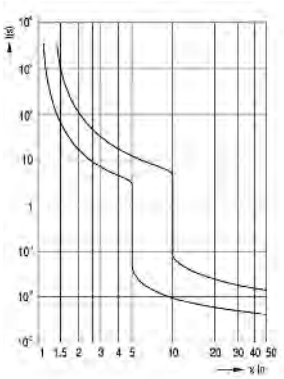
MCB Technical and application information
Din-T and Safe-T range

RCD Technical and application information
Din-T and Safe-T types



Din-T MCBs + RCDs Technical data

Selection table MCBs

Series	Application	No. of Poles	Add-on devices	Tripping characteristic	Current rating (A)	Short-circuit capacity (kA)
Din-T6		1, 1+N, 2, 3, 4	yes	C	0.5-63	6 10 20
			yes	D	0.5-63	6 10 20
Din-T10		1, 1+N, 2, 3, 4	yes	B	6-63	10 15 30
			yes	C	0.5-63	10 15 30
			yes	D	0.5-63	10 15 30
Din-T15		1, 2, 3, 4	yes	C	0.5-63	15 20 25
			yes	D	0.5-63	15 20 25
Din-TDC		1, 2	yes	C	0.5-63	6 10
Din-T10H		1, 2, 3, 4	yes	C	80-125	10 15
			yes	D	80-125	7.5
Safe-T		1, 2, 3, 4	yes	NEMA device curve	6-100	6


domestic


commercial


industrial

B : 3-5 In
C : 5-10 In
D : 10-20
NEMA : Zero point extinguishing curve.

AS/NZS 60898
AS/NZS 60947-2
NEMA AB1

Din-T MCBs + RCDs Technical data

Din-T, 3 pole 10 kA MCB

Line protection by means of MCBs

Protective devices shall be capable of breaking any overcurrent up to and including the prospective short-circuit current at the point where the device is installed. One of the protective devices complying with those conditions is the MCB.

Protection against short-circuit

According to IEC 60364 protective devices shall be provided to break any short-circuit current flowing in the circuit conductors before such a current could cause danger due to thermal and mechanical effects produced in conductors and connections. To consider that an installation is well protected against short-circuits, it is required that the protective device complies with the following conditions:

- The breaking capacity shall not be less than the prospective short-circuit current at the place of its installation.

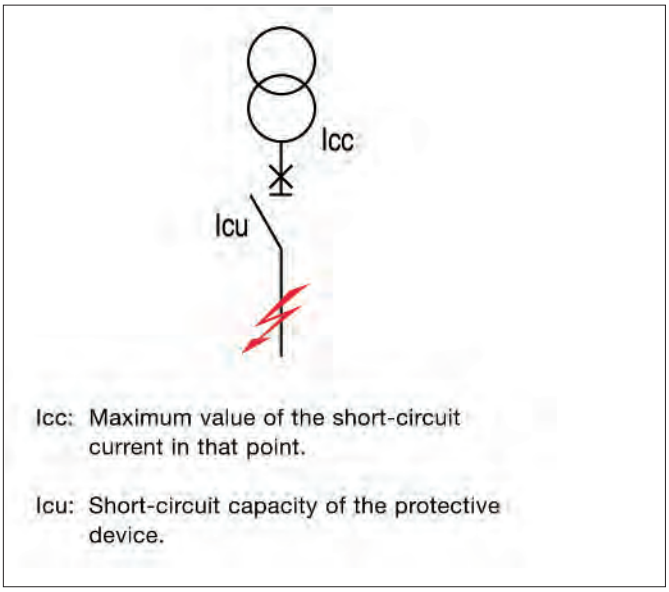
$$Icu \geq Icc$$

- Let-through energy I^2t smaller than admissible energy of the cable.
- According to IEC 60364-4-473 there are some cases where the omission of devices for protection against overload is recommended for circuits supplying current-used equipment where unexpected opening of the circuit could cause danger.

  Examples of such cases are:

  - Excitation circuit of rotating machines.
  - Supply circuit of lifting magnets.
  - Secondary circuits of current transformers.

As in those cases the Iu>Iz, it is necessary to verify the short-circuit value at the point of the installation to ensure the protection (Icc min).

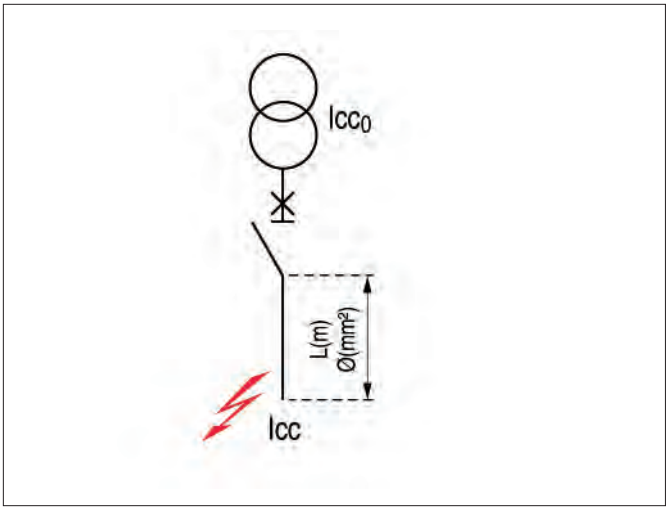


Icc: Maximum value of the short-circuit current in that point.

Icu: Short-circuit capacity of the protective device.

Calculation of Icc

The value of the short-circuit current flowing at the end of a cable depends on the short-circuit current flowing at the beginning of the cable (transformer terminals), the cross-section as well as its length.



Short-circuit current at the transformer terminals (Icc0)

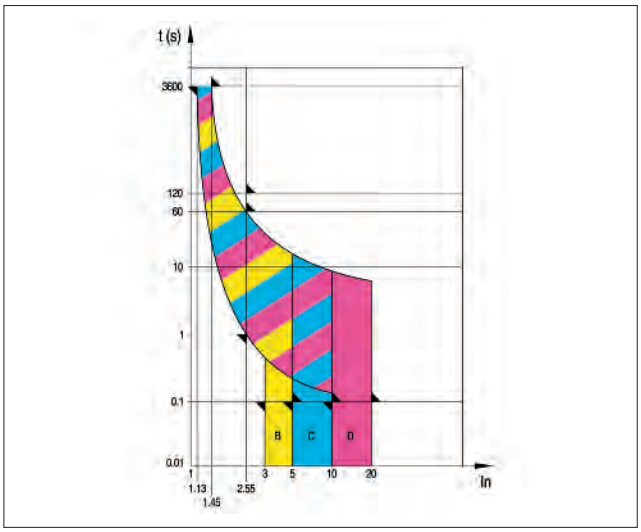
Three phase oil transformer - 400 V

Transformer power kVA	Voltage Ucc In %	In A RMS	Icc0 kA RMS
250	4	352	8.7
315	4	443	10.9
400	4	563	13.8
500	4	704	17.1
630	4	887	21.6
800	4.5	1126	24.1
1000	5	1408	27
1250	5.5	1760	30.4
1600	6	2253	35.5
2000	6.5	2816	40.5
2500	7	3520	46.6
3150	7	4435	57.6

Din-T MCBs + RCDs Technical data
Characteristics according to AS/NZS 60898

Miniature Circuit Breakers are intended for the protection of wiring installations against both overloads and short-circuits in **domestic** or **commercial** wiring installations where operation is possible by **uninstructed** people

Tripping characteristic curves



Magnetic release

An electromagnet with plunger ensures instantaneous tripping in the event of short-circuit. The NHP Din-T range has 3 different types, following the current for instantaneous release: types B, C and D curve.

Icn (A)	Test current	Tripping time	Applications
B	3 x In 5 x In	0.1<t<45 s (In≤32 A) 0.1<t<90 s (In>32 A) t<0.1 s	Only for resistive loads eg: • electrical heating • water heater • stoves.
C	5 x In 10 x In	0.1<t<15 s (In≤32 A) 0.1<t<30 s (In>32 A) t<0.1 s	Usual loads such as: • lighting • socket outlets • small motors
D	10 x In 20 x In	0.1<t<4 s(**) (In≤32 A) 0.1<t<8 s (In>32 A) t<0.1 s	Control and protection of circuits having important transient inrush currents (large motors)

** If In ≤ 10 A, + < 8 s

Thermal release

The release is initiated by a bimetal strip in the event of overload. The standard defines the range of releases for specific overload values. Reference ambient temperature is 30 °C.

Test current	Tripping time
1.13 x In	t ≥ 1 h (In ≤ 63 A) t ≥ 2 h (In > 63 A)
1.45 x In	t < 1 h (In ≤ 63 A) t < 2 h (In > 63 A)
2.55 x In	1 s < t < 60 s (In ≤ 32 A) 1 s < t < 120 s (In >32 A)

Rated short-circuit breaking capacity (Icn)

Is the value of the short-circuit that the MCB is capable of withstanding in the following test of sequence of operations: O-t-CO.

After the test the MCB is capable, without maintenance, to withstand a dielectric strength test at a test voltage of 900 V. Moreover, the MCB shall be capable of tripping when loaded with 2.8 In within the time corresponding to 2.55 In but greater than 0.1s.

Service short-circuit breaking capacity (Ics)

Is the value of the short-circuit that the MCB is capable of withstanding in the following test of sequence of operations: O-t-CO-t-CO.

After the test the MCB is capable, without maintenance, to withstand a dielectric strength test at a test voltage of 1500 V. Moreover, the MCB shall not trip at a current of 0.96 In. The MCB shall trip within 1h when current is 1.6 In.

O - Represents an opening operation

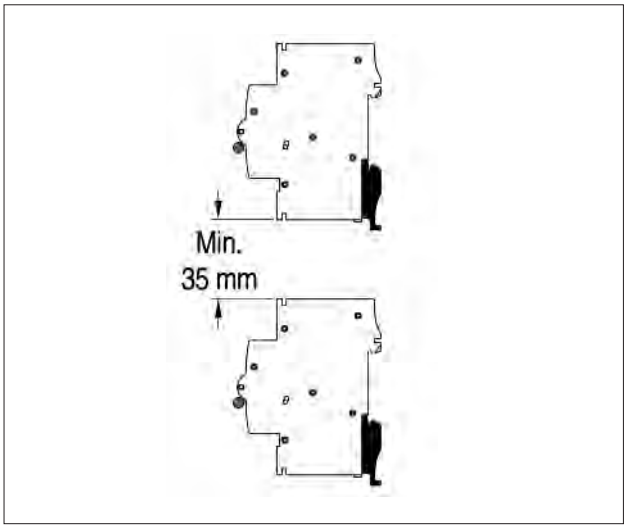
C - Represents a closing operation followed by an automatic opening.

t - Represents the time interval between two successive short-circuit operations: 3 minutes.

The relation between the rated short-circuit capacity (Icn) and the rated service short-circuit breaking capacity (Ics) shall be as follows:

Icn (A)	Ics (A)
≤ 6000	6000
> 6000 ≤ 10000	0.75 Icn min. 6000
> 10000	0.75 Icn min. 7500

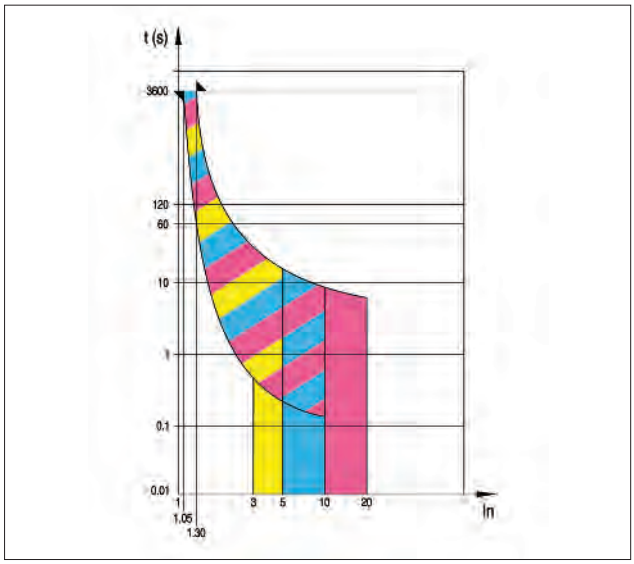
In both sequences all MCBs are tested for emission of ionized gases during short-circuit (grid distance), in a safety distance between two MCBs of 35 mm when devices are installed in two different rows in the enclosure. This performance allows the use of any NHP/Terasaki enclosure.



Din-T MCBs + RCDs Technical data
Characteristics according to AS/NZS 60947-2

Miniature Circuit Breakers are intended for the protection of the lines against both overloads and short-circuits in **industrial** wiring installations where normal operation is done by **instructed** people

Tripping characteristic curves



Magnetic release

An electromagnet with plunger ensures instantaneous tripping in the event of short-circuit. The standard leaves the calibration of magnetic release to the manufacturers discretion.

NHP offers instantaneous tripping ranges:

- release between 3 and 5 In (typically 4 In)
- release between 5 and 10 In (typically 8.5 In)
- release between 10 and 20 In (typically 14 In)

Thermal release

The release is initiated by a bimetal strip in the event of overload. The standard defines the range of release for two special overload values. Reference ambient temperature is 40 °C.

Test current	Tripping time
1.05 x In	$t \geq 1$ h (In $\leq$ 63 A) $t \geq 2$ h (In > 63 A)
1.30 x In	$t < 1$ h (In $\leq$ 63 A) $t < 2$ h (In > 63 A)

Rated ultimate short-circuit breaking capacity (Icu)

Is the value of the short-circuit that the MCB is capable of withstanding in the following test of sequence of operations: O-t-CO.

After the test the MCB is capable, without maintenance, to withstand a dielectric strength test at a test voltage of 1000 V. Moreover the MCB shall be capable of tripping when loaded with 2.5 In within the time corresponding to 2 In but greater than 0.1 s.

Rated service short-circuit breaking capacity (Ics)

Is the value of the short-circuit that the MCB is capable of withstanding in the following test of sequence of operations: O-t-CO-t-CO.

After the test the MCB is capable, without maintenance, to withstand a dielectric strength test at a test voltage of twice its rated insulation voltage with a minimum of 1000 V. A verification of the overload releases on In and moreover the MCB shall trip within 1 h when current is 1.45 In (for In<63 A) and 2 h (for In>63 A).

O - Represents an opening operation

C - Represents a closing operation followed by an automatic opening.

t - Represents the time interval between two successive short-circuit operations: 3 minutes.

Category A: Without a short-time withstand current rating.

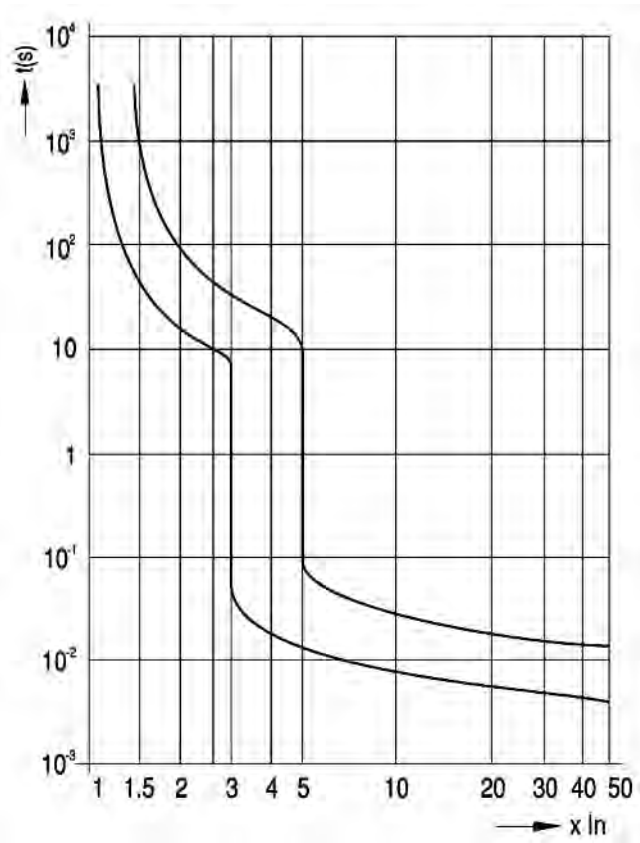
Utilisation category	Application with respect to selectivity
A	Circuit breakers not specifically intended for selectivity under short-circuit conditions with respect to other short-circuit protective devices in series on the load side, i.e. without an intentional short-time delay provided for selectivity under short-circuit conditions, and therefore without a short-time withstand current rating according to 4.3.5.4
B	Circuit breakers specifically intended for selectivity under short-circuit conditions with respect to other short-circuit protective devices in series on the load side, i.e. without an intentional short-time delay (which may be adjustable), provided for selectivity under short-circuit conditions. Such circuit-breakers have a short-time withstand current rating according to 4.3.5.4

Din-T MCBs + RCDs Technical data
Tripping curves according to AS/NZS 60898

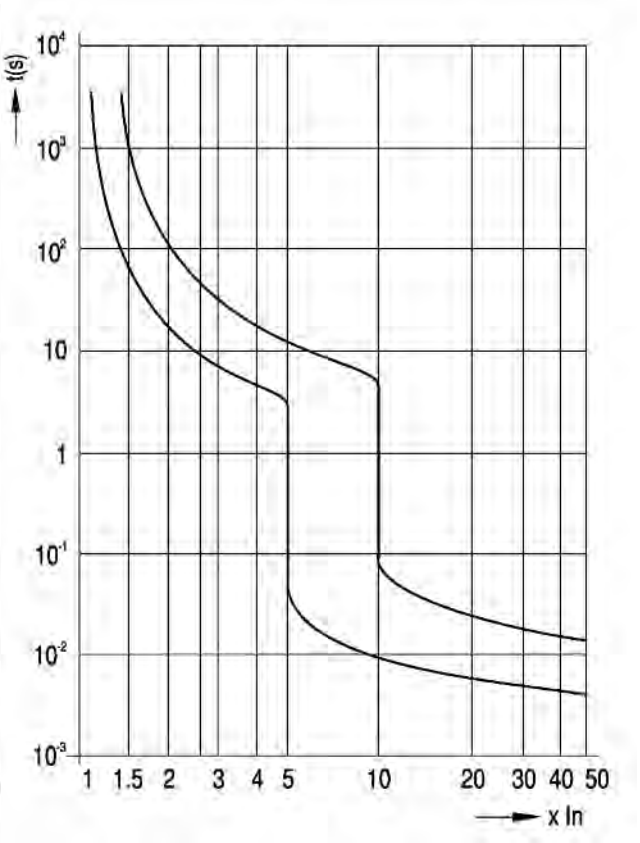
The following tables show the average tripping curves of the Terasaki Din-T MCBs based on the thermal and magnetic characteristics.

3

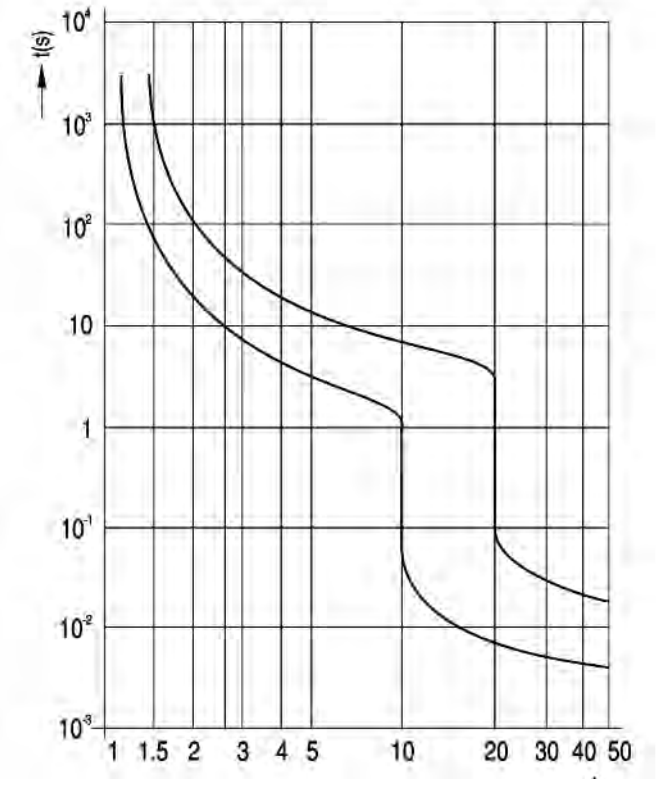
Curve B



Curve C



Curve D



Din-T MCBs + RCDs Technical data
Definitions related to circuit breakers

MCB = Miniature Circuit Breaker

Short-circuit (making and breaking) capacity
Alternating component of the prospective current, expressed by its RMS value, which the circuit breaker is designed to make, to carry for its opening time and to break under specified conditions.

Ultimate or rated short-circuit breaking capacity (Icn - AS/NZS 60898)
A breaking capacity for which the prescribed conditions, according to a specified test sequence, do not include the capability of the MCB to carry 0.96 times its rated current for the conventional time.

Ultimate short-circuit breaking capacity (Icu - AS/NZS 60947-2)
A breaking capacity for which the prescribed conditions, according to a specified test sequence, do not include the capability of the MCB to carry its rated current for the conventional time.

Service short-circuit breaking capacity (Ics - AS/NZS 60898)
A breaking capacity for which the prescribed conditions, according to a specified test sequence, include the capability of the MCB to carry 0.96 times its rated current for the conventional time.

Prospective current
The current that would flow in the circuit, if each main current path of the MCB were replaced by a conductor of negligible impedance.

Conventional non-tripping current (Int)
A specified value of current which the circuit breaker is capable of carrying for a specified time without tripping.

Open position
The position in which the predetermined clearance between open contacts in the main circuit of the MCB is secured.

Closed position
The position in which the predetermined continuity of the main circuit of the MCB is secured.

Maximum prospective peak current (Ip)
The prospective peak current when the initiation of the current takes place at the instant which leads to the highest possible value.

Din-T MCBs + RCDs Technical data

Influence of ambient air temperature on the rated current

The maximum value of the current which can flow through an MCB depends on the nominal current of the MCB, the conductor cross-section and the ambient air temperature.

The values shown in the table below are for devices in free air. For devices installed with other modular devices in the same switchboard, a correction factor (K) shall be applied relative to the mounting situation of the MCB, the ambient temperature and the number of main circuits in the installation.

No of devices	K [1])
2 or 3	0.9
4 or 5	0.8
6 or 9	0.7
> 10	0.6

Calculation example

Within a distribution board consisting of eight 2 Pole, 16 A, 'C' curve type MCBs, with an operating ambient temperature of 45 °C, which is the highest temperature the MCB can operate at without unwanted tripping?

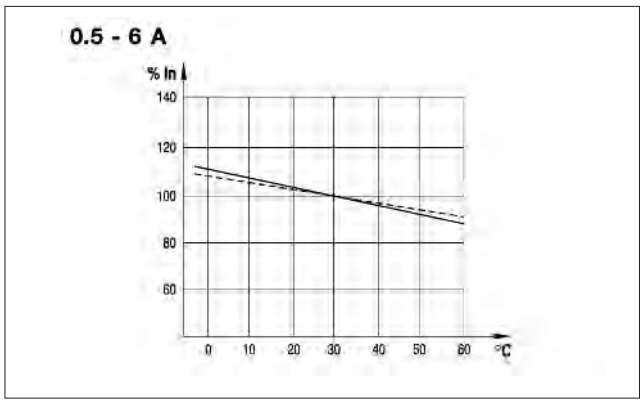
Calculation

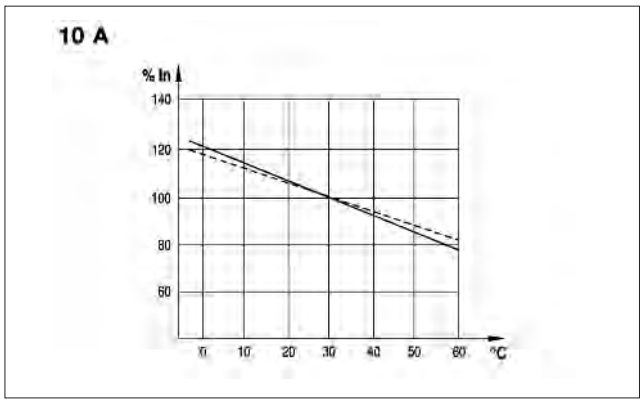
The correction factor K = 0.7, for use in an eight circuit installation: 16 A x 0.7 = 11.2 A

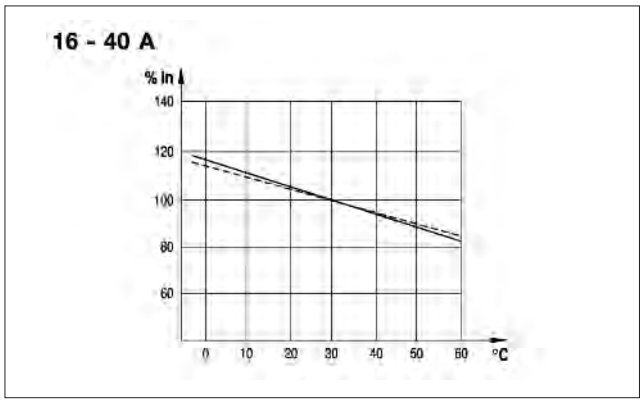
As the MCB is working at 45 °C it shall be given another factor (90 % = 0.9):
In at 45 °C = In at 30 °C x 0.9 = 11.2 A x 0.9 = 10.1 A.

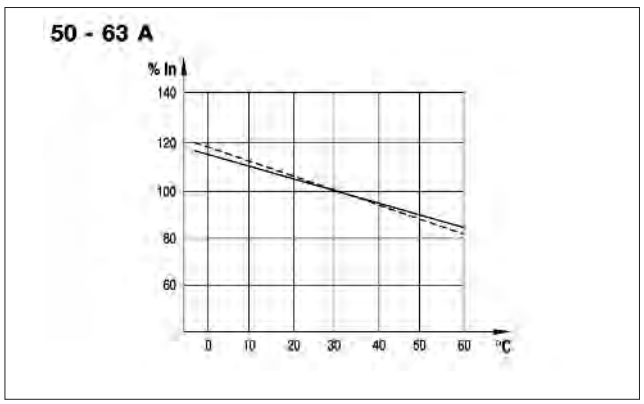
Note: [1]) Applicable for MCBs working at maximum rated currents.

The thermal calibration of the MCBs was carried out at an ambient temperature of 30 °C. Ambient temperatures different from 30 °C influence the bimetal and this results in earlier or later thermal tripping.









——— : 1P (single pole)

- - - - - - - - : mP (multi-pole)

Din-T MCBs + RCDs Technical data

Effects of frequency on the tripping characteristic

All the MCBs are designed to work at frequencies of 50-60 Hz, therefore to work at different values, consideration must be given to the variation of the tripping characteristics. The thermal tripping does not change with variation of the frequency but the magnetic tripping values can be up to 50 % higher than the ones at 50-60 Hz.

Tripping current variation

60 Hz	100 Hz	200 Hz	300 Hz	400 Hz
1	1.1	1.2	1.4	1.5

Power losses

The power losses are calculated by measuring the voltage drop between the incoming and the outgoing terminals of the device at rated current.

Power loss per pole

In (A)	Voltage drop (V)	Energy loss (W)	Resistance (mOhm)
0.5	2.230	1.115	4458.00
1	1.270	1.272	1272.00
2	0.620	1.240	310.00
3	0.520	1.557	173.00
4	0.370	1.488	93.00
6	0.260	1.570	43.60
8	0.160	1.242	19.40
10	0.160	1.560	15.60
13	0.155	2.011	11.90
16	0.162	2.586	10.10
20	0.138	2.760	6.90
25	0.128	3.188	5.10
32	0.096	3.072	3.00
40	0.100	4.000	2.50
50	0.090	4.500	1.80
63	0.082	5.160	1.30
80	0.075	6.000	0.90
100	0.075	7.500	0.75
125	0.076	9.500	0.60

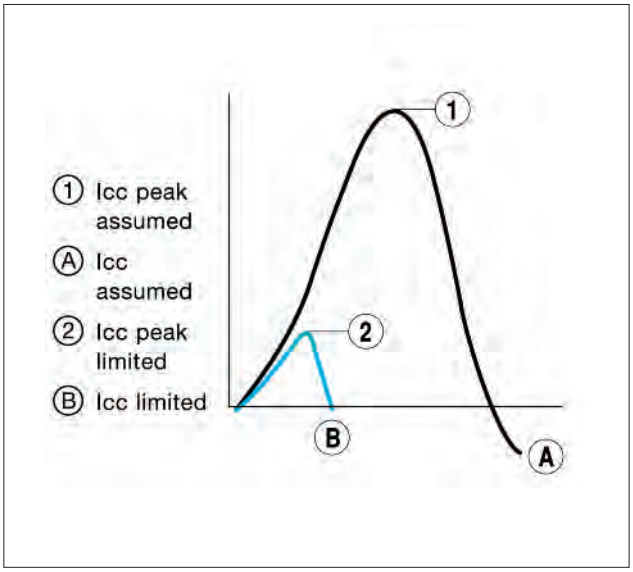
Limitation curves

Let-through energy I^2t

The limitation capacity of an MCB in short-circuit conditions, is its capacity to reduce the value of the let-through energy that the short-circuit would be generating.

Peak current Ip

Is the value of the maximum peak of the short-circuit current limited by the MCB.



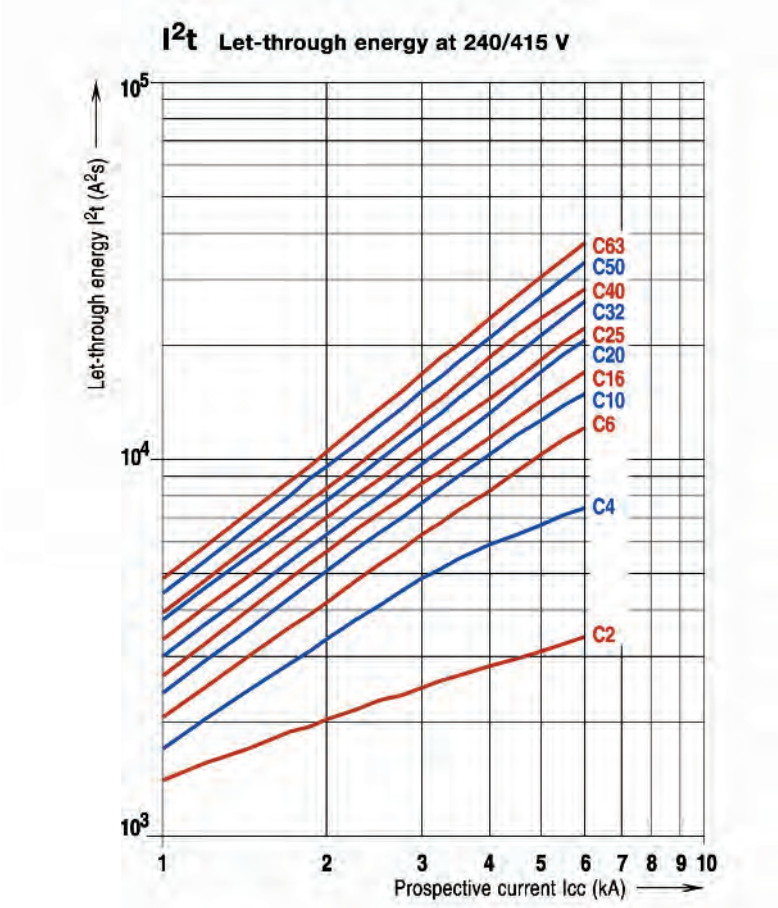
See following pages

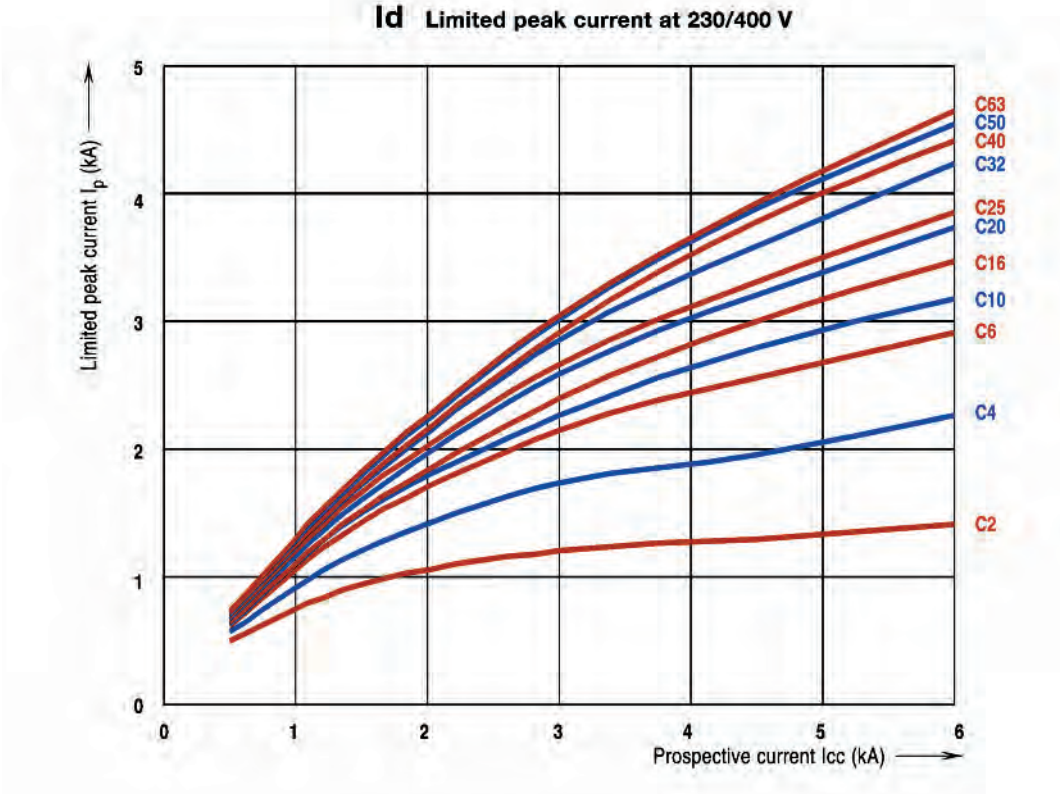
Din-T MCBs + RCDs Technical data

Din-T 6

6 kA

C curve



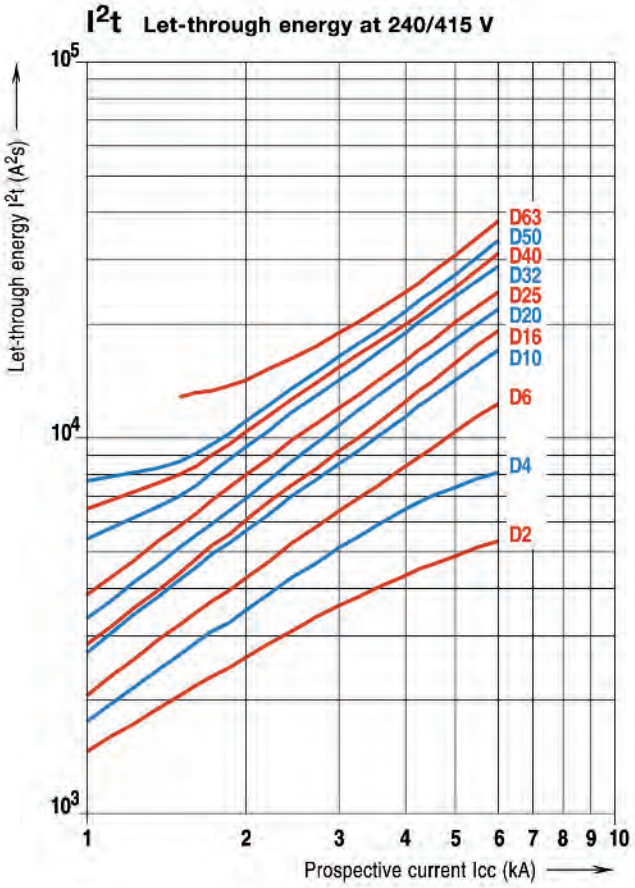


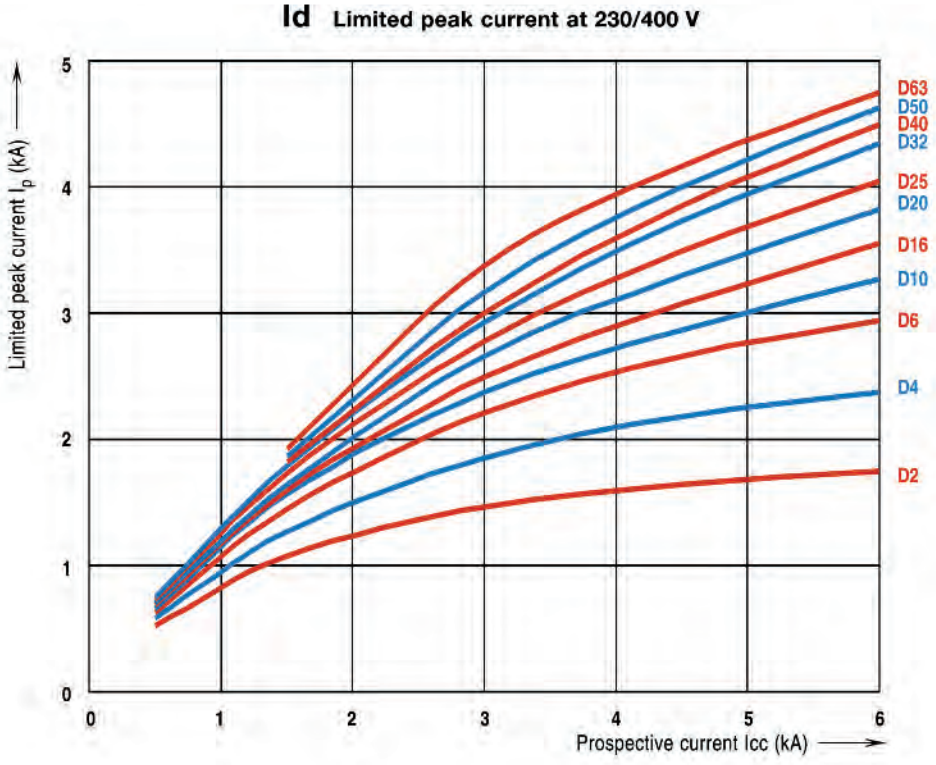
Din-T MCBs + RCDs Technical data

Din-T 6

6 kA

D curve



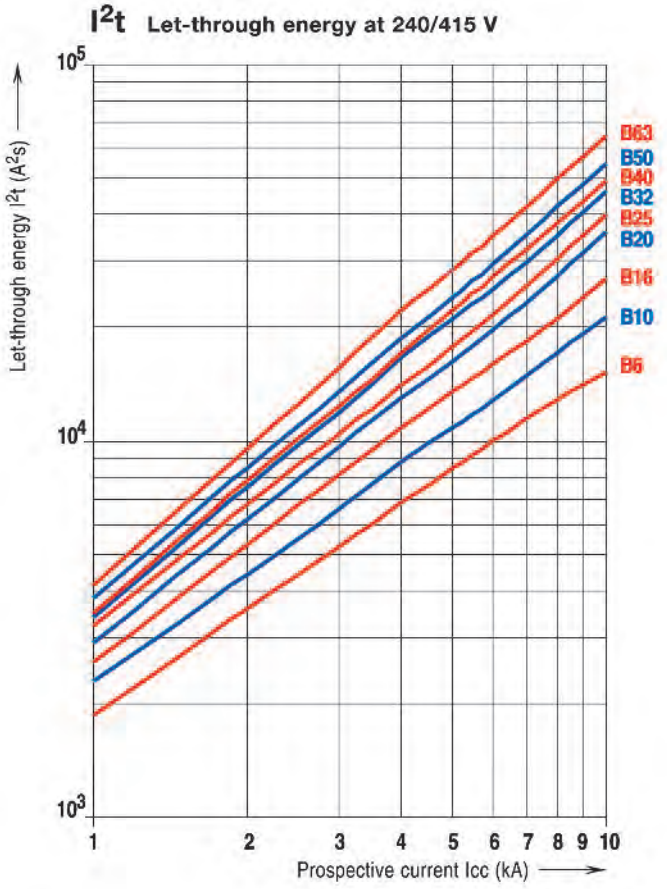


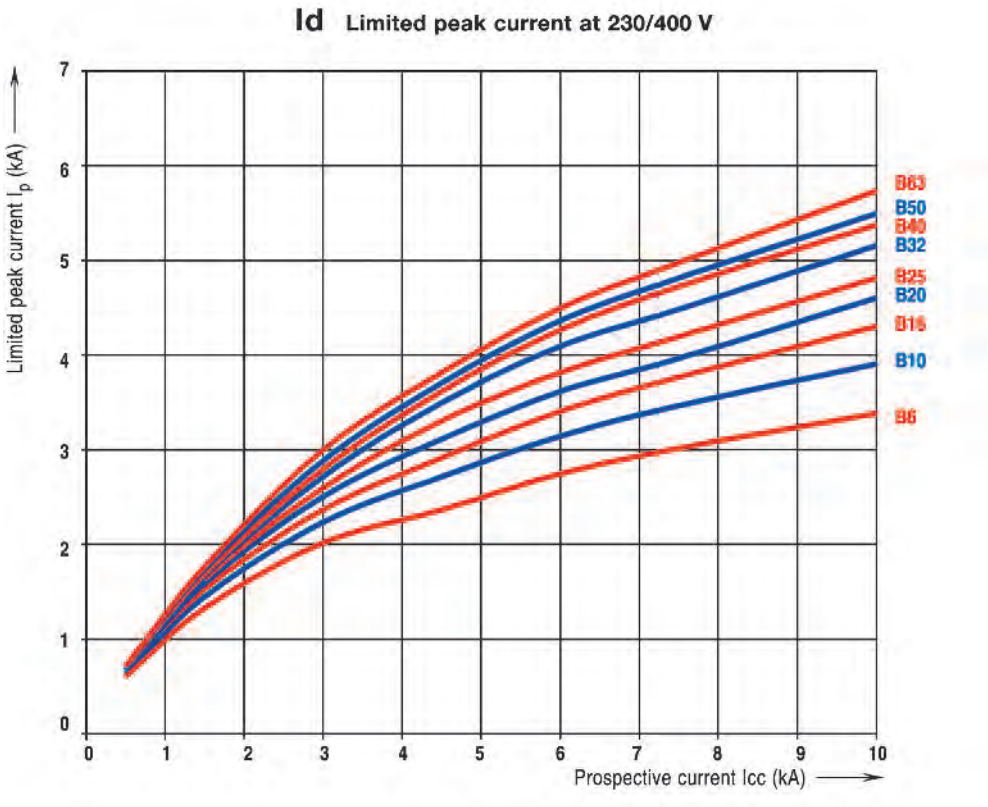
Din-T MCBs + RCDs Technical data

Din-T 10

10 kA

B curve



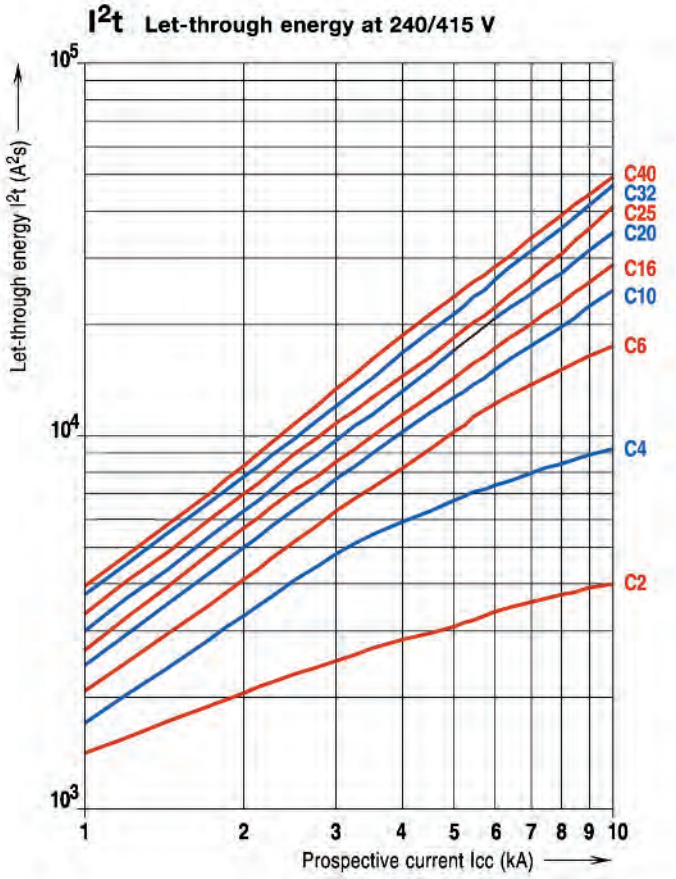


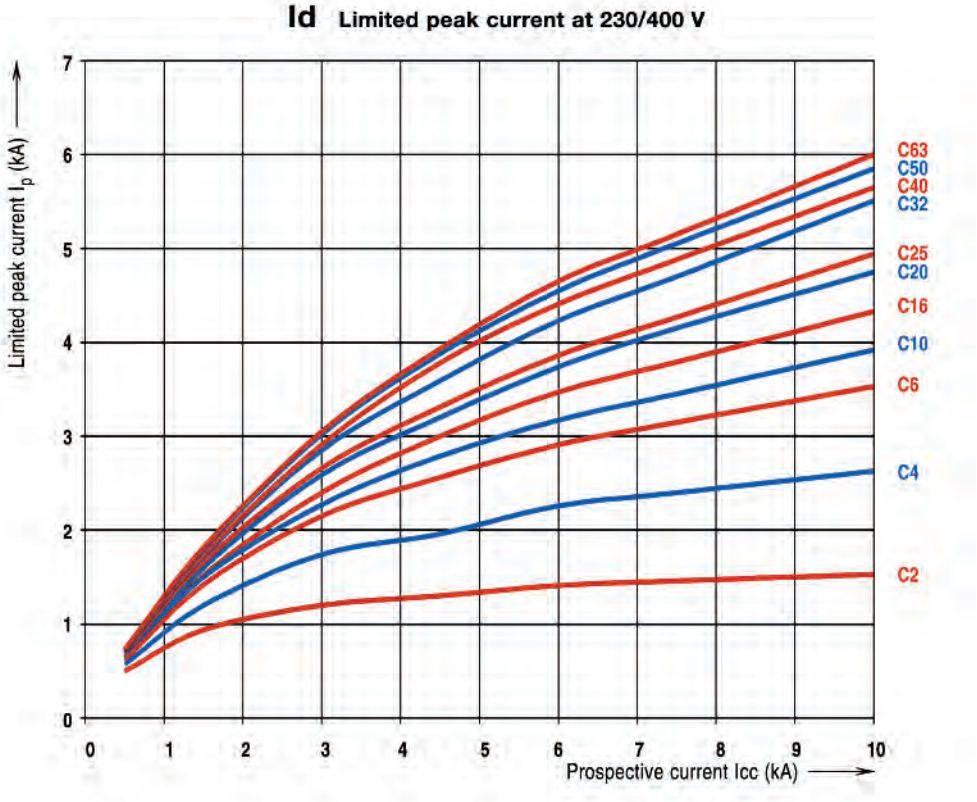
Din-T MCBs + RCDs Technical data

Din-T 10

10 kA

C curve



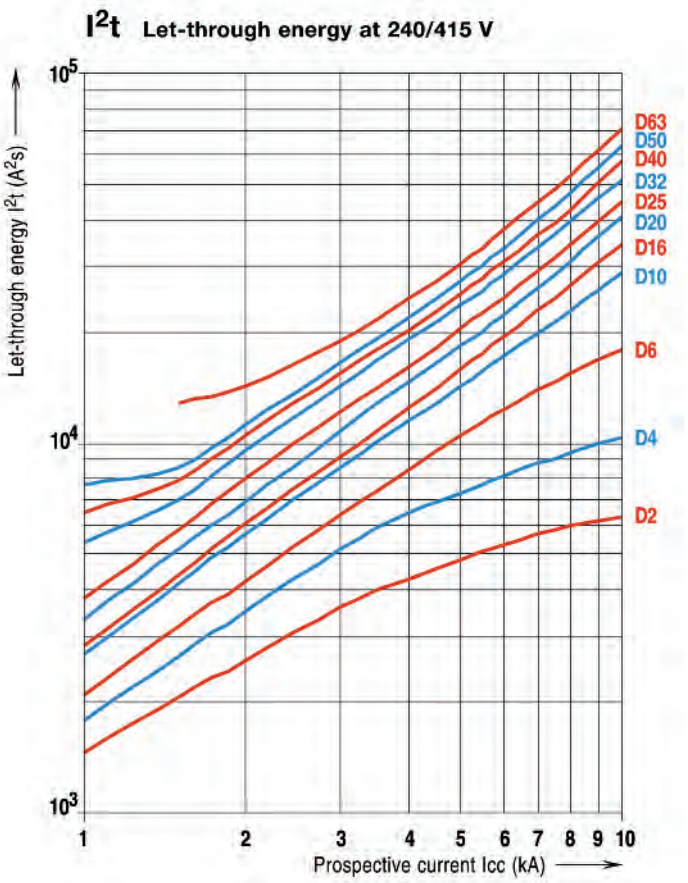


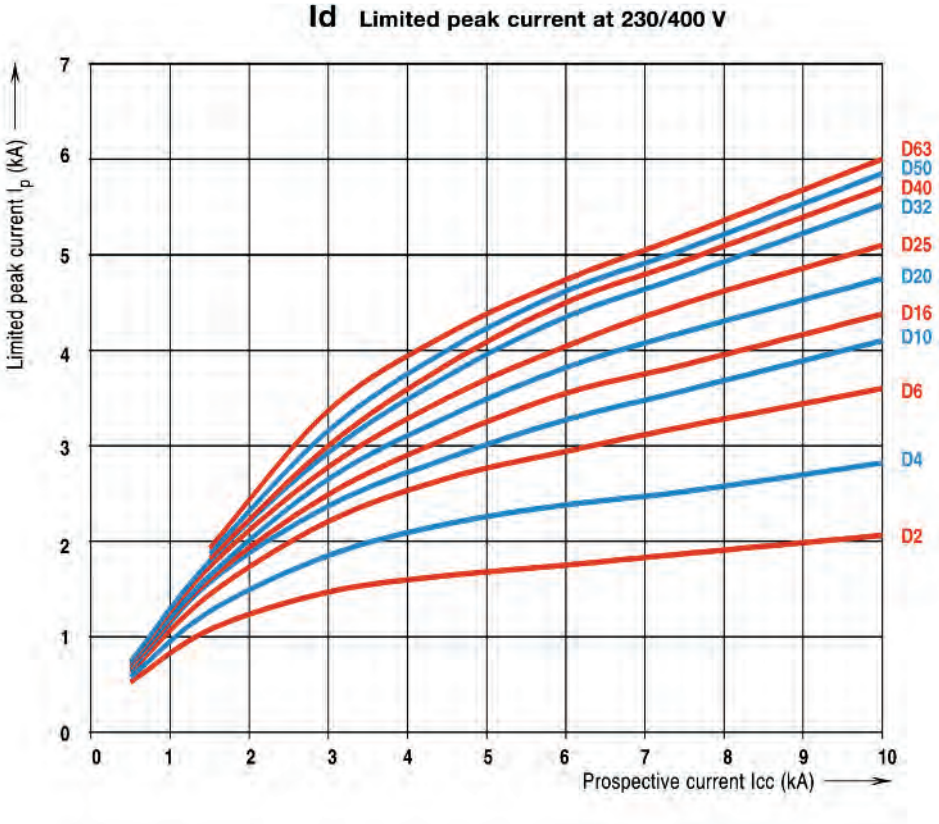
Din-T MCBs + RCDs Technical data

Din-T 10

10 kA

D curve





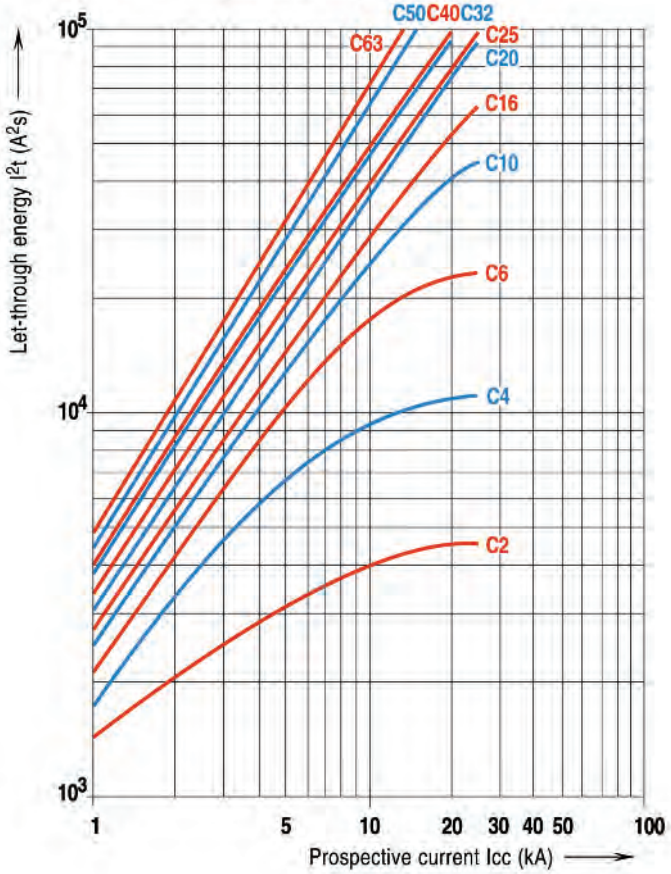
Din-T MCBs + RCDs Technical data

Din-T 15

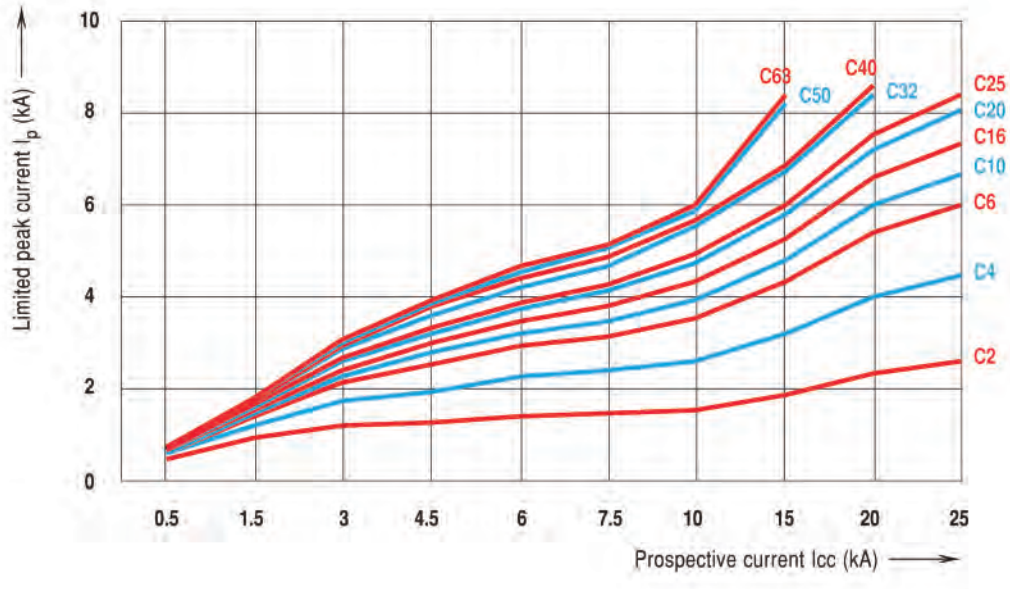
15 kA

C curve

I^2t Let-through energy at 240 V

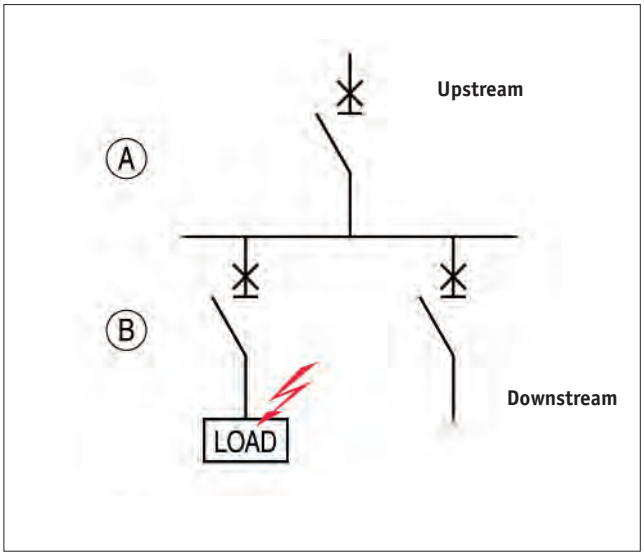


Ip Limited peak current at 230/400 V



Din-T MCBs + RCDs Technical data
Selectivity and Cascade

An installation with some protective devices in series (a protective device must be placed at the point where a reduction of the cross sectional area of the conductors or another change causes modification in the characteristics of the installation) is considered selective when, in the event of short-circuit, the installation is interrupted only by the device which is immediately upstream of the fault point. Selectivity is ensured when the characteristic time/current of the upstream MCB (A) is above the characteristic time/current of the downstream MCB (B). Selectivity may be total or partial.



SCPD: Short circuit protective device

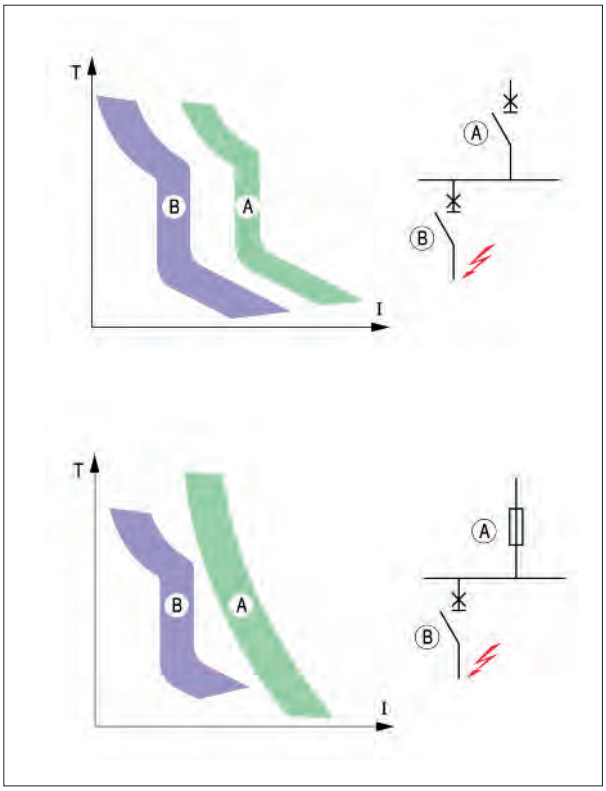
Cascade (Back-up protection)

Cascading is achieved by using an upstream device to assist (back-up) a downstream device in clearing a fault current that happens to be greater than the breaking capacity of the downstream device.
In Cascading applications, the upstream device may have to trip (unlatch) in order to give sufficient protection to the downstream device, thus interrupting supply of power to all devices downstream. Therefore, Cascading is generally used in applications involving the supply of non-essential loads, such as basic lighting. The main benefit of Cascading is that in certain circumstances circuit breakers with breaking capacities lower than the prospective fault level, hence lower in cost, can be safely used downstream provided it is backed-up by the relevant upstream breaker.

Total selectivity

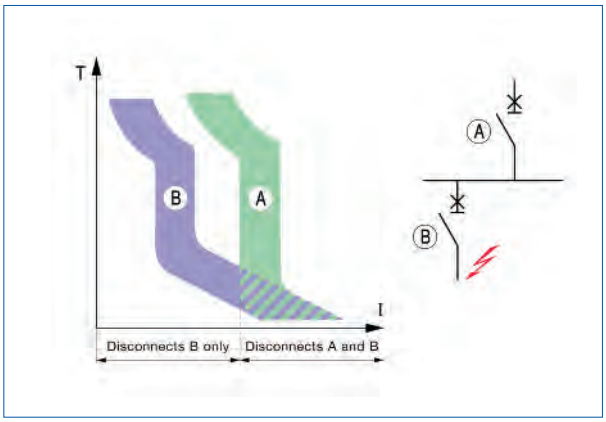
Selectivity is total in the event of a short-circuit fault and only disconnects the protective device (B) immediately upstream of the fault point.

The let-through energy (I^2t) of the downstream protective device shall be lower than the upstream protective device.



Partial selectivity

Selectivity is partial when the disconnection of the protective device (A) is ensured only up to a certain level of the current.



Refer MCB Selectivity and Cascade tables in section 13

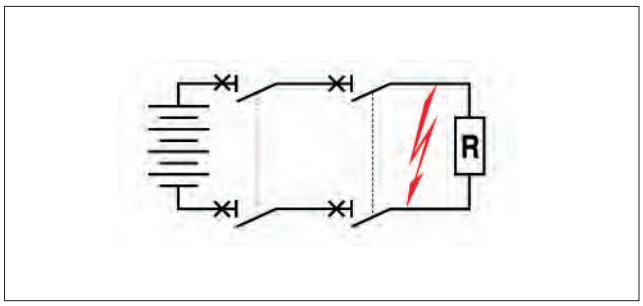
Din-T MCBs + RCDs Technical data
Use in DC installations

Selection criteria
The selection of an MCB to protect a DC installation depends on the following parameters:

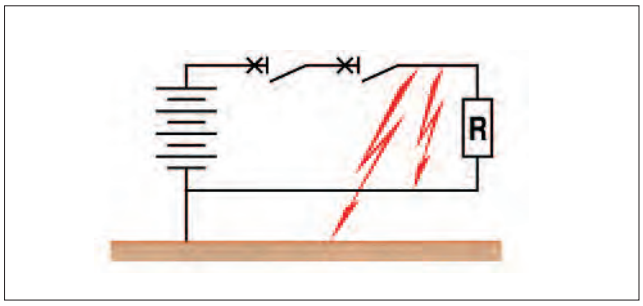
- The nominal current
- The nominal voltage of the power supply, which determines the number of poles to switch the device
- The maximum short-circuit current, to determine the short-circuit capacity of the MCB
- Type of power supply

In the event of an insulation fault, it is considered as an overload when one pole or an intermediate connection of the power supply is connected to earth, and the conductive parts of the installation are also connected to earth.

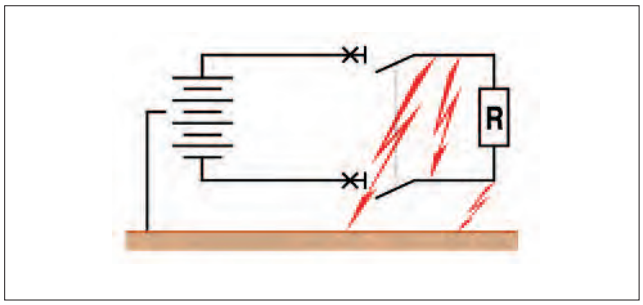
Insulated generator
In insulated generators there is no earth connection, therefore, an earth leakage in any pole has no consequence. In the event of a fault between the two poles (+ and –) there is a short-circuit in the installation, the value of which will depend on the impedance of the installation as well as of the voltage Un. Each polarity shall be provided with the appropriate number of poles.



Generator with one earthed pole
In the event of a fault occuring in the earthed pole (-) there is no consequence. In the event of a fault between the two poles (+ and -) or between the pole + and earth, then there is a short-circuit in the installation, the value of which depends on the impedance of the installation as well as of the voltage Un. The unearthed pole (+) shall be provided with the necessary number of poles to break the maximum short-circuit.



Generator with centre point earth connection
In the event of short-circuit between any pole (+ or -) and earth, there is an Isc<Isc max because the voltage is Un/2.
If the fault occurs between the two poles there is a short-circuit in the installation, the value of which depends on the impedance of the installation as well as the voltage Un. Each polarity shall be provided with the necessary number of poles to break the maximum short-circuit at Un/2.



Din-T MCBs + RCDs Technical data

Use of standard MCB for DC use

For MCBs designed to be used in alternating current but used in installations in direct current, the following should be taken into consideration:

- For protection against overloads it is necessary to connect the two poles to the MCB. In these conditions the tripping characteristic of the MCB in direct current is similar to alternating current.
- For protection against short-circuits it is necessary to connect the two poles to the MCB. In these conditions the tripping characteristic of the MCB in direct current is 40% higher than the one in alternating current.

Use of special MCB Din-T DC for DC use. (UC = Universal current)

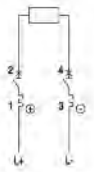
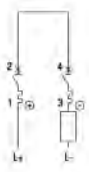
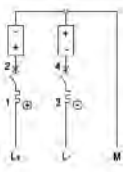
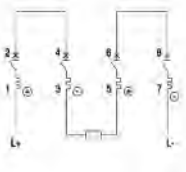
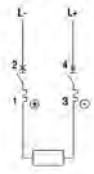
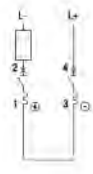
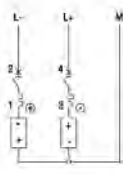
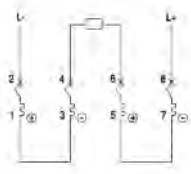
For MCBs designed to work in both alternating and direct current, it is necessary to respect the polarity of the terminals since the device is equipped with a permanent magnet.

Use in DC selection table

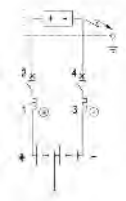
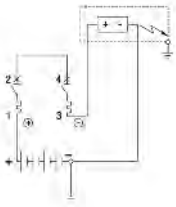
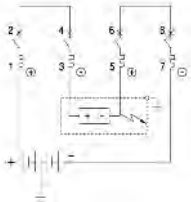
Series	Rated current (A)	48 V 1 pole Icu (kA)	110 V 2 poles in series Icu (kA)	250 V 1 pole Icu (kA)	440 V 2 poles in series Icu (kA)
Din-T 6	0.5....63 A	20	25	-	-
Din-T 10	0.5....63 A	25	30	-	-
Din-T DC	0.5....63 A	-	-	6	6
Din-T 15	6....25 A	10	10	-	-

Installation of Din-T DC MCBs in direct current

Example of utilisation for maximum voltage between lines according to the number of poles

MCB	Din-T DC 1 P	Din-T DC 2 P			Din-T DC 4 P
Maximum voltage between lines	250 V ⎓	250 V ⎓	500 V ⎓	500 V ⎓	880 V ⎓
Maximum voltage between lines and earth	250 V ⎓	250 V ⎓	500 V ⎓ [1])	250 V ⎓ [2])	440 V ⎓ [2])
Power supply at bottom terminals					
Power supply at top terminals					

Example of utilisation for maximum voltage between lines according to the number of poles

MCB	Din-T DC 2 P		Din-T DC 4 P
Maximum voltage between lines	500 V DC Multi-pole breaking	500 V DC Multi-pole breaking	880 V DC Multi-pole breaking
Maximum voltage between lines and earth	250 V DC Generator with centre point earth connection 	500 V DC Generator without earth connection or with one earthed pole 	440 V DC Generator with centre point earth connection 

Notes: [1]) Negative pole connected to earth
[2]) Centre point earth connection

Din-T MCBs + RCDs Technical data
Text for specifiers

MCB Series Din-T 6 and 10

- According to AS/NZS 60898 standard
- For DIN rail mounting
  (top hat rail 35 mm)
- Grid distance 35 mm
- Working ambient temperature from -25 °C up to +50 °C
- Approved by CEBEC, VDE, KEMA, IMQ
- Lloyd listed
- 1 pole is a module of 18 mm wide
- Nominal rated currents are:
  0.5/1/2/3/4/6/10/13/16/20/25/32/40/50/63 A
- Tripping characteristics: B,C,D (B curve Din-T 10 only)
- Number of poles: 1 P, 2 P, 3 P, 4 P
- The short-circuit breaking capacity is: 6/10 kA, energy limiting class 3
- Terminal capacity from 1 up to 35 mm^2 rigid wire or 1.5 up to 25 mm^2 flexible wire
- Screw head suitable for flat or Pozidrive screwdriver
- Can be connected by means of both pin or fork busbars
- The toggle can be sealed in the ON or OFF position
- Captive locking option
- Rapid closing
- Both incoming and outgoing terminals have a protection degree of IP 20 and they are sealable
- Isolator function thanks to Red/Green printing on the toggle
- Maximum voltage between two phases; 440 V~
- Maximum voltage for utilisation in DC current: 48 V 1 P and 110 V 2 P
- Two position rail clip
- Mechanical shock resistance 40 g (direction x, y, z) minimum 18 shocks 5 ms half-sinusoidal acc. to IEC 60068-2-27
- Vibration resistance: 3 g (direction x, y, z) minimum 30 min. according to IEC 60068-2-6
- Extensions can be added on both left or right hand side
  - Auxiliary contact
  - Shunt trip
  - Undervoltage release
  - Motor operator
  - Panelboard switch
- Add-on RCD can be coupled

MCB Series Din-T 15

- According to AS/NZS 60947.2 standard
- For DIN rail mounting
  (top hat rail 35 mm)
- Working ambient temperature from -25 °C up to +50 °C
- 1 pole is a module of 18 mm wide
- Nominal rated currents are:
  6/10/13/16/20/25/32/40/50/63 A
- Tripping characteristic: C
- Number of poles: 1 P, 2 P, 3 P, 4 P
- Short-circuit capacity is: 15 kA
- Terminal capacity from 1 up to 35 mm^2 rigid wire or 1.5 up to 25 mm^2 flexible wire
- Screw head suitable for flat or Pozidrive screwdriver
- Can be connected by means of both pin or fork busbars
- The toggle can be sealed in the ON or OFF position
- Captive locking option
- Rapid closing
- Both incoming and outgoing terminals have a protection degree of IP 20 and they are sealable
- Isolator function thanks to Red/Green printing on the toggle
- Maximum voltage between two phases; 440 V~
- Maximum voltage for utilisation in DC current: 48 V 1 P and 110 V 2 P
- Two position rail clip
- Mechanical shock resistance 40 g (direction x, y, z) minimum 18 shocks 5 ms half-sinusoidal acc. to IEC 60068-2-27
- Vibration resistance: 3 g (direction x, y, z) minimum 30 min. according to IEC 60068-2-6
- Extensions can be added on both left or right hand side
  - Auxiliary contact
  - Shunt trip
  - Undervoltage release
  - Motor operator
  - Panelboard switch
- Add-on RCD can be coupled

Din-T MCBs + RCDs Technical data
Text for specifiers

MCB Series Din-T 2-in-1

- According to AS/NZS 60898 standard
- For DIN rail mounting (top hat rail 35 mm)
- Grid distance 35 mm
- Working ambient temperature from -25 °C up to +50 °C
- Approved by CEBEC, VDE, KEMA, IMQ
- 1 P + 1 P or 2 pole is one module 18 mm in width
- 3 P or 4 pole is 2 modules 36 mm in width
- Nominal rated currents are: 2/3/4/6/10/13/16/20/25/32/40 A
- Tripping characteristics: C
- Number of poles: 1 P + 1 P, 2 P, 3 P, 4 P
- The short-circuit breaking capacity is: 6 kA, energy limiting class 3
- Terminal capacity from 1 up to 16 mm^2 wire
- Screw head suitable for flat or Pozidrive screwdriver
- Can be connected by means of 9 mm pitch pin busbars
- The toggle can be sealed in the ON or OFF position
- Captive locking option
- Rapid closing
- Both incoming and outgoing terminals have a protection degree of IP 20 and they are sealable
- Isolator function thanks to Red/Green printing on the toggle
- Maximum voltage between two phases; 440 V~
- Two position rail clip
- Dual Din clip
- Extensions can be added on both left or right hand side
  - Auxiliary contact
  - Shunt trip
  - Undervoltage release

MCB Series Din-T Easy-Fit

- According to AS/NZS 60898 standard
- For DIN rail mounting (top hat rail 35 mm)
- Working ambient temperature from -25 °C up to +50 °C
- 1 pole is a module of 18 mm wide
- Nominal rated currents are: 6/10/16/20/25/32/40/50/63 A
- Tripping characteristic: C
- Number of poles: 1 P, 3 P
- Short-circuit capacity is: 6 kA
- Terminal capacity: Line side 35 mm^2
  Load $\leq$ 20 A 2 x 4 mm^2
  25 - 63 A 35 mm^2
- Screw head suitable for flat or Pozidrive screwdriver
- Line side connection - screw terminal
  - fast clamp terminal
- Load side connection 6 - 20 A dual fast clamp terminal
  25 - 63 A screw terminal
- Can be connected by means of pin busbars
- The toggle can be sealed in the ON or OFF position
- Rapid closing
- Both incoming and outgoing terminals have a protection degree of IP 20 and they are sealable
- Isolator function thanks to Red/Green printing on the toggle
- Maximum voltage between two phases; 440 V~
- Maximum voltage for utilisation in DC current: 48 V 1 P and 110 V 2 P
- Two position rail clip
- Dual Din Clip
- Mechanical shock resistance 40 g (direction x, y, z) minimum 18 shocks 5 ms half-sinusoidal acc. to IEC 60068-2-27
- Vibration resistance: 3 g (direction x, y, z) minimum 30 min. according to IEC 60068-2-6
- Extensions can be added on both left or right hand side
  - Auxiliary contact
  - Shunt trip
  - Undervoltage release
  - Motor operator

Din-T MCBs + RCDs Technical data
Text for specifiers

MCB Series Din-T DC

- According to AS/NZS 60898-2 standard
- For DIN rail mounting (top hat rail 35 mm)
- Grid distance 35 mm
- Working ambient temperature from -25 °C up to +50 °C
- 1 pole is a module of 18 mm wide
- Nominal rated currents are:

  1P/2P - 0.5/1/2/3/4/6/10/13/16/20/25/32/40/50/63 A

  4 P - 10/16/20/25/32/40/63 A
- Tripping characteristic: C - 1P and 2P, B - 4P
- Number of poles: 1 P, 2 P, 4 P
- The short-circuit breaking capacity is: 6 kA, "energy limiting" class 3
- Terminal capacity from 1 up to 35 mm^2 rigid wire or 1.5 up to 25 mm^2 flexible wire
- Screw head suitable for flat or Pozidrive screwdriver
- Can be connected by means of both pin or fork busbars
- The toggle can be sealed in the ON or OFF position
- Rapid closing
- Both incoming and outgoing terminals have a protection degree of IP 20 and they are sealable
- Isolator function thanks to Red/Green printing on the toggle
- Maximum voltage: 1 P - 250 V, 2 P - 500 V, 4 P-880 V Poles in series
- Two position rail clip
- Mechanical shock resistance 40 g (direction x, y, z) minimum 18 shocks 5 ms half-sinusoidal according to IEC 60068-2-27
- Vibration resistance: 3 g (direction x, y, z) minimum 30 min. according to IEC 60068-2-6
- Extensions can be added on both left or right hand side
  - Auxiliary contact
  - Shunt trip
  - Undervoltage release
  - Motor operator
  - Panelboard switch

MCB Series Din-T 10H

- According to AS/NZS 60947.2 standard
- For DIN rail mounting (top hat rail 35 mm)
- Working ambient temperature from -25 °C up to +50 °C
- 1 pole is a module 1.5 module (27mm)
- Nominal rated currents are: 80/100/125 A
- Tripping characteristics: B, C, D
- Number of poles: 1 P, 2 P, 3 P, 4 P
- The short-circuit capacity is: 10 kA
- Terminal capacity from 2.5 up to 70 mm^2
- The toggle can be sealed in the ON or OFF position
- Both incoming and outgoing terminals have a protection degree of IP 20 and they are sealable
- Isolator function thanks to red/green printing on the toggle. It can be used as a main switch
- Maximum voltage between two phases: 440 V~
- Two position rail clip
- Mechanical shock resistance 40 g (direction x, y, z) minimum 18 shocks 5 ms half-sinusoidal according to IEC 60068-2-27
- Extensions can be added
  - Auxiliary contact
  - Shunt trip
- Endurance:
  - Mechanical: 10000 operations
  - Electrical: 4000 operations

Din-T MCBs + RCDs Technical data

Series					Din-T6 AS/NZS 60898	Din-T 2-in-1 AS/NZS 60898	Din-T Easy-fit AS/NZS 60898	Din-TDC AS/NZS 60898
Standards (Aust / NZ / International)					IEC 60898	IEC 60898	IEC 60898	IEC 60898
Tripping characteristics					C, D	C	C	B, C
Nominal current				A	2 - 63	2 - 40	6 - 63	1P/ 2P 0.5 - 63, 4P 10 - 63
Calibration temperature				°C	30	30	30	30
Number of poles (# mod)					1P/2P/3P	1P + 1P/2P/3P/4P	1P/3P	1P/2P/4P
Neutral pole protected					yes	yes	yes	-
Nominal voltage Un	AC	1 P		V	240/415	240/415	240/415	240/415
		3 P/4 P		V	415	415	415	415
	DC	1 P		V DC	48	-	48	250
		2 P		V DC	110 [1])	-	110 [1])	500 [1])
Frequency				Hz	50/60	50/60	50/60	50/60
				Hz	DC: mag.trip +40 %	-	DC: mag.trip +40 %	DC: mag.trip +40 %
				Hz	400: mag.trip +50 %	-	400: mag.trip +50 %	400: mag.trip +50 %
Maximum service voltage Ubmax between two wires				V	250/440; 53/120	250/440; 53/120	250/440; 53/120	250/500/880
Minimum service voltage Ubmin				V	12; 12	12; 12	12; 12	12; 12
Selectivity class (IEC 60898)					3	3	3	3
Isolator application	IEC 60947-2				yes	yes	yes	yes
Rated insulation voltage	Pollution degree 2			V	500	500	500	500
	Pollution degree 3			V	440	440	440	440
Impulse withstand test voltage				kV	6	6	6	6
Insulation resistance				mOhm	10,000	10,000	10,000	10,000
Dielectric rigidity				kV	2.5	2.5	2.5	2.5
Vibration resistance (in x, y, z direction) (IEC 77/16.3)					3 g	3 g	3 g	5 g
Endurance	Electrical at Un, In				10,000	10,000	10,000	1000
	mechanical				20,000	20,000	20,000	20,000
Utilisation category (IEC 60947-2)					A	A	A	A
Protection degree (outside / inside, in enclosure with door)					IP 20/IP 40	IP 20/IP 40	IP 20/IP 40	IP 20/IP 40
Self-extinguish degree (according to UL94)					V2	V2	V2	V2
Tropicalisation (according to IEC 60068-2 / DIN 40046)				°C/RH	+55 °C/95 % RH	+55 °C/95 % RH	+55 °C/95 % RH	+55 °C/95 % RH
Operating temperature				°C	-25/+55	-25/+55	-25/+55	-25/+55
Storage temperature				°C	-55/+55	-55/+55	-55/+55	-55/+55
Terminal capacity Rigid cable min/max (top)				mm²	1/35	1/35	2 x 4	1/35
	Flexible cable min*/max (top)			mm²	0.75/25	0.75/25	2 x 4	0.75/25
	Rigid cable min/max (bottom)			mm²	1/35	1/35	1/35	1/35
	Flexible cable min*/max (bottom) (* Flexible cable 0.75/1/1.5 mm² with cable lug)			mm²	0.75/25	0.75/25	0.75/25	0.75/25
	Torque			Nm	4.5	-	-	4.5
Add-on devices (side add-on)	Auxiliary contacts				yes	yes	yes	yes
	UVT				yes	yes	yes	yes
	Shunt trip				yes	-	yes	yes
	Motor operator				yes	-	yes	yes
	Panelboard switch				yes	-	yes	yes
Busbar systems	Pin (top/bottom)				yes/yes	yes/yes	-/yes	yes/yes
	Fork (top/bottom)				-/yes	-/-	-/-	yes/yes
Accessories					yes	yes	yes	yes
Dimensions, weights, packaging								
	(HxDxW) 86x68xW			mm/mod.	18	18	18	18
	Weight/mod.			g	120	-	125	125
	Package			mod.	12	12	12	12
Short-circuit capacity AC			**(kA)**		**AS/NZS 60898**	**AS/NZS 60898**	**AS/NZS 60898**	**AS/NZS 60898**
IEC 60898	Icn	1 P	230/400 V		6	6	6	6 (250 V DC) [3])
		2 P	230/400 V		6	6	6	6 (500 V DC) [4])
		3 P/4 P	230/400 V		6	6	6	6 (880 V DC)
	Ics (service)				100 % Icn	-	100 % Icu	100 % Icn
IEC 60947-2	Icu (ultimate)	1 P	127 V		20	-	20	-
			240 V		10	-	10	10 [5])
			415 V		3	-	3	-
		2 P	127 V		-	-	30	-
			240 V		15	-	20	-
			415 V		10	-	10	10 [5])
		3 P, 4 P	240 V		15	-	20	-
			415 V		10	-	10	-
			440 V		6	-	6	-
	Ics (service)				75 % Icu	-	75 % Icu	-
	NEMA AB1 (120/240V)				20	-	-	-
Short-circuit capacity DC			**(kA)**			-		
IEC 60947-2	Icu (ultimate)	1 P	≤60 V		20	-	20	-
			≤220 V		-	-	-	-
		2 P	≤125 V		25	-	25	-
			≤440 V		-	-	-	-
	Ics (service)				100 % Icu	-	100 Icu	-

Notes: Refer page 3 - 25 for information on Safe-T MCBs.

[1]) Poles in series
[2]) 0.5-4 A/6-25 A/32-40 A/50-63 A
[3]) 10 (125 V DC)
[4]) 10 (250 V DC)
[5]) On request.

Din-T MCBs + RCDs Technical data

Series					Din-T10 AS/NZS 60898	Din-T10H AS/NZS 60947-2	Din-T15 AS/NZS 60947-2
Standards (Aust / NZ / International)					IEC 60898	IEC 60947-2	IEC 60947-2
Tripping characteristics					B, C, D	C, D	C
Nominal current				A	B6 -63 , C/D 0.5 - 63	80 up to 125	0.5-63
Calibration temperature				°C	30	40	40
Number of poles (# mod)					1/2/3/4	1/2/3/4	1/2/3/4
Neutral pole protected					yes	Yes	Yes
Nominal voltage Un	AC	1 P		V	240/415	240/415	240/415
		3 P/4 P		V	415	415	415
	DC	1 P		V DC	48	48	48
		2 P		V DC	110 [1])	110 [1])	110 [1])
Frequency				Hz	50/60	50/60	50/60
				Hz	DC: mag.trip +40 %	DC: mag.trip +40 %	DC: mag.trip +40 %
				Hz	400: mag.trip +50 %	400: mag.trip +50 %	400: mag.trip +50 %
Maximum service voltage Ubmax between two wires				V	250/440; 53/120	250/440; 53/120	250/440; 53/120
Minimum service voltage Ubmin				V	12; 12	12; 12	12; 12
Selectivity class (IEC 60898)					3	-	-
Isolator application	IEC 60947-2				yes	yes	yes
Rated insulation voltage	Pollution degree 2			V	500	500	500
	Pollution degree 3			V	440	440	440
Impulse withstand test voltage				kV	6	6	6
Insulation resistance				mOhm	10,000	10,000	10,000
Dielectric rigidity				kV	2.5	2.5	2.5
Vibration resistance (in x, y, z direction) (IEC 77/16.3)					3 g	3 g	3 g
Endurance	Electrical at Un, In				10,000	4000	4000
	mechanical				20,000	20,000	20,000
Utilisation category (IEC 60947-2)					A	A	A
Protection degree (outside / inside, in enclosure with door)					IP 20/IP 40	IP 20/IP 40	IP 20/IP 40
Self-extinguish degree (according to UL94)					V2	V2	V2
Tropicalisation (according to IEC 60068-2 / DIN 40046)				°C/RH	+55 °C/95 % RH	+55 °C/95 % RH	+55 °C/95 % RH
Operating temperature				°C	-25/+55	-25/+55	-25/+55
Storage temperature				°C	-55/+55	-55/+55	-55/+55
Terminal capacity Rigid cable min/max (top)				mm²	1/35	70	1/35
	Flexible cable min*/max (top)			mm²	0.75/25	-	0.75/25
	Rigid cable min/max (bottom)			mm²	1/35	70	1/35
	Flexible cable min*/max (bottom) (* Flexible cable 0.75/1/1.5 mm² with cable lug)			mm²	0.75/25	-	0.75/25
	Torque			Nm	4.5	5	4.5
Add-on devices (side add-on)	Auxiliary contacts				yes	yes	yes
	UVT				yes	-	yes
	Shunt trip				yes	yes	yes
	Motor operator				yes	-	yes
	Panelboard switch				yes	-	yes
Busbar systems	Pin (top/bottom)				yes/yes	-	yes/yes
	Fork (top/bottom)				-/yes	-	-/yes
Accessories					yes	-	yes
Dimensions, weights, packaging							
	(HxDxW) 86x68xW			mm/mod.	18	27	18
	Weight/mod.			g	120	210	120
	Package			mod.	12	8	12
Short-circuit capacity AC			**(kA)**		**AS/NZS 60898**	**AS/NZS 60947-2**	**AS/NZS 60947-2**
IEC 60898	Icn	1 P		230/400 V	10	-	-
		2 P		230/400 V	10	-	-
		3 P/4 P		230/400 V	10	-	-
	Ics (service)				75 % Icn	-	-
IEC 60947-2	Icu (ultimate)	1 P		127 V	30	-	50
				240 V	15	C 10; D 7.5	50/25/20/15 [2])
				415 V	4	4.5	-
		2 P		127 V	40	-	-
				240 V	30	C 15	50/50/40/30 [2])
				415 V	15	C 10; D 7.5	50/25/20/15 [2])
		3 P, 4 P		240 V	30	B/C 15	50/50/40/30 [2])
				415 V	15	C 10; D 7.5	50/25/20/15 [2])
				440 V	10	-	50/20/15/10 [2])
	Ics (service)				50 % Icu	100 % Icu	75 % Icu
	NEMA AB1 (120/240V)				30	-	-
Short-circuit capacity DC			**(kA)**				
IEC 60947-2	Icu (ultimate)	1 P		≤60 V	25	10	25
				≤220 V	-	-	-
		2 P		≤125 V	30	15	30
				≤440 V	-	-	-
	Ics (service)				100 % Icu	100 % Icu	100 % Icu

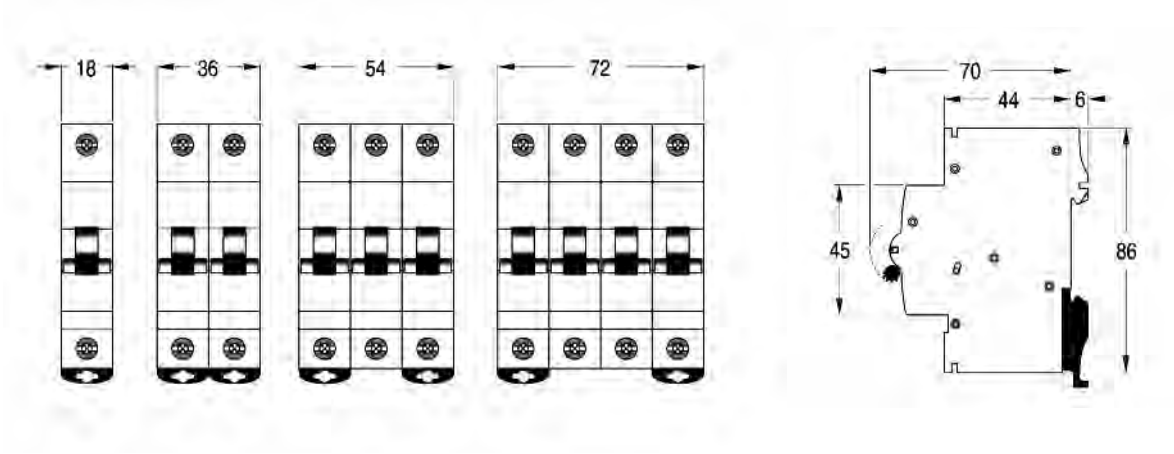
Notes: Refer page 3 - 25 for information on Safe-T MCBs.

[1]) Poles in series
[2]) 0.5-4 A/6-25 A/32-40 A/50-63 A
[3]) 10 (125 V DC)

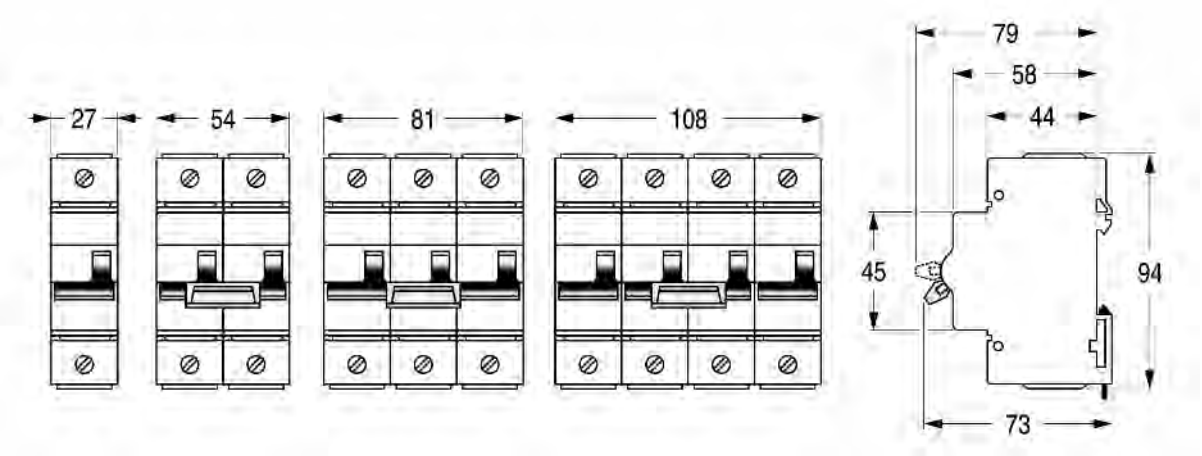
Din-T MCBs + RCDs Technical data

Miniature circuit breakers - Din-T 6, 10, 15 / Easy-fit

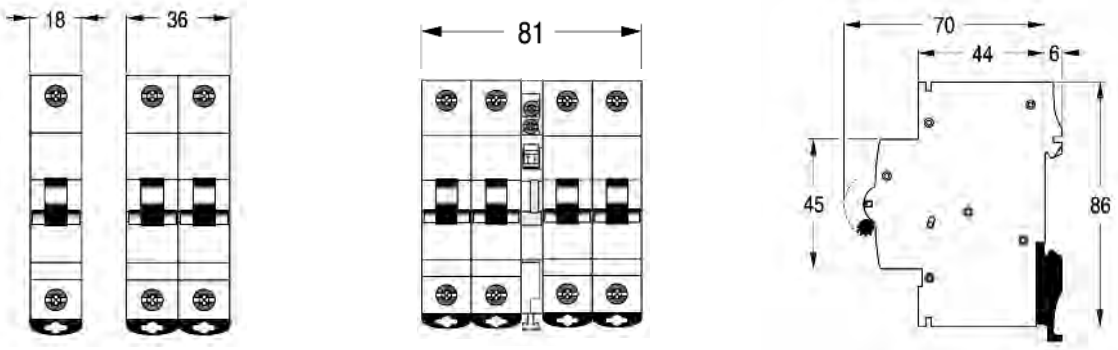
Dimensions in mm.



Miniature circuit breakers - Din-T 10H



Miniature circuit breakers - Din-T DC



Safe-T MCBs + RCDs Technical data
Safe-T series 6 kA MCB

Safe-T 6 kA MCB

Technical data

Number of poles		1	2	3	4
Width	(mm)	25	50	75	100
Depth	(mm)	60	60	60	60
Rated voltage	(V AC)	240/440	240/440	440	440
Highest rated current	(A)	100	100	100	100

Fluorescent lighting switching duty - UL 489

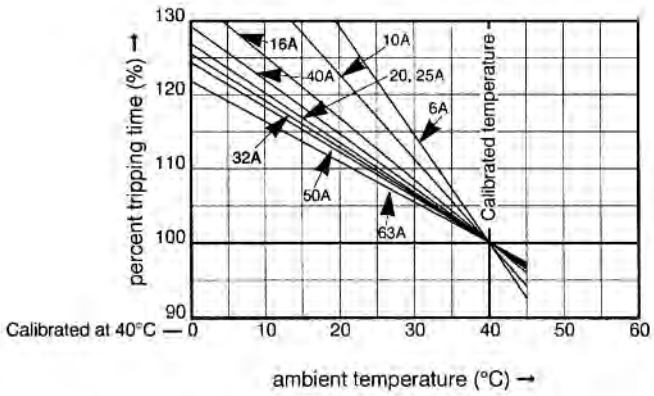
Standard Safe-T 16 and 20 amp MCBs are designed to be suitable for fluorescent light switching duty as per the requirements of UL 489 issued by Underwriters Laboratories (USA).

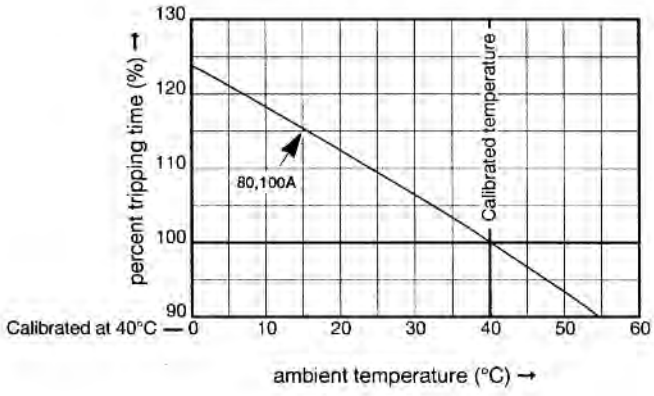
Performance standards to regularly switch banks of fluorescent lights ON and OFF requires the MCB to withstand higher inrush current (up to 30 times normal rating). If the MCB cannot withstand this inrush current, contact erosion and excess temperature rise will be experienced. Safe-T 16 and 20 amp MCBs have been designed to withstand this type of duty.

Ambient temperature influence

The thermal calibration of the Safe-T series was carried out at 40 °C. Temperatures above or below will alter the trip characteristics controlled through the bi-metal.

See curves below





Short circuit capacity 6000 amps

In (A)	6 - 100
1 P	240 - 440 V AC
2 P	240 - 440 V AC
3 P	440 V AC
4 P	440 V AC

DC use

	1 P	2 P [1])
Short circuit	1000 A	5000 A
Max. voltage	125 V DC	125 V DC

Use at DC

When using Safe-T in a DC application the magnetic tripping current is 40% higher than in AC 50/60 Hz.

Vibration resistance (In X, Y, Z directions)

Vibration frequency 600-1500 cycles per minute with amplitude of 2 mm conducted for 1 hour.

Storage temperature

From -25 °C to +55 °C.

Operating temperature

From -25 °C to +55 °C.

Use at 400 Hz

At 400 Hz the magnetic trip curves are 50 % higher than in AC 50/60 Hz.

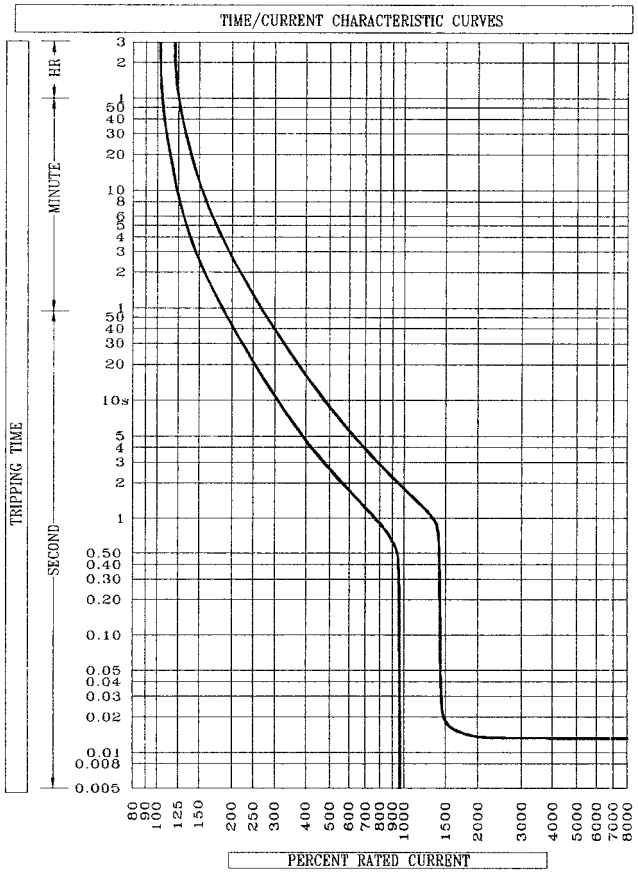
Voltage drop and energy loss

In (A)	Voltage drop (V)	Energy loss (W)
6-10	0.066	0.66
16	0.081	1.14
20	0.083	1.66
32	0.078	2.20
40	0.069	2.77
50	0.075	3.75
63	0.095	5.99
80	0.092	7.36
100	0.082	8.20

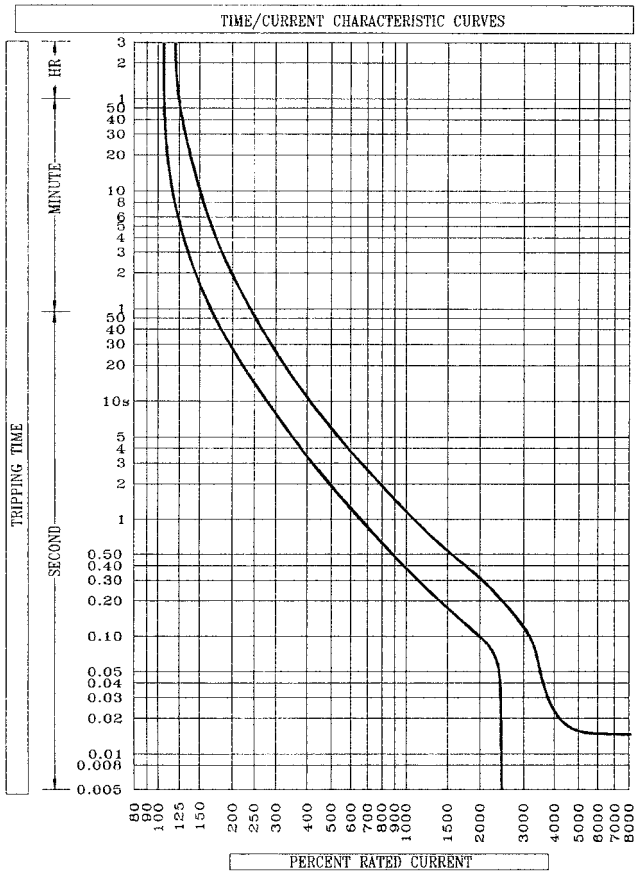
Note: [1]) 2 poles in series

Safe-T MCBs + RCDs Technical data
Tripping characteristics Safe-T series MCB

Safe-T (80-100 amp)



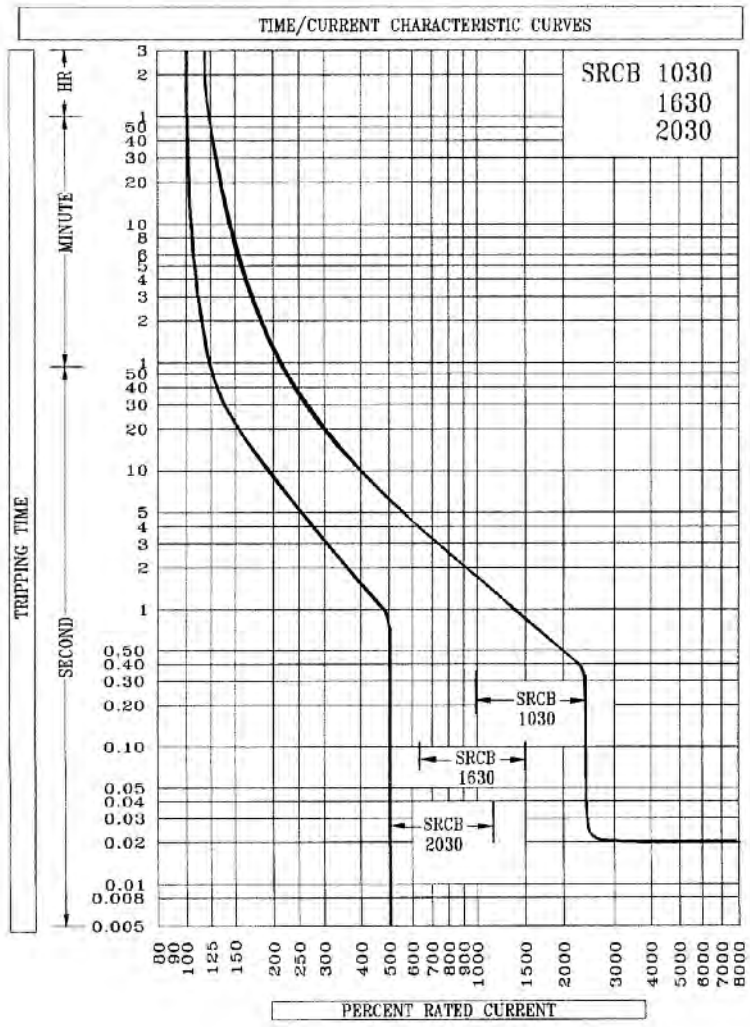
Safe-T (20 amp) [1])

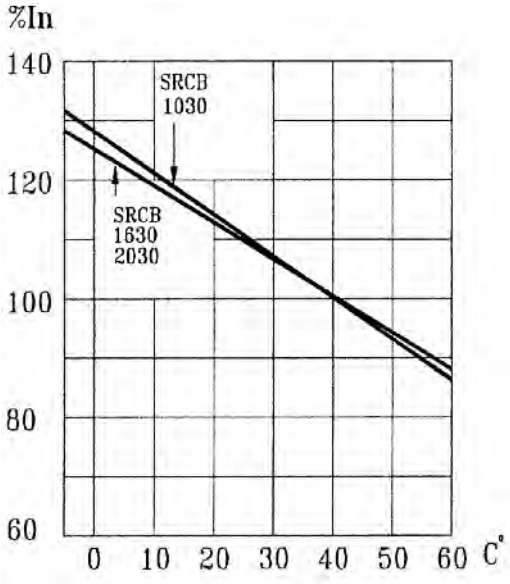


Note: [1]) Typical curve only shown, for other current ranges refer NHP.

Safe-T MCBs + RCDs Technical data

Tripping characteristics Safe-T SRCB, temperature compensation



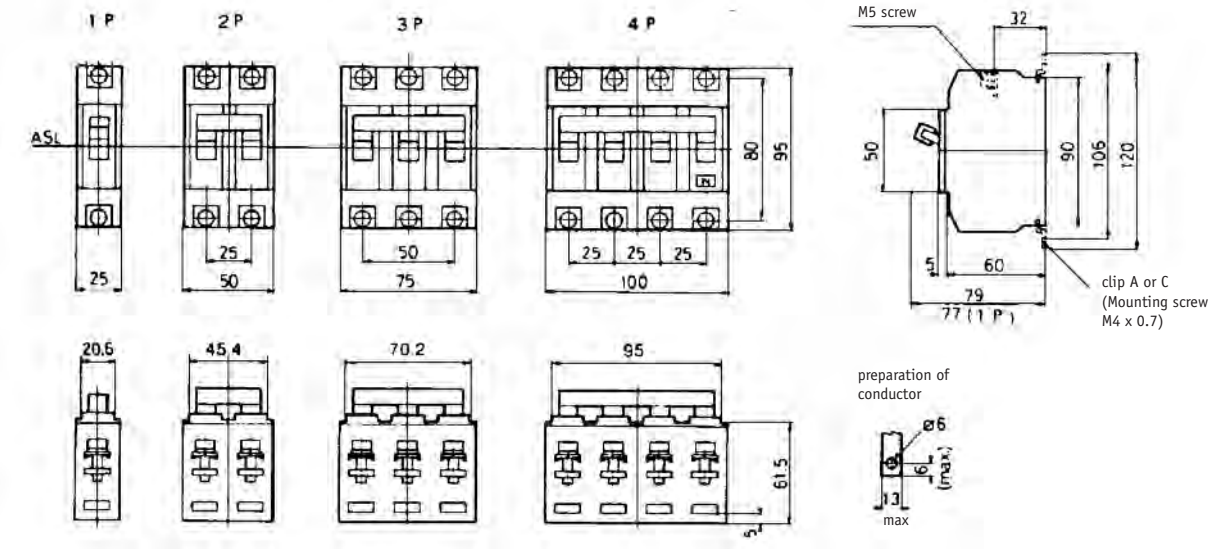


TEMPERATURE COMPENSATING CURVE

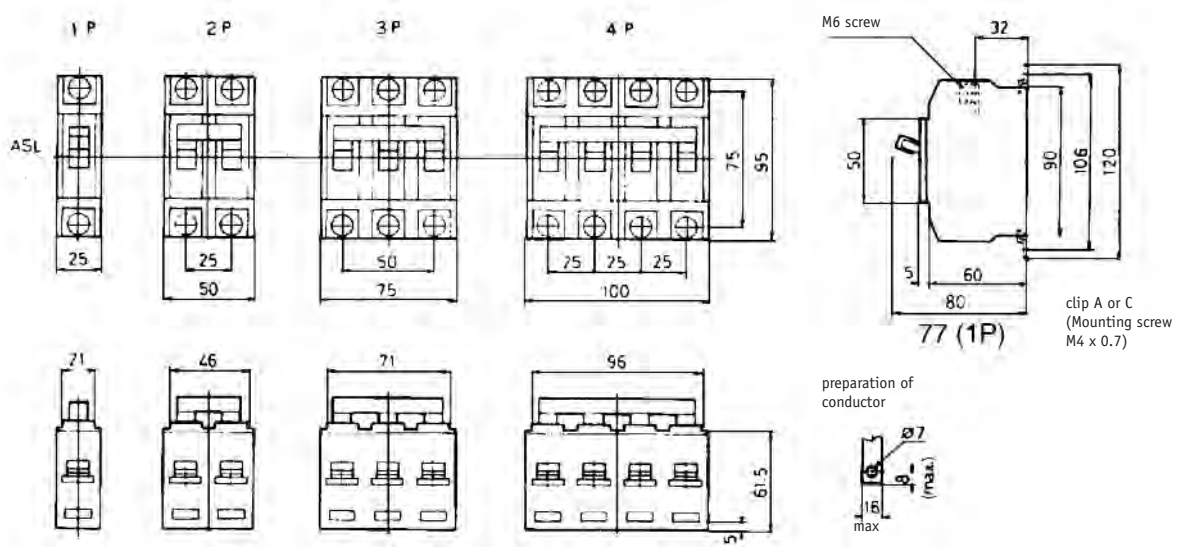
Safe-T MCBs + RCDs Technical data

Dimensions (mm) Safe-T series

Safe-T (6-63 A) MCBs



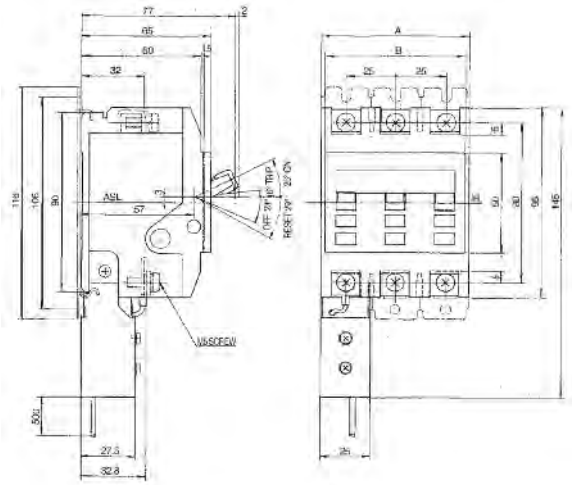
Safe-T (80-100 A) MCBs



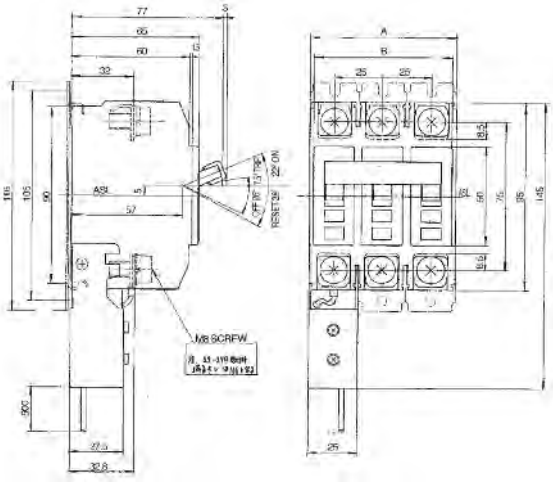
All dimensions in mm

Safe-T MCBs + RCDs Technical data
Dimensions (mm) Safe-T with shunt trip

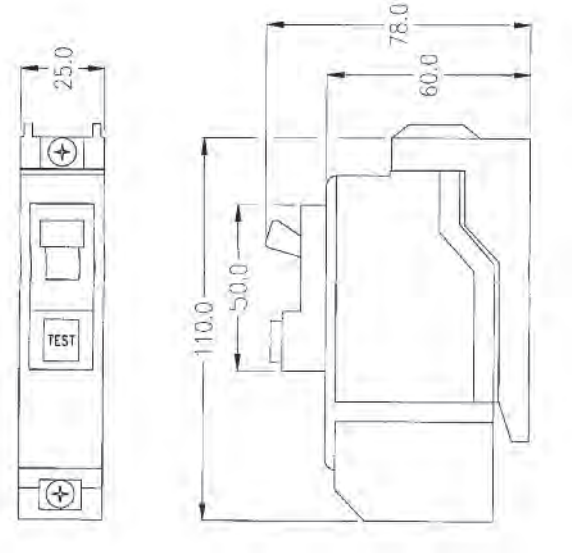
Safe-T shunt (6-63 A)



Safe-T shunt (80-100 A)



Safe-T (SRCB) RCBO



All dimensions in mm

Din-T MCBs + RCDs Technical data

What is an RCD?

The RCD (Residual Current Device) is a device intended to protect people against indirect contact, the exposed conductive parts of the installation being connected to an appropriate earth electrode. It may be used to provide protection against fire hazards due to a persistent earth fault current, without operation of the overcurrent protective device.

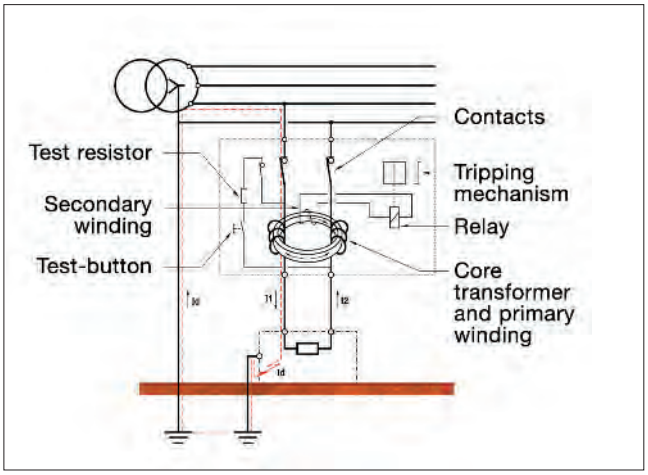
RCDs having a rated residual operating current not exceeding 30 mA are also used as a means for additional protection in case of failure of the protective means against electric shock (direct contact).

Working Principle

The main components of an RCD are the following:

- The core transformer: which detects the earth fault current.
- The relay: when an earth fault current is detected, the relay reacts by tripping and opening the contacts.
- The mechanism: element to open and close the contacts either manually or automatically.
- The contacts: to open or close the main circuit.

The RCD constantly monitors the vectorial sum of the current passing through all the conductors. In normal conditions the vectorial sum is zero (I1+I2=0) but in case of an earth fault, the vectorial sum differs from zero (I1+I2=Id), this causes the actuation of the relay and therefore the release of the main contacts.



Definitions related to RCDs

RCCB = Residual Current Circuit Breaker *without* overcurrent protection.

RCBO = Residual Current Circuit Breaker *with* overcurrent protection.

Breaking capacity

A value of AC component of a prospective current that an RCCB is capable of breaking at a stated voltage under prescribed conditions of use and behaviour.

Residual making and breaking capacity (I∆m)

A value of the AC component of a residual prospective current which an RCCB can make, carry for its opening time and break under specified conditions of use and behaviour.

Conditional residual short-circuit current (I∆c)

A value of the AC component of a prospective current which an RCCB protected by a suitable SCPD (short-circuit protective device) in series, can withstand, under specific conditions of use and behaviour.

Conditional short-circuit current (Inc)

A value of the AC component of a residual prospective current which an RCCB protected by a suitable SCPD in series, can withstand, under specific conditions of use and behaviour.

Residual short-circuit withstand current

Maximum value of the residual current for which the operation of the RCCB is ensured under specified conditions, and above which the device can undergo irreversible alterations.

Prospective current

The current that would flow in the circuit, if each main current path of the RCCB and the overcurrent protective device (if any) were replaced by a conductor of negligible impedance.

Making capacity

A value of AC component of a prospective current that an RCCB is capable to make at a stated voltage under prescribed conditions of use and behaviour.

Open position

The position in which the predetermined clearance between open contacts in the main circuit of the RCCB is secured.

Closed position

The position in which the predetermined continuity of the main circuit of the RCCB is secured.

Tripping time

The time which elapses between the instant when the residual operating current is suddenly attained and the instant of arc extinction in all poles.

Residual current (I∆n)

Vector sum of the instantaneous values of the current flowing in the main circuit of the RCCB.

Residual operating current

Value of residual current which causes the RCCB to operate under specified conditions.

Rated short-circuit capacity (Icn)

Is the value of the ultimate short-circuit breaking capacity assigned to the circuit breaker. (Only applicable to RCBO).

Conventional non-tripping current (Int)

A specified value of current which the circuit breaker is capable of carrying for a specified time without tripping. (Only applicable to RCBO).

Conventional tripping current (It)

A specified value of current which causes the circuit breaker to trip within a specified time.
(Only applicable to RCBO).

Din-T MCBs + RCDs Technical data

RCDs classification according to AS/NZS 61008/61009

RCDs may be classified according to:

The behaviour in the presence of DC current

(types for general use).

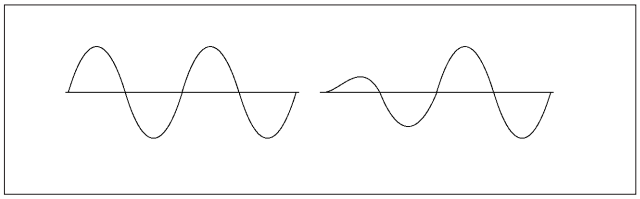
- Type AC
- Type A

The time-delay (in the presence of residual current)

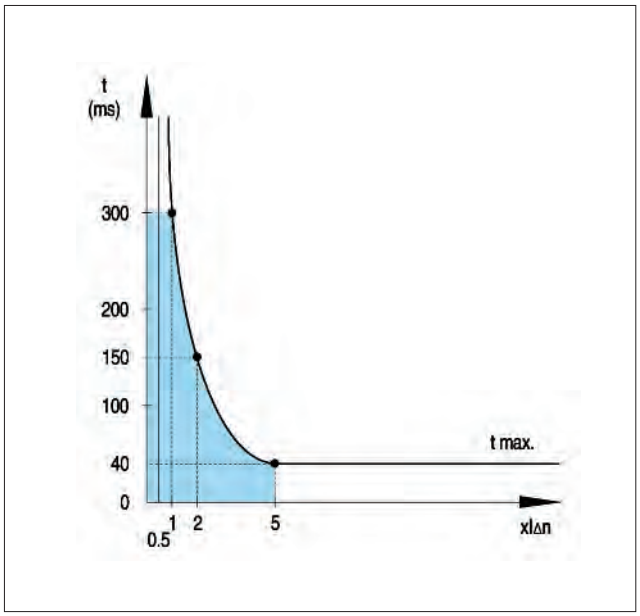
- RCDs without time delay: type for general use
- RCDs with time delay: type S for selectivity

Type AC

The type AC RCDs are designed to release with sinusoidal residual currents which occur suddenly or slowly rise in magnitude.



Residual current	Tripping time
0.5 x IΔn	t = ∞
1 x IΔn	t = <300 ms
2 x IΔn	t = <150 ms
5 x IΔn	t = ≤40 ms



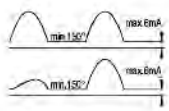
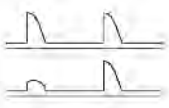
Tripping curve type AC

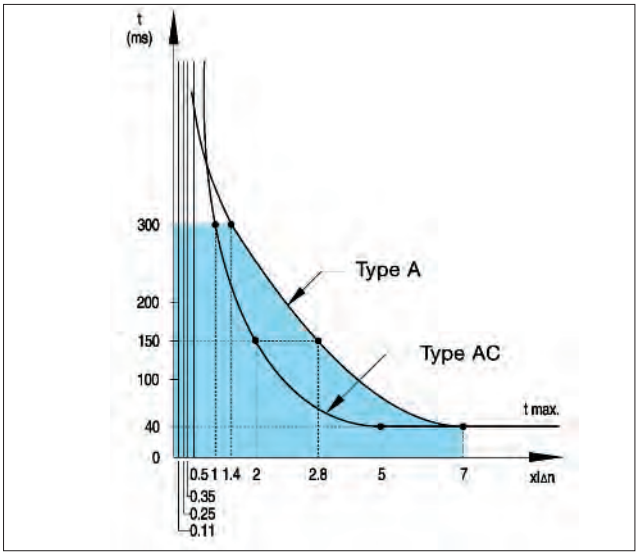
Type A

Certain devices during faults can be the source of non-sinusoidal earth leakage currents (DC components) due to the electronic components e.g. diodes, thyristors etc.

Type A RCDs are designed to ensure that under these conditions the residual current devices operate on sinusoidal residual current and also with pulsating direct current [1]) which occur suddenly or slowly rise in magnitude.

[1]) Pulsating direct current: current of pulsating wave form which assumes, in each period of the rated power frequency, the value 0 or a value not exceeding 0.006 A DC during one single interval of time, expressed in angular measure of at least

	Residual current	Tripping time
1. For sinusoidal residual current		
	0.5 x IΔn	t = ∞
	1 x IΔn	t = <300 ms
	2 x IΔn	t = <150 ms
	5 x IΔn	t = ≤40 ms
2. For residual pulsating direct current		
	At point of wave 0°	
	0.35 x IΔn	t = ∞
	1.4 x IΔn	t = <300 ms
	2.8 x IΔn	t = <150 ms
	7 x IΔn	t = ≤40 ms
	At point of wave 90°	
	0.25 x IΔn	t = ∞
	1.4 x IΔn	t = <300 ms
	2.8 x IΔn	t = <150 ms
	7 x IΔn	t = ≤40 ms
	At point of wave 135°	
	0.11 x IΔn	t = ∞
	1.4 x IΔn	t = <300 ms
	2.8 x IΔn	t = <150 ms
	7 x IΔn	t = ≤40 ms

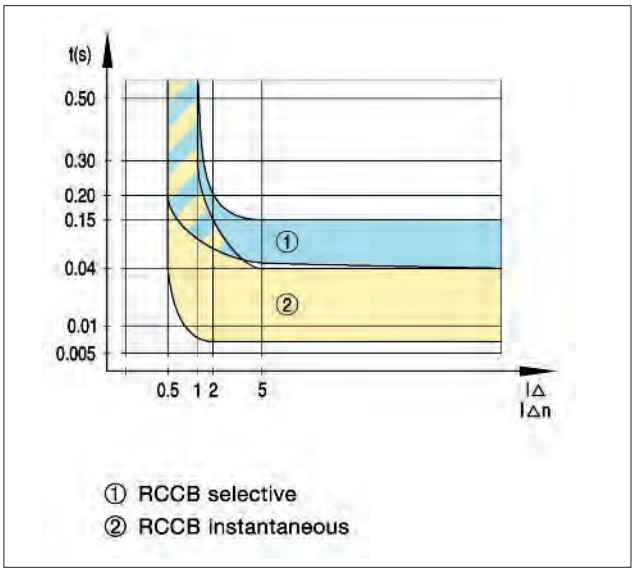


Din-T MCBs + RCDs Technical data
Selectivity

Type S [S] [1])

RCDs type A or AC have instantaneous tripping. In order to provide full people protection in vertical installations with more than one circuit, as well as to ensure the service in the installation in case of earth leakage in one of the circuits, or to avoid unwanted tripping because of harmonics, high connection currents due to the use of motors, reactive loads, or variable speed drives, we need to use selective RCDs at the top of the installation.

Any RCD type S is selective to any other instantaneous RCD installed downstream with lower sensitivity.



Note: [1]) DSRCD Safety switches are available as "S" types.

Type B

In the event of a fault occurring electronic devices can, in addition to AC residual currents and pulsating DC residual currents, give rise to smooth DC and AC residual currents of various frequencies which would not trip Type AC or A residual current circuit-breakers. The Type B devices respond to all types of residual currents in accordance with tripping characteristic B of IEC Standard 60755, i.e. also smooth DC residual currents. Furthermore, AC residual currents of any frequency up to 1 MHz will also be detected.

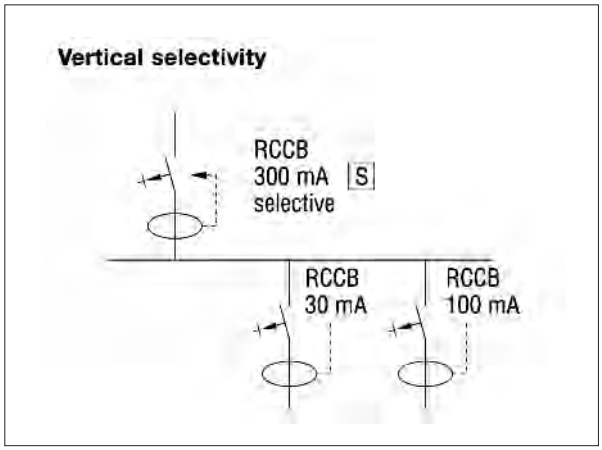
Vertical selectivity

In an installation with RCDs installed in series we need to pay special attention to the vertical selectivity, in order to ensure that in case of earth leakage only, the RCD which is immediately upstream of the fault point will operate.

Selectivity is ensured when the characteristic time/current of the upstream RCD is above the characteristic time/current of the downstream RCD. To obtain vertical selectivity we should take into consideration the following parameters:

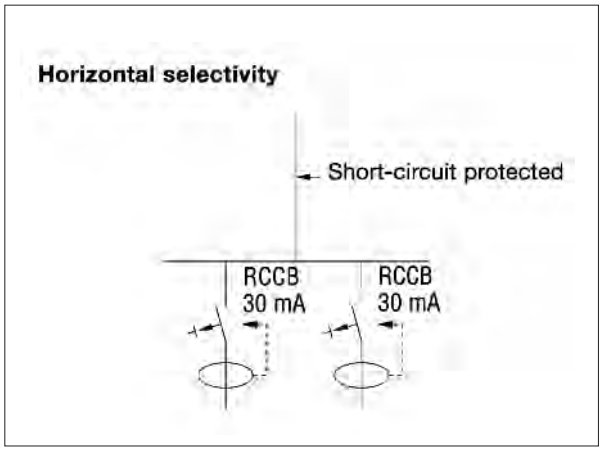
The RCD placed at the top of the installation shall be Type S. The residual operating current of the RCCB installed downstream shall have a lower residual operating current than the RCD installed upstream according to:

IΔn downstream< IΔn upstream/3



Horizontal selectivity

To have horizontal selectivity in an installation with RCDs we need to avoid the use of RCDs in cascading. Every single circuit of the installation shall be provided with an RCD of the appropriate residual operating current. The connection between the back-up protective device and the RCD must be short-circuit protected.



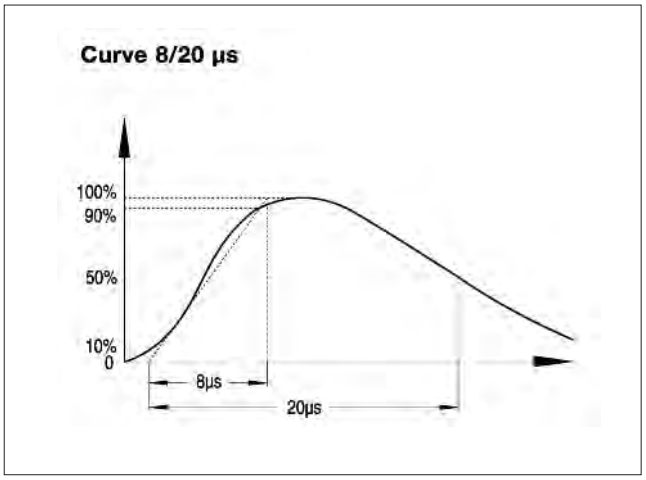
Din-T MCBs + RCDs Technical data

Nuisance tripping

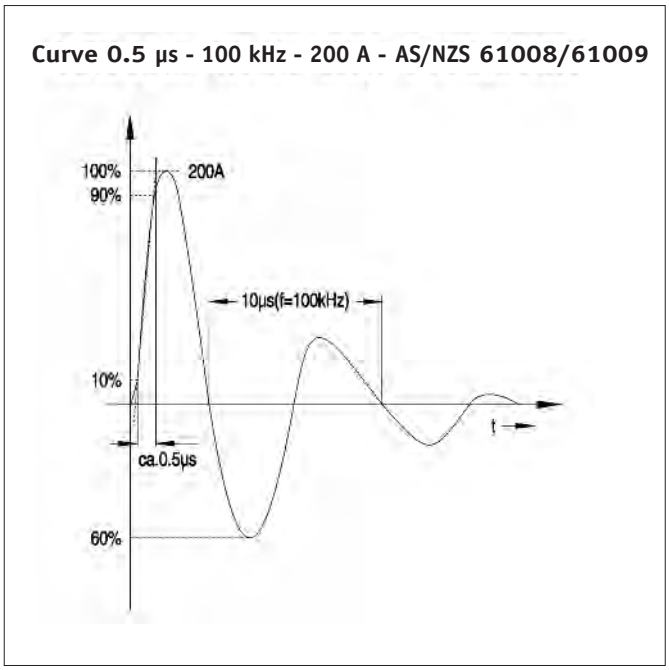
All DinSafe RCDs have a high level of immunity to transient currents, against current impulses of 8/20 µs according to AS/NZS 61008/61009.

Type A, AC.....250 A 8/20 µs

Type AI, S .....3000 A 8/20 µs

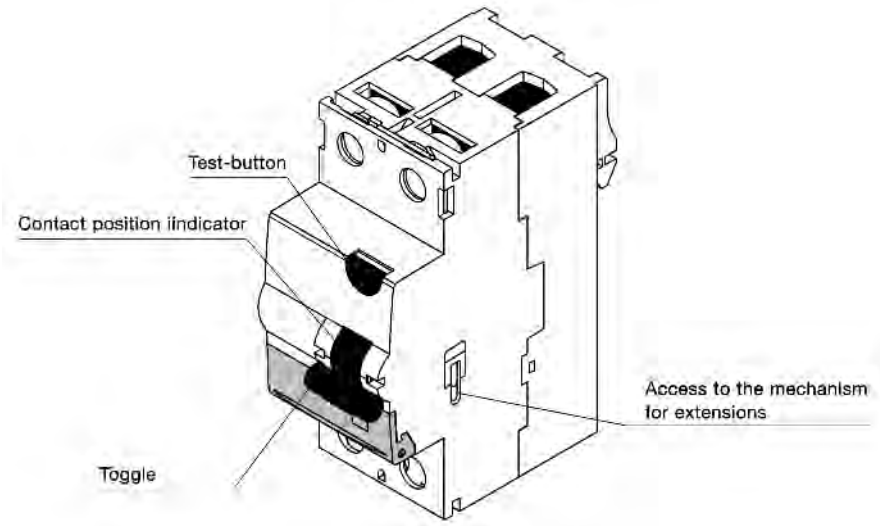


RCDs have a high level of immunity against alternating currents of high frequency 0.5 µs/ 100 kHz according to AS/NZS 61008/61009, up to 200 A.



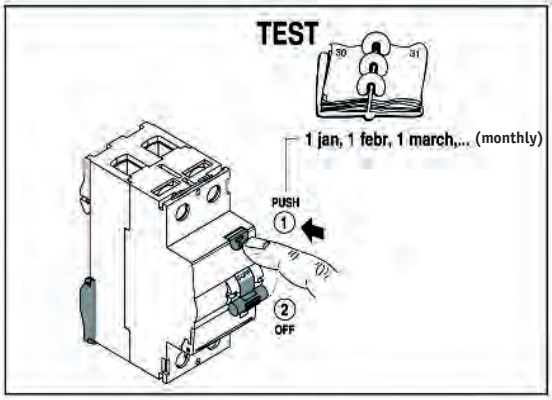
Din-T MCBs + RCDs Technical data

RCCB type Din-Safe (DSRCD) and its use



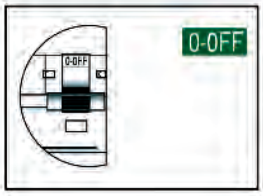
TEST-BUTTON

To ensure the correct functioning of the RCCB, the test button T should be pressed frequently. The device must trip when pressed.

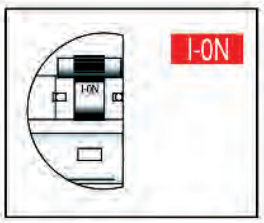


CONTACT POSITION INDICATOR

Printing on the toggle to provide information of the real contact position.



O-OFF
Contacts in open position. Ensure a distance between contacts > 4 mm.



I-ON
Contacts in closed position. Ensure continuity in the main circuit.

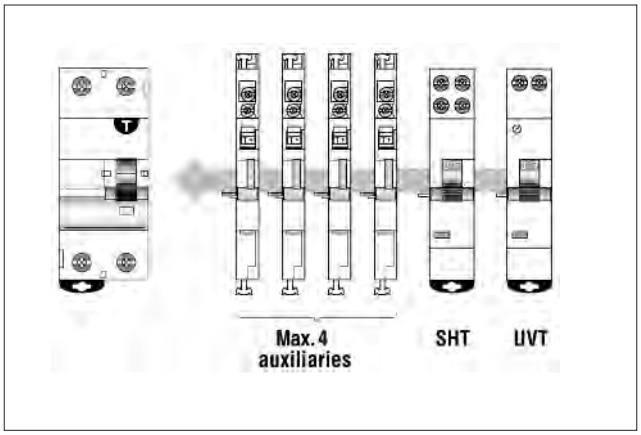
TOGGLE

To switch the RCCB ON or OFF

Din-T MCBs + RCDs Technical data

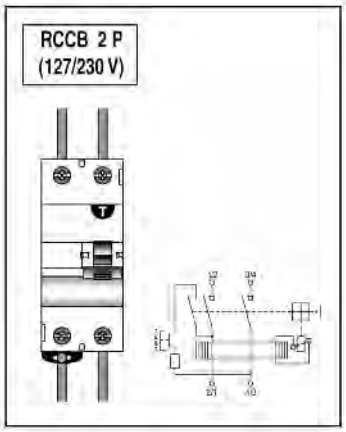
Access to the mechanism for extensions

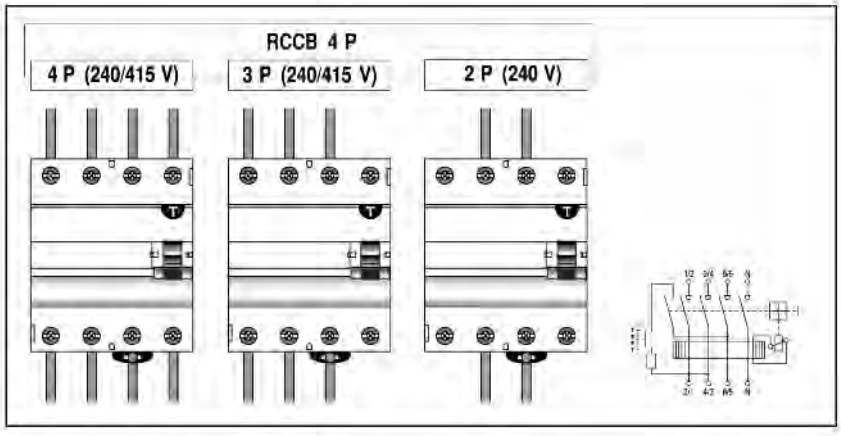
To couple extensions we need to remove the cap on the right hand side of the breaker, in order to get access to the mechanism.
It is possible to add an auxiliary contact, shunt trip, undervoltage release or motor operator, following the stack-on configuration of the extensions in section 1.



All cables must be connected to the RCCB

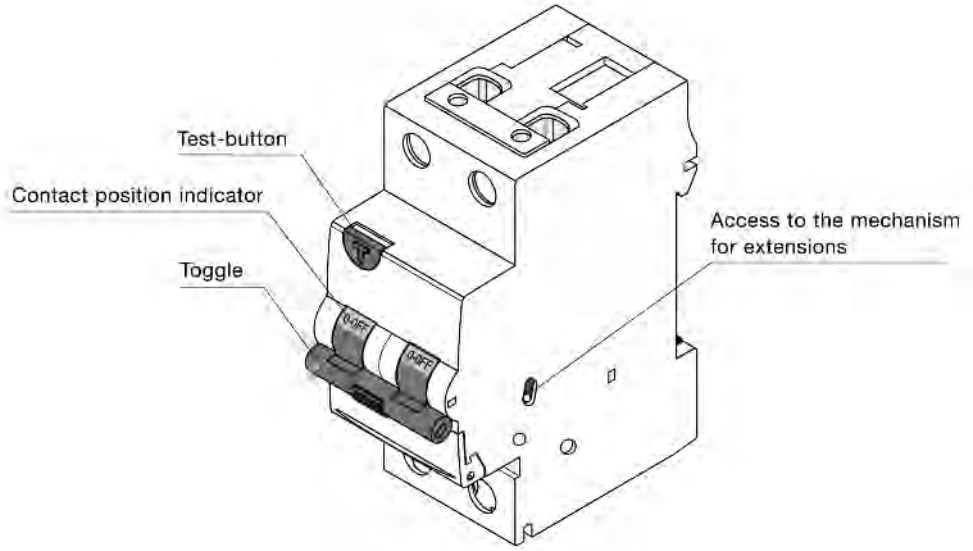
All conductors, phases and neutral, that constitute the power supply of the installation to be protected, must be connected to the RCCB to either upper or lower terminals according to one of the following diagrams.





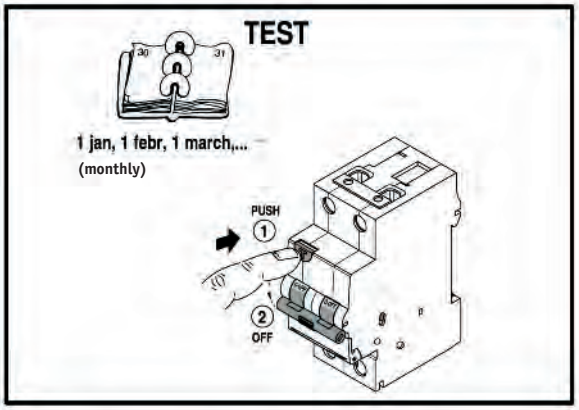
Din-T MCBs + RCDs Technical data

Use of an RCBO Din-Safe (DSRCB)



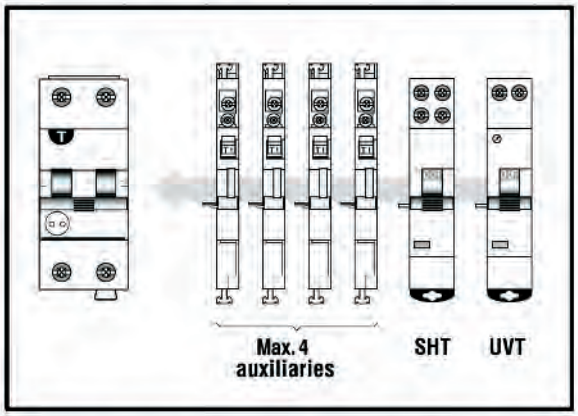
TEST-BUTTON

To ensure the correct functioning of the RCBO, the test button T shall be pressed frequently. The device must trip when the test button is pressed.



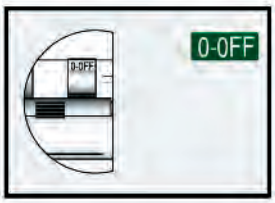
ACCESS TO THE MECHANISM FOR EXTENSIONS

It is possible to add an auxiliary contact, shunt trip, undervoltage release or motor operator, following the stack-on configuration of the extensions in section 4.

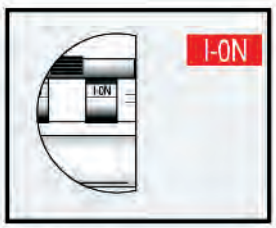


CONTACT POSITION INDICATOR

Printing on the toggle to provide information of the real contact position.



O-OFF
Contacts in open position. Ensure a distance between contacts > 4 mm.



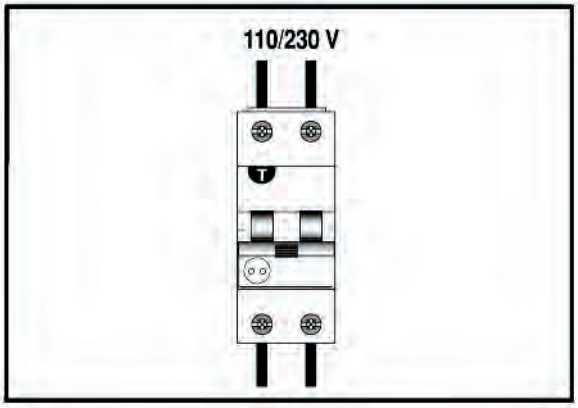
I-ON
Contacts in closed position. Ensure continuity in the main circuit.

TOGGLE

To manually switch the RCBO ON or OFF

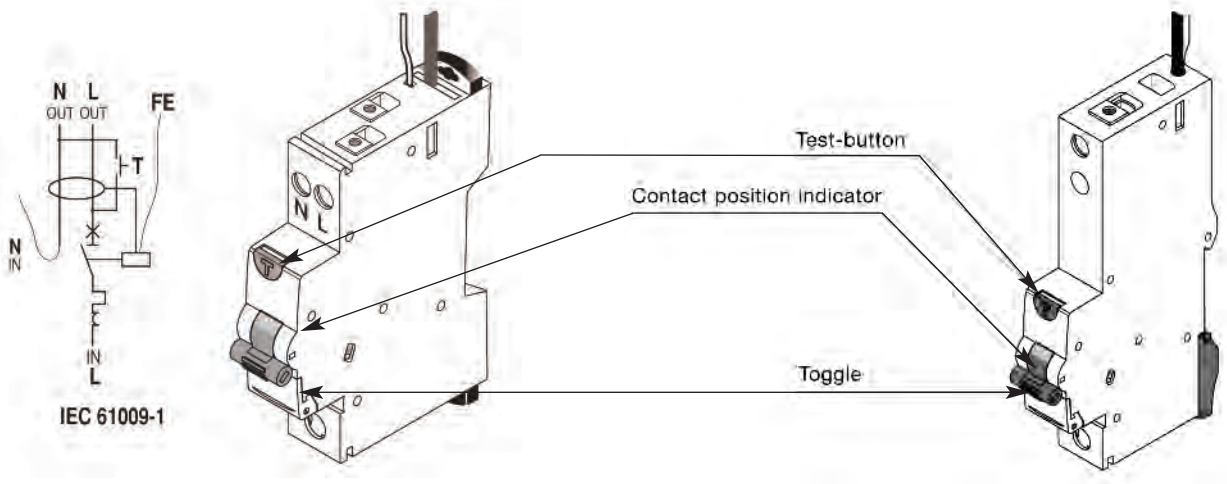
ALL CABLES MUST BE CONNECTED TO THE RCBO

All conductors, phase and neutral, that constitute the power supply of the installation to be protected, must be connected to the RCBO to either upper or lower terminals according to the following diagram.



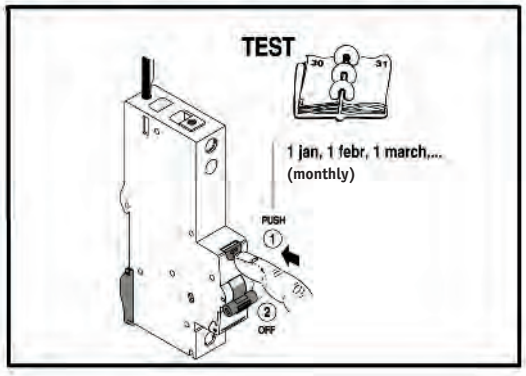
Din-T MCBs + RCDs Technical data

Use of an 1P RCBO



TEST-BUTTON

To ensure the correct functioning of the RCBO, the test-button T shall be pressed frequently. The device must trip when the test-button is pressed.



CONTACT POSITION INDICATOR

Printing on the toggle to provide information of the real contact position.

O-OFF
Contacts in open position. Ensure a distance between contacts > 4 mm.

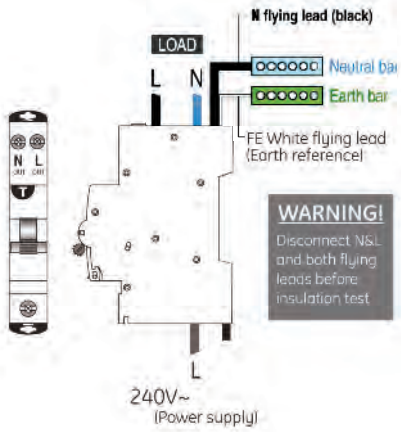
I-ON
Contacts in closed position. Ensure continuity in the main circuit.

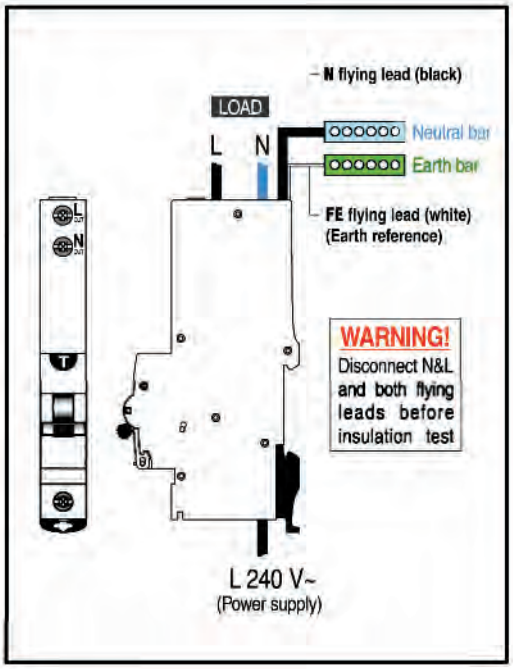
TOGGLE

To manually switch the RCBO ON or OFF

CABLE CONNECTION

The power supply (L) must be done at the bottom terminal, and the supply neutral flying cable (black) shall be connected to the neutral bar.
Load connection shall be done in both terminals at the top side (L out / N out).
The earth reference cable (FE white) ensures protection against earth leakage in case of loss of supply neutral.





Din-T MCBs + RCDs Technical data
Din-Safe-M add-on earth leakage modules

Assembly

To assemble the Din-T MCB and the Din-Safe-M unit follow the steps below:

Place the MCB and Din-Safe-M unit on a flat surface. Be sure that both the MCB and the Din-Safe-M toggles are in the On position.

Slide the two units towards each other and insert the connecting link or links into the MCB tunnel terminal. Do not put any pressure onto the metal pin of the Din-Safe-M unit.

Push in the connecting clip, locking the unit together.

Check that the MCB trips when the toggle on the Din-Safe-M is moved to the OFF position.

Tighten the connections between the MCB and the Din-Safe-M and fit the insulating covers supplied.

After power is applied check unit operation with test button provided on Din-Safe-M module.

If pigtail and N are reversed, the breaker will trip as soon as load is energised.

Reset Din-Safe-M module before switching MCB 'ON'.

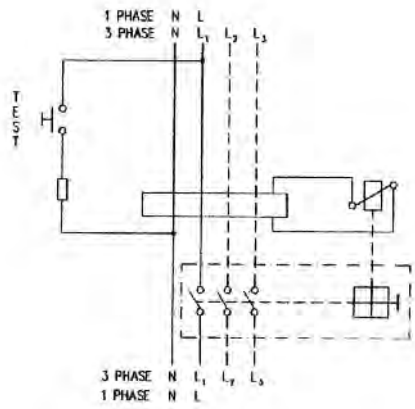
If the unit is feeding three phase load (no neutral) use 3 phase models only.

Din-Safe-M space requirements

Type	Without MCB fitted neutral not switched	MCB fitted neutral not switched	MCB fitted neutral switched
1 P + N 32/63 A	2 modules (36 mm)[1])	3 modules (54 mm)	4 modules (72 mm)
3 P + N 32 A	2 modules (36 mm)[1])	5 modules (90 mm)	6 modules (108 mm)
3 P + N 63 A	3 modules (54 mm)[2])	6 modules (108 mm)	7 modules (126 mm)
3 P 63 A	3 modules (54 mm)[2])	6 modules (108 mm)	N/A

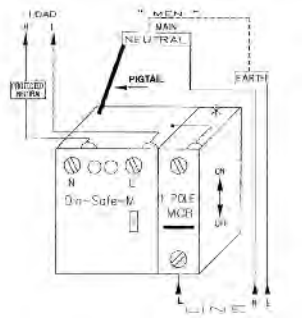
Connection diagram

1 PHASE N L and 3 PHASE N L_1 L_2 L_3

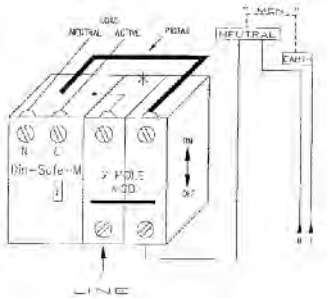


Notes: [1]) Refer diagrams A, B & C on Page 3 - 47.
[2]) Refer diagram D on Page 3 - 47.

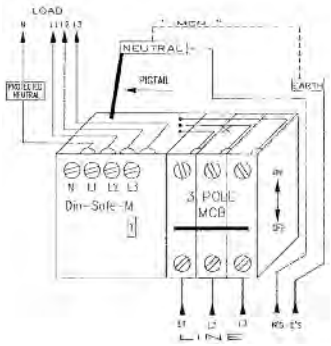
Din-Safe-M 1P + N with 1 pole MCB (Neutral not switched)



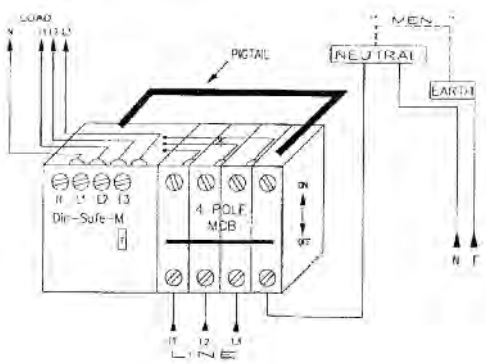
Din-Safe-M 1P + N with 2 pole MCB (Switching active + neutral)



Din-Safe-M 3P + N with 3 pole MCB (Neutral not switching)



Din-Safe-M 3P + N with 4 pole MCB (Switching active + neutral)

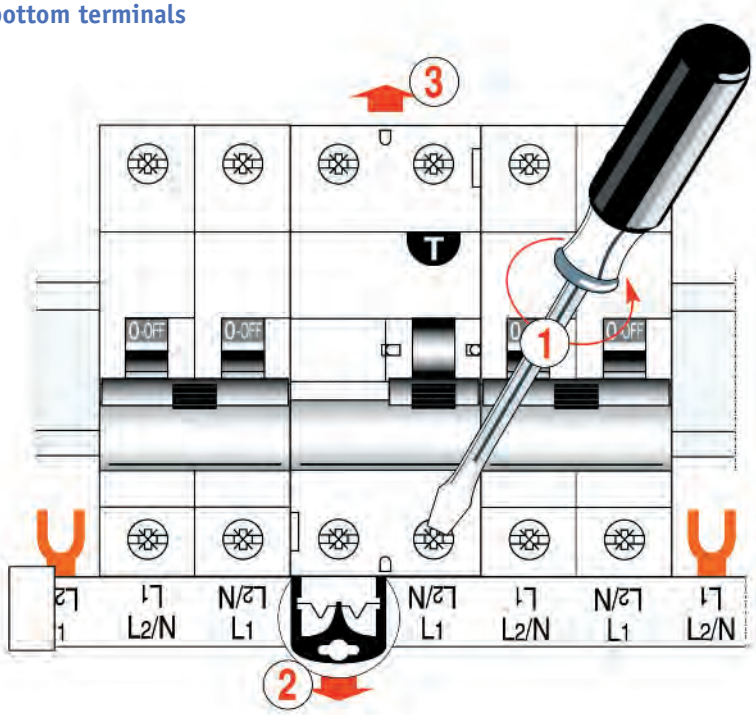


Din-T MCBs + RCDs Technical data
Easy DIN-rail extraction

RCCBs can easily be removed from the DIN rail when installed with busbars, by taking into consideration the following instructions.

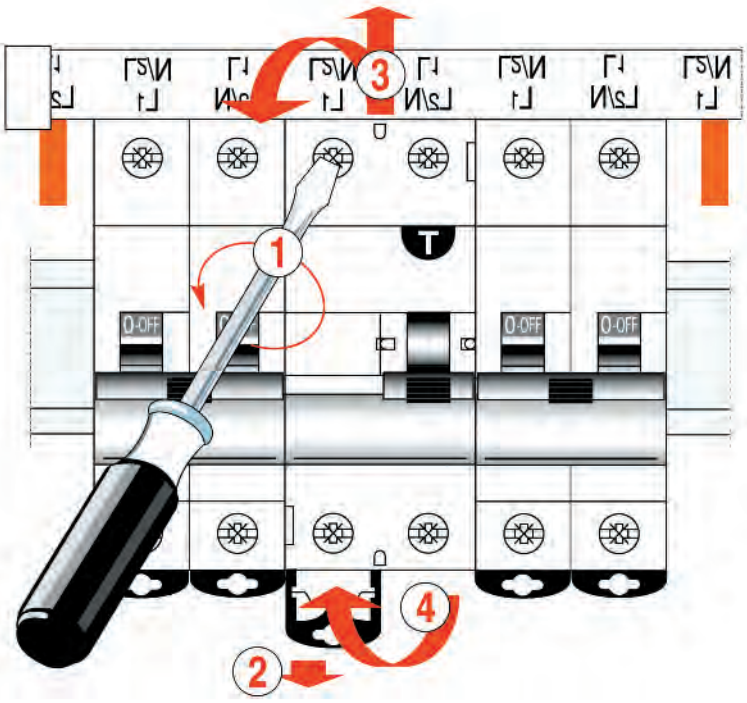
Pin and fork busbar - bottom terminals

① Open the terminals totally
② Unclick the DIN rail clip
③ Lift the RCCB up and remove it from the DIN rail



Pin busbar - top terminals

① Open the terminals totally
② Unclick the DIN rail clip
③ Lift the RCCB up and turn the top side inwards
④ Turn the bottom side inwards and remove the RCCB from the DIN rail



Din-T MCBs + RCDs Technical data
Product related information

Influence of air ambient temperature on the rated current

Influence of temperature on RCCB (DinSafe DSRCD)

The maximum value of the current which can flow through an RCCB depends on the nominal current as well as the ambient air temperature. The protective device placed up-stream of the RCCB must ensure disconnection at the values in the following table:

In	25 °C	30 °C	40 °C	50 °C	60 °C
16 A	19	18	16	14	13
25 A	31	28	25	23	25
40 A	48	44	40	36	32
63 A	76	69	63	57	51
80 A	97	88	80	72	65
100 A	121	110	100	90	81
125 A	151	137	125	112	101

The above-mentioned values are for devices in free air.
For devices installed with other modular devices in the same switchboard, a correction coefficient (K) shall be applied in relation to the number of main circuits in the installation (EN 60439-1):

Number of devices	K
2 or 3	0.9
4 or 5	0.8
6 to 9	0.7
> 10	0.6

Calculation example

Within a distribution panel consisting of eight 16 A MCBs and with an operating ambient temperature of 45 °C, which is the highest temperature the MCB can operate at without unwanted tripping.

Calculation

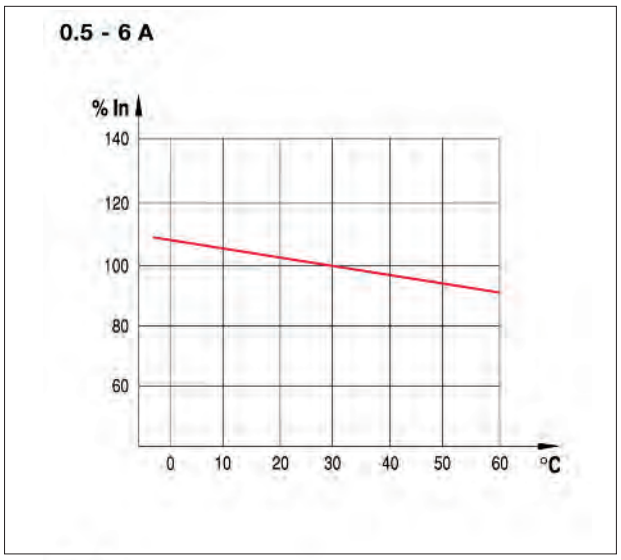
The correction factor K = 0.7, for use in an eight circuit installation: 16 A x 0.7 = 11.2 A

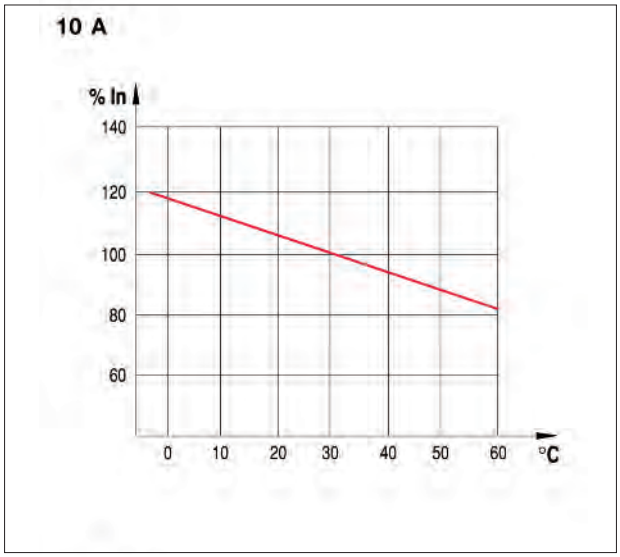
As the MCB is working at 45 °C another factor is applied (90 % = 0.9):

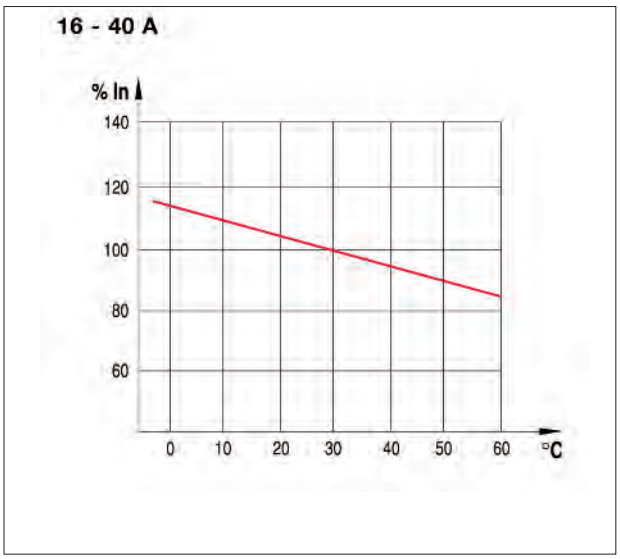
At 45 °C = In at 30 °C x 0.9 = 11.2 A x 0.9 = 10.1 A

Influence of temperature on RCBOs (DinSafe DSRCB)

The thermal calibration of the RCBO was carried out at an ambient temperature of 30 °C. Ambient temperatures different from 30 °C influence the bimetal and this results in earlier or later thermal tripping.







Din-T MCBs + RCDs Technical data

Tripping current as a function of the frequency

All RCDs are designed to work at frequencies of 50-60 Hz, therefore to work at different values, we must consider the variation of the tripping sensitivity according to the tables below. It should be taken into consideration that there is a no tripping risk when pushing the test-button, due to the fact that such action is made by means of an internal resistor with a fixed value.

RCCB DSRCD safety switches [3])

Type AC [1])	10 Hz	30 Hz	50 Hz	100 Hz	200 Hz	300 Hz	400 Hz
30 mA	3.63	1.50	0.80	1.63	2.40	3.03	4.63
100 mA	0.75	0.74	0.80	1.18	1.69	2	2.46
300 mA	0.62	0.71	0.80	1.15	1.45	1.84	2.16
500 mA	0.80	0.72	0.80	1.15	1.52	1.79	2.12
Type A							
30 mA	7.57	2.40	0.75	1.63	2.53	3.70	9.23
100 mA	4.50	1.85	0.75	1.22	2.17	4.35	10.85
300 mA	3.56	1.55	0.75	1.18	2.10	4.40	17.10
500 mA	3.24	1.39	0.75	0.95	12.17	25.40	33.06

RCBO DSRCB / DSRCBH [3])

Type AC [1])	10 Hz	30 Hz	50 Hz	100 Hz	200 Hz	300 Hz	400 Hz
30 mA	0.62	0.65	0.80	0.91	1.24	1.55	1.88
100 mA	0.74	0.71	0.80	0.95	1.16	1.38	1.59
300 mA	0.80	0.74	0.80	0.97	1.19	1.44	1.64
500 mA	1.10	0.81	0.80	0.89	1.18	1.38	1.68
Type A [2])							
30 mA	8.17	3.13	0.75	1.70	3.10	3.52	3.67
100 mA	6.81	2.71	0.75	1.43	2.35	2.58	2.71
300 mA	6.20	2.16	0.75	0.49	0.87	0.74	0.95
500 mA	4.34	1.53	0.75	0.39	0.59	0.62	0.64

Notes: [1]) The standard NHP/Terasaki type is the "type AC" in Australia, Type "A" in New Zealand.
[2]) The standard NHP/Terasaki DSRCBH single pole RCBO is "type A" in Australia and New Zealand.
[3]) The numbers in the table above are multipliers, e.g. A "DSRCD" at 50 hz has an 0.8 multiplier. Therefore a 30 mA, "type AC" RCD will trip at (0.8 x 30 mA) 24 mA.

Power losses

The power losses are calculated by means of measuring the voltage drop between the incoming and the outgoing terminal of the device at rated current. Power loss per pole:

RCCB-DinSafe safety switch type DSRCD

In (A)	16	25	40	63	80	100
Z (mOhm)	9.95	3.75	2.15	1.30	1.3	0.9
Pw (W)	2.55	2.33	3.43	5.16	8.3	8.7

RCBO-DinSafe MCB DSRCB

In (A)	4	6	10	13	16	20	25	32	40
Z (mOhm)	125	53	16.5	11.9	9.8	7.1	5.6	4.7	3.6
Pw (W)	2.0	1.9	1.6	2.0	2.5	2.8	3.5	4.8	5.8

RCBO-Single pole DSRCBH

In (A)	6	10	13	16	20	25	32	40	50	63
Z (mOhm)	45.8	16.4	12.5	10.6	7.3	5.4	3.2	2.6	1.9	1.4
Pw (W)	1.65	1.7	2.1	2.7	2.9	3.3	3.4	4.2	4.8	5.6

Coupled MCB + Add-on RCD type DSRCM

In (A)	6	10	13	16	20	25	32	40	50	63
Z (mOhm)	45.4	17.4	13.7	11.9	8.7	6.9	4.8	3.6	2.9	2.4
Pw (W)	1.6	1.7	2.3	3.0	3.5	4.3	4.9	5.8	7.3	9.6

Din-T MCBs + RCDs Technical data
Protection of RCCBs type DSRCD

RCCBs are not overcurrent protected. Therefore we don't need to consider both protection against short-circuits and overloads.

Protection against short-circuits
Coordination of RCCBs with MCBs or fuses, back-up protection

RCCBs protected with an SCPD have to be able to withstand, without damage, short-circuit currents up to its rated conditional short-circuit capacity. The SCPD has to be carefully selected, since the association of this device with the RCCB is interrupting the short-circuit of the installation.

The value of the presumed short-circuit current at the point where the RCCB is installed shall be lower than the values of the following table:

The RCCB and the protective device must be installed in the same switchboard, paying special attention to the connection between these two devices since, if the SCPD is installed downstream of the RCCB, such a connection must be short-circuit protected.

SCPD = Short-Circuit Protective Device.

Back-up protection with MCBs

	In(A)	Din-T6	Din-T10	Din-T15	Din-T10H
RCCB	16 A	20 kA	20 kA	20 kA	10 kA
2 Poles	25 A	20 kA	20 kA	20 kA	10 kA
240 V	40 A	20 kA	20 kA	20 kA	10 kA
(DSRCD)	63 A	20 kA	20 kA	20 kA	10 kA
	80 A	-	-	-	10 kA
	100 A	-	-	-	10 kA
RCCB 4 Poles	25 A	10 kA	10 kA	10 kA	10 kA
415 V	40 A	10 kA	10 kA	10 kA	10 kA
(DSRCD)	63 A	10 kA	10 kA	10 kA	10 kA
	80 A	-	-	-	10 kA
	100 A	-	-	-	10 kA

Back-up protection with fuses gG

	In(A)	16 A	25 A	32 A	40 A	50 A	63 A	80 A	100 A
RCCB	16 A	100 kA	100 kA	80 kA	50 kA	40 kA	25 kA	16 kA	10 kA
2 Poles	25 A	100 kA	100 kA	80 kA	50 kA	40 kA	25 kA	16 kA	10 kA
240 V	40 A	100 kA	100 kA	80 kA	50 kA	40 kA	25 kA	16 kA	10 kA
(DSRCD)	63 A	100 kA	100 kA	80 kA	50 kA	40 kA	25 kA	16 kA	10 kA
	80 A	100 kA	100 kA	80 kA	50 kA	40 kA	25 kA	16 kA	10 kA
	100 A	100 kA	100 kA	80 kA	50 kA	40 kA	25 kA	16 kA	10 kA
RCCB	25 A	100 kA	100 kA	80 kA	50 kA	40 kA	25 kA	16 kA	10 kA
4 Poles	40 A	100 kA	100 kA	80 kA	50 kA	40 kA	25 kA	16 kA	10 kA
415 V	63 A	100 kA	100 kA	80 kA	50 kA	40 kA	25 kA	16 kA	10 kA
(DSRCD)	80 A	100 kA	100 kA	80 kA	50 kA	40 kA	25 kA	16 kA	10 kA
	100 A	100 kA	100 kA	80 kA	50 kA	40 kA	25 kA	16 kA	10 kA

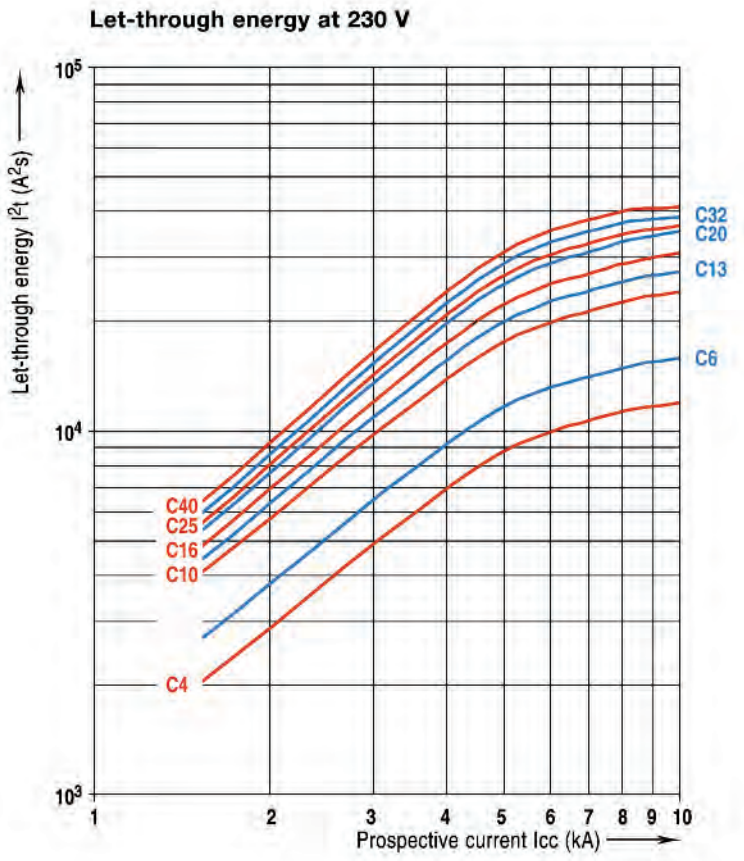
Din-T MCBs + RCDs Technical data

RCBO (DSRCB) let-through energy I^2t

The benefit of an RCBO in short-circuit conditions, is its ability to reduce the value of the let-through energy that the short-circuit would be generating.

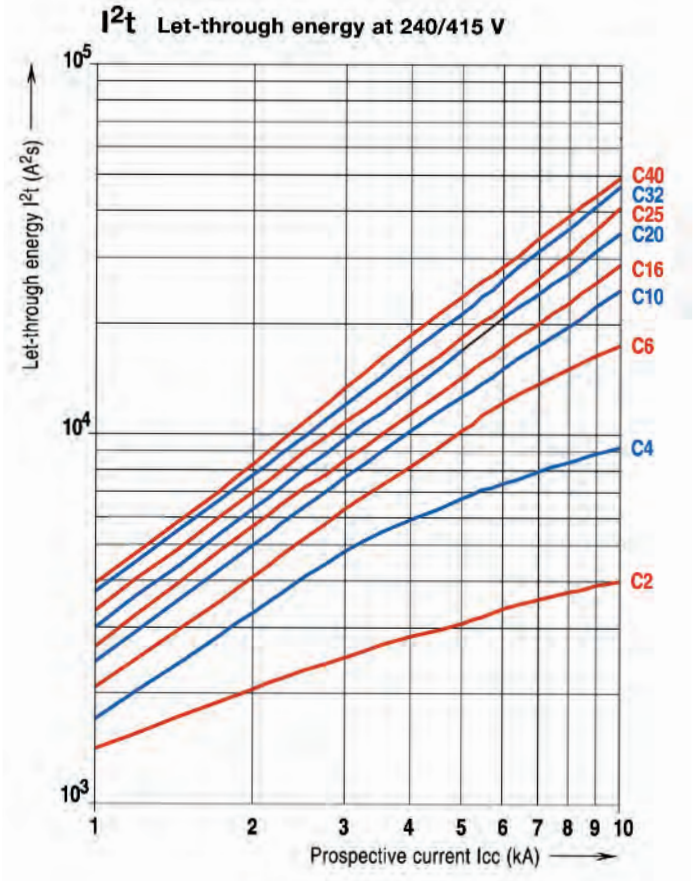
Din-Safe DSRCB

Curve C



Din-T single pole width RCD (DSRCBH)

Curve C



Din-T MCBs + RCDs Technical data
Text for specifiers

RCCB - DinSafe safety switches (DSRCD)

- According to AS/NZS 61008 standard.
- Intended to detect residual sinusoidal currents (type AC) or residual pulsating direct currents (type A).
- Resistance against nuisance tripping according to VDE 0664 T1 and EN 61008.
- Working ambient temperature from –25 °C up to +40 °C for type A and from –5 °C up to +40 °C for type AC.
- Approved by CEBEC, VDE, KEMA, IMQ etc.
- The RCCB are 2 P and 3 P+N with 2 and 4 modules wide.
- The neutral pole in the 3 P+N RCCB is on the right hand side. The N pole closes first of all poles and opens last of all poles.
- Nominal rated currents are: 16, 25, 40, 63, 80, 100, 125 A.
- Nominal residual currents are: 10, 30, 100, 300, 500 mA.
- The test circuit is protected against overloads.
- All RCCBs have a minimum short-circuit resistance of 10 kA when they are back-up protected by means of MCBs or fuses.
- The making and breaking capacity is 500 A.
- The residual making and breaking capacity is 1500 A.
- Terminal capacity from 1 up to 50 mm² rigid wire or 1.5 up to 50 mm² flexible wire.
- The devices 10, 30, 100 mA type A or AC always have vertical selectivity with devices 300 mA type S.
- The selective types have a delayed tripping time in comparison with the instantaneous ones (type A, AC) with sensitivity lower than 300 mA.
- Both incoming and outgoing terminals have a protection degree of IP 20 and are sealable.
- Isolator function due to Red/Green printing on the toggle.
- Auxiliary contacts can be added on the right hand side.
- RCCBs can be released by means of a shunt trip or undervoltage release.
- RCCBs can be remotely controlled by means of a motor operator.
- RCCBs have a tripping indicator which is activated in case of automatic release only.

Add-on RCD DinSafe (DSRCM)

- According to AS/NZS 61009 standard.
- Intended to detect residual sinusoidal currents (type AC) or residual pulsating direct currents (type A).
- Resistance against nuisance tripping according to VDE 0664 T1 and EN 61009.
- Working ambient temperature from –25 °C up to +40 °C for type A and from –5 °C up to +40 °C for type AC.
- Approved by CEBEC, VDE, KEMA, IMQ, etc.
- Add-on RCD widths are:
  - 2 P - 2 modules 32 A & 63 A
  - 3 P - 2 modules 32 A & 4 modules 63 A
  - 4 P – 2 or 4 modules 32 A & 4 modules 63 A
- Nominal rated currents are: 32 – 63 A
- Nominal residual currents are: 30, 100, 300, 500, 1000 mA.
- The test circuit is protected against overloads.
- The short-circuit capacity depends on the associated MCB:
  - Din-T6 .....6000 A
  - Din-T10 .....10000 A
- The residual making and breaking capacity depends on the associated MCB:
  - Din-T6 .....6000 A
  - Din-T10 .....7500 A
- Terminal capacity:
  - 2 P - 2 modules 32 A & 63 A.....35 mm²
  - 3 P - 2 modules 32 A.....16 mm²
  - 3 P - 4 modules 63 A.....35 mm²
  - 4 P - 2 modules 32 A.....16 mm²
  - 4 P - 4 modules 32 A & 4 modules 63 A.....35 mm²
- The devices 10, 30, 100 mA type A or AC always have vertical selectivity with devices 300 mA type S.
- The selective types have a delayed tripping time in comparison with the instantaneous ones (type A, AC) with sensitivity lower than 300 mA.
- Both incoming and outgoing terminals (MCB+Add-on RCD) have a protection degree of IP 20 and are sealable.
- A codification system between MCB and RCD avoids incorrect assembly (i.e. MCB 50 A coupled with RCD 32 A).
- Auxiliary contacts can be added on the left hand side of the MCB.
- It can be released by means of a shunt trip or undervoltage release.
- It can be remotely controlled by means of a motor operator. The toggles of the MCB and RCD are independent, so it is possible to identify the reason that the device has tripped.

RCBO DinSafe (DSRCB)

- According to AS/NZS 61009 standard.
- Intended to detect residual sinusoidal currents (type AC) or residual pulsating direct currents (type A).
- Resistance against nuisance tripping according to VDE 0664 T1 and EN 61009.
- Working ambient temperature from –25 °C up to +40 °C for type A and from –5 °C up to +40 °C for type AC.
  Approved by CEBEC, VDE , KEMA, IMQ, etc.
- The RCBO 1 P+N is 2 modules wide or 1 module wide.
- The neutral pole is on the left hand side. The N pole closes first of all poles and opens last of all poles.
- Nominal rated currents are: 6 A to 40 A.
- Characteristic B & C.
- Nominal residual currents are: 10, 30, 100 mA.
- The test circuit is protected against overloads.
- The short-circuit capacity is 10 kA (DSRCBS is 6 kA) with selectivity class 3.
- The residual making and breaking capacity is 7500 A. (DSRCBS is 3000 A)
- Terminal capacity from 1 up to 25 mm² (16 mm² for DSRCBS) rigid in the top terminals and from 1 up to 35 mm² in the bottom terminals.
- The devices 10, 30, 100 mA type A or AC always have vertical selectivity with devices 300 mA type S.
- Both incoming and outgoing terminals have a protection degree of IP 20.
- Isolator function due to Red/Green printing on the toggle.
- Auxiliary contacts can be added on the right hand side.
- RCBOs can be released by means of a shunt trip or undervoltage release.
- RCBOs can be remotely controlled by means of a motor operator.

Din-T MCBs + RCDs Technical data

Overview of Din-Safe RCDs

Device type definition

Rating/description			Cat. No.	RCBO	RCBO	RCBO
						
				DSRCB	**DSRCBH**	**DSRCBS**
Standards				AS/NZS 61009-1	AS/NZS 61009-1	AS/NZS 61009-1
Magnetic tripping characteristics				C	C	B-C
Residual tripping characteristic [1]				AC, A	A	AC-A
Tripping time at IΔn	Instantaneous		ms	<300	<300	<300
	Selective		ms	-	-	-
Rated current			A	4, 6, 10, 13, 16, 20, 25, 32, 40	6, 10, 16, 20, 25, 32, 40	6, 10, 16, 20, 25, 32
Rated residual current IΔn			mA	10, 30	10, 30	10,30
Calibration temperature			°C	30	30	30
Number of poles versus modules				1	1	1
Rated voltage Un	2 P AC		V	110, 240 (1 P+N)	240 (1 P+N)	240 (1P+N)
	3 P AC		V	-	-	-
	4 P AC		V	-	-	-
Frequency			Hz	50/60	50/60	50/60
Maximum service voltage Ubmax			V	255	255	255
Minimum service voltage Ubmin			V	100	100	100
Power supply				Top/Bottom	Bottom	Bottom
Selectivity class				3	3	3
Rated making and breaking capacity (Im)			A	-	-	-
Residual making and breaking capacity (IΔm)			A	7500	10000	3000
Conditional short-circuit capacity (Inc)			A	-	-	-
Conditional residual short-circuit capacity (IΔc)			A	-	-	-
Short-circuit capacity (Icn)			A	10000	10000	6000
Grid distance (safety distance between two devices)			mm	35	-	-
Isolator application				yes	yes	Yes
Insulation degree	Insulation voltage		V (DC)	500	500 [2]	500 [2]
	Shock voltage (1.2/50 ms)		kV	6	6 [2]	6 [2]
	Insulation resistance		(mOhm)	1000	1000 [2]	1000 [2]
	Dielectric strength		V	2500	2500 [2]	2500 [2]
Shock resistance (in x, y, z direction)(IEC 60077/16.3)				40 g, 18 shocks 5 ms	40 g, 18 shocks 5 ms	40 g, 18 shocks 5 ms
Vibration resistance (in x, y, z direction; IEC 60068-2-6)				1.5 g, 30 min, 0...80 Hz	2 g, 30 min, 0...80 Hz	1.5 g, 30 mins, 0...80 Hz
Endurance	electrical at Un, In			10000	10000	1000
	mechanical at Un, In			20000	20000	2000
Protection degree (outside/inside electrical enclosure)				IP 20 / IP 40	IP 20 / IP 40	IP 20/IP 40
Self extinguish degree (according to UL 94)				V2	V2	V2
Tropicalisation (according to IEC 60068-2, DIN 40046)			°C/RH	+55/95 %	+55/95 %	+55/95 %
Pollution degree (acc. IEC 60947-1)				3	3	3
Operating temperature			°C	-25..+60	-5..+60	-5...+55
Storage temperature			°C	-5..+70	-25..+70	-25...+70
Terminals capacity	Rigid cable min/max (Top)		mm²	1/25	1/25	1/16
	Flexible cable min*/max (Top)		mm²	1/16	1/16	1/16
	Rigid cable min/max (bottom)		mm²	1/35	1/35	1/25
	Flexible cable min*/max (bottom)		mm²	1/25	1/25	1/25
	(*Flexible cable 0.75/1/1.5 mm² with cable lug)					
Torque	Top/Bottom		Nm	3/4	3	3
Add-on devices (side add-on)	Auxiliary contacts			yes	-	Yes
	UVT			yes	-	Yes
	Shunt trip			yes	-	Yes
	Motor operator			yes	-	Yes
	Panelboard switch			Bottom	Bottom	-
Busbars systems	Pin			Bottom	Bottom	Bottom
	Fork			yes	yes	-
Accessories						
Dimensions, weights, packaging	No of Poles			1+N	1+N	IP+N
	(HxDxW)	mm		86 x 76 x 36	125 x 76 x 18	86 x 76 x 18
	Weight/unit		g	250	350	300
	Package/unit			1/6	1	1

Notes: [1]) Refer catalogue section for types.

[2]) Making sure that N-L and both flying leads are disconnected.

Din-T MCBs + RCDs Technical data

Overview of Din-Safe RCDs

Device type definition

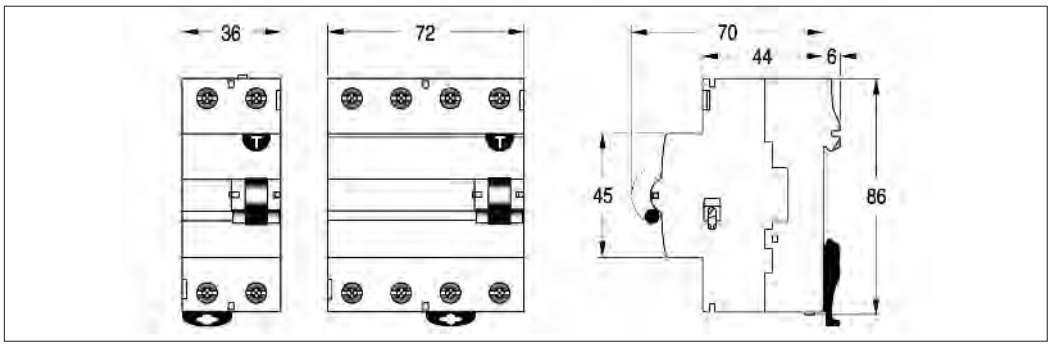
Rating/description		Cat. No.	RCCB  DSRCD SAFETY SWITCH	RCCB  DSRCM ADD-ON MODULE
Standards			AS/NZS 61008-1	AS/NZS 61009-1
Magnetic tripping characteristics			-	-
Residual tripping characteristic [1])			AC, A, S	AC, A
Tripping time at IΔn	Instantaneous	ms	<300	<300
	Selective	ms	>150	-
Rated current		A	40, 63, 80, 100	32, 63
Rated residual current IΔn		mA	30, 100, 300, 500	30, 100, 300
Calibration temperature		°C	30	30
Number of poles versus modules			1	1
Rated voltage Un	2 P AC	V	240	240/415
	3 P AC	V	-	415
	4 P AC	V	415	415
Frequency		Hz	50/60	50/60
Maximum service voltage Ubmax		V	2 P=265 / 4 P=455	2 P=265 / 4 P=455
Minimum service voltage Ubmin		V	2 P=110 / 4 P=190	2 P=117 / 4 P=190
Power supply			Top/Bottom	Top
Selectivity class			-	3
Rated making and breaking capacity (Im)		A	500 (or 10xIn)	-
Residual making and breaking capacity (IΔm)		A	500 (or 10xIn)	see MCB
Conditional short-circuit capacity (Inc)		A	10000 fuse 100 A	-
Conditional residual short-circuit capacity (IΔc)		A	10000	-
Short-circuit capacity (Icn)		A	-	see MCB
Grid distance (safety distance between two devices)		mm	35	35
Isolator application			yes	no
Insulation degree	Insulation voltage	V (DC)	500	500
	Shock voltage (1.2/50 ms)	kV	8	8
	Insulation resistance	(mOhm)	1000	1000
	Dielectric strength	V	2500	2500
Shock resistance (in x, y, z direction)(IEC 60077/16.3)			40 g, 18 shocks 5 ms	40 g, 18 shocks 5 ms
Vibration resistance (in x, y, z direction; IEC 60068-2-6)			1.5 g, 30 min, 0...80 Hz	5 g, 30 min, 0...80 Hz
Endurance	electrical at Un, In		10000	10000
	mechanical at Un, In		20000	20000
Protection degree (outside/inside electrical enclosure)			IP 20 / IP 40	IP 20 / IP 40
Self extinguish degree (according to UL 94)			V2	V2
Tropicalisation (according to IEC 60068-2, DIN 40046)		°C/RH	+55/95 %	+55/95 %
Pollution degree (acc. IEC 60947-1)			3	3
Operating temperature		°C	AC (-5.. +60); A -25.. +60)	AC (-5..+60); A(-25..+60)
Storage temperature		°C	-25..+70	-25..+70
Terminals capacity	Rigid cable min/max (Top)	mm²	1.5/50 [1.5/35]	32 A - 1/16, 63 A - 1/25
	Flexible cable min*/max (Top)	mm²	1.5/35 [1.5/25]	32 A - 1/16, 63 A - 1/25
	Rigid cable min/max (bottom)	mm²	1.5/50 [1.5/35]	-
	Flexible cable min*/max (bottom)	mm²	1.5/35 [1.5/25]	-
	(*Flexible cable 0.75/1/1.5 mm² with cable lug)			
Torque	Top/Bottom	Nm	5/5	-
Add-on devices (side add-on)	Auxiliary contacts		yes	yes (coupled to MCB)
	UVT		yes	yes (coupled to MCB)
	Shunt trip		yes	yes (coupled to MCB)
	Motor operator		yes	yes (coupled to MCB)
	Panelboard switch		yes	-
Busbars systems	Pin		yes	-
	Fork		yes	yes
Accessories				
Dimensions, weights, packaging	No of Poles		2-4	2-3-4
	(HxDxW) 86x76xW	mm	36/72	72/90/108/125/144
	Weight/unit	g	2 P=250 / 4 P=368	2 P=250 / 3 P=320 / 4 P=340
	Package/unit		2 P=1/6 / 4 P=1/3	1

Notes: [1]) Refer catalogue section for types.

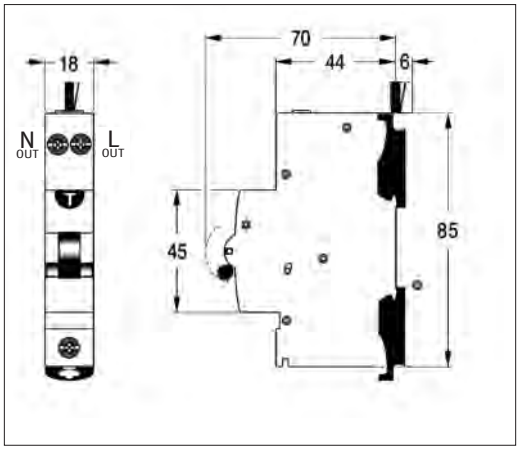
Din-T MCBs + RCDs Technical data

RCCB - Din-Safe safety switch (DSRCD)

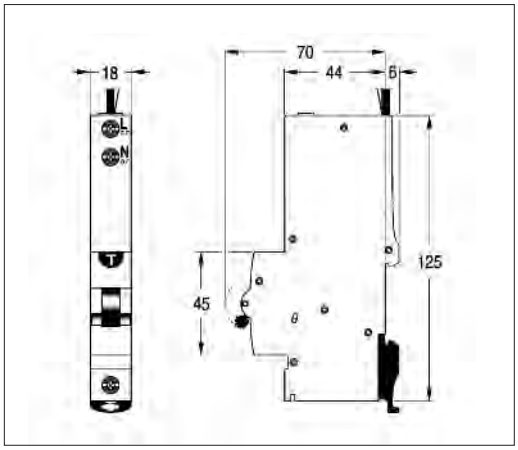
Dimensions in mm



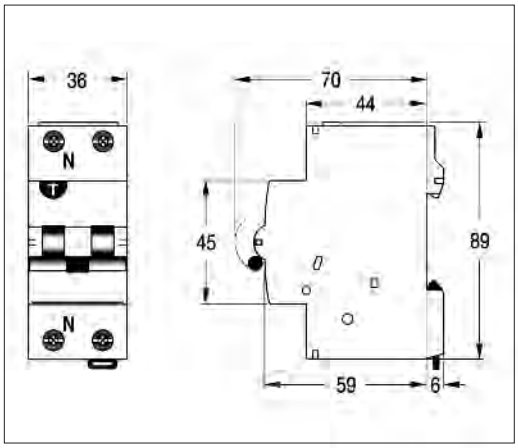
RCBO - Din-Safe (DSRCBS)



RCBO - Din-Safe (DSRCBH)



RCBO - Din-Safe (DSRCB)



Din-Safe-M clip-on earth leakage module (DSRCM)

Diagram (A)

1 P+N

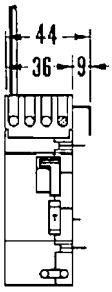


Diagram (B)

3 P+N

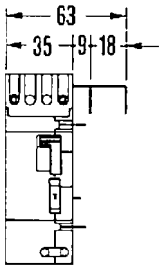


Diagram (C)

3 P+N

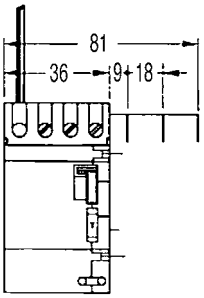
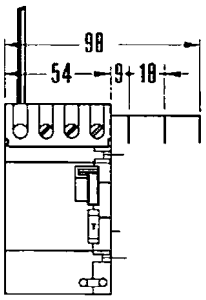


Diagram (D)

3 P



Note: **(A), (B), (C) and (D),** refer to earth leakage modules shown on pages 1 - 29 and 3 - 38.

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