



NB310L Residual Current Operated Circuit Breaker with over-current protection (Magnetic)

1. General

1.1 Function

Personnel and fire protection: Cable and line protection against overload and short-circuits.

1.2 Selection

Rated residual operating current

$I_{\Delta n}$ = 30mA, 300mA: additional protection in the case of direct contact.

Tripping class

A and AC class

A class tripping is ensured for sinusoidal, alternating residual currents as well as for pulsed DC residual currents, whether they be quickly or slowly increase.

AC class tripping is ensured for sinusoidal, alternating residual currents, whether they be quickly or slowly increase.

Tripping curve

B curve ($I_1 = 1.13I_n$; $I_2 = 1.45I_n$; $I_4 = 3I_n$; $I_5 = 5I_n$) protection and control of the circuits against overloads and short-circuits; protection for people and big length cables in TN and IT systems.

C curve ($I_1 = 1.13I_n$; $I_2 = 1.45I_n$; $I_4 = 5I_n$; $I_5 = 10I_n$) protection and control of the circuits against overloads and short-circuits; protection for resistive and inductive loads with low inrush current.

BK curve ($I_1 = 1.05I_n$; $I_2 = 1.3I_n$; $I_4 = 3I_n$; $I_5 = 5I_n$) protection and control of the circuits against overloads and short-circuits;

protection for people and big length cables in TN and IT systems.

CK curve ($I_1 = 1.05I_n$; $I_2 = 1.3I_n$; $I_4 = 5I_n$; $I_5 = 10I_n$) protection and control of the circuit against overloads and short-circuits; protection for resistive and inductive loads with low inrush current.

1.3 Approvals and certificates

CE/CB/KEMA

1.4 Add-on devices

XF9 auxiliary contacts

S9 shunt release

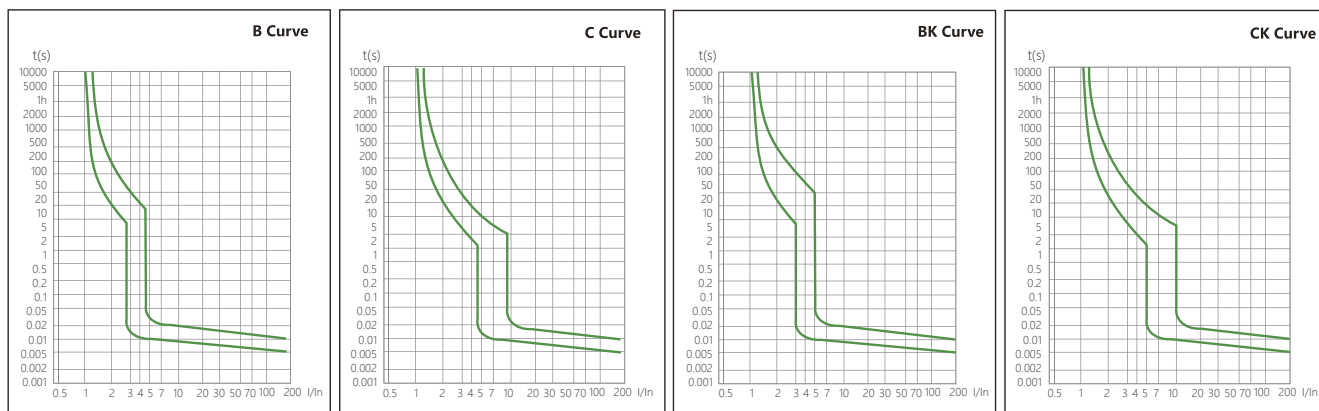
V9 under voltage release

OVT-1 over voltage release



2. Technical data

2.1 Curves



2.2

	Standard		IEC/EN 61009-1			
Electrical features	Type (wave form of the earth leakage sensed)		A			A,AC
	Thermo-magnetic release characteristic		B,C		BK,CK	B,C
	Rated current I _n	A	6, 10, 13, 16	20, 25, 32	10,13,15	6, 10, 13, 16, 20, 25, 32, 40
	Poles		2P			3P+N
	Rated voltage U _e	V	110/230/240			230/400
	Rated sensitivity I Δ n	A	0.03			0.03,0.3
	Rated residual making and breaking capacity I Δ m	A	3,000			
	Rated short-circuit capacity I _{cn}	A	6,000 , 10,000	6,000	10,000	6,000
	Break time under I Δ n	s	≤0.1			
	Rated frequency	Hz	50/60			
	Rated impulse withstand voltage (1.2/50)U _{imp}	V	4,000			4,000
	Dielectric TEST voltage at ind. Freq. for 1min	kV	2			
	Insulation voltage U _i	V	500			
	Pollution degree		2			
Mechanical features	Electrical life		2,000			
	Mechanical life		20,000			10,000
	Contact position indicator		Yes			
	Protection degree		IP20			
	Ambient temperature (with daily average≤35℃)	℃	-25...+40			
	Storage temperature	℃	-25...+70			
Installation	Terminal connection type		Cable/U-type busbar/Pin-type busbar			
	Terminal size top/bottom for cable	mm ² AWG	25 18-3			
	Terminal size top/bottom for busbar	mm ² AWG	10 18-8			
	Tightening torque	N·m In-lbs.	2 18			
	Mounting		On DIN rail EN 60715 (35mm) by means of fast clip device			
	Connection		From top or bottom			

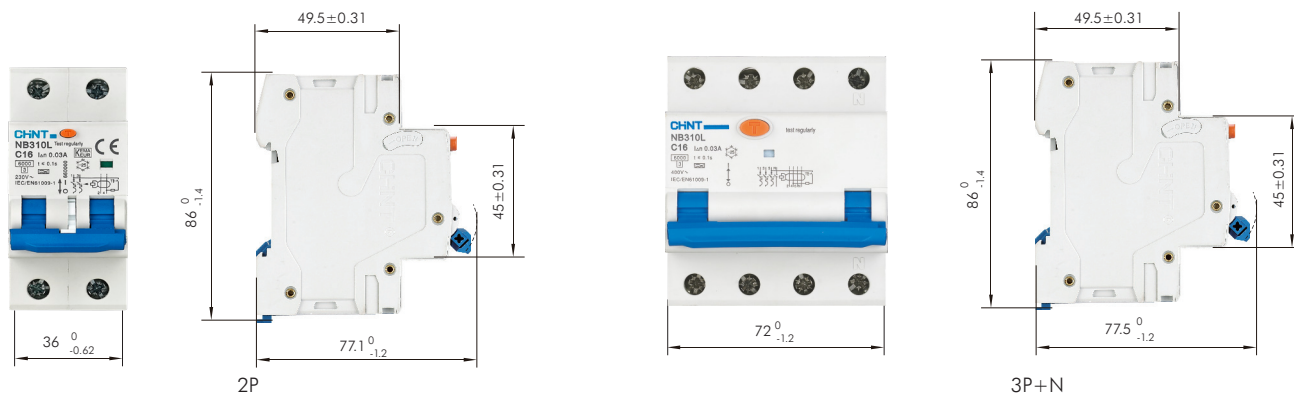
2.3 Temperature derating

The maximum permissible current in a circuit breaker depends on the ambient temperature where the circuit breaker is placed. Ambient temperature is the temperature inside the enclosure or switchboard in which the circuit breakers are installed.

The reference temperature is 30°C

Temperature	-25°C	-20°C	-10°C	0°C	10°C	20	30°C	40°C	50°C	60°C	70°C
Temperature compensation coefficient of rated current	1.27	1.25	1.20	1.15	1.10	1.05	1.00	0.95	0.90	0.85	0.80

3. Overall and mounting dimensions (mm)



NB310L	2P	B	6	30mA	Type A	10kA
↓	↓	↓	↓	↓	↓	↓
Frame	Poles	Curve	Current(In)	Rated sensitivity (IΔn)	Leakage type	Leakage type
NB310L	2P 3P+N	B BK C CK	6A~40A	30mA 300mA	A AC	6kA 10kA

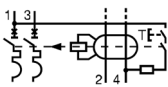
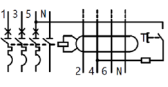
Diagram	Curve	Poles	In(A)	Icu(kA)	Ue(V)	IΔn(mA)	Leakage type	Description	Code
	B	2P	6	10	AC230/240	30	A	NB310L 2P B6 30mA A 10kA	329958
	B	2P	6	6	AC110	30	A	NB310L 2P B6 30mA A 6kA 110V	296986
	B	2P	6	6	AC230/240	30	A	NB310L 2P B6 30mA A 6kA	660033
	B	2P	10	10	AC230/240	30	A	NB310L 2P B10 30mA A 10kA	329956
	B	2P	10	6	AC110	30	A	NB310L 2P B10 30mA A 6kA 110V	296987
	B	2P	10	6	AC230/240	30	A	NB310L 2P B10 30mA A 6kA	660003
	B	2P	13	10	AC230/240	30	A	NB310L 2P B13 30mA A 10kA	329957
	B	2P	13	6	AC110	30	A	NB310L 2P B13 30mA A 6kA 110V	296988
	B	2P	13	6	AC230/240	30	A	NB310L 2P B13 30mA A 6kA	660005
	B	2P	16	10	AC230/240	30	A	NB310L 2P B16 30mA A 10kA	329955
	B	2P	16	6	AC110	30	A	NB310L 2P B16 30mA A 6kA 110V	296989
	B	2P	16	6	AC230/240	30	A	NB310L 2P B16 30mA A 6kA	660002
	B	2P	20	6	AC110	30	A	NB310L 2P B20 30mA A 6kA 110V	296990
	B	2P	20	6	AC230/240	30	A	NB310L 2P B20 30mA A 6kA	660009
	B	2P	25	6	AC110	30	A	NB310L 2P B25 30mA A 6kA 110V	296991
	B	2P	25	6	AC230/240	30	A	NB310L 2P B25 30mA A 6kA	660008
	B	2P	32	6	AC110	30	A	NB310L 2P B32 30mA A 6kA 110V	296992
	B	2P	32	6	AC230/240	30	A	NB310L 2P B32 30mA A 6kA	660032
	B	3P+N	10	6	AC400	30	AC	NB310L/3N 3P+N B10 30mA AC 6kA	660041
	B	3P+N	10	6	AC400	30	A	NB310L/3N 3P+N B10 30mA A 6kA	660034
	B	3P+N	10	6	AC400	300	AC	NB310L/3N 3P+N B10 300mA AC 6kA	255676
	B	3P+N	10	6	AC400	300	A	NB310L/3N 3P+N B10 300mA A 6kA	255661
	B	3P+N	13	6	AC400	30	AC	NB310L/3N 3P+N B13 30mA AC 6kA	660042
	B	3P+N	13	6	AC400	30	A	NB310L/3N 3P+N B13 30mA A 6kA	660035
	B	3P+N	13	6	AC400	300	AC	NB310L/3N 3P+N B13 300mA AC 6kA	255677
	B	3P+N	13	6	AC400	300	A	NB310L/3N 3P+N B13 300mA A 6kA	255662
	B	3P+N	16	6	AC400	30	AC	NB310L/3N 3P+N B16 30mA AC 6kA	660043
	B	3P+N	16	6	AC400	30	A	NB310L/3N 3P+N B16 30mA A 6kA	660036
	B	3P+N	16	6	AC400	300	AC	NB310L/3N 3P+N B16 300mA AC 6kA	255678
	B	3P+N	16	6	AC400	300	A	NB310L/3N 3P+N B16 300mA A 6kA	255663
	B	3P+N	20	6	AC400	30	AC	NB310L/3N 3P+N B20 30mA AC 6kA	660044
	B	3P+N	20	6	AC400	30	A	NB310L/3N 3P+N B20 30mA A 6kA	660037
	B	3P+N	20	6	AC400	300	AC	NB310L/3N 3P+N B20 300mA AC 6kA	255679
	B	3P+N	20	6	AC400	300	A	NB310L/3N 3P+N B20 300mA A 6kA	255664
	B	3P+N	25	6	AC400	30	AC	NB310L/3N 3P+N B25 30mA AC 6kA	660045
	B	3P+N	25	6	AC400	30	A	NB310L/3N 3P+N B25 30mA A 6kA	660038

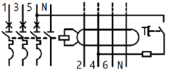
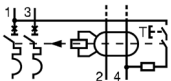
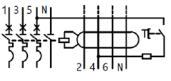
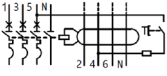
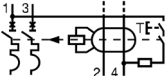
Diagram	Curve	Poles	In(A)	Icu(kA)	Ue(V)	IΔn(mA)	Leakage type	Description	Code
	B	3P+N	25	6	AC400	300	AC	NB310L/3N 3P+N B25 300mA AC 6kA	255680
	B	3P+N	25	6	AC400	300	A	NB310L/3N 3P+N B25 300mA A 6kA	255665
	B	3P+N	32	6	AC400	30	AC	NB310L/3N 3P+N B32 30mA AC 6kA	660046
	B	3P+N	32	6	AC400	30	A	NB310L/3N 3P+N B32 30mA A 6kA	660039
	B	3P+N	32	6	AC400	300	AC	NB310L/3N 3P+N B32 300mA AC 6kA	255681
	B	3P+N	32	6	AC400	300	A	NB310L/3N 3P+N B32 300mA A 6kA	255666
	B	3P+N	40	6	AC400	30	AC	NB310L/3N 3P+N B40 30mA AC 6kA	660047
	B	3P+N	40	6	AC400	30	A	NB310L/3N 3P+N B40 30mA A 6kA	660040
	B	3P+N	40	6	AC400	300	AC	NB310L/3N 3P+N B40 300mA AC 6kA	255682
	B	3P+N	40	6	AC400	300	A	NB310L/3N 3P+N B40 300mA A 6kA	255667
	BK	2P	10	10	AC230/240	30	A	NB310L 2P BK10 30mA A 10kA	329950
	BK	2P	13	10	AC230/240	30	A	NB310L 2P BK13 30mA A 10kA	329949
	BK	2P	15	10	AC230/240	30	A	NB310L 2P BK15 30mA A 10kA	329951
	C	2P	6	10	AC230/240	30	A	NB310L 2P C6 30mA A 10kA	329948
	C	2P	6	6	AC110	30	A	NB310L 2P C6 30mA A 6kA 110V	296993
	C	2P	6	6	AC230/240	30	A	NB310L 2P C6 30mA A 6kA	660031
	C	2P	10	10	AC230/240	30	A	NB310L 2P C10 30mA A 10kA	329946
	C	2P	10	6	AC110	30	A	NB310L 2P C10 30mA A 6kA 110V	296994
	C	2P	10	6	AC230/240	30	A	NB310L 2P C10 30mA A 6kA	660001
	C	2P	13	10	AC230/240	30	A	NB310L 2P C13 30mA A 10kA	329947
	C	2P	13	6	AC110	30	A	NB310L 2P C13 30mA A 6kA 110V	296995
	C	2P	13	6	AC230/240	30	A	NB310L 2P C13 30mA A 6kA	660004
	C	2P	16	10	AC230/240	30	A	NB310L 2P C16 30mA A 10kA	329945
	C	2P	16	6	AC110	30	A	NB310L 2P C16 30mA A 6kA 110V	296996
	C	2P	16	6	AC230/240	30	A	NB310L 2P C16 30mA A 6kA	660000
	C	2P	20	6	AC110	30	A	NB310L 2P C20 30mA A 6kA 110V	296997
	C	2P	20	6	AC230/240	30	A	NB310L 2P C20 30mA A 6kA	660007
	C	2P	25	6	AC110	30	A	NB310L 2P C25 30mA A 6kA 110V	296998
	C	2P	25	6	AC230/240	30	A	NB310L 2P C25 30mA A 6kA	660006
	C	2P	32	6	AC110	30	A	NB310L 2P C32 30mA A 6kA 110V	297144
	C	2P	32	6	AC230/240	30	A	NB310L 2P C32 30mA A 6kA	660030
	C	3P+N	6	6	AC400	30	AC	NB310L/3N 3P+N C6 30mA AC 6kA	660018
	C	3P+N	6	6	AC400	30	A	NB310L/3N 3P+N C6 30mA A 6kA	660010
	C	3P+N	6	6	AC400	300	AC	NB310L/3N 3P+N C06 300mA AC 6kA	255683
	C	3P+N	6	6	AC400	300	A	NB310L/3N 3P+N C06 300mA A 6kA	255668
	C	3P+N	10	6	AC400	30	AC	NB310L/3N 3P+N C10 30mA AC 6kA	660019
	C	3P+N	10	6	AC400	30	A	NB310L/3N 3P+N C10 30mA A 6kA	660011
	C	3P+N	10	6	AC400	300	AC	NB310L/3N 3P+N C10 300mA AC 6kA	255684
	C	3P+N	10	6	AC400	300	A	NB310L/3N 3P+N C10 300mA A 6kA	255669
	C	3P+N	13	6	AC400	30	AC	NB310L/3N 3P+N C13 30mA AC 6kA	660020
	C	3P+N	13	6	AC400	30	A	NB310L/3N 3P+N C13 30mA A 6kA	660012
	C	3P+N	13	6	AC400	300	AC	NB310L/3N 3P+N C13 300mA AC 6kA	255685
	C	3P+N	13	6	AC400	300	A	NB310L/3N 3P+N C13 300mA A 6kA	255670

Diagram	Curve	Poles	In(A)	Icu(kA)	Ue(V)	IΔn(mA)	Leakage type	Description	Code
	C	3P+N	16	6	AC400	30	AC	NB310L/3N 3P+N C16 30mA AC 6kA	660021
	C	3P+N	16	6	AC400	30	A	NB310L/3N 3P+N C16 30mA A 6kA	660013
	C	3P+N	16	6	AC400	300	AC	NB310L/3N 3P+N C16 300mA AC 6kA	255686
	C	3P+N	16	6	AC400	300	A	NB310L/3N 3P+N C16 300mA A 6kA	255671
	C	3P+N	20	6	AC400	30	AC	NB310L/3N 3P+N C20 30mA AC 6kA	660022
	C	3P+N	20	6	AC400	30	A	NB310L/3N 3P+N C20 30mA A 6kA	660014
	C	3P+N	20	6	AC400	300	AC	NB310L/3N 3P+N C20 300mA AC 6kA	255687
	C	3P+N	20	6	AC400	300	A	NB310L/3N 3P+N C20 300mA A 6kA	255672
	C	3P+N	25	6	AC400	30	AC	NB310L/3N 3P+N C25 30mA AC 6kA	660023
	C	3P+N	25	6	AC400	30	A	NB310L/3N 3P+N C25 30mA A 6kA	660015
	C	3P+N	25	6	AC400	300	AC	NB310L/3N 3P+N C25 300mA AC 6kA	255688
	C	3P+N	25	6	AC400	300	A	NB310L/3N 3P+N C25 300mA A 6kA	255673
	C	3P+N	32	6	AC400	30	AC	NB310L/3N 3P+N C32 30mA AC 6kA	660024
	C	3P+N	32	6	AC400	30	A	NB310L/3N 3P+N C32 30mA A 6kA	660016
	C	3P+N	32	6	AC400	300	AC	NB310L/3N 3P+N C32 300mA AC 6kA	255689
	C	3P+N	32	6	AC400	300	A	NB310L/3N 3P+N C32 300mA A 6kA	255674
	C	3P+N	40	6	AC400	30	AC	NB310L/3N 3P+N C40 30mA AC 6kA	660025
	C	3P+N	40	6	AC400	30	A	NB310L/3N 3P+N C40 30mA A 6kA	660017
	C	3P+N	40	6	AC400	300	AC	NB310L/3N 3P+N C40 300mA AC 6kA	255690
	C	3P+N	40	6	AC400	300	A	NB310L/3N 3P+N C40 300mA A 6kA	255675
	CK	2P	10	10	AC230/240	30	A	NB310L 2P CK10 30mA A 10kA	329952
	CK	2P	10	6	AC230/240	30	A	NB310L 2P K10 30mA A 6kA	660029
	CK	2P	13	10	AC230/240	30	A	NB310L 2P CK13 30mA A 10kA	329953
	CK	2P	13	6	AC230/240	30	A	NB310L 2P K13 30mA A 6kA	660028
	CK	2P	15	10	AC230/240	30	A	NB310L 2P CK15 30mA A 10kA	329954
	CK	2P	15	6	AC230/240	30	A	NB310L 2P K15 30mA A 6kA	660027
	CK	2P	20	6	AC230/240	30	A	NB310L 2P K20 30mA A 6kA	660026