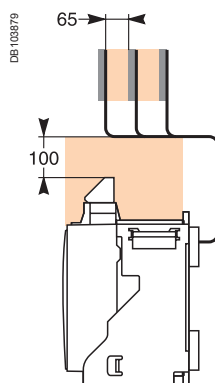
Busbars (NT NAVY, NW NAVY)

The mechanical connection must exclude the possibility of formation of a magnetic loop around a conductor.



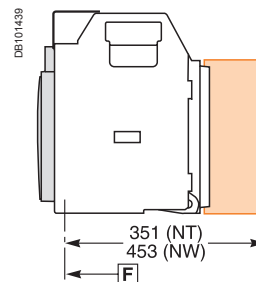
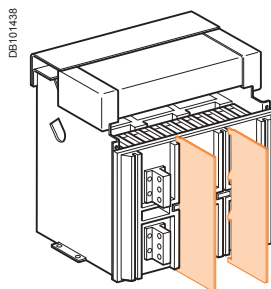
Busbars (NT NAVY)

For live busbars installed immediately above the circuit breaker (respecting the 100 mm safety clearance), the distance between bars must be 65 mm minimum.



Interphase barrier

If the insulation distance between phases is not sufficient (≤ 14 mm), it is advised to install phase barriers (taking into account the safety clearances). Mandatory for a Masterpact NAVY NT > 500 V.



Control wiring

Wiring of voltage releases

During pick-up, the power consumed is approximately 150 to 200 VA. For low control voltages (12, 24, 48 V), maximum cable lengths are imposed by the voltage and the cross-sectional area of cables.

Recommended maximum cable lengths (meter).

		12 V		24 V		48 V	
		2,5 mm ²	1,5 mm ²	2,5 mm ²	1,5 mm ²	2,5 mm ²	1,5 mm ²
MN	U source 100 %	–	–	58	35	280	165
	U source 85 %	–	–	16	10	75	45
MX-XF	U source 100 %	21	12	115	70	550	330
	U source 85 %	10	6	75	44	350	210

Note: the indicated length is that of each of the two wires.

24 V DC power-supply module

External 24 V DC power-supply module for Micrologic (F1-, F2+)

- Do not connect the positive terminal (F2+) to earth
- The negative terminal (F1-) can be connected to earth, except in IT systems
- A number of Micrologic control units can be connected to the same 24 V DC power supply (the consumption of a Micrologic control unit is approximately 100 mA)
- Do not connect any devices other than a Micrologic control unit
- The maximum length for each conductor is ten metres. For greater distances, it is advised to twist the supply wires together
- The 24 V DC supply wires must cross the power cables perpendicularly. If this is difficult, it is advised to twist the supply wires together
- The technical characteristics of the external 24 V DC power-supply module for Micrologic control units are indicated on page A-20.

Communication bus

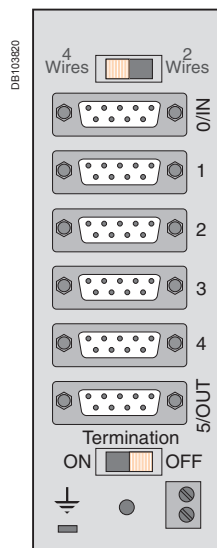
- Do not connect the positive terminal (E1) to earth
- The negative terminal (E2) can be connected to earth
- A number of "device" or "chassis" communication modules can be connected to the same 24 V DC power supply (the consumption of each module is approximately 30 mA)
- The 24 V DC (E1, E2) power supply for the communication bus must be separate from the external 24 V DC power-supply module for Micrologic control units (F1-, F2+).

E1	E2	E3	E4	E5	E6
+	-	A/Tx ⁻	B/Tx ⁺	A'/Rx ⁻	B'/Rx ⁺

To create a two-wire Modbus communication bus, simply connect Tx⁻ with Rx⁻ and Tx⁺ with Rx⁺.

To connect a Modbus slave (Micrologic) to a Modbus master (PLC), connect:
 the slave Tx⁻ to the master Rx⁻ the slave Rx⁻ to the master Tx⁻
 the slave Tx⁺ to the master Rx⁺ the slave Rx⁺ to the master Tx⁺.

RS 485 Modbus junction block



The diagram shows the RS 485 Modbus junction block with terminals for 4 wires (0/V, 1, 2, 3, 4) and 5/OUT. It includes a Termination switch (ON/OFF) and a ground symbol. A side view shows pins 1 through 9.

Pins	Signal	Color
1	0 V	Black
2	24 V	Red
3	NC	
4	B' / Rx ⁺	Blue
5	B / Tx ⁺	Yellow
6	0 V	Black
7	24 V	Red
8	A' / Rx ⁻	White
9	A / Tx ⁻	Brown

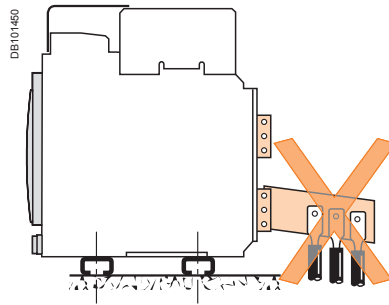
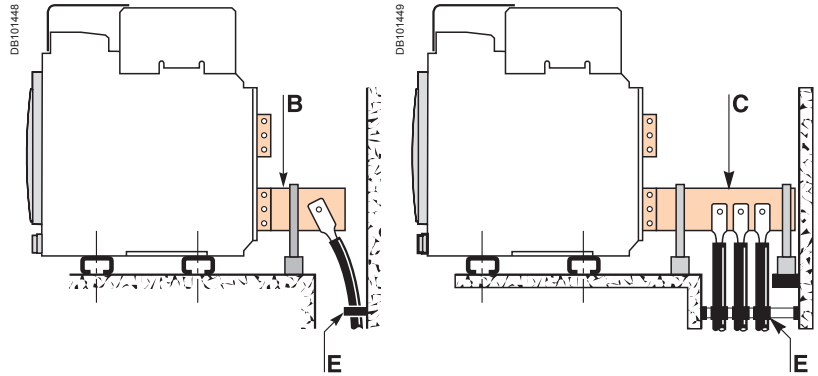
Wiring of ZSI: it is recommended to use twisted shielded cable. The shield must be connected to earth at both ends.

Cables connections

If cables are used for the power connections, make sure that they do not apply excessive mechanical forces to the circuit breaker terminals.

For this, make the connections as follows:

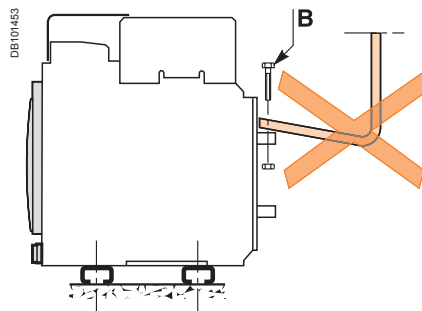
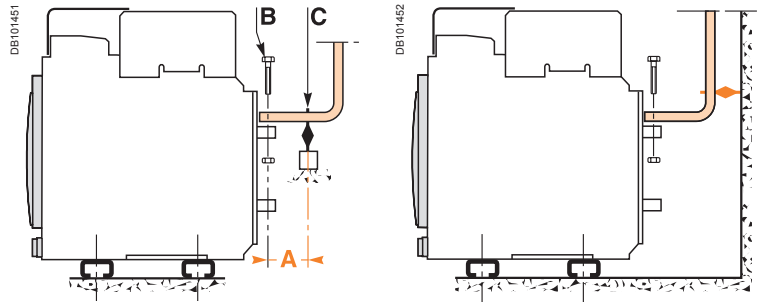
- extend the circuit breaker terminals using short bars designed and installed according to the recommendations for bar-type power connections:
 - for a single cable, use solution **B** opposite
 - for multiple cables, use solution **C** opposite
- in all cases, follow the general rules for connections to busbars:
 - position the cable lugs before inserting the bolts
 - the cables should firmly secured to the framework **E**.



Busbars connections

The busbars should be suitably adjusted to ensure that the connection points are positioned on the terminals before the bolts are inserted **B**

The connections are held by the support which is solidly fixed to the framework of the switchboard, such that the circuit breaker terminals do not have to support its weight **C**. (This support should be placed close to the terminals).

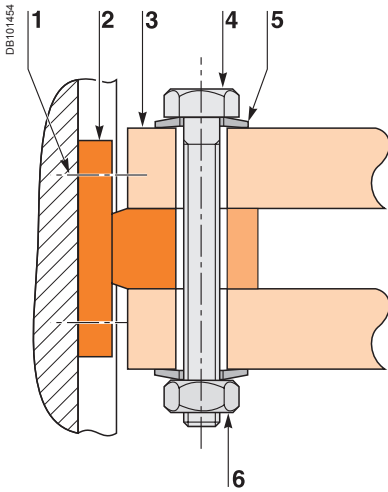


Electrodynamic stresses

The first busbar support or spacer shall be situated within a maximum distance from the connection point of the breaker (see table below). This distance must be respected so that the connection can withstand the electrodynamic stresses between phases in the event of a short circuit.

Maximum distance A between busbar to circuit breaker connection and the first busbar support or spacer with respect to the value of the prospective short-circuit current.

Isc (kA)	30	50	65	80	100	150
Distance A (mm)	350	300	250	150	150	150



- 1 Terminal screw factory-tightened to 16 Nm (NW), 13 Nm (NT).
- 2 Breaker terminal.
- 3 Busbar.
- 4 Bolt.
- 5 Washer.
- 6 Nut.

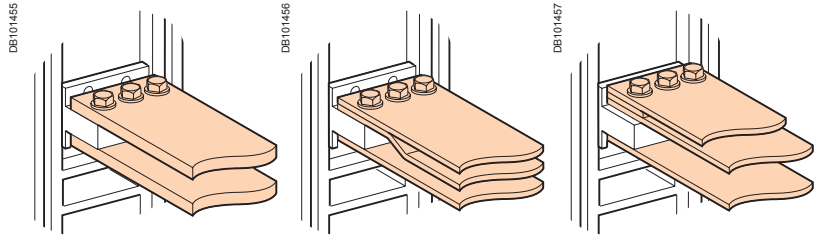
Clamping

Correct clamping of busbars depends amongst other things, on the tightening torques used for the nuts and bolts. Over-tightening may have the same consequences as under-tightening.

For connecting busbars (Cu ETP-NFA51-100) to the circuit breaker, the tightening torques to be used are shown in the table below.

These values are for use with copper busbars and steel nuts and bolts, class 8.8. The same torques can be used with AGS-T52 quality aluminium bars (French standard NFA 02-104 or American National Standard H-35-1).

Examples

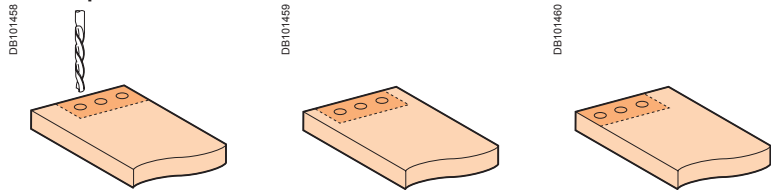


Tightening torques

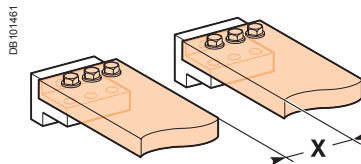
\varnothing (mm) Nominal	\varnothing (mm) Drilling	Tightening torques (Nm) with grower or flat washers	Tightening torques (Nm) with contact or corrugatec washers
10	11	37.5	50

Busbar drilling

Examples



Isolation distance

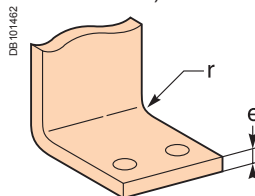


Dimensions (mm)

Ui	X min
600 V	8 mm

Busbar bending

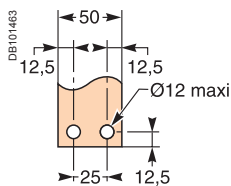
When bending busbars maintain the radius indicated below (a smaller radius would cause cracks).



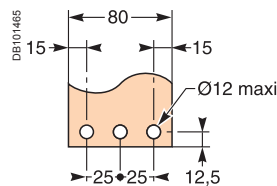
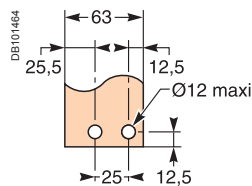
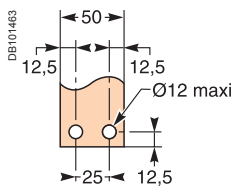
Dimensions (mm)

e	Radius of curvature r	
	Min	Recommended
5	5	7.5
10	15	18 to 20

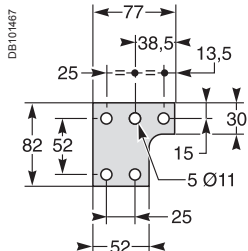
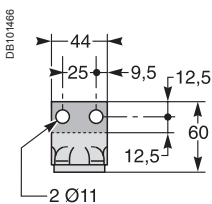
Rear connection



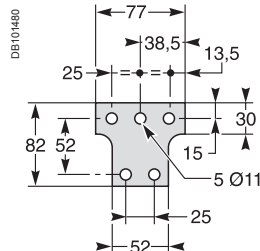
Rear connection with spreaders



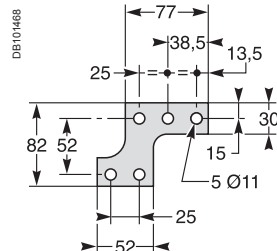
Middle left or middle right spreader for 4P



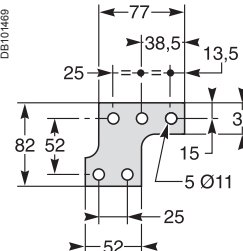
Middle spreader for 3P



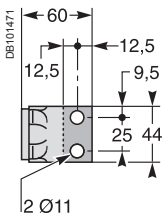
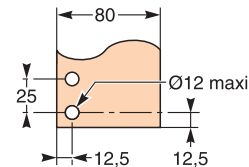
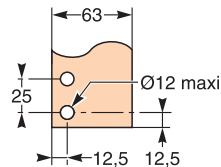
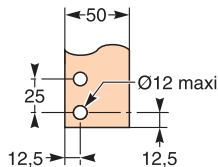
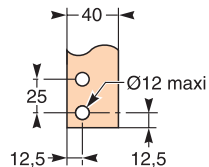
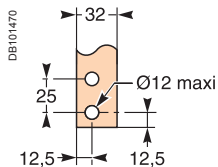
Left or right spreader for 4P



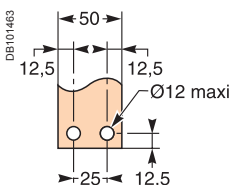
Left or right spreader for 3P



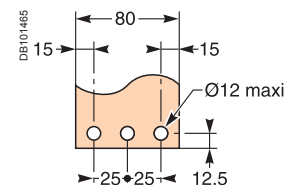
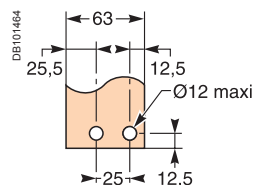
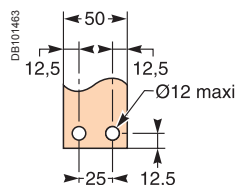
Vertical rear connection



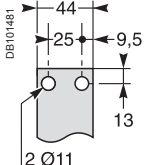
Front connection



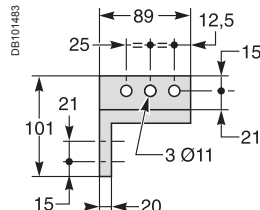
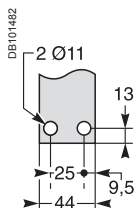
Front connection via vertical connection adapters



Top connection

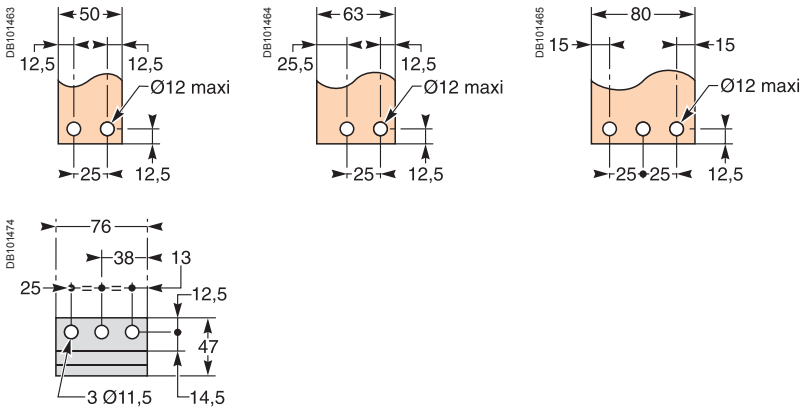


Bottom connection

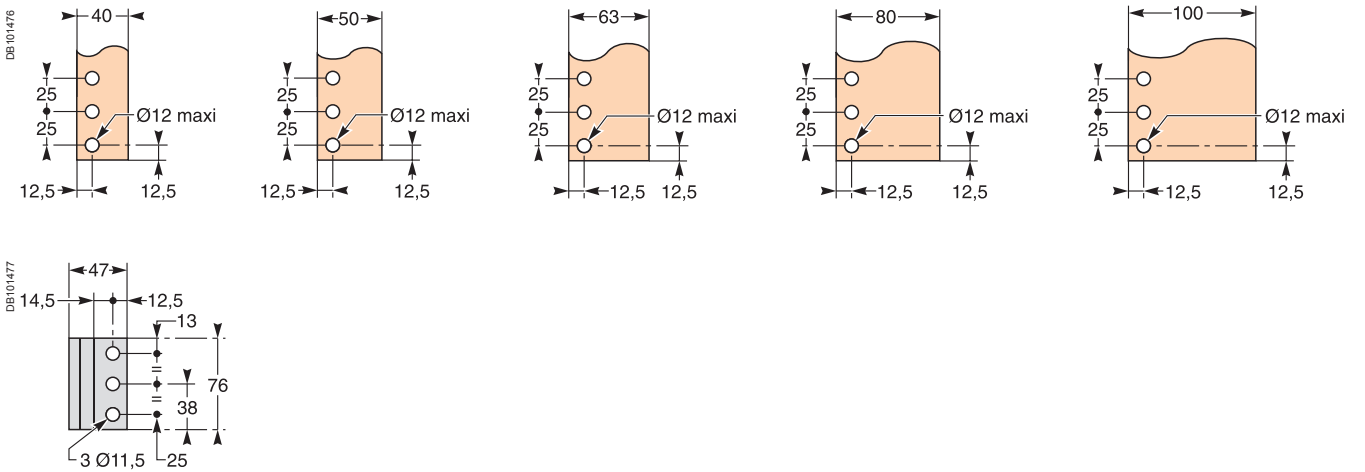


Masterpact NW08 to NW40 NAVY

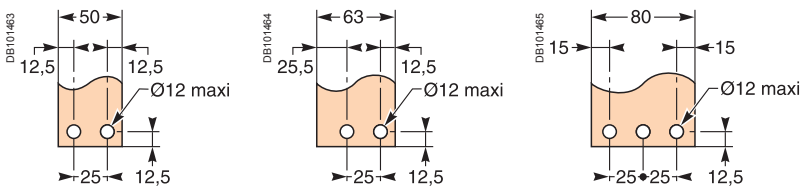
Horizontal rear connection NW08 to NW32 NAVY



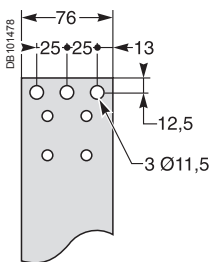
Vertical rear connection NW08 to NW32 NAVY



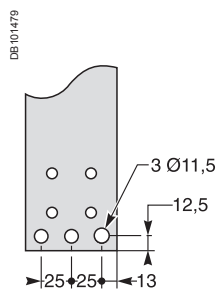
Front connection NW08 to NW32 NAVY



Top connection



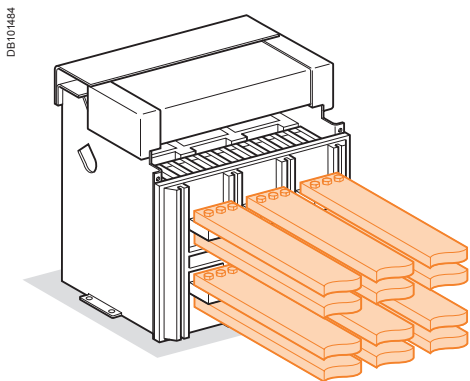
Bottom connection



Basis of tables:

- maximum permissible busbars temperature: 100 °C
- T_i : temperature around the circuit breaker and its connection
- busbar material is unpainted copper.

Front or rear horizontal connection



Masterpact NAVY	Maximum service current	$T_i : 40\text{ °C}$		$T_i : 50\text{ °C}$		$T_i : 60\text{ °C}$		$T_i : 70\text{ °C}$	
		No. of 5 mm thick bars	No. of 10 mm thick bars	No. of 5 mm thick bars	No. of 10 mm thick bars	No. of 5 mm thick bars	No. of 10 mm thick bars	No. of 5 mm thick bars	No. of 10 mm thick bars
NT06 NAVY	630	2b.40 x 5	1b.40 x 10	2b.40 x 5	1b.40 x 10	2b.40 x 5	1b.40 x 10	2b.40 x 5	1b.40 x 10
NT08 or NW08 NAVY	800	2b.50 x 5	1b.50 x 10	2b.50 x 5	1b.50 x 10	2b.50 x 5	1b.63 x 10	2b.50 x 5	1b.63 x 10
NT10 or NW10 NAVY	1000	3b.50 x 5	1b.63 x 10	3b.50 x 5	2b.50 x 10	3b.63 x 5	2b.50 x 10	3b.63 x 5	2b.50 x 10
NT12 or NW12 NAVY	1250	3b.50 x 5	2b.40 x 10	3b.50 x 5	2b.50 x 10	3b.63 x 5	2b.50 x 10	3b.63 x 5	2b.50 x 10
		2b.80 x 5	2b.40 x 10	2b.80 x 5					
NT16 or NW16 NAVY	1400	3b.63 x 5	2b.40 x 10	3b.63 x 5	2b.50 x 10	3b.80 x 5	2b.63 x 10	3b.80 x 5	2b.63 x 10
NT16 or NW16 NAVY	1600	3b.80 x 5	2b.63 x 10	3b.80 x 5	2b.63 x 10	3b.80 x 5	3b.50 x 10	3b.80 x 5	3b.50 x 10
NW20 NAVY	1800	3b.80 x 5	2b.63 x 10	3b.80 x 5	2b.63 x 10	3b.100 x 5	2b.80 x 10	3b.100 x 5	2b.80 x 10
NW20 NAVY	2000	3b.100 x 5	2b.80 x 10	3b.100 x 5	2b.80 x 10	3b.100 x 5	3b.63 x 10	3b.100 x 5	3b.63 x 10
NW25 NAVY	2200	4b.100 x 5	2b.80 x 10	4b.100 x 5	2b.80 x 10	4b.100 x 5	2b.100 x 10	5b.80 x 5	2b.100 x 10
NW25 NAVY	2500	4b.100 x 5	2b.100 x 10	4b.100 x 5	2b.100 x 10	4b.100 x 5	3b.80 x 10	4b.100 x 5	3b.80 x 10
NW32 NAVY	2800	4b.100 x 5	3b.80 x 10	4b.100 x 5	3b.80 x 10	5b.100 x 5	3b.100 x 10	5b.100 x 5	3b.100 x 10
NW32 NAVY	3000	5b.100 x 5	3b.80 x 10	6b.100 x 5	3b.100 x 10	8b.100 x 5	4b.80 x 10	6b.100 x 5	4b.80 x 10
NW32 NAVY	3200	6b.100 x 5	3b.100 x 10	8b.100 x 5	3b.100 x 10		4b.100 x 10		4b.100 x 10
NW40 NAVY	3800		4b.100 x 10		5b.100 x 10		5b.100 x 10		5b.100 x 10

With Masterpact NT NAVY, it is recommended to use 50 mm wideness bars (see "Recommended busbars drilling").

Example

Conditions:

- drawout version
- horizontal busbars
- T_i : 50 °C
- service current: 1800 A.

Solution:

For $T_i = 50\text{ °C}$, use an NW20 NAVY which can be connected with three 80 x 5 mm bars or two 63 x 10 mm bars.

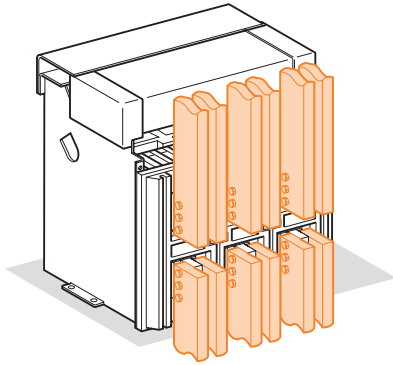
Note: the values indicated in these tables have been extrapolated from test data and theoretical calculations. These tables are only intended as a guide and cannot replace industrial experience or a temperature rise test.

Basis of tables:

- maximum permissible busbars temperature: 100 °C
- T_i : temperature around the circuit breaker and its connection
- busbar material is unpainted copper.

Rear vertical connection

DB10487



Masterpact NAVY	Maximum service current	$T_i : 40\text{ °C}$		$T_i : 50\text{ °C}$		$T_i : 60\text{ °C}$		$T_i : 70\text{ °C}$	
		No. of 5 mm thick bars	No. of 10 mm thick bars	No. of 5 mm thick bars	No. of 10 mm thick bars	No. of 5 mm thick bars	No. of 10 mm thick bars	No. of 5 mm thick bars	No. of 10 mm thick bars
NT06 NAVY	630	2b.40 x 5	1b.40 x 10	2b.40 x 5	1b.40 x 10	2b.40 x 5	1b.40 x 10	2b.40 x 5	1b.40 x 10
NT08 or NW08 NAVY	800	2b.50 x 5	1b.50 x 10	2b.50 x 5	1b.50 x 10	2b.50 x 5	1b.50 x 10	2b.50 x 5	1b.50 x 10
NT10 or NW10 NAVY	1000	2b.50 x 5	1b.50 x 10	2b.50 x 5	1b.50 x 10	2b.63 x 5	1b.63 x 10	2b.63 x 5	1b.63 x 10
NT12 or NW12 NAVY	1250	2b.63 x 5	1b.63 x 10	3b.50 x 5	2b.40 x 10	3b.50 x 5	2b.40 x 10	3b.63 x 5	2b.40 x 10
NT16 or NW16 NAVY	1400	2b.80 x 5	1b.80 x 10	2b.80 x 5	2b.50 x 10	3b.63 x 5	2b.50 x 10	3b.63 x 5	2b.50 x 10
NT16 or NW16 NAVY	1600	3b.63 x 5	2b.50 x 10	3b.63 x 5	2b.50 x 10	3b.80 x 5	2b.63 x 10	3b.80 x 5	2b.63 x 10
NW20 NAVY	1800	2b.100 x 5	1b.80 x 10	2b.100 x 5	2b.50 x 10	3b.80 x 5	2b.63 x 10	3b.80 x 5	2b.63 x 10
NW20 NAVY	2000	3b.100 x 5	2b.63 x 10	3b.100 x 5	2b.63 x 10	3b.100 x 5	2b.80 x 10	3b.100 x 5	2b.80 x 10
NW25 NAVY	2200	3b.100 x 5	2b.63 x 10	3b.100 x 5	2b.63 x 10	3b.100 x 5	2b.80 x 10	4b.100 x 5	2b.100 x 10
NW25 NAVY	2500	4b.100 x 5	2b.80 x 10	4b.100 x 5	2b.80 x 10	4b.100 x 5	3b.80 x 10	4b.100 x 5	3b.80 x 10
NW32 NAVY	2800	4b.100 x 5	2b.100 x 10	4b.100 x 5	2b.100 x 10	4b.100 x 5	3b.80 x 10	4b.125 x 5	3b.80 x 10
NW32 NAVY	3000	5b.100 x 5	3b.80 x 10	6b.100 x 5	3b.100 x 10	5b.100 x 5	4b.80 x 10	5b.125 x 5	4b.80 x 10
NW32 NAVY	3200	6b.100 x 5	3b.100 x 10	6b.100 x 5	3b.100 x 10		4b.100 x 10		4b.100 x 10
NW40 NAVY	3800		4b.100 x 10		4b.100 x 10		4b.100 x 10		4b.100 x 10

Example

Conditions:

- drawout version
- vertical connections
- T_i : 40 °C
- service current: 1100 A.

Solution :

For $T_i = 40\text{ °C}$ use an NT12 NAVY or NW12 NAVY which can be connected with two 63 x 5 mm bars or with one 63 x 10 mm bar.

Note: the values indicated in these tables have been extrapolated from test data and theoretical calculations. These tables are only intended as a guide and cannot replace industrial experience or a temperature rise test.

Temperature derating Power dissipation and input / output resistance

Temperature derating

The table below indicates the maximum current rating, for each connection type, as a function of T_i around the circuit breaker and the busbars.

Circuit breakers with mixed connections have the same derating as horizontally connected breakers.

For T_i greater than 70 °C, consult us.

T_i : temperature around the circuit breaker and its connection.

Version	Drawout																					
	Front or rear horizontal							Rear vertical														
Temp. T_i	40	45	50	55	60	65	70	40	45	50	55	60	65	70								
NT06 NAVY H1/H2/L1	630							630														
NT08 NAVY H1/H2/L1	800							800														
NT10 NAVY H1/H2/L1	1000							1000														
NT12 NAVY H1/H2	1250							1250														
NT16 NAVY H1/H2	1600		1520		1480		1430		1380		1330		1600		1560		1510		1450		1250	
NW08 NAVY N/H/L	800							800														
NW10 NAVY N/H/L	1000							1000														
NW12 NAVY N/H/L	1250							1250														
NW16 NAVY N/H/L	1600							1600														
NW20 NAVY H1/H2/H3	2000			1980		1890		1790		1690		2000		1750								
NW25 NAVY H1/H2/H3	2500							2500														
NW32 NAVY H1/H2/H3	3200		3100		3000		2900		2800		2700		3200		3150							
NW40 NAVY H1/H2/H3	4000		3900		3750		3650		3500		3350		4000		3850		3700		3450			

Power dissipation and input / output resistance

Total power dissipation is the value measured at I_n , 50/60 Hz, for a 3 pole or 4 pole breaker (values above the power $P = 3RI^2$).

The resistance between input / output is the value measured per pole (cold state).

Version	Drawout	
	Power dissipation (Watts)	Input/output resistance (μohm)
NT06 NAVY H1/H2/L1	55/115 (H1/L1)	38/72
NT08 NAVY H1/H2/L1	90/140 (H1/L1)	38/72
NT10 NAVY H1/H2/L1	150/230 (H1/L1)	38/72
NT12 NAVY H1/H2	250	36
NT16 NAVY H1/H2	460	36
NW08 NAVY N1	137	42
NW08 NAVY H	100	30
NW10 NAVY N1	220	42
NW10 NAVY H	150	30
NW12 NAVY N1	330	42
NW12 NAVY H	230	27
NW16 NAVY N1	480	37
NW16 NAVY H	390	27
NW20 NAVY H	470	27
NW25 NAVY H1/H2	600	19
NW32 NAVY H1/H2	670	13
NW40 NAVY H1/H2	900	11

Derating in switchboards

Factors affecting switchboard design

The temperature around the circuit breaker and its connections:

This is used to define the type of circuit breaker to be used and its connection arrangement.

Vents at the top and bottom of the cubicles:

Vents considerably reduce the temperature inside the switchboard, but must be designed so as to respect the degree of protection provided by the enclosure. For weatherproof heavy-duty cubicles, a forced ventilation system may be required.

The heat dissipated by the devices installed in the switchboard:

This is the heat dissipated by the circuit breakers under normal conditions (service current).

The size of the enclosure:

This determines the volume for cooling calculations.

Switchboard installation mode:

Free-standing, against a wall, etc.

Horizontal partitions:

Partitions can obstruct air circulation within the enclosure.

Basis of tables

- Switchboard dimensions
- Number of circuit-breakers installed
- Type of breaker connections
- Drawout versions
- Ambient temperature outside of the switchboard: T_a (IEC 60439-1).

Masterpact NT06-16 NAVY H1/H2/L1 (switchboard 2000 x 400 x 400) - area of outlet vents: 150 cm²

Type	NT06 NAVY H1/H2/L1	NT08 NAVY H1/H2/L1	NT10 NAVY H1/H2/L1	NT12 NAVY H1/H2	NT16 NAVY H1/H2																																																																																																																																																											
Switchboard composition																																																																																																																																																																
Connection type																																																																																																																																																																
Busbar dimensions (mm)	2b. 40 x 5	2b. 50 x 5	3b. 63 x 5	3b. 63 x 5 3b. 50 x 5	3b. 80 x 5 3b. 63 x 5																																																																																																																																																											
Ventilated switchboard (→ IP31)	<table border="1"> <thead> <tr> <th></th> <th colspan="2">H1/L1</th> <th colspan="2">H1/L1</th> <th colspan="2">H1/L1</th> <th colspan="2">H1/L1</th> <th colspan="2">H1/L1</th> </tr> </thead> <tbody> <tr> <td>$T_a = 35\text{ °C}$</td> <td>4</td> <td>630</td> <td>630</td> <td>800</td> <td>800</td> <td>1000/1000</td> <td>1000/1000</td> <td>1250</td> <td>1250</td> <td>1400</td> <td>1520</td> </tr> <tr> <td></td> <td>3</td> <td>630</td> <td>630</td> <td>800</td> <td>800</td> <td>1000/950</td> <td>1000/1000</td> <td>1250</td> <td>1250</td> <td>1330</td> <td>1440</td> </tr> <tr> <td></td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>$T_a = 45\text{ °C}$</td> <td>4</td> <td>630</td> <td>630</td> <td>800</td> <td>800</td> <td>1000/890</td> <td>1000/960</td> <td>1200</td> <td>1250</td> <td>1250</td> <td>1340</td> </tr> <tr> <td></td> <td>3</td> <td>630</td> <td>630</td> <td>800</td> <td>800</td> <td>1000/910</td> <td>1000/980</td> <td>1220</td> <td>1250</td> <td>1260</td> <td>1330</td> </tr> <tr> <td></td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>$T_a = 55\text{ °C}$</td> <td>4</td> <td>630</td> <td>630</td> <td>800</td> <td>800</td> <td>1000/860</td> <td>1000/930</td> <td>1150</td> <td>1230</td> <td>1200</td> <td>1260</td> </tr> <tr> <td></td> <td>3</td> <td>630</td> <td>630</td> <td>800</td> <td>800</td> <td>1000/860</td> <td>1000/930</td> <td>1150</td> <td>1230</td> <td>1200</td> <td>1260</td> </tr> <tr> <td></td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						H1/L1		H1/L1		H1/L1		H1/L1		H1/L1		$T_a = 35\text{ °C}$	4	630	630	800	800	1000/1000	1000/1000	1250	1250	1400	1520		3	630	630	800	800	1000/950	1000/1000	1250	1250	1330	1440		2												1											$T_a = 45\text{ °C}$	4	630	630	800	800	1000/890	1000/960	1200	1250	1250	1340		3	630	630	800	800	1000/910	1000/980	1220	1250	1260	1330		2												1											$T_a = 55\text{ °C}$	4	630	630	800	800	1000/860	1000/930	1150	1230	1200	1260		3	630	630	800	800	1000/860	1000/930	1150	1230	1200	1260		2												1										
	H1/L1		H1/L1		H1/L1		H1/L1		H1/L1																																																																																																																																																							
$T_a = 35\text{ °C}$	4	630	630	800	800	1000/1000	1000/1000	1250	1250	1400	1520																																																																																																																																																					
	3	630	630	800	800	1000/950	1000/1000	1250	1250	1330	1440																																																																																																																																																					
	2																																																																																																																																																															
	1																																																																																																																																																															
$T_a = 45\text{ °C}$	4	630	630	800	800	1000/890	1000/960	1200	1250	1250	1340																																																																																																																																																					
	3	630	630	800	800	1000/910	1000/980	1220	1250	1260	1330																																																																																																																																																					
	2																																																																																																																																																															
	1																																																																																																																																																															
$T_a = 55\text{ °C}$	4	630	630	800	800	1000/860	1000/930	1150	1230	1200	1260																																																																																																																																																					
	3	630	630	800	800	1000/860	1000/930	1150	1230	1200	1260																																																																																																																																																					
	2																																																																																																																																																															
	1																																																																																																																																																															
Non ventilated switchboard (→ IP54)	<table border="1"> <thead> <tr> <th></th> <th colspan="2">H1/L1</th> <th colspan="2">H1/L1</th> <th colspan="2">H1/L1</th> <th colspan="2">H1/L1</th> <th colspan="2">H1/L1</th> </tr> </thead> <tbody> <tr> <td>$T_a = 35\text{ °C}$</td> <td>4</td> <td>630</td> <td>630</td> <td>800</td> <td>800</td> <td>1000/960</td> <td>1000/1000</td> <td>1250</td> <td>1250</td> <td>1330</td> <td>1400</td> </tr> <tr> <td></td> <td>3</td> <td>630</td> <td>630</td> <td>800</td> <td>800</td> <td>1000/910</td> <td>1000/980</td> <td>1220</td> <td>1250</td> <td>1260</td> <td>1330</td> </tr> <tr> <td></td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>$T_a = 45\text{ °C}$</td> <td>4</td> <td>630</td> <td>630</td> <td>800</td> <td>800</td> <td>1000/860</td> <td>1000/930</td> <td>1150</td> <td>1230</td> <td>1200</td> <td>1260</td> </tr> <tr> <td></td> <td>3</td> <td>630</td> <td>630</td> <td>800</td> <td>800</td> <td>1000/860</td> <td>1000/930</td> <td>1150</td> <td>1230</td> <td>1200</td> <td>1260</td> </tr> <tr> <td></td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						H1/L1		H1/L1		H1/L1		H1/L1		H1/L1		$T_a = 35\text{ °C}$	4	630	630	800	800	1000/960	1000/1000	1250	1250	1330	1400		3	630	630	800	800	1000/910	1000/980	1220	1250	1260	1330		2												1											$T_a = 45\text{ °C}$	4	630	630	800	800	1000/860	1000/930	1150	1230	1200	1260		3	630	630	800	800	1000/860	1000/930	1150	1230	1200	1260		2												1																																																										
	H1/L1		H1/L1		H1/L1		H1/L1		H1/L1																																																																																																																																																							
$T_a = 35\text{ °C}$	4	630	630	800	800	1000/960	1000/1000	1250	1250	1330	1400																																																																																																																																																					
	3	630	630	800	800	1000/910	1000/980	1220	1250	1260	1330																																																																																																																																																					
	2																																																																																																																																																															
	1																																																																																																																																																															
$T_a = 45\text{ °C}$	4	630	630	800	800	1000/860	1000/930	1150	1230	1200	1260																																																																																																																																																					
	3	630	630	800	800	1000/860	1000/930	1150	1230	1200	1260																																																																																																																																																					
	2																																																																																																																																																															
	1																																																																																																																																																															

(1) Area of outlet vents: 150 cm².

(2) Area of inlet vents: 150 cm².

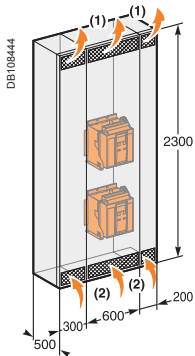
Note: the values indicated in these tables have been extrapolated from test data and theoretical calculations. These tables are only intended as a guide and cannot replace industrial experience or a temperature rise test.

The values indicated for the cross-sectional area of the vents should be considered as general indications only given that the thermal performance of a switchboard with natural ventilation depends on many parameters, e.g. shape, porosity and location of vents and air flow within the switchboard.

Masterpact NAVY NT06-08 H1/H2/L1 (switchboard 2300 x 1100 x 500) - area of outlet vents: 300 cm²

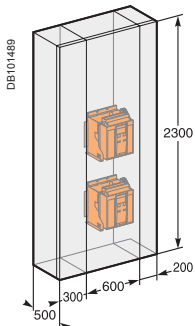
Type	NT06 NAVY H1/H2/L1						NT08 NAVY H1/H2/L1				
Switchboard composition											
Connection type											
Busbar dimensions (mm)	2b. 40 x 5						2b. 50 x 5				

Ventilated switchboard (→ IP31)		NT06						NT08				
$T_a = 35\text{ °C}$	5	630 630						800				
	4	630 630 630						800 800				
	3	630 630 630 630						800 800 800				
$T_a = 45\text{ °C}$	2	630	630	630	630	630	630	800	800	800	800	800
	1	630						800				
	5	630 630						800				
$T_a = 55\text{ °C}$	4	630 630 630						800 800				
	3	630 630 630 630						800 800 800				
	2	630	630	630	630	630	630	800	800	800	800	800
	1	630						800				



(1) Area of outlet vents: 300 cm².
(2) Area of inlet vents: 300 cm².

Non ventilated switchboard (→ IP54)		NT06						NT08				
$T_a = 35\text{ °C}$	5	630 630						800				
	4	630 630 630						800 800				
	3	630 630 630 630						800 800 800				
$T_a = 45\text{ °C}$	2	630	630	630	630	630	630	800	800	800	800	800
	1	630						800				
	5	630 630						800				
$T_a = 55\text{ °C}$	4	630 630 630						800 800				
	3	630 630 630 630						800 800 800				
	2	630	630	630	630	630	630	800	800	800	800	800
	1	630						800				



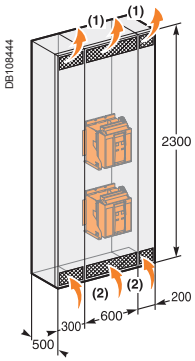
Note: the values indicated in these tables have been extrapolated from test data and theoretical calculations. These tables are only intended as a guide and cannot replace industrial experience or a temperature rise test.

The values indicated for the cross-sectional area of the vents should be considered as general indications only given that the thermal performance of a switchboard with natural ventilation depends on many parameters, e.g. shape, porosity and location of vents and air flow within the switchboard.

Masterpact NAVY NT10-16 H1/H2/L1 (switchboard 2300 x 1100 x 500) - area of outlet vents: 300 cm²

Type	NT10 NAVY H1/H2/L1				NT12 NAVY H1/H2				NT16 NAVY H1/H2		
Switchboard composition											
Connection type											
Busbar dimensions (mm)	3b. 63 x 5				3b. 63 x 5				3b. 80 x 5		

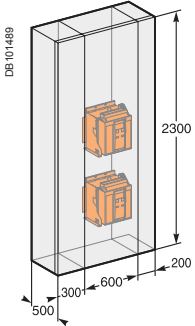
Ventilated switchboard (→ IP31)



	5 H1/L1	H1/L1	H1/L1	H1/L1							
$T_a = 35\text{ °C}$					1000/1000			1250			1500
	1000/1000	1000/1000	1000/1000	1000/1000	1250	1250	1250	1250	1460	1600	1550
$T_a = 45\text{ °C}$					1000/1000			1250			1420
	1000/960	1000/1000	1000/1000	1000/1000	1250	1250	1250	1250	1400	1500	1480
$T_a = 55\text{ °C}$					1000/920			1250			1330
	1000/900	1000/1000	1000/970	1000/950	1250	1250	1250	1250	1300	1400	1370

- (1) Area of outlet vents: 300 cm².
- (2) Area of inlet vents: 300 cm².

Non ventilated switchboard (→ IP54)



	5											
$T_a = 35\text{ °C}$					1000/950			1250			1370	
	1000/1000	1000/1000	1000/1000	1000/970	1250	1250	1250	1250	1400	1500	1400	
$T_a = 45\text{ °C}$					1000/900			1180			1300	
	1000/950	1000/1000	1000/960	1000/930	1250	1250	1250	1220	1350	1430	1320	
$T_a = 55\text{ °C}$					1000/850			1120			1210	
	1000/880	1000/970	1000/910	1000/870	1210	1250	1210	1150	1250	1350	1250	

Note: the values indicated in these tables have been extrapolated from test data and theoretical calculations. These tables are only intended as a guide and cannot replace industrial experience or a temperature rise test.
The values indicated for the cross-sectional area of the vents should be considered as general indications only given that the thermal performance of a switchboard with natural ventilation depends on many parameters, e.g. shape, porosity and location of vents and air flow within the switchboard.

Masterpact NW08-10 NAVY N/H (switchboard 2300 x 800 x 900) - area of outlet vents: 350 cm²

Type	NW08 NAVY N/H					NW10 NAVY N/H				
Switchboard composition										
Connection type										
Busbar dimensions (mm)	2b. 50 x 5					3b. 63 x 5 2b. 63 x 5				
Ventilated switchboard (→ IP31)										
$T_a = 35\text{ °C}$ $T_a = 45\text{ °C}$ $T_a = 55\text{ °C}$	4	800								
	3	800				1000				
	2	800	800	800	800	1000				
	1	800	800	800	800	800	1000	1000	1000	1000
	4	800								
	3	800				1000				
	2	800	800	800	800	1000				
	1	800	800	800	800	800	1000	1000	1000	1000
	4	800								
	3	800				1000				
	2	800	800	800	800	1000				
	1	800	800	800	800	800	1000	1000	1000	1000
Non ventilated switchboard (→ IP54)										
$T_a = 35\text{ °C}$ $T_a = 45\text{ °C}$ $T_a = 55\text{ °C}$	4	800								
	3	800				1000				
	2	800	800	800	800	1000				
	1	800	800	800	800	800	1000	1000	1000	1000
	4	800								
	3	800				1000				
	2	800	800	800	800	1000				
	1	800	800	800	800	800	1000	1000	1000	1000
	4	800								
	3	800				1000				
	2	800	800	800	800	1000				
	1	800	800	800	800	800	1000	1000	1000	1000

(1) Area of outlet vents: 350 cm²
 (2) Area of inlet vents: 350 cm².

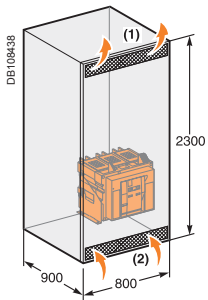
Note: the values indicated in these tables have been extrapolated from test data and theoretical calculations. These tables are only intended as a guide and cannot replace industrial experience or a temperature rise test.

The values indicated for the cross-sectional area of the vents should be considered as general indications only given that the thermal performance of a switchboard with natural ventilation depends on many parameters, e.g. shape, porosity and location of vents and air flow within the switchboard.

Masterpact NW12-16 NAVY N/H (switchboard 2300 x 800 x 900) - area of outlet vents: 350 cm²

Type	NW12 NAVY N1	NW12 NAVY H	NW16 NAVY N1	NW16 NAVY H
Switchboard composition				
Connection type				
Busbar dimensions (mm)	3b. 63 x 5 3b. 50 x 5	3b. 63 x 5 3b. 50 x 5	3b. 80 x 5 3b. 63 x 5	3b. 80 x 5 3b. 63 x 5

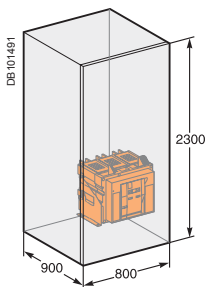
Ventilated switchboard (→ IP31)



Temperature (T _a)	4	3	2	1	4	3	2	1	4	3	2	1
T _a = 35 °C		1250	1250	1250	1250	1250	1250	1250	1550	1600	1600	1600
T _a = 45 °C		1250	1250	1250	1250	1250	1250	1250	1470	1600	1600	1600
T _a = 55 °C		1250	1250	1250	1250	1250	1250	1250	1380	1500	1500	1520

- (1) Area of outlet vents: 350 cm².
- (2) Area of inlet vents: 350 cm².

Non ventilated switchboard (→ IP54)



Temperature (T _a)	4	3	2	1	4	3	2	1	4	3	2	1
T _a = 35 °C		1240	1250	1250	1250	1250	1250	1250	1440	1550	1550	1600
T _a = 45 °C		1170	1210	1210	1250	1250	1250	1250	1360	1470	1470	1500
T _a = 55 °C		1100	1140	1170	1250	1250	1250	1250	1280	1380	1380	1400

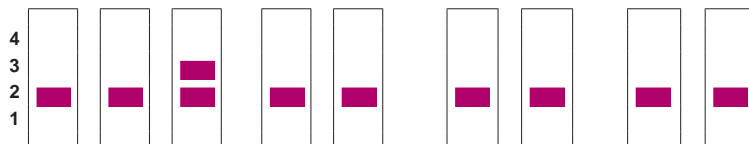
Note: the values indicated in these tables have been extrapolated from test data and theoretical calculations. These tables are only intended as a guide and cannot replace industrial experience or a temperature rise test.

The values indicated for the cross-sectional area of the vents should be considered as general indications only given that the thermal performance of a switchboard with natural ventilation depends on many parameters, e.g. shape, porosity and location of vents and air flow within the switchboard.

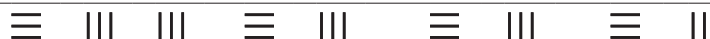
Masterpact NW20-40 NAVY N/H (switchboard 2300 x 800 x 900) - area of outlet vents: 350 cm²

Type **NW20 NAVY H1/H2** **NW25 NAVY H1/2** **NW32 NAVY H1/2** **NW40 NAVY H1/2**

Switchboard composition



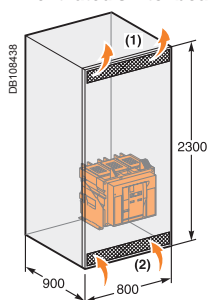
Connection type



Busbar dimensions (mm)

3b. 100 x 5 4b. 100 x 5 3b. 100 x 10 4b. 100 x 10

Ventilated switchboard (→ IP31)



T_a = 35 °C

4									
3			2000						
2	2000	2000	2000	2375	2500	3040	3200	3320	3700
1									

T_a = 45 °C

4									
3			2000						
2	2000	2000	2000	2250	2380	2880	3100	3160	3500
1									

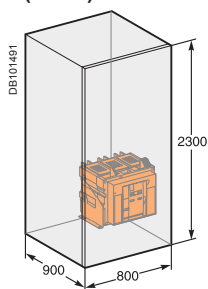
T_a = 55 °C

4									
3			2000						
2	2000	2000	2000	2100	2250	2690	2900	2960	3280
1									

(1) Area of outlet vents: 350 cm².

(2) Area of inlet vents: 350 cm².

Non ventilated switchboard
(→ IP54)



T_a = 35 °C

4									
3			2000						
2	2000	2000	2000	2125	2275	2650	2850	3040	3320
1									

T_a = 45 °C

4									
3			1900						
2	1900	1960	1960	2000	2150	2550	2700	2880	3120
1									

T_a = 55 °C

4									
3			1780						
2	1800	1920	1920	1900	2020	2370	2530	2720	2960
1									

Note: the values indicated in these tables have been extrapolated from test data and theoretical calculations. These tables are only intended as a guide and cannot replace industrial experience or a temperature rise test.

The values indicated for the cross-sectional area of the vents should be considered as general indications only given that the thermal performance of a switchboard with natural ventilation depends on many parameters, e.g. shape, porosity and location of vents and air flow within the switchboard.



schneider-electric.com

This international site allows you to access all the Schneider Electric products in just 2 clicks via comprehensive range data-sheets, with direct links to:

- complete library: technical documents, catalogs, FAQs, brochures...
- selection guides from the e-catalog.
- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts...



Training

Training allows you to acquire the Schneider Electric expertise (installation design, work with power on, etc.) for increased efficiency and a guarantee of improved customer service.

The training catalogue includes beginner's courses in electrical distribution, knowledge of MV and LV switchgear, operation and maintenance of installations, design of LV installations to give but a few examples.

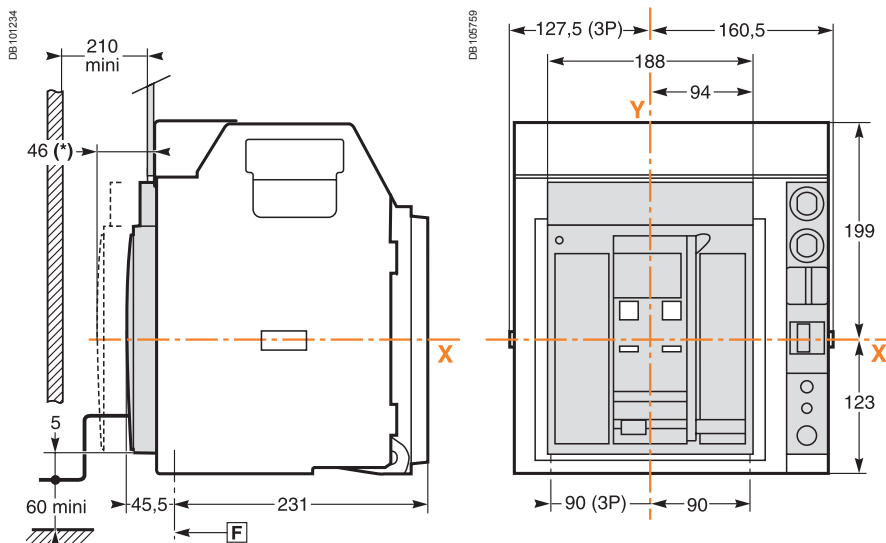


<i>Presentation</i>	1
<i>Functions and characteristics</i>	A-1
<i>Installation recommendations</i>	B-1
NT06 to NT16 NAVY circuit breakers	C-2
Drawout device	C-2
NW08 to NW32 NAVY circuit breakers	C-6
Drawout device	C-6
NW40 NAVY circuit breakers	C-8
Drawout device	C-8
NT/NW NAVY accessories	C-10
NT/NW NAVY external modules	C-11
<i>Electrical diagrams</i>	D-1
<i>Additional characteristics</i>	E-1
<i>Catalogue numbers and order form</i>	F-1

NT06 to NT16 NAVY circuit breakers

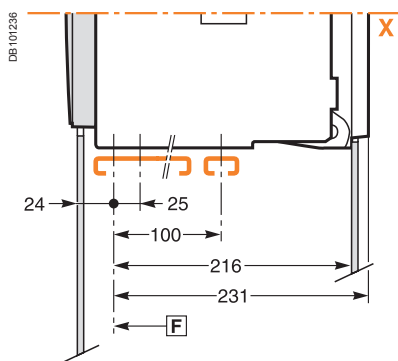
Drawout device

Dimensions

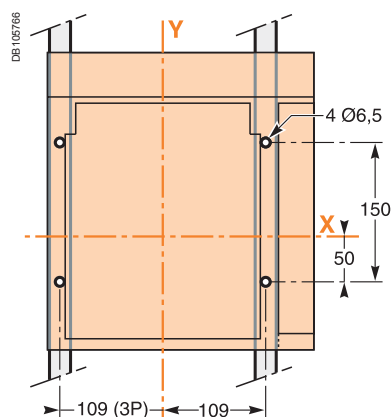
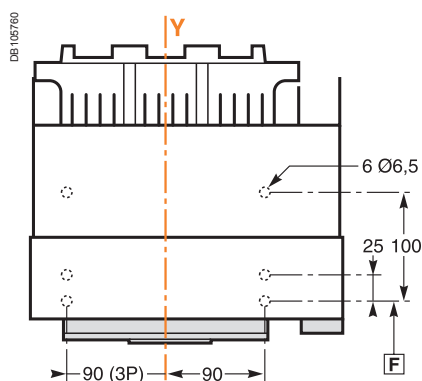


(*) Disconnected position.

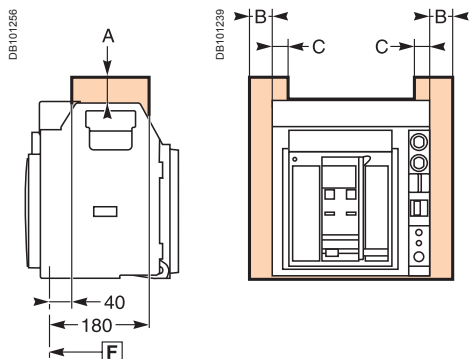
Bottom mounting (on base plate or rails)



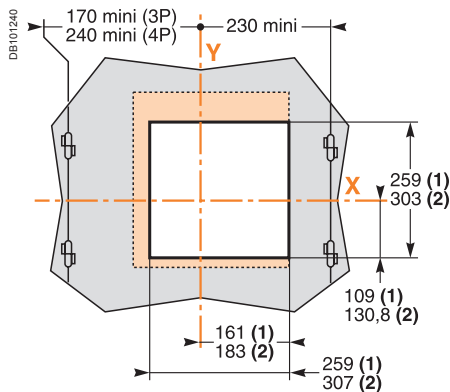
Rear mounting detail (on upright or backplate)



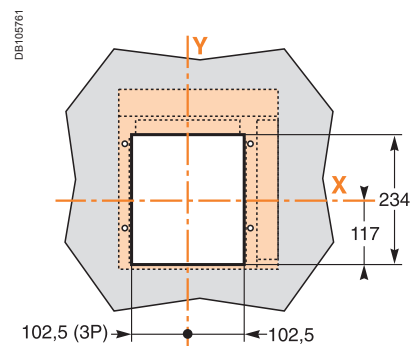
Safety clearances



Door cutout



Rear panel cutout



For voltages < 690 V.

	Parts		
	Insulated	Metal	Energised
A	0	0	30
B	10	10	60
C	0	0	30

F : datum.

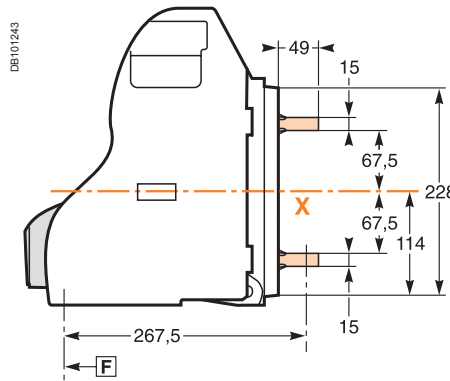
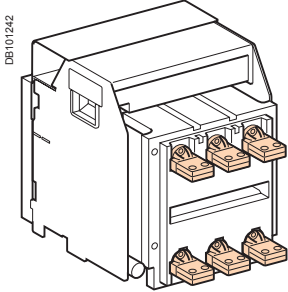
(1) Without escutcheon.

(2) With escutcheon.

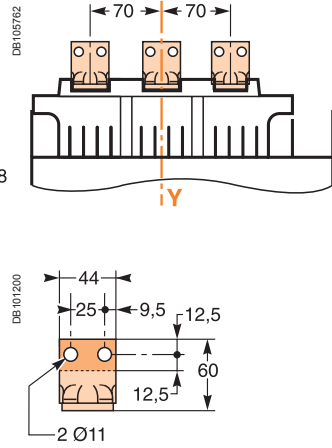
Note: X and Y are the symmetry planes for a 3-pole device.

Connections

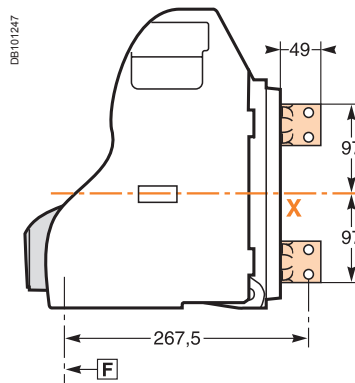
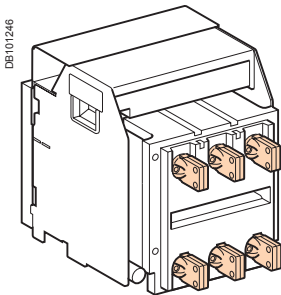
Horizontal rear connection



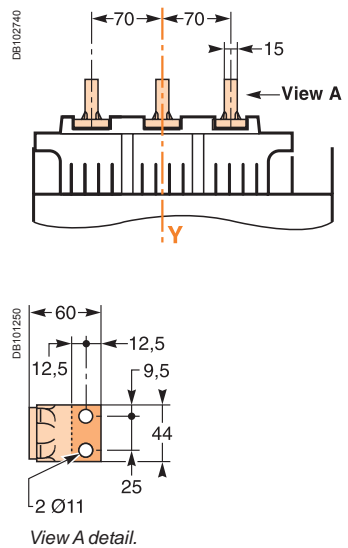
Detail



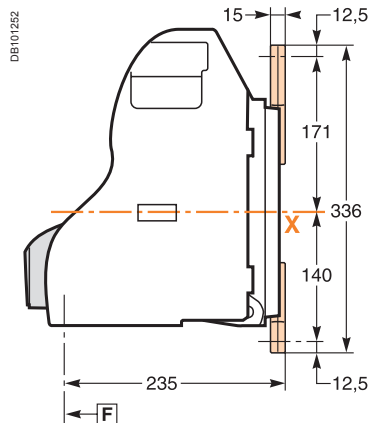
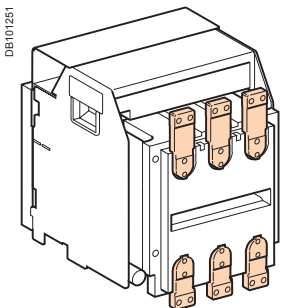
Vertical rear connection



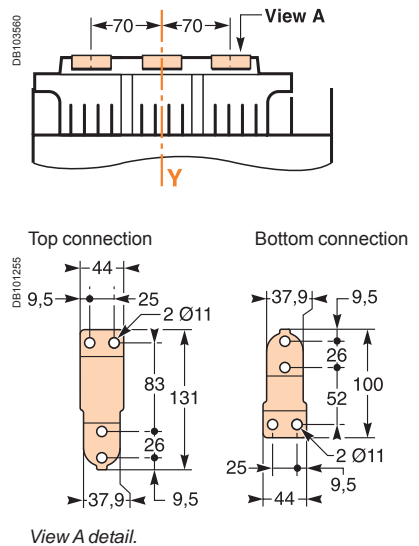
Detail



Front connection



Detail



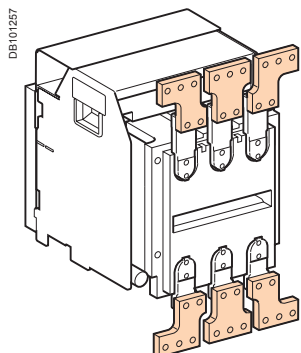
Note: recommended connection screws: **M10** class 8.8.
Tightening torque: **50 Nm** with contact washer.

NT06 to NT16 NAVY circuit breakers

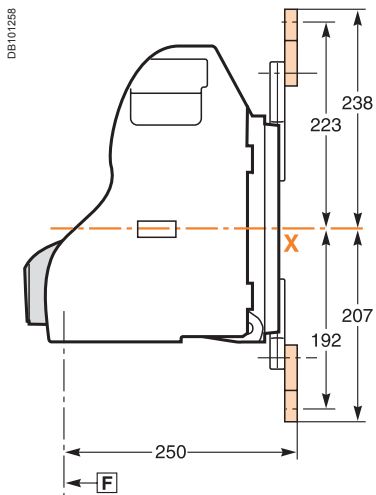
Drawout device

Connections

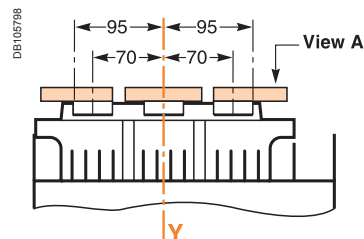
Front connection with spreaders



DB101257



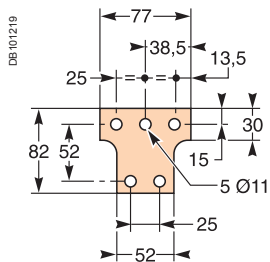
DB101258



DB105798

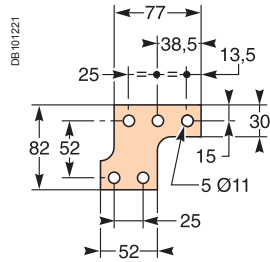
Spreader detail

Middle spreader for 3P.



DB101219

Left or right spreader for 3P.



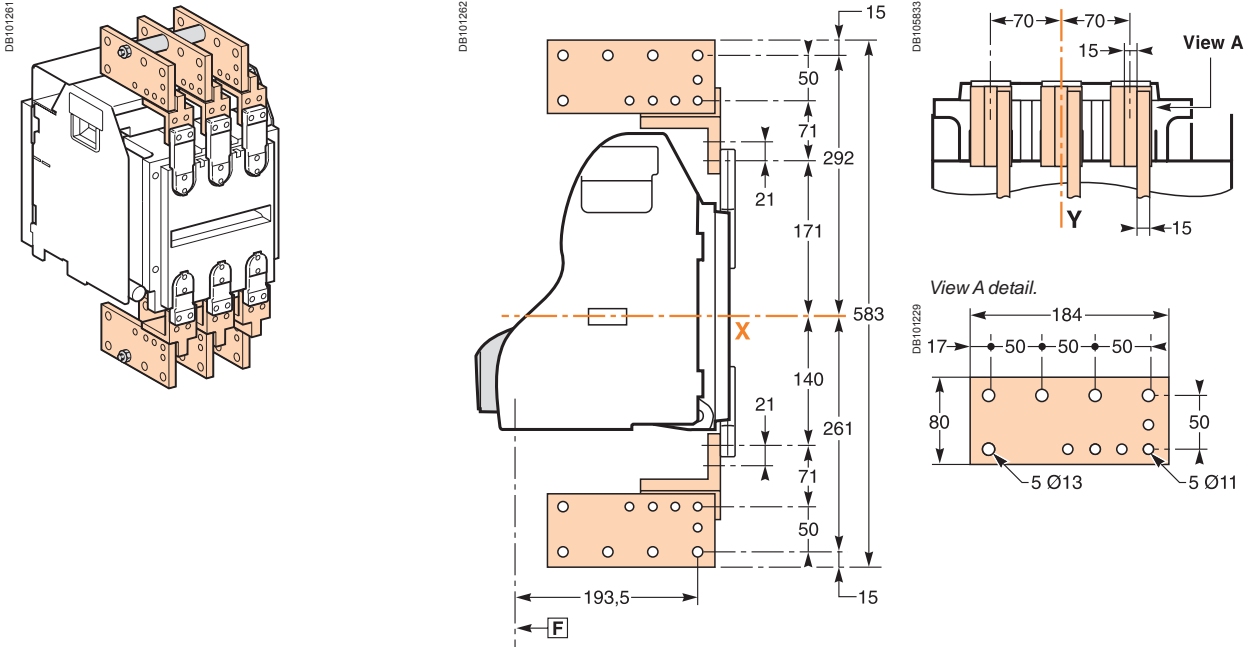
DB101221

F : datum.

Note: X and Y are the symmetry planes for a 3-pole device.

Connections

Front connection via vertical connection adapters fitted with cable-lug adapters

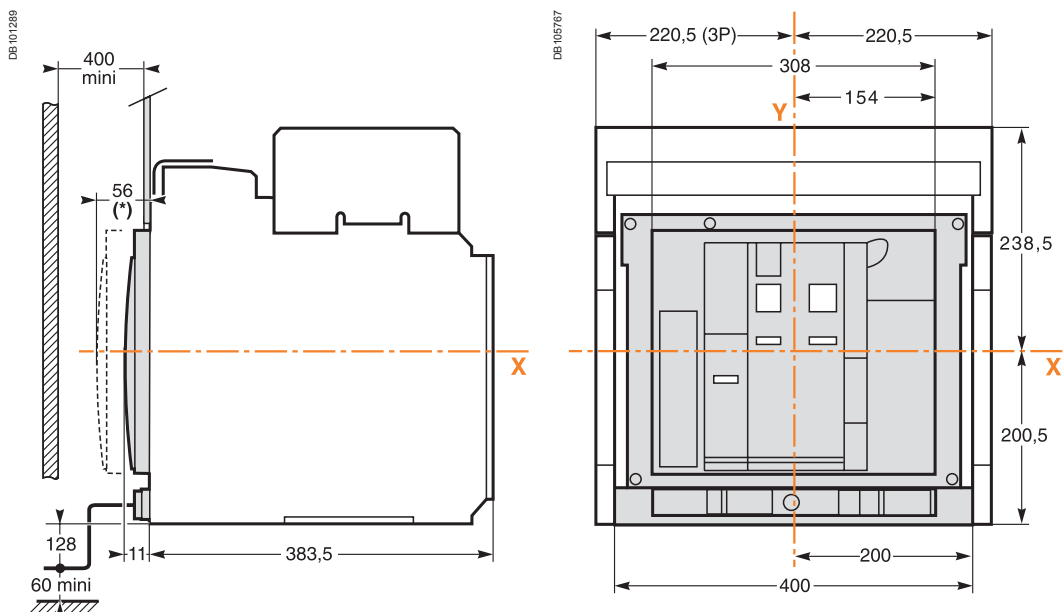


Note: recommended connection screws: **M10** class 8.8.
Tightening torque: **50 Nm** with contact washer.

NW08 to NW32 NAVY circuit breakers

Drawout device

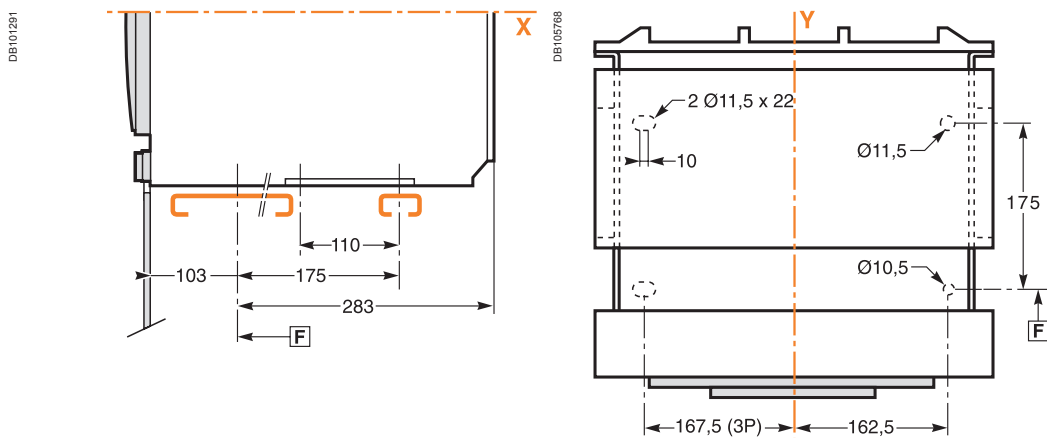
Dimensions



(*) Disconnected position.

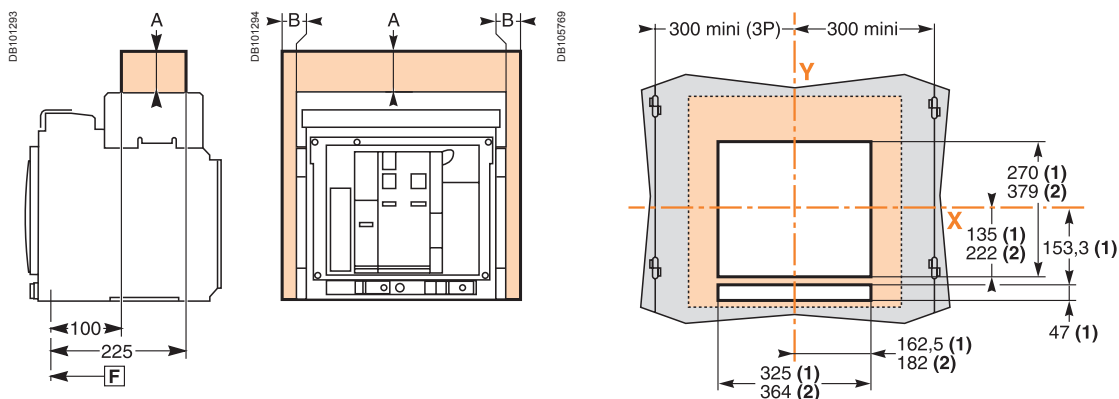
Mounting on base plate or rails

Mounting detail



Safety clearances

Door cutout



	Insulated parts	Metal parts	Energised parts
A	0	0	0
B	0	0	60

F: datum.

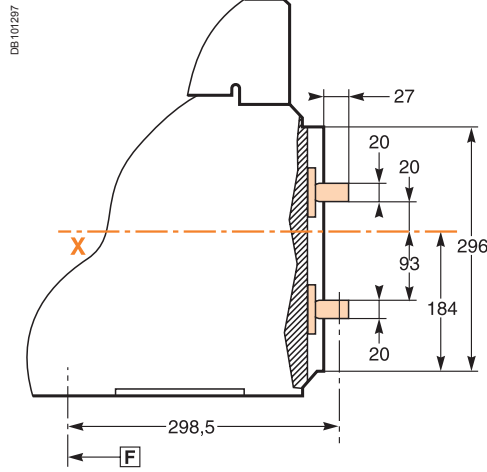
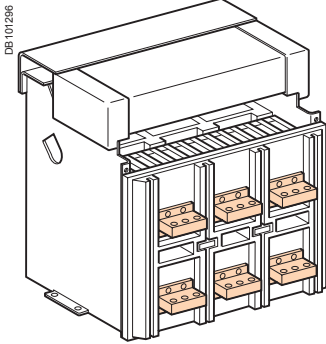
(1) Without escutcheon.

(2) With escutcheon.

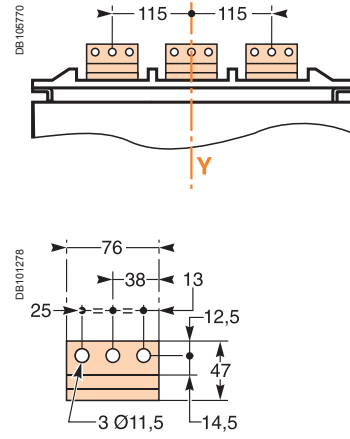
Note: X and Y are the symmetry planes for a 3-pole device.

Connections

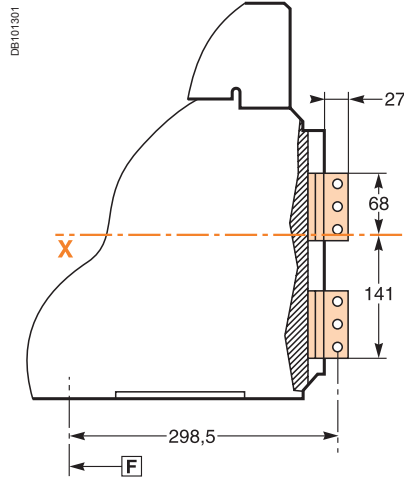
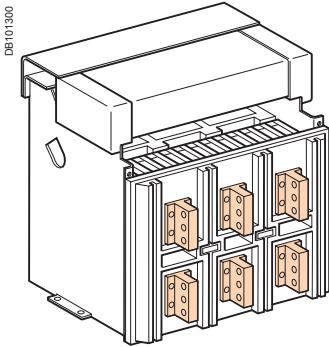
Horizontal rear connection



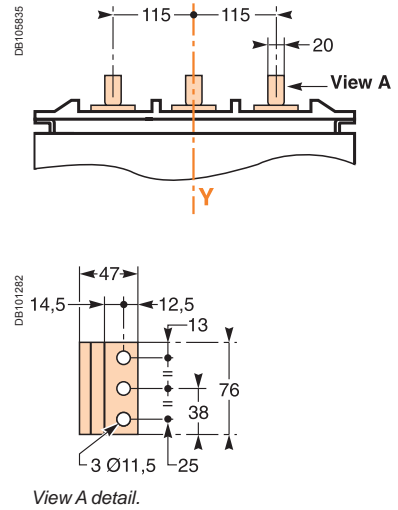
Detail



Vertical rear connection

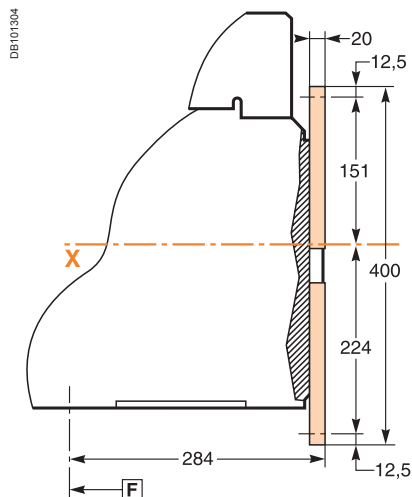
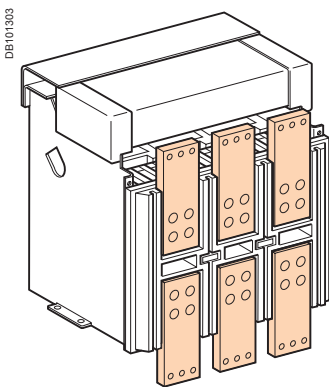


Detail

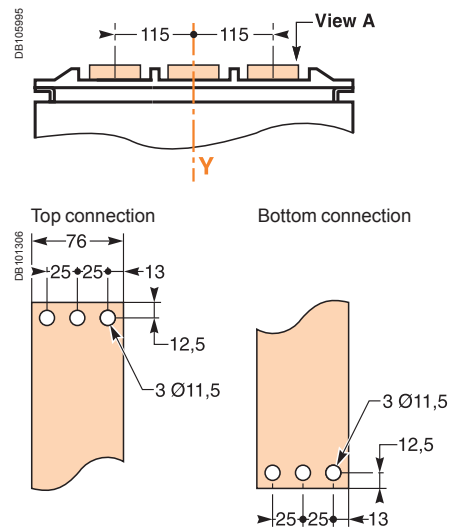


View A detail.

Front connection



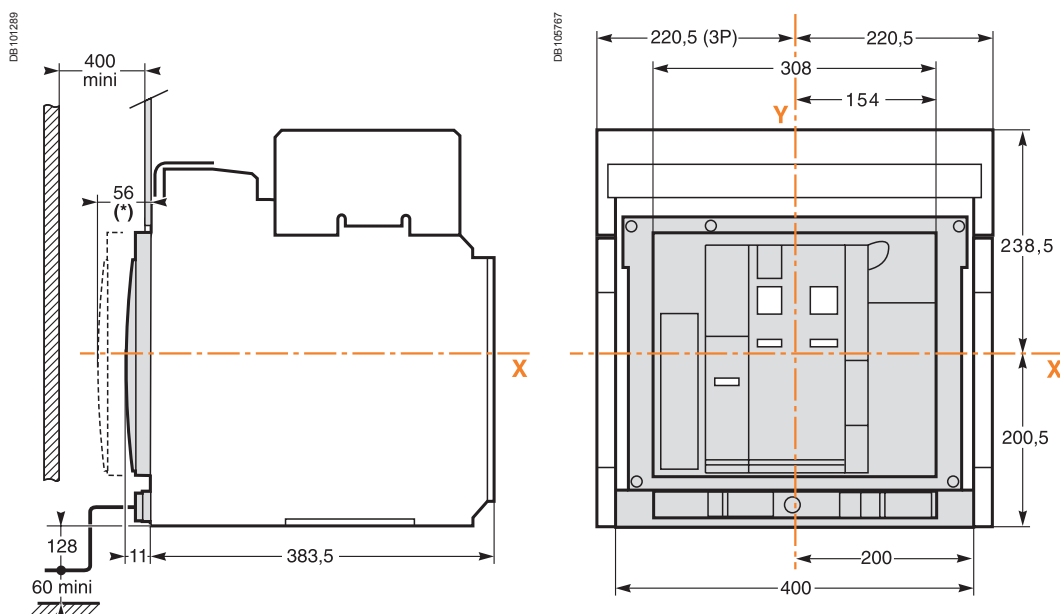
Detail



View A detail.

Note: recommended connection screws: **M10 class 8.8.**
Tightening torque: **50 Nm** with contact washer.

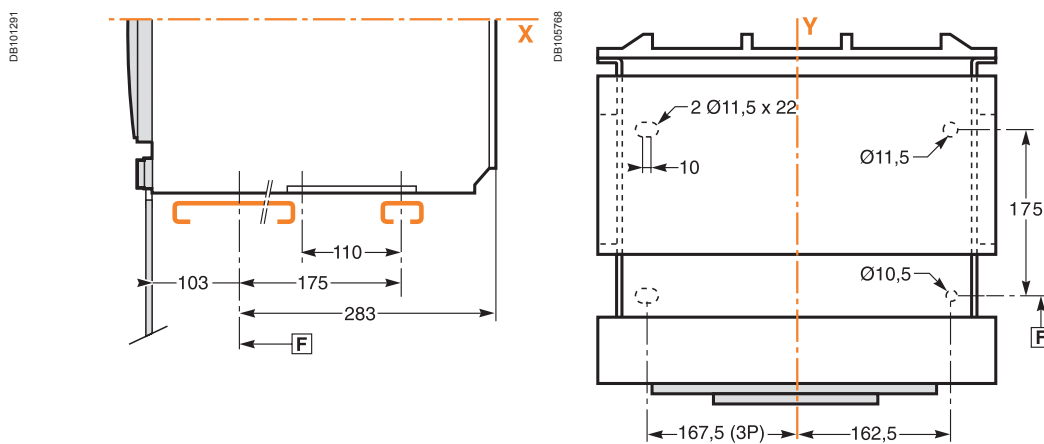
Dimensions



(*) Disconnected position.

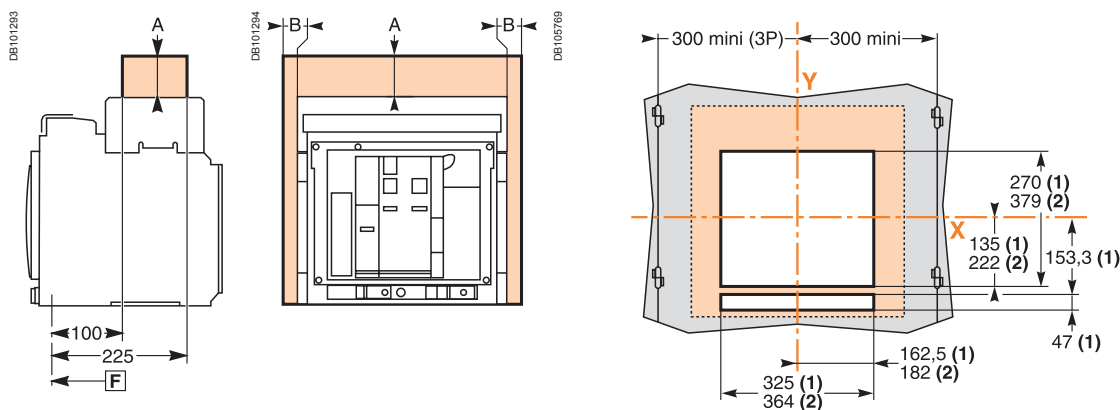
Mounting on base plate or rails

Mounting detail



Safety clearances

Door cutout



	Insulated parts	Metal parts	Energised parts
A	0	0	0
B	0	0	60

(1) Without escutcheon.

(2) With escutcheon.

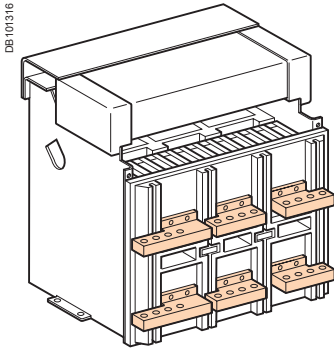
Note: X and Y are the symmetry planes for a 3-pole device.

The safety clearances take into account the space required to remove the arc chutes.

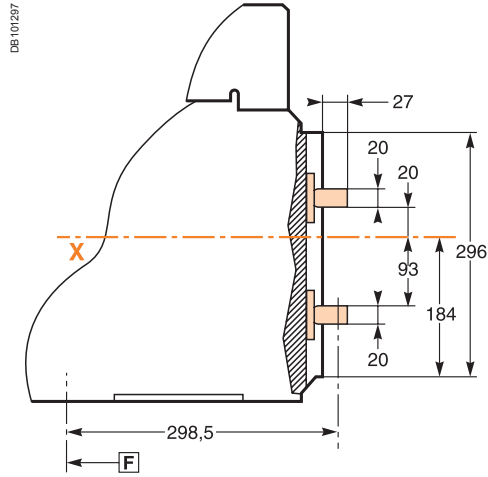
F : datum.

Connections

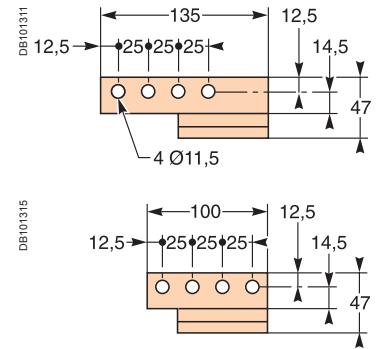
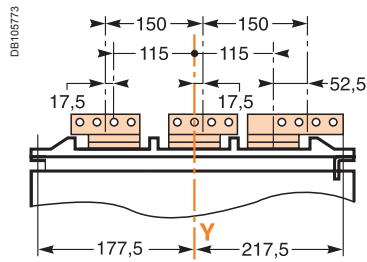
Horizontal rear connection



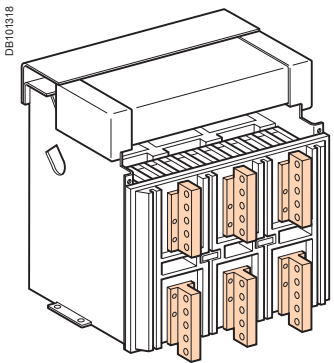
DB101316



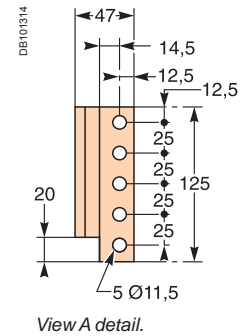
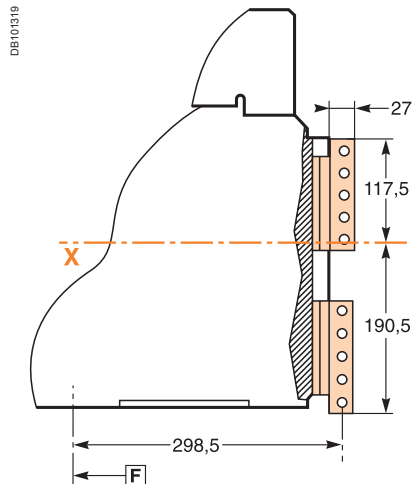
Detail



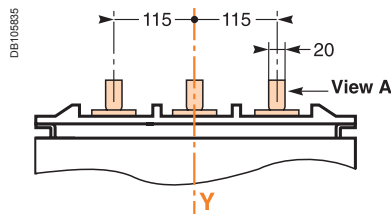
Vertical rear connection



DB101318



Detail

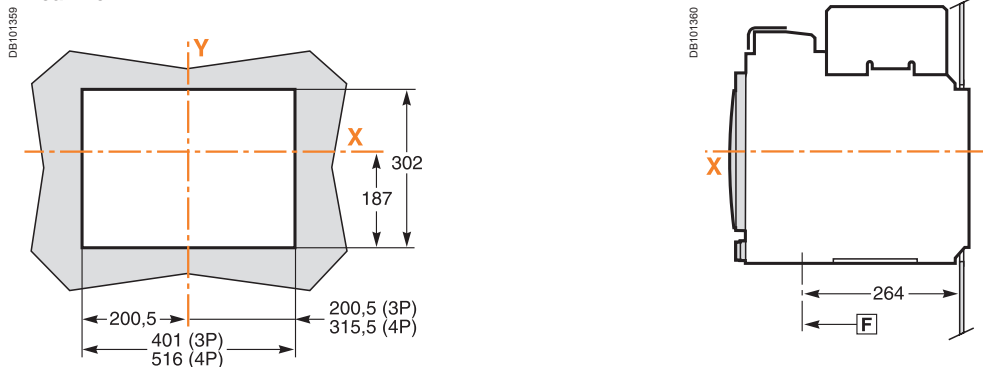


Note: recommended connection screws: **M10** class 8.8.
Tightening torque: **50 Nm** with contact washer.

Rear panel cutout (drawout devices)

NW08 to NW40 NAVY

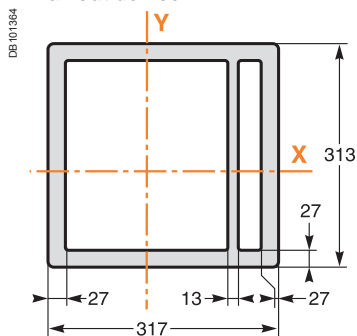
Rear view



Escutcheon

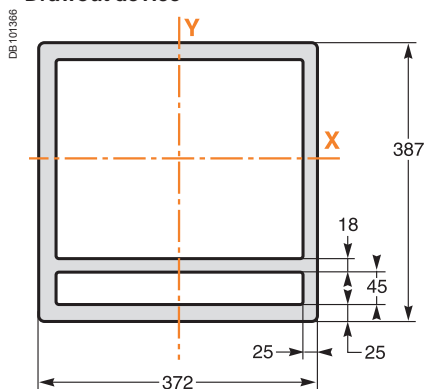
Masterpact NT NAVY

Drawout device



Masterpact NW NAVY

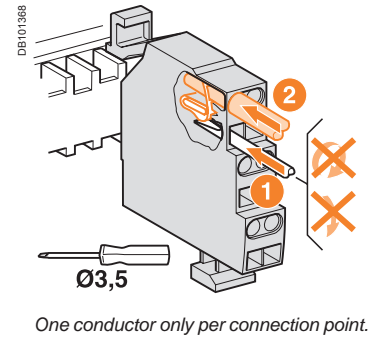
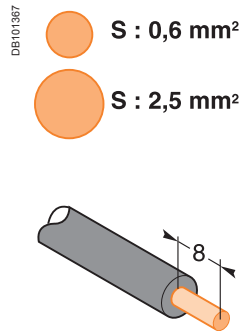
Drawout device



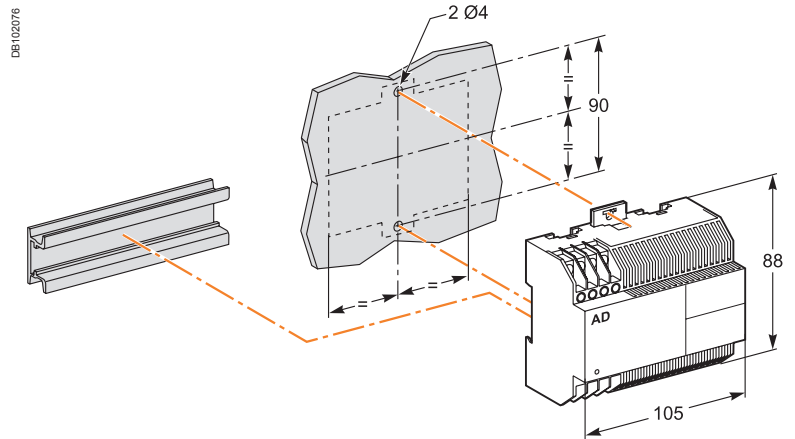
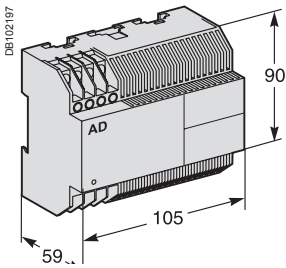
F : datum.

NT/NW NAVY external modules

Connection of auxiliary wiring to terminal block

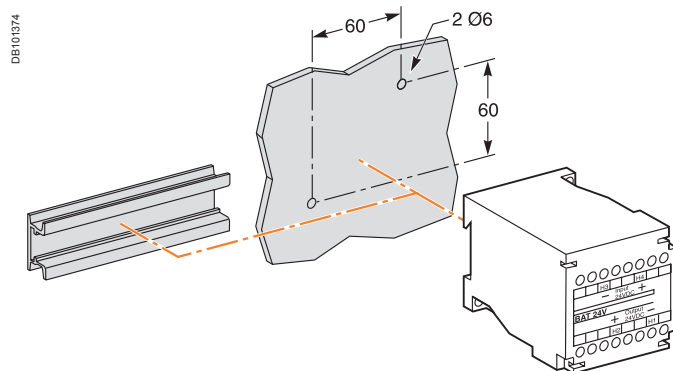
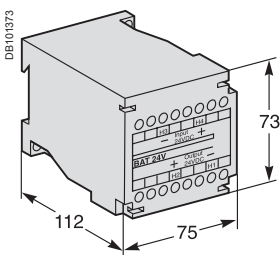


External power supply module (AD)



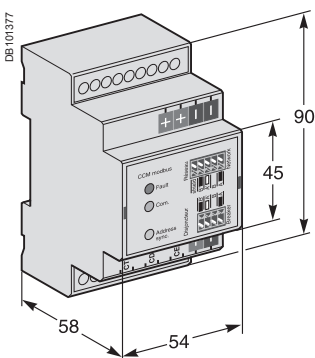
Battery module (BAT)

Mounting



“Chassis” communication module

ModBUS



schneider-electric.com

This international site allows you to access all the Schneider Electric products in just 2 clicks via comprehensive range data-sheets, with direct links to:

- complete library: technical documents, catalogs, FAQs, brochures...

- selection guides from the e-catalog.

- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts...



The electrical installation guide

According to IEC 60364

This guide, part of the Schneider Electric offer, is the essential tool to "guide" you any time in your business:

- design office, consultant
- contractor, panelbuilder
- teacher, trainer.

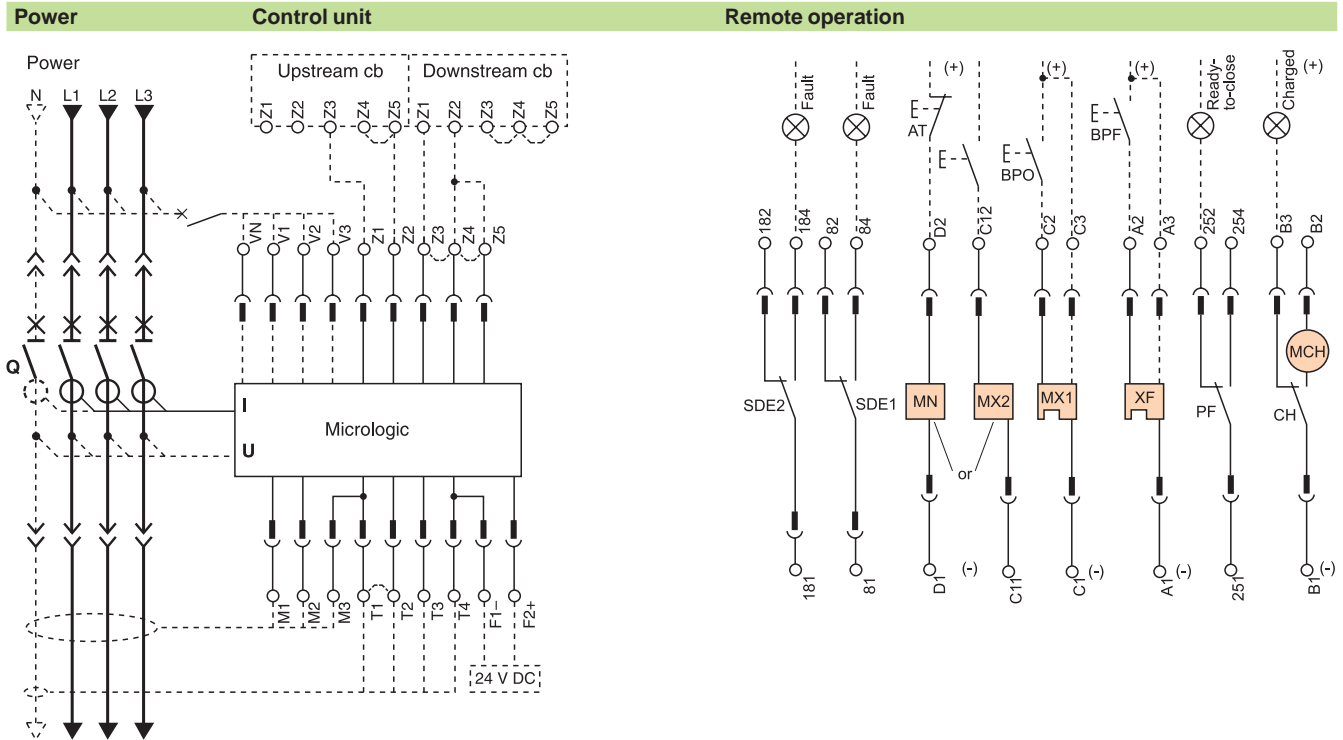
Comprehensive and concrete information on:

- all the new technical solutions
- all the components
- of an installation from a global point of view
- all the IEC standards modifications
- all the fundamental electrotechnical knowledge
- all the design stages, from medium to low voltage.



<i>Presentation</i>	1
<i>Functions and characteristics</i>	A-1
<i>Installation recommendations</i>	B-1
<i>Dimensions and connections</i>	C-1
Masterpact NT06 to NT16 NAVY	D-2
Drawout devices	D-2
<hr/>	
Masterpact NW08 to NW63 NAVY	D-4
Drawout devices	D-4
<hr/>	
Masterpact NT and NW NAVY	D-6
Communications option 24 V DC external power supply	D-6
Zone selective interlocking	D-8
<i>Additional characteristics</i>	E-1
<i>Catalogue numbers and order form</i>	F-1

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



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

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

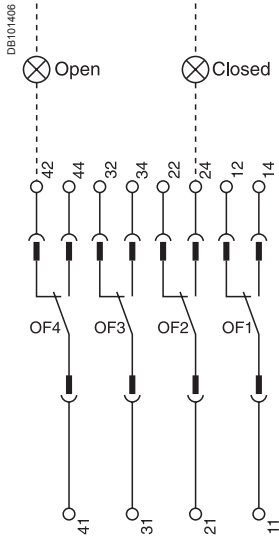
A	P	H	Control unit
■	■	■	Com : E1-E6 communication
■	■	■	UC1 : Z1-Z5 zone selective interlocking Z1 = ZSI OUT SOURCE Z2 = ZSI OUT ; Z3 = ZSI IN SOURCE Z4 = ZSI IN ST (short time) Z5 = ZSI IN GF (earth fault)
■	■	■	M1 = Vigi module input (Micrologic 7)
■	■	■	UC2 : T1, T2, T3, T4 = external neutral M2, M3 = Vigi module input (Micrologic 7)
■	■	■	UC3 : F2+, F1- external 24 V DC power supply VN external voltage connector (must be connected to the neutral with a 3P circuit breaker)
■	■	■	UC4 : External Voltage Connector (PTE option)

Remote operation
SDE2 : fault-trip indication contact
SDE1 : fault-trip indication contact (supplied as standard)
MN : undervoltage release or MX2 : shunt release
MX1 : shunt release (standard or communicating)
XF : closing release (standard or communicating)
PF : ready-to-close contact
MCH : electric motor

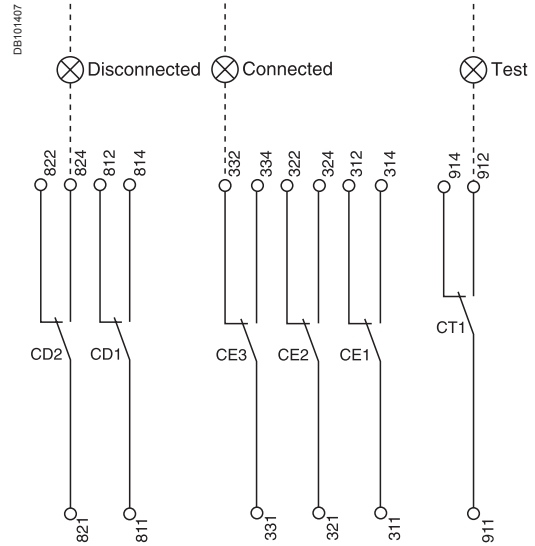
Note: when communicating MX or XF releases are used, the third wire (C3,A3) must be connected even if the communication module is not installed.

A : digital ammeter.
P : A + power meter + additional protection.
H : P + harmonics.

Indication contacts



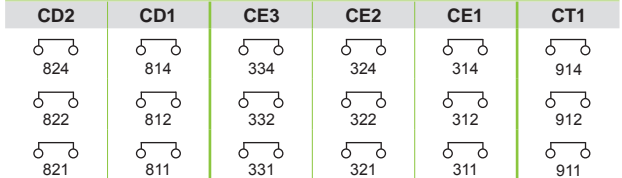
Chassis contacts



Indication contacts



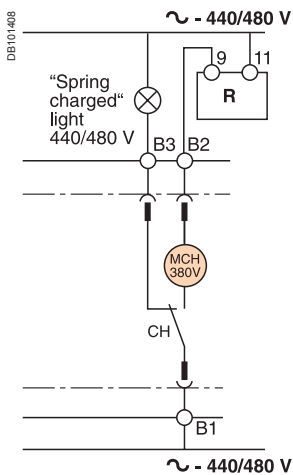
Chassis contacts



Indication contacts

OF4 / OF3 / OF2 / OF1 : ON/OFF indication contacts.

(*) **Spring charging motor 440/480 V AC**
(380 V motor + additional resistor).



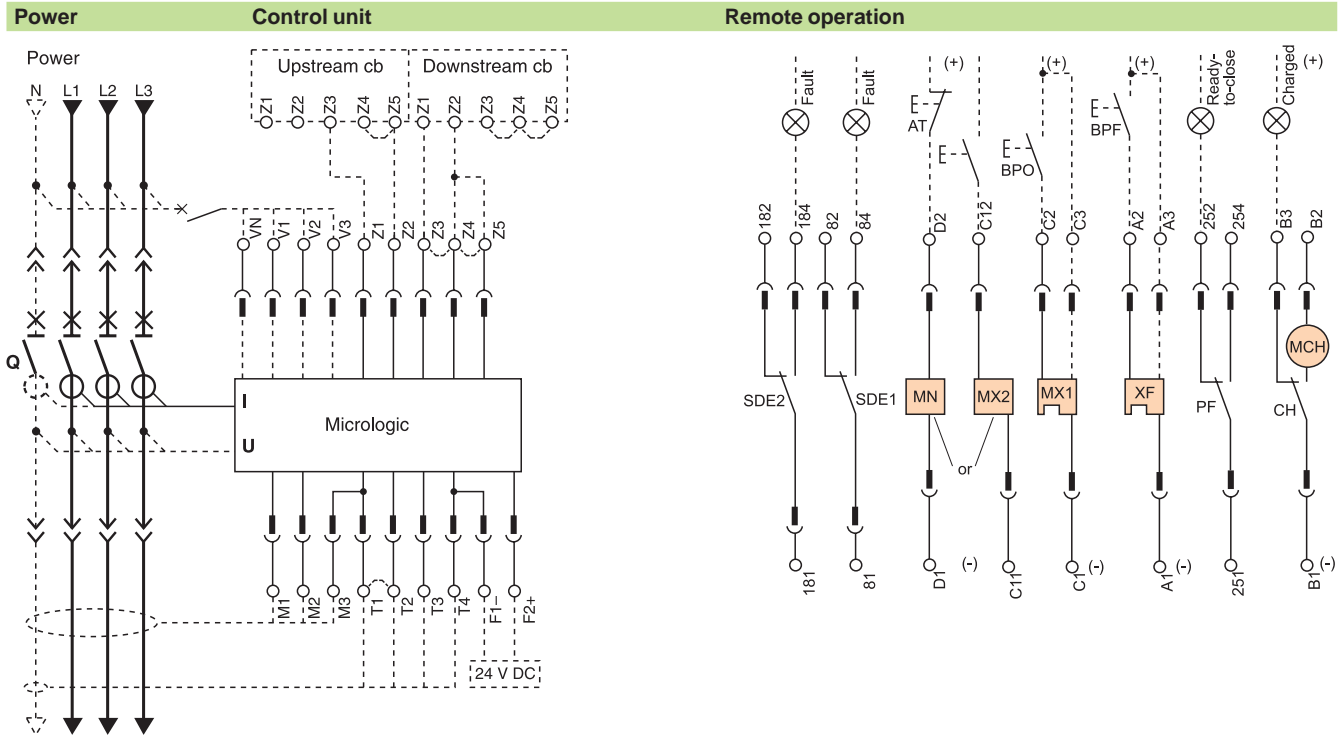
Chassis contacts

CD2 : disconnected position contacts
CD1 : disconnected position contacts
CE3 : connected position contacts
CE2 : connected position contacts
CE1 : connected position contacts
CT1 : test position contacts

Key:

- drawout device only.
- SDE1, OF1, OF2, OF3, OF4 supplied as standard.
- interconnected connections (only one wire per connection point).

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



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

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

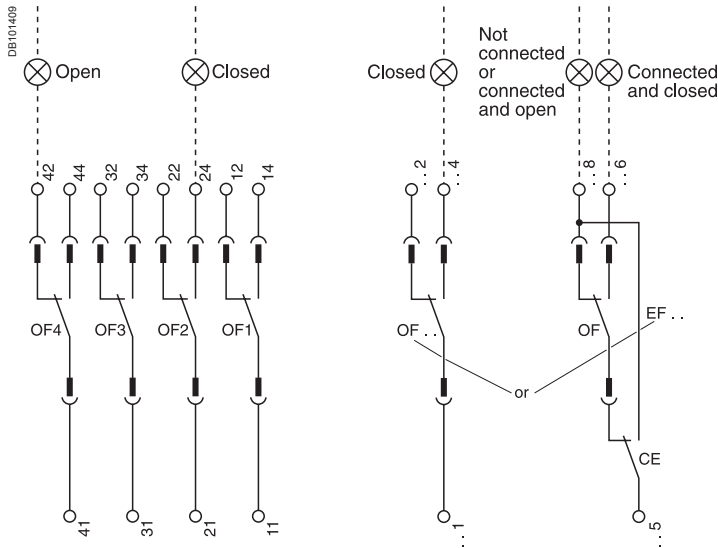
A	P	H	Control unit
■	■	■	Com : E1-E6 communication
■	■	■	UC1 : Z1-Z5 zone selective interlocking Z1 = ZSI OUT SOURCE Z2 = ZSI OUT ; Z3 = ZSI IN SOURCE Z4 = ZSI IN ST (short time) Z5 = ZSI IN GF (earth fault)
■	■	■	M1 = Vigi module input (Micrologic 7)
■	■	■	UC2 : T1, T2, T3, T4 = external neutral M2, M3 = Vigi module input (Micrologic 7)
■	■	■	UC3 : F2+, F1- external 24 V DC power supply VN external voltage connector (must be connected to the neutral with a 3P circuit breaker)
■	■	■	UC4 : External Voltage Connector (PTE option)

Remote operation
SDE2 : fault-trip indication contact
SDE1 : fault-trip indication contact (supplied as standard)
MN : undervoltage release or MX2 : shunt release
MX1 : shunt release (standard or communicating)
XF : closing release (standard or communicating)
PF : ready-to-close contact
MCH : electric motor

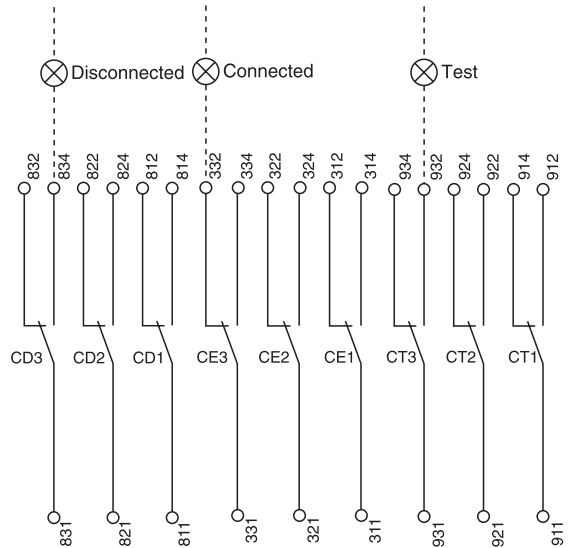
Note: when communicating MX or XF releases are used, the third wire (C3,A3) must be connected even if the communication module is not installed.

A : digital ammeter.
P : A + power meter + additional protection.
H : P + harmonics.

Indication contacts



Chassis contacts



Indication contacts

OF4	OF3	OF2	OF1	OF14	OF13	OF12	OF11
44	34	24	14	144	134	124	114
42	32	22	12	142	132	122	112
41	31	21	11	141	131	121	111
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
or						or		
CE6	CE5	CE4				CE9	CE8	CE7
364	354	344				394	384	374
362	352	342				392	382	372
361	351	341				391	381	371

Indication contacts

OF4 :	ON/OFF indication contacts	OF14 or EF14	Combined "connected-deconnected" indication contacts
OF3		OF13 or EF13	
OF2		OF12 or EF12	
OF1		OF11 or EF11	

Chassis contacts

CD3	disconnected position contacts	CE3	connected position contacts	CT3	test position contacts
CD2		CE2		CT2	
CD1		CE1		CT1	
or					
CE6	connected position contacts	CE9	connected position contacts	CE8	connected position contacts
CE5		CE7		CE7	
CE4		CD6	disconnected position contacts	CD5	disconnected position contacts
		CD4		CD4	

Key:

drawout device only.

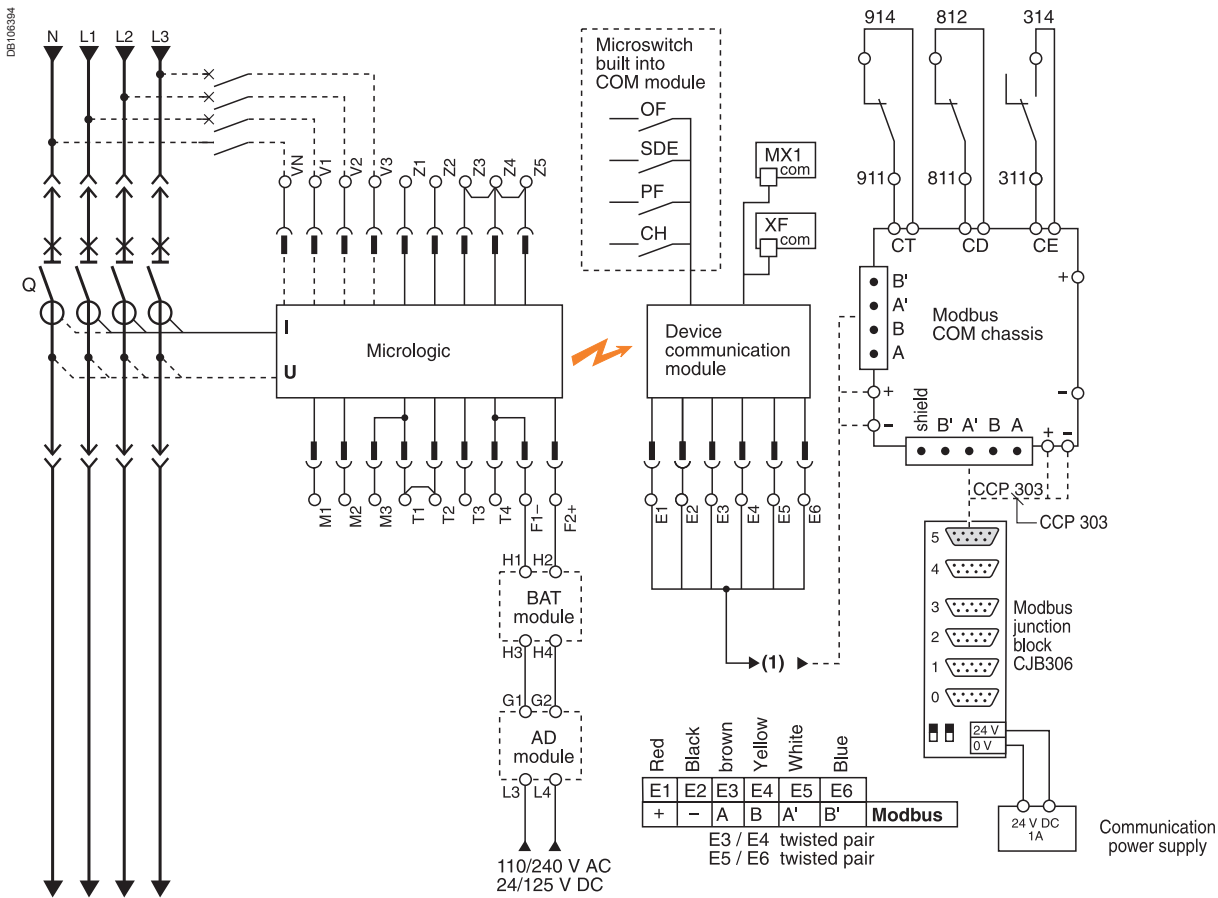
SDE1, OF1, OF2, OF3, OF4 supplied as standard.

interconnected connections (only one wire per connection point).

Masterpact NT and NW NAVY

Communications option 24 V DC external power supply

Connection of the communications option



None of the control-unit protection functions require an auxiliary source. However, the 24 V DC external power-supply (AD module) is required for certain operating configurations as indicated in the table below.

Circuit breaker	Closed		Open	
	Powered	Not powered	Powered	Not powered
Voltage measurement inputs				
Protection function	No	No	No	No
Display function	No ⁽³⁾	Yes	No ⁽⁴⁾	Yes
Time-stamping function	No	Yes ⁽⁵⁾	No	Yes ⁽⁵⁾
Circuit-breaker status indications and control via communications bus	No	No	No	No
Identification, settings, operation and maintenance aids via communications bus	No ⁽³⁾	Yes	No ⁽⁴⁾	Yes

- (1) Drawout device equipped with Modbus chassis COM.
- (3) Except for Micrologic A control units (if current < 20 % I_n).
- (4) Except for Micrologic A control units.
- (5) Time setting is manual and can be carried out automatically by the supervisor via the communications bus.

The communications bus requires its own 24 V DC power source (E1, E2). This source is not the same as the 24 V DC external power-supply module (F1-, F2+).

In case of using the 24 V DC external power supply (AD module), maximum cable length between 24 V DC (G1, G2) and the control unit (F1-, F2+) must not exceed 10 meters.

The BAT battery module, mounted in series upstream of the AD module, ensures an uninterrupted supply of power if the AD module power supply fails.

The voltage measurement inputs are standard equipment on the downstream connectors of the circuit breaker.

External connections are possible using the PTE external voltage measurement input option. With this option, the internal voltage measurement inputs are disconnected and terminals VN, V1, V2, V3 are connected only to the control unit (Micrologic P and H only). The PTE option is required for voltages less than 220 V and greater than 690 V (in which case a voltage transformer is compulsory). For three-pole devices, the system is supplied with terminal VN connected only to the control unit (Micrologic P and H).

When the PTE option is implemented, the voltage measurement input must be protected against short-circuits. Installed as close as possible to the busbars, this protection function is ensured by a P25M circuit breaker (1 A rating) with an auxiliary contact (cat. no. 21104 and 21117). This voltage measurement input is reserved exclusively for the control unit and must not ever be used to supply other circuits outside the switchboard.

Examples using the COM communications option

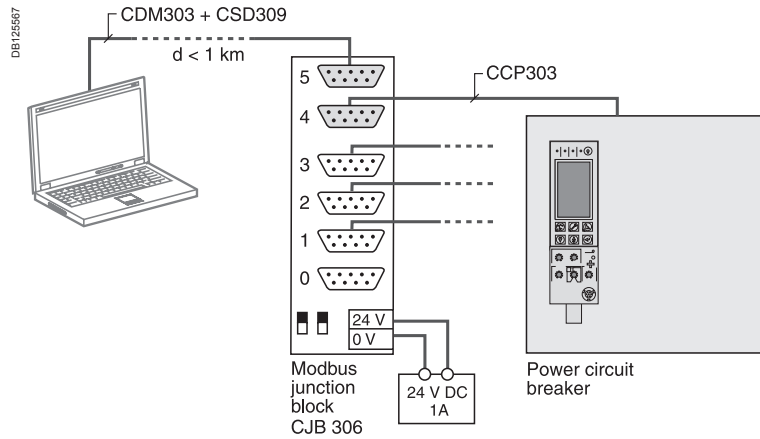
Switchboard display unit

This architecture provides remote display of the variables managed by Micrologic control units equipped with the eco COM Modbus module.

- I (Micrologic A)
- I, U, P, E (Micrologic P)
- I, U, P, E, THD (Micrologic H)

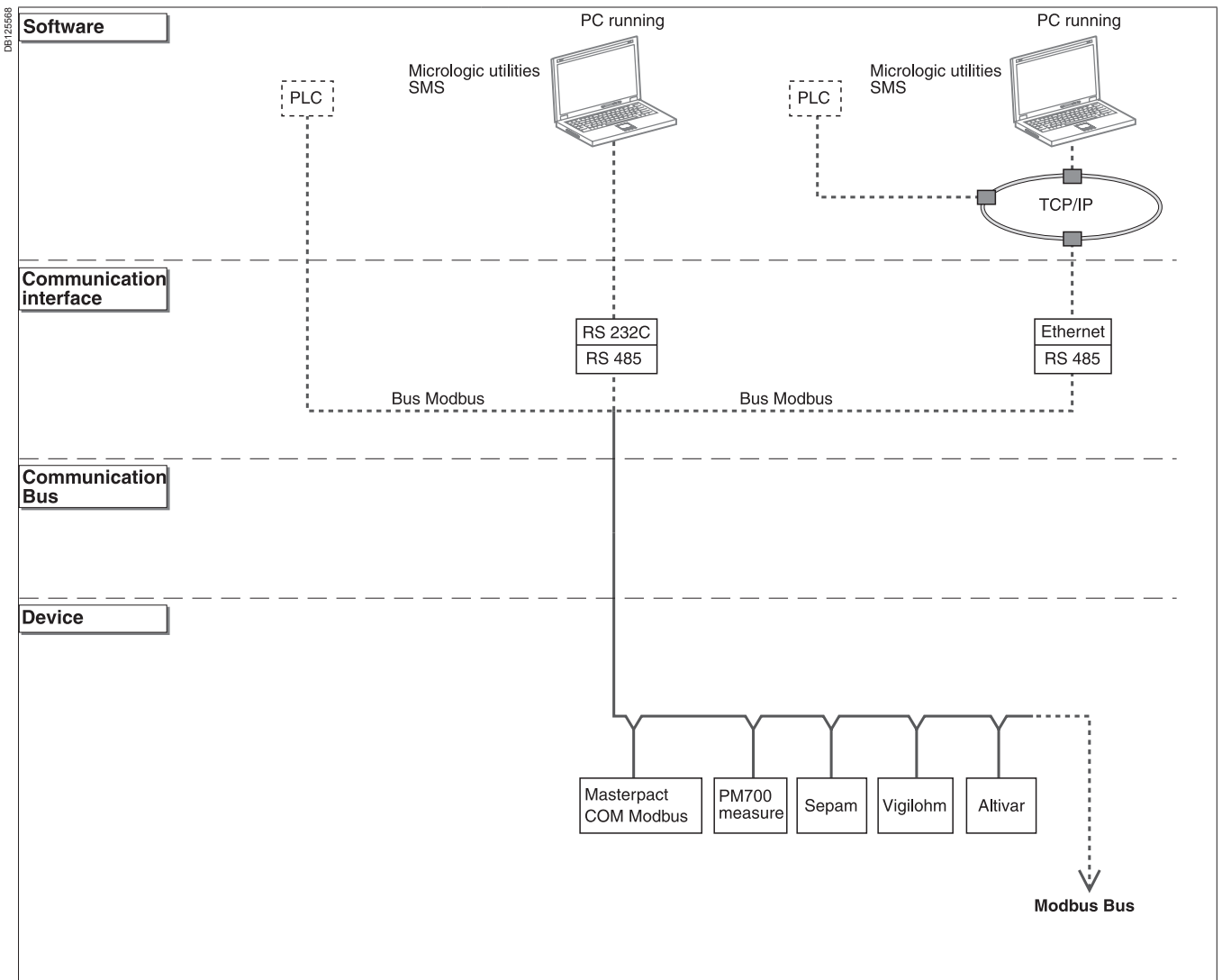
No programming is required.

For Micrologic A control unit (if current < 20 % I_n), it is recommended to use the 24 V DC external power supply (AD module).



Communicating switchboard

This configuration provides remote display and control of Masterpacts NAVY equipped with the Modbus COM module. The Digipact bus can be combined with the Modbus bus.



Zone selective interlocking

Zone-selective interlocking is used to reduce the electrodynamic forces exerted on the installation by shortening the time required to clear faults, while maintaining time discrimination between the various devices.

A pilot wire interconnects a number of circuit breakers equipped with Micrologic A/P/H control units, as illustrated in the diagram above.

The control unit detecting a fault sends a signal upstream and checks for a signal arriving from downstream. If there is a signal from downstream, the circuit breaker remains closed for the full duration of its tripping delay. If there is no signal from downstream, the circuit breaker opens immediately, regardless of the tripping-delay setting.

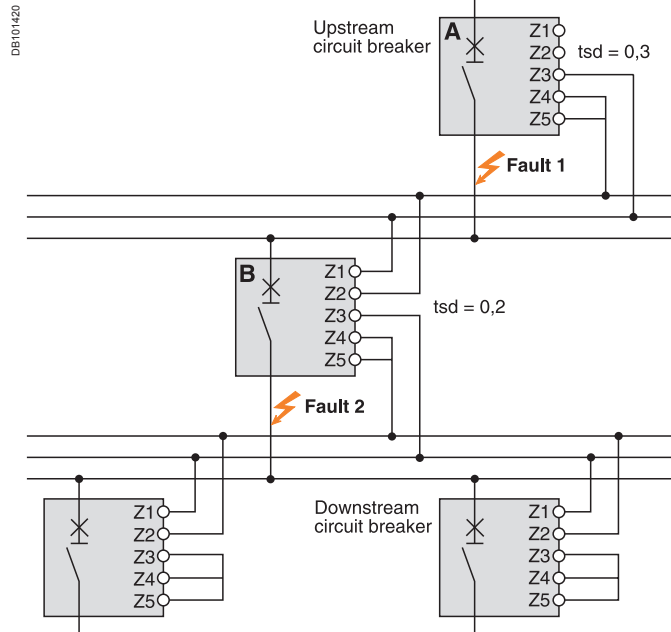
Fault 1.

Only circuit breaker A detects the fault. Because it receives no signal from downstream, it opens immediately, regardless of its tripping delay set to 0.3.

Fault 2.

Circuit breakers A and B detect the fault. Circuit breaker A receives a signal from B and remains closed for the full duration of its tripping delay set to 0.3. Circuit breaker B does not receive a signal from downstream and opens immediately, in spite of its tripping delay set to 0.2.

Note: the maximum permissible distance between two devices is 3000 m. A downstream circuit breaker can "control" up to ten upstream circuit breakers.





schneider-electric.com

This international site allows you to access all the Schneider Electric products in just 2 clicks via comprehensive range data-sheets, with direct links to:

- complete library: technical documents, catalogs, FAQs, brochures...
- selection guides from the e-catalog.
- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts...



The technical guide

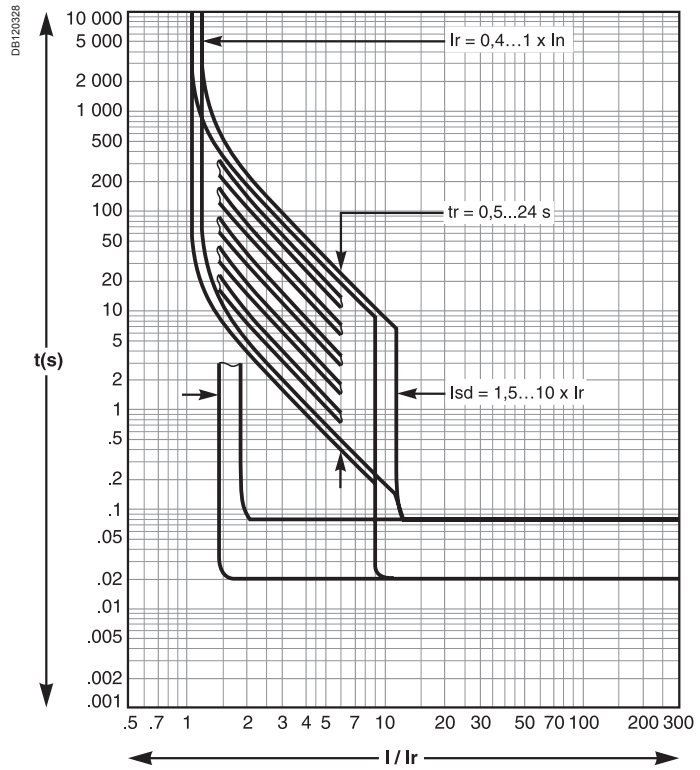
These technical guides help you comply with installation standards and rules i.e.: the electrical installation guide, the protection guide, the switchboard implementation guide, the technical booklets and the co-ordination tables all form genuine reference tools for the design of high performance electrical installations. For example, the LV protection co-ordination guide - discrimination and cascading - optimises choice of protection and connection devices while also increasing markedly continuity of supply in the installations.



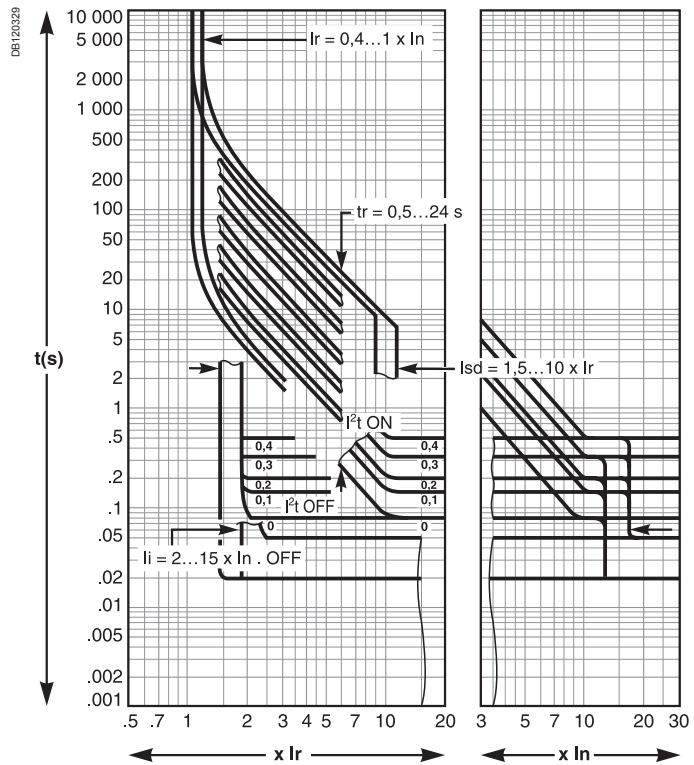
<i>Presentation</i>	1
<i>Functions and characteristics</i>	A-1
<i>Installation recommendations</i>	B-1
<i>Dimensions and connections</i>	C-1
<i>Electrical diagrams</i>	D-1
Tripping curves	E-2
Limitation curves	E-4
Current limiting	E-4
Energy limiting	E-5
Protection discrimination	E-6
<i>Catalogue numbers and order form</i>	F-1

Tripping curves

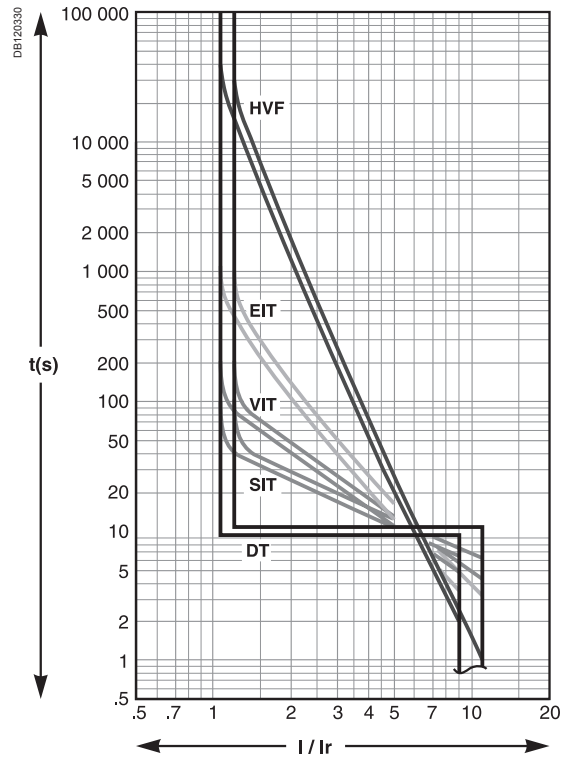
Micrologic 2.0



Micrologic 5.0



IDMTL curve (Micrologic P and H)

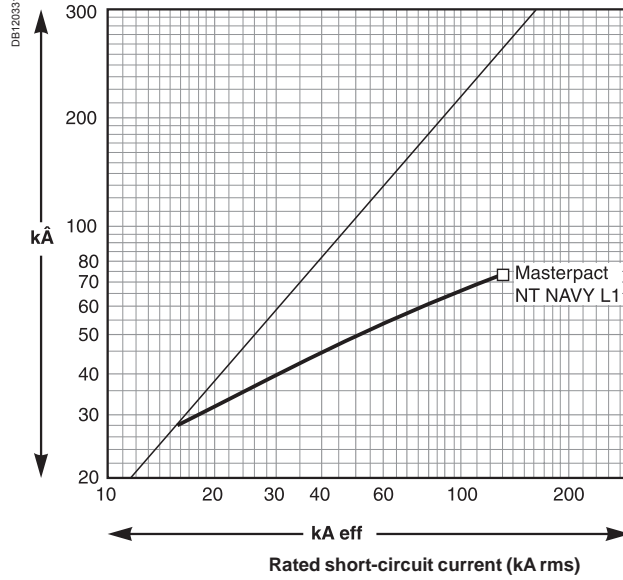


Limitation curves

Current limiting

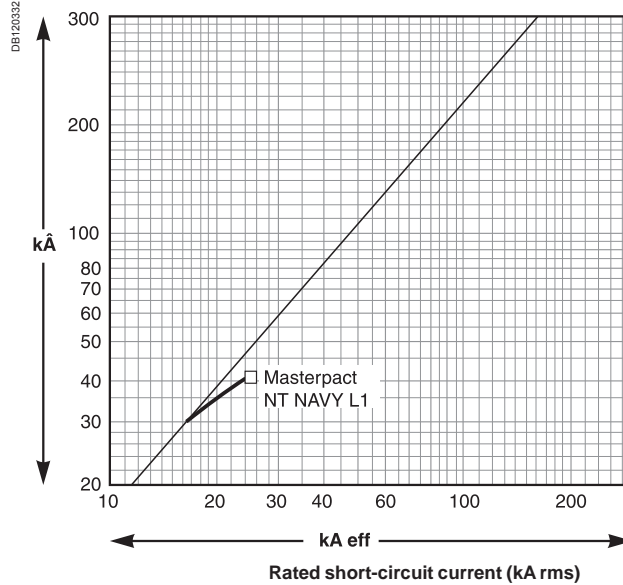
Voltage 380/415/440 V AC

Limited short-circuit current (kA peak)



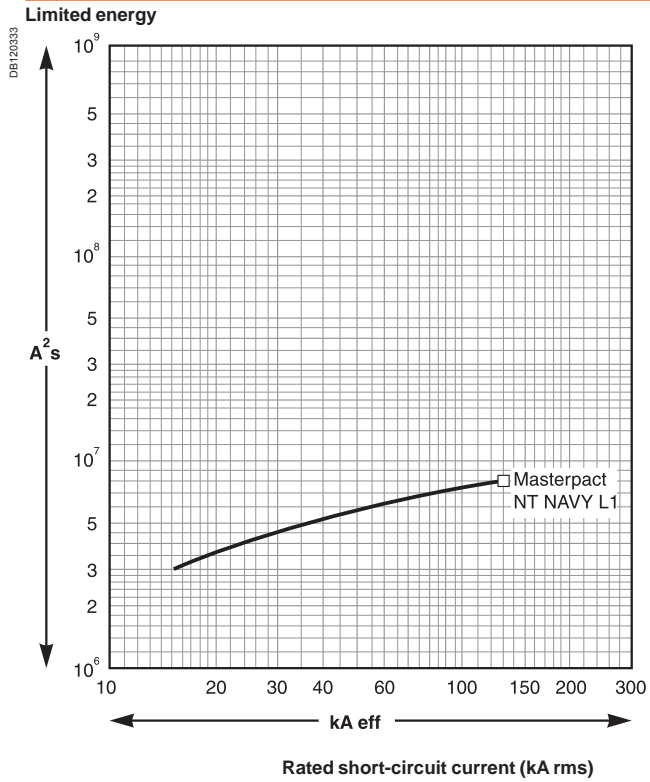
Voltage 660/690 V AC

Limited short-circuit current (kA peak)

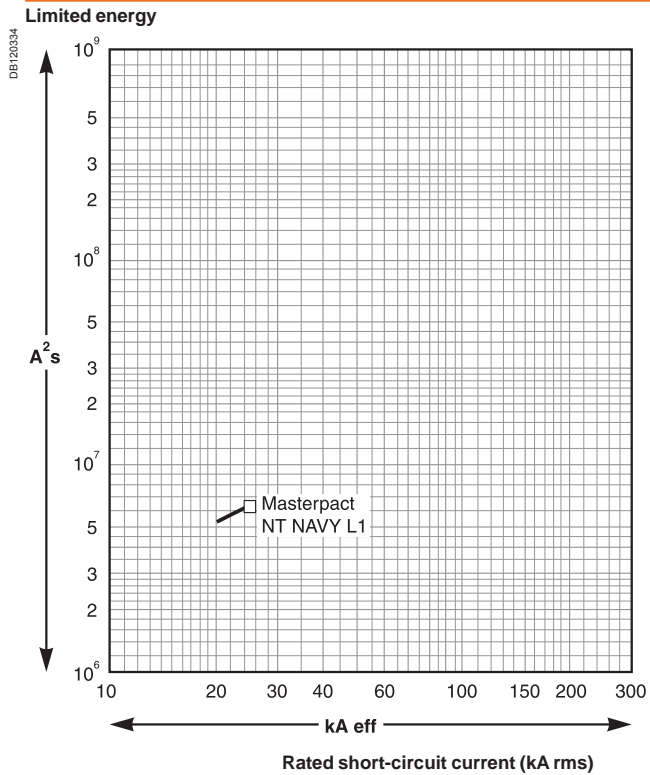


Energy limiting

Voltage 380/415/440 V AC



Voltage 660/690 V AC



DOWNSTREAM	UPSTREAM trip rating (A) adjustment I _r	NS250H/L DB TM-D			NR/NS250H/L DB STR22SE					NR/NS630H/L DB STR23SE/53UE				
		160	200	250	100	125	160	200	250	250	320	400	500	630
NS100H/L DB trip TM-D	16	36	T	T	T	T	T	T	T	T	T	T	T	T
	25	36	T	T	T	T	T	T	T	T	T	T	T	T
	40	36	36	36	36	36	36	36	36	T	T	T	T	T
	63	36	36	36		36	36	36	36	T	T	T	T	T
	80	3	36	36			36	36	36	T	T	T	T	T
NS100H/L DB trip STR22SE	100	3	36	36				36	36	T	T	T	T	T
	16	3	T	T	T	T	T	T	T	T	T	T	T	T
	25	3	T	T	T	T	T	T	T	T	T	T	T	T
	40	3	36	36	36	36	36	36	36	T	T	T	T	T
	63	3	36	36	36	36	36	36	36	T	T	T	T	T
NS250H/L DB trip TM-D	80	3	36	36		36	36	36	36	T	T	T	T	T
	100	3	36	36			36	36	36	T	T	T	T	T
	≤ 100									T	T	T	T	T
	125										T	T	T	T
	160											T	T	T
NS250H/L DB trip STR22SE	200												T	T
	250													T
	≤ 100									T	T	T	T	T
	125									T	T	T	T	T
	160									T	T	T	T	T
NS630H/L DB STR23SE STR53UE	200										T	T	T	T
	250											T	T	T
	250													
	320													
	400													
DB83 STR35SE STR55UE	500													
	630													
	800													
	320													
	400													
DBL83 STR35SE STR55UE	500													
	630													
	800													
	320													
	400													
Masterpact NT NAVY H1 Micrologic 2.0	500													
	630													
	800													
	NT06													
Masterpact NT NAVY H1 Micrologic 5.0	NT10													
	NT12													
	NT16													
	NT06													
Masterpact NT NAVY H2 Micrologic 2.0	NT10													
	NT12													
	NT16													
	NT06													
Masterpact NT NAVY H2 Micrologic 5.0	NT10													
	NT12													
	NT16													
	NT06													
Masterpact NT NAVY L1 Micrologic 2.0	NT10													
	NT12													
	NT16													
	NT06													
Masterpact NW NAVY N1/H1/H2 Micrologic 2.0	NT10													
	NW08													
	NW10													
	NW12													
	NW16													
	NW20													
	NW25													
	NW32													
	NW40													
Masterpact NW NAVY N1/H1/H2 Micrologic 5.0	NW08													
	NW10													
	NW12													
	NW16													
	NW20													
	NW25													
	NW32													
NW40														

T Total discrimination, up to breaking capacity of the downstream circuit breaker.

DOWNSTREAM	UPSTREAM trip rating (A) adjustment I _r	DB83 STR35SE - STR55UE					DBL83 STR35SE - STR55UE					DBL83 STR45BE				
		400	500	630	800	1000	320	400	500	630	800	320	400	500	630	800
		I _m (kA)														
NS100H/L DB trip TM-D	16	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
	25	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
	40	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
	63	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
	80	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
	100	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
NS100H/L DB trip STR22SE	16	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
	25	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
	40	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
	63	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
	80	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
	100	45	45	45	45	45	10	10	10	10	10	T	T	T	T	T
NS250H/L DB trip TM-D	≤ 100	45	45	45	45	45	7	7	7	7	7	T	T	T	T	T
	125	45	45	45	45	45	7	7	7	7	7	T	T	T	T	T
	160	45	45	45	45	45		7	7	7	7	T	T	T	T	T
	200		45	45	45	45			7	7	7	T	T	T	T	T
	250			45	45	45				7	7		T	T	T	T
NS250H/L DB trip STR22SE	≤ 100	45	45	45	45	45	7	7	7	7	7	T	T	T	T	T
	125	45	45	45	45	45	7	7	7	7	7	T	T	T	T	T
	160	45	45	45	45	45	7	7	7	7	7	T	T	T	T	T
	200	45	45	45	45	45	7	7	7	7	7	T	T	T	T	T
	250	45	45	45	45	45		7	7	7	7		T	T	T	T
NS630H/L DB STR23SE STR53UE	250						15	15	15	15	15		T	T	T	T
	320							15	15	15	15			T	T	T
	400								15	15	15				T	T
	500									15	15					T
	630										15					
DB83 STR35SE STR55UE	320															
	400															
	500															
	630															
	800															
DBL83 STR35SE STR55UE	320															
	400															
	500															
	630															
	800															
Masterpact NT NAVY H1 Micrologic 2.0	NT06															
	NT10															
	NT12															
	NT16															
Masterpact NT NAVY H1 Micrologic 5.0	NT06															
	NT10															
	NT12															
	NT16															
Masterpact NT NAVY H2 Micrologic 2.0	NT06															
	NT10															
	NT12															
	NT16															
Masterpact NT NAVY L1 Micrologic 2.0	NT06															
	NT10															
Masterpact NT NAVY L1 Micrologic 5.0	NT06															
	NT10															
Masterpact NW NAVY N1/H1/H2 Micrologic 2.0	NW08															
	NW10															
	NW12															
	NW16															
	NW20															
	NW25															
	NW32															
Masterpact NW N1/H1/H2 Micrologic 5.0	NW08															
	NW10															
	NW12															
	NW16															
	NW20															
	NW25															
	NW32															
NW40																

DOWNSTREAM	UPSTREAM	Masterpact NT NAVY H1 Micrologic 2.0 I _{sd} : 10 I _r					Masterpact NT NAVY H1 Micrologic 5.0 - 6.0 - 7.0 Inst 15 I _n					Masterpact NT NAVY H1 Micrologic 5.0 - 6.0 - 7.0 Inst OFF						
		NT06	NT08	NT10	NT12	NT16	NT06	NT08	NT10	NT12	NT16	NT06	NT08	NT10	NT12	NT16		
		630	800	1000	1250	1600	630	800	1000	1250	1600	630	800	1000	1250	1600		
	trip rating (A) adjustment I _r																	
	I _m (kA)																	
NS100H/L DB trip TM-D	16	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	40	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	63	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	80	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
NS100H/L DB trip STR22SE	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	16	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	40	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	63	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
NS250H/L DB trip TM-D	80	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	≤ 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	125	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	160	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
NS250H/L DB trip STR22SE	200	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	250	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	≤ 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	125	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	160	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
NS630H/L DB STR23SE STR53UE	200	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	250	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	250	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	320	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	400	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
DB83 STR35SE STR55UE	500	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	630	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	800																	
	320			10	12.5	16				15	18.7	24				T	T	T
	400			10	12.5	16				15	18.7	24				T	T	T
DBL83 STR35SE STR55UE	500			10	12.5	16				15	18.7	24				T	T	T
	630				12.5	16					18.7	24					T	T
	800					16						24						T
	320			10	12.5	16				15	18.7	24				T	T	T
	400			10	12.5	16				15	18.7	24				T	T	T
Masterpact NT NAVY H1 Micrologic 2.0	500			10	12.5	16				15	18.7	24				T	T	T
	630				12.5	16					18.7	24					T	T
	NT10					16						24						T
	NT12																	
	NT16																	
Masterpact NT NAVY H1 Micrologic 5.0, 6.0, 7.0	NT06									15	18.7	24				T	T	T
	NT08										18.7	24					T	T
	NT10											24						T
	NT12																	
	NT16																	
Masterpact NT NAVY H2 Micrologic 2.0	NT06			10	12.5	16				15	18.7	24				T	T	T
	NT08				12.5	16					18.7	24					T	T
	NT10					16						24						T
	NT12																	
	NT16																	
Masterpact NT NAVY H2 Micrologic 5.0, 6.0, 7.0	NT06									15	18.7	24				T	T	T
	NT08										18.7	24					T	T
	NT10											24						T
	NT12																	
	NT16																	
Masterpact NT NAVY L1 Micrologic 2.0	NT06			10	12	16				15	18.7	24				T	T	T
	NT08				12	16					18.7	24					T	T
	NT10					16						24						T
Masterpact NT NAVY L1 Micrologic 5.0, 6.0, 7.0	NT06									15	18.7	24				T	T	T
	NT08										18.7	24					T	T
	NT10											24						T
Masterpact NW NAVY N1/H1/H2 Micrologic 2.0 Micrologic 5.0	NW08																	
	NW10																	
	NW12																	
	NW16																	
	NW20																	
	NW25																	
	NW32																	
NW40																		

DOWNSTREAM	UPSTREAM	Masterpact NT NAVY H2 Micrologic 2.0 Isd : 10 Ir					Masterpact NT NAVY H2 Micrologic 5.0, 6.0, 7.0 Inst 15 In					Masterpact NT NAVY H2 Micrologic 5.0, 6.0, 7.0 Inst OFF					
		NT06	NT08	NT10	NT12	NT16	NT06	NT08	NT10	NT12	NT16	NT06	NT08	NT10	NT12	NT16	
		630	800	1000	1250	1600	630	800	1000	1250	1600	630	800	1000	1250	1600	
		630	800	1000	1250	1600	630	800	1000	1250	1600	630	800	1000	1250	1600	
trip rating (A) adjustment Ir																	
Im (kA)																	
NS100H/L DB trip TM-D	16	T		T	T	T	T		T	T	T	T		T	T	T	
	25	T		T	T	T	T		T	T	T	T		T	T	T	
	40	T		T	T	T	T		T	T	T	T		T	T	T	
	63	T		T	T	T	T		T	T	T	T		T	T	T	
	80	T		T	T	T	T		T	T	T	T		T	T	T	
100	T		T	T	T	T		T	T	T	T		T	T	T		
NS100H/L DB trip STR22SE	16	T		T	T	T	T		T	T	T	T		T	T	T	
	25	T		T	T	T	T		T	T	T	T		T	T	T	
	40	T		T	T	T	T		T	T	T	T		T	T	T	
	63	T		T	T	T	T		T	T	T	T		T	T	T	
	80	T		T	T	T	T		T	T	T	T		T	T	T	
100	T		T	T	T	T		T	T	T	T		T	T	T		
NS250H/L DB trip TM-D	≤ 100	T		T	T	T	T		T	T	T	T		T	T	T	
	125	T		T	T	T	T		T	T	T	T		T	T	T	
	160	T		T	T	T	T		T	T	T	T		T	T	T	
	200	T		T	T	T	T		T	T	T	T		T	T	T	
	250	T		T	T	T	T		T	T	T	T		T	T	T	
NS250H/L DB trip STR22SE	≤ 100	T		T	T	T	T		T	T	T	T		T	T	T	
	125	T		T	T	T	T		T	T	T	T		T	T	T	
	160	T		T	T	T	T		T	T	T	T		T	T	T	
	200	T		T	T	T	T		T	T	T	T		T	T	T	
	250	T		T	T	T	T		T	T	T	T		T	T	T	
NS630H/L DB STR23SE STR53UE	250	T		T	T	T	T		T	T	T	T		T	T	T	
	320	T		T	T	T	T		T	T	T	T		T	T	T	
	400	T		T	T	T	T		T	T	T	T		T	T	T	
	500	T		T	T	T	T		T	T	T	T		T	T	T	
	630	T		T	T	T	T		T	T	T	T		T	T	T	
DB83 STR35SE STR55UE	320			15	18.7	24			12	15	18.7	24			36	36	36
	400			15	18.7	24			12	15	18.7	24			36	36	36
	500			15	18.7	24			12	15	18.7	24			36	36	36
	630				18.7	24					18.7	24				36	36
	800					24						24					36
DBL83 STR35SE STR55UE	320		12	15	18.7	24		12	15	18.7	24		36	36	36	36	
	400		12	15	18.7	24		12	15	18.7	24		36	36	36	36	
	500			15	18.7	24			15	18.7	24			36	36	36	
	630				18.7	24					18.7	24				36	36
	800					24						24					36
Masterpact NT NAVY H1 Micrologic 2.0	NT06			10	12.5	16			15	18.7	24			36	36	36	
	NT08				12.5	16				18.7	24				36	36	
	NT10					16					24					36	
	NT12																
	NT16																
Masterpact NT NAVY H1 Micrologic 5.0, 6.0, 7.0	NT06								15	18.7	24			36	36	36	
	NT08									18.7	24				36	36	
	NT10										24					36	
	NT12																
	NT16																
Masterpact NT NAVY H2 Micrologic 2.0	NT06			10	12.5	16			15	18.7	24			36	36	36	
	NT08				12.5	16				18.7	24				36	36	
	NT10					16					24					36	
	NT12																
	NT16																
Masterpact NT NAVY H2 Micrologic 5.0, 6.0, 7.0	NT06								15	18.7	24			36	36	36	
	NT08									18.7	24				36	36	
	NT10										24					36	
	NT12																
	NT16																
Masterpact NT NAVY L1 Micrologic 2.0	NT06			10	12.5	16			15	18.7	24			36	36	36	
	NT08				12.5	16				18.7	24				36	36	
	NT10					16					24					36	
Masterpact NT NAVY L1 Micrologic 5.0, 6.0, 7.0	NT06								15	18.7	24			36	36	36	
	NT08									18.7	24				36	36	
	NT10										24					36	
Masterpact NW NAVY N1/H1/H2 Micrologic 2.0 Micrologic 5.0	NW08																
	NW10																
	NW12																
	NW16																
	NW20																
	NW25																
	NW32																
NW40																	

DOWNSTREAM	UPSTREAM	Masterpact NT NAVY L1 Micrologic 2.0 Isd : 10 Ir			Masterpact NT NAVY L1 Micrologic 5.0 Inst 15 In			Masterpact NT NAVY L1 Micrologic 5.0 Inst off		
		NT06	NT08	NT10	NT06	NT08	NT10	NT06	NT08	NT10
		630	800	1000	630	800	1000	630	800	1000
		trip rating (A)								
		adjustment Ir								
		Im (kA)								
NS100H/L DB trip TM-D	16	T	T	T	T	T	T	T	T	T
	25	T	T	T	T	T	T	T	T	T
	40	T	T	T	T	T	T	T	T	T
	63	T	T	T	T	T	T	T	T	T
	80	T	T	T	T	T	T	T	T	T
NS100H/L DB trip STR22SE	100	T	T	T	T	T	T	T	T	T
	16	T	T	T	T	T	T	T	T	T
	25	T	T	T	T	T	T	T	T	T
	40	T	T	T	T	T	T	T	T	T
	63	T	T	T	T	T	T	T	T	T
NS250H/L DB trip TM-D	80	T	T	T	T	T	T	T	T	T
	100	T	T	T	T	T	T	T	T	T
	≤ 100	T	T	T	T	T	T	T	T	T
	125	T	T	T	T	T	T	T	T	T
	160	T	T	T	T	T	T	T	T	T
NS250H/L DB trip STR22SE	200	T	T	T	T	T	T	T	T	T
	250	T	T	T	T	T	T	T	T	T
	≤ 100	T	T	T	T	T	T	T	T	T
	125	T	T	T	T	T	T	T	T	T
	160	T	T	T	T	T	T	T	T	T
NS630H/L DB STR23SE STR53UE	200	T	T	T	T	T	T	T	T	T
	250	T	T	T	T	T	T	T	T	T
	250	T	T	T	T	T	T	T	T	T
	320	T	T	T	T	T	T	T	T	T
	400	T	T	T	T	T	T	T	T	T
DB83 STR35SE STR55UE	500	T	T	T	T	T	T	T	T	T
	630	T	T	T	T	T	T	T	T	T
	320						10			10
	400						10			10
	500						10			10
DBL83 STR35SE STR55UE	630									
	800									
	320			10			10			10
	400			10			10			10
	500			10			10			10
Masterpact NT NAVY H1 Micrologic 2.0	630									
	800									
	NT06			10			10			10
	NT08									
	NT10									
Masterpact NT NAVY H1 Micrologic 5.0, 6.0, 7.0	NT12									
	NT16									
	NT06									10
	NT08									
	NT10									
Masterpact NT NAVY H2 Micrologic 2.0	NT12									
	NT16									
	NT06			10			10			10
	NT08									
	NT10									
Masterpact NT NAVY H2 Micrologic 5.0, 6.0, 7.0	NT12									
	NT16									
	NT06									10
	NT08									
	NT10									
Masterpact NT NAVY L1 Micrologic 2.0	NT12			10			10			10
	NT16									
	NT06									10
Masterpact NT NAVY L1 Micrologic 5.0, 6.0, 7.0	NT08									
	NT10									
	NT12									
Masterpact NW NAVY N1/H1/H2 Micrologic 2.0 Micrologic 5.0	NT16									
	NW08									
	NW10									
	NW12									
	NW16									
	NW20									
	NW25									
	NW32									
NW40										

DOWNSTREAM	UPSTREAM	Masterpact NW NAVY N1 - H1 - H2								Masterpact NW NAVY N1 - H1 - H2							
		Micrologic 2.0								Micrologic 5.0							
		Isd 10 lr								Inst 15 ln							
		trip rating (A) adjust. lr	NW08	NW10	NW12	NW16	NW20	NW25	NW32	NW40	NW08	NW10	NW12	NW16	NW20	NW25	NW32
Im (kA)	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000	
NS100H/L DB trip TM-D	16	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	63	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	80	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NS100H/L DB trip STR22SE	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	16	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	63	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NS250H/L DB trip TM-D	80	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	≤100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	125	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	160	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NS250H/L DB trip STR22SE	200	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	250	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	≤100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	125	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	160	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NS630H/L DB STR23SE STR53UE	200	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	250	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	320	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	400	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	500	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
DB83 STR35SE STR55UE	630	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	320		10	12.5	16	20	25	32	40		T	T	T	T	T	T	T
	400		10	12.5	16	20	25	32	40		T	T	T	T	T	T	T
	500		10	12.5	16	20	25	32	40		T	T	T	T	T	T	T
	630			12.5	16	20	25	32	40		T	T	T	T	T	T	T
DBL83 STR35SE STR55UE	800			16	20	25	32	40			T	T	T	T	T	T	T
	320		10	12.5	16	20	25	32	40		15	18.75	24	30	37.5	60	T
	400		10	12.5	16	20	25	32	40		15	18.75	24	30	37.5	60	T
	500		10	12.5	16	20	25	32	40		15	18.75	24	30	37.5	60	T
	630			12.5	16	20	25	32	40			18.75	24	30	37.5	60	T
Masterpact NT NAVY H1/H2 Micrologic 2.0	800			16	20	25	32	40				24	30	37.5	60	T	
	NT06		10	12	16	20	25	32	40		15	18.75	24	30	37.5	T	T
	NT08			12	16	20	25	32	40			18.75	24	30	37.5	T	T
	NT10				16	20	25	32	40				24	30	37.5	T	T
	NT12					20	25	32	40					30	37.5	T	T
Masterpact NT NAVY H1/H2 Micrologic 5.0, 6.0, 7.0	NT16					25	32	40						30	37.5	T	T
	NT06										15	18.75	24	30	37.5	T	T
	NT08											18.75	24	30	37.5	T	T
	NT10												24	30	37.5	T	T
	NT12													30	37.5	T	T
Masterpact NT NAVY L1 Micrologic 2.0	NT16													30	37.5	T	T
	NT06		10	12	16	20	26	45	T		15	18.75	24	35	65	T	T
	NT08			12	16	20	26	45	T			18.75	24	35	65	T	T
Masterpact NT NAVY L1 Micrologic 5.0, 6.0, 7.0	NT10				16	20	26	45	T				24	35	65	T	T
	NT06										15	18.75	24	35	65	T	T
	NT08											18.75	24	35	65	T	T
Masterpact NW NAVY N1/H1/H2 Micrologic 2.0	NT10											24	35	65	T	T	
	NW08			12	16	20	25	32	40			18.75	24	30	37.5	48	60
	NW10				16	20	25	32	40				24	30	37.5	48	60
	NW12					20	25	32	40					30	37.5	48	60
	NW16						25	32	40						37.5	48	60
	NW20							32	40							48	60
	NW25								40								60
	NW32																
Masterpact NW NAVY N1/H1/H2 Micrologic 5.0	NW40																
	NW08			12	16	20	25	32	40			18.75	24	30	37.5	48	60
	NW10				16	20	25	32	40				24	30	37.5	48	60
	NW12					20	25	32	40					30	37.5	48	60
	NW16						25	32	40						37.5	48	60
	NW20							32	40							48	60
	NW25								40								60
	NW32																
NW40																	

DOWNSTREAM	UPSTREAM	Masterpact NW NAVY N1 - H1 - H2 Micrologic 5.0 - 6.0 - 7.0							
		Inst OFF							
	trip rating (A) adjustment Ir	NW08 800	NW10 1000	NW12 1250	NW16 1600	NW20 2000	NW25 2500	NW32 3200	NW40 4000
	Im (kA)								
NS100H/L DB trip TM-D	16	T	T	T	T	T	T	T	T
	25	T	T	T	T	T	T	T	T
	40	T	T	T	T	T	T	T	T
	63	T	T	T	T	T	T	T	T
	80	T	T	T	T	T	T	T	T
NS100H/L DB trip STR22SE	100	T	T	T	T	T	T	T	T
	16	T	T	T	T	T	T	T	T
	25	T	T	T	T	T	T	T	T
	40	T	T	T	T	T	T	T	T
	63	T	T	T	T	T	T	T	T
NS250H/L DB trip TM-D	80	T	T	T	T	T	T	T	T
	100	T	T	T	T	T	T	T	T
	≤ 100	T	T	T	T	T	T	T	T
	125	T	T	T	T	T	T	T	T
	160	T	T	T	T	T	T	T	T
NS250H/L DB trip STR22SE	200	T	T	T	T	T	T	T	T
	250	T	T	T	T	T	T	T	T
	≤ 100	T	T	T	T	T	T	T	T
	125	T	T	T	T	T	T	T	T
	160	T	T	T	T	T	T	T	T
NS630H/L DB STR23SE STR53UE	200	T	T	T	T	T	T	T	T
	250	T	T	T	T	T	T	T	T
	250	T	T	T	T	T	T	T	T
	320	T	T	T	T	T	T	T	T
	400	T	T	T	T	T	T	T	T
DB83 STR35SE STR55UE	500	T	T	T	T	T	T	T	T
	630	T	T	T	T	T	T	T	T
	800		T	T	T	T	T	T	T
	320		T	T	T	T	T	T	T
	400		T	T	T	T	T	T	T
DBL83 STR35SE STR55UE	500		T	T	T	T	T	T	T
	630		T	T	T	T	T	T	T
	800			T	T	T	T	T	T
	320			T	T	T	T	T	T
	400			T	T	T	T	T	T
Masterpact NT NAVY H1 Micrologic 2.0	500			T	T	T	T	T	T
	630			T	T	T	T	T	T
	800				T	T	T	T	T
	NT06		T	T	T	T	T	T	T
	NT08			T	T	T	T	T	T
Masterpact NT NAVY H1 Micrologic 5.0, 6.0, 7.0	NT10				T	T	T	T	T
	NT12					T	T	T	T
	NT16						T	T	T
	NT06		T	T	T	T	T	T	T
	NT08			T	T	T	T	T	T
Masterpact NT NAVY L1 Micrologic 2.0	NT10			T	T	T	T	T	T
	NT12					T	T	T	T
	NT16						T	T	T
Masterpact NT NAVY L1 Micrologic 5.0, 6.0, 7.0	NT06		T	T	T	T	T	T	T
	NT08			T	T	T	T	T	T
	NT10				T	T	T	T	T
	NT12					T	T	T	T
Masterpact NW NAVY N1/H1/H2 Micrologic 2.0	NT16						T	T	T
	NW08			T	T	T	T	T	T
	NW10				T	T	T	T	T
	NW12					T	T	T	T
	NW16						T	T	T
	NW20							T	T
	NW25								T
	NW32								
	NW40								
Masterpact NW NAVY N1/H1/H2 Micrologic 5.0	NW08			T	T	T	T	T	T
	NW10				T	T	T	T	T
	NW12					T	T	T	T
	NW16						T	T	T
	NW20							T	T
	NW25								T
	NW32								
	NW40								



schneider-electric.com

This international site allows you to access all the Schneider Electric products in just 2 clicks via comprehensive range data-sheets, with direct links to:

- complete library: technical documents, catalogs, FAQs, brochures...
- selection guides from the e-catalog.
- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts...

CAD software and tools

The CAD software and tools enhance productivity and safety. They help you create your installations by simplifying product choice through easy browsing in the Schneider Electric offers.

Last but not least, they optimise use of our products while also complying with standards and proper procedures.



<i>Presentation</i>	1
<i>Functions and characteristics</i>	A-1
<i>Installation recommendations</i>	B-1
<i>Dimensions and connections</i>	C-1
<i>Electrical diagrams</i>	D-1
<i>Additional characteristics</i>	E-1
NT06 to NT16 Navy drawout circuit breakers	F-3
Circuit breakers	F-3
Connections	F-4
Chassis locking and accessories	F-5
Indication contacts	F-6
Remote operation	F-7
Accessories for NT06 to NT16 Navy drawout circuit breakers	F-8
NW08 to NW40 Navy drawout circuit breakers	F-10
Circuit breakers	F-10
Chassis and connections	F-11
Chassis locking and accessories	F-12
Chassis accessories	F-13
Indication contacts	F-14
Remote operation	F-15
Accessories for NW08 to NW40 Navy drawout circuit breakers	F-16
NW08 to NW40 Navy drawout circuit breakers	F-18
Switch-disconnectors	F-18
Connections	F-19
Masterpact NT NAVY	F-20
Connection	F-20
Micrologic control unit, communication option, portable data acquisition	F-21
Remote operation	F-22
Chassis locking and accessories	F-23
Clusters	F-24
Circuit breaker locking and accessories	F-25
Indication contacts	F-26
Masterpact NW NAVY	F-27
Connection	F-27
Micrologic control unit, communication option	F-28
Remote operation	F-29
Chassis locking and accessories	F-30
Clusters	F-31
Circuit breaker locking and accessories	F-32
Indication contacts	F-33
Masterpact NT or NW NAVY	F-34
Circuit breakers and switch-disconnectors	F-34

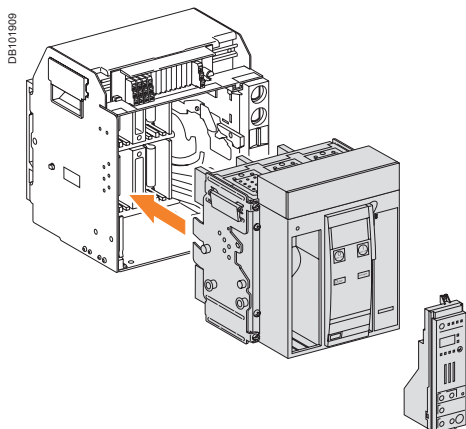
NT06 to NT16 Navy drawout circuit breakers

Circuit breakers

A Navy Masterpact drawout circuit breaker is described by 5 catalogue numbers corresponding to:

- the basic circuit breaker
- a control unit
- a chassis
- a top connection
- a bottom connection.

A communication option and various auxiliaries and accessories may also be added.



Navy basic circuit breaker

Type H1

	In (A at 40 °C)	Icu (kA for U = 220/415 V) - Ics = 100 % Icu	3P
NT06	630	42	64572
NT08	800	42	64573
NT10	1000	42	64574
NT12	1250	42	64575
NT16	1600	42	64576

Type H2

	In (A at 40 °C)	Icu (kA for U = 220/415 V) - Ics = 100 % Icu	3P
NT06	630	50	64621
NT08	800	50	64622
NT10	1000	50	64623
NT12	1250	50	64624
NT16	1600	50	64625

Type L1

	In (A at 40 °C)	Icu (kA for U = 220/415 V) - Ics = 100 % Icu	3P
NT06	630	150	64577
NT08	800	150	64578
NT12	1000	150	64579

Micrologic control unit

“Ammeter” A

Micrologic 2.0	Basic protection	65304
Micrologic 5.0	Selective protection	65305

“Power meter” P

Micrologic 5.0 P	Selective protection	47297
------------------	----------------------	-------

“Harmonic meter” H

Micrologic 5.0 H	Selective protection	47301
------------------	----------------------	-------

Navy chassis

For type H1/H2

	3P
630/1250 A	64581
1600 A	64582

For type L1

	3P
630/1000 A	64584

Communication option

	Chassis +	Circuit breaker
Modbus COM	33852	47485
Eco Modbus COM module		33843

Portable data acquisition

Masterpact GetnSet product with battery and accessories	48789
---	-------

NT06 to NT16 Navy drawout circuit breakers Connections

Chassis front connection

E-46440 	630/1600 A	Top	3P
		Bottom	33727
			33728

Front connection accessories

Vertical connection adapters 630/1600 A

E-46426 	3P (3 parts)		33642
--	--------------	--	-------

Chassis rear connection

Vertical connection

E-46429 	630/1600 A	Top	3P
		Bottom	33729
			33730

Horizontal connection

E-46430 	630/1600 A	Top	3P
		Bottom	33731
			33732

Rear connection accessories

E-46428 	interphase barriers (3 parts)		3P
			33768

Common accessories for front and rear connection


Spreaders

E-46431 	800-1600 A	3P	33622
	For front and horizontal rear connection.		

Cable lug adapters 630/1600 A

E-46427 	3P (3 parts)		33644
--	--------------	--	-------

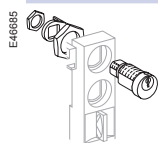
Cable lug kits

E-47820 	240 mm ²	3P (6 lug kit)	33013
	300 mm ²	3P (6 lug kit)	33015

Chassis locking and accessories

Chassis locking

“Disconnected” position locking



By padlocks		
	VCPO	Standard
By Profalux keylocks		
Profalux	1 lock with 1 key + adaptation kit	33773
	2 locks 1 keys + adaptation kit	33774
	2 locks 2 different keys + adaptation kit	33775
1 keylock Profalux (without adaptation kit):		
	identical key not identified combination	33173
	identical key identified 215470 combination	33174
	identical key identified 215471 combination	33175
By Ronis keylocks		
Ronis	1 lock with 1 key + adaptation kit	33776
	2 locks 1 keys + adaptation kit	33777
	2 locks 2 different keys + adaptation kit	33778
1 keylock Ronis (without adaptation kit):		
	identical key not identified combination	33189
	identical key identified EL24135 combination	33190
	identical key identified EL24153 combination	33191
	identical key identified EL24315 combination	33192
Optional disconnected/test/connected position locking		
		33779
Adaptation kit (without keylock):		
	adaptation kit Profalux	33769
	adaptation kit Ronis	33770
	adaptation kit Castell	33771
	adaptation kit Kirk	33772

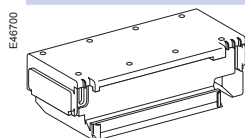
Racking interlock



Racking interlock (VPOC)	33788
--------------------------	-------

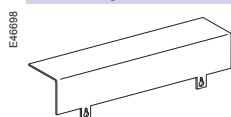
Chassis accessories

Arc chute cover



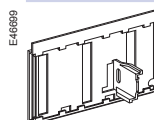
	Standard
--	----------

Auxiliary terminal shield (CB)



Terminal shield	33763
-----------------	-------

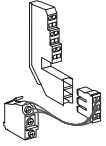
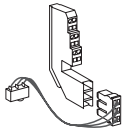
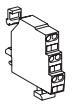
Safety shutters as standard



Safety shutters (VO)	Standard
----------------------	----------

NT06 to NT16 Navy drawout circuit breakers

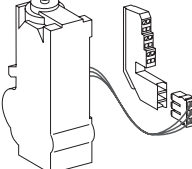
Indication contacts

ON/OFF indication contacts (OF)		
E46467 	Changeover contacts (6 A - 240 V)	4 (standard)
	1 low-level OF to replace 1 standard OF (4 max.)	33806
"Fault trip" indication contacts (SDE)		
E47759 	Changeover contact (5 A - 240 V)	1 (standard)
	1 additional SDE (5 A - 240 V)	47430
	1 additional low-level SDE	47431
Carriage switches (connected / disconnected / test position)		
E46861 	Changeover contacts (6 A - 240 V)	
	1 connected position contact (3 max.)	33751
	1 test position contact (1 max.)	33752
	1 disconnected position contact (2 max.)	33753
	And/or low-level changeover contacts	
	1 connected position contact (3 max.)	33754
1 test position contact (1 max.)	33755	
1 disconnected position contact (2 max.)	33756	
Auxiliary terminals for chassis alone		
	3 wire terminal (30 parts)	47071
	6 wire terminal (10 parts)	47072
	Jumpers (10 parts)	47900

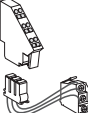
Remote operation

Remote ON/OFF

Gear motor

	AC 50/60 Hz	100/130 V	MCH	
		200/240 V	47465	
		277/415 V	47466	
		440/480 V	47468	
		47470	47470	
	DC	24/30 V	47460	

Navy instantaneous voltage release

	Standard	AC 50/60 Hz	115 V AC/DC	Closing release	Opening release
				Navy XF	Navy MX
				64587	64592
				64588	64593
	Communicating	AC 50/60 Hz	115 V AC/DC	Navy XF com	Navy MX com
				64597	64602
				64598	64603
				64599	64604
DC	220 V AC/DC	380/480 V AC	64599	64604	

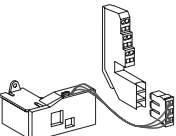
“Ready to close” contact (1 max.)

	1 changeover contact (5 A - 240 V)	PF
		47432
		47433

Electrical closing pushbutton

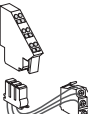
	1 pushbutton	BPFE
		47512

Remote reset after fault trip

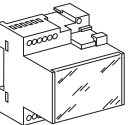
	Automatic reset	RAR
	Adaptation	47346

Remote tripping

Navy instantaneous voltage release (MN or 2nd MX)

	AC 50/60 Hz	24/30 V DC, 24 V AC	2nd MX	or	MN		
					33819		
			DC	100/130 V AC/DC			33821
				115 V AC/DC	64612		
				200/250 V AC/DC			33822
				220 V AC/DC	64613		
				380/480 V AC	64614		33824

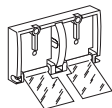
MN delay unit

	AC 50/60 Hz	48/60 V AC/DC	R (non-adjustable)	Rr (adjustable)		
				33680		
			DC	100/130 V AC/DC	33684	33681
				200/250 V AC/DC	33685	33682
				380/480 V AC		33683

Circuit breaker locking

Pushbutton locking device

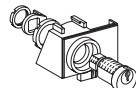
E46866



By padlocks	33897
-------------	-------

OFF position locking

E46701



By padlocks + BPFE support		
VCPO		47514
By Profalux keylocks		
Profalux	1 lock with 1 key + adaptation kit	47519
	2 locks 1 keys + adaptation kit	47520
1 keylock Profalux (without adaptation kit):		
	identical key not identified combination	33173
	identical key identified 215470 combination	33174
	identical key identified 215471 combination	33175
By Ronis keylocks + BPFE support		
Ronis	1 lock with 1 key + adaptation kit	47521
	2 locks 1 keys + adaptation kit	47522
1 keylock Ronis (without adaptation kit):		
	identical key not identified combination	33189
	identical key identified EL24135 combination	33190
	identical key identified EL24153 combination	33191
	identical key identified EL24315 combination	33192
Adaptation kit (without keylock):		
	adaptation kit Profalux	47515
	adaptation kit Ronis	47516
	adaptation kit Kirk	47517
	adaptation kit Castell	47518

Other circuit breaker accessories

Mechanical operation counter

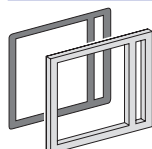
E46867



Operation counter CDM	33895
-----------------------	-------

Escutcheon and accessories

E46868



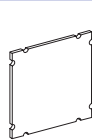
Escutcheon

E46869



Cover

E46870



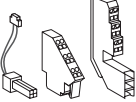
Blanking plate

	Drawout
Escutcheon	33857
Transparent cover (IP54)	33859
Escutcheon blanking plate	33858


Accessories for Micrologic control units

External sensors

Voltage measurement input (for breakers supplied via bottom terminals)

E46673		Voltage measurement input	Drawout	47507

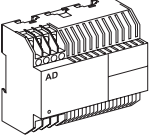
Long-time rating plug (limits setting range for higher accuracy)

E46674		Standard	0.4 to 1 x Ir	33542
		Low-setting option	0.4 to 0.8 x Ir	33543
		High-setting option	0.8 to 1 x Ir	33544
		Without long-time protection	off	33545

Zone Selective Interlocking option for Micrologic P and H

ZSI	Standard
-----	----------

External power supply module (AD)

DE 105360		24/30 V DC	54440
		48/60 V DC	54441
		100/125 V DC	54442
		110/130 V AC	54443
		200/240 V AC	54444
		380/415 V AC	54445

Battery module (BAT)

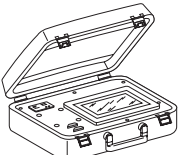
E47787		1 24 V battery	54446
--------	--	----------------	-------

Test equipment

Mini test kit

E59621		Hand held test kit (HHTK)	33594
--------	---	---------------------------	-------

Portable test kit

E59654		Full function test kit (FFTK)	33595
		Test report edition come from FFTK	34559
		FFTK test cable 2 pin for STR trip unit	34560
		FFTK test cable 7 pin for Micrologic trip unit	33590

Special settings

For circuit breaker derating

To be specified when ordering

Rating	NT08	NT10	NT12	NT16
400	Available	Available		
630	Available	Available	Available	
800		Available	Available	Available
1000			Available	Available
1250				Available

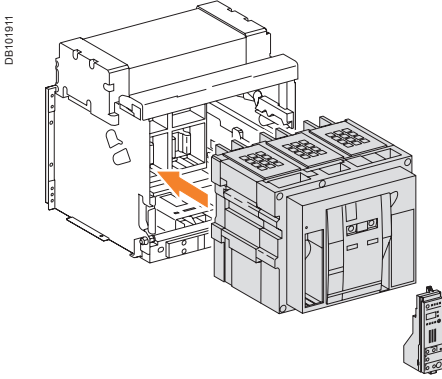
NW08 to NW40 Navy drawout circuit breakers

Circuit breakers

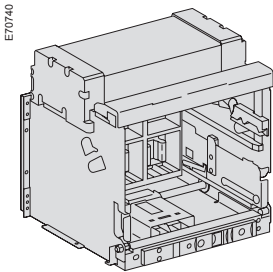
A Navy Masterpact drawout circuit breaker is described by 5 catalogue numbers corresponding to:

- the basic circuit breaker
- a control unit
- a chassis
- a top connection
- a bottom connection.

A communication option and various auxiliaries and accessories may also be added.



Basic circuit breaker + chassis ≤ 4000 A



Chassis ≤ 4000 A

Navy basic circuit breaker

			3P
--	--	--	-----------

Type N1

	In (A at 40 °C)	Icu (kA for U = 220/440 V) - Ics = 100 % Icu	
NW08	800	42	64500
NW10	1000	42	64501
NW12	1250	42	64502
NW16	1600	42	64503

Type H1

	In (A at 40 °C)	Icu (kA for U = 220/440 V) - Ics = 100 % Icu	
NW08	800	65	64505
NW10	1000	65	64506
NW12	1250	65	64507
NW16	1600	65	64508
NW20	2000	65	64509
NW25	2500	65	64510
NW32	3200	65	64511
NW40	4000	65	64512

Type H2

	In (A at 40 °C)	Icu (kA for U = 220/440 V) - Ics = 100 % Icu	
NW08	800	100	64523
NW10	1000	100	64524
NW12	1250	100	64525
NW16	1600	100	64526
NW20	2000	100	64527
NW25	2500	100	64528
NW32	3200	100	64529
NW40	4000	100	64530

Micrologic control unit

“Ammeter” A

Micrologic 2.0 A	Basic protection	48358
Micrologic 5.0 A	Selective protection	48360

“Power meter” P

Micrologic 5.0 P	Selective protection	48363
------------------	----------------------	--------------

“Harmonic meter” H

Micrologic 5.0 H	Selective protection	48366
------------------	----------------------	--------------

Navy chassis

		3P
--	--	-----------

For type N1

800/1250 A	64514
1600 A	64515

For type H1/H2

800/1600 A	64517
2000 A	64518
2500 A	64519
3200 A	64520
4000 A	64521

Communication option

	Chassis +	Circuit breaker
Modbus COM	33852	48384
Eco Modbus COM module		48385

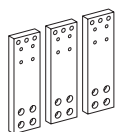
Portable data acquisition

Masterpact GetnSet product with battery and accessories	48789
---	--------------

Chassis and connections

Chassis front connection

E46450



		3P
800-1600 A	Top	48415
	Bottom	48418
2000 A	Top	48413
	Bottom	48414
2500/3200 A	Top	48416
	Bottom	48419

Chassis rear connection

3P

Vertical connection

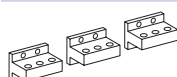
E46445



800-2000 A	Top	48133
	Bottom	48138
2500/3200 A	Top	48134
	Bottom	48139
4000 A	Top	48135
	Bottom	48140

Horizontal connection

E46446

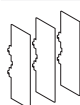


800-2000 A	Top	48143
	Bottom	48148
2500/3200 A	Top	48144
	Bottom	48149
4000 A	Top	48145
	Bottom	48150

Rear connection accessories

Interphase barriers

E46428



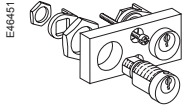
3P/4P/ (3 parts)	48600
------------------	-------

NW08 to NW40 Navy drawout circuit breakers

Chassis locking and accessories

Chassis locking

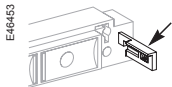
"Disconnected" position locking



E46451

By padlocks		
	VCPO	Standard
By Profalux keylocks		
Profalux	1 lock with 1 key + adaptation kit	48568
	2 locks 1 key + adaptation kit	48569
	2 locks 2 different keys + adaptation kit	48570
1 keylock Profalux (without adaptation kit):		
	identical key not identified combination	33173
	identical key identified 215470 combination	33174
	identical key identified 215471 combination	33175
By Ronis keylocks		
Ronis	1 lock with 1 key + adaptation kit	48572
	2 locks 2 same keys + adaptation kit	48573
	2 locks 2 different keys + adaptation kit	48574
1 keylock Ronis (without adaptation kit):		
	identical key not identified combination	33189
	identical key identified EL24135 combination	33190
	identical key identified EL24153 combination	33191
	identical key identified EL24315 combination	33192
	Optional disconnected/test/connected position locking	33779
Adaptation kit (without keylock):		
	adaptation kit Profalux / Ronis	48564
	Kirk key adapter kit	48565
	Castell key adapter kit	48566

Racking interlock



E46453

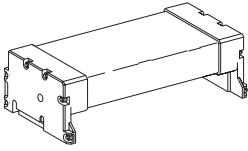
1 part	48582
--------	-------

Chassis accessories

Chassis accessories

Arc chute cover

E46457

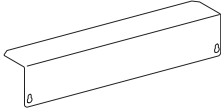


3P

Standard

Auxiliary terminal shield (CB)

E46459



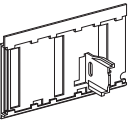
800/4000 A

3P

48595

Safety shutters

E46699



Safety shutters (VO)

Standard

Shutter locking block (for replacement)

E46460



2 parts for 800/4000 A

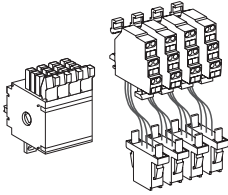
48591

NW08 to NW40 Navy drawout circuit breakers

Indication contacts

ON/OFF indication contacts (OF)

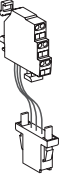
E46889



Navy block of 4 changeover contacts (6 A - 240 V)	1 block (standard)
1 additional Navy block of 4 contacts (1 max.)	64556

Combined closed / connected contacts for use with 1 auxiliary contact

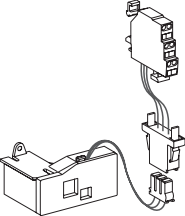
E46890



1 contact (5 A - 240 V) (8 max.)	48477
or 1 low-level contact (8 max.)	48478

“Fault trip” indication contacts (SDE)

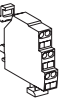
E46891



Changeover contact (5 A - 240 V)	1 (standard)
1 additional SDE (5 A - 240 V)	48475
or 1 additional low-level SDE	48476

Carriage switches (connected / disconnected / test position)

E46861



Changeover contacts (6 A - 240 V)	
1 connected position contact (3 max.)	33751
1 test position contact (3 max.)	33752
1 disconnected position contact (3 max.)	33753
and/or low-level changeover contacts	
1 connected position contact (3 max.)	33754
1 test position contact (3 max.)	33755
1 disconnected position contact (3 max.)	33756
Actuator for additional carriage switches	48560

Auxiliary terminals for chassis alone

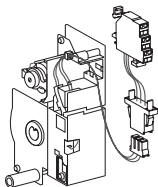
3 wire terminal (30 parts)	47898
6 wire terminal (10 parts)	47899
Jumpers (10 parts)	47900

Remote operation

Remote ON/OFF

Gear motor

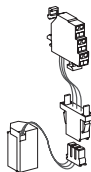
E46892



		MCH
AC 50/60 Hz	100/130 V	48526
	200/240 V	48527
	250/277 V	48528
	380/415 V	48529
	440/480 V	48530
DC	24/30 V	48521

Navy instantaneous voltage releases

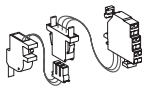
E46893



		Closing release	Opening release
Standard		Navy XF	Navy MX
AC 50/60 Hz	115 V AC/DC	64542	64547
	220 V AC/DC	64543	64548
	380-480 V AC	64544	64549
Communicating		Navy XF com	Navy MX com
AC 50/60 Hz	115 V AC/DC	64552	64559
	220 V AC/DC	64553	64560
	380/480 V AC	64554	64561

“Ready to close” contact (1 max.)

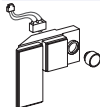
E46895



		PF
1 changeover contact (5 A - 240 V)		48469
1 low-level changeover contact		48470

Electrical closing pushbutton

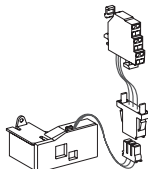
E46877



		BPFE
1 pushbutton		48534

Remote reset after fault trip

E46891

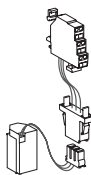


		RAR
Automatic reset		
Adaptation		47346

Remote tripping

Instantaneous voltage release

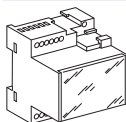
E46893



		2 nd MX	or	MN
AC 50/60 Hz	24/30 V DC, 24 V AC			48501
	100/130 V AC/DC			48503
DC	115 V AC/DC	64569		
	200/250 V AC/DC			48504
	220 V AC/DC	64570		
	380/480 V AC	64571		48506

MN delay unit

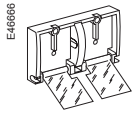
E46894



		R (non-adjustable)	Rr (adjustable)
AC 50/60 Hz	48/60 V AC/DC		33680
	100/130 V AC/DC	33684	33681
	200/250 V AC/DC	33685	33682
	380/480 V AC/DC		33683

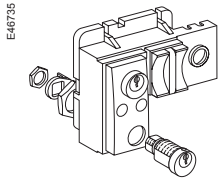
Circuit breaker locking

Pushbutton locking device



By padlocks	48536
-------------	-------

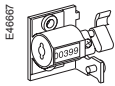
OFF position locking



By padlocks		
	VCPO	48539
By Profalux keylocks		
Profalux	1 lock with 1 key + adaptation kit	48545
	2 locks 2 same keys + adaptation kit	48546
	2 locks 2 different keys + adaptation kit	48547
1 keylock Profalux (without adaptation kit):	identical key not identified combination	33173
	identical key identified 215470 combination	33174
	identical key identified 215471 combination	33175
By Ronis keylocks		
Ronis	1 lock with 1 key + adaptation kit	48549
	2 locks 2 same keys + adaptation kit	48550
	2 locks 2 different keys + adaptation kit	48551
1 keylock Ronis (without adaptation kit):	identical key not identified combination	33189
	identical key identified EL24135 combination	33190
	identical key identified EL24153 combination	33191
	identical key identified EL24315 combination	33192
Adaptation kit (without keylock):	adaptation kit Profalux / Ronis	48541
	adaptation kit Kirk	48542
	adaptation kit Castell	48543

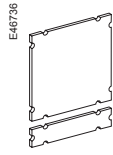
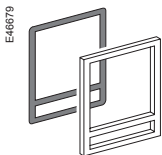
Other circuit breaker accessories

Mechanical operation counter



operation counter CDM	48535
-----------------------	-------

Escutcheon and accessories



Escutcheon

Cover

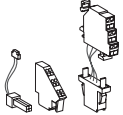
Blanking plate

	Drawout
Escutcheon	48603
Transparent cover IP54	48604
Escutcheon blanking plate	48605


Accessories for Micrologic control units

External sensors

Voltage measurement input (for breakers supplied via bottom terminals)

E46890 	Voltage measurement input	Drawout	48533

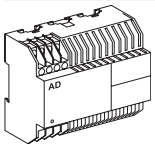
Long-time rating plug (limits setting range for higher accuracy)

E46874 	Standard	0.4 to 1 x Ir	33542
	Low-setting option	0.4 to 0.8 x Ir	33543
	High-setting option	0.8 to 1 x Ir	33544
	Without long-time protection	off	33545

Zone Selective Interlocking option for Micrologic P and H

ZSI	Standard
-----	----------

External power supply module (AD)

DE 105390 	24/30 V DC	54440
	48/60 V DC	54441
	100/125 V DC	54442
	110/130 V AC	54443
	200/240 V AC	54444
	380/415 V AC	54445

Battery module (BAT)


E47787 	1 24 V battery	54446
--	----------------	-------

Test equipment

Mini test kit

E69921 	Hand held test kit (HHTK)	33594
---	---------------------------	-------

Portable test kit

E69854 	Full function test kit (FFTK)	33595
	Test report edition come from FFTK	34559
	FFTK test cable 2 pin for STR trip unit	34560
	FFTK test cable 7 pin for Micrologic trip unit	33590

Special settings

For circuit breaker derating

To be specified when ordering

Rating	NW08	NW10	NW12	NW16	NW20	NW25	NW32
400	Available	Available					
630	Available	Available	Available				
800		Available	Available	Available			
1000			Available	Available	Available		
1250				Available	Available	Available	
1600					Available	Available	Available
2000						Available	Available
2500							Available
Rating	NW40						
2000	Available						
2500	Available						
3200	Available						
4000							

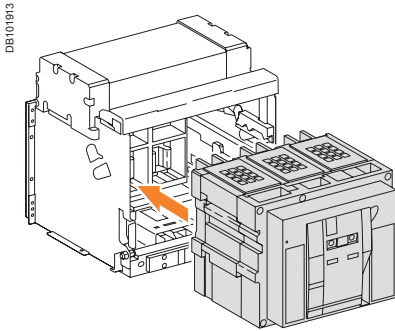
NW08 to NW40 Navy drawout switch-disconnectors

Switch-disconnectors

A Navy Masterpact drawout switch-disconnector is described by 4 catalogue numbers corresponding to:

- the basic switch-disconnector
- a chassis
- a top connection
- a bottom connection.

A communication option and various auxiliaries and accessories may also be added.



Basic switch-disconnector + chassis ≤ 4000 A

Navy basic switch-disconnector

Type HA

	In (A at 40 °C)	Icm (kA peak for U = 220/690 V)	3P
NW08	800	105	64532
NW10	1000	105	64533
NW12	1250	105	64534
NW16	1600	105	64535
NW20	2000	105	64536
NW25	2500	135	64537
NW32	3200	135	64538
NW40	4000	135	64539

Navy chassis

Type HA

	3P
800/1600 A	64517
2000 A	64518
2500 A	64519
3200 A	64520
4000 A	64521

Communication option

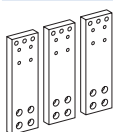
	Chassis +	Switch-disconnector
Modbus COM	33852	48384

Auxiliaries and accessories: see [page F-8](#) and [page F-9](#).

Connections

Chassis front connection

E-60460

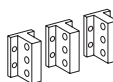


800-1600 A	Top	3P
	Bottom	48415
2000 A	Top	48418
	Bottom	48413
2500/3200 A	Top	48414
	Bottom	48416
	Bottom	48419

Chassis rear connection

Vertical connection

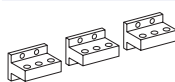
E-60445



800-2000 A	Top	3P
	Bottom	48133
2500/3200 A	Top	48138
	Bottom	48134
4000 A	Top	48139
	Bottom	48135
	Bottom	48140

Horizontal connection

E-60446

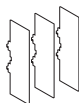


800-2000 A	Top	3P
	Bottom	48143
2500/3200 A	Top	48148
	Bottom	48144
4000 A	Top	48149
	Bottom	48145
	Bottom	48150

Rear connection accessories

Interphase barriers

E-60428

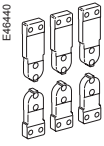


3P/4P (3 parts)	48600
-----------------	-------

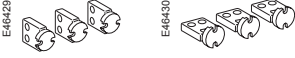
Connection

Drawout circuit breakers

Front connection / Replacement kit (6 parts)

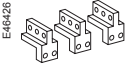
	Top and bottom	630/1600 A	33588
	Installation manual		47102

Rear connection (vertical or horizontal mounting) / Replacement kit (3 parts)

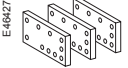
		630/1600 A	33586
	<i>Vert. mounting.</i> <i>Horiz. mounting.</i>	Installation manual	

Connection accessories

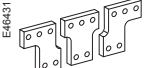
Vertical connection adapters 630/1600 A / Replacement kit (3 parts)

	For drawout front-connected circuit breakers		33642
	Installation manual		47102


Cable lug adapters 630/1600 A / Replacement kit (3 parts)

	For drawout front-connected circuit breakers		33644
	Installation manual		47102

Spreaders / Replacement kit (3 parts)

	For drawout front and rear-connected circuit breakers		33622
	Installation manual		47102


Interphase barriers / Replacement kit (3 parts)

	For drawout front and rear-connected circuit breakers		33648
	For drawout rear-connected circuit breakers		33768
	Installation manual		47102

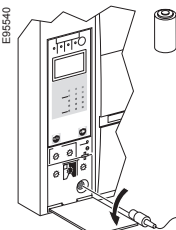
Micrologic control unit, communication option, portable data acquisition

Replacement parts for Micrologic control units

Long-time rating plug (limits setting range for higher accuracy) / 1 part

E46874 	Standard	0.4 at 1 x Ir	33542
	Low-setting option	0.4 at 0.8 x Ir	33543
	High-setting option	0.8 at 1 x Ir	33544
	Without long-time protection	off	33545

Battery + cover

E99540 	Battery (1 part)		33593
	Cover (1 part)	For Micrologic A	33592
		For Micrologic P and H	47067

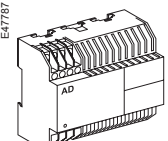
Communication option

Chassis

E98541 	Modbus COM		33852
	6 wires terminal drawout (1 part)		33099

Installation manual | 33088

External power supply module (AD) / 1 part

E47787 		24-30 V DC	54440
		48-60 V DC	54441
		100-125 V DC	54442
		110-130 V AC	54443
		200-240 V AC	54444
		380-415 V AC	54445

Battery module (BAT) / 1 part

E47787 	1 battery	24 V DC	54446
---	-----------	---------	-------

Test equipments / 1 part

E99554 	Mini test kit		33594
	Portable test kit		33595
	Wiring kit or mini test kit or portable test kit		33590

Portable data acquisition

Masterpact GetnSet (*)

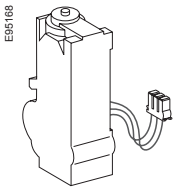
Masterpact GetnSet product with battery and accessories	48789
Spare battery for Masterpact GetnSet product	48790
Spare cable for Masterpact GetnSet product	48791

(*) Consult us.

Nota: Installation manual must be ordered separately, it is not supply with the component.

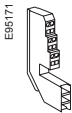
Remote operation

Gear motor



MCH (1 part)

AC 50/60 Hz	100-130 V	33176
	200-240 V	33177
	380-415 V	33179
	400-440 V	33179
	+ resistor	33193

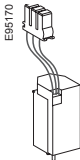


Terminal block (1 part)	For drawout circuit breaker	33098
-------------------------	-----------------------------	-------

Drawout.

Installation manual	47103
---------------------	-------

Closing and opening release (XF or MX)

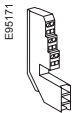


Standard coil (1 part)

AC 50/60 Hz	115 V AC	64628
	220 V AC	64629
	380/440 V AC	64630

Communicating coil (1 part)

AC 50/60 Hz	115 V AC	64633
	220 V AC	64634
	380/440 V AC	64635

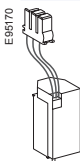


Terminal block (1 part)	For drawout circuit breaker	33098
-------------------------	-----------------------------	-------

Drawout.

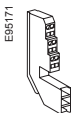
Installation manual	47103
---------------------	-------

Undervoltage release MN



Undervoltage release (1 part)

AC 50/60 Hz	100-130 V AC	33670
	200-250 V AC	33671
	380-480 V AC	33673

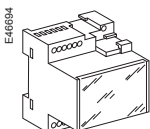


Terminal block (1 part)	For drawout circuit breaker	33098
-------------------------	-----------------------------	-------

Drawout.

Installation manual	47103
---------------------	-------

MN delay unit



MN delay unit (1 part)

AC 50/60 Hz		R (non-adjustable)	Rr (adjustable)
	100-130 V	33684	33681
	200-250 V	33685	33682
	380-480 V		33683

Installation manual	47103
---------------------	-------

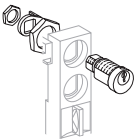
Nota: Installation manual must be ordered separately, it is not supply with the component.

Chassis locking and accessories

Chassis locking

"Disconnected" position locking / 1 part

E46885



By padlocks		Standard
By keylocks		
Profalux	1 lock	33773
	1 lock + 1 lock with same key profile	33774
	2 locks (different key profiles)	33775
1 identical keylock Profalux with the same key:		
	key: random not identified combination	33173
	key: random identified 215470 combination	33174
	key: random identified 215471 combination	33175
Ronis	1 lock	33776
	1 lock + 1 lock with same key profile	33777
	2 locks (different key profiles)	33778
1 identical keylock Ronis with the same key :		
	key: random not identified combination	33189
	key: random identified EL24135 combination	33190
	key: random identified EL24153 combination	33191
	key: random identified EL24315 combination	33192
Locking kit without locks for	Profalux	33769
	Ronis	33770
	Castell	33771
	Kirk	33772
Installation manual		47104

Racking interlock / 1 part

E46465



Racking interlock (VPOC)	33788
Installation manual	47104

Chassis accessories

Auxiliary terminal shield (CB) / 1 part

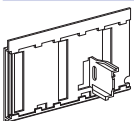
E46888



Terminal shield	3P	33763
Installation manual		47104

Safety shutters + locking / 1 part

E46889

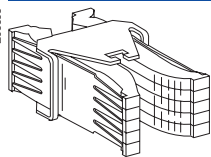


Safety shutters (VO)	3P	33765
Installation manual		47104
Note: the locking of safety shutters is integrated.		

Nota: Installation manual must be ordered separately, it is not supply with the component.

Clusters

E95538



1 disconnecting contact cluster for chassis (see table below) 1 part

33166

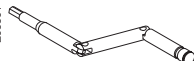
Table : number of clusters required for the different chassis models

Chassis rating (A)	Masterpact NT NAVY
630	12
800	12
1000	12
1250	12
1600	18

Note: the minimum order is 6 parts.

Racking handle / 1 part

E95561



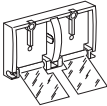
Racking handle

47098

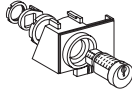
Circuit breaker locking and accessories

Circuit breaker locking

Pushbutton locking device / 1 part

E46666 	By padlocks	33897
	Installation manual	47103

OFF position locking / 1 part

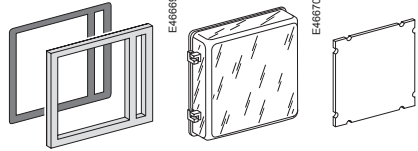
E46701 	By padlocks + BPFE support		
		47514	
	By keylocks + BPFE support		
	Profalux	1 lock	47519
		1 lock + 1 lock with same key profile	47520
	1 identical keylock Profalux with the same key:		
		key: random not identified combination	33173
		key: random identified 215470 combination	33174
		key: random identified 215471 combination	33175
	Ronis	1 lock	47521
		1 lock + 1 lock with same key profile	47522
	1 identical keylock Ronis with the same key :		
		key: random not identified combination	33189
		key: random identified EL24135 combination	33190
		key: random identified EL24153 combination	33191
	key: random identified EL24315 combination	33192	
Locking kit without locks for	Profalux	47515	
	Ronis	47516	
	Kirk	47517	
	Castell	47518	
Installation manual		47103	

Other circuit breaker accessories

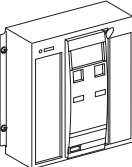
Mechanical operation counter / 1 part

E46667 	Operation counter CDM	33895
	Installation manual	47103

Escutcheon and accessories / 1 part

E46668 	Escutcheon	33857
	Transparent cover (IP54)	33859
	Escutcheon blanking plate	33858
	Escutcheon	
	Cover	
Blanking plate		
Installation manual		47103

Front cover / 1 part

E96558 	Front cover	47094
	Installation manual	47103

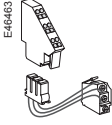
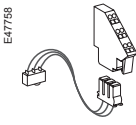
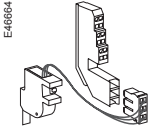
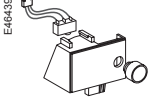
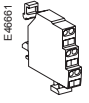
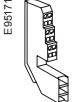
Spring charging handle / 1 part

E96559 	Spring charging handle	47092
	Installation manual	47103

Arc chute for Masterpact NT NAVY / 1 part

E96560 	Type H1/H2	3 x	47095
	Type L1	3 x	47096
	Installation manual		47103

Nota: Installation manual must be ordered separately, it is not supply with the component.

Indication contacts		
ON/OFF indication contacts (OF) / 1 part		
	Changeover contacts (6 A - 240 V)	47076
	1 low-level OF to replace 1 standard OF (4 max.)	47077
	Wiring	For drawout circuit breaker 33098
	Installation manual	47103
"Fault trip" indication contacts (SDE) / 1 part		
	1 additional SDE (5 A - 240 V)	47078
	1 additional low-level SDE	47079
	Wiring	For drawout circuit breaker 33098
	Installation manual	47103
"Ready to close" contact (1 max.) / 1 part		
		PF
	1 changeover contact (5 A - 240 V)	47080
	1 low-level changeover contact	47081
	Wiring	For drawout circuit breaker 33098
	Installation manual	47103
Electrical closing pushbutton / 1 part		
		BPFE
	1 pushbutton	47512
	Installation manual	47103
Carriage switches (connected / disconnected / test position) / 1 part		
	Changeover contacts (6A - 240 V)	
	1 connected position contact (3 max.)	33170
	1 test position contact (1 max.)	33170
	1 disconnected position contact (2 max.)	33170
	And/or low-level changeover contacts	
	1 connected position contact (3 max.)	33171
	1 test position contact (1 max.)	33171
1 disconnected position contact (2 max.)	33171	
Auxiliary terminals for chassis alone		
	3 wire terminal (1 part), terminal block (1 part)	33098
	Jumpers (10 parts)	47900
	Installation manual	47104

Nota: Installation manual must be ordered separately, it is not supply with the component.

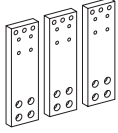
Masterpact NW NAVY Connection

Connection

Drawout circuit breakers

Front connection / Replacement kit (3 parts)

E46450

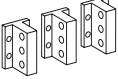


800/1600 A	Top or bottom	47960
2000/3200 A	Top or bottom	47962

Installation manual		47950
---------------------	--	-------

Rear connection (vertical or horizontal mounting) / Replacement kit (3 parts)

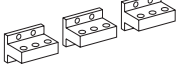
E46445



Vertical mounting

800/2000 A types N1/H1/H2	Vertical	47964
800/1600 A types H3/L1	Horizontal	47964
2500/3200 A types H1/H2	Vertical	47966
2000/3200 A types H3/L1	Horizontal	47966
4000 A	Vertical	47968
	Horizontal	47970

E46446



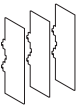
Horizontal mounting

Installation manual		47950
---------------------	--	-------

Connection accessories

Interphase barriers / Replacement kit (3 parts)

E46428



For drawout rear-connected circuit breaker		48600
--	--	-------

Installation manual		47950
---------------------	--	-------

Nota: Installation manual must be ordered separately, it is not supply with the component.

Replacement parts for Micrologic control units

Long-time rating plug (limits setting range for higher accuracy) / 1 part

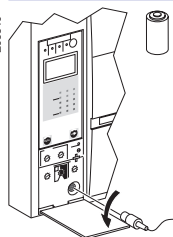
E46874



Standard	0.4 at 1 x I _r	33542
Low-setting option	0.4 at 0.8 x I _r	33543
High-setting option	0.8 at 1 x I _r	33544
Without long-time protection	off	33545

Battery + cover

E95540

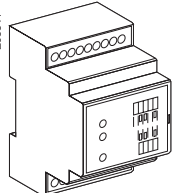


Battery (1 part)		33593
Cover (1 part)	For Micrologic A	33592
	For Micrologic P and H	47067

Communication option

Chassis

E95541

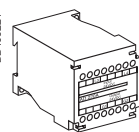


Modbus COM		33852
6 wires terminal drawout (1 part)		47850
6 wires terminal fixed (1 part)		47075

Installation manual		33088
---------------------	--	-------

External power supply module / 1 part

DB 109221



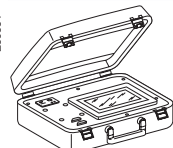
24-30 V DC	54440
48-60 V DC	54441
100-125 V DC	54442
110-130 V AC	54443
200-240 V AC	54444
380-415 V AC	54445

Battery module / 1 part

1 battery	24 V DC	54446
-----------	---------	-------

Test equipments / 1 part

E95554



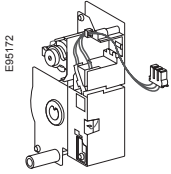
Mini test kit		33594
Portable test kit		33595
Wiring kit or mini test kit or portable test kit		33590

(*) Consult us.

Remote operation

Remote operation

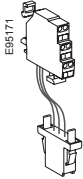
Gear motor



MCH (1 part)

AC 50/60 Hz	100-130 V	47893
	200-240 V	47894
	380-415 V	47896
	440-480 V	47897

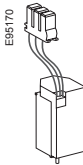
Terminal block (1 part)	For drawout circuit breaker	47849
-------------------------	-----------------------------	-------



Drawout.

Installation manual		47951
---------------------	--	-------

Closing and opening release (XF or MX)



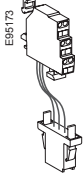
Standard coil (1 part)

AC 50/60 Hz	115 V AC	64628
	220 V AC	64629
	380-480 V AC	64630

Communicating coil (1 part)

AC 50/60 Hz	115 V AC	64633
	220 V AC	64634
	380-480 V AC	64635

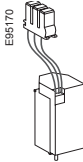
Terminal block (1 part)	For drawout circuit breaker	47849
-------------------------	-----------------------------	-------



Drawout.

Installation manual		47951
---------------------	--	-------

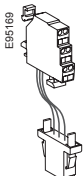
Undervoltage release MN



Undervoltage release (1 part)

AC 50/60 Hz	100-130 V AC	33670
	200-250 V AC	33671
	380-480 V AC	33673

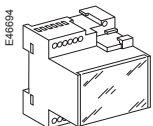
Terminal block (1 part)	For drawout circuit breaker	47849
-------------------------	-----------------------------	-------



Drawout.

Installation manual		47951
---------------------	--	-------

MN delay unit



MN delay unit (1 part)

AC 50/60 Hz	100-130 V	R (non-adjustable)	Rr (adjustable)
		33684	33681
		33685	33682
	380-480 V		33683

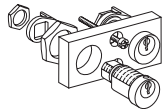
Installation manual		47951
---------------------	--	-------

Nota: Installation manual must be ordered separately, it is not supply with the component.

Chassis locking

"Disconnected" position locking / 1 part

E46451



By padlocks

Standard

By Profalux keylocks

Profalux	1 lock	48568
	1 locks + 1 lock with same key profile	48569
	2 locks (different key profiles)	48570

1 identical keylock Profalux with the same key:

key: random not identified combination	33173
key: random identified 215470 combination	33174
key: random identified 215471 combination	33175

By Ronis keylocks

Ronis	1 lock	48572
	1 lock + 1 lock with same key profile	48573
	2 locks (different key profiles)	48574

1 identical keylock Ronis with the same key :

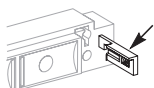
key: random not identified combination	33189
key: random identified EL24135 combination	33190
key: random identified EL24153 combination	33191
key: random identified EL24315 combination	33192

Locking kit without locks for Profalux, Ronis	48564
Kirk key adapter kit	48565
Castell key adapter kit	48566

Installation manual	47952
---------------------	-------

Racking interlock

E46453



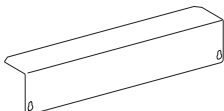
5 parts	48582
---------	-------

Installation manual	47952
---------------------	-------

Chassis accessories

Auxiliary terminal shield (CB) / 1 part

E46458

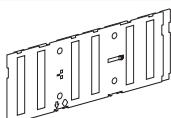


800/4000 A	3P	48595
------------	----	-------

Installation manual	47952
---------------------	-------

Safety shutters + locking block / 1 part

E46459



800/4000 A	3P	48721
------------	----	-------

Installation manual	47952
---------------------	-------

Shutter locking block (for replacement) / 1 part

E46460



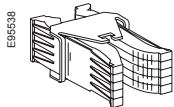
2 parts for 800/4000 A	48591
------------------------	-------

Installation manual	47952
---------------------	-------

Nota: Installation manual must be ordered separately, it is not supply with the component.

Clusters

Clusters



EA9538

1 disconnecting contact cluster for chassis (see table below) (part 1)

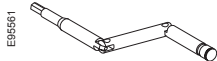
33166

Table : number of clusters required for the different chassis models

Chassis rating (A)	Masterpact NW NAVY	
	N1	H1/H2
630		
800	6	12
1000	6	12
1250	6	12
1600	12	12
2000		24
2500		24
3200		36
4000		42

Note: the minimum order is 6 parts.

Racking handle



EA9561

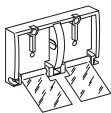
Racking handle

47944

Circuit breaker locking

Pushbutton locking device / 1 part

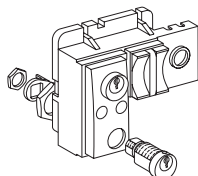
E46686



By padlocks		48536
Installation manual		47951

OFF position locking / 1 part

E46735



By padlocks		
		48539
By Profalux keylocks		
Profalux	1 lock	48545
	1 lock + 1 lock with same key profile	48546
	2 locks (different key profiles)	48547
1 identical keylock Profalux with the same key:		
	key: random not identified combination	33173
	key: random identified 215470 combination	33174
	key: random identified 215471 combination	33175
By Ronis keylocks		
Ronis	1 lock	48549
	1 lock + 1 lock with same key profile	48550
	2 locks (different key profiles)	48551
1 identical keylock Ronis with the same key :		
	key: random not identified combination	33189
	key: random identified EL24135 combination	33190
	key: random identified EL24153 combination	33191
	key: random identified EL24315 combination	33192
Locking kit without locks for	Profalux, Ronis	48541
	Kirk key adapter kit	48542
	Castell key adapter kit	48543
Installation manual		47951

Other circuit breaker accessories

Mechanical operation counter / 1 part

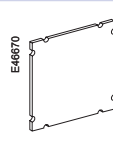
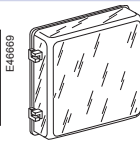
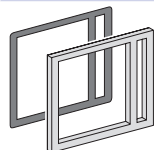
E46667



Operation counter CDM		48535
Installation manual		47951

Escutcheon and accessories / 1 part

E46688

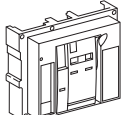


Escutcheon		48603
Transparent cover (IP 54)		48604
Escutcheon blanking plate		48605

Escutcheon	Cover	Blanking plate	Installation manual	47951
------------	-------	----------------	---------------------	-------

Front cover / 1 part

E95535



Front cover		47939
Installation manual		47951

Spring charging handle / 1 part

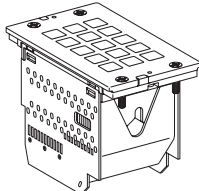
E95536



Spring charging handle		47940
Installation manual		47951

Arc chute for Masterpact NW / 1 part

E95537



Type N1	3 x	47935
Type H1/H2 (NW08 to NW40 NAVY)	3 x	47935
Installation manual		47951

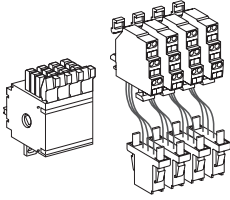
Nota: Installation manual must be ordered separately, it is not supply with the component.

Indication contacts

Indication contacts

ON/OFF indication contacts (OF) / 1 parts

E4689

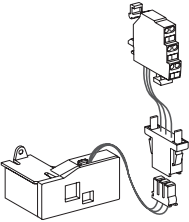


1 additional block of 4 contacts	64556
Wiring	For drawout circuit breaker 47849

Installation manual	47951
---------------------	-------

"Fault trip" indication contacts (SDE) / 1 part

E46891

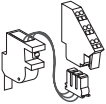


Changeover contact (SDE)	6 A - 240 V 47915
	Low-level 47916
Wiring	For drawout circuit breaker 47849

Installation manual	47951
---------------------	-------

"Ready to close" contact (1 max.) / 1 part

E46438

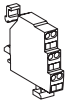


1 changeover contact (5 A - 240 V)	PF 47080
1 low-level changeover contact	47081
Wiring	For drawout circuit breaker 47849

Installation manual	47951
---------------------	-------

"Connected, disconnected, test position" indication contact (carriage switches) / 1 part

E46861



Changeover contacts	6 A - 240 V 33170
CE, CD, CT	Low-level 33171

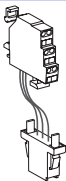
Installation manual	47952
---------------------	-------

Set of additional actuators for carriage switches / 1 set

1 set	48560
-------	-------

Combined closed / connected contacts for use with 1 auxiliary contact / 1 part

E46890

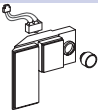


1 contact (5 A - 240 V)	48477
or 1 low-level contact	48478

Installation manual	47952
---------------------	-------

Electrical closing pushbutton / 1 part

E46877



1 pushbutton	BPFE 48534
--------------	---------------

Installation manual	47951
---------------------	-------

Auxiliary terminals for chassis alone

3 wire terminal (1 part)	47849
6 wire terminal (1 part)	47850
Jumpers (10 parts)	47900

Nota: Installation manual must be ordered separately, it is not supply with the component.

Masterpact NT or NW NAVY

Circuit breakers and switch-disconnectors

To indicate your choice, check the applicable square boxes

and enter the appropriate information in the rectangles

Circuit breaker or switch-disconnector		Quantity
Masterpact type	NT <input type="checkbox"/> NW <input type="checkbox"/>	
Rating	A	
Sensor rating	A	
Circuit breaker	N1, H1, H2, L1	
Switch-disconnector	HA	
Number of poles	3	
Brand	MG	
Type of equipment	Drawout with chassis <input type="checkbox"/>	
	Drawout without chassis (moving part only) <input type="checkbox"/>	
	Chassis alone <input type="checkbox"/>	

Micrologic control unit	
A - ammeter	2.0 <input type="checkbox"/> 5.0 <input type="checkbox"/>
P - power meter	5.0 <input type="checkbox"/>
H - harmonic meter	5.0 <input type="checkbox"/>
LR - long-time rating plug	Standard 0.4 to 1 Ir <input type="checkbox"/>
	Low setting 0.4 to 0.8 Ir <input type="checkbox"/>
	High setting 0.8 to 1 Ir <input type="checkbox"/>
	LR OFF <input type="checkbox"/>

AD - external power-supply module	V <input type="checkbox"/>
BAT - battery module	<input type="checkbox"/>
PTE - external voltage connector	<input type="checkbox"/>

Communication	
COM module	JBus/ModBus <input type="checkbox"/> Device <input type="checkbox"/> Chassis <input type="checkbox"/>

Eco COM module	ModBus (for XF or MX communicating release) <input type="checkbox"/>
----------------	--

Connection	
Horizontal	Top <input type="checkbox"/> Bottom <input type="checkbox"/>
Vertical	Top <input type="checkbox"/> Bottom <input type="checkbox"/>
Front	Top <input type="checkbox"/> Bottom <input type="checkbox"/>
Vertical-connection adapters	NT - FC drawout <input type="checkbox"/>
Cable-lug adapters	NT - FC drawout <input type="checkbox"/>
Interphase barriers	NT, NW drawout <input type="checkbox"/>
Spreaders	NT drawout <input type="checkbox"/>
Lugs for 240 ² or 300 ² cables	NT drawout <input type="checkbox"/>

Micrologic control unit functions:
 2.0 : basic protection (long time + inst.)
 5.0 : selective protection (long time + short time + inst.)

Indication contacts

OF - ON/OFF indication contacts	
Standard	4 OF 6 A-240 V AC (10 A-240 V AC and low-level for NW)
Alternate	1 OF low-level for NT Max. 4 qty <input type="checkbox"/>
Additional	1 block of 4 OF for NW Max. 1 qty <input type="checkbox"/>

EF - combined "connected/closed" contacts	
	1 EF 6 A-240 V AC for NW Max. 4 qty <input type="checkbox"/>
	1 EF low-level for NW Max. 4 qty <input type="checkbox"/>

SDE - "fault-trip" indication contact	
Standard	1 SDE 6 A-240 V AC
Additional	1 SDE 6 A-240 V AC <input type="checkbox"/> 1 SDE low level <input type="checkbox"/>

Carriage switches	
Low level	<input type="checkbox"/> 6 A-240 V AC <input type="checkbox"/>
CE - "connected" position	Max. 3 for NW/NT qty <input type="checkbox"/>
CD - "disconnected" position	Max. 3 for NW - 2 for NT qty <input type="checkbox"/>
CT - "test" position	Max. 3 for NW - 1 for NT qty <input type="checkbox"/>
AC - NW actuator for 6 CE - 3 CD - 0 CT additional carriage switches	qty <input type="checkbox"/>

Remote operation

Remote ON/OFF	MCH - gear motor V <input type="checkbox"/>
	XF - closing voltage release V <input type="checkbox"/>
	MX - opening voltage release V <input type="checkbox"/>
	PF - "ready to close" contact Low level <input type="checkbox"/>
	6 A-240 V AC <input type="checkbox"/>
	BPFE - electrical closing pushbutton <input type="checkbox"/>
	RAR - automatic reset option <input type="checkbox"/>

Remote tripping	MN - undervoltage release V <input type="checkbox"/>
	R - delay unit (non-adjustable) <input type="checkbox"/>
	Res - adjustable delay unit <input type="checkbox"/>
	2 nd MX - shunt release V <input type="checkbox"/>

Locking

VBP - ON/OFF pushbutton locking (by transparent cover + padlocks)

OFF position locking:	
VCPO - by padlocks	<input type="checkbox"/>
VSP0 - by keylocks	Keylock kit (w/o keylock) Profalux <input type="checkbox"/> Ronis <input type="checkbox"/>
	1 keylock Profalux <input type="checkbox"/> Ronis <input type="checkbox"/>
	2 identical keylocks, 1 key Profalux <input type="checkbox"/> Ronis <input type="checkbox"/>
	2 keylocks, different keys (NW) Profalux <input type="checkbox"/> Ronis <input type="checkbox"/>

Chassis locking in "disconnected" position:

VSPD - by keylocks	Keylock kit (w/o keylock) Profalux <input type="checkbox"/> Ronis <input type="checkbox"/>
	Kirk <input type="checkbox"/> Castell <input type="checkbox"/>
	1 keylock Profalux <input type="checkbox"/> Ronis <input type="checkbox"/>
	2 identical keylocks, 1 key Profalux <input type="checkbox"/> Ronis <input type="checkbox"/>
	2 keylocks, different keys Profalux <input type="checkbox"/> Ronis <input type="checkbox"/>
	Optional connected/disconnected/test position lock <input type="checkbox"/>

VPOC - racking interlock

Accessories

VO - safety shutters on chassis for NT and NW	<input checked="" type="checkbox"/>
CDM - mechanical operation counter NT, NW	<input type="checkbox"/>
CB - auxiliary terminal shield for chassis NT, NW	<input type="checkbox"/>
CDP - escutcheon NT, NW	<input type="checkbox"/>
CP - transparent cover for escutcheon NT, NW	<input type="checkbox"/>
OP - blanking plate for escutcheon NT, NW	<input type="checkbox"/>
Test kits	Mini test kit <input type="checkbox"/> Portable test kit <input type="checkbox"/>

Schneider Electric Industries SAS

35, rue Joseph Monier
CS 30323
F- 92506 Rueil Malmaison Cedex

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

As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.



This document has been printed on ecological paper

Design: Schneider Electric
Photos: Schneider Electric
Printed: Centre Impression - made in France