

### Option-1. Looping (Protect smaller current by looping option)

Some motor size may require one-third or one-fourth of particular EOCR current range. These installations can be accommodated by looping the motor wire 2 or 3 times through the integral current transformers of the EOCR. This reduces the number and type of relays inventoried for spare purposes. Each additional loop will increase the current measured as indicated by the following chart.

Looping Option	Current Setting Range(A)	Time of Passing (#)	No. of Loops (#)
05 Type	0.5 - 6	1	0 --- Fig 1
	0.25 - 3	2	1 --- Fig 2
	0.17 - 2	3	2
Looping Option	0.12 - 1.5	4	3
	0.10 - 1.2	5	4

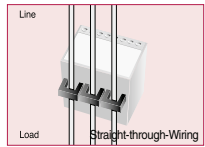


Fig 1

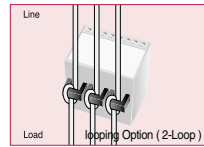
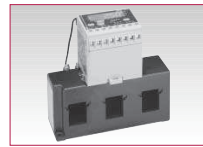


Fig 2

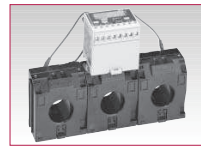
### Option-2. External Current Transformer Option (Ext. CT option protect bigger current)

Ordering option - 05 type of each model fitted to an external current transformer can achieve higher ampere ranges.

Ext. CT Option	Current Setting Range(A)	Current Ratio of Ext. CT
05 Type	0.5 - 6	NIL
	5.0 - 60	NIL
	10 - 120	100 : 5
60 Type	15 - 180	150 : 5
	20 - 240	200 : 5
	30 - 360	300 : 5



External 3CT Option

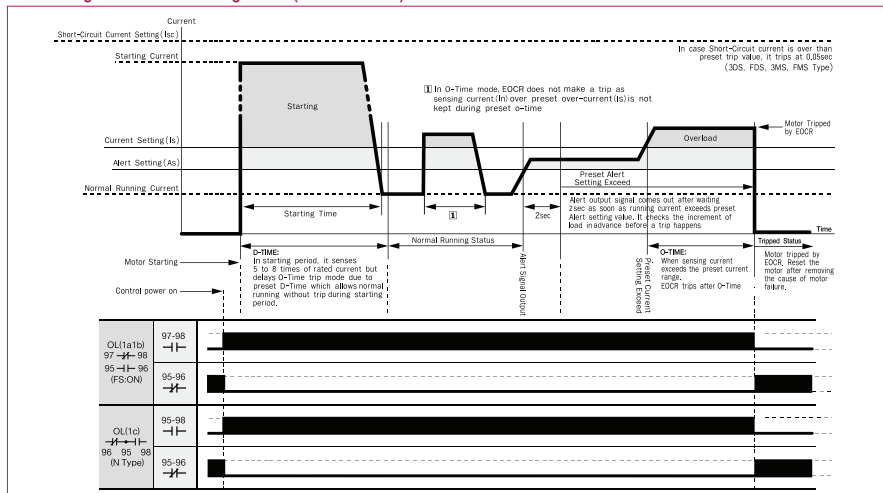


External SR-CT Option

### EOCR Type Table for 3phase Motor

Current Setting Range (Adjustable) (A)	Capacity of 3 Phase Motor (kW/HP)			TYPE	Cable Size		Remark			
	AC220(V)		Current (A)		AC380/440(V)					
0.5 - 6	0.75	1	4.8	1.5	2	4.2 / 3.6	05	3.5	28	Assemble with External CT
5.0 - 60	5.5	7.5	26	32	30	49 / 46	60	5.5-14	67	
10 - 120	22	30	93	37	50	84 / 73	100:05	38	130	
20 - 240	37	50	160	75	100	163 / 141	200:05	100	240	
30 - 360	55	75	230	132	175	263 / 227	300:05	250	430	
40 - 480	95	125	360	190	250	376 / 325	400:05	325	495	
50 - 600	110	150	440	220	300	423 / 390	500:05	400	565	
60 - 720	150	200	570	300	400	602 / 520	600:05	500	625	

### EOCR Setting Pattem / Motor Running Current (3DD & FD Series)



### Overview

#### D-TIME(Delay Time):

When starting the motor, its current is increasing 5 to 8 times of rated current and its starting time is different according to the load of motors. D-Time knob(Mode) has a function to delay the trip during starting period even if starting current exceeds over preset over-current value.

#### O-TIME (Operating Delay Time):

When EOCR senses over-current which exceeds over preset over-current range. O-Time knob(Mode) delays trip until EOCR trips after detecting over-current during running period. In case of Definite type, Over-current protection is provided by the relay tripping when motor operating current(I<sub>n</sub>) exceeds EOCR current setting(I<sub>s</sub>) for a period greater than preset trip time(O-Time), while Inverse type shows that Over-current protection is provided by the relay tripping according to the Time-Current Characteristic Curve.

#### RESET

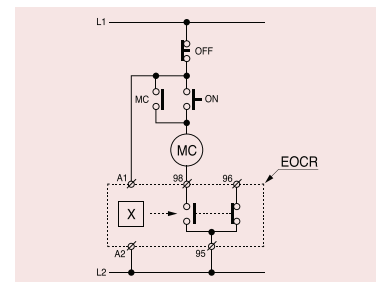
Depressing the RESET button or interrupting power supply resets the relay immediately. Depress the RESET button on the facia for manual reset. Electrical Reset can be achieved by interrupting power supply in remote area. Auto Reset can be achieved automatically according to R-Time setting. Auto reset function is selectable by using mode switch. EOCR with fixed auto reset time or adjustable auto reset time is applicable.

#### TEST

It has function to check and confirm the status of the motor by depressing the TEST button on the facia. To keep depressing the TEST button makes relay trip after the elapse of D-Time and/or O-Time. Once TEST is done, then reset the relay by depressing RESET button. The test function of Digital EOCR with 7 Segment Display CANNOT be performed during motor running, but possible when motor is stopped.

### N Type ( Fail-safe Mode / No Volt Release )

NVR(No Volt Release)/On(N Type)  
Fail-safe

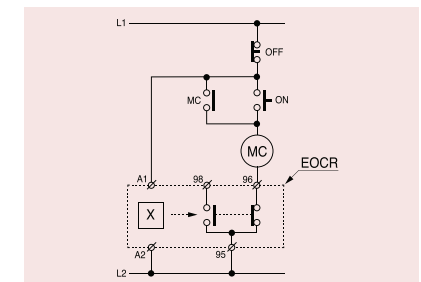


The output of relay is normally energized with control power applied. It is called NVR (No Volt Release) function and recommended to use output mode for safe protection. It is selectable by DIP switch or FS Mode

Caution) NVR function is designed to offer more accurate protection for motor. The motor can not start in case there is no power supply to EOCR or the span of life of motor is gone through. It is able to find the problem in its process in advance.

### R type ( Non-Fail-Safe Mode )

NVR(No Volt Release)/Off (R Type)  
Non-Fail-safe



In all case, the failure of the control voltage may not interrupt the process. It is selectable by DIP switch or FS Mode

Caution) In case of Non-Fail-Safe mode, periodical checking is required in case there is abnormal power supply to EOCR or the span of life of motor is gone through.

Classification		EOCR-3DE Series			EOCR-3M Series			
Model								
Model		3DE	3EZ	3DM	3MS	3MZ	3M4Z	
Wiring	Wire-through	○	○	○	○	○	○	
	Terminal	-	-	-	-	-	-	
Mount	Flush Mounting	-	-	-	-	-	-	
	Panel Mounting	○	○	○	○	○	○	
Protection	Overcurrent	Basic Type	0.5-60A		05: 05-10A, 60: 5-70A	05: 05-10A, 20: 5-20A	05: 05-10A, 60: 5-70A	05: 05-10A, 60: 5-70A
		Use external CT	1-960A(10.5-800.5)		1-960A(10.5-800.5)			
	Undercurrent		0.5-less than preset O.C / OFF		0.5-less than preset O.C / OFF			
		Locked Rotor	Running	0.5, 1-10sec		1-10sec		
		Starting	Within 0.5sec after D-Time		Within 0.5sec after D-Time			
		Phase Loss	Within 3sec		Within 3sec			
		Phase Reversal	0.1-0.3sec		0.1sec			
		Phase Unbalance	Within 8sec		Within 8sec			
		Ground Fault	-	A:0.02-3A, B:0.2-10A	-	-	A:0.03-2.5A, B:0.2-10A	-
		Short Circuit	-	-	-	0.05sec	-	-
Alert Output		A/F/H/U		A/F/H	-	-	-	
Trip Cause Memory		Last 3 Trip Cause			Last 1 Trip Cause			
Trip Cause Display		○	○	○	○	○	○	
Display		4-Digit 7segment			5-Digit 7segment			
Running Time Memory & Setting		-	-	○	○	○	○	
Bar-Graph		-	-	○	○	○	○	
Current Signal Output		-	-	-	-	-	4-20mA	
Setting SW. Type		Button SW.			Rotary SW & Button SW.			
Ground Fault Current Sensing		-	Zero Phase Current	-	-	Zero Phase Current	-	
Contacts	Mode	O.L:2-SPST(1a1b)	O.L:1-SPST(1a)	O.L:2-SPST(1a1b)	O.L:2-SPST(1a1b)	O.L:1-SPST(1a)	O.L:2-SPST(1a1b)	
		AL:1-SPST(1a)	GR:1-SPST(1a)	AL:1-SPST(1a)	S.C:1-SPST(1a)	GR:1-SPST(1a)	-	-
Rating		3A/250VAC, Resistive			3A/250VAC, Resistive			
Control Voltage (50/60Hz)		24VAC/DC, 220VAC ± 15%, 110VAC ± 15%			24VAC/DC, 85-250VAC/DC			

**Panel Mounting / Flush Mounting makes it easier for use.**

- Digital Ammeter is installed at the front cover of panel door in Flush Mounting type. It makes possible to check sensing current and finding the cause of trip with tripped current easily, to set current and O-time by simple button selection without removing unit from panel.  
- Panel Mounting type with Digital Ammeter is installed inside the MCC panel and Just Operator is Possible to adjust it.

**Following conditions should be considered in case of installing EOCR.**

- Overcurrent & Phase Loss must be included as basic protective function in the point of view for its law and regulation.  
- Earth leakage current protection must be added against moisture and humidity conditions.  
- In case you need to sense the overload increasing, Alert function must be added.  
- If you need to confirm the current of many motors in one place , Current signal output transducer function (4-20mA) must be added.  
- Short Circuit protection must be added if you protect line damage caused by Short Circuit.  
- EOCR with 3CT is recommended to not only 3 φ 3w, but also 3 φ 4w condition.

**Window / Terminal makes it easier for installation.**

- Wire is passing through CT without cutting, that is much easier for installation. It has also more convenient application to external CTs.  
- As for Terminal type, display part is Flush Mounting type but Converter is Panel Mounting type with its application less than 60Amp.

**The same diameter of Digital Ammeter to conventional Analogue Ammeter makes it easier for installation.**

- Ammeter Selector SW is not necessary as 3 phase current is displayed L1, L2, L3 in order every 5 seconds.  
- It is easy to install Ammeter by using cap cover and it saves install time.

**Alert Output Mode**

- "A" (Ampere Relay) : Energized when sensing current  
- "H" (Holding) : ON-OFF output mode

- "F" (Flicker) : Flicker  
- "U" (Under Current Mode) : "AL" output is transferred to UC (3DD/FD version "E")

Classification		EOCR-FDE Series		EOCR-FM Series				EOCR-P Series	
Model									
Model		FDE	FEZ	FDM	FMS	FMZ	FM420	PMZ	
Wiring	Wire-through	○	○	○	○	○	○	○	○
	Terminal	○	○	○	○	○	○	○	○
Mount	Flush Mounting	○ (Display)	○ (Display)	○ (Display)	○ (Display)	○ (Display)	○ (Display)	○ (Display)	-
	Panel Mounting	○ (Converter)	○ (Converter)	○ (Converter)	○ (Converter)	○ (Converter)	○ (Converter)	○ (Converter)	○
Protection	Overcurrent	0.5-60A		05: 05-10A, 60: 5-70A	05: 05-10A, 20: 5-20A	05: 05-10A, 60: 5-70A	05: 05-10A, 60: 5-70A	05: 05-10A, 60: 5-70A	05-60A
		1-960A(10.5-800.5)		1-960A(10.5-800.5)					
	Undercurrent	0.5-less than preset O.C / OFF		0.5-less than preset O.C / OFF					
		Locked Rotor	Running	0.5, 1-10sec		1-10sec			
		Starting	Within 0.5sec after D-Time		Within 0.5sec after D-Time				Within 0.5sec after D
		Phase Loss	Within 3sec		Within 3sec				Within 3sec
		Phase Reversal	0.1-0.3sec		0.1sec				0.1-0.3sec
		Phase Unbalance	Within 8sec		Within 8sec				Within 8sec
		Ground Fault	-	A:0.02-3A, B:0.2-10A	-	-	A:0.03-2.5A, B:0.5-10A	-	Definite: 0.03-10A, Invers
		Short Circuit	-	-	-	0.05sec	-	-	0.03-0.05sec
Alert Output		A/F/H/U		A/F/H	-	-	-	-	-
Trip Cause Memory		Last 3 Trip Cause			Last 1 Trip Cause				Last 3 Trip Cause
Trip Cause Display		○	○	○	○	○	○	○	○
Display		4-Digit 7segment			5-Digit				5-Digit
Running Time Memory & Setting		-	-	○	○	○	○	○	○
Bar-Graph		-	-	○	○	○	○	○	○
Current Signal Output		-	-	-	-	-	4-20mA	4-20mA	4-20mA
Setting SW. Type		Button SW.		Rotary SW. & Button SW.				Button SW.	
Ground Fault Current Sensing		-	Zero Phase Current	-	-	Zero Phase Current	-	Zero Phase Current	
Contacts	Mode	O.L:2-SPST(1a1b)	O.L:1-SPST(1a)	O.L:2-SPST(1a1b)	O.L:2-SPST(1a)	O.L:1-SPST(1a)	O.L:2-SPST(1a1b)	O.L:SH : 2-SPST(1a	
		AL:1-SPST(1a)	GR:1-SPST(1a)	AL:1-SPST(1a)	SC:1-SPST(1a)	GR:1-SPST(1a)	-	GR : 1-SPST(1a	
Rating		3A/250VAC, Resistive		3A/250VAC, Resistive				3A/250VAC, Resist	
Control Voltage (50/60Hz)		24VAC/DC, 220VAC ± 15%, 110VAC ± 15%		24VAC/DC, 85-250VAC/DC				24VAC/DC, 85-250V	

**EOCR-3DE/FDE**

- MC
  - Re
  - Ov
  - Un
  - Tir
  - -0.5
  - "U"
  - OFF
  - Di
  - / Tri
  - Tri
  - Me
  - Th
  - Fit
  - Re
- CU Based  
 al Time Processing / Higher Precision  
 ercurrent Protection Range: 0.5-60A, Wide Range Protection (Use with external CT from 11 to 960A, Direct application without CT up to 60A)  
 ndercurrent Protection Range: 0.5-59A / OFF (Use with external CT less than 960A)  
 me Characteristic for Overcurrent  
 i-10A : Definite / Inverse Selectable, Over 11A : Definite(Use with external CT in case using Inverse time)  
 C" output is used as common to "OC" output. When choosing "U" in AL mode, "AL" mode becomes  
 gital display / 3 Phase Current Display: Digital Ammeter (Every 5 seconds)  
 pped Cause Digital Display: Easy Troubleshooting  
 ip Cause Memory: Last 3 trip check function. Possible to check with tripped trip cause and current  
 anual / Electrical Reset  
 e tripping relay is normally energized with control power supply. (Selectable)  
 : to a variety of environment as Terminal & Window type.  
 sistance Strengthened against variable frequency device such as inverter : 20-400Hz.



# EOCR-SSD

Series



<b>PFZ</b>
<input type="radio"/>
<input type="radio"/>
<input type="radio"/> (Display)
<input type="radio"/> (Converter)
A
~3000:5)
et O.C / OFF
/Adjustable
ter D-Time
sec
sec
sec
erwise: 0.03-1A
5sec
-
Cause
<input type="radio"/>
<input type="radio"/>
<input type="radio"/>
IA
W.
Current
ST(1a1b)
IT(1a)
Resistive
≥50VAC/DC

## Protection

Protective Item	Trip Time	Description
Over-current	O-Time	$I_s < I_n$
Phase Loss	3sec	$[(MAX - MIN) / MAX] \times 100 > 90$
Locked Rotor	0.5sec after elapse dt	$\geq 3$ times OC setting value

## Specification

Over-current Setting	Current	05	0.5 ~ 6A
		30	3 ~ 30A
		60	10 ~ 60A
	Starting delay time	D-Time	1 ~ 30sec
		Trip time	O-Time
Reset		Manual / Electrical	
Operating t-c characteristic		Definite	
Tolerance		Current	$I < 1A : \pm 0.05A, I \geq 1A : \pm 5\%$
		Time	$t \leq 3S : \pm 0.2s, t > 3s : \pm 5\%$
Environment	Temperature	Operation	-20°C ~ -60°C
	Humidity	Store	-30°C ~ -80°C
Control Power		30-85% RH non-condensing	
		• 110 : 110VAC $\pm 15\%$ , 50/60Hz	
		• 220 : 220VAC $\pm 15\%$ , 50/60Hz	
		• 440 : 440VAC $\pm 15\%$ , 50/60Hz	
• 24 : 240VAC/DC			
Contact Rating		2-SPST	3A / 250VAC , Resistive
Insulation	Between casing and circuit		Over 10 M $\Omega$ , DC500V
	Dielectric Strength	Between casing and circuit	2000VAC 60Hz, 1min
Between open contacts		1000VAC 60Hz, 1min	
	between circuit	2000VAC 60Hz, 1min	
Installation		35mm Din Rail or Panel Mounting	

- MCU(Micro Controller Unit) based / 2-CT Type
- Real Time Processing / Higher Precision
- Current Setting Renge - 05Type : 0.5 ~ 6A / 30Type : 3 ~ 30A / 60Type : 10 ~ 60A
- Digital display : trip cause / easy troubleshooting
- Reset : Manual (instantaneous) / Electrical (remote)
- Load selection by DIP switch : Single phase(1P) / Three phase(3P)
- Fail safe(N) / Non-fail safe(R)

# EOCR-3DM/FDM Series

## Features

- Compact Design
- 3DM : Panel Mounting Type
- FDM : Flush Mounting Type
- MCU(Microprocessor Control Unit) & ASIC Based
- 3 Integral Current Transformers
- Multiple Protection Functions
- Digital Ammeter
- Troubleshooting / Trip Cause Memory, Display
- Adjustable Operating Features by Pulse Rotary switch
- Wide Current Adjustment Range
- Selectable Time-Current Characteristics (Inverse / Definite)
- Manual Instantaneous / Electrical Remote Auto Reset
- Test Function
- Ambient Insensitive
- Selectable Fail-safe and Non-fail-safe Operation Modes

## Comparison Table of Model

EOCR	3DM / FDM	3MZ / FMZ
Protection		
Over-current	●	●
Under-current	●	●
Phase Loss	●	●
Phase Unbalance	●	●
Phase Reverse	●	●
Locked Rotor	●	●
Ground Fault	-	●
Run Monitor & Load Alert Function	●	-
Selectable Alerting Pulse	●	-

## Protection Feature

Function	DIP Switch	Description
Over current	DEF sw#3 on	When motor operating current(In) exceeds preset "oc" setting, relay will trip after preset O-Time in "of" setting. The amperage of In(operating current) does not effect on relay trip time.
	INV sw#3 off	The tripping time of relay depends on the amperage of In(operating current) according to time-current characteristics
Under current	Definite time characteristic	This is for idle/dry running protection. The relay operates when the operating current is less than preset "uc" current after preset "ut" time elapses.
Phase Loss		The relay will be operated within 3sec. when the phase failure occurs. This function works during D-Time.
Phase Unbalance		The relay operates within 8sec. when the current difference among 3 phases is greater than 50%. The calculation formula is (Max-Min)/Max current 100 > 50%
Phase Reversal	on : enable off : disable	In the event of wrong phase sequence, relay will be operated in 0.1sec. Phase reversal protection function can be disabled by DIP selection.
Ground Fault	A Type : 0.03-2.5A B Type : 0.5-10A	Ground fault protection is provided by the relay tripping sensed by Zero Phase Current Transformer (Core Balanced Current Transformer). The relay shows the leakage current during operation (3MZ & FMZ)
Locked Rotor		The setting range is 2-10 times of oc setting. If the starting current exceeds more than setting value after preset D-Time elapses, the relay will be energized within 0.5sec. This function is available on definite time characteristic.
Stall		The setting range is 1-10sec. If the operating current exceeds more than 180% of preset "oc" setting the relay will be energized after preset "st" time elapses.

## Looping & External CT Option

Refer to page 10

## Alert Function : 3DM & FDM

When motor operating current (In) exceeds the alert setting (As), the alert relay outputs three kind of signal. The output can be used to warn customers/operators of possible overloading and avoid unnecessary motor shutdown.

The type of output signal is decided by the selection in the "Alo" mode "A"(Ampere relay): energized whenever CT senses a current "F"(Flickering): character "A" and current value flash frequently "H"(Holding): ON-OFF

Running state Setting "ALO"	Normal (operation)	More then preset(% of Alert)	Trip
Flicker "F"			
Hole "H"	3sec		
Aux "A"			

In = Motor Operating Current / Is = EOCR Over-current Setting / As = Alert Setting

## Fail-safe & Non-fail-safe

The tripping relay can be operated in a fail-safe or non-fail-safe mode

## Application of the Fail-safe (Electrically Held) Connection

Fail safe setting in NVR mode : ON

The tripping relay is normally energized with control power supply

## Application of the Non-fail-safe Connection

Fail safe setting in NVR mode: OFF

In all cases, the failure of the control voltage may not interrupt the process.

	Control power on →	Relay Trip →
FS:ON (Fail safe)	95-  96	■
	97-  98	■
FS:-- (OFF) (Non-Fail safe)	95-  96	■
	97-  98	■

## \* Tolerance (3DM/ FDM / EVR Series)

Current	I < 1A : $\pm 0.1A$ I $\geq 1A$ : $\pm 5\%$
Time	0.05s → Within 0.05s t < 1s : $\pm 0.1s$ t $\geq 1s$ : $\pm 5\%$

# EOCR-3DM/FDM Series

Digital Over Current Relay

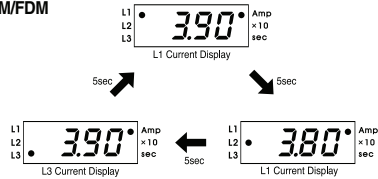
## LED Display



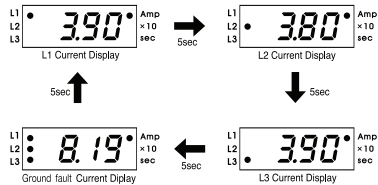
## Digital Ammeter

3 phase motor currents (In) are displayed in sequence on the LED display.

### • 3DM/FDM



### • 3MZ/FMZ



## Digital Trip Cause Indication / Easy Troubleshooting

- Enter into "FAULT" mode with mode switch by depressing once Set/store button, then last trip cause is shown
- Each phase current is displayed in order whenever turn mode switch right or left

## Test

This is the self-test of this product. If the relay enters into this mode, it begins its count down preset value of O-time of "Ot" mode after waiting 3sec and becomes trip state as showing "END" message that means this relay is ready to work.

- "END" message of a result of this test is also stored in "Fault" mode as last trip.
- Not permitted to test this function during the operation to prevent unnecessary trip

## Reset

Pushing the RESET button or interrupting power resets the relay immediately. Electrical remote reset is also available through the panel mounted reset switch. The relay cannot be reset by control power interruption when the hand reset (H-r) selected in mode. In this case, it is possible to press the reset button on the relay facia. Automatic reset is also available if enter into reset mode (rt:A-r) and reset delay time is adjustable from 0.3sec to 20min

## Examples of Trip Cause Indication

<b>Over-current Trip</b> Relay displays a trip, caused by maximum over-current. 10.7A which has been detected from phase L3(T/T3)	L1 L2 L3 Amp x10 Sec
<b>Under-current Trip</b> Relay displays a trip, caused by minimum Under-current. 1.14A which has been detected from phase L2(S/T3)	L1 L2 L3 Amp x10 Sec
<b>Locked Rotor Trip</b> Relay displays a trip, caused by locked rotor and maximum current. 26.9A which has been detected from phase L1(R/T1)	L1 L2 L3 Amp x10 Sec
<b>Locked Rotor Trip</b> Relay displays a trip, caused by locked rotor while motor is working	L1 L2 L3 Amp x10 Sec
<b>Phase reversal Trip</b> Relay displays a trip, caused by phase reversal	L1 L2 L3 Amp x10 Sec
<b>Phase Unbalance Trip</b> Relay displays a trip, caused by Phase unbalance and maximum current. 2.78A which has been detected from phase L1(R/T1)	L1 L2 L3 Amp x10 Sec
<b>Phase Loss Trip</b> Relay displays a trip, caused by phase loss which has been detected from phase L1(R/T1)	L1 L2 L3 Amp x10 Sec
<b>Phase Loss Trip</b> Relay displays a trip, caused by phase loss which has been detected from phase L2(S/T2)	L1 L2 L3 Amp x10 Sec
<b>Phase Loss Trip</b> Relay displays a trip, caused by phase loss which has been detected from phase L3(T/T3)	L1 L2 L3 Amp x10 Sec
<b>Ground Fault Trip</b> Relay displays a trip, caused by ground fault current. 0.6A which has been detected from ZCT	L1 L2 L3 Amp x10 Sec

## Time-Current Characteristic Curve

Refer to Curve-1 and Curve-2 on page 11

## Setting Step of 3DM & FDM

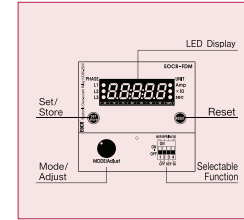
MODE		Select the mode to adjust with turning the MODE/Adjust switch CW or CCW.
Set		Depress the SET/store button once to start the setting
Adjust		Adjust the required amount with MODE/Adjust switch
Store		Depress the SET/store button once to memorize the setting

# EOCR-FDM/FMS/FMZ/FM420

MCU & ASIC Based Overload Relay



EOCR-FDM / FMS / FMZ / FM420



- Over-current, Under-current, Phase Loss, Phase reversal, Phase Unbalance, Locked rotor protection
- Short current protection ← FMS
- Ground Fault Protection ← FMZ
- Current Loop Communication ← FM420
- Including Current Transducer : 4~20mA output
- Accumulation to Running time

## Protection

Protective Item	Trip Time			
	FDM	FMS	FMZ	FM420
Over-current	DEF: 0.2 - 30sec, INV: 1 - 30	DEF: 0.2 - 30sec, INV: 1 - 30	DEF: 0.2 - 30sec, INV: 1 - 30	DEF: 0.2 - 30sec, INV: 1 - 30
Under-Current	0.5 - 30sec(DEF)	0.5 - 30sec(DEF)	0.5 - 30sec(DEF)	0.5 - 30sec(DEF)
Phase loss	3sec	3sec	3sec	3sec
Phase reversal	0.1sec	0.1sec	0.1sec	0.1sec
Phase Unbalance	8sec	8sec	8sec	8sec
Locked Rotor	Lock stall	0.5sec after dt 1 - 10sec	0.5sec after dt 1 - 10sec	0.5sec after dt 1 - 10sec
Ground fault	-	-	0.1 - 10sec	-
Short circuit	-	0.05sec	-	-

## Specification

Model	FDM	FMS	FMZ	FM420
Current Setting	Over-Current(Ioc) Under-Current(Iuc) Ground Fault Current(Ic)	Refer to Table #1 Refer to Table #1 -	Refer to Table #1 Refer to Table #1 A : 0.03 - 2.5A / B : 0.5 - 10A	Refer to Table #1 Refer to Table #1 -
Time Setting	Starting Delay T <sub>ime</sub> (dt) Over-Current Trip Delay(ot) Under-Current Trip Delay(ut) Ground Fault Trip Delay(Et)	OFF - 200sec DEF : 0.2 - 30sec / INV : 1 - 30 0.5 - 30sec(DEF) -	OFF - 200sec DEF : 0.2 - 30sec / INV : 1 - 30 0.5 - 30sec(DEF) 0.1 - 10sec	OFF - 200sec DEF : 0.2 - 30sec / INV : 1 - 30 0.5 - 30sec(DEF) -
Short circuit	-	0.05sec	-	-
Control Power	24 220	24VAC/DC 85 - 250VAC/DC, 50/60Hz	24VAC/DC 85 - 250VAC/DC, 50/60Hz	24VAC/DC 85 - 250VAC/DC, 50/60Hz
Contact Rating	OL AL(GR/SC)	2-SPST, 3A/250VAC, Resistive 1-SPST(AL)	2-SPST, 3A/250VAC, Resistive 1-SPST(S,C)	2-SPST, 3A/250VAC, Resistive 1-SPST(GR)
Environment	Temperature Store Operation	-30°C - 80°C -20°C - 60°C	-30°C - 80°C -20°C - 60°C	-30°C - 80°C -20°C - 60°C
Humidity	30 - 85RH, Without condensation	30 - 85RH, Without condensation	30 - 85RH, Without condensation	30 - 85RH, Without condensation
Display	7-Segment LEDs Bar-Graph	o o	o o	o o
Mounting	35mm Din-rail	35mm Din-rail	35mm Din-rail	35mm Din-rail

Table #1. Current Range : Same as Table#1 on page 16

Caution : The external CT should be used in case Inverse curve(oin setting) is applied over 10Amps.