

Digital Protection & Measurement Device

LSIS protection and measurement products specializes in the protection and monitoring of electricity distribution networks, making your power distribution easier and more reliable. You can either integrate these products into your intelligent switchgear or use them as stand-alone multifunction units. In addition, all of these products provide versatile communications as well as sophisticated functionality for event, alarm and fault analysis.

The whole GIPAM, GIMAC product family for line, motor, generator protection and monitoring offers you an integrated solution which starts with extensive protection, measurement and control functionality.





X GIPAM	O1
GIPAM-2000/2200	O2
GIPAM-115	O3
DPR-1000	P1
DPR	P2
IMC-III	Q
GIMAC-PQ	R
GIMAC-IV	S1
GIMAC-II plus	S2
GIMAC-i	T1
GIMAC-DC	T2



Digital Protection device

		X-GIPAM					GIPAM-2000			GIPAM-2200			GIPAM-115FI	DPR-1000
		F	B	M	T	DG	FI	T	M	F	T	DG/IG		
PROTECTION	Phase time overcurrent (51)	●	●	●	●	●	●	●	●	●	●	●	●	●
	Ground time overcurrent (51N/G)	●	●	●	●	●	●	●	●	●	●	●	●	●
	Phase instantaneous overcurrent (50)	●	●	●	●	●	●	●	●	●	●	●	●	●
	Ground instantaneous overcurrent (50N/G)	●	●	●	●	●	●	●	●	●	●	●	●	●
	Overcurrent Hiset & lowset (50,51H/L)	●	●	●	●	●	●	●	●	●	●	●	-	●(51)
	Negative sequence time overcurrent (46)	-	●	●	-	●	-	-	●	●	-	▲	-	●
	Negative sequence overvoltage (47)	●	●	●	-	●	●	-	-	●	-	-	●	(POR)
	Thermal overload (49)	-	-	●	-	-	-	-	●	●	-	▲	-	●
	Directional ground (67N)	●	●	●	-	●	●	-	●	●	●	-	-	●
	Sensitive ground (67G)	●	●	●	-	●	●	-	●	●	●	-	●	●
	Overvoltage ground (59N, 64)	●	●	●	-	●	●	-	-	●	●	-	●	-
	Undervoltage (27)	●	●	●	●	●	●	-	-	●	-	●	●	-
	Overvoltage (59)	●	●	●	●	●	●	-	-	●	-	●	●	-
	Stall/ Locked rotor (48/51LR)	-	-	●	-	-	-	-	●	●	-	-	-	●
	Undercurrent (37)	-	-	●	-	-	-	-	●	●	-	-	-	●
	Underfrequency (81U)	-	●	-	-	●	-	-	-	-	-	●	-	-
	Overfrequency (81O)	-	●	-	-	●	-	-	-	-	-	●	-	-
	Transformer phase differential (87T-P)	-	-	-	●	-	-	●	-	-	●	-	-	-
	Transformer ground differential (87T-G)	-	-	-	●	-	-	●	-	-	●	-	-	-
	Inrush Detector (68)	-	-	-	●	-	-	●	-	-	●	-	-	-
	Sync check (25)	●	●	-	-	●	-	-	-	-	-	●	-	-
	Forward/reverse active power (32P)	-	●	-	●	●	-	-	-	-	-	●	-	-
	Reverse reactive power (32Q)	-	●	-	-	●	-	-	-	-	-	●	-	-
	Underpower (37P)	-	-	-	-	●	-	-	-	-	-	●	-	-
	Supervision of startingtime/Notching (66)	-	●	-	-	-	-	-	●	●	-	-	-	●
	Lock-out (86)	●	●	●	●	●	●	●	●	●	●	●	-	-
	Reclosing (79)	●	●	-	-	-	●	-	-	-	-	-	-	-
	Temperature (38)	●	●	●	●	-	-	-	-	-	-	-	-	●
	Setting Gr.	4					1			1			1	
I/O	Power outputs Point (Option)	4(+2×2)					4			2			2	
	Digital outputs Point (Option)	16(+8×2)					16			10			8	5
	Digital inputs Point (Option)	20(+10×2)					20			6			3	3
	Analog inputs/Output Channel (Option)	(+AI/AO 6/4×2)					-			(+AI 4)			-	(+AI 2)
MONITORING & METERING	Ia, Ib, Ic, In	●					●			●			●	●
	Va, Vb, Vc, Vab, Vbc, Vca	●					●	-	●	●	-	●	●	-
	Watts	●					●	-	●	●	-	●	●	-
	Vars	●					●	-	●	●	-	●	●	-
	kWh	●					●	-	●	●	-	●	●	-
	kVarh	●					●	-	●	●	-	●	●	-
	Frequency	●					●	-	●	●	-	●	●	-
	Power factor	●					●	-	●	●	-	●	●	-
	Trip circuit supervision	●					●			●			-	-
	Trip relay supervision	●					●			●			-	-
	VT fuse failure	●					-			●			-	-
	CB operation failure	●					▲			●			●	●
	Sag, Swell, Interruption	●					-			-			-	-
	Harmonics, THD, TDD, K-Factor	63th, THD, TDD, K-Factor					13th, THD			-			-	-
	HMI	8.4" color touch LCD					320x240 Graphic LCD			20x4 text LCD			16x2 LCD	20x4 LCD
ADDITIONAL	Accuracy	±0.2%					±0.5%			±0.5%			±0.5%	±0.5%
		±0.5%					±1.0%			±1.0%			±1.0%	-
COMMUNICATION	Event recording	1000					800			800			128	128
	Fault recording	200					200			200			32	32
	Fault wave recording	128Cycle					Max. 512Cycle			Max. 64Cycle			-	Max. 32Cycle
	Self-Test	●					-			-			-	-
	Programmable logic	●					●			▲			-	-
	Mounting	Drow Out					Drow Out			Drow Out			Drow Out	
COMMUNICATION	PC Interface USB Port	1					-			-			-	-
	PC Interface IrDA port	-					1			1			-	1
	RS-485 (422) port	2					1			1			1	1
	100/10 Base - T (TE)	2					1			-			-	-
	100 Base - FX (FE)	2					1			1			-	-
	I-NET (Custom LS)	-					●			●			●	-
	Modbus	●					●			●			-	●
	DNP3.0	●					●			●			-	-
	IEC61850 (TE)	●					-			-			-	-

Digital Measurement device

		GIMAC-PQ	GIMAC-415	GIMAC-115 Plus	GIMAC-i EX	GIMAC-i NO
MONITORING & METERING	Ia, Ib, Ic, In	●	●	●	●	●
	Io, I1, I2	●	●	●	●	●
	Va, Vb, Vc, Vab, Vbc, Vca	●	●	●	●	●
	Vo, V1, V2	●	●	●	●	●
	Watts	●	●	●	●	●
	Vars	●	●	●	●	●
	VA	●	●	●	●	●
	kWh	●	●	●	●	●
	kVarh	●	●	●	●	●
	VAh				●	●
	Reverse Watts	●	●	●	●	●
	Reverse Vars	●	●	●	●	●
	Reverse VA	●	●	●	●	●
	Reverse kWh	●	●	●	●	●
	Reverse kVarh					●
	Frequency	●	●	●	●	●
	Power factor	●	●	●	●	●
	Phase	●	●	●	●	
	Unbalanced factor	●	●	●		
	Harmonics (V, I)	● (15th)	● (63th)	● (15th)	● (15th)	
	THD (V, I)	●	●	●	●	
	TDD (I)	●	●	●		
	k-factor	●	●	●		
	Demand I	●	●	●	●	
	Demand W	●	●	●	●	
	CB operation	●	●	●		
	CB operating time	●	●	●		
	AccuracyI, V	±0.2%	±0.2%	±0.3%	±0.3%	±0.3%
	W, Wh	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
I/O	Power outputs	2	2	2		
	Digital outputs	8	8	8		
	Digital inputs	10	10	10		
	Analog inputs	2	2			
ADDITIONAL	Power quality	●				
	Sag	●				
	Swell	●				
	Interruption	●				
	Undervoltage	●				
	Overvoltage	●				
	Auto power factor controller Option		●			
	Demand controller Option		●			
	Event recording	256	300	256		
COMMUNICATION	Fault wave recording	Max. 60cycle				
	RS-485 (422)	●	●	●	●	●
	I-NET (Custom LS)		●	●		
	Modbus	●	●	●	●	●
	Dual	●				

X GIPAM

neXt Generation Intelligent Device

XGIPAM is next generation intelligent device having IEC 61850, Setting Group, Power Quality, Arc Protection and function for control and Protection, monitoring that make possible to construct power protection and monitoring system





O₁



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XGIPAM

neXt Generation Intelligent Device

Digital Integrated Protection & Monitoring Device

neXt
Generation
HMI

neXt
Generation
Flexibility

neXt
Generation
Intelligent
Device

neXt
Generation
Application



The whole GIPAM, product family for line, motor, generator protection and monitoring offers you an integrated solution which starts with extensive protection, measurement and control functionality.

neXt Generation Intelligent Device

Features HMI

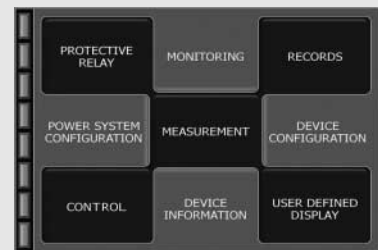
8.4" inches of large color Touch screen

- Convenient operation by 8.4" large color Touch screen
- Easy management by Graphic color LCD
- Intuitive display of various diagrams, pictures, charts
- Available to control and operate on screen by graphic user interface



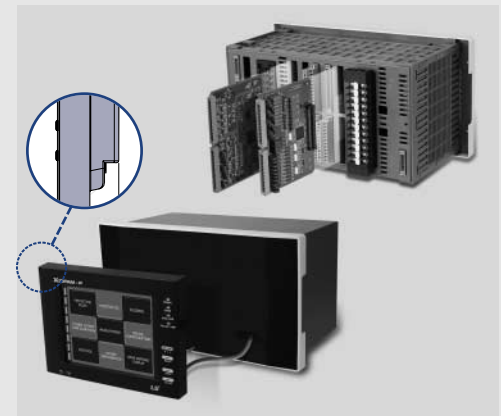
Language selection and User selective menu

- Language selecting on X-GIPAM screen menu (Korean/English)
- Customizing frequent monitoring 3 menu



H/W, S/W flexibility

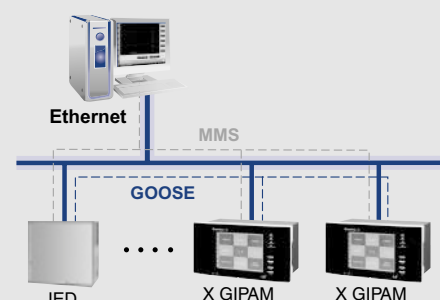
- Reliability Improvement by Independent module structure
- Expandable DI/DO boards (DI:40, DO:40 points)
- Expandable AI/AO boards (AI:12, AO:8 channels)
- 6 kinds of modular option
- Easy configuration and installation of switchgear by detachable HMI option



* Cable length: 5m

IEC 61850 communication

- Providing high-speed and two-way communication based on Ethernet
- Realization of wireless interlock by supplying GOOSE function
- Supporting all defined in IEC 61859 Standards (Report, Dataset, Control)
- Available to establish connection of communication system with different IEDs



Hardware & software Flexibility

X-GIPAM manager with advanced function

- Available to set various menu through PC manager (relay elements, CB, CT/PT ratio, etc.)
- Setting and editing Digital or analogue I/O points
- Measuring voltage, Frequency, Current ,power, Energy harmonics, etc.
- Analysis of Power quality, fault waveform (COMTRADE format)

Mimic Diagram function

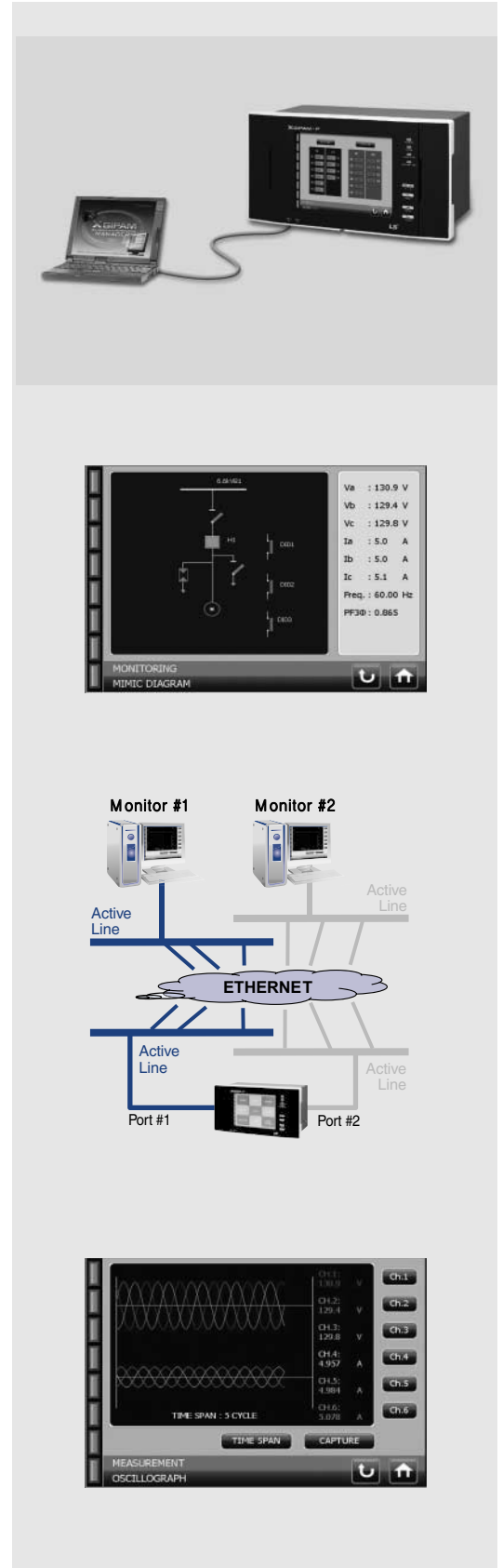
- Convenient monitoring by graphic mimic diagram of power system on HMI
- Possible to check out status and control CB by touching the screen

Dual Communication System

- Supporting Independent dual communication system due to built-in dual ports
- Possible to communicate with multi-SCADA system without port switching
- Building a fail-safe communication system with Preliminary communication lines

Various measurements and monitoring functions

- 0.2% of Voltage and Current Measuring accuracy
- Graphical display of the load rate factor
- Recording peak/demand value of current and power
- Available to wave-capture for input voltage and current
- Easy to check wiring by VECTOR diagram in color LCD



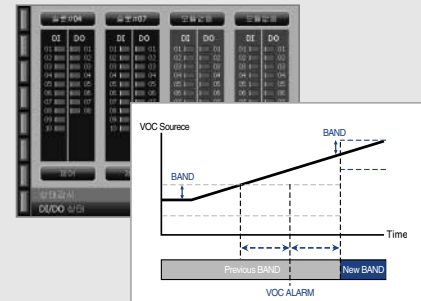
neXt Generation Intelligent Device

Features

Intelligent Device

Input/Output points monitoring and control function

- Monitoring AI/AO variation rate through VOC(Value of Change) function
- Showing the status of Digital I/O and performing each point control.
- Multi SW control(6 switching devices) through Power output.



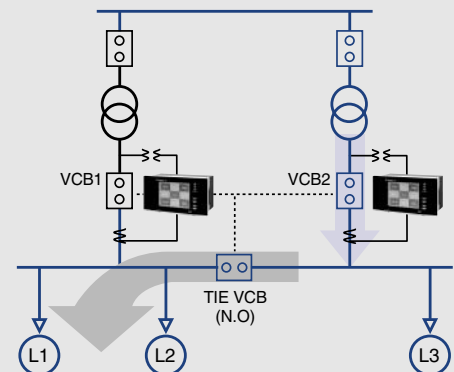
Advanced PQ(Power Quality) measurement

- Analysis/Measurement of Sag, Swell, Interruption
- Offering analyze of harmonics(up to 63rd levels)
(1~63 Harmonics and THD, TDD, K-factor)
- 0.2% of measurement accuracy for Current and Voltage and 0.5% for Power, Energy, etc.



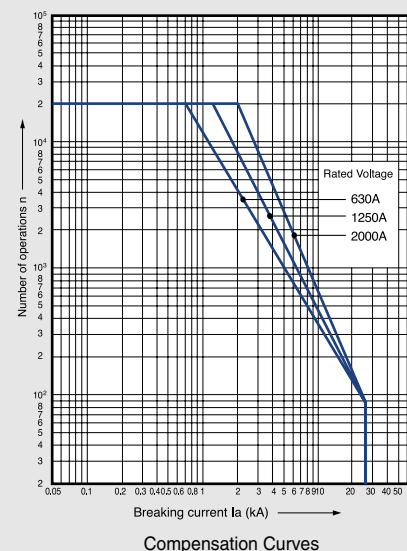
Group setting function

- Available to configure up to 4 setting groups for each relay element
- Possible to change setting values automatically depending on field status.
- Automatically recognizing any change of the status in power system.



Supervision of CB Capacity Limit

- Calculation of thermal energy through accumulating value of breaking current and operating times
- Realizing prevention of break failure through advanced monitoring system



Application

Self Test Function

- It is a function which can test Relay operation & wiring
 - Simulation test can be carry out on various scenario
 - It is not available to test for SYNC, Reclosing, Temperature and ROCOF(df/dt)

Various extra monitoring, control and Fault recording

- SBO(Select Before Operating)
- TCS(Trip Circuit Supervision), TRS(Trip Relay Supervision)
- CBF(Circuit Breaker Failure), PTF(PT Failure)
- Saving 1,000 events, 200 Fault data
- Saving up to 62 fault waveform
(Available to choose the terms and conditions of saving waveform)

Trip Logic and PLC Function

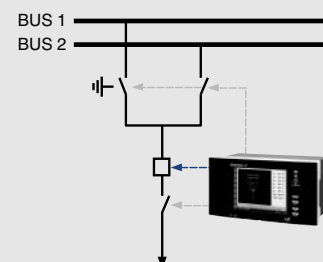
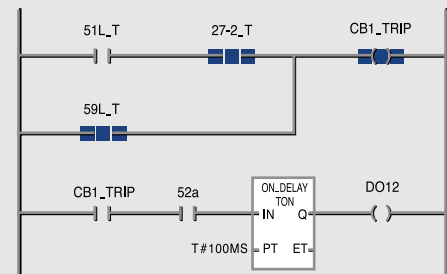
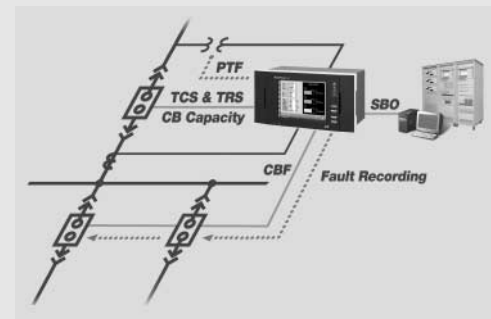
- Real-time monitoring I/O points and logic status
- PLC function based on IEC Standard
- Available logic programming with using various I/O status or relay operation signal

Supporting SMS/Voice alarm module and USB port

- Providing voice message service
- Establishing 24-hour alarming and unmanned monitoring system through SMS information
- Available to download various recorded data to USB (Wave, Demand etc.) and upload setting value to device by X-GIPAM Manager

Bay Controller

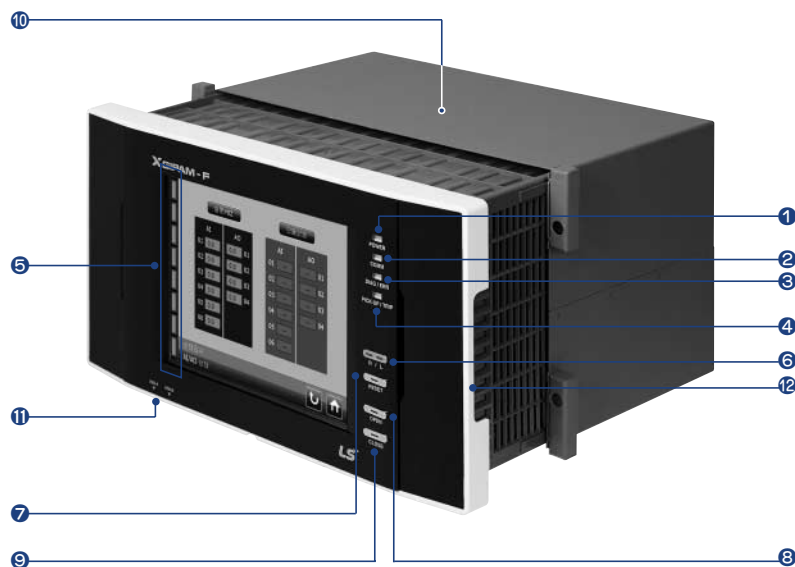
- In possession of Reclosing(79) and directional overcurrent(67) element
- Various earth protection function (50NG, 51NG, 67N, 67G)
- Overvoltage/Undervoltage monitoring and protecting system(59,27)
- Overfrequency/Underfrequency monitoring and protecting system(81O, 81U)
- Available to control 8 Switching devices (CB DS ES etc)
- Expandable DI/DO structure



neXt Generation Intelligent Device

External & Structure

Structure



LED

- ① POWER LED (Green)
- ② COMM LED (Yellow)
- ③ DIAG/ERR LED (Red)
- ④ PICK-UP/TRIP LED (Red)
- ⑤ Fault assign LED (Virtual)

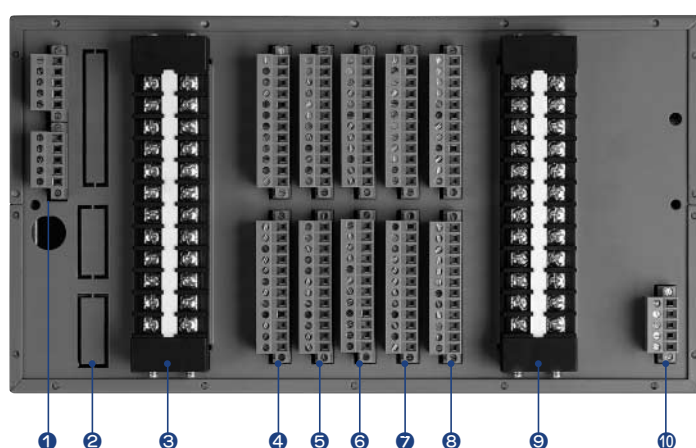
Key

- ⑥ R/L: Remote(Green)/ Local(Red)
- ⑦ RESET: Message Clear (Red: Trip)
- ⑧ OPEN: Green: CB Open
- ⑨ CLOSE: Red: CB Close

Other

- ⑩ X GIPAM Case
- ⑪ USB (Memory, Mouse, PC)
- ⑫ Draw-Out handle

Rear View

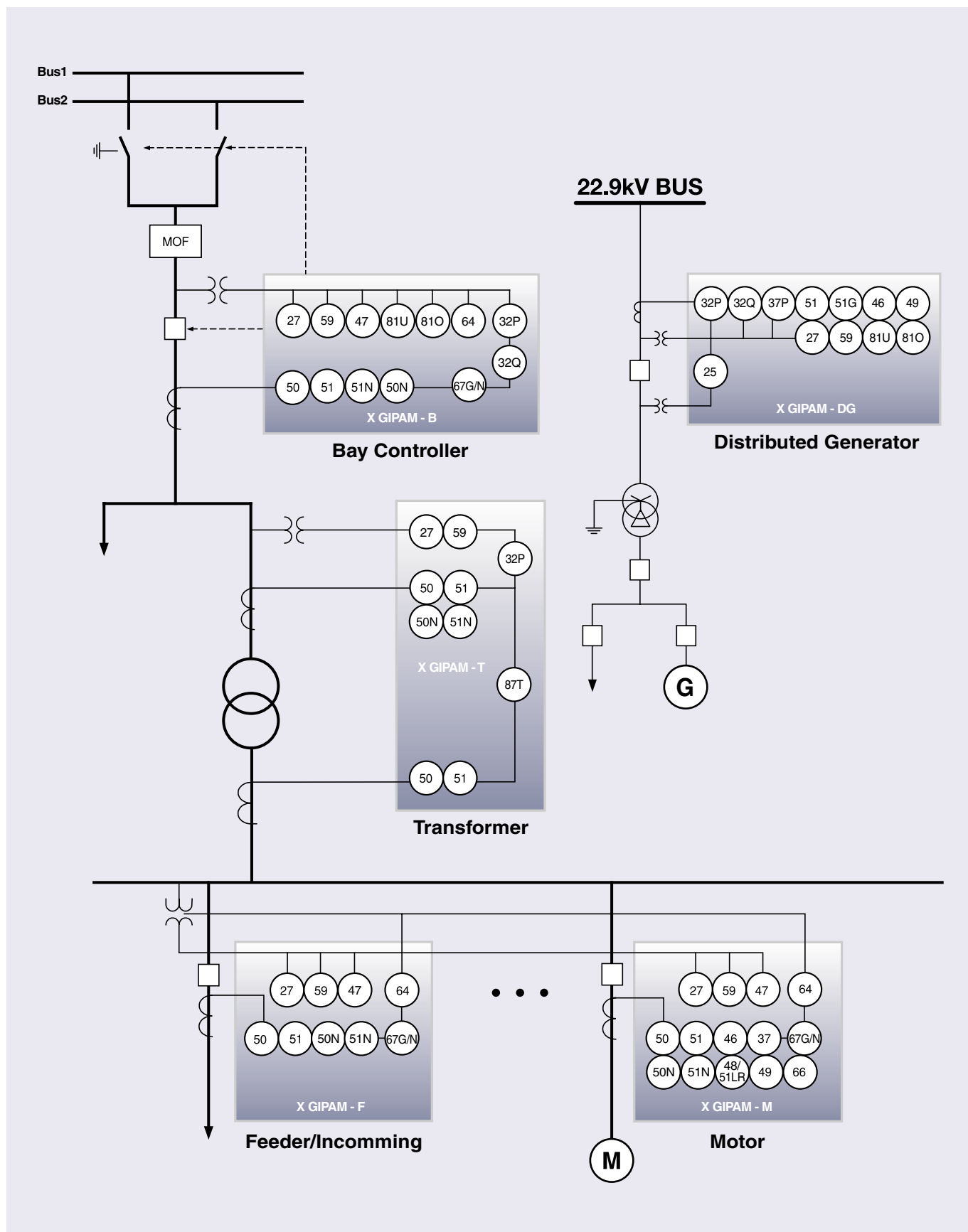


Slot

Module

- | | |
|-------------------|-------------------------------|
| ① Main processing | |
| ② Slot #0 | Extended communication Module |
| ③ Slot #1 | Arithmetic and control |
| ④ Slot #2 | AIO (Option) |
| ⑤ Slot #3 | AIO, SMS/Voice, Arc(Option) |
| ⑥ Slot #4 | DIO (Standard) |
| ⑦ Slot #5 | DIO (Bay, DG) |
| ⑧ Slot #6 | DIO |
| ⑨ Slot #7 | Arithmetic and control/D |
| ⑩ Slot #8 | Power module |

Functional Block Diagram



neXt Generation Intelligent Device

Technical Specifications

Type of Protection

Type	Vsage	Protection
X GIPAM - F	Feeder/Incomming	OCR(50/51), OCGR(50/51N), UVR(27), OVR(59), SGR(67G), DGR(67N), OVGR(64I/D), NSOVR(47N), POR(47), SYNC Check(25), Reclosing(79), Temperature(38)
X GIPAM - B	Bay Controller	OCR(50/51), OCGR(50/51N), UVR(27), OVR(59), SGR(67G), DGR(67N), OVGR(64I/D), NSOVR(47N), POR(47), SYNC Check(25), Reclosing(79), Temperature(38), DOCR(67I/D), NSOCR(46I/D), UFR(81U), OFR(81O), DPR(32P), DQR(32Q)
X GIPAM - M	Motor	OCR(50/51), OCGR(50/51N), UVR(27), OVR(59), SGR(67G), DGR(67N), OVGR(64I/D), NSOVR(47N), POR(47), Temperature(38), Stall/Locked Rotor(48/51LR), THR(49), DOCR(67I/D), UCR(37), NCH(66), NSOCR(46I/D),
X GIPAM - T	Transformer	OCR(50/51) × 2, OCGR(50/51N), UVR(27), OVR(59), Temperature(38), DPR(32P), DFR(87T)
X GIPAM - DG	Distributed Generator	OCR(50/51), OCGR(50/51N), UVR(27), OVR(59), DPR(32P), UPR(37P), DQR(32Q), UFR(81U), OFR(81O), DGR(67N), SYNC Check(25), DOCR(67I/D), NSOCR(46I/D), POR(47), NSOVR(47N), ROCOF(81R), SGR(67G), OVGR(64I/D)

Measurement function

Measurement	Range	Accuracy	Remarks
Voltage	0.0V ~ 999.999 kV	± 0.2%	Phase voltage, Line voltage
Zero-phase voltage	0.0V ~ 999.999 kV	± 2.0%	Vo
Phase voltage	0.0V ~ 999.999 kV	± 0.2%	VB
Unbalanced voltage rate	0.0% ~ 200.00%	± 2.0%	IEEE Std. 141
Reverse voltage	0.0V ~ 999.999 kA	± 1.0%	V ₂
Current	0.0A ~ 999.999 kA	± 0.2%	Phase current
Zero-phase current (CT4)	0.0A ~ 999.999 kA	± 2.0%	I _n
Zero-phase current (ZCT)	0.0A ~ 999.999 kA	± 1.0%	I _o
Reverse current	0.0A ~ 999.999 kA	± 1.0%	I ₂
Phase	0.0 ° ~ 360.0 °	± 5 °	-
Active power	0.00W ~ 9999.999 MW	± 0.5%	+ Forward, - Reverse
Reactive power	0.00VAR ~ 9999.999 MVAR	± 0.5%	-
Apparent power	0.00VA ~ 9999.999 MVA	± 1.0%	-
Active power amount	0.00WH ~ 99999.999 MWH	± 0.5%	+ Forward, - Reverse
Reactive power amount	0.00VARH ~ 99999.999 MVARH	± 0.5%	-
Frequency (Va)	45Hz ~ 65Hz	± 0.005Hz	-
Frequency (VB)	45Hz ~ 65Hz	± 0.005Hz	-
PF	-1.000 ~ 1.000	± 1.0%	Forward/Reverse
DPF	-1.000 ~ 1.000	± 1.0%	
Voltage hamonics	0.00% ~ 100.00%	± 5.0%	2nd ~ 63th harmonics THD, TDD, K-Factor
Current hamonics	0.00% ~ 100.00%	± 5.0%	
Active power demand	0.00W ~ 9999.999 MW	-	Peak Demand
Reactive power demand	0.00VAR ~ 9999.999 MVAR	-	
Voltage demand	0.3A ~ 999.999 kA	-	Each phase & Peak Demand
Load factor	0.0% ~ 100.000%	± 0.2%	Each phase current

Rating

Ratings

Type		Specification	
Wiring		3P3W, 3P4W	
Input	Frequency	60Hz (50Hz"")	
	Voltage	PT: 100/√3, 110/√3, 120/√3, 190/√3, 100, 110, 120V GPT: 190, 190/√3 V	
	Current	CT: 5A, ZCT: 1.5mA	
	Power consumption	Normal: Max. 30W, Operating: Max. 70W	
	Control voltage	AC/DC 110/125V (±20%)	
	Burden	PT: Max. 0.5VA, Max. 1.0VA	
Output contact	TRIP	Rated	AC 250V 10A / DC 30V 10A, Resistive Load
		Open	AC 2500VA, DC 300W
	ALARM	Close	AC 250V 5A / DC 30V 5A, Resistive Load
		Open	AC 1250VA, DC 150W
Insulation Resistance		Over DC 500V 10MΩ	
Dielectric Strength		AC 2kV(1kV) / for 1 min	
Overload withstand	Current circuit	3 In for 3 hours, 20 In for 2 seconde	
	Voltage circuit	1.15Vn for 3 hours	
Fast Transient Disturbance		Power Input 4kV, Other Input 2kV	
Electrostatic Discharge(ESD)		Air 8kV, Contact 6kV	
Operation temperature		-10℃ ~ 55℃	
Storage temperature		-25℃ ~ 70℃	
Humidity		30% ~ 80%	
Others		Non-impact place, Non-air pollution place	
Weight		7 kg (HMI: 2kg)	
Standard		IEC 60255-22-1: 1MHz Burst disturbance tests IEC 60255-22-2: Electrostatic discharge tests IEC 60255-22-3: Radiated radio frequency electromagnetic field IEC 60255-22-4: Electrical fast transient/burst immunity test IEC 60255-22-5: Surge immunity test IEC 60255-22-6: Immunity to conducted disturbances induced by radio frequency fields IEC 60255-22-7: Power frequency immunity test IEC 60255-11: Interruptions to and alternating component (ripple) in d.c. auxiliary quantity of measuring relay IEC 60255-25: Electromagnetic emission tests for measuring relays and protection equipment KEMC 1120	

Characteristics

X GIPAM - F

Protection	Operating part	Setting range	Operating characteristics	Operating time	Delay time	Remarks
OCR (50)	Stage 1	OFF, 0.10~32.00In/0.01In	Instantaneous	30msec and below	-	-
	Stage 2		Definite	0.050~300.000s/0.001s		
OCR (51)	Stage 1	OFF, 0.02~10.00In/0.01In	Definite	0.050~300.000s/0.001s	- 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/LI KEPCO SI/VI
	Stage 2		Inverse	0.05~1.2/0.01		
OCGR (50N)	Stage 1	OFF, 0.1~32.00In/0.01In	Instantaneous	30msec and below	-	-
	Stage 2		Definite	0.050~300.000s/0.001s		
OCGR (51N)	Stage 1	OFF, 0.02~10.00In/0.01In	Definite	0.050~300.000s/0.001s	- 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/LI KEPCO SI/VI
	Stage 2		Inverse	0.05~1.2/0.01		
SGR (67G)	Stage 1	OFF, 0.6~6.0mA/0.1mA Vo: 0V, 8V~80V/1V	Definite	0.050~10.000s/0.001s	-	-
	Stage 2	Characteristics angle: 0~±90°/1°				
DGR (67N)	Stage 1	OFF, 0.02~10.00In/0.01In Vo: 8~80V/1V	Instantaneous	45msec and below	-	IEC SI/VI/EI/LI ANSI SI/VI/LI KEPCO SI/VI
	Stage 2	Characteristics angle: 0~±90°/1° Operating range: 60~87°/1°	Definite Inverse	0.050~300.000s/0.001s 0.05~1.20/0.01	- 0~300.000s/0.001s	
UVR (27)	Stage 1	OFF, 0.10~1.10Vn/0.01Vn	Definite	0.050~300.000s/0.001s	-	Dead Voltage Block: 0.05Vn
	Stage 2	Auto Reset: Enable/Disable				
OVR (59)	Stage 1	OFF, 0.80~1.60Vn/0.01	Definite	0.050~300.000s/0.001s	-	IEC SI/VI/EI/LI
	Stage 2		Inverse	0.01~1.20/0.01	0~300.000s/0.001s	ANSI SI/VI/EI
OVGR (64I)	Stage 1	OFF, 5~80V/1V	Instantaneous	30msec and below	-	-
	Stage 2		Definite	0.050~300.000s/0.001s		
OVGR (64D)	Stage 1	OFF, 5~80V/1V	Definite	0.050~300.000s/0.001s	0~300.00s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/EI
	Stage 2		Inverse	0.05~1.20/0.01		
NSOVR (47N)	Stage 1	OFF, 11~120V/1V	Definite	0.050~300.000s/0.001s	-	-
	Stage 2					
POR (47)	Stage 1	OFF, 2.0~100%/1%	Definite	0.050~300.000s/0.001s	-	-
	Stage 2					
Synchro-check (25)	Stage 1	V Diff: OFF, 2~50V/1V Phase Diff: OFF, 5~45/1° F Diff: 0.01~0.50/0.01Hz Dead V: 0.2~0.4Vn/0.01Vn	-	1sec and below	-	0.5Vn~1.2Vn
Temperature(38)	Stage 1	OFF, 20~180℃/1℃	Definite	0.050~300.000s/0.001s	-	-
	Stage 2					
Reclosing (79)	Stage 1	Reclosing counts: 1 ~ 5 times • Prepare Timer: 0.020 s ~ 60.000 s (0.001 s) • Dead Timer: Max. 5, 0.060 s ~ 300.000 s (0.001 s) • CB Operation Timer: 0.05 s ~ 0.500 s (0.001 s) • Reclaim Time: 1.000 s ~ 300.000 s (0.001 s) • Scheme: Dead Bus-Dead Line, Dead Bus-Live Line, Live Bus-Dead Line, Live Bus-Live Line • Dead: 0 ~ 0.1Vn • Live: 0.5Vn ~				

X GIPAM - B

Protection	Operating part	Setting range	Operating characteristics	Operating time	Delay time	Remarks
OCR (50)	Stage 1	OFF, 0.10~32.00In/0.01In	Instantaneous Definite	30msec and below 0.050~300.000s/0.001s	-	-
	Stage 2					
OCR (51)	Stage 1	OFF, 0.02~10.00In/0.01In	Definite Inverse	0.050~300.000s/0.001s 0.05~1.2/0.01	- 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/LI KEPCO SI/VI
	Stage 2					
OCGR (50N)	Stage 1	OFF, 0.1~32.00In/0.01In	Instantaneous	30msec and below	-	-
	Stage 2		Definite	0.050~300.000s/0.001s		
OCGR (51N)	Stage 1	OFF, 0.02~10.00In/0.01In	Definite Inverse	0.050~300.000s/0.001s 0.05~1.2/0.01	- 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/LI KEPCO SI/VI
	Stage 2					
SGR (67G)	Stage 1	OFF, 0.6~6.0mA/0.1mA Vo: 0V, 8V~80V/1V Characteristics angle: 0~±90°/1°	Definite	0.050~10.000s/0.001s	-	-
	Stage 2					
DGR (67N)	Stage 1	OFF, 0.02~10.00In/0.01In Vo: 8~80V/1V Characteristics angle: 0~±90°/1° Operating range: 60~87°/1°	Instantaneous Definite Inverse	45msec and below 0.050~300.000s/0.001s 0.05~1.20/0.01	- - 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/LI KEPCO SI/VI
	Stage 2					
UVR (27)	Stage 1	OFF, 0.10~1.10Vn/0.01Vn Auto Reset: Enable/Disable	Definite	0.050~300.000s/0.001s	-	Dead Voltage Block : 0.05Vn
	Stage 2					
OVR (59)	Stage 1	OFF, 0.80~1.60Vn/0.01	Definite Inverse	0.050~300.000s/0.001s 0.01~1.20/0.01	- 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/EI
	Stage 2					
OVGR (64I)	Stage 1	OFF, 5~80V/1V	Instantaneous Definite	30msec and below 0.050~300.000s/0.001s	-	-
	Stage 2					
OVGR (64D)	Stage 1	OFF, 5~80V/1V	Definite Inverse	0.050~300.000s/0.001s 0.05~1.20/0.01	0~300.00s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/EI
	Stage 2					
NSOVR (47N)	Stage 1	OFF, 11~120V/1V	Definite	0.050~300.000s/0.001s	-	-
	Stage 2					
POR (47)	Stage 1	OFF, 2.0~100%/1%	Definite	0.050~300.000s/0.001s	-	-
	Stage 2					
Synchro-check (25)	Stage 1	V Diff: OFF, 2~50V/1V Phase Diff: OFF, 5~45/1° F Diff: 0.01~0.50/0.01Hz Dead V: 0.2~0.4Vn/0.01Vn	-	1sec and below	-	0.5Vn ~1.2Vn
Temperature (38)	Stage 1	OFF, 20~180℃/1℃	Definite	0.050~300.000s/0.001s	-	-
	Stage 2					
UFR (81U)	Stage 1	OFF, 50~60Hz/0.05Hz Block: 0.50~0.90Vn/0.01Vn	Definite	0.100~300.000s/0.001s	-	PT #1 or PT #5
	Stage 2					
	Stage 3					
	Stage 4					
OFR (81O)	Stage 1	OFF, 60~70Hz/0.05Hz Block: 0.50~0.90Vn/0.01Vn	Definite	0.100~300.000s/0.001s	-	
	Stage 2					
	Stage 3					
	Stage 4					
DPR (32P)	Stage 1	OFF, 0.01~1.50Pn/0.01Pn (Forward, Reverse)	Definite	0.100~300.000s/0.001s	-	-
	Stage 2					
DQR (32Q)	Stage 1	OFF, 0.02~1.50Qn/0.01Qn (Forward, Reverse)	Definite	0.100~300.000s/0.001s	-	-
	Stage 2					
DOCR (67I)	Stage 1	OFF, 0.10~32.00In/0.01In Characteristics angle: 0~±90°/1° Operating range: 60~87°/1° Forward/Reverse	Instantaneous Definite	45msec and below 0.050~300.000s/0.001s	-	-
	Stage 2					
DOCR (67D)	Stage 1	OFF, 0.02~10.00In/0.01In V(a-b), V(b-c), V(c-a) Characteristics angle: 0~±90°/1° Operating range: 60~87°/1° Forward/Reverse	Definite Inverse	0.050~300.000s/0.001s 0.05~1.20/0.01	- 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/EI KEPCO SI/VI
	Stage 2					
NSOCR (46I)	Stage 1	OFF, 0.1~2.0/0.01In	Instantaneous Definite	50msec and below 0.050~300.000s/0.001s	-	-
	Stage 2					
NSOCR (46D)	Stage 1	OFF, 0.05~2.00/0.01In	Definite Inverse	0.050~300.000s/0.001s 0.05~1.20/0.01	- 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/EI
	Stage 2					
Reclosing (79)	Stage 1	Reclosing counts: 1 ~ 5 times • Prepare Timer: 0.020 s ~ 60.000 s (0.001s) • Dead Timer: Max. 5, 0.060 s ~ 300.000 s (0.001s) • CB Operation Timer: 0.05 s ~ 0.500 s (0.001s) • Reclaim Time: 1.000 s ~ 300.000 s (0.001s) • Scheme: Dead Bus-Dead Line, Dead Bus-Live Line, Live Bus-Dead Line, Live Bus-Live Line • Dead: 0 ~ 0.1Vn • Live: 0.5Vn ~				

neXt Generation Intelligent Device

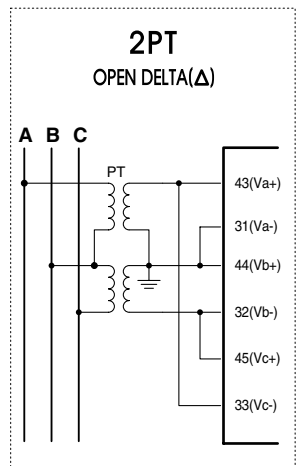
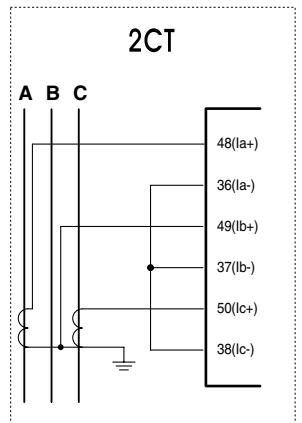
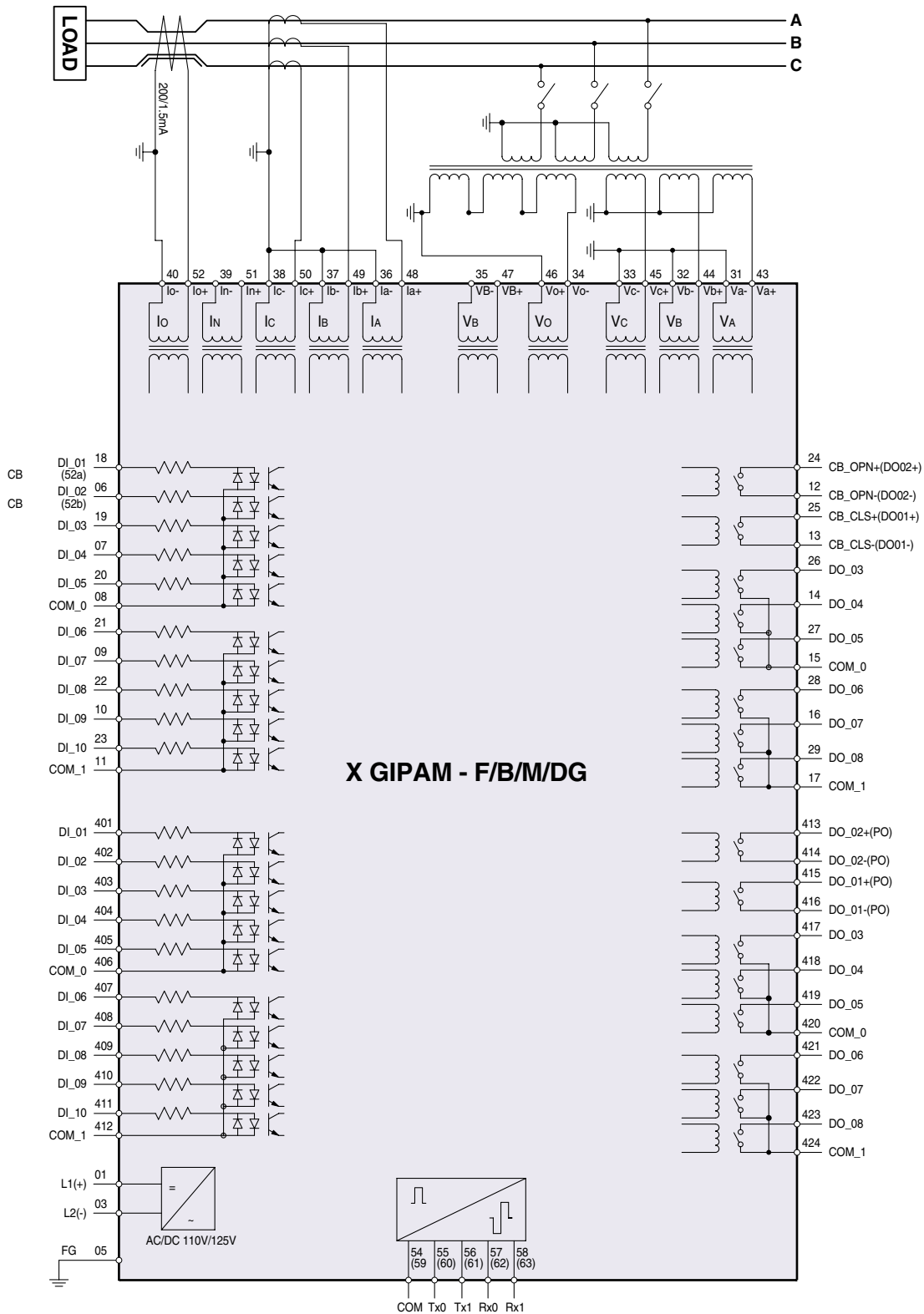
Characteristics

X GIPAM - T

Protection	Operating part	Setting range	Operating characteristics	Operating time	Delay time	Remarks
OCR-1(50)	Stage 1	OFF, 0.10~32.00In/0.01In	Instantaneous	30msec and below	-	-
	Stage 2		Definite	0.050~300.000s/0.001s		
OCR-1(51)	Stage 1	OFF, 0.02~10.00In/0.01In	Definite	0.050~300.000s/0.001s	- 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/LI KEPCO SI/VI
	Stage 2		Inverse	0.05~1.2/0.01		
OCGR (50N)	Stage 1	OFF, 0.1~32.00In/0.01In	Instantaneous	30msec and below	-	-
	Stage 2		Definite	0.050~300.000s/0.001s		
OCGR (51N)	Stage 1	OFF, 0.02~10.00In/0.01In	Definite	0.050~300.000s/0.001s	- 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/LI KEPCO SI/VI
	Stage 2		Inverse	0.05~1.2/0.01		
OCR-2 (50)	Stage 1	OFF, 0.10~32.00In/0.01In	Instantaneous	30msec and below	-	-
	Stage 2		Definite	0.050~300.000s/0.001s		
OCR-2 (51)	Stage 1	OFF, 0.02~10.00In/0.01In	Definite	0.050~300.000s/0.001s	- 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/LI KEPCO SI/VI
	Stage 2		Inverse	0.05~1.2/0.01		
UVR (27)	Stage 1	OFF, 0.10~1.10Vn/0.01Vn	Definite	0.050~300.000s/0.001s	-	Dead Voltage Block : 0.05Vn
	Stage 2	Auto Reset: Enable/Disable				
OVR (59)	Stage 1	OFF, 0.80~1.60Vn/0.01	Definite	0.050~300.000s/0.001s	- 0~300.000s/0.001s	IEC SI/VI/EI/LI ANSI SI/VI/EI
	Stage 2		Inverse	0.01~1.20/0.01		
DPR (32P)	Stage 1	OFF, 0.01~1.50Pn/0.01Pn	Definite	0.100~300.000s/0.001s	-	-
	Stage 2	(Forward, Reverse)				
Temperature (38)	Stage 1	OFF, 20~180℃/1℃	Definite	0.050~300.000s/0.001s	-	-
	Stage 2					
DFR(87T)	Stage1	OFF, 2~32 In/0.01In			40ms and below	-
	Stage 2	OFF, 0.2~1.0In/0.01In Slope 1: 15~100%/1% Slope 2: 15~100%/1% Knee Point: 1.0~20.0In/0.1In Inrush Inhibit: ON (5~50%/1%) : OFF Io Elimination: ON/OFF	Definite	-	0, 0.05~300s/0.001s	-

Wiring

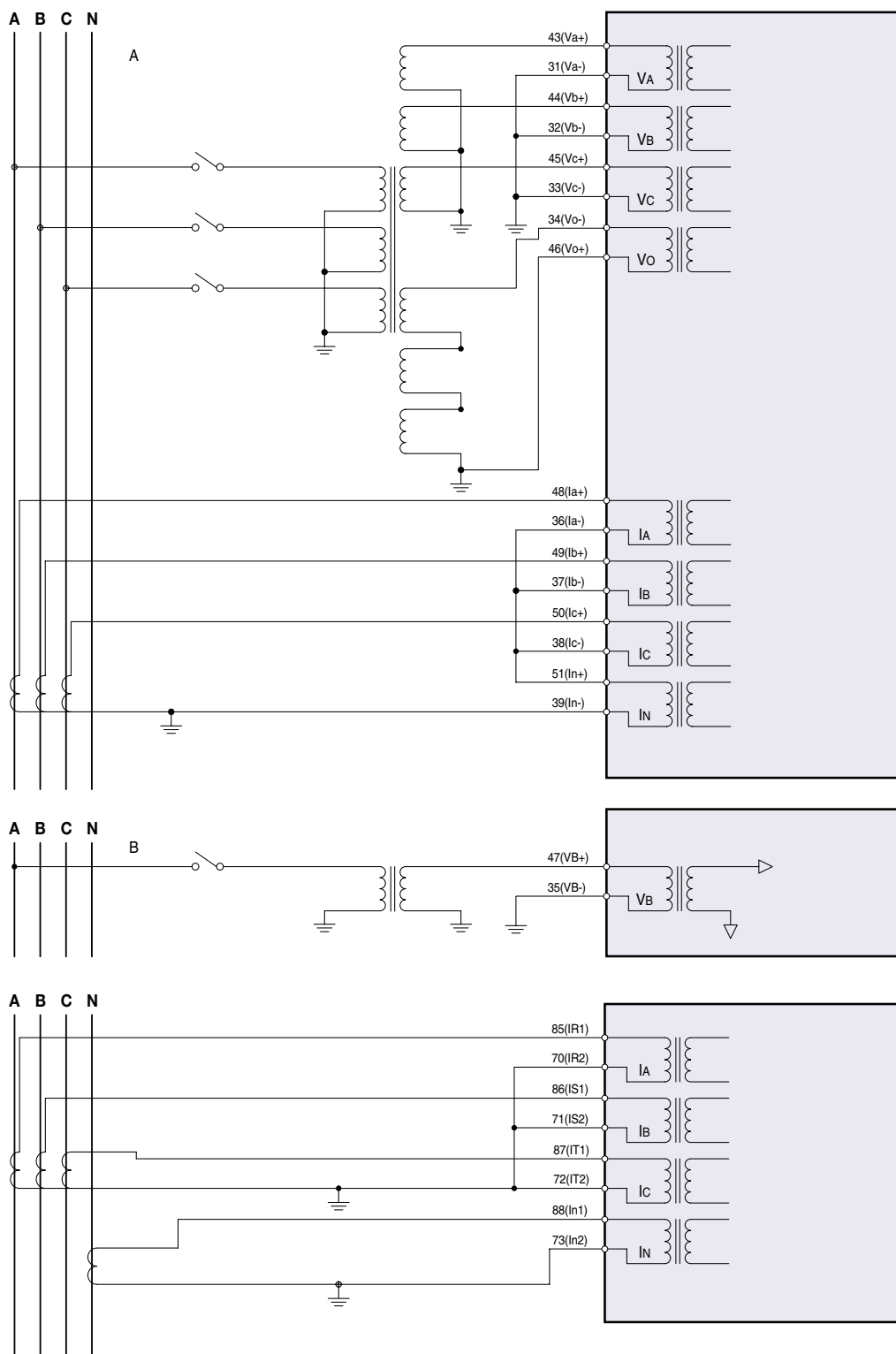
X GIPAM - F/B/M/DG (3P3W)



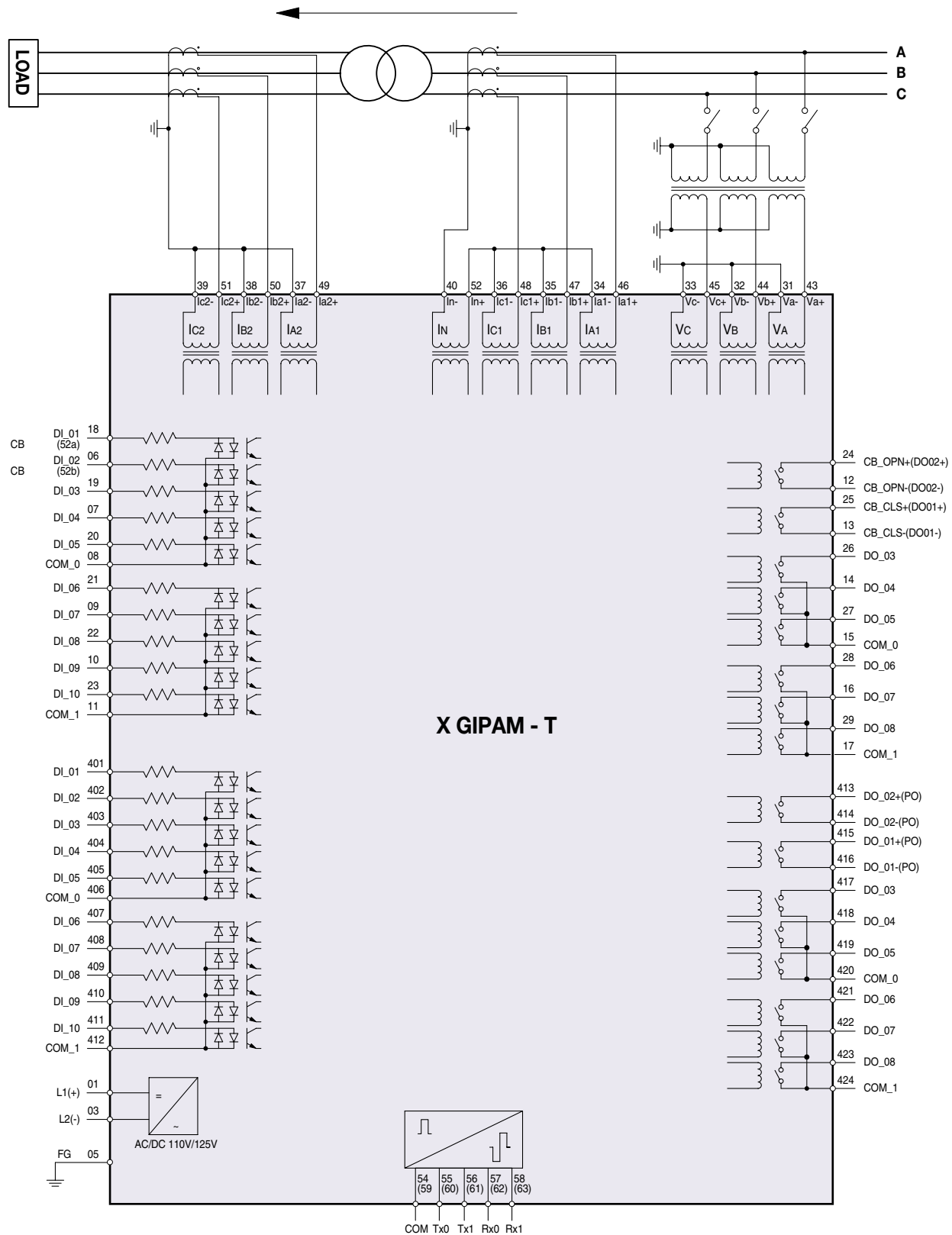
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Wiring

X GIPAM - F/B/M/DG (3P4W)



X GIPAM - T



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Contact and Logic Usage

X GIPAM - F/B/M/DG

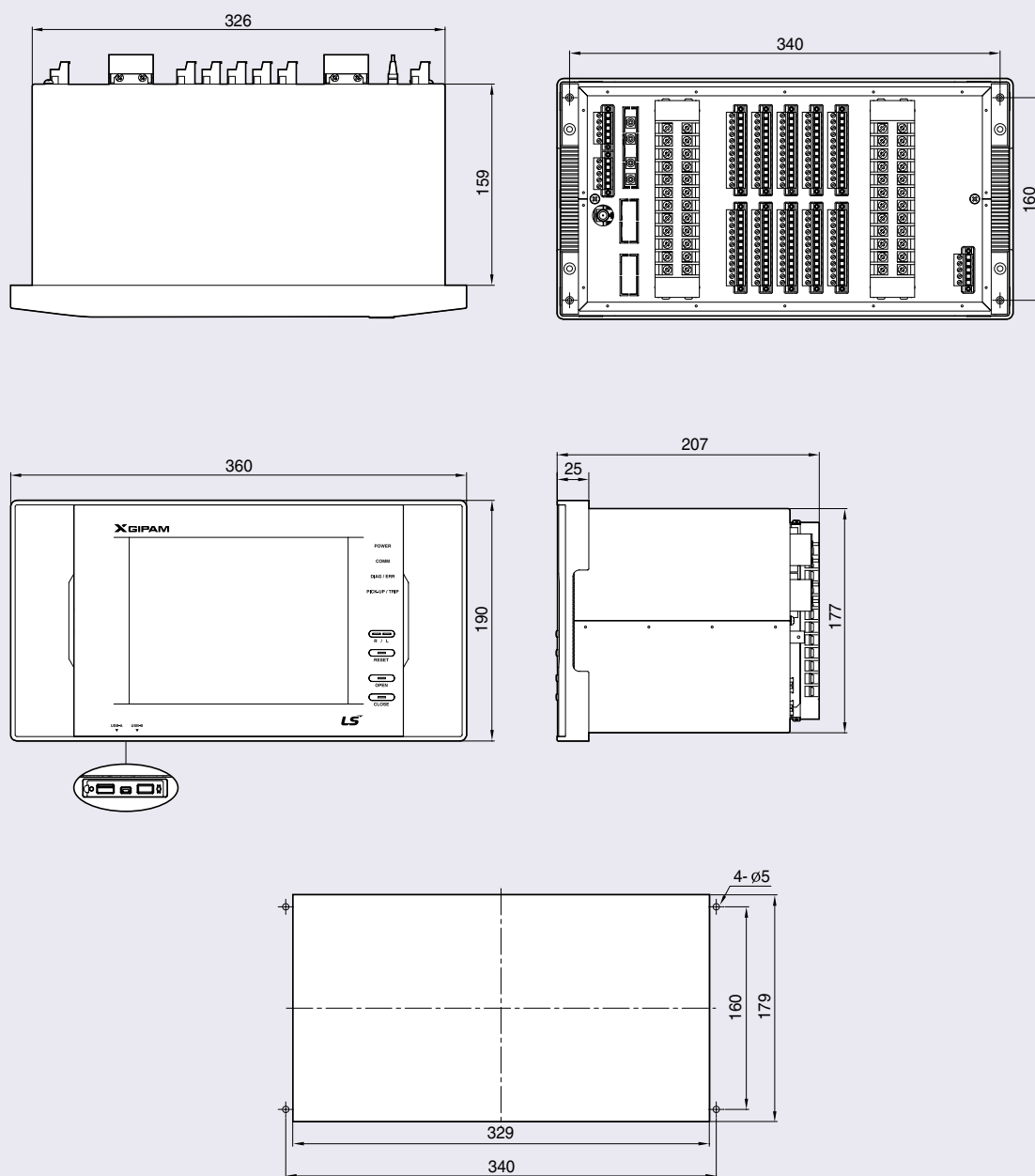
Comm	Extended Comm	CT/PT	Slot2	Slot3	Slot4	Slot5	Slot6	Slot7	
54 COM A 55 TxDO A 56 TxD1 A 57 RxDO A 58 RxD1 A	64 FX RXA 65 FX TXA 66 FX RXB 67 FX TXB	42 BLK BLK 30 43 Va+ Va- 31 44 Vb+ Vb- 32 45 Vc+ Vc- 33 46 Vo+ Vo- 34 47 VB+ VB- 35 48 Ia+ Ia- 36 49 Ib+ Ib- 37 50 Ic+ Ic- 38 51 In+ In- 39 52 Io+ Io- 40 53 BLK BLK 41	01 AI01+ 02 AI01- 03 AI02+ 04 AI02- 05 AI03+ 06 AI03- 07 AI04+ 08 AI04- 09 AI05+ 10 AI05- 11 AI06+ 12 AI06-	01 AI01+ 02 AI01- 03 AI02+ 04 AI02- 05 AI03+ 06 AI03- 07 AI04+ 08 AI04- 09 AI05+ 10 AI05- 11 AI06+ 12 AI06-	01 DI01 02 DI02 03 DI03 04 DI04 05 DI05 06 COM0 07 DI06 08 DI07 09 DI08 10 DI09 11 DI10 12 COM1	01 DI01 02 DI02 03 DI03 04 DI04 05 DI05 06 COM0 07 DI06 08 DI07 09 DI08 10 DI09 11 DI10 12 COM1	01 DI01 02 DI02 03 DI03 04 DI04 05 DI05 06 COM0 07 DI06 08 DI07 09 DI08 10 DI09 11 DI10 12 COM1	18 DI01 DI02 06 19 DI03 DI04 07 20 DI05 COM0 08 21 DI06 DI07 09 22 DI08 DI09 10 23 DI10 COM1 11 24 CB OPN+ (DO02+) CB OPN- (DO02-) 12 25 CB CLS+ (DO01+) CB CLS- (DO01-) 13 26 DO03 DO04 14 27 DO05 COM0 15 28 DO06 DO07 16 29 DO08 COM1 17	
59 COM B 60 TxDO B 61 TxD1 B 62 RxDO B 63 RxD1 B	68 LAN A 69 LAN B		13 AO01+ 14 AO01- 15 AO02+ 16 AO02- 17 AO03+ 18 AO03- 19 AO04+ 20 AO04- 21 22 23 24	13 AO01+ 14 AO01- 15 AO02+ 16 AO02- 17 AO03+ 18 AO03- 19 AO04+ 20 AO04- 21 22 23 24	13 DO02+ (PO) 14 DO02- (PO) 15 DO01+ (PO) 16 DO01- (PO) 17 DO03 18 DO04 19 DO05 20 COM0 21 DO06 22 DO07 23 DO08 24 COM1	13 DO02+ (PO) 14 DO02- (PO) 15 DO01+ (PO) 16 DO01- (PO) 17 DO03 18 DO04 19 DO05 20 COM0 21 DO06 22 DO07 23 DO08 24 COM1	13 DO02+ (PO) 14 DO02- (PO) 15 DO01+ (PO) 16 DO01- (PO) 17 DO03 18 DO04 19 DO05 20 COM0 21 DO06 22 DO07 23 DO08 24 COM1	01 L1/+ 02 L2/- 03 04 05 FG	
Comm	Extended Comm	CT/PT	AI/AO (Option)	AI/AO (Option)	DI/DO	DI/DO (Option)	DI/DO (Option)	DI/DO	PWR
RS-485	100Base-FX ● 100/10Base-F	3I+I _N +I _o 3V+V _o +V _s	AI : 6 Channel AO : 4 Channel	AI : 6 Channel AO : 4 Channel	DI : 10 Point DO : 8 Point - S/W 2 Point - General 6 Point	DI : 10 Point DO : 8 Point - S/W 2 Point - General 6 Point	DI : 10 Point DO : 8 Point - S/W 2 Point - General 6 Point	DI : 10 Point DO : 8 Point - S/W 2 Point - General 6 Point	

X GIPAM - T

Comm	Extended Comm	CT/PT	Slot2	Slot3	Slot4	Slot5	Slot6	Slot7	
54 COM A 55 TxDO A 56 TxDI A 57 RxDO A 58 RxDI A	64 FX RXA 65 FX TXA 66 FX RXB 67 FX TXB	42 BLK BLK 30 43 Va+ Va- 31 44 Vb+ Vb- 32 45 Vc+ Vc- 33 46 Ia1+ Ia1- 34 47 Ib1+ Ib1- 35 48 Ic1+ Ic1- 36 49 Ia2+ Ia2- 37 50 Ib2+ Ib2- 38 51 Ic2+ Ic2- 39 52 In+ In- 40 53 BLK BLK 41	01 AI01+ 02 AI01- 03 AI02+ 04 AI02- 05 AI03+ 06 AI03- 07 AI04+ 08 AI04- 09 AI05+ 10 AI05- 11 AI06+ 12 AI06-	01 AI01+ 02 AI01- 03 AI02+ 04 AI02- 05 AI03+ 06 AI03- 07 AI04+ 08 AI04- 09 AI05+ 10 AI05- 11 AI06+ 12 AI06-	01 DI01 02 DI02 03 DI03 04 DI04 05 DI05 06 COM0 07 DI06 08 DI07 09 DI08 10 DI09 11 DI10 12 COM1	01 DI01 02 DI02 03 DI03 04 DI04 05 DI05 06 COM0 07 DI06 08 DI07 09 DI08 10 DI09 11 DI10 12 COM1	01 DI01 02 DI02 03 DI03 04 DI04 05 DI05 06 COM0 07 DI06 08 DI07 09 DI08 10 DI09 11 DI10 12 COM1	18 DI01 DI02 06 19 DI03 DI04 07 20 DI05 COM0 08 21 DI06 DI07 09 22 DI08 DI09 10 23 DI10 COM1 11 24 CB OPN+ (DO02+) CB OPN- (DO02-) 12 25 CB CLS+ (DO01+) CB CLS- (DO01-) 13 26 DO03 DO04 14 27 DO05 COM0 15 28 DO06 DO07 16 29 DO08 COM1 17	
59 COM B 60 TxDO B 61 TxDI B 62 RxDO B 63 RxDI B	68 LAN A 69 LAN B		13 AO01+ 14 AO01- 15 AO02+ 16 AO02- 17 AO03+ 18 AO03- 19 AO04+ 20 AO04- 21 22 23 24	13 AO01+ 14 AO01- 15 AO02+ 16 AO02- 17 AO03+ 18 AO03- 19 AO04+ 20 AO04- 21 22 23 24	13 DO02+ (PO) 14 DO02- (PO) 15 DO01+ (PO) 16 DO01- (PO) 17 DO03 18 DO04 19 DO05 20 COM0 21 DO06 22 DO07 23 DO08 24 COM1	13 DO02+ (PO) 14 DO02- (PO) 15 DO01+ (PO) 16 DO01- (PO) 17 DO03 18 DO04 19 DO05 20 COM0 21 DO06 22 DO07 23 DO08 24 COM1	13 DO02+ (PO) 14 DO02- (PO) 15 DO01+ (PO) 16 DO01- (PO) 17 DO03 18 DO04 19 DO05 20 COM0 21 DO06 22 DO07 23 DO08 24 COM1	01 L1/+ 02 L2/- 03 04 05 FG	
Comm	Extended Comm	CT/PT	AI/AO (Option)	AI/AO (Option)	DI/DO	DI/DO (Option)	DI/DO (Option)	DI/DO	PWR
RS-485	100Base-FX or 100/10Base-F	3I+I _N +I _o 3V	AI : 6Channel AO : 4Channel	AI : 6Channel AO : 4Channel	DI : 10Point DO : 8Point - S/W 2Point - General 6Point	DI : 10Point DO : 8Point - S/W 2Point - General 6Point	DI : 10Point DO : 8 - S/W 2Point - General 6Point	DI : 10Point DO : 8Point - S/W 2Point - General 6Point	

Dimension

Dimensions (with integrated HMI)



Cut size (329×179)

neXt Generation Intelligent Device

Odering

X GIPAM

F

Type	
F	Feeder/Incoming
B	Bay Controller
M	Motor
T	Transformer
DG	Distributed Generator

TE

Communication	
RS	RS-485
TE	100/10 Base-T Ethernet
FE	100 Base-FX Ethernet

M

Protocol	
M	MODBUS
D	DNP3.0
C	IEC 61850

NO

Option	
NO	NO
D1	DI/O Module 1ea
D2	DI/O Module 2ea
A1	AI/O Module 1ea
A2	AI/O Module 2ea
P1	PI/O Module 1ea
P2	PI/O Module 2ea
SV	SMS/VOICE
SE	Remote HMI

60

Frequency	
60	60Hz
50	50Hz **

5

Current input	
5	5A

** For further information about 50Hz, please address inquiries to us separately.

neXt Generation Technology

XGIPAM



Digital Protection & Measurement Device



IEC 61850 Certificate Level A¹

Page 1/2

No. 30920476-Consulting 09-1763

Issued to:
LS Industrial Systems Co., Ltd.
LS Tower 1026-6, Hoggie-dong, Dongan-gu,
Anyang-si, Gyeonggi-do 431-848
Korea

For the product:
X GIPAM
Multifunctional Protection & Control Device
IEC61850 EXT. v1.0

Issued by:



The product has not shown to be non-conforming to:
IEC 61850-6, 7-1, 7-2, 7-3, 7-4 and 8-1
Communication networks and systems in substations

The conformance test has been performed according to IEC 61850-10 with product's protocol, model and technical issue implementation conformance statements: "X GIPAM Ext. v1.0 PICS", "X GIPAM Ext. v1.0 MICS", "X GIPAM Ext. v1.0 TICS" and product's extra information for testing: "X GIPAM Ext. v1.0 PIXIT".

The following IEC 61850 conformance blocks have been tested with a positive result (number of relevant and executed test cases / total number of test cases as defined in the UCA International Users Group Device Test procedures v2.2):

1	Basic Exchange (19/24)	12a	Direct Control (6/11)
2+	Data Set Definition (26/29)	12b	SBO Control (8/15)
5	Unbuffered Reporting (16/18)	12c	Enhanced Direct Control (6/13)
6	Buffered Reporting (18/20)	12d	Enhanced SBO Control (11/19)
9a	GOOSE Publish (6/12)	13	Time Synchronization (4/4)
9b	GOOSE Subscribe (9/10)	14	File Transfer (4/7)

This Certificate includes a summary of the test results as carried out at KEMA in The Netherlands with UniCasim 61850 version 3.19.02 with test suite 3.19.01 and UniCA 61850 analyzer 4.18.01. The test is based on the UCA International Users Group Device Test Procedures version 2.2. This document has been issued for information purposes only, and the original paper copy of the KEMA report: No. 30920476-Consulting 09-1762 will prevail.

The test has been carried out on one single specimen of the products as referred above and submitted to KEMA by LS Industries. The manufacturer's production process has not been assessed. This Certificate does not imply that KEMA has certified or approved any product other than the specimen tested.

Arnhem, August 28, 2009

W. Strabbing
Manager Intelligent Networks and Communication

M. Flohil
Senior Test Engineer

1 Level A - Independent Test lab with certified ISO 9000 or ISO 17025 Quality System

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