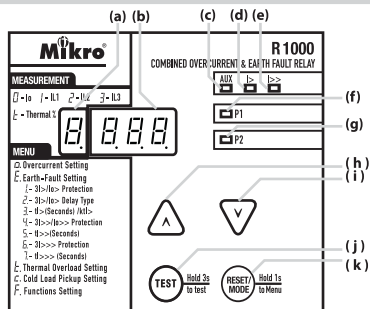


R1000 Combined Overcurrent and Earth-fault Relay User Guide

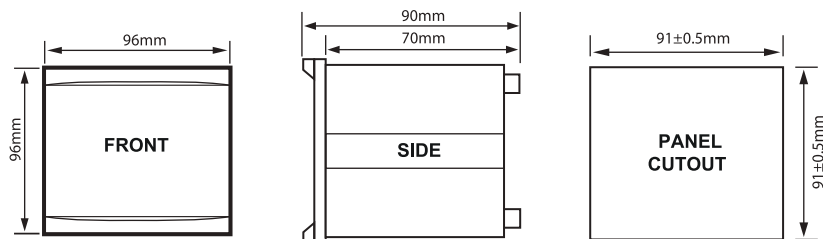


- (a) Function indication
- (b) Data indication
- (c) Auxiliary power supply indicator
- (d) Low-set start/trip status indicator
- (e) High-set start/trip status indicator
- (f) Programmable LED1 indicator
- (g) Programmable LED2 indicator
- (h) Up button
- (i) Down button
- (j) Test button
- (k) Reset/Mode button

Features

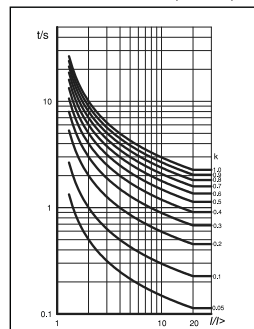
- Three-phase, three stages setting for phase overcurrent
- Two stages setting for earth fault
- IDMT and definite time
- Thermal overload protection
- Cold load pickup protection
- Circuit breaker failure protection
- Selectable fundamental or true RMS
- Selectable 50 or 60 Hz frequency
- 2 Programmable LED
- Programmable Output Contacts
- Complies with IEC 60255 standard
- ANSI code: 50G, 50P, 50N, 51G, 51P, 51N, CLP, 50BF, 49RMS

Case Dimensions

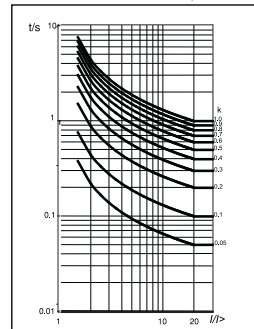


IDMT Curve

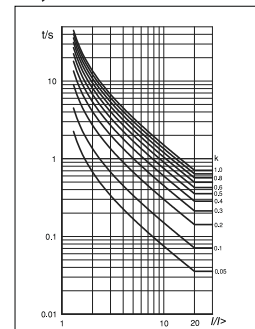
Normal Inverse 3/10 (NI3/10)



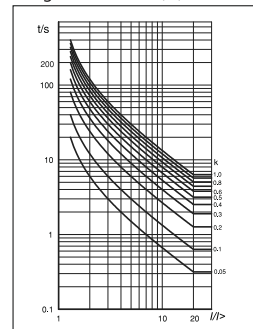
Normal Inverse 1.3/10 (NI1.3/10)



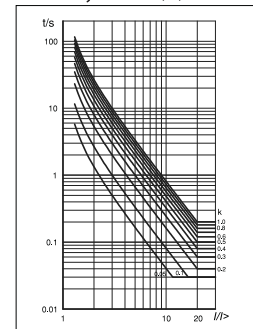
Very Inverse (VI)



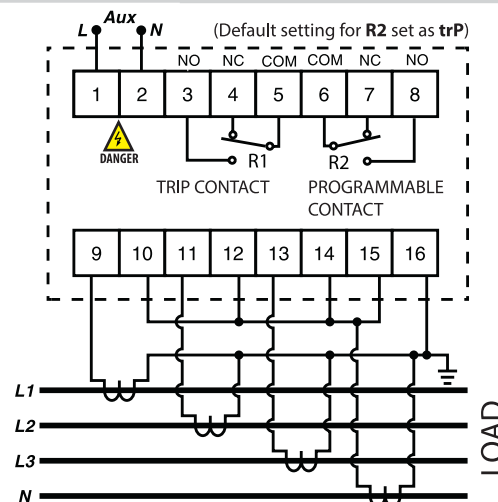
Long-time Inverse (LI)



Extremely Inverse (EI)



Typical Application Diagram



Technical Data

Ratings

Rate Current In.....	5A
Frequency.....	50 or 60Hz
Burden.....	<0.3VA at In
Thermal Withstand.....	4 x In continuous

Auxiliary Supply

Supply Voltage.....	198 ~ 265VAC
Supply Frequency.....	50 or 60Hz
VA Rating.....	3VA max

Accuracy

Protection Thresholds.....	±3% or ±20mA whichever is greater
Time Delay.....	±3% or ±40ms whichever is greater

Setting Ranges

(i) Overcurrent Setting

Low-set Setting 3I>.....	0.5A - 12.5A(10% - 250%)
Low-set time Multiplier ktI>.....	0.01 - 1.00
Low-set Definite Time tI>.....	0.03 - 100s
Delay Type.....	*DT, NI3/10, NI1.3/10, VI, LI, EI
High-set Setting 3I>>.....	OFF/0.5 - 100A (10% - 2000%)
High-set Definite Time tI>>.....	0.03 - 100s
Highest-set Setting 3I>>>.....	OFF/0.5 - 100A (10% - 2000%)
Highest-set Definite Time tI>>>.....	0.03 - 100s

(ii) Earth-fault Setting

Low-set Setting Io>.....	0.1A - 10.0A(2% - 200%)
Low-set time Multiplier ktIo>.....	0.01 - 1.00
Low-set Definite Time tIo>.....	0.03 - 100s
Delay Type.....	DT, NI3/10, NI1.3/10, VI, LI, EI
High-set Setting Io>>.....	OFF/0.1 - 50A (2% - 1000%)
High-set Definite Time tIo>>.....	0.03 - 100s

(iii) Thermal Overload Setting

Low-set Setting I0>.....	OFF/0.5A - 10.0A(10% - 200%)
Low-set T0.....	1 to 200 minutes
Low-set time Multiplier ktI0>.....	1.00 - 1.50
θ Trip.....	50 to 200%
θ Alarm.....	50 to 200%

Output Contacts

Rated Voltage.....	250VAC
Continuous Carry.....	5A(Cosφ = 1.0)
Expected Electrical Life.....	10 ⁵ operations
Expected Mechanical Life.....	5 x 10 ⁶ operations

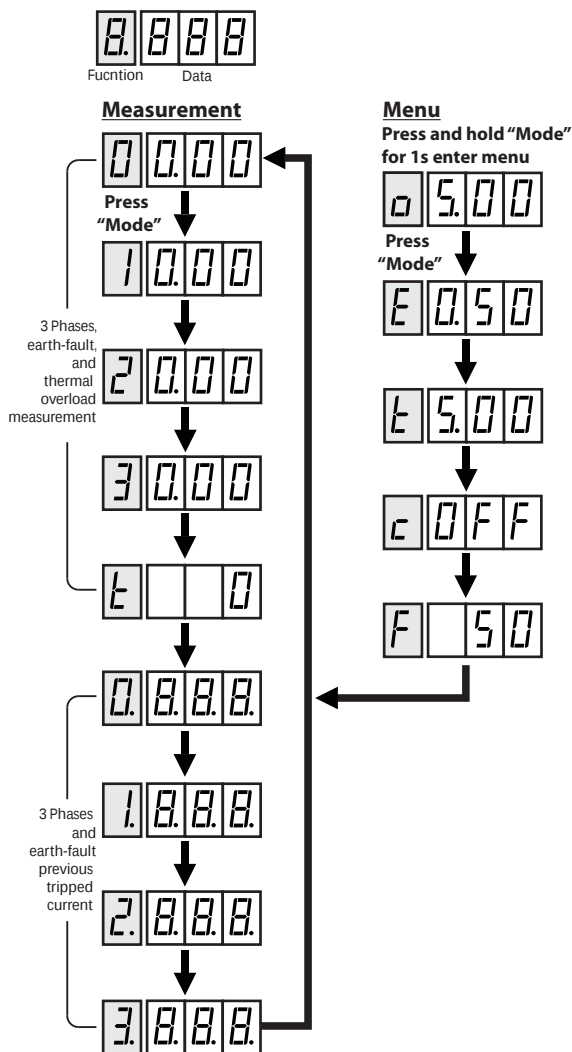
Enviromental Conditions

Temperature.....	-10°C to 55°C
Humidity.....	5% to 95% non-condensing

Mechanical

Mounting.....	Panel mounting
Dimension (mm)	96(w) x 96(h) x 90(d)
Enclosure Protection.....	IP54 at the panel IP20 at the body
Approximate Weight.....	0.8kg

*DT = Definite time



Push Button Operation

Trip Test	Press and hold "TEST" button for 3.5 seconds
Trip Reset	Press "RESET" button
Scroll Display	Press "MODE" button
Enter Menu Mode	Press and hold "MODE" button for 1 second
Set/Save Setting	Press "UP" and "DOWN" button simultaneously
Adjust Setting	Press "UP" or "DOWN" button
Auto Scroll Reading	Press and hold "UP" and "DOWN" button simultaneously for 2 seconds on Measurement mode
Clear Thermal %	Press and hold "UP" and "DOWN" button simultaneously for 1.5 seconds on Thermal page
Display Off Mode	Press "RESET" button for 10 seconds to toggle display off mode. The display will switch off after 6 minutes if no key is pressed.

LED Indicator

LED Indicator				Status
AUX	I>	I>>	P1/P2	
0	0	0	0	No Auxiliary power supply
1	0	0	0	Normal condition, no tripping
1	1	0	X	Low-set pickup
1	0	1	X	High-set pickup
1	B	0	X	Low-set tripped
1	X	B	X	High-set tripped
1	X	X	1	Link element pickup
1	X	X	B	Link element tripped

1 = ON 0 = OFF B = Blinking X = don't care

Parameter Settings

	Overcurrent Setting
1	3I> Protection (A) [DEF=5.00]
2	3I> Delay type [DEF=NI]
3	tI> (Seconds)/kI> [DEF=0.1]
4	3I>> Protection (A) [DEF=50.0]
5	tI>> (Seconds) [DEF=0.05]
6	3I>>> Protection (A) [DEF=100]
7	tI>>> (Seconds) [DEF=0.03]

E	Earth-Fault Setting
1	lo> Protection (A) [DEF=0.50]
2	lo> Delay type [DEF=NI]
3	tlo> (Seconds)/ktlo> [DEF=0.10]
4	lo>> Protection (A) [DEF=10.0]
5	tlo>> (Seconds) [DEF=0.05]

	Thermal Overload Setting
1	IO> Protection (A) [DEF=OFF]
2	tlO> (Minutes) [DEF=10]
3	ktlO> [DEF=1.10]
4	Θ Trip (%) [DEF=100]
5	Θ Alarm (%) [DEF=100]

C	Cold Load Setting
1	3I> [DEF=OFF]
2	3I>> [DEF=OFF]
3	3I>>> [DEF=OFF]
4	Io> [DEF=OFF]
5	Io>> [DEF=OFF]
6	IO> [DEF=OFF]

[DEF=Default setting]

F	Functions Setting
1	Frequency [50Hz/60Hz] [DEF=50Hz]
2	Measurement display [Fn=Fundamental, RnS=RMS] [DEF=Fn]
3	Programmable LED 1 [Refer figure 1] [DEF=20h]
4	Programmable LED 2 [Refer figure 1] [DEF=00h]
5	Output R1 reset type [n-A= Manual, AuT= Auto] [DEF=n-A]
6	Output R2 reset type [n-A= Manual, AuT= Auto] [DEF=AuT]
7	Output R2 function [DEF=trp] [Str= Start, trp= Trip, cbF=Circuit breaker failure]
8	Output R1 link element [Refer figure 1] [DEF=3Fh]
9	Output R2 link element [Refer figure 1] [DEF=3Fh]
A	CBFP Delay [0.05s - 10.0s] [DEF=0.10]

Digit2 Digit1

	Digit2		Digit1			
HEX	IO>	lo>>	lo>	3I>>>	3I>>	3I>
00	0	0	0	0	0	0
01	0	0	0	0	0	1
02	0	0	0	0	1	0
03	0	0	0	0	1	1
04	0	0	0	1	0	0
05	0	0	0	1	0	1
06	0	0	0	1	1	0
07	0	0	0	1	1	1
08	0	0	1	0	0	0
09	0	0	1	0	0	1

⋮

3A	1	1	1	0	1	0
3B	1	1	1	0	1	1
3C	1	1	1	1	0	0
3D	1	1	1	1	0	1
3E	1	1	1	1	1	0
3F	1	1	1	1	1	1

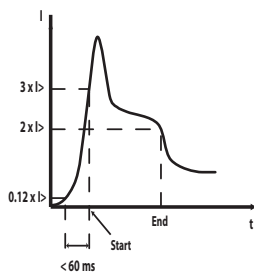
Figure 1:
Link element in
Hexadecimal
value

0= Off,
1= On

	Digit2		Digit1			
User's setting						
User's setting hexadecimal value						

* Not applicable when output R2 function set as cbF

Cold Load Pick-up



When current rises from $0.12 \times I_D$ to $3 \times I_D$ within 60 msec., I_D actual is temporarily doubled until current falls to below $2 I_D$.

Thermal Overload Curve

