



TemBreak 2 MCCBs from 125A frame to 400A frame are available with thermal magnetic protection units. Refer to Section 9 for details of TemBreak thermal magnetic MCCBs up to 800A.

Thermal Magnetic trip units are especially suited to the following applications:

- Installations where harmonic distortion of current waveforms is likely. They operate inherently on the root mean square (rms) heating effect of current.
- DC circuits. Refer to Section 4, “The Application of MCCBs in DC Systems” for more information.



3 Pole MCCB with Adjustable Thermal and Adjustable Magnetic Characteristics



Single Pole MCCB with Fixed Characteristics

### Models with Adjustable Thermal and Adjustable Magnetic Characteristics

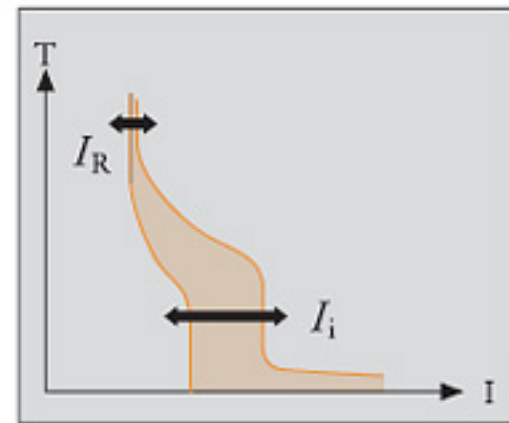
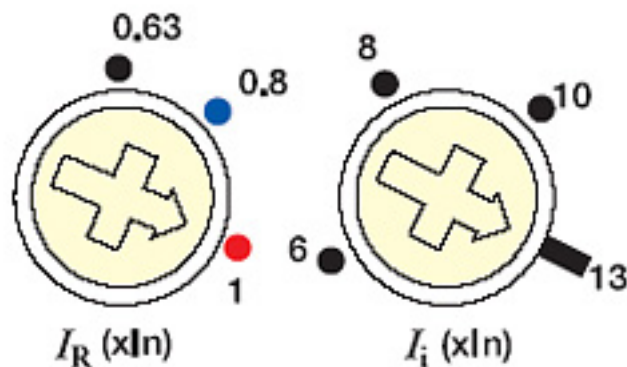
All standard 3 pole and 4 pole TemBreak 2 thermal magnetic models have adjustable thermal and adjustable magnetic characteristics.

Traditionally, thermal magnetic MCCBs have had adjustable thermal with fixed magnetic characteristics. The fixed magnetic element can limit the application of the MCCB.

An adjustable magnetic characteristic allows short-circuit protection to be matched to the load and supply characteristics, for example motor inrush currents or generator short-circuit currents. Lowering the short-circuit tripping threshold can allow a higher earth-loop impedance in an installation and provide end-of-cable protection with the correct disconnection times.



## Adjustment Dials



1.  $I_R$  is the thermal element adjustment dial and is used to set the rated current to match the conductor rating.

$I_R$  can be set between 0.63 and 1.0 times  $I_n$ .

2.  $I_i$  is the magnetic element adjustment dial and is used to set the short circuit tripping threshold to suit the application.

$I_i$  can be set between 6 and 12 times  $I_n$  on 125A and 400A frame models.

$I_i$  can be set between 6 and 13 times  $I_n$  on 250A frame models with ratings of 160A, 200A and 250A.

$I_i$  can be set between 6 and 12 times  $I_n$  on 250A frame models with ratings of 125A and less.

## Models, Types and Rated Currents of Thermal Elements

Model	Type	Current Rating $I_n$ (A)
S125	-NF	16, 20, 25, 32, 40, 50, 63, 80, 100, 125
E125	-NJ	20, 32, 50, 63, 100, 125
S125	-NJ	20, 32, 50, 63, 100, 125
S125	-GJ	20, 32, 50, 63, 100, 125
H125	-NJ	20, 32, 50, 63, 100, 125
L125	-NJ	20, 32, 50, 63, 100, 125
S160	-NF	16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160
S160	-NJ	20, 32, 50, 63, 100, 125, 160
S160	-GJ	50, 63, 100, 125, 160
H160	-NJ	160
L160	-NJ	160
E250	-NJ	20, 32, 50, 63, 100, 125, 160, 200, 250
S250	-NJ	160, 200, 250
S250	-GJ	160, 200, 250
H250	-NJ	160, 250*
L250	-NJ	160, 250*
E400	-NJ	250, 400
S400	-CJ	250, 400



Single Pole MCCBs

Single pole models have fixed thermal and fixed magnetic characteristics.

Generator Protection

Generators may need specially modified protection characteristics, based on their short-circuit capacity.

If a generator is capable of delivering short-circuit current greater than six times its full load current, a standard TemBreak 2 thermal magnetic MCCB may be used, with  $I_i$  set at less than the available short-circuit current. (Note that MCCBs, with fixed magnetic characteristics may not be suitable for this application.)

A thermal magnetic MCCB with low instantaneous protection may be used where the generator short-circuit current is less than six times its full load current. These are modified versions of the standard MCCB.

Four pole MCCBs with low instantaneous protection have protection on the neutral pole as standard. The magnetic characteristic of MCCBs with low instantaneous protection is fixed at the following values.

Model	Magnetic Trip Current
E125	$3 \times I_n$
S125	$3 \times I_n$
S160	$3 \times I_n$
E250	$3 \times I_n$
S250	$3 \times I_n$
E400	$3.5 \times I_n$
S400	$3.5 \times I_n$

Neutral Pole Protection

Neutral pole protection is available as an optional extra on four pole thermal magnetic MCCBs. The thermal and magnetic elements in the neutral pole are related to those in the phase poles as follows.

	Phase Trip Threshold	Neutral Trip Threshold
Thermal	$I_r$ (adjustable)	$I_N$ (adjustable) = $I_n$
Magnetic	$I_i$ (adjustable)	$I_i$ (adjustable)

Motor Protection

MCCBs feeding motors are often only required to provide protection from short-circuits. Overload protection is provided by a dedicated thermal or electronic overload relay. Tembreak 2 MCCBs with thermal protection elements are available for this application. Four pole MCCBs with magnetic trip have protection on the neutral pole as standard.

