

GIPAM-10 Series

Digital Protection Relay



GIPAM-10

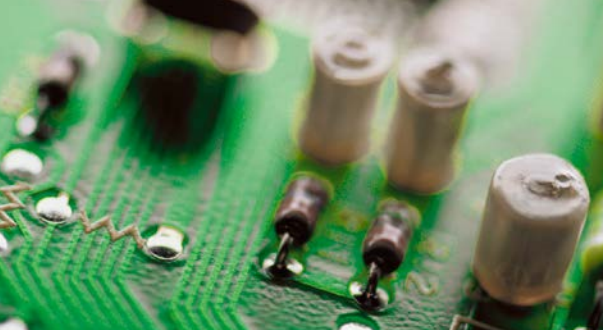


Digital Protection Relay



IEC 60255, KEMC 1120
ISO 9001, ISO 14001





Contents:

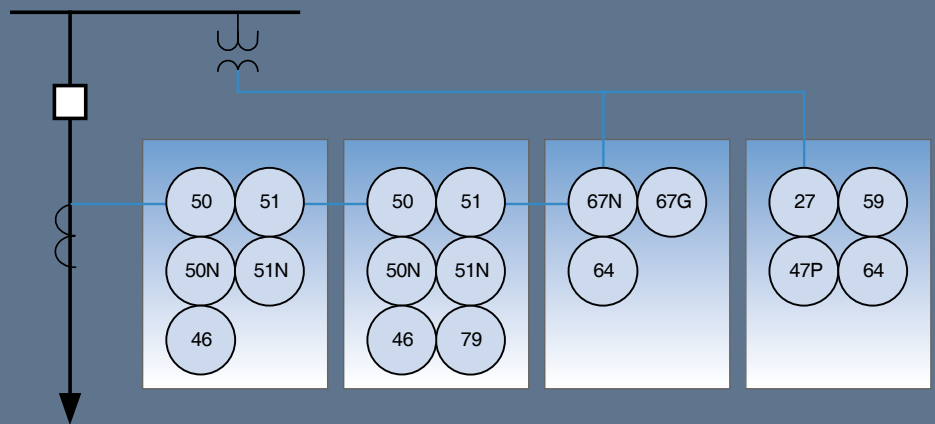
Features	5
Technical Specification	6
Constitution	8
Menu Tree (MMI)	8
Protection elements specification	10
Additional Functions	13
Wirings	14
Characteristic Curves	16
Dimension & Ordering	18



GIPAM-10 Series



Reliable, high-quality response for your network protection applications.



- Carefully designed and robustly manufactured to work in a severe environment providing the essential protection functions.
- GIPAM-10 Series provide accurate measurement and monitoring information necessary for efficient maintenance and post-fault analysis.





Wave Recording

Convenient analyzing by storing DI/DO Status simultaneously when faults happen



Event Recording

Analyzing operations conveniently by storing before and after factors to Event Record



DO Latch function

Available to set DO operation (DO 4ea independently)



Convenient DO setting

Available to set Trip DO and Alarm DO to each protection element



GIPAM-10 manager with advanced function

By sending information (Event Recording, Fault Recording, Wave Recording) to PC, available to set and verify all the functions that GIPAM-10 supports.



Easy connecting to GIPAM-10 manager

Convenient connecting by adopting common USB mini B Type



Setting Group

Available to set up Setting Group up to 3 and capable to change by the KEY of device or DI.

* Only GIPAM-10CU/10CR available



GIPAM-10 Series

Technical Specification

Protection function

Type	Function	Device No.	GIPAM-10CU	GIPAM-10CR	GIPAM-10VO	GIPAM-10NZ
Protection	OCR	50/51	●	●	-	-
	OCGR	50/51N	●	●	-	-
	NSOCR	46	●	●	-	-
	Reclosing*	79	-	●	-	-
	OVR	59	-	-	●	-
	UVR	27	-	-	●	-
	POR	47P	-	-	●	-
	OVGR	64	-	-	●	●
	SGR	67G	-	-	-	●
	DGR	67N	-	-	-	●
Control & Supervision	Latching	86	●	●	●	●
	Trip Indication		●	●	●	●
	Event Recording		32 EA			
	Fault Recording		32 EA			
	Wave Recording		4 EA (32 Samples/Cycle×30 Cycle)			
Communication	Modbus		●	●	●	●
Inputs/Outputs	Digital Input		5 EA			
	Digital Output		4 EA (2: Power, 2: Alarm)			
PC Interface	USB mini B		●	●	●	●

* Available only to Recloser.

Measurement

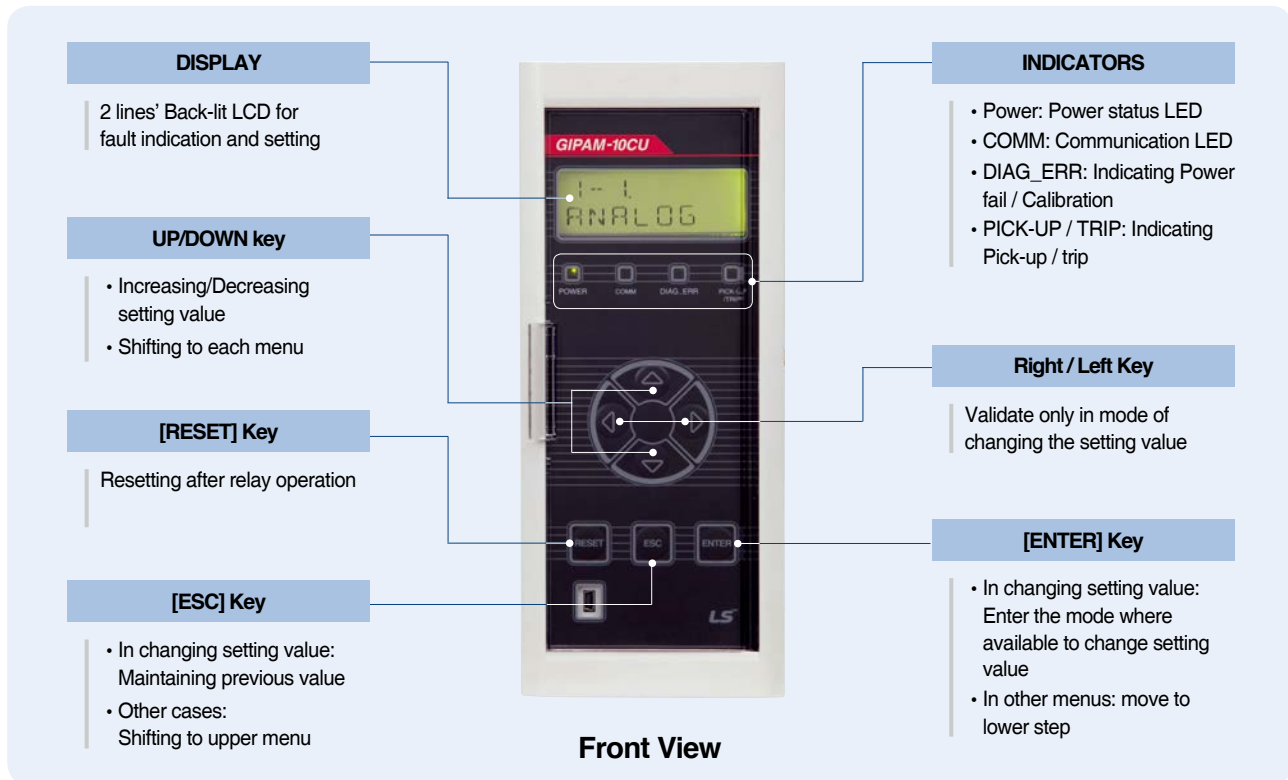
Measurement	Displayrange	Accuracy	Applicable models
Phase voltage (V)	0.000V ~ 999.999kV	±0.5%	GIPAM-10VO
Line voltage (V)	0.000V ~ 999.999kV	±0.5% or ±1V	GIPAM-10VO
ZERO Phase voltage (Vo)	0.000V ~ 999.999V	±0.5% or ±1V	GIPAM-10VO/10NZ
Phase current (A)	0.000A ~ 999.999kA	±0.5% at In, ±0.5% or ±0.05A (Rating 5A), ±0.01A (Rating 1A) at Other Current range	GIPAM-10CU/10CR
Zero phase current (In)	0.000A ~ 999.999A	±0.5% or ±0.05A (Rating 5A), ±0.01A (Rating 1A)	GIPAM-10NZ
Zero phase current (Io)	0.000mA ~ 99.999mA	±0.5%	GIPAM-10NZ
Reverse phase current (I ₂)	0.000A ~ 999.999kA	±0.5% or ±0.05A (Rating 5A), ±0.01A (Rating 1A)	GIPAM-10CU/10CR
Unbalanced voltage rate	0.00~200.00 %	±5% or ±2.5%	GIPAM-10VO
Phase	0.00°~ 360.00° (Ang(Vo) - Ang(Io))	±5°	GIPAM-10NZ

Ratings

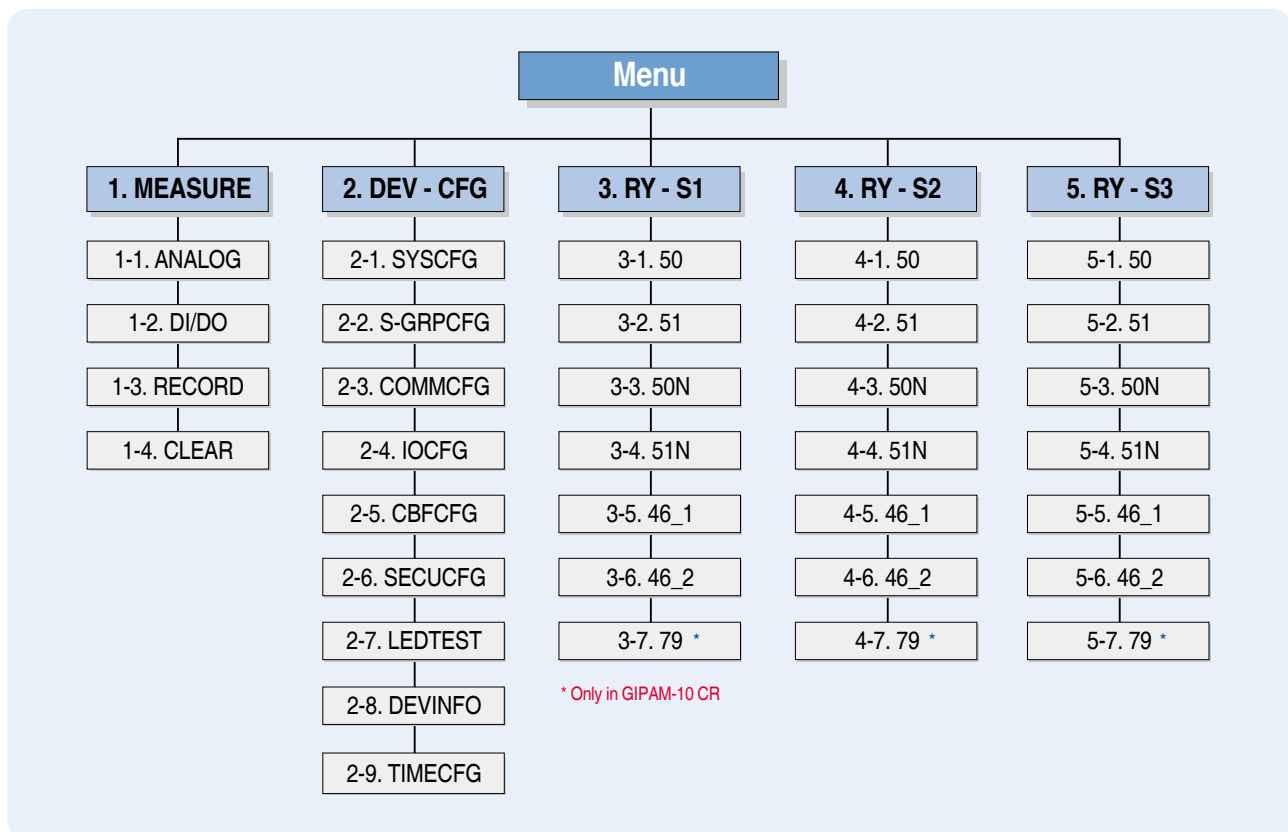
Type			Specification	
Rating	Wiring		3P3W, 3P4W	
	Frequency		60Hz or 50Hz	
	Voltage		100, 110, 120, 100/√3, 110/√3, 120/√3, 190/√3 V	
	Current		CT : 5A or 1A	
			ZCT: 1.5mA	
	Control voltage		AC/DC 110/220V (Max. 30W)	
	Power consumption		Normal: Max.20W, Operating: Max.25W	
	Burden		PT: Max. 0.5VA	
			CT: Max.1.0VA	
Input contact		Digital Input, AC/DC 110V		
Contact Output	Trip	Rated	AC250V 16A/DC30V 16A	Resistive Load
		Open	380VAC, 125VDC/16A	
	Alarm	Rated	AC240V 3A/DC30V 3A	Resistive Load
		Open	240VAC, 30VDC/5	
	Insulation Resistance			Over DC 500V 100MΩ
Insulation voltage			AC 2kV (1kV)/for 1 min	
Impulse voltage			AC 5kV (3kV) Over 1.2 × 50μs	
Overload withstand	Current circuit		2 In for 3 hours, 20 In for 2 seconds	
	Voltage circuit		1.15Vn for 3 hours	
Fast Transient Disturbance			Power Input 4kV, Other Input 2kV	
ESD, Electrostatic Discharge			Air 8kV, Contact 6kV	
Operation temperature			-25℃ ~ +55℃ (-13°F~131°F)	
Storage temperature			-30℃ ~ +70℃ (-22°F~158°F)	
Humidity			Average 30% ~ 80%	
Altitude			1000m and below	
Others			Non-impact place, Non-air pollution place	
Standard			KEMC1120, IEC60255	
Dimension (W×H×D)			100 × 240 × 217 (mm)	
Weight			3kg	

GIPAM-10 Series

Constitution / Menu Tree (MMI)

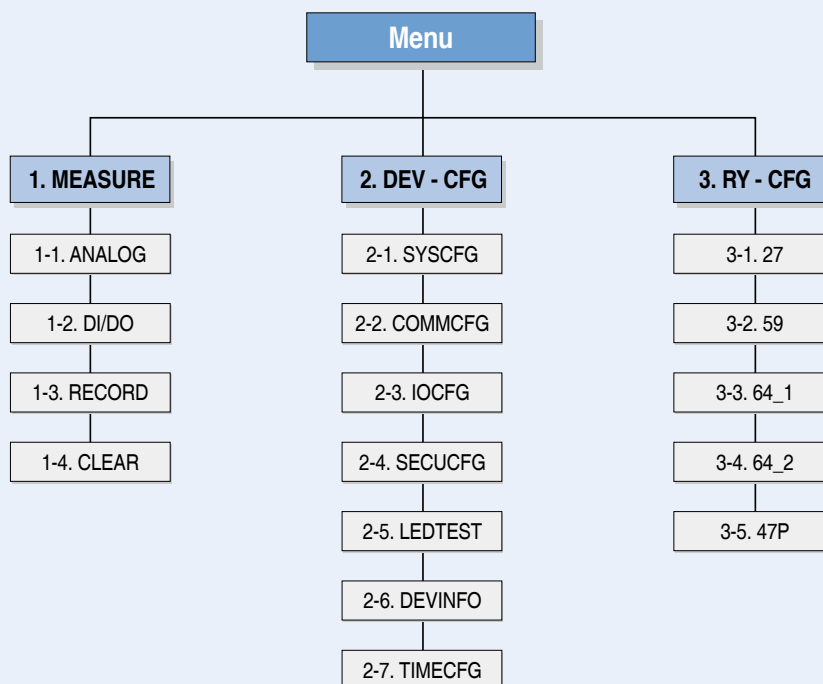


Menu Tree (MMI) GIPAM-10CR(CU)

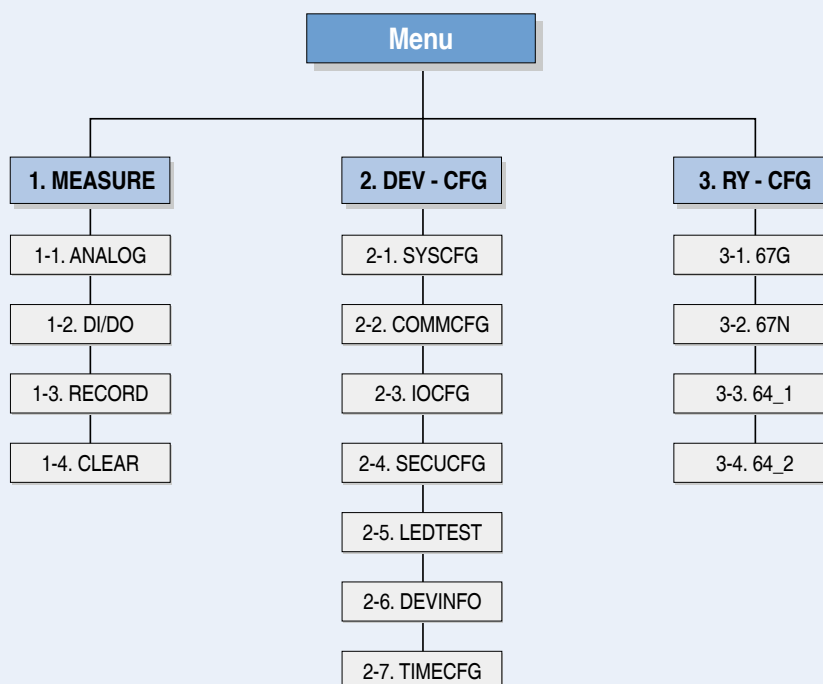


Menu Tree (MMI)

GIPAM-10VO



GIPAM-10NZ



GIPAM-10 Series

Protection elements specification

OCR (Over Current Relay - 50)

Type			Details	Remarks
Setting	Operating value:	5A	5~100A/1A	-
	Setting range	1A	1~1 20A/1A	
	Operating time setting		0.04~60.00s/0.01s	0.04s : instantaneous, 0.05~60.00s : definite
	Trip/Alarm contact		One in DO01~DO04	Available to not use or multi-use

OCR (Over Current Relay - 51)

Type			Details	Remarks
Setting	Operating value:	5A	1.0~12.0A/0.1A	-
	Setting range	1A	0.2~2.4A/0.1A	
	TC (Time Characteristics)		DT, SI, VI, EI, LI	-
	TD (Time Delay)		0.10~60.00/0.01	DT
	TL (Time Lever)		0.05~1.20/0.01	SI, VI, EI, LI
	RTC (Reclaim time characteristics)		DT, SI, VI, EI, LI	available only to characteristics the same as TC
	Trip/Alarm contact		One in DO01~DO04	Available to not use or multi-use

OCGR (Over Current Ground Relay - 50N)

Type			Details	Remarks
Setting	Motor Block Time	-	0.1~60.0s/0.1s	Standard current: 1A
	Operating value:	5A	2.5~40.0A/0.1A	-
	Setting range	1A	0.5~8.0A/0.1A	
	Operating time: Correcting range		0.04~60.00s/0.01s	0.04s: instantaneous, 0.05~60.00s: definite
	Trip/Alarm contact		One in DO01~DO04	Available to not use or multi-use

OCGR (Over Current Ground Relay - 51N)

Type			Details	Remarks
Setting	Motor Block Time	-	0.1~60.0s/0.1s	Standard current: 1A
	Operating value:	5A	0.5~5.0A/0.1A	-
	Setting range	1A	0.1~1.0A/0.1A	
	TC (Time characteristics)		DT, SI, VI, EI, LI	-
	TD (Time Delay)		0.10~60.00/0.01	DT
	TL (Time Lever)		0.05~1.20/0.01	SI, VI, EI, LI
	RTC (Reclaim time characteristics)		DT, SI, VI, EI, LI	available only to characteristics the same as TC
	Trip/Alarm contact		One in DO01~DO04	Available to not use or multi-use

NSOCR (Negative Sequence Over Current Relay - 46)

Type			Details	Remarks
Setting	Operating value:	5A	0.5~5.0A/0.1A	-
	Correcting range	1A	0.1~1.0A/0.1A	
	Operating time: Correcting range		0.10~60.00s/0.01s	Definite
	Trip/Alarm contact		One in DO01~DO04	Available to not use or multi-use

Autoreclose - 79

Type			Details	Remarks
Setting	Times of reclosing		1~4 times	-
	Prepare time		0.10~200.00sec/0.01sec	-
	Reclaim time		0.10~200.00sec/0.01sec	-
	Prepare time		0.10~200.00sec/0.01sec	-
	1st Shot Delay		0.10~200.00sec/0.01sec	-
	2nd Shot Delay		0.10~200.00sec/0.01sec	-
	3rd Shot Delay		0.10~200.00sec/0.01sec	-
	4th Shot Delay		0.10~200.00sec/0.01sec	-

SGR (Selective Ground Relay - 67G)

Type			Details	Remarks
Setting	Zero-phase current (Io)		0.9~6.0mA/0.1mA	-
	Zero-phase voltage (Vo)		10~80V/1V	-
	Time characteristics angle		0 ~ 90°/1°	-
	TD (Time Delay)		0.10~60.00/0.01	Definite
	Trip/Alarm contact		One in DO01~DO04	Available to not use or multi-use

DGR (Directional Ground Relay - 67N)

Type			Details	Remarks
Setting	Zero-phase current (IN)	5A	0.5~5.0A/0.1A	-
		1A	0.1~1.0A/0.1A	
	Zero-phase voltage (Vo)		10~80V/1V	-
	Time characteristics angle		0~90°/1°	-
	TD (Time Delay)		0.10~60.00/0.01	Definite
	Trip/Alarm contact		One in DO01~DO04	Available to not use or multi-use

GIPAM-10 Series

Protection elements specification

OVGR (Over Voltage Ground Relay - 64)

Type		Details	Remarks
Setting	Operating value: Correcting range	10~110V/1V	-
	TD (Time Delay)	0.10~60.00s/0.01s	Definite
	Trip/Alarm contact	One in DO01~DO04	Available to not use or multi-use

UVR (Under Voltage Relay - 27)

Type		Details	Remarks
Setting	Operating value: Correcting range	10~110V/1V	-
	TD (Time Delay)	0.10~60.00s/0.01s	Definite Standard voltage: 15V
	UVR Block	ON/OFF available	
	Operating mode	AND/OR available	- AND: Operated when 3 phases are all below Operating value - OR: Operated when one or two of 3 phases are below Operating value
	Trip/Alarm contact	One in DO01~DO04	Available to not use or multi-use

OVR (Over Voltage Relay - 59)

Type		Details	Remarks
Setting	Operating value: Correcting range	60~160V/1V	-
	TD (Time Delay)	0.10~60.00s/0.01s	Definite
	Trip/Alarm contact	One in DO01~DO04	Available to not use or multi-use

POR (Phase Open Relay - 47P)

Type		Details	Remarks
Setting	Operating value: Correcting range	5~100%/1%	-
	TD (Time Delay)	0.10~60.00s/0.01s	Definite
	Trip/Alarm contact	One in DO01~DO04	Available to not use or multi-use

Additional Functions

Recording functions

System Event	
System Event	32ea
Trigger	Power on, Setting change, DI/DO COS The
Time Tag	moment of event

Fault Event	
System Event	32ea
Trigger	Pickup, Operation
Time Tag	The moment of event
Main	Voltage and current when faults happen
Additional	DI/DO Status

* HMI gives only final Operation Event

Wave Recording	
Wave Recording	4ea
Trigger	Operation
Sample / Cycle	32
Cycle	30 Cycle (50/60Hz)
Time Tag	The moment of event

Wave: Available only through GIPAM-10 manager

Group setting function

- Available to configure up to 3 setting groups for each relay element.
- Possible to change setting values automatically depending on field status.
- Automatically recognizing any change of the system status in power system.

* Only GIPAM-10CU/CR available.

Circuit Breaker Failure (CBF)

GIPAM-10 supports breaker failure function that can prevent further extension of accident by controlling upper circuit breaker to trip, when lower breaker failed to act despite protection relay was activated and sent trip signal for problems in the circuit.

1. Setting range : OFF, 0.5 ~ 5.0A/0.1A
2. Operating time : 0.10 ~ 60.00 /0.01sec
3. Contact output : None, DO01, DO02, DO03, DO04

GIPAM-10 Series

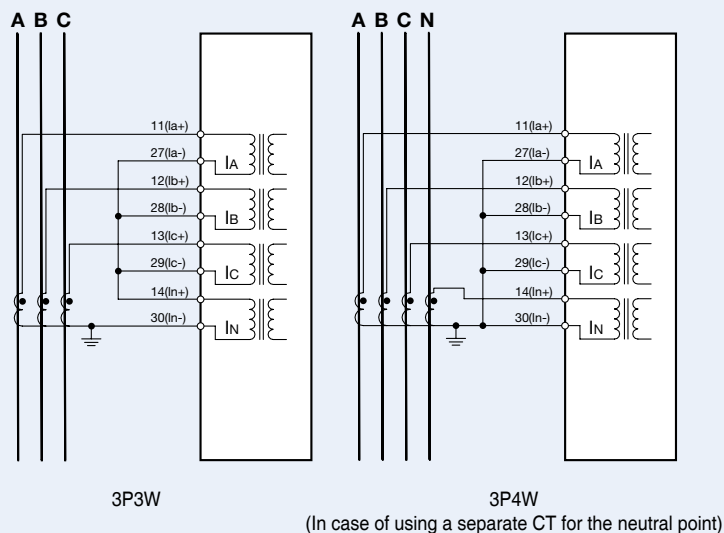
Wirings

GIPAM-10CU, 10CR

Wirings

GIPAM-10CU, 10CR

POWER-	17	1	POWER+
DO 01-	18	2	DO 01+
DO 02-	19	3	DO 02+
DO 03-	20	4	DO 03+
DO 04-	21	5	DO 04+
DI 01-	22	6	DI 01+
DI 02-	23	7	DI 02+
DI 03-	24	8	DI 03+
DI 04-	25	9	DI 04+
DI 05-	26	10	DI 05+
Ia-	27	11	Ia+
Ib-	28	12	Ib+
Ic-	29	13	Ic+
IN-	30	14	IN+
NC	31	15	NC
TRX-	32	16	TRX+

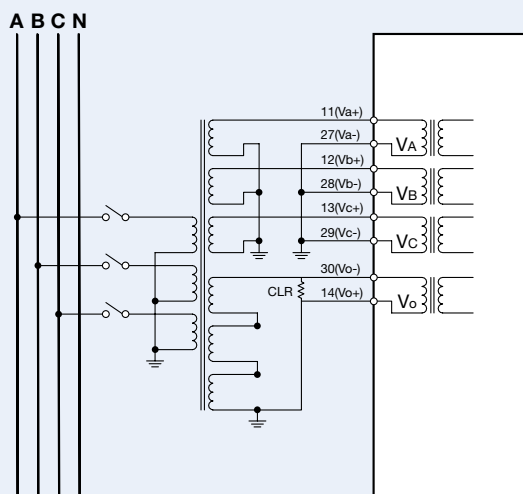


GIPAM-10VO

Wirings

GIPAM-10VO

POWER-	17	1	POWER+
DO 01-	18	2	DO 01+
DO 02-	19	3	DO 02+
DO 03-	20	4	DO 03+
DO 04-	21	5	DO 04+
DI 01-	22	6	DI 01+
DI 02-	23	7	DI 02+
DI 03-	24	8	DI 03+
DI 04-	25	9	DI 04+
DI 05-	26	10	DI 05+
Va-	27	11	Va+
Vb-	28	12	Vb+
Vc-	29	13	Vc+
Vo-	30	14	Vo+
NC	31	15	NC
TRX-	32	16	TRX+



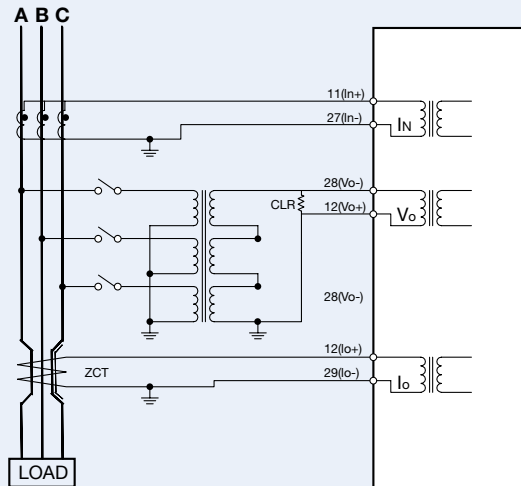
* Attention to wiring the zero phase voltage.

GIPAM-10NZ

Wirings

GIPAM-10NZ

POWER-	17	1	POWER+
DO 01-	18	2	DO 01+
DO 02-	19	3	DO 02+
DO 03-	20	4	DO 03+
DO 04-	21	5	DO 04+
DI 01-	22	6	DI 01+
DI 02-	23	7	DI 02+
DI 03-	24	8	DI 03+
DI 04-	25	9	DI 04+
DI 05-	26	10	DI 05+
IN-	27	11	IN+
Vo-	28	12	Vo+
IO-	29	13	IO+
NC	30	14	NC
NC	31	15	NC
TRX-	32	16	TRX+



* Attention to wiring the zero phase voltage.

* In case of using 3P4W : Separate NCT available to the neutral point.

Output Contacts

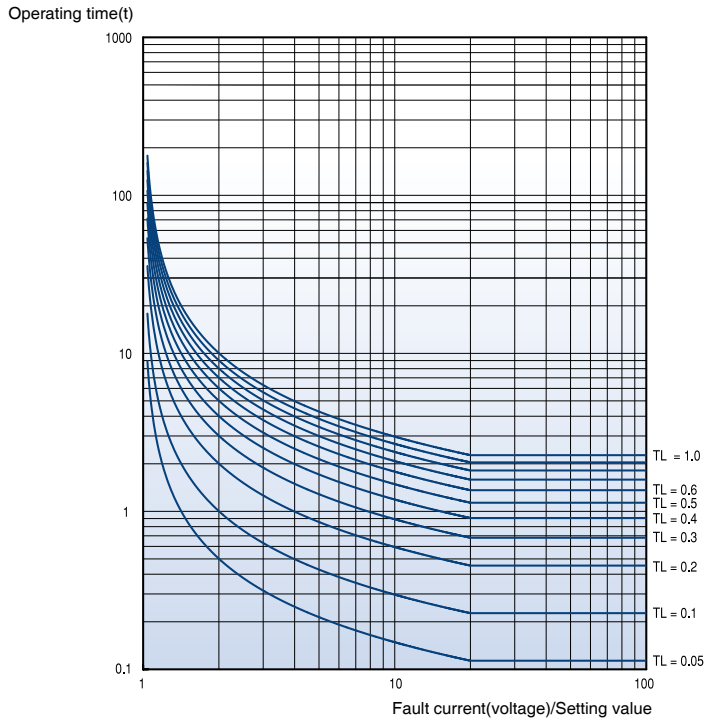
Terminal Description	Terminal No.	Usage (default setting)	Usage (for change)	Remarks
DI01	22-6	CB_OFF	DO01~DO04, SG1~SG3 (GIPAM-10CU, 10CR), General DI	
DI02	23-7	CB ON	DO01~DO04, SG1~SG3 (GIPAM-10CU, 10CR), General DI	
DI03	24-8	GI	DO01~DO04, SG1~SG3 (GIPAM-10CU,10CR), General DI	
DI04	25-9	GI	DO01~DO04, SG1~SG3 (GIPAM-10CU,10CR), General DI	
DI05	26-10	GI	DO01~DO04, SG1~SG3 (GIPAM-10CU,10CR), General DI	
DO01	18-2	TPIP	TRIP, ALARM, General DO	Latch ON/OFF
DO02	19-3	ALARM	TRIP ALARM DO 79 Autoreclose	Latch ON/OFF
DO03	20-4	-	TRIP, ALARM, General DO	Latch ON/OFF
DO04	21-5	-	TRIP, ALARM, General DO	Latch ON/OFF

* Setting Group : Only GIPAM-10CU/10CR available

GIPAM-10 Series

Characteristic Curves

Standard Inverse Time-SI

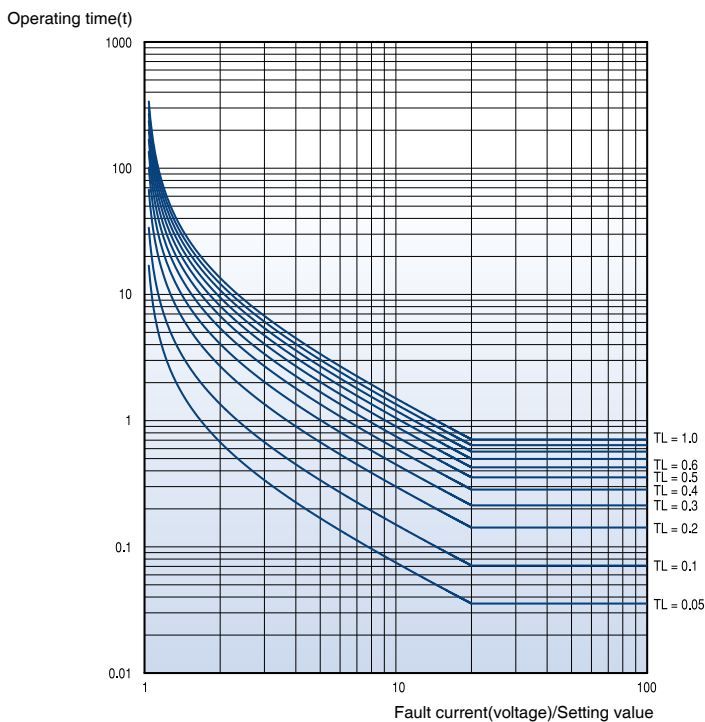


- Application : OCR (50/51)
OCGR (50/51N)
OVGR (64)
NSOCR (46)

$$t = \frac{0.14}{(I/I_s)^{0.02}-1} \times TL + C$$

- Time lever (TL) : 0.05~1.2
(OVGR
NSOCR } TL: 0,05~1,0)
- Relay constant C: 0
- Operation Delay Time: 0.00~10.00s/0.01s
(OCR, OCGR, NSOCR)

Very Inverse Time-VI

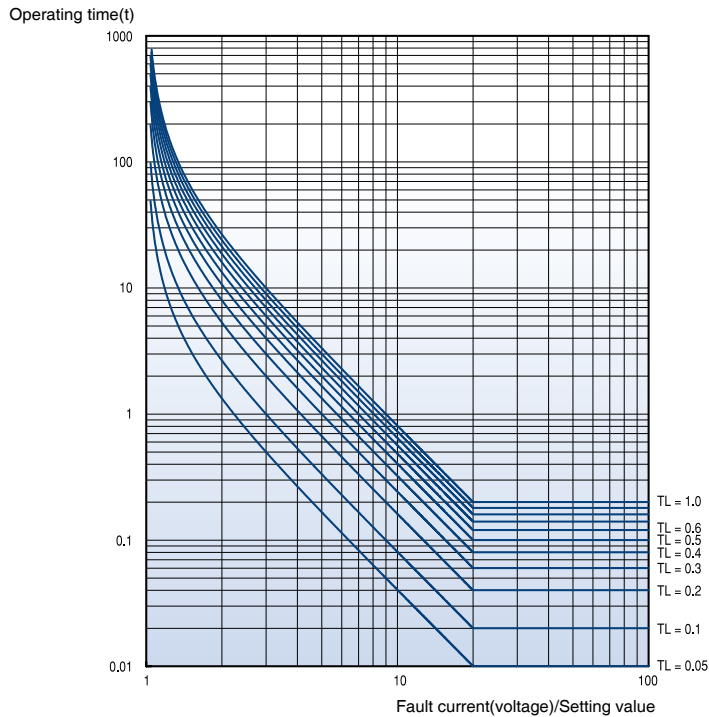


- Application : OCR (50/51)
OCGR (50/51N)
OVGR (64)
NSOCR (46)
Locked Rotor (51LR)

$$t = \frac{13.5}{(I/I_s)-1} \times TL + C$$

- Time lever (TL) : 0.05~1.2
(OVGR
NSOCR
Locked Rotor } TL: 0,05~1,0)
- Relay constant C: 0
- Operation Delay Time: 0.00~10.00s/0.01s
(OCR, OCGR, NSOCR)

Extremely Inverse Time-EI



- Application : OCR (50/51)
OCGR (50/51N)
OVGR (64)
NSOCR (46)
Locked Rotor (51LR)

$$t = \frac{80}{(I/I_s)^2 - 1} \times TL + C$$

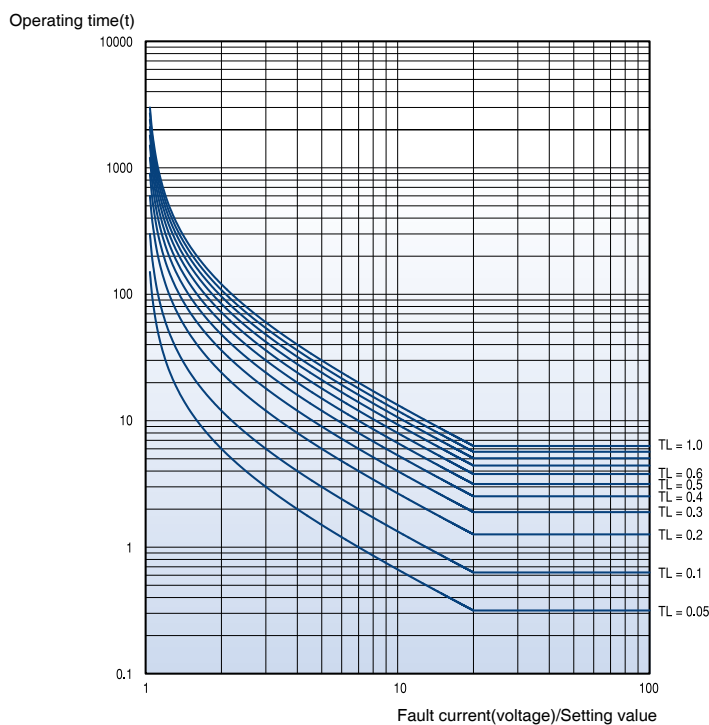
- Time lever (TL) : 0.05~1.2

$$\left(\begin{array}{l} \text{OVGR} \\ \text{NSOCR} \\ \text{Locked Rotor} \end{array} \right) \left\{ \begin{array}{l} \text{TL: 0.05~1.0} \end{array} \right\}$$

- Relay constant C: 0

- Operation Delay Time: 0.00~10.00s/0.01s
(OCR, OCGR, NSOCR)

Long Inverse Time-LI



- Application : OCR (50/51)
OCGR (50/51N)
NSOCR (46)

$$t = \frac{120}{(I/I_s) - 1} \times TL + C$$

- Time lever TL: 0.05~1.2
(NSOCR (TL): 0.05~1.0)

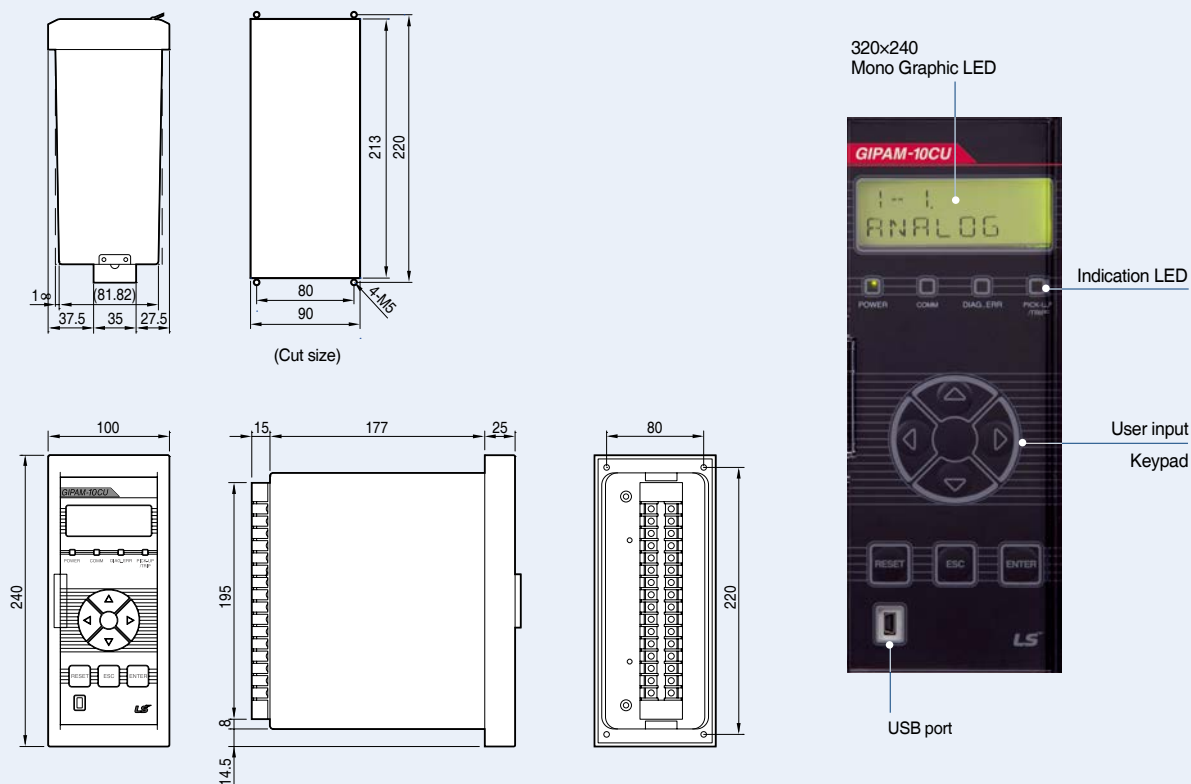
- Relay constant C: 0

- Operation Delay Time: 0.00~10.00s/0.01s
(NSOCR)

GIPAM-10 Series

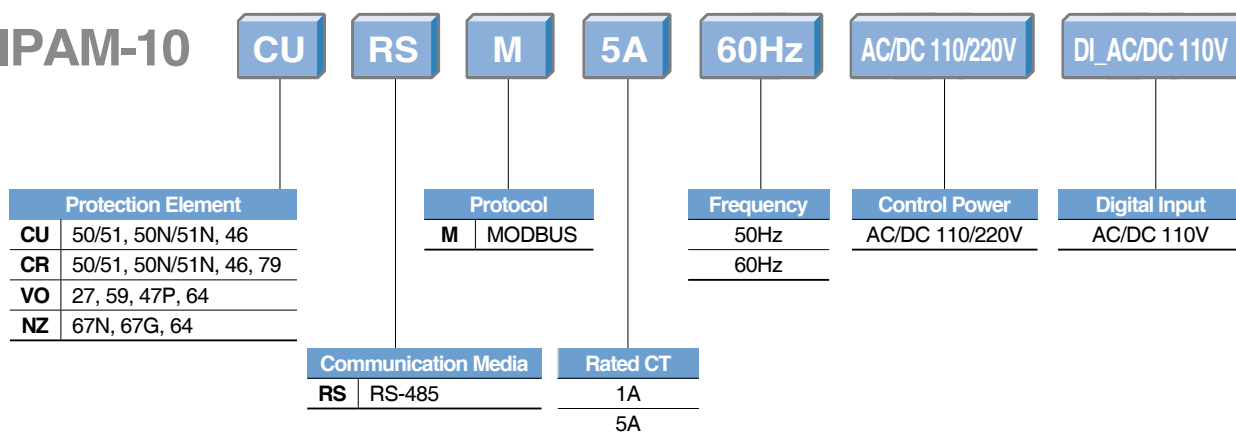
Dimension & Oding

Dimension



Oding

GIPAM-10



* Available only to
GIPAM-10 CU/CR

* Rated Voltage: AC 50~110 / 0.1 [V] (Available only to GIPAM-10VO)

Memo



Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance.
Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.



www.lsis.com

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