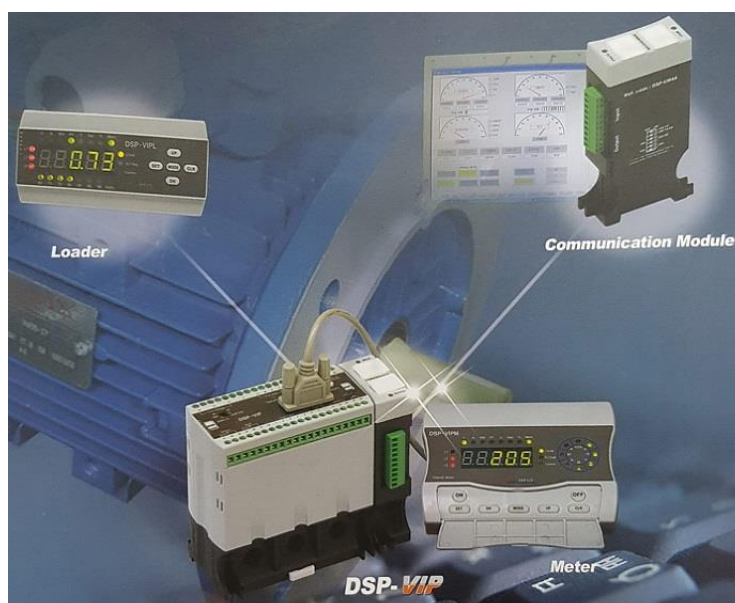


Digital Ground Fault Protection Relay

<DSP-DGFR , DGFR-M>

<Socket PIN type, RS485, DM II meter>



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Sam
Wha DSP Ltd.

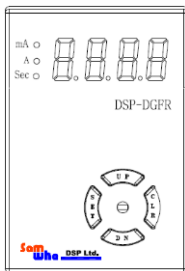
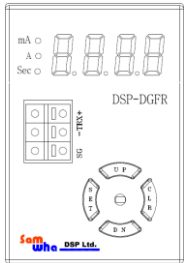
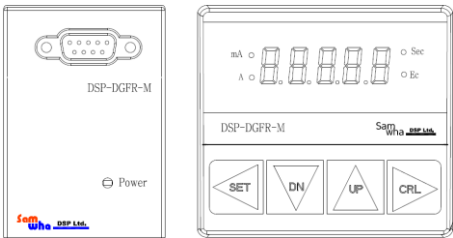
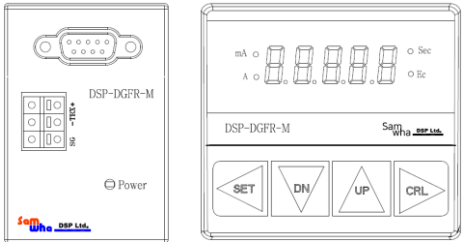
Digital Ground Fault Protection Relay

<DSP-DGFR , DGFR-M>

<Socket PIN type, RS485, DM II meter>

1. Abstraction

Installation	Model	Protection	Auxiliary Function
Panel Mounting Type	DGFR	Ground fault protection	
	DGFR-C		RS485
Panel Flush Mounting Type	DGFR-M		
	DGFR-M-C		RS485

DIVISION	Basic	Communication
Panel Mounting Type		
Panel Flush Mounting Type		

2. Main Feature

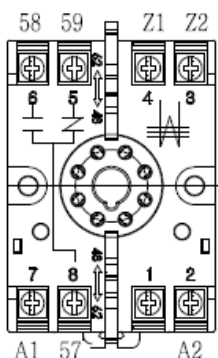
- Minimized compact size, Easy installation on the 8 pin socket
- MCU (Microprocessor Control Unit) based
- High sensitive, wide operation range: 30mA~4A/ZCT , 0.5A~100A/NCT
- Precised preset for zero phase current
 - DGFR : 4 Digit Window
 - DGFR-M : 5 Digit Window
- Easy and flexible response: Adjustable time/Eot
- Active Low Pass Filter is used to have duty against harmonic frequency
- Self-diagnostic function
- Various type based on current sensing device

Type	Current sensor	Current range
DGFR-M-A	ZCT: 200mA/1.5mA	30mA~4A
DGFR-M-V	ZCT: 200mA/100mV	30mA~4A
DGFR-M-N	NCT: 100A/5A	0.5A~100A

3. Technical Specification

Division		Description
Trip delay time	Eot	0.05sec, 0.1~60sec
Trip output relay		1a/3A, 250VAC, Resistive
ZCT Type	DGFR-M-A Type	ZCT : 200mA/1.5mA
	DGFR-M-V Type	ZCT : 200mA/100mV
	DGFR-M-N Type	NCT : 100A/5A
Environment	Temperature	Operation -20°C~60°C
		Storage -30°C~80 °C
	Humidity	30~85%, Relative/Non-condensing
Allowable tollerance	Earth current	*A, V Type: $I_o \leq 100\text{mA} : \pm 10\text{mA}$, 100mA < $I_o : \pm 10\%$ *N Type: $I_o \leq 500\text{mA} : \pm 10\text{mA}$, 500mA > $I_o : \pm 10\%$
	Operation time	$t \leq 2\text{sec} : \pm 0.2\text{sec}$, $t > 2\text{sec} : \pm 10\%$
Insulation for Case-Circuit		10MOhm or more/500VDC
Withstanding voltage	Case-Circuit	2KV/60Hz, 1min
	Contact-Contact	1KV/60hz, 1 min
Control power		85~260VAC, 50/60Hz((120~370VDC)
Digital communication (DGFR-C Type, DGFR-M-C Type)	Physical	2 wire RS 485, Modbus/RTU
	Address	1 ~ 250
	Speed	9.6/19.2/38.4/57.6/76.8/115.2kbps
	Connection	Terminal: TRX(+), TRX(-)
	Termination resistance	it needs to use external resistance with 120 Ω
	Cable	Sheathed 2 Pair
Consuming power		6W/max
Installation		35mm DIN Rail, Panel Mounting/ converter

4. Input-Output/Converter with 8 PIN



Input	A1-A2	Control Power
	Z1-Z2	ZCT
Output	57-58-59/1c	Trip output relay
	LED	*Green: Power-on *Yellow: Trip

5. Preset mode

► Main Mode

Press "SET" key to enter into setting mode ,then enter password. The more detail is described in "Operation of Control key "

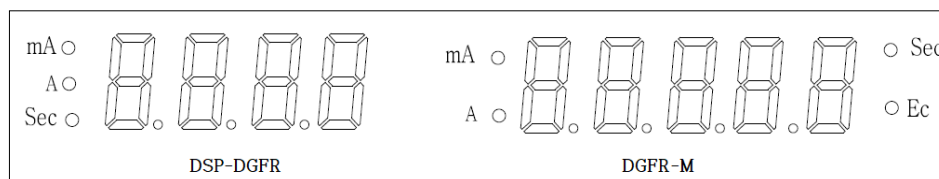
Mode	Function/ range	Description	Factory Setting value
Out/a/b	to define the pattern of main trip output in initial state	* In case the control power is powered, • a:initial state of 1c(main trip) output is changed to opposite state(57-58/open→ close, 57-59/close→open) • b:initial state of 1c is not changed(57-58/open, 57-59/close) *Not possible to change the preset value of this mode in any case during operation even if "OPSET" mode of "CAB" mode group is "ON"	b
Ec/oFF/setting value	to preset zero phase current	*OFF:disable *A,V Type:30mA ~ 4A/adjustable *N Type:500mA ~ 100A/adjustable	4
Eot /setting value	to preset operating trip delay time for GF protection	*adjustable:0.05sec, 0.1 ~ 60sec	60
rESEt(rESt)/Er/ A-rE	to decide how to reset trip state	*Er:"CLR" key, power off *A-rE:auto reset	Er
Aut/setting value	to preset auto reset time	*time range :0.5 ~ 60sec *If Hr is preset in "rESEt" mode, this mode becomes disable	60
Addr /Setting value	to put self-address to communicate with PC	*to preset an address for 485 communication *range of number : #1 ~ #250	1
bPS /setting value	to decide communication speed	*to select communication speed :9.6/19.2/38.4/57.6/76.8/115.2kbps	9.6
trIP /8 ~ 1/trip cause / trip value	to show latest number of 8 trip cause	*to show the number of 8 trip cause in the order *press "UP" or "DN" in the "trip" mode state, then trip cause and value is shown alternatively *press "CLR" or ""SET" to check next event or previous event *In order to enter setup state on the way of trip condition, press both "SET" and "CLR" in the same time, finally release	none
*Self-diagnostic Test :Release pressed both key or the button after "tEst" is shown as pressing both "UP" key and "DN" key in the same time for 3 sec , so consequently the trip output relay is energized after counting the preset Eot down. It is necessary that the energized trip out relay must be reset as pressing "CLR" key			

► Cab Mode

This mode is appeared as pressing "SET" key for 5 sec or more , and is disappeared as "SET" key once more

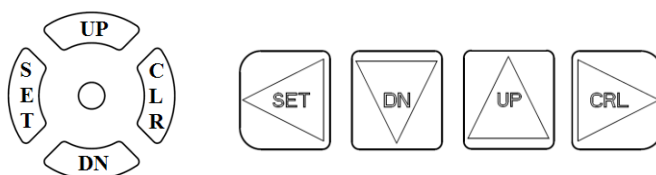
Mode	Function/ range	Description	Factory Setting value
EcPEr(EcPr)	to have a calibration for GF current	Possible to adjust within +,- 50% by using UP", "DN" key.	100
ActIv(Actv)/OFF/50/60	to select frequency of power system	*to eliminate the input noise from Z1-Z2 *50 : 50Hz power svstem *60 : 60Hz power system	60
oPSEt(oPSt)/ON/OFF	to decide if it is possible to preset during the operation	*ON : it is possible for operator to change a preset value during motor normal operation except "out" mode * OFF : it is not possible for operator to change a preset value during motor normal operation	60
485US(485S)	To select condition to transmit 485 signal	*FASt : able to transmit a signal in real time *Slow : able to transmit a signal based on display meter	Er

6.Indication



mA	1~999mA	Sec	time processed
A	1~5A	Ec	GF protection processed

7.Key Operation

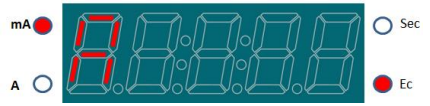
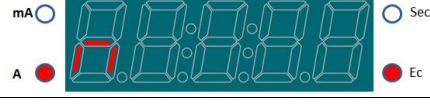


Key	Description
SET	*:SET" is appeared as pressing "SET" Key for 3 sec or more *First mode and preset value is showned alternatively as releasing "SET" key
UP,DN	*to change preset value in each mode
SET,CLR	*SET key: forward to next mode *CLR key:backward to previous mode

SET & CLR/store	*Possible to enter into the operation state after storing a preset value as pressing both “SET” and “CLR” key or waiting for 15sec without any touch.
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8.Window indication of each type

“A”, “V”, or “n” is indicated in the window as control power is loaded, but this is not shown during operation

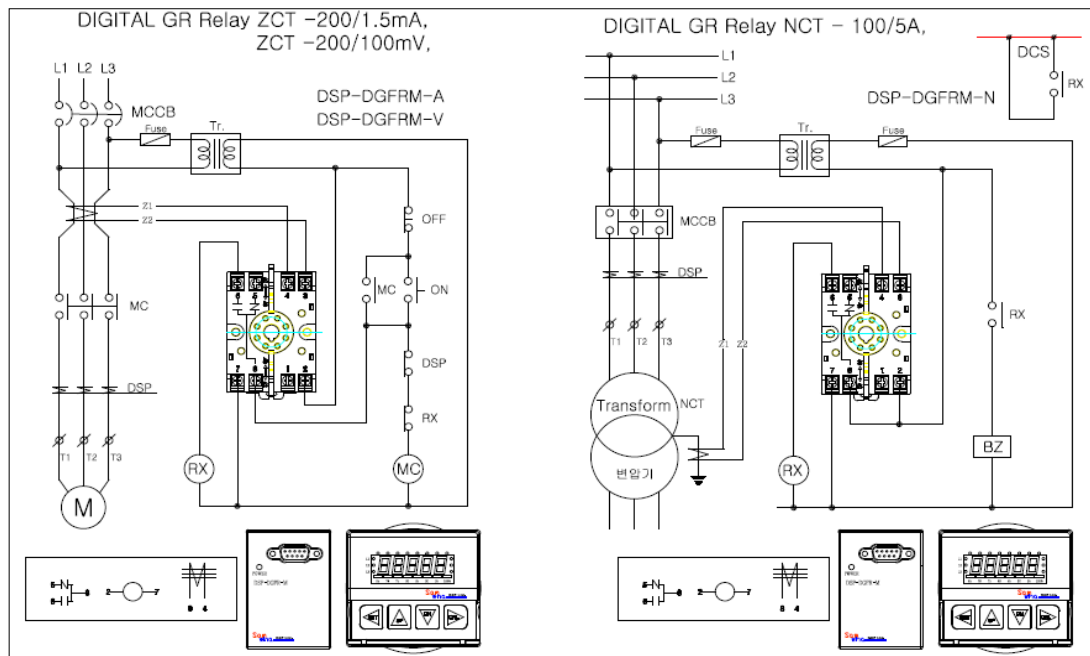
Type	Zero phase current(earth current) sensor	Display
DGFR-M-A	ZCT:200mA/1.5mA	
DGFR-M-V	ZCT:200mA/100mV	
DGFR-M-N	NCT:100A/5A	

- ▶ 0(zero) is shown in initial state after control power is loaded, not turned on LED for mA,A
- ▶ LED for mA and A is turned on according to current value as sensing earth current

9.Trip State Indication

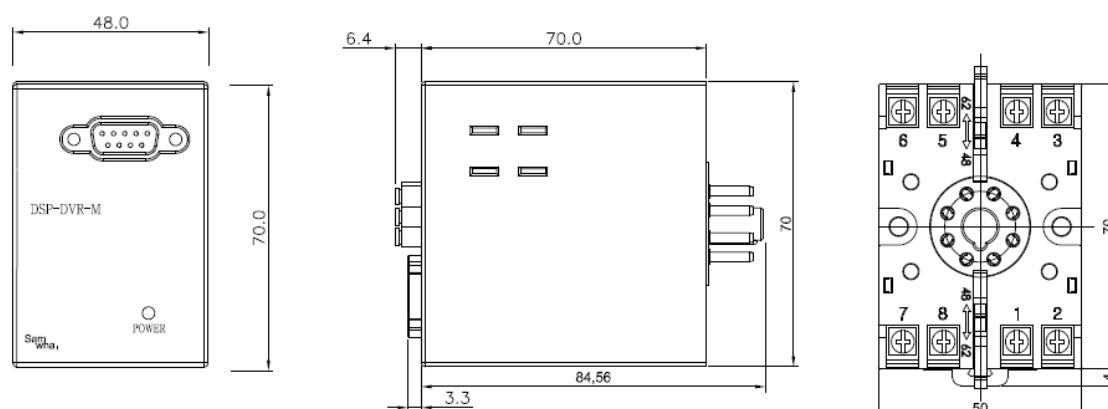
- ▶ Trip value & Ec are shown alternatively

10.Application Sequence Diagram

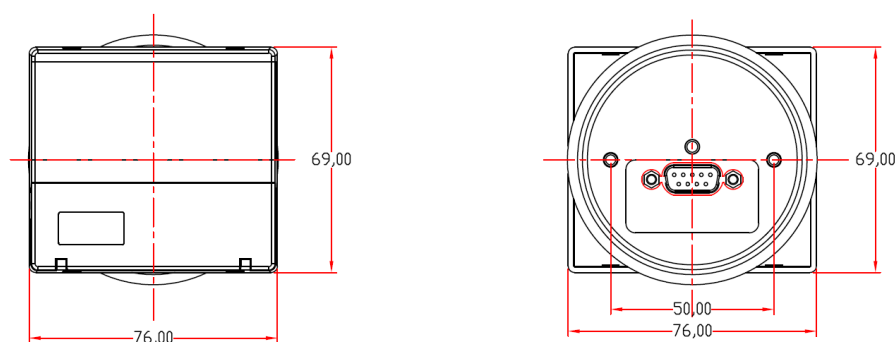


11.Dimension

► Converter



► Converter



12.Order Form

Model	Reference	Remarks	
DGFR-A	DSP-DGFR-A	ZCT:200mA/1.5mA	Panel Mounting Type,Control Voltage :85~260VAC,50/60Hz(120 ~ 370VDC)
DGFR-V	DSP-DGFR-V	ZCT:200mA/100mV	
DGFR-N	DSP-DGFR-N	NCT:100A/5A	
DGFR-A-C	DSP-DGFR-A-C	ZCT:200mA/1.5mA	Panel Mounting Type,Control voltage :85~260VAC,50/60Hz(120 ~ 370VDC), RS485
DGFR-V-C	DSP-DGFR-V-C	ZCT:200mA/100mV	
DGFR-N-C	DSP-DGFR-N-C	NCT:100A/5A	
DGFR-M-A	DSP-DGFR-M-A	ZCT:200mA/1.5mA	Panel Flush Mounting Type, Control voltage:85 ~ 260VAC,50/60Hz(120 ~ 370VDC)
DGFR-M-V	DSP-DGFR-M-V	ZCT:200mA/100mV	
DGFR-M-N	DSP-DGFR-M-N	NCT:100A/5A	
DGFR-M-C-A	DSP-DGFR-M-A-C	ZCT:200mA/1.5mA	Panel Flush Mounting Type, Control voltage:85~260VAC,50/60Hz(120 ~ 370VDC), RS485
DGFR-M-C-V	DSP-DGFR-M-V-C	ZCT:200mA/100mV	
DGFR-M-C-N	DSP-DGFR-M-N-C	NCT:100A/5A	

Accessory

Item	Referece	Description	Remarks
Cable	DSP -CABLE-12	1.2m	

	DSP -CABLE-18	1.8m	
	DSP -CABLE-30	3m	
	DSP -CABLE-50	5m	
ZCT-A	DSP-ZCT-A-XX	200mA/1.5mA	XX:Inner diameter of ZCT (30,50,65,80,100, 50,200)
ZCT-V	DSP—ZCT-V-XX	200mA/100mV	*The other manufacturer Product is provided. *XX:Inner diameter of ZCT (30,50,65, 80)