



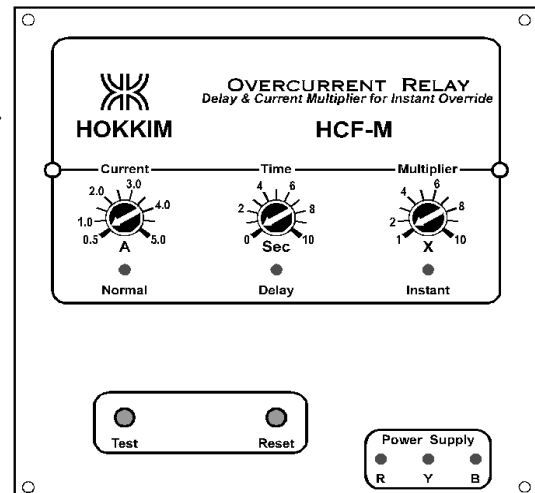
**HOKKIM**  
Giving You Control

# Control & Protection Relays

**MODEL : HCF-M**

**DESCRIPTION: OVERCURRENT RELAY WITH DELAY & CURRENT MULTIPLIER SETTING FOR INSTANT OVERRIDE TRIP**

- Test and reset facility.
- Convenient C. T. connections.
- Double pole double throw 10A 250VAC Relay Output.
- High precision comparators for excellent accuracy of settings.
- Stepless adjustment for current, time delay tap and current multiplier.
- LEDs to indicate R-Y-B power, normal condition, delayed and instantaneous trip.
- Three supply transformers— one per phase; only one of which is required for relay operation.



## FUNCTION

The Hokkim Earthfault & Overcurrent Relays are protection devices which, when installed in the main switchboard, facilitates the tripping of the mains circuit breaker when earth fault or over current condition exceeds the preset value.

## MODELS

There are various models of the Hokkim Earthfault & Overcurrent Relays depending on the type of protection and mode of operation. There are models for earthfault protection only. There are models for overcurrent protection only. And there are models for both earthfault and overcurrent protection.

Some models are designed for instantaneous tripping. Some have a setting for time delay before tripping. And some have a current multiplier setting for instant override tripping under excessive earthfault or overcurrent conditions.

This data sheet describes the Hokkim IDMT type of Earthfault and Overcurrent Relays. There are twelve models depending on the type of protection:

HCF-D	Overcurrent with Adjustable Delay Trip
HCF-I	Overcurrent Relay with Instantaneous
HCF-M	Overcurrent with Delay & Current Multiplier Setting for Instant Override Trip
HCF-T	Overcurrent Relay with IDMT
HEC-D	Earthfault & Overcurrent Relay with Adjustable Trip
HEC-I	Earthfault & Overcurrent Relay with Instantaneous
HEC-M	Earthfault & Overcurrent Relay with Delay & Current Multiplier Setting for Instant Override Trip
HEC-T	Earthfault & Overcurrent with IDMT
HEF-D	Earthfault Relay with Adjustable Delay Trip
HEF-I	Earthfault Relay with Instantaneous
HEF-M	Earthfault Relay with Delay & Current Multiplier Setting for Instant Override Trip
HEF-T	Earthfault Relay with IDMT

## IDMT OPERATION

The Hokkim IDMT Earthfault & Overcurrent Relays have a setting for time delay tap instead of a setting for time delay interval. Models with adjustable time delay intervals will trip after the set delay irregardless of the magnitude of the fault or over current. For IDMT models, the delay time varies inversely to the magnitude of the fault or over current. The greater the fault or over current, the shorter the delay time. Conversely, the smaller the fault or over current, the longer the delay time. See the Time Delay versus Magnitude of Fault or Over Current Graphs below.

Note that you can vary the delay time for a particular magnitude of fault or over current by varying the Delay Time Tap setting. In this way, these IDMT models provide for efficient protection by tripping quickly when fault or over current is severe and thus dangerous; and, at the same time, avoid false tripping when fault and over current is small and momentary owing to transients during the switching of electrical loads.

For additional protection, these models also have a current multiplier setting which will cause the Relay to trip instantly when the magnitude of the fault or over current reaches the multiplier value.

## SETTING

Specification of settings are to be supplied by the consultant engineer in charge. Actual setting and testing must be done by an approved Testing & Commissioning Agency. A copy of the manufacturer's test report with serial number is included with each unit for reference purposes.

The Inverse Time Graphs on this data sheet can be use as a guide to set the time delay according to the consultant's specification.

## WIRING

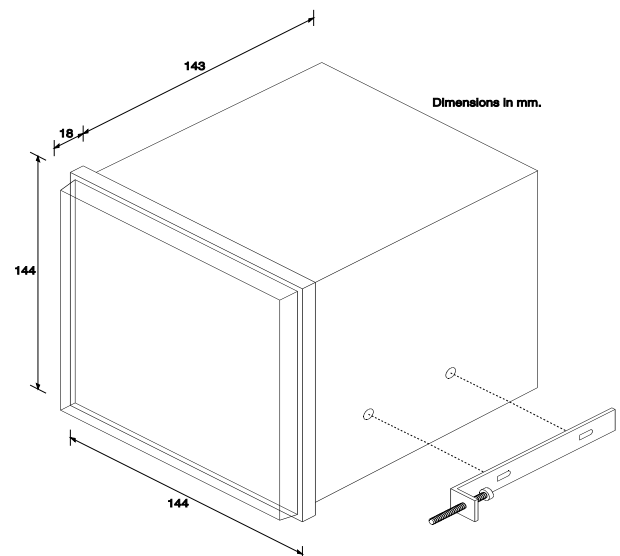
The connections for the IDMT models are the same as for the other models. See wiring diagrams in the data sheets for the other models.

The supply voltage should be tapped from the incoming side of the circuit breaker and fuse or MCB protected. Only single phase supply is required to power the unit but it is recommended to connect 3 phases & neutral to it. The reason being, any single phase failure will not disable this protection device; only total power failure will. The protection class current transformers should be mounted on the outgoing side of the circuit breaker.

## ADJUSTMENTS & FACILITIES

The following parameters or facilities can be adjusted or operated from the front of the Relay where applicable:

<b>CURRENT:</b>	Earthfault	- 0.5A to 2.0A
	Overcurrent	- 2A to 8A
<b>TIME TAP:</b>	Earthfault	- 0 to 10
	Overcurrent	- 0 to 10
<b>MULTIPLIER:</b>	Earthfault	- x1 to x10 of Current Setting for instant tripping
	Overcurrent	- x1 to x10 of Current Setting for instant tripping



**TEST:**

When pushed, the Normal LEDs go off, the Delay and Instant LEDs come on and the output relay energizes. When released, the Normal LEDs come on again, the Delay and Instant LEDs remain latched on and the output relay de-energizes.

**RESET:**

When pushed, the Delay and Instant LEDs that was latched on, go off.

Note: Certain models may not have some of the features described.

**OUTPUT:**

Two sets of single pole double throw output contacts are available. Each are rated at 10A 250VAC resistive load. These contacts are not latched. When fault occurs they energize and release again when the fault condition is no longer present.

**TECHNICAL SPECIFICATIONS**

Supply Voltage	3-phase 4-wire 415V 50Hz (1.2 x Rating continuous, 1.5 x Rating for 10 sec.)
Power Consumption	Max. 3VA
Current Input	- Overcurrent 8A - Earthfault 2A (2x continuous, 10x for 3 sec. to BS5149)
Current Consumption	Max. 1.5VA
Earthfault Current Setting	0.5A to 2.0A (Stepless Adjustment)
Overcurrent Current Setting	2A to 8A (Stepless Adjustment)
Earthfault Time Delay Tap Setting	0 to 10 (Stepless Adjustment)
Overcurrent Time Delay Tap Setting	0 to 10 (Stepless Adjustment)
Earthfault Multiplier Setting	x1 to x10 of Current Setting for Instant Tripping
Overcurrent Multiplier Setting	x1 to x10 of Current Setting for Instant Tripping
Adjustment Error	±2%
Contact Type	Double Pole Double Throw DPDT
Contact Rating	10A 250VAC resistive load
Contact Electrical Life	1x10 <sup>6</sup> operations at rated load
Instantaneous Tripping Time	< 20ms
Dimensions	144 x 144 x 161mm

The manufacturer reserves the right to alter performance, specifications or design without notice.