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TM-D Thermal-Magnetic Trip Unit for 3P and 4P Circuit Breakers from 80 A to 250 A

Introduction

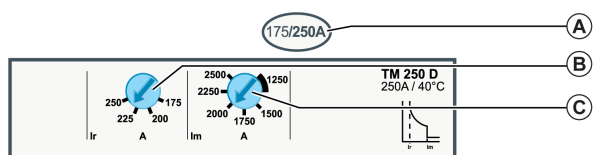
The TM-D thermal-magnetic trip unit is designed to protect conductors in commercial and industrial electrical distribution.

The trip unit exists in two configurations:

- o 3P, 3D
- o 4P, 3D

Description

The adjustment dials are on the front of the trip unit:

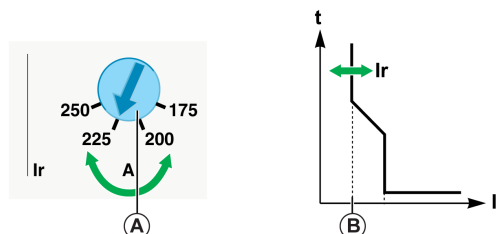


- A Setting range for the TM-D thermal-magnetic trip unit
- B Adjustment dial for the thermal protection pickup I_r
- C Adjustment dial for the magnetic protection pickup I_m (for TM-D 200/250 only)

Setting the Thermal Protection

The thermal protection pickup I_r is set by a 4-setting dial.

Turning the thermal protection adjustment dial (A) modifies the trip curve as shown (B).



The following table shows the values of the pickup I_r (in amperes) for thermal protection (values indicated on the dial) with respect to every trip unit rating, relative to the position of the dial I_r .

Trip unit rating I_n (A)	16	25	32	40	50	63	80	100	125	160	200	250
Pickup I_r (A)	11	18	22	28	35	44	56	70	88	112	140	175
	13	20	26	32	40	50	64	80	100	128	160	200
	14	23	29	36	45	57	72	90	113	144	180	225
	16	25	32	40	50	63	80	100	125	160	200	250

Setting the Magnetic Protection on Trip Units with I_n from 80 A to 160 A

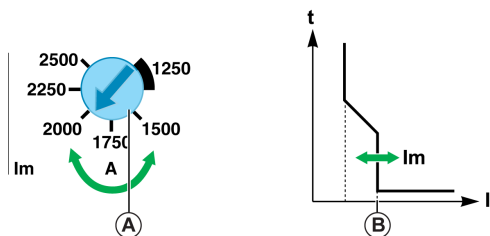
For trip units rated below 200 A, the magnetic protection pickup cannot be adjusted and equals the value shown below:

Trip unit rating I_n (A)	16	25	32	40	50	63	80	100	125	160
Pickup I_m (A) +/- 20%	190	300	400	500	500	500	640	800	1250	1250

Setting the Magnetic Protection on Trip Units with I_n from 200 A to 250 A

For trip units rated between 200 A and 250 A, the magnetic protection pickup I_m is set using a 6-setting dial.

Turning the magnetic protection adjustment dial (A) modifies the trip curve as shown (B).



The following table shows the values of the pickup I_m (in amperes) for magnetic protection (values indicated on the dial), relative to the position of the I_m dial:

Trip unit rating I_n (A)	200	250
Pickup I_m (A) +/- 20%	1000	1250
	1200	1500
	1400	1750
	1600	2000
	1800	2250
	2000	2500

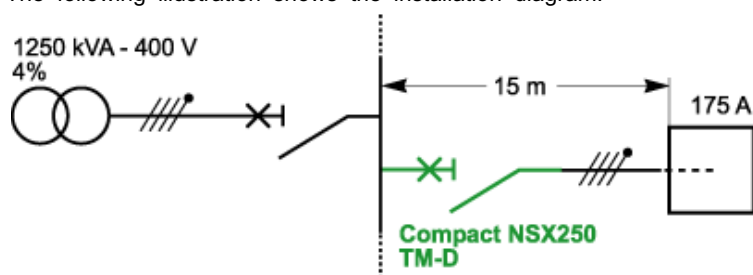
Example of Application

Protection of a feed with the following characteristics:

- Power supplied by a 1,250 kVA transformer - 400 V, 4%
- Protection of a distribution box located 15 m away, the loads on which are mainly for lighting (incandescent bulbs), heating, and small machines

The value of the calculated rated current (load consumption) is $I_n = 175$ A.

The following illustration shows the installation diagram:



Calculations performed on the installation in accordance with the regulations can be used to determine the characteristics of the appropriate Compact NSX circuit breaker to install (calculations performed using the Ecodialsoftware).

The following table presents the circuit breaker selection:

Installation	Chosen Compact NSX	Comments
$I_n = 175$ A	Compact NSX250	Determination of case size
Distributed neutral	4P, 3D	Full neutral and linear loads
$I_{sc} = 28.5$ kA	F	I_{cu} performance can be read from rating plate
$I_{kmin} = 14.0$ kA	—	—

The following table shows the trip unit protection settings:

Installation	Chosen trip unit	Comments
$I_n = 175$ A	TM-D 200, I_r set to 180	Optimizing the choice
	TM-D 250, I_r set to 175	Necessary if extensions envisaged
$I_{kmin} = 14.0$ kA	$I_m = 2,000$ A or 2,500 A	Natural adjustment to the I_m protection for distribution, compatible with: <ul style="list-style-type: none"> Inrush currents (no trip) Short-circuit protection (trip)