

Introduction

Characteristics and performance of Compact NSX circuit breakers from 100 to 630 A



Compact NSX100/160/250.



Compact NSX400/630.

Common characteristics

Rated voltages		
Insulation voltage (V)	Ui	800
Impulse withstand voltage (kV)	Uimp	8
Operational voltage (V)	Ue	AC 50/60 Hz 690
Suitability for isolation	IEC/EN 60947-2	yes
Utilisation category		A
Pollution degree	IEC 60664-1	3

Circuit breakers

Breaking capacity levels

Electrical characteristics as per IEC 60947-2

Rated current (A)	In	40 °C
Number of poles		

Breaking capacity (kA rms)

Icu	AC 50/60 Hz	220/240 V 380/415 V 440 V 500 V 525 V 660/690 V
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Service breaking capacity (kA rms)

Ics	AC 50/60 Hz	220/240 V 380/415 V 440 V 500 V 525 V 660/690 V
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Durability (C-O cycles)	Mechanical	
	Electrical	440 V In/2 690 V In/2
		In

Characteristics as per Nema AB1

Breaking capacity (kA rms)	AC 50/60 Hz	240 V 480 V 600 V
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Characteristics as per UL 508

Breaking capacity (kA rms)	AC 50/60 Hz	240 V 480 V 600 V
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Protection and measurements

Short-circuit protection	Magnetic only
Overload / short-circuit protection	Thermal magnetic
	Electronic
	with neutral protection (Off-0.5-1-OSN) ⁽¹⁾
	with ground-fault protection
	with zone selective interlocking (ZSI) ⁽²⁾
Display / I, U, f, P, E, THD measurements / interrupted-current measurement	
Options	Power Meter display on door
	Operating assistance
	Counters
	Histories and alarms
	Metering Com
	Device status/control Com
Earth-leakage protection	By Vigi module
	By Vigirex relay

Installation / connections

Dimensions and weights

Dimensions (mm)	Fixed, front connections	2/3P
W x H x D		4P
Weight (kg)	Fixed, front connections	2/3P 4P

Connections

Connection terminals	Pitch	With/without spreaders
Large Cu or Al cables	Cross-section	mm ²

⁽¹⁾ OSN: Over Sized Neutral protection for neutrals carrying high currents (e.g. 3rd harmonics).

⁽²⁾ ZSI: Zone Selective Interlocking using pilot wires.

⁽³⁾ 2P circuit breaker in 3P case for B and F types, only with thermal-magnetic trip unit.

Protection of distribution systems

Micrologic 2 and 1.3-M trip units

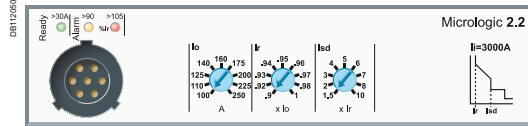
Micrologic 2 trip units can be used on Compact NSX100 to 630 circuit breakers with performance levels B/F/H/N/S/L.

They provide:

- standard protection of distribution cables
- indication of:
 - overloads (via LEDs)
 - overload tripping (via the SDx relay module).

Circuit breakers equipped with Micrologic 1.3-M trip units, without thermal protection, are used in certain applications to replace switch-disconnectors at the head of switchboards. Micrologic 1.3-M trip units are dedicated to Compact NSX400/630 A circuit breakers.

Micrologic 2



Circuit breakers equipped with Micrologic 2 trip units can be used to protect distribution systems supplied by transformers. For generators and long cables, Micrologic 2-G trip units offer better suited low pick-up solutions (see page A-50).

Protection

Settings are made using the adjustment dials with fine adjustment possibilities.

Overloads: Long time protection (Ir)

Inverse time protection against overloads with an adjustable current pick-up Ir set using a dial and a non-adjustable time delay tr.

Short-circuits: Short-time protection with fixed time delay (Isd)

Protection with an adjustable pick-up Isd. Tripping takes place after a very short delay used to allow discrimination with the downstream device.

Short-circuits: Non-adjustable instantaneous protection

Instantaneous short-circuit protection with a fixed pick-up.

Neutral protection

- On 3-pole circuit breakers, neutral protection is not possible.
- On four-pole circuit breakers, neutral protection may be set using a three-position switch:
 - 4P 3D: neutral unprotected
 - 4P 3D + N/2: neutral protection at half the value of the phase pick-up, i.e. $0.5 \times I_r$
 - 4P 4D: neutral fully protected at I_r .



Indications

Front indications

- Green "Ready" LED: flashes slowly when the circuit breaker is ready to trip in the event of a fault.
- Orange overload pre-alarm LED: steady on when $I > 90 \% I_r$
- Red overload LED: steady on when $I > 105 \% I_r$

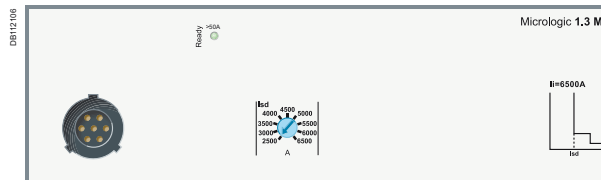


Remote indications

An overload trip signal can be remoted by installing an SDx relay module inside the circuit breaker.

This module receives the signal from the Micrologic electronic trip unit via an optical link and makes it available on the terminal block. The signal is cleared when the circuit breaker is reclosed. For description, see page A-81.

Micrologic 1.3-M for magnetic protection only



Micrologic 1.3-M trip units provide magnetic protection only, using electronic technology. They are dedicated to 400/630 A 3-pole (3P 3D) circuit breakers or 4-pole circuit breakers with detection on 3 poles (4P, 3D) and are used in certain applications to replace switch-disconnectors at the head of switchboards. They are especially used in 3-pole versions for motor protection, see page A-40.

PR10337



SDx remote indication relay module with its terminal block.

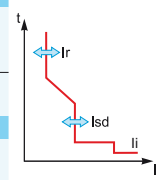
Note: all the trip units have a transparent lead-sealable cover that protects access to the adjustment dials.

Ratings (A)		In at 40 °C ⁽¹⁾	40	100	160	250	400	630
Circuit breaker	Compact NSX100		■	■	-	-	-	-
	Compact NSX160		■	■	-	-	-	-
	Compact NSX250		■	■	■	■	-	-
	Compact NSX400		-	-	-	■	■	-
	Compact NSX630		-	-	-	■	■	■

L Long-time protection		lo	value depending on trip unit rating (In) and setting on dial								
Pick-up (A) tripping between 1.05 and 1.20 Ir	In = 40 A	lo =	18	18	20	23	25	28	32	36	40
	In = 100 A	lo =	40	45	50	55	63	70	80	90	100
	In = 160 A	lo =	63	70	80	90	100	110	125	150	160
	In = 250 A (NSX250)	lo =	100	110	125	140	160	175	200	225	250
	In = 250 A (NSX400)	lo =	70	100	125	140	160	175	200	225	250
	In = 400 A	lo =	160	180	200	230	250	280	320	360	400
	In = 630 A	lo =	250	280	320	350	400	450	500	570	630
	Ir = lo x ...		9 fine adjustment settings from 0.9 to 1 (0.9 - 0.92 - 0.93 - 0.94 - 0.95 - 0.96 - 0.97 - 0.98 - 1) for each value of lo								
Time delay (s) accuracy 0 to -20%	tr		non-adjustable								
		1.5 x Ir	400								
		6 x Ir	16								
		7.2 x Ir	11								
Thermal memory		20 minutes before and after tripping									

S ₀ Short-time protection with fixed time delay		Isd = Ir x ...	1.5	2	3	4	5	6	7	8	10
Pick-up (A) accuracy ±10 %											
Time delay (ms)	tsd	non-adjustable									
	Non-tripping time	20									
	Maximum break time	80									

I Instantaneous protection		li non-adjustable	600	1500	2400	3000	4800	6900
Pick-up (A) accuracy ±15 %								
	Non-tripping time	10 ms						
	Maximum break time	50 ms for I > 1.5 li						



⁽¹⁾ If the trip units are used in high-temperature environments, the Micrologic setting must take into account the thermal limitations of the circuit breaker. See the temperature derating table.

Ratings (A)		In at 65 °C	320	500
Circuit breaker	Compact NSX400		■	-
	Compact NSX630		■	■

S Short time protection		Isd	adjustable directly in amps	
Pick-up (A) accuracy ±15 %			9 settings: 1600, 1920, 2440, 2560, 2880, 3200, 3520, 3840, 4160 A	
			9 settings: 2500, 3000, 3500, 4000, 4500, 5000, 5500, 6000, 6500 A	
Time delay (ms)	tsd	non-adjustable		
	Non-tripping time	20		
	Maximum break time	60		

I Instantaneous protection		li non-adjustable	4800	6500
Pick-up (A) accuracy ±15 %				
	Non-tripping time	0		
	Maximum break time	30 ms		

