

Product Information

Type : MCB 1 to 4 poles NCxxxE
 Reference : NCxxxE

General Characteristics

Protection against overloads and short circuits, switch control and isolation.
 In commercial and industrial electrical distribution systems.

Curve : C (see Appendix 1)
 Pôles : 1P, 2P, 3P
 Current rating : 0,5 to 63 A
 Voltage rating : 230V to 240V / 400V to 415V and +10%

Breaking capacity (Icn) 60898 :

Number of poles	Voltage (V)	Breaking capacity (A)
1P	230 to 240	10 000
2P, 3P	230 to 240	10 000
	400 to 415	10 000

Breaking capacity (Ics) 60898 : 7 500A

Breaking capacity (Icu) 60947-2 :

Number of poles	Voltage (V)	Breaking capacity (kA)
1P	230 to 240	10kA
	400 to 415	3kA (1)
2P, 3P	230 to 240	20kA
	400 to 415	10kA

(1) Breaking capacity on 1 pole for IT system

Breaking capacity (Ics) 60947-2 : 75% of Icu

Frequency : 50 – 60 Hz
 Rating insulation voltage (Ui) : 500 V according to EN60898-1
 Rated impulse voltage (Uimp) : 4 kV
 Electrical endurance : 10 000 cycles (O-C) up 25A to In according to EN60898
 4 000 cycles (O-C) up 63A to In according to EN60898
 Mechanical endurance : 20 000 cycle without load
 IP rating : IP2x of terminals IP40 of enclosure

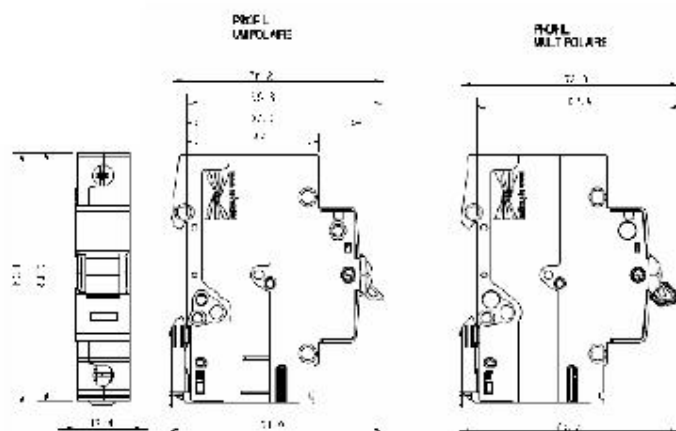
Temperature :	Calibration temperature : 30°C according to IEC / EN 60898 Working temperature : - 25°C to + 60 °C Storage temperature : - 25°C to + 80 °C										
Temperature derating :	MCBs are designed and calibrated to carry their rated current and to operate within their designated thermal time/current zone at 30 °C. Testing is carried out with the breaker mounted singly in a vertical plane in a controlled environment. Therefore if the circuit breaker is required to operate in conditions which differ from the reference conditions, certain factors have to be applied to the standard data. For instance if the circuit breaker is required to operate at higher ambient temperature than 30 °C it will require progressively less current to trip within the designated time/current zone.										
Temperature Correction factor :	You will find in <i>Appendix 1</i> the correction values considering the ambient temperature										
Grouping factor :	Rated current reduced by factor K Consideration should also be given to the proximity heating effect of the breakers themselves when fully loaded and mounted together in groups. There is a certain amount of watts loss from each breaker depending on the trip rating which may well elevate the ambient air temperature of the breaker above the ambient air temperature of the enclosure <table> <tr> <th>No. of units n</th><th>K (grouping factor)</th></tr> <tr> <td>n = 1</td><td>1</td></tr> <tr> <td>2 ≤ n < 4</td><td>0,95</td></tr> <tr> <td>4 ≤ n < 6</td><td>0,9</td></tr> <tr> <td>6 ≤ n</td><td>0,85</td></tr> </table> Note : If the design current of a circuit (Ib) is less than 0,85 times the nominal setting of the circuit breaker (In) grouping can be ignored.	No. of units n	K (grouping factor)	n = 1	1	2 ≤ n < 4	0,95	4 ≤ n < 6	0,9	6 ≤ n	0,85
No. of units n	K (grouping factor)										
n = 1	1										
2 ≤ n < 4	0,95										
4 ≤ n < 6	0,9										
6 ≤ n	0,85										
Pollute degree :	3										
Dielectric strength :	2,5kV according to EN 60898										
Case material :	Thermoplastic (Polyamide) Compliance with IEC 695-2-1										
Glow-wire test :	960°C for case according to IEC 60695-2-1 650°C for toggle according to IEC 60695-2-1										
Tropicalisation :	All climates, treatment 2 (relative humidity = 95% at 55°C)										

Dimensional characteristics

Dimensions

Poles	Lg (Nb. Modules)*
1P	1
2P	2
3P	3

* Width of 1 Mod 17,6 ±0,1



Weight & packaging

No. of pole	1P	2P	3P	
Weight (g)	118	237	354	
Number of products per box	x12	x6	x4	

Each product is packaged on a plastic film

Marking

On the shoulder :



On the face :

Installation

Mounting :	Din rail EN 50.022-35
Supply :	Feed either top or bottom
Connection capacity :	Rigid conductor : 25 mm ² Flexible conductor : 16 mm ² On a bottom, there is a bi-connect terminal
Tightening torque :	2,5 Nm nominal with Screw head pozidrive size 2 and slot 6 mm 3,15 Nm maximal with Screw head pozidrive size 2 and slot 6 mm
Type of cable :	Copper
Sealable :	The locking kit (MZN 175) allows locking MCB in the "OFF" and "ON" position. The locking kit is sealable. The MCB can be lock in the "OFF" and "ON" position with max.Ø 1,5mm leading wire
Installation altitude :	2 000 meters max
Working position :	Product performances not affected if installed vertically, horizontally or flat
Din clip type :	Metal Din clip with 2 positions
Auxiliaries :	Yes

Options

Auxiliaries :

Earth leakage add-on blocks :	please see the catalogue
Auxiliary contacts :	MZ 201
Auxiliary contact	
+ alarm indication :	MZ 202
Shunt trip :	MZ 203
Under voltage release :	MZ 205 (48 VAC) MZ 206 (230 VAC)
Remote control :	KF 900

Accessories :

Locking kit :	MZN 175
Locking wire :	MZN 176
Fork Busbar :	KDN xxx
Connectors :	KF xxx

Standards

Complies with : EN 60898 and IEC 60898

Approval laboratory	Logo	Countries
INMETRO		Brasil

Power loss :

The power loss of MCB's is closely controlled by the standards and is calculated on the basis of the voltage drop across the main terminals measured at rated current.
 The table below gives the watts loss per pole at rated current.

MCB rated current (A)	0.5A	1A	2A	4A	6A	10A	16A	20A	25A	32A	40A	50A	63A
Watts loss per pole (W)	-	1.3	1.5	1.8	1.4	1.9	3	2.8	3.2	3.8	4.5	5.1	6.4

Operation in DC current

Because of their quick make and break design and excellent arc quenching capabilities Hager circuit breakers are suitable for DC applications.

The following parameters must be considered :

Max voltage per pole : 48V (15kA)

Network voltage : determined by the number of poles connected in series.

Short circuit current : determined the breaking capacity in relation to the network voltage and the number of poles connected in series.

No. of poles in series	Breaking capacity (kA) L/R= 15 ms		
	≤ 48 V	≤ 125 V	≤ 250 V
1	15	-	-
2	20	15	-
3	25	20	-
4	35	25	-

Tripping characteristics : the thermal trip remains unchanged.
 the magnetic trip will become less sensitive requiring derating by $\sqrt{2}$ the AC value.

Magnetic trip	C Curve	
	50 Hz	DC
I _{rm1}	5 I _n	5 I _n
I _{rm2}	10 I _n	15 I _n

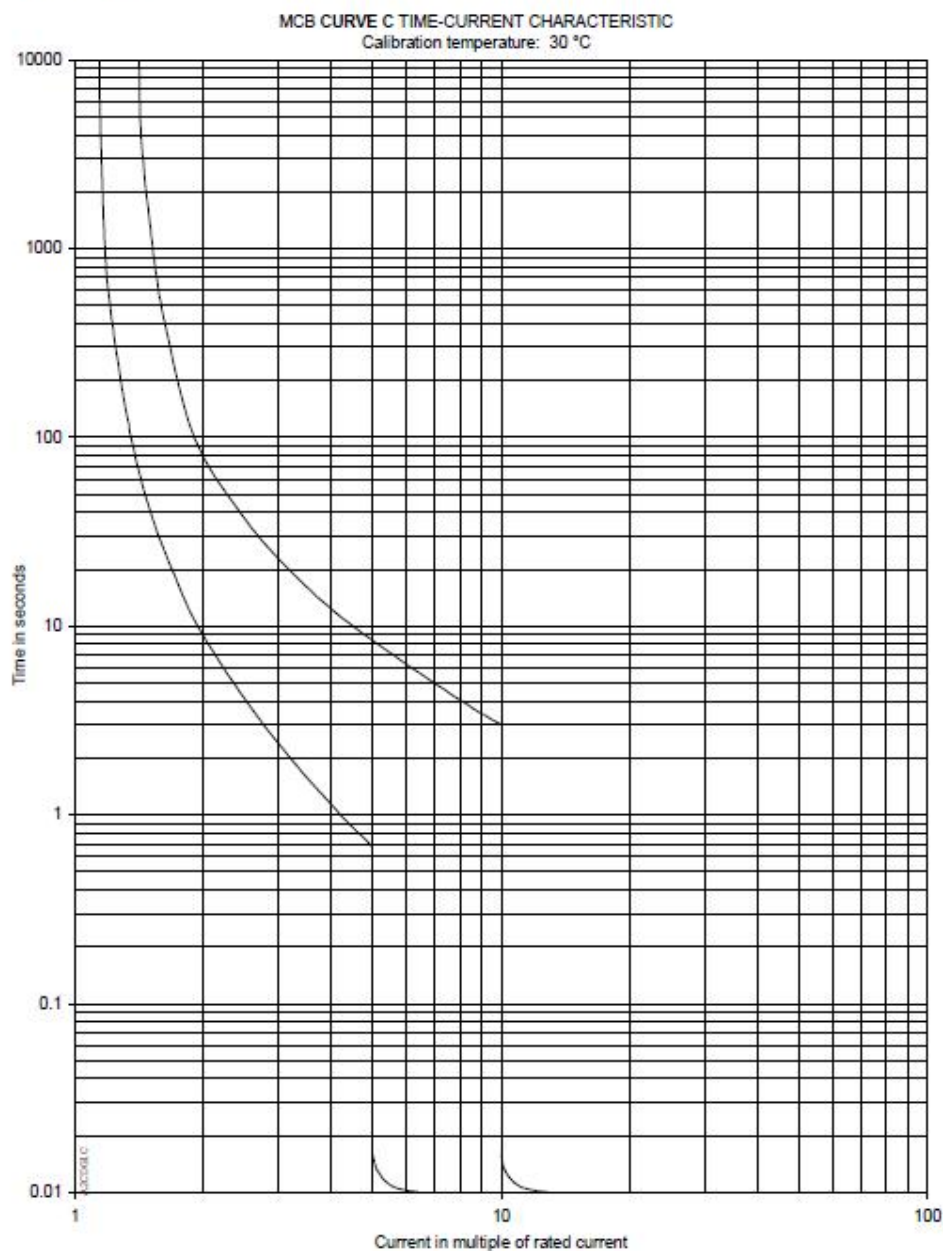
Appendix 1 : Temperature correction factor table

Miniature circuit breaker
 Standard EN 60898
 Curve B, C and D

I _n (A)	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C
0.5	0.72	0.7	0.68	0.66	0.64	0.62	0.6	0.58	0.56	0.54	0.52	0.5	0.48	0.46	0.44	0.42	-	-
1	1.44	1.4	1.36	1.32	1.28	1.24	1.2	1.16	1.12	1.08	1.04	1	0.96	0.92	0.88	0.84	0.8	0.76
2	2.88	2.8	2.72	2.64	2.56	2.48	2.4	2.32	2.24	2.16	2.08	2	1.92	1.84	1.76	1.68	1.6	1.52
3	4.32	4.2	4.08	3.96	3.84	3.72	3.6	3.48	3.36	3.24	3.12	3	2.88	2.76	2.64	2.52	2.4	2.28
4	5.76	5.6	5.44	5.28	5.12	4.96	4.8	4.64	4.48	4.32	4.16	4	3.84	3.68	3.52	3.36	3.2	3.04
6	8.64	8.4	8.16	7.92	7.68	7.44	7.2	6.96	6.72	6.48	6.24	6	5.76	5.52	5.28	5.04	4.8	4.56
10	14.4	14	13.6	13.2	12.8	12.4	12	11.6	11.2	10.8	10.4	10	9.6	9.2	8.8	8.4	8	7.6
16	23.0	22.4	21.8	21.1	20.5	19.8	19.2	18.6	17.9	17.3	16.6	16	15.4	14.7	14.1	13.4	12.8	12.2
20	28.8	28	27.2	26.4	25.6	24.8	24	23.2	22.4	21.6	20.8	20	19.2	18.4	17.6	16.8	16	15.2
25	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19
32	46.1	44.8	43.5	42.2	41.0	39.7	38.4	37.1	35.8	34.6	33.3	32	30.7	29.4	28.2	26.9	25.6	24.3
40	57.6	56	54.4	52.8	51.2	49.6	48	46.4	44.8	43.2	41.6	40	38.4	36.8	35.2	33.6	32	30.4
50	72	70	68	66	64	62	60	58	56	54	52	50	48	46	44	42	40	38
63	90.7	88.2	85.7	83.2	80.6	78.1	75.6	73.1	70.6	68.0	65.5	63	60.5	58.0	55.4	52.9	50.4	47.9

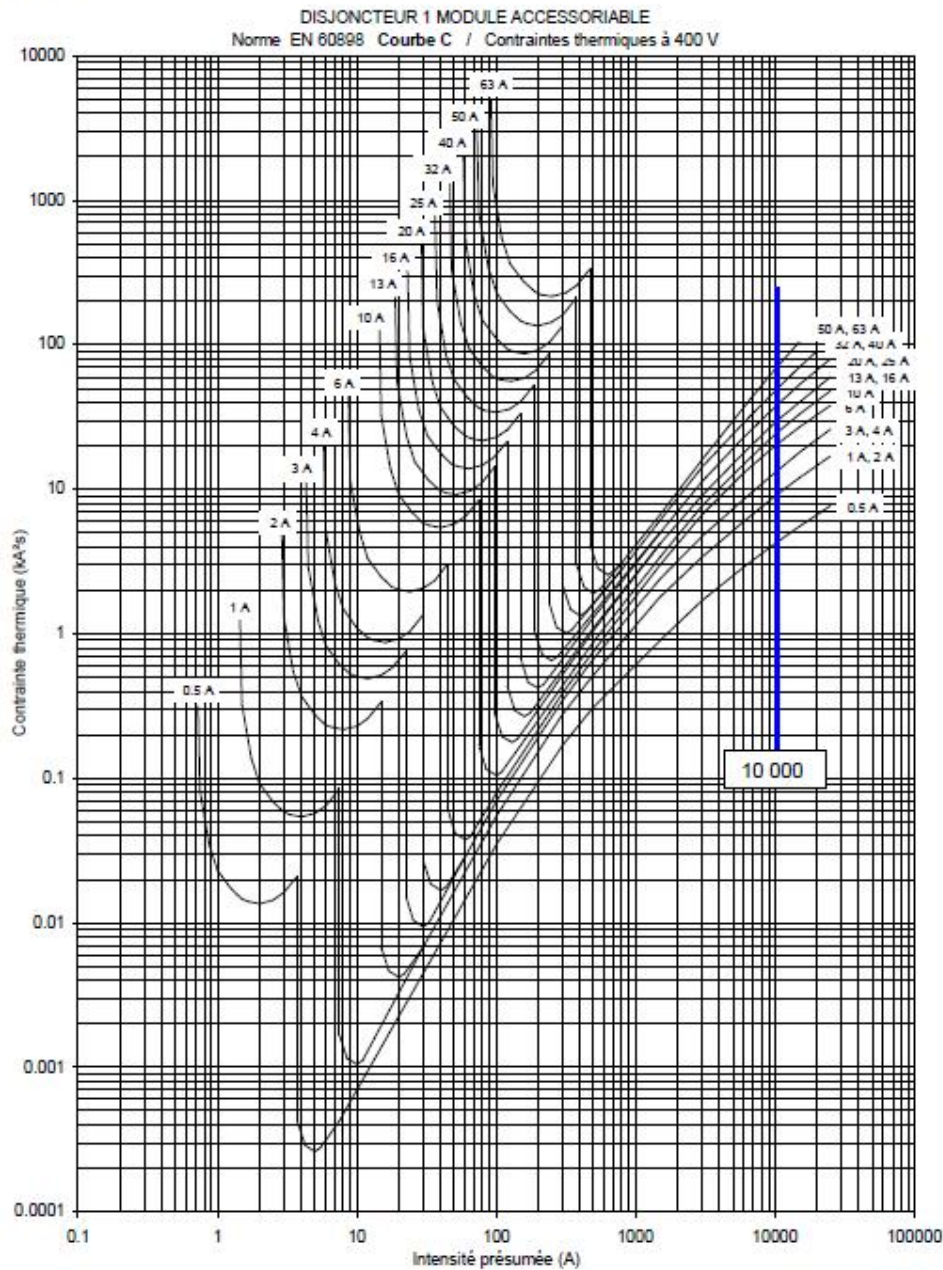
Appendix 2 : C Curve at 30 °C

Miniature circuit breaker
 Standard EN 60898



Appendix 3 : Energy let through at 400 V

Miniature circuit breaker
 Standard EN 60898
 Curve C



Appendix 4 : Current limitation at 400 V
Miniature circuit breaker
Standard EN 60898
Curve C

