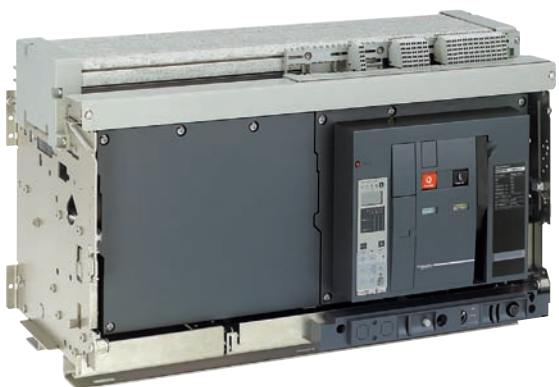


Low voltage

# Masterpact NT and NW

LV power circuit breakers  
and switch-disconnectors

Catalogue  
2009



## Masterpact NT and NW

# The standard for power circuit breakers around the world.

Over the years, other major manufacturers have tried to keep up by developing products incorporating Masterpact's most innovative features, including the breaking principle, modular design and the use of composite materials.

In addition to the traditional features of power circuit breakers (withdrawability, discrimination and low maintenance), Masterpact NT and NW ranges offer built-in communications and metering functions, all in optimised frame sizes.

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



## Two families and three frame sizes

The range of power circuit breakers includes two families:

- > Masterpact NT, the world's smallest true power circuit breaker, with ratings from 630 to 1600 A
- > Masterpact NW, in two frame sizes, one from 800 to 4000 A and the other from 4000 A to 6300 A.

## 5 performance levels

- > N1 - for standard applications with low short-circuit levels.
- > H1 - for industrial sites with high short-circuit levels or installations with two parallel-connected transformers.
- > H2 - high-performance for heavy industry where very high short-circuits can occur.
- > H3 - for incoming devices supplying critical applications requiring both high performance and a high level of discrimination.
- > L1 - for high current-limiting capability and a discrimination level (37 kA) as yet unequalled by any other circuit breaker of its type; intended for the protection of cable-type feeders or to raise the performance level of a switchboard when the transformer power rating is increased.

### Masterpact NT

630 to 1600 A



L1	150 kA	■	■	■		
H2	50 kA	■	■	■	■	■
H1	42 kA	■	■	■	■	■
		NT06	NT08	NT10	NT12	NT16

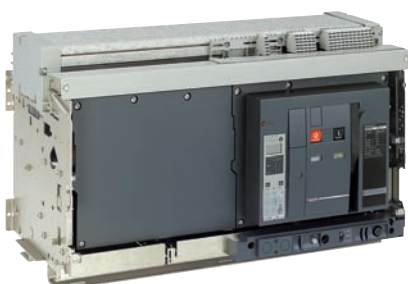
### Masterpact NW

800 to 4000 A



L1	150 kA	■	■	■	■	■		
H3	150 kA					■	■	■
H2	100 kA	■	■	■	■	■	■	■
H1	65 kA	■	■	■	■	■	■	■
N1	42 kA	■	■	■	■			
		NW08	NW10	NW12	NW16	NW20	NW25	NW32
								NW40

4000 to 6300 A



H2	150 kA	■	■	■
H1	100 kA	■	■	■
		NW40b	NW50	NW63

# Optimised volumes and ease of installation

Aiming at standardising electrical switchboards at a time when installations are increasingly complex, Masterpact provides an unequalled simplicity, both concerning choice and installation.

## The smallest circuit breaker in the world

Masterpact NT 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 draw out circuit breaker can be installed in a switchboard section 400 mm wide and 400 mm deep.

## Maximum security

The arc 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.

## Optimised volumes

Up to 4000 A, Masterpact NW circuit breakers are all the same size, the same as the old M08 to 32 range. From 4000 A to 6300 A, there is just one size.

More than

# 60

patents are used to design Masterpact

## Retrofit solutions

- > Special connections terminals are available to replace a fixed or a drawout Masterpact M08 to 32 with a Masterpact NW, without modifying the busbars or the door cut-out.
- > "Plug and Play" retrofit solution : this solution enables retrofitting of Masterpact M units with considerably reducing on-site intervention time and getting the performance of last generation device.



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.

PB100762-60A



**Circuit breakers and switch-disconnectors** page A-4

- ratings:
  - Masterpact NT 630 to 1600 A
  - Masterpact NW 800 to 6300 A
- circuit breakers type N1, H1, H2, H3, L1
- switch-disconnectors type NA, HA, HF
- 3 or 4 poles
- fixed or drawout versions
- option with neutral on the right
- protection derating.

**Micrologic control units** page A-10

**Ammeter A**

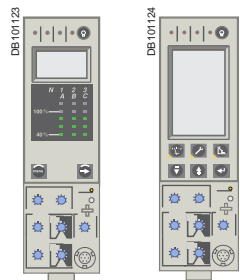
- 2.0 basic protection
- 5.0 selective protection
- 6.0 selective + earth-fault protection
- 7.0 selective + earth-leakage protection

**Power meter P**

- 5.0 selective protection
- 6.0 selective + earth-fault protection
- 7.0 selective + earth-leakage protection

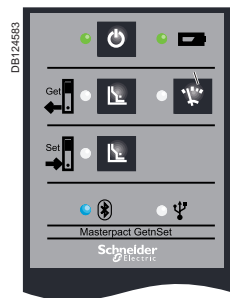
**Harmonic meter H**

- 5.0 selective protection
- 6.0 selective + earth-fault protection
- 7.0 selective + earth-leakage protection
- external sensor for earth-fault protection
- rectangular sensor for earth-leakage protection
- setting options (long-time rating plug):
  - low setting 0.4 to 0.8 x I<sub>r</sub>
  - high setting 0.8 to 1 x I<sub>r</sub>
  - without long-time protection
- external power-supply module
- battery module.



**Portable data acquisition** page A-22

- Masterpact and GetnSet



**Communication** page A-24

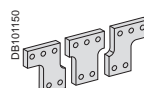
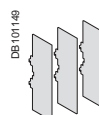
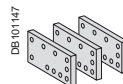
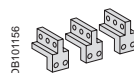
- COM option in Masterpact
- Masterpact in a communication network
- Masterpact and the Micro Power Server MPS100.

PB104347A55



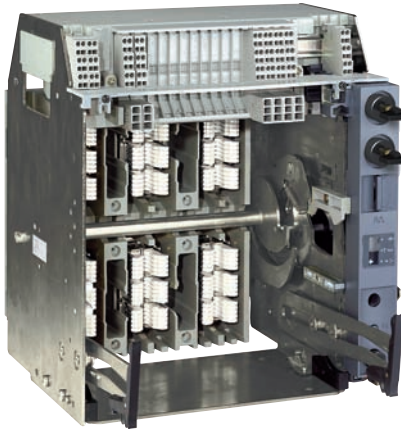
**Connections** page A-31

- 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
  - disconnectable front-connection adapter
  - safety shutters, shutter locking blocks, shutter position indication and locking.





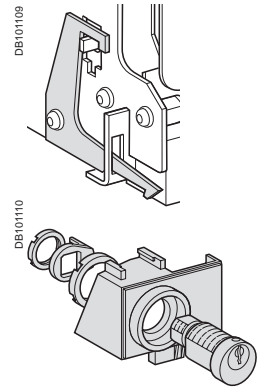
PB104348A55



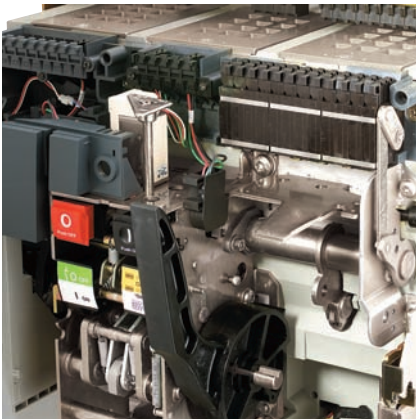
## Locking

page A-35

- 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
- door interlock (inhibits door opening with breaker in connected position)
- racking interlock (inhibits racking with door open)
- racking interlock between crank and OFF pushbutton
- automatic spring discharge before breaker removal
- mismatch protection.



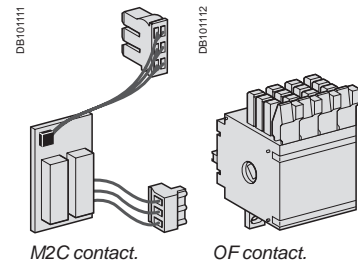
PB104353A55



## Indication contacts

page A-37

- standard or low-level contacts:
  - ON/OFF indication (OF)
  - "fault trip" indication (SDE)
  - carriage switches for connected (CE) disconnected (CD) and test (CT) positions
- programmable contacts:
  - 2 contacts (M2C)
  - 6 contacts (M6C).



M2C contact.

OF contact.

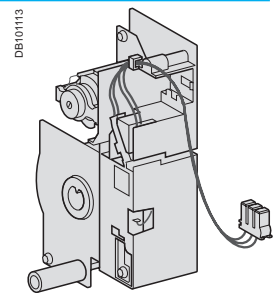
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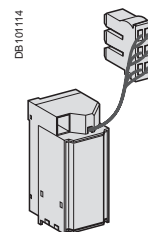
## Remote operation

page A-39

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



Gear motor.

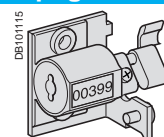


MX, XF and MN voltage releases.

## Accessories

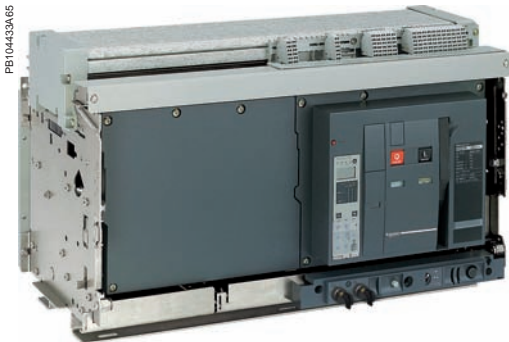
page A-43

- auxiliary terminal shield
- operation counter
- escutcheon
- transparent cover for escutcheon
- escutcheon blanking plate.



# Circuit breakers and switch-disconnectors

## NW08 to NW63



### Common characteristics

Number of poles		3/4
Rated insulation voltage (V)	<b>Ui</b>	1000/1250
Impulse withstand voltage (kV)	<b>Uimp</b>	12
Rated operational voltage (V AC 50/60 Hz)	<b>Ue</b>	690/1150
Suitability for isolation	IEC 60947-2	
Degree of pollution	IEC 60664-1	4 (1000 V) / 3 (1250 V)

### Basic circuit-breaker

#### Circuit-breaker as per IEC 60947-2

Rated current (A)		at 40 °C / 50 °C <sup>(1)</sup>
Rating of 4th pole (A)		
Sensor ratings (A)		

#### Type of circuit breaker

Ultimate breaking capacity (kA rms) V AC 50/60 Hz	<b>Icu</b>	220/415/440 V 525 V 690 V 1150 V
Rated service breaking capacity (kA rms)	<b>Ics</b>	% Icu

Utilisation category		
Rated short-time withstand current (kA rms) V AC 50/60 Hz	<b>Icw</b>	1 s 3 s

Integrated instantaneous protection (kA peak ±10 %)		
Rated making capacity (kA peak) V AC 50/60 Hz	<b>Icm</b>	220/415/440 V 525 V 690 V 1150 V

Break time (ms) between tripping order and arc extinction  
Closing time (ms)

#### Circuit-breaker as per NEMA AB1

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

### Unprotected circuit-breaker

#### Tripping by shunt trip as per IEC 60947-2

##### Type of circuit breaker

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

Overload and short-circuit protection  
External protection relay: short-circuit protection, maximum delay: 350 ms <sup>(4)</sup>

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

### Switch-disconnector 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	<b>Icm</b>	220...690 V 1150 V
Rated short-time withstand current (kA rms) AC23A/AC3 category V AC 50/60 Hz	<b>Icw</b>	1 s 3 s

### Earthing switch

Latching capacity (kA peak)		135
Rating short time withstand (kA rms)	<b>Icw</b>	1 s 60 Hz 3 s 50 Hz

### 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		<b>In (A)</b>	
C/O cycles x 1000	Electrical	without maintenance	440 V <sup>(5)</sup> 690 V 1150 V
IEC 60947-2			

#### Type of circuit breaker or switch-disconnector

Rated operational current		<b>Ie (A)</b>	<b>AC23A</b>
C/O cycles x 1000	Electrical	without maintenance	440 V <sup>(5)</sup> 690 V
IEC 60947-3			

#### Type of circuit breaker or switch-disconnector

Rated operational current		<b>Ie (A)</b>	<b>AC3 <sup>(6)</sup></b>
Motor power			380/415 V (kW) 440 V <sup>(5)</sup> (kW) 690 V (kW)
C/O cycles x 1000	Electrical	without maintenance	440/690 V <sup>(5)</sup>
IEC 60947-3 Annex M/IEC 60947-4-1			

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

<sup>(2)</sup> See the current-limiting curves in the "additional characteristics" section.

<sup>(3)</sup> Equipped with a trip unit with a making current of 90 kA peak.

<sup>(4)</sup> 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.

<sup>(5)</sup> Available for 480 V NEMA.

<sup>(6)</sup> Suitable for motor control (direct-on-line starting).

## Sensor selection

Sensor rating (A)	250 <sup>(1)</sup>	400	630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300
Ir threshold setting(A)	100 to 250	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	2000 to 5000	2500 to 6300

(1) For circuit-breaker NW02, please consult us.

NW08	NW10	NW12	NW16		NW20					NW25	NW32	NW40		NW40b	NW50	NW63
800	1000	1250	1600		2000					2500	3200	4000		4000	5000	6300
800	1000	1250	1600		2000					2500	3200	4000		4000	5000	6300
400 to 800	400 to 1000	630 to 1250	800 to 1600		1000 to 2000					1250 to 2500	1600 to 3200	2000 to 4000		2000 to 4000	2500 to 5000	3200 to 6300
N1	H1	H2	L1 <sup>(2)</sup>	H10	H1	H2	H3	L1 <sup>(2)</sup>	H10	H1	H2	H3	H10	H1	H2	
42	65	100	150	-	65	100	150	150	-	65	100	150	-	100	150	
42	65	85	130	-	65	85	130	130	-	65	85	130	-	100	130	
42	65	85	100	-	65	85	100	100	-	65	85	100	-	100	100	
-	-	-	-	50	-	-	-	-	50	-	-	-	50	-	-	
100 %					100 %					100 %				100 %		
B					B					B				B		
42	65	85	30	50	65	85	65	30	50	65	85	65	50	100	100	
22	36	50	30	50	36	75	65	30	50	65	75	65	50	100	100	
-	-	190	80	-	-	190	150	80	-	-	190	150	-	-	270	
88	143	220	330	-	143	220	330	330	-	143	220	330	-	220	330	
88	143	187	286	-	143	187	286	286	-	143	187	286	-	220	286	
88	143	187	220	-	143	187	220	220	-	143	187	220	-	220	220	
-	-	-	-	105	-	-	-	-	105	-	-	-	105	-	-	
25	25	25	10	25	25	25	25	10	25	25	25	25	25	25	25	
< 70					< 70					< 70				< 80		
42	65	100	150	-	65	100	150	150	-	65	100	150	-	100	150	
42	65	85	100	-	65	85	100	100	-	65	85	100	-	100	100	

	HA	HF <sup>(3)</sup>		HA	HF <sup>(3)</sup>		HA	HF <sup>(3)</sup>		HA	
	50	85		50	85		55	85		85	
	100 %			100 %			100 %			100 %	
	50	85		50	85		55	85		85	
	36	50		36	75		55	75		85	
	-	-		-	-		-	-		-	
	105	187		105	187		121	187		187	
NW08/NW10/NW12	NW16			NW20			NW25/NW32/NW40			NW40b/NW50/NW63	
NA	HA	HF	HA10	HA	HF	HA10	HA	HF	HA10	HA	
88	105	187	-	105	187	-	105	187	-	121	187
-	-	-	105	-	-	105	-	-	105	-	
42	50	85	50	50	85	50	50	85	50	55	85
-	36	50	50	36	50	50	36	75	50	55	75

25				20				10					
12.5				10				5					
N1/H1/H2	L1	H10		H1/H2	H3	L1	H10	H1/H2	H3	H10	H1	H2	
800/1000/1250/1600				2000				2500/3200/4000				4000b/5000/6300	
10	3	-		8	2	3	-	5	1.25	-	1.5	1.5	
10	3	-		6	2	3	-	2.5	1.25	-	1.5	1.5	
-	-	0.5		-	-	-	0.5	-	-	0.5	-	-	
H1/H2/HA/HF				H1/H2/H3/HA/HF				H1/H2/H3/HA/HF				H1/H2/HA	
800/1000/1250/1600				2000				2500/3200/4000				4000b/5000/6300	
10				8				5				1.5	
10				6				2.5				1.5	
H1/H2/HA/HF				H1/H2/H3/HA/HF									
800	1000	1250		1600				2000					
335 to 450	450 to 560	560 to 670		670 to 900				900 to 1150					
400 to 500	500 to 630	500 to 800		800 to 1000				1000 to 1300					
≤ 800	800 to 1000	1000 to 1250		1250 to 1600				1600 to 2000					

6



Micrologic A control units protect power circuits. They also offer measurements, display, communication and current maximeters. Version 6 provides earth-fault protection, version 7 provides earth-leakage protection.

### "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:

- settings
- all “ammeter” measurements
- tripping causes
- maximeter readings.

### Protection

Protection thresholds and delays are set using the adjustment dials.

#### 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.

Overload protection can be cancelled using a specific LT rating plug "Off".

#### Short-circuit protection

Short-time (rms) and instantaneous protection.

Selection of  $I^2t$  type (ON or OFF) for short-time delay.

#### Earth-fault protection

Residual or source ground return earth fault protection.

Selection of  $I^2t$  type (ON or OFF) for delay.

#### Residual earth-leakage protection (Vigi).

Operation without an external power supply.

⌚ Protected against nuisance tripping.

⚡ DC-component withstand class A up to 10 A.

#### Neutral protection

On three-pole circuit breakers, neutral protection is not possible.

On four-pole circuit breakers, neutral protection may be set using a three-position switch: neutral unprotected (4P 3d), neutral protection at 0.5  $I_r$  (4P 3d + N/2), neutral protection at  $I_r$  (4P 4d).

#### 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.

#### Overload alarm

A yellow alarm LED goes on when the current exceeds the long-time trip threshold.

#### Fault indications

LEDs indicate the type of fault:

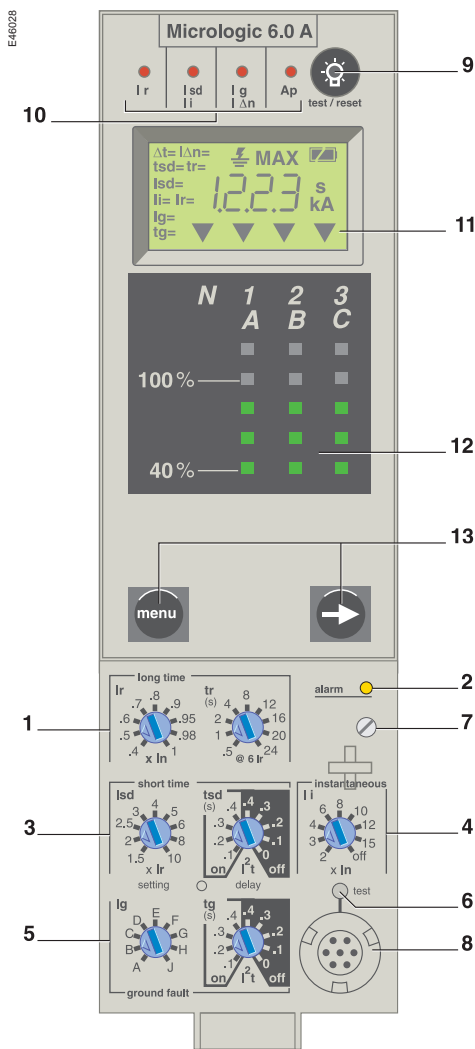
- overload (long-time protection  $I_r$ )
- short-circuit (short-time  $I_{sd}$  or instantaneous  $I_i$  protection)
- earth fault or earth leakage ( $I_g$  or  $I_{\Delta n}$ )
- internal fault ( $A_p$ ).

#### Battery power

The fault indication LEDs remain on until the test/reset button is pressed. Under normal operating conditions, the battery supplying the LEDs has a service life of approximately 10 years.

#### Test

A mini test kit or a portable test kit may be connected to the test connector on the front to check circuit-breaker operation. For Micrologic 6.0 A and 7.0 A control units, the operation of earth-fault or earth-leakage protection can be checked by pressing the test button located above the test connector.



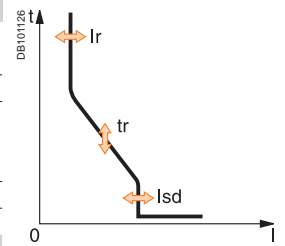
- 1 long-time threshold and tripping delay
- 2 overload alarm (LED) at 1,125  $I_r$
- 3 short-time pick-up and tripping delay
- 4 instantaneous pick-up
- 5 earth-leakage or earth-fault pick-up and tripping delay
- 6 earth-leakage or earth-fault test button
- 7 long-time rating plug screw
- 8 test connector
- 9 lamp test, reset and battery test
- 10 indication of tripping cause
- 11 digital display
- 12 three-phase bargraph and ammeter
- 13 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)		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 Ir		Other ranges or disable by changing long-time rating plug											
Time setting	<b>tr (s)</b>	0.5	1	2	4	8	12	16	20	24			
Time delay (s)	Accuracy: 0 to -30 %	1.5 x Ir	12.5	25	50	100	200	300	400	500	600		
	Accuracy: 0 to -20 %	6 x Ir	0.7 <sup>(1)</sup>	1	2	4	8	12	16	20	24		
	Accuracy: 0 to -20 %	7.2 x Ir	0.7 <sup>(2)</sup>	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6		
Thermal memory		20 minutes before and after tripping											
<b>(1) 0 to -40 % - (2) 0 to -60 %</b>													
Instantaneous													
Pick-up (A)	<b>I<sub>sd</sub> = I<sub>r</sub> x ...</b>	1.5	2	2.5	3	4	5	6	8	10			
Accuracy: ±10 %													
Time delay		Max resettable time: 20 ms Max break time: 80 ms											



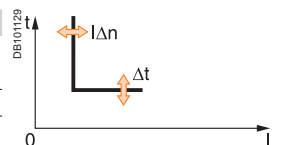
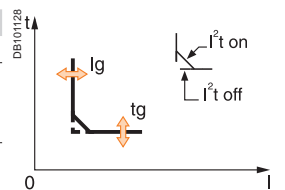
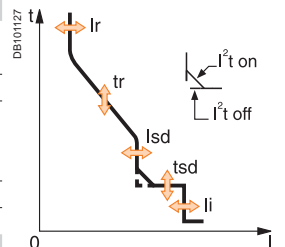
## Ammeter Micrologic 2.0 A

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



## Protection Micrologic 5.0 / 6.0 / 7.0 A

Long time		Micrologic 5.0 / 6.0 / 7.0 A											
Current setting (A)	<b>I<sub>r</sub> = I<sub>n</sub> x ...</b>	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 Ir		Other ranges or disable by changing long-time rating plug											
Time setting	<b>tr (s)</b>	0.5	1	2	4	8	12	16	20	24			
Time delay (s)	Accuracy: 0 to -30 %	1.5 x Ir	12.5	25	50	100	200	300	400	500	600		
	Accuracy: 0 to -20 %	6 x Ir	0.7 <sup>(1)</sup>	1	2	4	8	12	16	20	24		
	Accuracy: 0 to -20 %	7.2 x Ir	0.7 <sup>(2)</sup>	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6		
Thermal memory		20 minutes before and after tripping											
<b>(1) 0 to -40 % - (2) 0 to -60 %</b>													
Short time													
Pick-up (A)	<b>I<sub>sd</sub> = I<sub>r</sub> x ...</b>	1.5	2	2.5	3	4	5	6	8	10			
Accuracy: ±10 %													
Time setting tsd (s)	Settings	I <sup>2</sup> t Off	0	0.1	0.2	0.3	0.4						
		I <sup>2</sup> t On	-	0.1	0.2	0.3	0.4						
Time delay (ms) at 10 x Ir (I <sup>2</sup> t Off or I <sup>2</sup> t On)	<b>tsd (max resettable time)</b>	20	80	140	230	350							
	<b>tsd (max break time)</b>	80	140	200	320	500							
Instantaneous													
Pick-up (A)	<b>I<sub>i</sub> = I<sub>n</sub> x ...</b>	2	3	4	6	8	10	12	15	off			
Accuracy: ±10 %													
Time delay		Max resettable time: 20 ms Max break time: 50 ms											
Earth fault		Micrologic 6.0 A											
Pick-up (A)	<b>I<sub>g</sub> = I<sub>n</sub> x ...</b>	A	B	C	D	E	F	G	H	J			
Accuracy: ±10 %	I <sub>n</sub> ≤ 400 A	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1			
	400 A < I <sub>n</sub> < 1250 A	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1			
	I <sub>n</sub> ≥ 1250 A	500	640	720	800	880	960	1040	1120	1200			
Time setting tg (s)	Settings	I <sup>2</sup> t Off	0	0.1	0.2	0.3	0.4						
		I <sup>2</sup> t On	-	0.1	0.2	0.3	0.4						
Time delay (ms)	<b>tg (max resettable time)</b>	20	80	140	230	350							
at I <sub>n</sub> or 1200 A (I <sup>2</sup> t Off or I <sup>2</sup> t On)	<b>tg (max break time)</b>	80	140	200	320	500							
Residual earth leakage (Vigi)		Micrologic 7.0 A											
Sensitivity (A)	<b>I<sub>Δn</sub></b>	0.5	1	2	3	5	7	10	20	30			
Accuracy: 0 to -20 %													
Time delay Δt (ms)	Settings	60	140	230	350	800							
	<b>Δt (max resettable time)</b>	60	140	230	350	800							
	<b>Δt (max break time)</b>	140	200	320	500	1000							



## Ammeter Micrologic 5.0 / 6.0 / 7.0 A

Continuous current measurements		Micrologic 5.0 / 6.0 / 7.0 A					
Display from 20 to 200 % of In		I1	I2	I3	IN	I <sub>g</sub>	I <sub>Δn</sub>
Accuracy: 1.5 % (including sensors)		No auxiliary source (where I > 20 % In)					
Maximeters		I1 max	I2 max	I3 max	IN max	I <sub>g</sub> max	I <sub>Δn</sub> 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.

# Remote operation

## Remote ON/OFF

Two solutions are available for remote operation of Masterpact 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:** MX 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 (2nd MX or MN).

When MX 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 MX or XF releases, it is necessary to wait 1.5 seconds before issuing an order. Consequently, it is advised to use standard MX 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 MX.

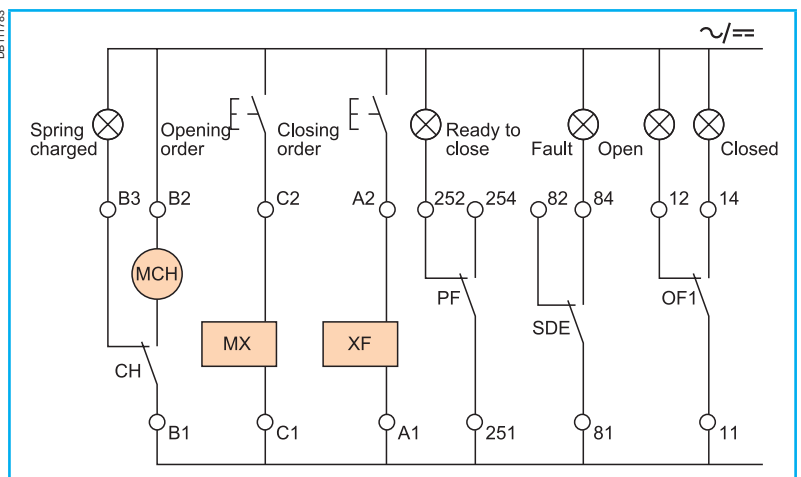
Optionally, other functions may be added:

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

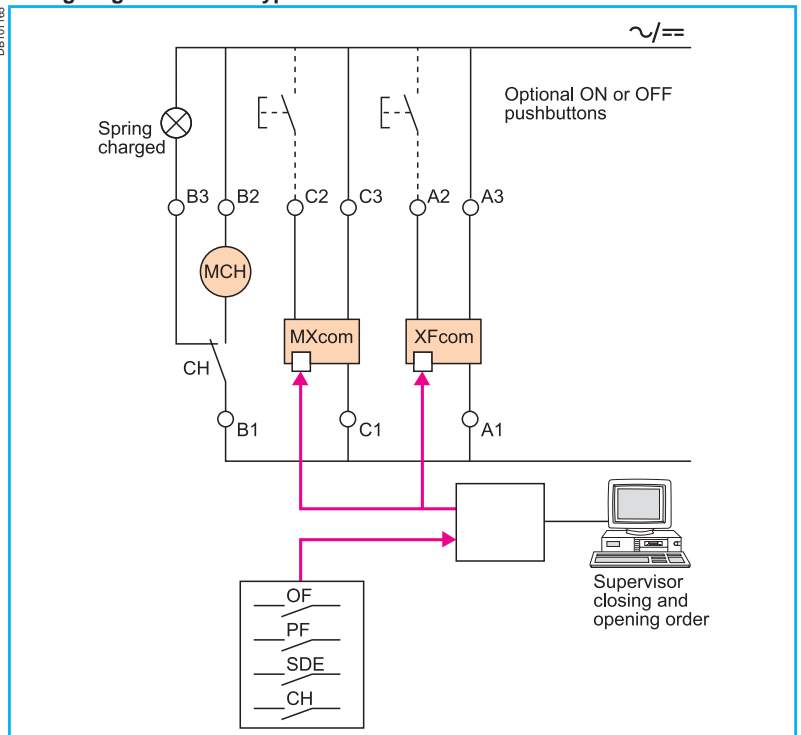
A remote-operation function is generally combined with:

- 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



PB100707-23



Electric motor MCH for Masterpact NT.

PB100808-32



Electric motor MCH for Masterpact NW.

### 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	48/60 - 100/130 - 200/240 - 277 - 380/415 - 400/440 - 480
	V DC	24/30 - 48/60 - 100/125 - 200/250
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	
	maximum 4 s for Masterpact NW	
Operating frequency	maximum 3 cycles per minute	
CH contact	10 A at 240 V	

### Voltage releases XF and MX

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.

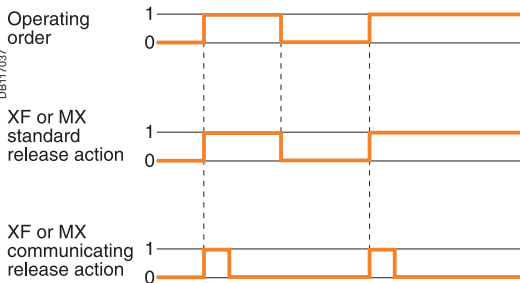
#### Opening release MX

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 MX “communicating” releases).

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

Characteristics	XF	MX
Power supply	V AC 50/60 Hz	24 - 48 - 100/130 - 200/250 - 277 - 380/480
	V DC	12 - 24/30 - 48/60 - 100/130 - 200/250
Operating threshold	0.85 to 1.1 Un	0.7 to 1.1 Un
Consumption (VA or W)	Hold: 4.5	Hold: 4.5
	Pick-up: 200 (200 ms)	Pick-up: 200 (200 ms)
Circuit-breaker response time at Un	55 ms ±10 (Masterpact NT)	50 ms ±10
	70 ms ±10 (NW ≤ 4000 A)	
	80 ms ±10 (NW > 4000 A)	

DB117037



PE100809-16



XF and MX voltage releases.

PB100818-16



“Ready to close” contacts PF.

### “Ready to close” contact PF

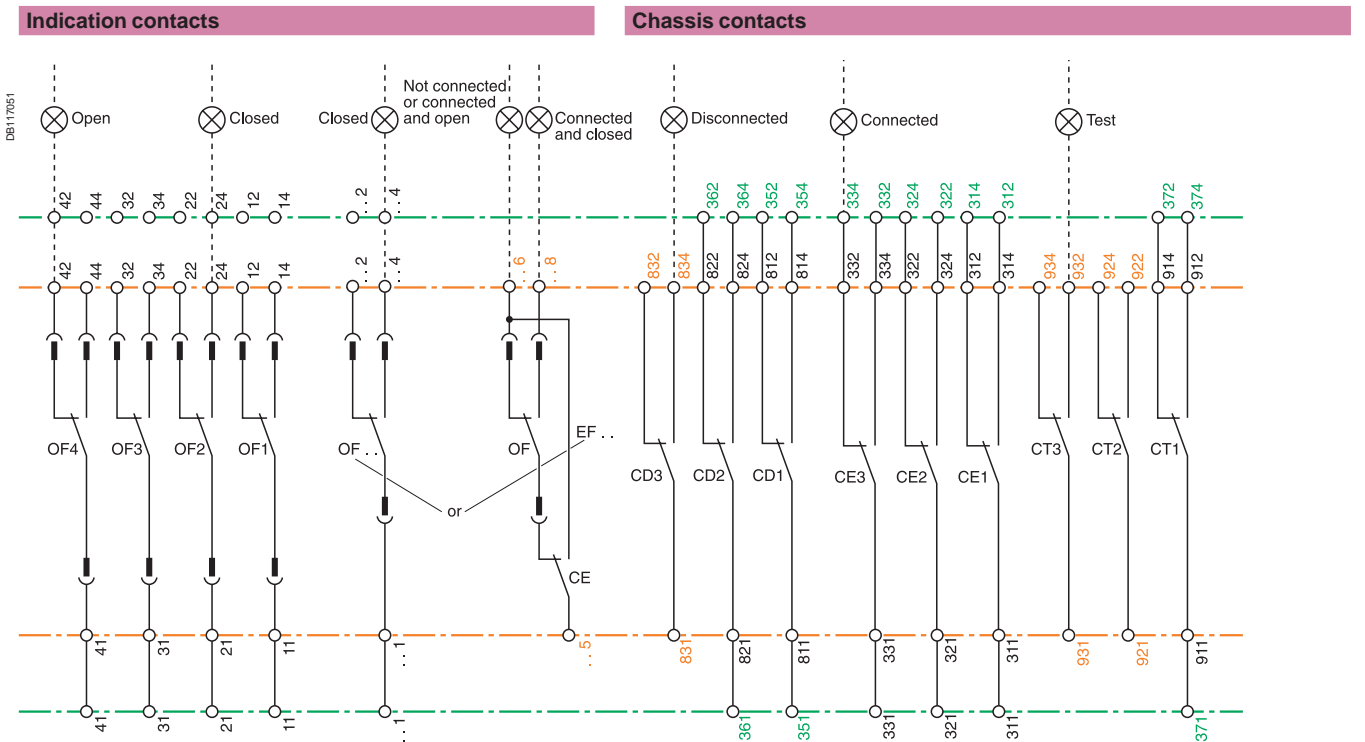
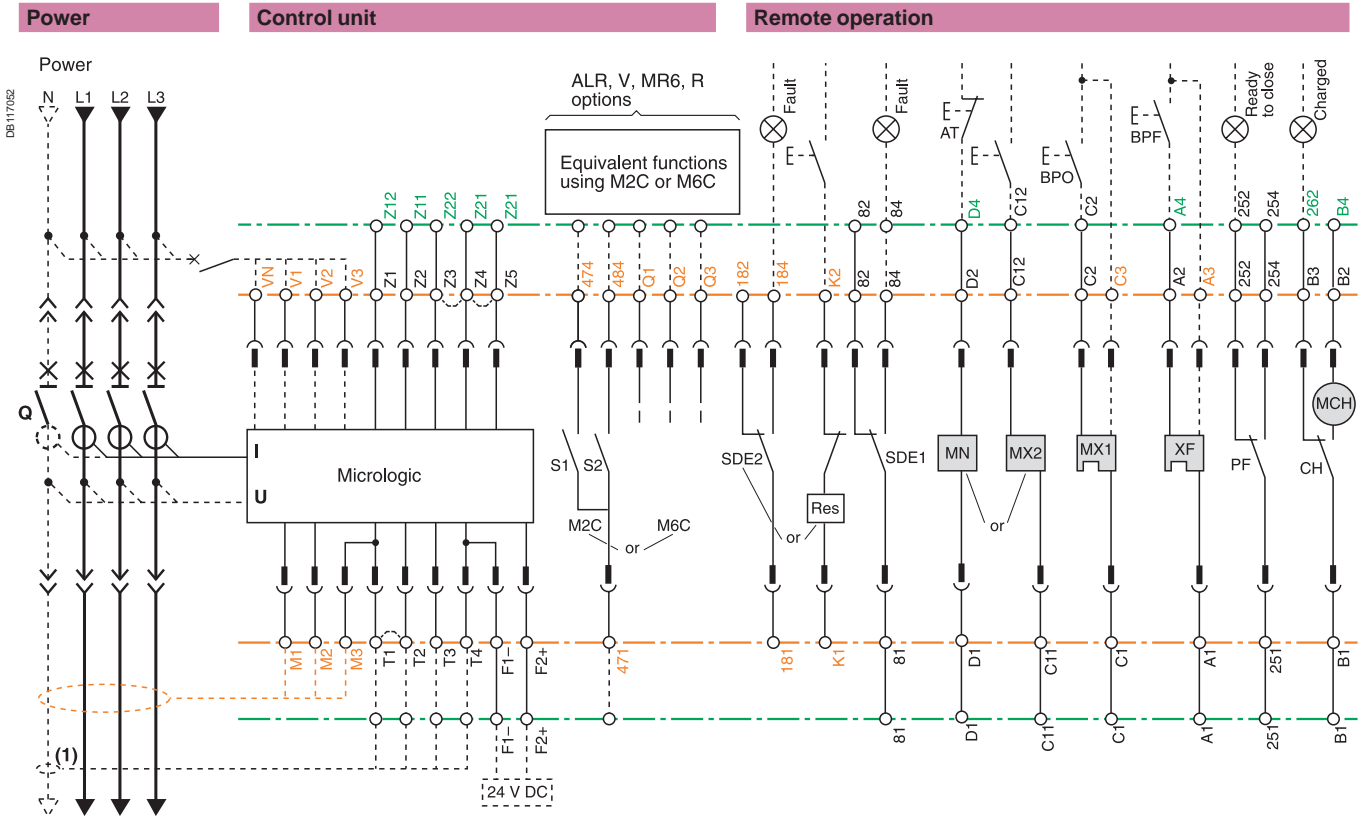
The “ready to close” position of the circuit breaker is indicated by a mechanical indicator and a PF changeover contact. This signal indicates that all the following are valid:

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

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

## Electrical diagrams

Correspondences between Masterpact NW and Masterpact M terminal blocks.



Identical to Masterpact M.

Different than Masterpact M.

New or additional functions.

(1) The current transformer for the external neutral must be replaced.



# Masterpact NT and NW

Earth-fault and earth-leakage protection  
Neutral protection  
Zone selective interlocking

## External sensor (CT) for residual earth-fault protection

### Connection of current-transformer secondary circuit for external neutral

Masterpact equipped with a Micrologic 6 A/P/H:

- shielded cable with 2 twisted pairs
  - T1 twisted with T2
  - maximum length 10 meters
  - cable cross-sectional area 0.4 to 1.5 mm<sup>2</sup>
  - recommended cable: Belden 9552 or equivalent.
- For proper wiring of neutral CT, refer to instruction Bulletin 48041-082-01 shipped with it.

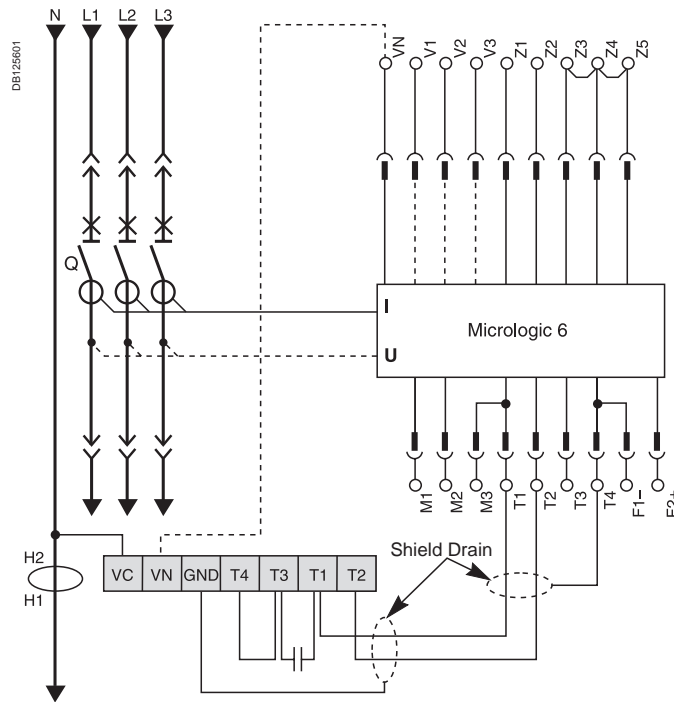
Do not remove factory-installed jumper between T1 and T2 unless neutral CT is connected.  
Do not install jumper between T3 and T4.

If supply is via the top, follow the schematics.

If supply is via the bottom, control wiring is identical; for the power wiring, H1 is connected to the source side, H2 to the load side.

For four-pole versions, for residual earth-fault protection, the current transformer for the external neutral is not necessary.

Connection for signal VN is required only for power measurements (3 Ø, 4 wires, 4CTs).



## External transformer for source ground return (SGR) earth-fault protection

### Connection of the secondary circuit

Masterpact equipped with a Micrologic 6 A/P/H:

- unshielded cable with 1 twisted pair
- maximum length 150 meters
- cable cross-sectional area 0.4 to 1.5 mm<sup>2</sup>
- terminals 5 and 6 may not be used at the same time
- use terminal 5 for NW08 to 40
- use terminal 6 for NW40b to 63
- recommended cable: Belden 9409 or equivalent.

