

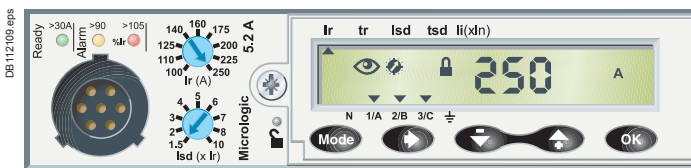
Protection of distribution systems

Micrologic 5 / 6 A or E trip units

Micrologic 5 / 6 A (Ammeter) or E (Energy) trip units can be used on Compact NSX100 to 630 circuit breakers with performance levels B/F/H/N/S/L. They all have a display unit.

They offer basic LSI protection (Micrologic 5) or LSI and ground-fault protection G (Micrologic 6).

They also offer measurement, alarm and communication functions.



Protection

Settings can be adjusted in two ways, using the dials and/or the keypad. The keypad can be used to make fine adjustments in 1 A steps below the maximum value defined by the setting on the dial. Access to setting modifications via the keypad is protected by a locking function displayed on the screen and controlled by a microswitch. The lock is activated automatically if the keypad is not used for 5 minutes. Access to the microswitch is protected by a transparent lead-sealable cover. With the cover closed, it is still possible to display the various settings and measurements using the keypad.

Overloads: Long time protection (Ir)

Inverse time protection against overloads with an adjustable current pick-up **Ir** set using a dial or the keypad for fine adjustments. The time delay **tr** is set using the keypad.

Short-circuits: Short-time protection (I_{sd})

Short-circuit protection with an adjustable pick-up **I_{sd}** and adjustable time delay **tsd**, with the possibility of including a portion of an inverse time curve (I^2t On).

Short-circuits: Instantaneous protection (Ii)

Instantaneous protection with adjustable pick-up **Ii**.

Additional ground fault protection (Ig) on Micrologic 6

Residual type ground-fault protection with an adjustable pick-up **Ig** (with Off position) and adjustable time delay **tg**. Possibility of including a portion of an inverse time curve (I^2t On).

Neutral protection

■ On 4-pole circuit breakers, this protection can be set via the keypad:

- Off: neutral unprotected
- 0.5: neutral protection at half the value of the phase pick-up, i.e. $0.5 \times I_r$
- 1.0: neutral fully protected at **Ir**
- OSN: Oversized neutral protection at 1.6 times the value of the phase pick-up.

Used when there is a high level of 3rd order harmonics (or orders that are multiples of 3) that accumulate in the neutral and create a high current. In this case, the device must be limited to $I_r = 0.63 \times I_n$ for the maximum neutral protection setting of $1.6 \times I_r$.

■ With 3-pole circuit breakers, the neutral can be protected by installing an external neutral sensor with the output (T1, T2) connected to the trip unit.

Zone selective interlocking (ZSI)

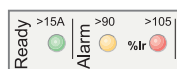
A ZSI terminal block may be used to interconnect a number of Micrologic control units to provide zone selective interlocking for short-time (**I_{sd}**) and ground-fault (**Ig**) protection, without a time delay. For Compact NSX 100 to 250, the ZSI function is available only in relation to the upstream circuit breaker (ZSI out).

Display of type of fault

On a fault trip, the type of fault (**Ir**, **I_{sd}**, **Ii**, **Ig**), the phase concerned and the interrupted current are displayed. An external power supply is required.

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 $I > 105 \% I_r$.

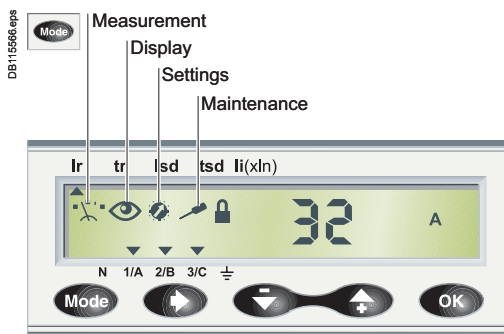
Remote indications

An SDx relay module installed inside the circuit breaker can be used to remote the following information:

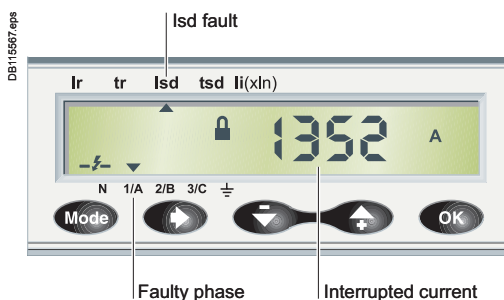
- overload trip
- overload prealarm (Micrologic 5) or ground fault trip (Micrologic 6).

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 closed.

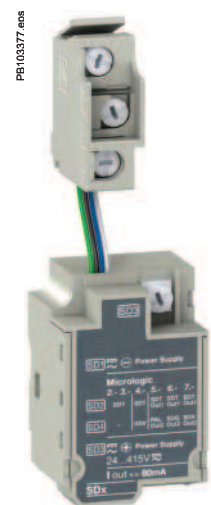
These outputs can be reprogrammed to be assigned to other types of tripping or alarm. The module is described in detail in the section dealing with accessories.



Trip unit menus.



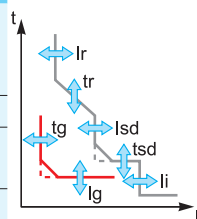
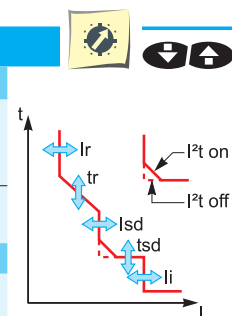
Display of interrupted current.



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.

Protection		Micrologic 5 / 6 A or E trip units										
Ratings (A)	In at 50 °C ⁽¹⁾	40 ⁽²⁾	100	160	250	400	630					
Circuit breaker	Compact NSX100	■	■	-	-	-	-					
	Compact NSX160	■	■	■	-	-	-					
	Compact NSX250	■	■	■	■	-	-					
	Compact NSX400	-	-	-	-	■	-					
	Compact NSX630	-	-	-	-	■	■					
L Long-time protection												
Pick-up (A)	Ir = ...	dial setting	value depending on trip unit rating (In) and setting on dial									
tripping between 1.05 and 1.20 Ir	In = 40 A	Io =	18	18	20	23	25	28	32	36	40	
	In = 100 A	Io =	40	45	50	55	63	70	80	90	100	
	In = 160 A	Io =	63	70	80	90	100	110	125	150	160	
	In = 250 A	Io =	100	110	125	140	160	175	200	225	250	
	In = 400 A	Io =	160	180	200	230	250	280	320	360	400	
	In = 630 A	Io =	250	280	320	350	400	450	500	570	630	
		keypad setting	Fine adjustment in 1 A steps below maximum value set on dial									
Time delay (s)	tr = ...	keypad setting	0.5	1	2	4	8	16				
		1.5 x Ir	15	25	50	100	200	400				
		6 x Ir	0.5	1	2	4	8	16				
		7.2 x Ir	0.35	0.7	1.4	2.8	5.5	11				
Thermal memory		20 minutes before and after tripping										
S Short-time protection with adjustable time delay												
Pick-up (A)	Isd = Ir x ...	dial setting	1.5	2	3	4	5	6	7	8	10	
accuracy ±10 %		for Micrologic 5	Fine adjustment in 0.5 x Ir steps using the keypad									
		keypad settings for micrologic 6	Adjustment in steps of 0.5 x In over the range 1.5 x In to: 15 x In (40 to 160 A), 12 x In (250 to 400 A) or 11 x In (630 A)									
Time delay (s)	tsd = ...	keypad setting	I²Off	0	0.1	0.2	0.3	0.4				
		setting	I²On	-	0.1	0.2	0.3	0.4				
	Non-tripping time (ms)		20	80	140	230	350					
	Maximum break time (ms)		80	140	200	320	500					
I Instantaneous protection												
Pick-up (A)	Ii = In x	keypad setting	Adjustment in steps of 0.5 x In over the range 1.5 x In to: 15 x In (40 to 160 A), 12 x In (250 to 400 A) or 11 x In (630 A)									
accuracy ±15 %	Non-tripping time		10 ms									
	Maximum break time		50 ms for I > Ii									
G Ground-fault protection - for Micrologic 6 A or E												
Pick-up (A)	Ig = In x	dial setting										
accuracy ±10 %	In = 40 A		0.4	0.4	0.5	0.6	0.7	0.8	0.9	1	Off	
	In > 40 A		0.2	0.3	0.4	0.5	0.6	0.7	0.8	1	Off	
			Fine adjustment in 0.05 A steps using the keypad									
Time delay (s)	tg = ...	keypad setting	I²Off	0	0.1	0.2	0.3	0.4				
		setting	I²On	-	0.1	0.2	0.3	0.4				
	Non-tripping time (ms)		20	80	140	230	350					
	Maximum break time (ms)		80	140	200	320	500					
Test	Ig function	built-in										



- (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.
- (2) For 40 A rating, the neutral N/2 adjustment is not possible.