



**LOADLINE**  
digital

**AUTHORISED DEALER :-**  
**TECHMECH ELECTRICALS**  
1540 - A , BHAGIRATH PALACE DELHI - 6  
TEL : 2386 5305 , FAX : 2387 3570  
Email : techmechelec@yahoo.com  
techmech4u@yahoo.com



**Moulded Case Circuit Breaker**

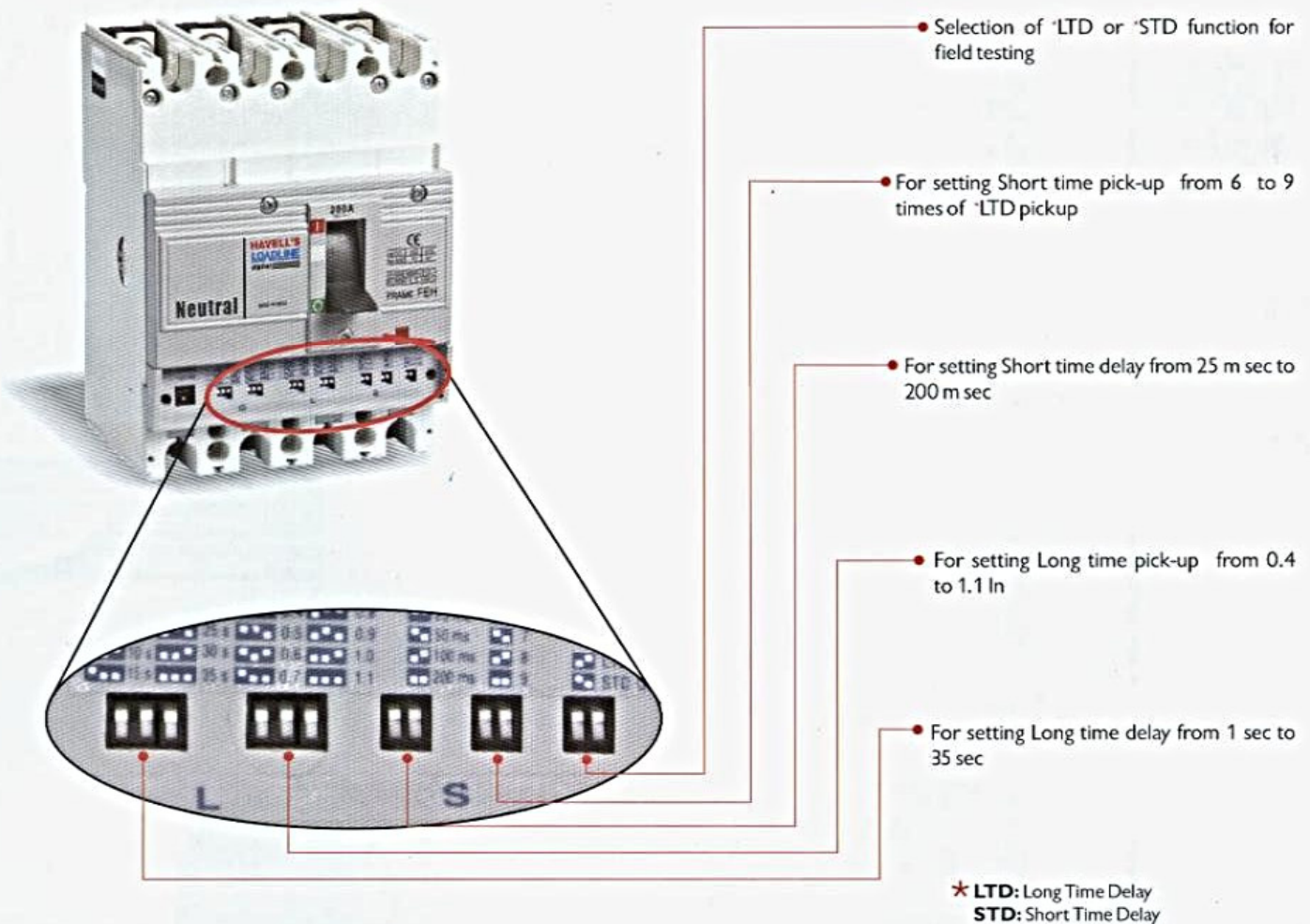
**Microprocessor Based**

**Rating-25A to 250A**



## Introduction

Digital range microprocessor based electronic MCCBs are designed and manufactured to world-class standards. These MCCBs provide high level of breaking capabilities and offer close, accurate and reliable protection against overload, short-circuit and ground fault through multiple adjustment options. The user-friendly breaker comes with a wide range of internal/external accessories.



## Range

25A, 40A, 63A, 100A, 125A, 160A, 200A & 250A in three pole and four pole execution.

## Specifications / Type Testing:

- Conforms to IEC: 947-2 / IS: 13947-2
- EMI/EMC - IEC: 61000-4-2 (ESD test)
- IEC: 61000-4-3 (Radiated Electromagnetic Field Test)
- IEC: 61000-4-4 (EFT test)
- IEC: 61000-4-5 (Surge Test)
- IEC: 61000-4-6 (Conducted Disturbances Test)

## Features:

- True RMS sensing-accurate and close protection.
- High repeat accuracy-reliable protection.
- Flexibility through multiple adjustment option-versatility and closer protection.
- Time delay on overload and short-circuit faults-suitable for discrimination.
- Built in adjustable electronic overload sensing (40% to 110% of  $I_n$ ).
- Built in adjustable short-circuit current sensing (600% to 1000% of  $I_r$ ).
- No external power required for basic functioning of the release.
- Built in operation-check function with Field Testing Provision.
- Accurate setting by use of DIP switches, ensuring reliable system protection/co-ordination.



## Product Construction

Loadline Digital Moulded Case Circuit Breakers have precision formed moulded case and cover of high performance resin bonded thermoset material. The circuit breakers are designed to allow grouping in distribution panels or switchboards top present their operating handles and label escutcheons uniformly aligned in a single panel cutout.

The **switching mechanism** is Quick make-Quickbreak type and is trip free, i.e. the breaker trips internally even if the operating knob is held in ON position.

The **contact mechanism** comprises of fixed and moving contacts made of sintered silver alloy for reliability, long life and anti-welding properties. Arcing contacts are provided in higher frames, further increasing the contact life.

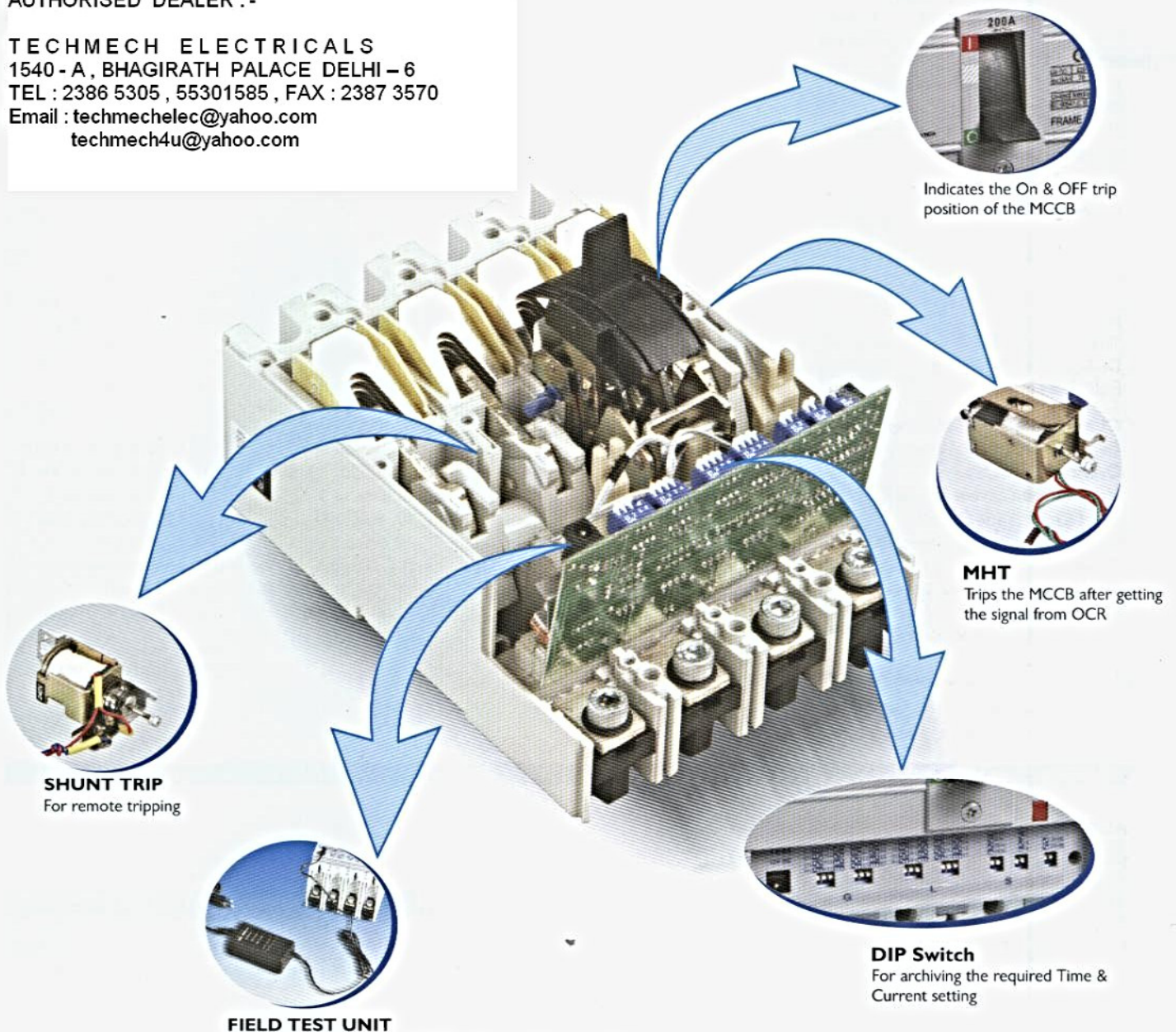
The **arc extinguishing** device comprises of arc chutes having grid plates mounted in parallel between supports of insulating material. The arc is divided between these grid plates which helps in its fast quenching. The arc is thus confined, divided and extinguished in the arc chute. The excellent insulation between the conducting parts and better energy dissipation after short circuit makes it possible to make the load and line connections on either side

The **tripping mechanism** comprises of magnet holder trigger which is coupled to the single trip bar unit to avoid single phasing. The electronic circuit gives a signal to this unit in case of over current fault and this unit further trips the MCCB.

**Over current protection** The sensing of the current is thru the current transformers fitted on the main terminals. In the case of any fault the secondary output of the CT increases. This secondary output of CT goes to the micro controller based electronic circuit. The micro controller is programmed to give a signal as per inverse time characteristics. The signal in the form of dc supply is given to magnet holder trigger which trips the MCCB. The tripping time and tripping current can be set with the help of the DIP switches provided on the front panel of the MCCB.

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**Technical Specification**

- Standard conformity : IEC 947-2/IS13947-2
- Rated operational voltage : 415V AC
- Rated Insulation Voltage : 690V AC
- Type of release : Microprocessor Based Electronic Release
- Utilisation Category : A
- Rated frequency : 50/60Hz
- Operating altitude : 2000 metres
- Humidity : 0 - 90%
- Rated impulse voltage : 8 kV



Frame		FEN	FEH
No. of Poles		3, 4	3, 4
Standard Current ratings (In)	A	25, 40, 63, 100, 125, 160, 200, 250	
Rated ultimate short circuit breaking capacity(Icu),	kA		
	380V	40	50
	415V	35	50
Rated service short circuit Breaking Capacity(% of Icu)	(Ics)	100%	75%
Rated short circuit Making capacity(Peak), Icm	kA	73.5	105
Weight	Kg		
TP (Triple Pole)		3.4	3.4
FP (Four Pole)		4	4
Terminal Type Cable		M8	M8
Terminal capacity (Cable)	Sq.mm	185	185
(Bus bar width)	mm	18	18

**Internal Accessories #**

- Auxiliary Switch (1 C/O or 2C/O) ●
- Shunt Trip (built-in auxiliary contact) ●
- Under Voltage Release ●
- Alarm Switch (1 C/O) ●

**External Accessories**

- Earth Fault Relay ●
- Rotary Handle ●
- Back Studs ●
- Extended Terminals (above 63A) +
- Phase Barriers +
- Terminal Shrouds ●
- Dolly pad locking Device ●
- Field Test Unit ●

**Characteristics of Microprocessor Based Release**

		©	©
Overload Current I <sub>1</sub>	xIn (A)	0.4-1.1 in steps of 0.1©	0.4-1.1 in steps of 0.1©
Overload Time Delay t <sub>1</sub>	Sec	1, 5, 10, 15, 20, 25, 30, 35	1, 5, 10, 15, 20, 25, 30, 35
Short Circuit Current Setting I <sub>2</sub>	xI <sub>1</sub> (A)	6-9 in steps of 1	6-9 in steps of 1
Short Circuit Time Delay t <sub>2</sub>	mSec	25, 50, 100, 200	25, 50, 100, 200
Instantaneous Pick up Threshold	xI <sub>1</sub> (A)	10 times	10 times
Ground Fault Current I <sub>g</sub> (4-pole only)	xI <sub>1</sub> (A)	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7 (with function block feature)	
Ground Fault Trip Time T <sub>g</sub> (4-pole only)	Sec	0.1, 0.2, 0.4, 0.6, 0.8, 1.0, 3.0, 5.0	
Field Test Switch		●	●
Auxiliary Power Module for Field Testing		●	●

- Available, + Supplied alongwith the MCCB above 63A
- # only one accessory can be fitted in the MCCB
- © At 1.1 time In for max. 2 hours only

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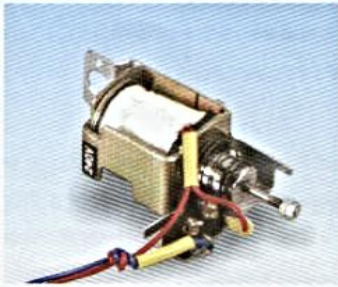
**Accessories**

**ALARM SWITCH**



Voltage	rating	Configuration	Cat. No.
125/250 VAC	1A	1NO + NC	LLALF1CO

### SHUNT TRIP



Voltage	Cat No.
18-30Vdc/12-36Vdc	LSTFE030
100-110Vac	LSTFE110
220-240Vac	LSTFE240
380-415 Vac	LSTFE415

Note: Shunt Trip releases is provided with built-in auxiliary contact

### UNDER VOLTAGE RELEASE



Voltage	Cat No.
110-120 Vac	LUVFE110
220-240 Vac	LUVFE240
380-440 Vac	LUVFE440

The breaker trips if the supply voltage dips below 70%- 35% of the rated voltage.

The breaker cannot be switched ON unless there is a supply to the UVR. (NVNC feature).

Supplied with external mounting Power pack to operate on AC supplies. Additional transformer is supplied with LUVRF440 & LUVRF110.

### AUXILIARY SWITCH



Voltage	Current Rating (AC15)	Cat No	Config.
250Vac/250Vdc	4 Amps	LASFE1C2	(1NO+1NC)
250Vac/250Vdc	4 Amps	LASFE2C2	2(1NO+1NC)
450Vac/250Vdc	4 Amps	LASFE1C4	(1NO+1NC)
450Vac/250Vdc	4 Amps	LASFE2C4	2(1NO+1NC)

Note: All internal accessories to be mounted on the left hand side of the breaker

### ROTARY HANDLE



Cat. No.
With Door interlock and 300mm remote shaft
LRRHFE30

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### OTHER ACCESSORIES



Cat. No.	
Dolly Pad locking device	
Extended terminals	
Phase Barriers	
Terminal Shrouds	Three Pole
	Four Pole
Back Studs	
LDPFE250	
LETFE250	
LPBFE250	
LTPPE250	
LTFPE250	
LBSFE250	

### FIELD TEST UNIT



For Field testing of digital MCCB with 220 VAC supply

**EARTH FAULT RELAY**



The RCD Relay is a common accessory for use in conjunction with all MCCB frames. The Earth Leakage detection system for use with Loadline MCCBs comprises of a core balance transformer (CT) coupled to an advanced RCD relay. The relay may be used to trip a circuit breaker via a shunt trip or an under voltage release in the event of an Earth Leakage.

The relay and one of the three available CT's is all that is required for a complete earth leakage sensing system suitable for the control of a circuit breaker in a circuit upto 250A fitted with either a shunt trip or an under voltage release. The simple arrangement and a small number of inter-connections necessary ensure that RCD is easily selected and installed.

The relay is suitable for 220-240V AC supply with the flexibility of choosing the sensitivity between 300mA to 1A and time delay in the range of 200m. sec - 5 sec. The required sensitivity and time delay should be selected by the DIP switches provided on the facia of the relay.

Supply Voltage : 220/240 V AC, 50/60 Hz  
 Changeover contact : 5A AC-15 250V  
 Sensitivity : 300mA, 500mA, 1A, 2A  
 Time delay (sec.) : 0.2, 0.5, 1000, 5000

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**FEATURES**

- No nuisance tripping
- DIN rail mounting
- Adjustable time delay
- Choice of sensitivity from 300mA upto 1A
- Trip indication LED (Red)
- ON indication LED (Green)
- Test push button
- Reset push button

**FUNCTION SETTING (DIP SWITCH)**

	RANGE
DIP Switch Position For Time Setting T(S)	<b>FOR TIME</b>
ON <input type="checkbox"/>	= 0.2S
OFF <input type="checkbox"/>	= 0.5S
	= 1.0S
	= 5.0S
DIP SWITCH POSITION FOR CURRENT SETTING IΔ(A)	<b>FOR CURRENT</b>
ON <input type="checkbox"/>	= 0.3A
OFF <input type="checkbox"/>	= 0.5A
	= 1.0A
	= NT

**CORE BALANCE CURRENT TRANSFORMER**

Size	MCCB Current Rating	Internal Dimension	Shape
1.	25-100A	60mm	Circular
2.	125-200A	95mm	Circular
3.	250A	145mm	Circular

**Ordering Information**

**(FE frame Three Pole MCCB)**



Current Rating (A)	Icu 35kA Cat. No.	Icu 50kA Cat. No.
25	LFENT0025	LFEHT0025
40	LFENT0040	LFEHT0040
63	LFENT0063	LFEHT0063
100	LFENT0100	LFEHT0100
125	LFENT0125	LFEHT0125
160	LFENT0160	LFEHT0160
200	LFENT0200	LFEHT0200
250	LFENT0250	LFEHT0250

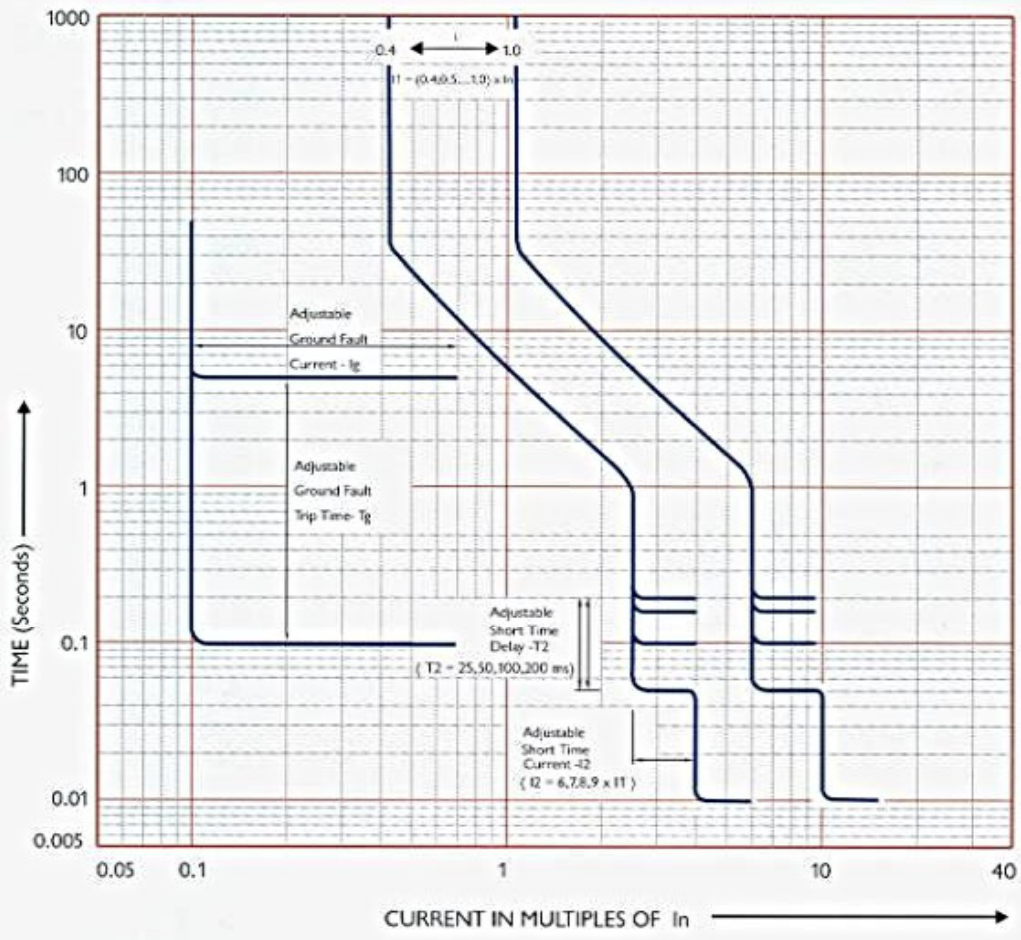
**(FE frame Four Pole MCCB)**



Current Rating (A)	Icu 35kA Cat. No.	Icu 50kA Cat. No.
25	LFENF0025	LFEHF0025
40	LFENF0040	LFEHF0040
63	LFENF0063	LFEHF0063
100	LFENF0100	LFEHF0100
125	LFENF0125	LFEHF0125
160	LFENF0160	LFEHF0160
200	LFENF0200	LFEHF0200
250	LFENF0250	LFEHF0250

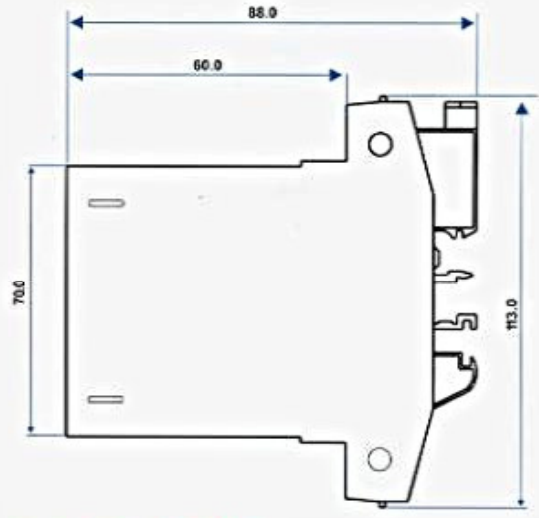
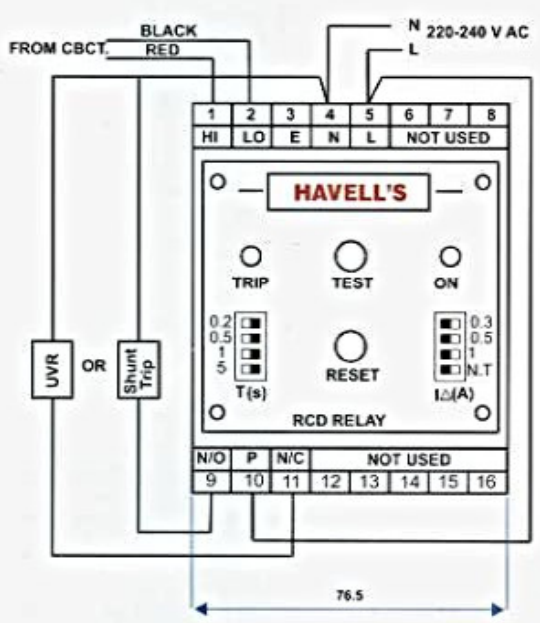
**Time Current Characteristics**

**Ground Fault & Over Current Tripping Characteristics**



**Dimensions (in mm)**

**Earth Fault Relay**

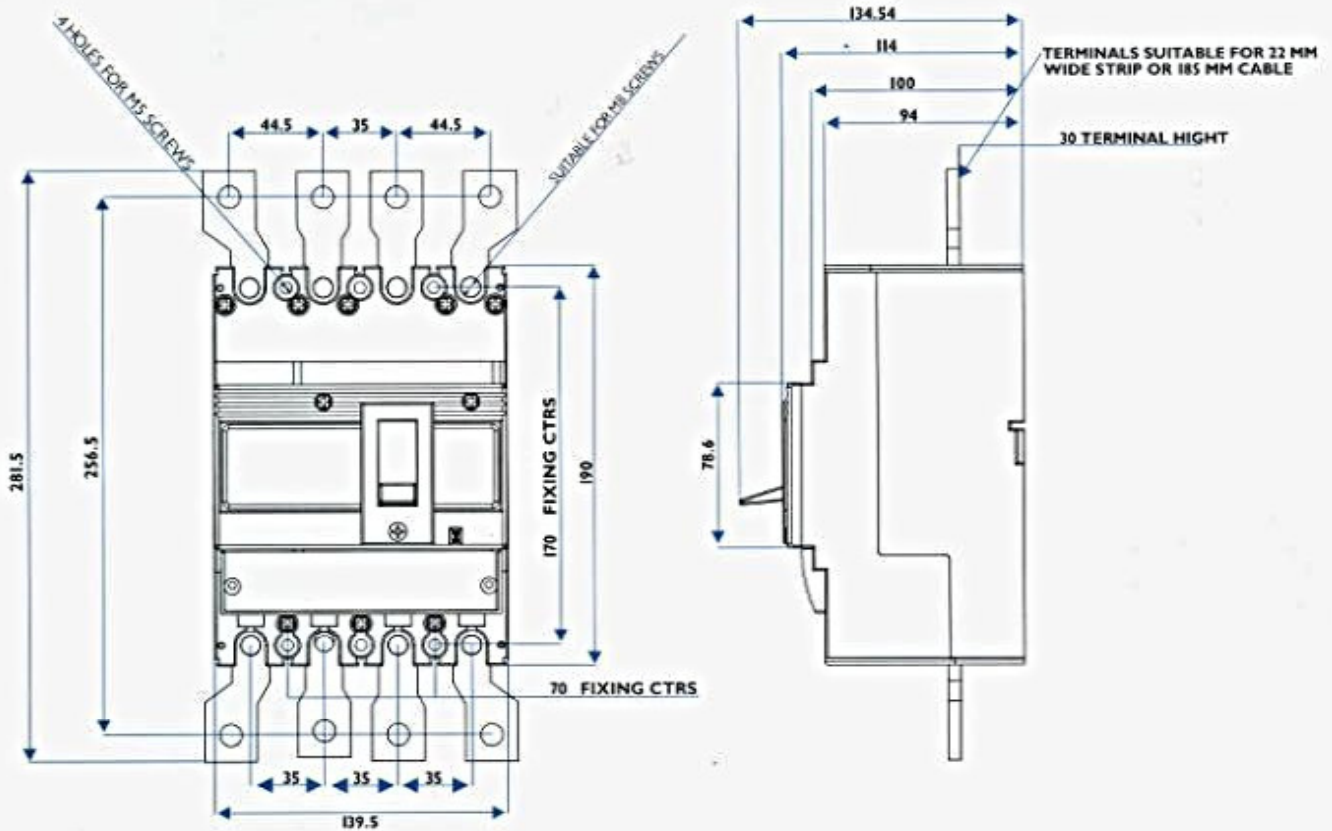


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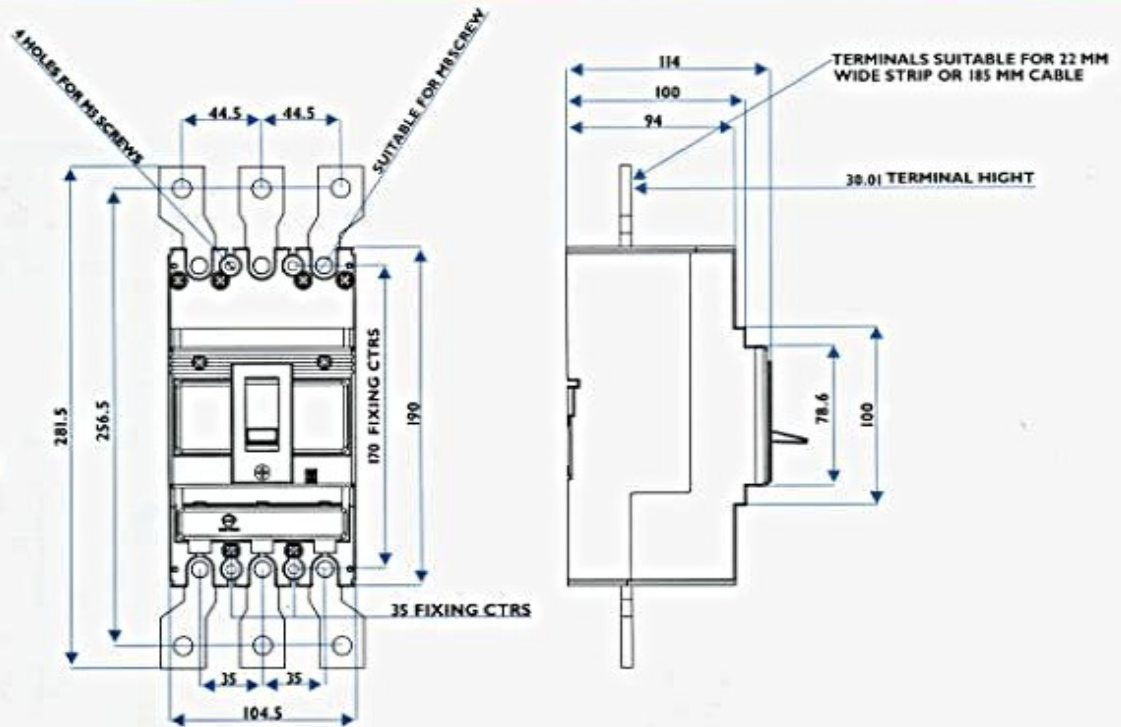
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**Dimensions (in mm)**

**Four Pole with Extended Terminal**



**Three Pole with Extended Terminal**



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