Low voltage

Masterpact NT and NW

LV power circuit breakers
and switch-disconnectors
Draw-out Type & Fixed Type

Catalogue
2019

Schneider Electric

Circuit breakers and switch-disconnectors
NT06 to NT16

PB106365A49

Common characteristics

Number of poles		3/4
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

Basic sweatchgear

Circuit-breaker as per IEC 60947-2

Rated current (A)	**In**	at 40 °C/50 °C (1)
Rating of 4th pole (A)		
Sensor ratings (A)		
Type of circuit breaker		
Ultimate breaking capacity (kA rms)	**Icu**	220/415 V
V AC 50/60 Hz		440 V
		525 V
		690 V
Rated service breaking capacity (kA rms)	**Ics**	% Icu
Utilisation category		
Rated short-time withstand current (kA rms)	**Icw**	0.5 s
V AC 50/60 Hz		1 s
		3 s
Integrated instantaneous protection (kA peak ±10 %)		
Rated making capacity (kA peak)	**Icm**	220/415 V
V AC 50/60 Hz		440 V
		525 V
		690 V
Break time (ms) between tripping order and arc extinction		
Closing time (ms)		

Circuit-breaker as per NEMA AB1

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

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

Type of switch-disconnector		
Rated making capacity (kA peak)	**Icm**	220 V
AC23A/AC3 category V AC 50/60 Hz		440 V
		525/690 V
Rated short-time withstand current (kA rms)	**Icw**	0.5 s
AC23A/AC3 category V AC 50/60 Hz		1 s
		3 s
Ultimate breaking capacity Icu (kA rms) with an external protection relay Maximum time delay: 350 ms		690 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)
IEC 60947-2				690 V
Type of circuit breaker or switch-disconnector				
Rated operationnal current			**Ie (A)**	**AC23A**
C/O cycles x 1000	Electrical	without maintenance		440 V (4)
IEC 60947-3				690V
Type of circuit breaker or switch-disconnector				
Rated operationnal 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)
IEC 60947-3 Annex M/IEC 60947-4-1				690 V

(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)	250 (1)	400	630	800	1000	1250	1600
Ir threshold setting(A)	100 to 250	160 to 400	250 to 630	320 to 800	400 to 1000	500 to 1250	640 to 1600

(1) For circuit-breaker NT02, please consult us.

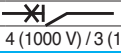
	NT06			NT08			NT10			NT12		NT16	
	630			800			1000			1250		1600	
	630			800			1000			1250		1600	
	400 to 630			400 to 800			400 to 1000			630 to 1250		800 to 1600	
	H1	**H2**	**L1** (2)							**H1**	**H2**		
	42	50	150							42	50		
	42	50	130							42	50		
	42	42	100							42	42		
	42	42	25							42	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		
	HA									**HA**			
	75									75			
	75									75			
	75									75			
	36									36			
	36									36			
	20									20			
	36									36			
	12.5												
	H1	**H2**	**L1**	**H1**	**H2**	**L1**	**H1**	**H2**	**L1**	**H1**	**H2**	**H1**	**H2**
	630			**800**			**1000**			**1250**			
	6	6	3	6	6	3	6	6	3	6	6	3	3
	3	3	2	3	3	2	3	3	2	3	3	1	1
	H1/H2/HA												
	630			**800**			**1000**			**1250**		**1600**	
	6			6			6			6		3	
	3			3			3			3		1	
	H1/H2/HA												
	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 NW63

PB106363A35

PB106362A65

Common characteristics

Number of poles		3/4
Rated insulation voltage (V)	**Ui**	1000/1250
Impulse withstand voltage (kV)	**Uimp**	12
Rated operational voltage (V AC 50/60 Hz)	**Ue**	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 (1)
Rating of 4th pole (A)		
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 1150 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 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	**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 (4)		
Rated making capacity (kA peak) V AC 50/60 Hz	**Icm**	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	**Icm**	220...690 V 1150 V
Rated short-time withstand current (kA rms) **AC23A/AC3 category** V AC 50/60 Hz	**Icw**	1 s 3 s

Earthing switch

Latching capacity (kA peak)		135
Rating short time withstand (kA rms)	**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 (5)
IEC 60947-2				690 V
				1150 V
Type of circuit breaker or switch-disconnector				
Rated operational current			**Ie (A)**	**AC23A**
C/O cycles x 1000	Electrical	without maintenance		440 V (5)
IEC 60947-3				690 V
Type of circuit breaker or switch-disconnector				
Rated operational current			**Ie (A)**	**AC3 (6)**
Motor power				380/415 V (kW)
				440 V (5) (kW)
				690 V (kW)
C/O cycles x 1000	Electrical	without maintenance		440/690 V (5)
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) Equipped with a trip unit with a making current of 90 kA peak.
(4) 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.
(5) Available for 480 V NEMA.
(6) Suitable for motor control (direct-on-line starting).
(7) The use of NW08 to NW20 H1 in IT systems is limited to 500 V network voltage.

Sensor selection

Sensor rating (A)	250 (1)	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.

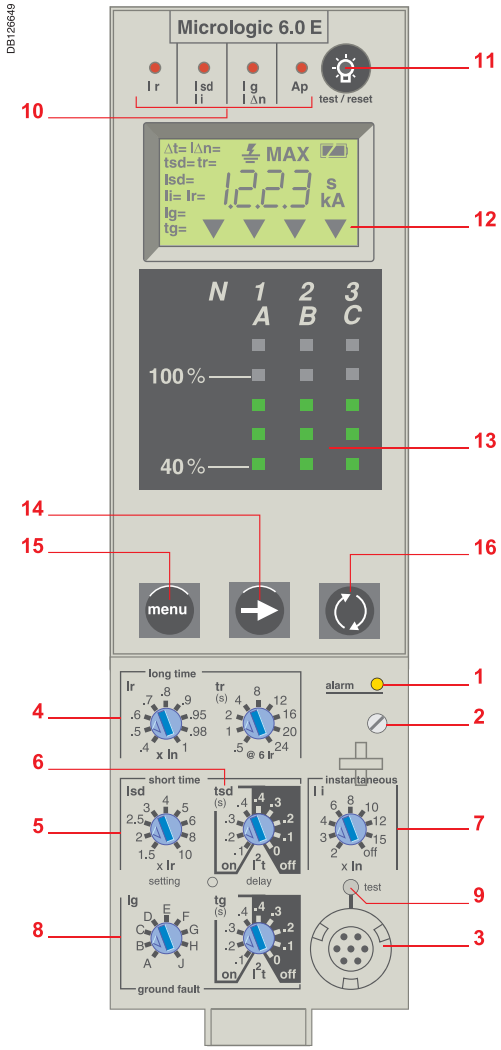
	NW08	NW10	NW12	NW16		NW20					NW25	NW32	NW40		NW40b	NW50	NW63
	800	1000	1250	1600		2000					2500	3200	4000		4000	5000	6300
	800	1000	1250	1600		2000					2500	3200	4000		4000	5000	6300
	400 to 800	400 to 1000	630 to 1250	800 to 1600		1000 to 2000					1250 to 2500	1600 to 3200	2000 to 4000		2000 to 4000	2500 to 5000	3200 to 6300
	N1	H1 (7)	H2	L1 (2)	H10	H1 (7)	H2	H3	L1 (2)	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 (3)			HA	HF (3)				HA	HF (3)			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	-	121	187	-	187
	-	-	-	105	-	-	105	-	-	105	-
	42	50	85	50	50	85	50	55	85	50	85
	-	36	50	50	36	75	50	55	75	50	85

	60 Hz												
	50 Hz												
	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/NA/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/NA/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 control units
Micrologic A “ammeter” and E “energy”

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



- 1 *overload alarm (LED) at 1.125 Ir*
- 2 *long-time rating plug screw*
- 3 *test connector*
- 4 *long-time threshold and tripping delay*
- 5 *short-time pick-up*
- 6 *short-time tripping delay*
- 7 *instantaneous pick-up*
- 8 *earth-fault pickup and tripping delay*
- 9 *earth-fault test button*
- 10 *indicator of tripping cause*
- 11 *lamp test, reset and battery test*
- 12 *digital display*
- 13 *three-phase bargraph and ammeter*
- 14 *navigation button to view menu contents*
- 15 *navigation button to change menu*
- 16 *navigation button "quick View"*

(1) Display on FDM121 only.

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

"Ammeter" measurements (Micrologic A)
"Energy meter" measurements (Micrologic E)

- True RMS current (I1, I2, I3, In, Ig): Micrologic A / Micrologic E
- current demand
- voltages: phase to phase, phase to neutral, average (1) and unbalanced (1)
- instantaneous power: P, Q, S
- power factor: PF
- power demand: P demand
- energy: Ep, Eq (1), Es (1).

Accuracy of active energy Ep is 2 % (including the sensors). No power supply needed, directly drawn power from circuit breaker’s current sensor for full operation when current is greater than 20%In. The optional external power supply (24Vdc) makes it possible to display currents <20%In.

Communication option
In conjunction with the COM communication option, the control unit transmits the following:
- settings
- all "ammeter" and "energy" measurements
- enable connection to FDM121 (***E*** only)
- tripping causes
- maximeter / minimeter 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
Source ground return earth fault protection.
Selection of I^2t type (ON or OFF) for delay.

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 0.5Ir (4P 3d+ N/2), neutral protection at Ir (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.

M2C programmable contacts
The M2C (two contacts) programmable contacts may be used to signal envents (Ir, Isd, Alarm Ir, Alarm Ig, Ig). They can be programmed using the keypad on the Micrologic E control unit or remotely using the COM option (BCM ULP).

Fault indications
LEDs indicate the type of fault:
- overload (long-time protection Ir)
- short-circuit (short-time Isd or instantaneous Ii protection)
- earth fault (Ig)
- internal fault (Ap).

Trip history (***E*** only)
The trip history displays the list of the last 10 trips. For each trip, the following indications are recorded and displayed:
- the tripping cause: Ir, Isd, Ii, Ig or Auto-protection (Ap) trips
- the date and time of the trip (requires communication option).

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 E control units, the operation of earth-fault or earth-leakage protection can be checked by pressing the test button located above the test connector.

Protection				2.0	5.0	2.0A	5.0A	6.0A	2.0E	5.0E	6.0E
Long time (Ir)				■	■	■	■	■	■	■	■
Current setting (A)	trip between 1.05 & 1.20 x Ir		Ir = 0.4~1 x In								
Time setting (s)			tr = 0.5~24								
Time delay (s)	accuracy: 0 to -30% , 1.5 x Ir		12.5~600								
	accuracy: 0 to -20% , 6 x Ir		0.7~24								
	accuracy: 0 to -20% , 7.2 x Ir		0.7~16.6								
Thermal memory	20 minutes before and after tripping										
Instantaneous (Isd)				■		■			■		
Pick-up (A)	accuracy: ±10%		Isd = 1.5~10 x Ir								
Time delay (s)	max. resettable time: 20ms										
	max. break time: 80ms										
Short time (Isd)					■		■	■		■	■
Pick-up (A)	accuracy: ±10%		Isd = 1.5~10 x Ir								
Time setting tsd (s)			I^2t Off: 0~0.4								
			I^2t On: 0.1~0.4								
Time delay (ms) at 10 x Ir	max. resettable time		tsd: 20~350								
(I^2t off or I^2t on)	max. break time		tsd: 80~500								
Instantaneous (Ii)					■		■	■		■	■
Pick-up (A)	accuracy: ±10%		Ii = 2~15 x In or off								
Time delay (s)	max. resettable time: 20ms										
	max. break time: 50ms										
Earth fault (Ig)								■			■
Pick-up (A)	Ig =	In<400A	0.3~1 x In								
(accuracy: ±10%)		400A<In<1250A	0.2~1 x In								
		In≥1250A	500~1200A								
Time setting tg (s)			I^2t Off: 0~0.4								
			I^2t On: 0.1~0.4								
Time delay (ms)	max. resettable time		tg: 20~350								
at In or 1200A (I^2t off or I^2t on)	max. break time		tg: 80~500								

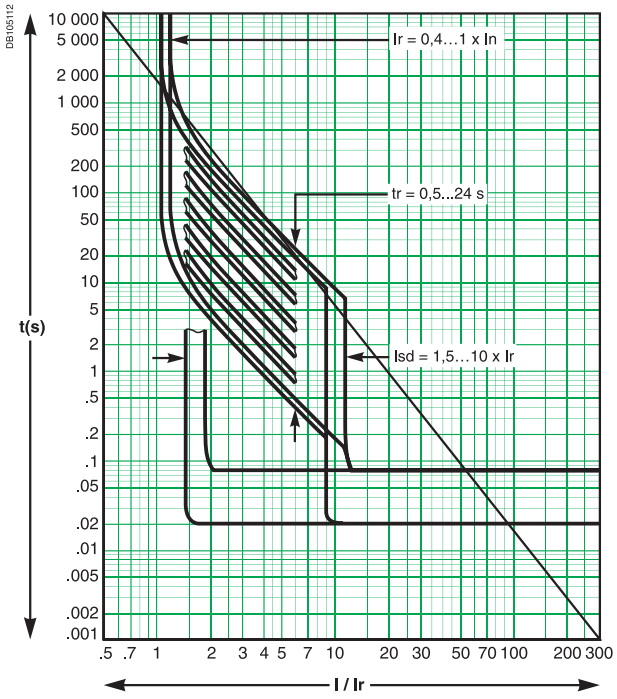
Ammeter & Energy	type	range	accuracy	2.0	5.0	2.0A	5.0A	6.0A	2.0E	5.0E	6.0E
Instantaneous current	I1, I2, I3, IN	0.2~1.2 x In	±1.5%			■	■	■	■	■	■
	Ig	0.2~1 x In	±10%					■			
		0.05~1 x In	±10%								■
Current maximeters	I1, I2, I3, IN	0.2~1.2 x In	±1.5%			■	■	■	■	■	■
Demand currents	I1, I2, I3, Ig	0.2~1 x In	±1.5%						■	■	■
Voltages	VL-L & VL-N	100~690V	±0.5%						■	■	■
Active power	P	30~2000kW	±2%						■	■	■
Power factor	PF	0~1	±2%						■	■	■
Demand power	P demand	30~2000kW	±2%						■	■	■
Active energy	Ep	-10^{10}~10^{10}GWh	±2%						■	■	■

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

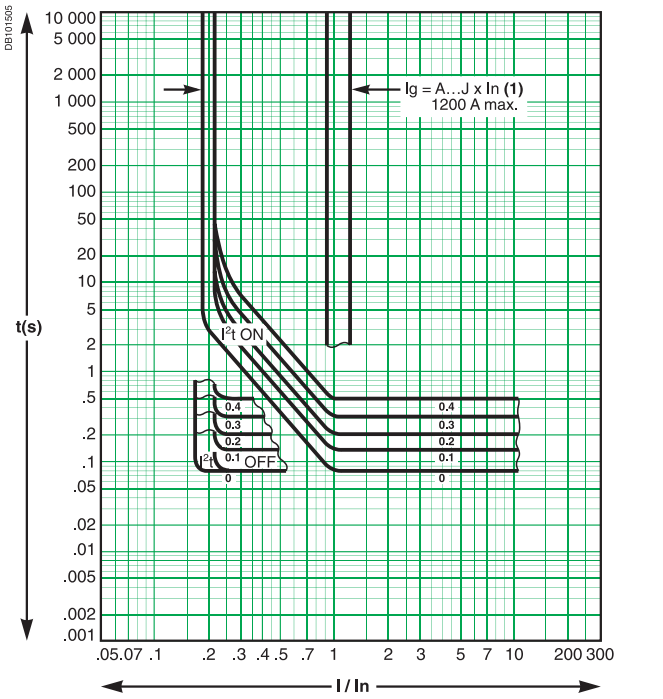
★for 5.0P, 6.0P and other Micrologic control units please contact us for more information.

Tripping curves

Micrologic 2.0



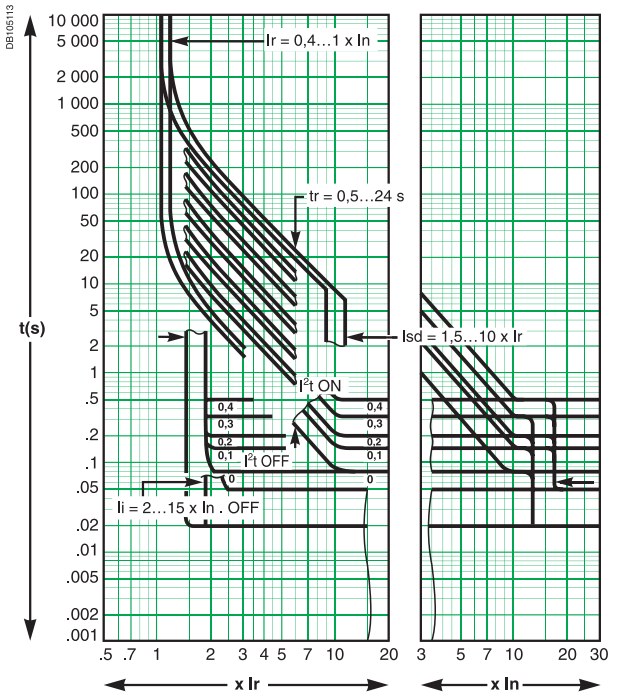
Earth fault protection (Micrologic 6.0)

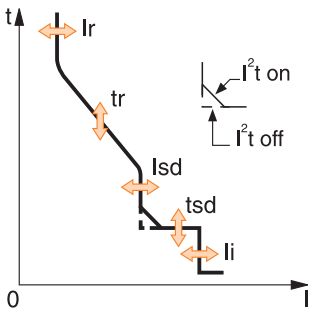


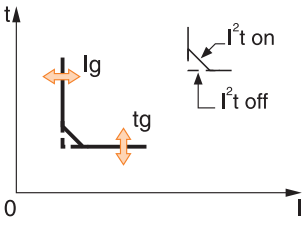
(1)

Ig = In x...	A	B	C	D	E	F	G	H	I
In < 400 A	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
400 A ≤ In ≤ 1250 A	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
In > 1250 A	500	640	720	800	880	960	1040	1120	1200

Micrologic 5.0, 6.0, 7.0







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