



PRODUCTS OVERVIEW

Expertise in Control & Protection Solutions

FANOX

fanox.com



At Fanox, we are specialized in the DESIGN and MANUFACTURE of Electronic Relays for Low and Medium Voltage Applications.

Fanox was founded in 1992 with the clear objective of bringing innovation to the electricity sector. As a driver of technology and trends, it is consolidating in the energy market as a powerful manufacturer of many Protection Relays that can be used in any application in Transmission and Distribution Lines.

The energy transition faced by the electricity sector has as one of its objectives the increase of renewable energies within the electricity mix to achieve the levels of decarbonization required by Europe. This fact will lead to a more flexible and decentralized electricity system that is impossible to manage without a digital transformation of the sector. Fanox, for years, has been committed to a product that allows facing this digitalization with guarantees.

CUSTOMERS & APPROVALS WORLDWIDE

All our relays are adapted to the technical specifications and requirements of our customers, obtaining the best technical solution to meet their application and assembly needs.



SELF POWERED TECHNOLOGY SOLUTION

INTELLIGENCE APPLIED TO PROTECTION RELAYS

We are a reference as specialists in SELF POWERED Protection Relays designing and manufacturing. Successfully proven experience, thousands of field installed devices operating in top conditions for over 20 years.

Our innovative spirit, the direct care of the market requirements and our extensive expertise in the manufacture of Protection Relays, have made our Self powered Relays a reference worldwide.

Furthermore, our Relays include the latest Technology: LCD, keyboard, event recording, SCADA communication, PC software Utilities worldwide have relied on our technology.



Main advantages over other brands

- ✓ The Relays are Self powered by the current measured by the CTs fitted on the lines. The MAIN ADVANTAGE comparing with other self powered relays in the market is that Fanox Relays do not required internal batteries. This means that the maintenance of transformation centers is heavily reduced.
- ✓ High electromagnetic compatibility makes Fanox Relays the safest in the market. KEMA certification proves it.
- ✓ 5 years warranty.
- ✓ Standard CTs /1A or /5A can be used saving money when specific CTs are not required.
- ✓ Fanox Self powered Relays are able to trip all the strikers in the market. Thanks to a setting that allows the user to select the required voltage by the striker.
- ✓ LOCAL AND REMOTE communication.
- ✓ Very intuitive menu, extremely easy to set.
- ✓ Our flexible design offers solutions for all the applications worldwide: coils, strikers, dual-powered installations...
- ✓ No one in the market gives more quality and specifications with so competitive prices.

Protection Relays



Pag 8

SIA-B Standard CT's

OC&EF Dual and Self Powered Protection Relay

PM I SP 0.075 xIn CI Std. CTs /1



Pag 10

SIA-B Specific CT's

OC&EF Dual and Self Powered Protection Relay

PM I SP 0.4 xIn CI Spec. CTs



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SIA-C

OC&EF Dual and Self Powered Protection Relay

PM I SP 0.075 xIn CI Std. CTs /1/5



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SIA-F

OC&EF Protection Relay

PM I CI Std. CTs /1/5



Pag 16

SIL-A

OC&EF Feeder Protection Relay

PM I CI Std. CTs /1/5 VI Conv. VTs (neutral)



Pag 18

SIL-G

Line, Feeder & Generator Protection Relay

PM I V f CI Std. CTs /1/5 VI Conv. VTs



Pag 20

SIL-C

Feeder & Generator Protection Relay / Compact Size

PM I V f CI Std. CTs /1/5 VI Conv. VTs

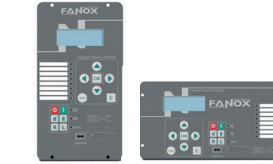


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SIL-S

LPIT Feeder Protection Relay

PM I V f CI Current sensors VI Voltage sensors



Pag 24

SIU-C

Voltage & Frequency Protection Relay

PM V f VI Conv. VTs



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SIR-A

Overhead Control / RTU & Feeder Protection Relay

PM I V f CI Std. CTs /1/5 VI Voltage sensors



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SIR-C

Overhead Control & Feeder Protection Relay / Compact Size

PM I V f CI Std. CTs /1/5 VI Voltage sensors



LEGEND

PM	PROTECTION & MEASUREMENT FUNCTIONS	SP	SELF POWERING LEVEL
I	CURRENT	CI	CURRENT INPUT
V	VOLTAGE	VI	VOLTAGE INPUT
f	FREQUENCY		

Other Medium Voltage Products / Accessories



CT-MT

Current transformers



PVS

Resistive Voltage
Sensors



TCM

Trip Capacitors



PRT's

Strikers



KITCOM

Auxiliary Battery
Power Supply



BNS

Coils



AFS

Arc Flash Sensors



SICOM

Communication
Software

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Communications & Automation Solutions for Grid Digitalisation



Pag 34

RNX-2000

Remote Control
Unit | RTU



Pag 36

SIC-A

Redundancy Protocols
Gateway (PRP/HSR)

PROTECTION & CONTROL

Low Voltage Products



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Protection & Control of Motors, Generators and Pumps | Control & Measurement | Earth Leakage Protection
Protection Against Transient Overvoltage Strikers | Low Voltage Transformers

ANSI codes

Protection Functions

ANSI PROTECTION CODES

50	Instantaneous phase overcurrent
67/51	Inverse time directional* phase overcurrent
50N	Instantaneous calculated neutral overcurrent
50G	Instantaneous measured neutral overcurrent
67N/51N	Inverse time directional* calculated neutral overcurrent
67G/51G	Inverse time directional* measured neutral overcurrent
67NI	Directional isolated calculated neutral overcurrent
67GI	Directional isolated measured neutral overcurrent
50INC	Incipient/Intermittent Fault detection
SOTF	Switch On To Fault
46	Phase balance current protection
46BC	Broken Conductor Detection
64REF	Restricted Earth Fault
37	Instantaneous phase undercurrent
TB	Trip block for switch disconnect
49	Thermal overload
49T	External trip
SHB	Second Harmonic Blocking
59	Instantaneous phase overvoltage (Bus Bar)
59N**/G	Instantaneous calculated/measured neutral overvoltage (Bus Bar)
59L	Instantaneous phase overvoltage (Line)
59N-L	Instantaneous calculated neutral overvoltage (Line)
47	Phase balance voltage protection (Bus Bar)
47-L	Phase Balance voltage protection (Line)
27	Instantaneous phase undervoltage (Bus Bar)
27L	Instantaneous phase undervoltage (Line)
27V1	Instantaneous positive sequence undervoltage (Bus Bar)
27V1-L	Instantaneous positive sequence undervoltage (Line)
dV/dt	Rate of Change of Voltage
32	Directional overpower
81O/U	Under/Overfrequency
81R	Rate of Change of Frequency (ROCOF)
78	Out of Step (Vector Shift)
24'	Overfluxing
CLP	Cold Load Pickup
79	AC Reclosing device
52	Breaker wear monitoring
25	Synchro Check

LMS	Load Management System
SCM**	Sequence Coordination Mode
SZM**	Sectionalizer Mode
HLT	Hot Line Tag
50BF	Circuit Breaker Failure
74TCS	Trip Circuit Supervision
74CCS	Close Circuit Supervision
60CTS	Phase CT Supervision
60CSS	Phase current sensors supervision
60VTS	Phase VT Supervision
60VSS**	Phase LPVT Supervision
AFD	Arc Flash Detection
21FL	Fault Locator
86	Trip lockout
68	Zone Selection Interlocking (ZSI)
PSC**	Power Supply Control
PGC	Programmable logic control

* ANSI 67, ANSI 67G and ANSI 67N can be converted into ANSI 51, ANSI 51G and ANSI 51N respectively by setting the "Directionality" parameter to NO. ANSI 50G, ANSI 67G and ANSI 67GI will be converted into ANSI 50GS, ANSI 67GS and ANSI 67GSI in the model with neutral current measurement digit 1 (IN = 0.1A or 1A)

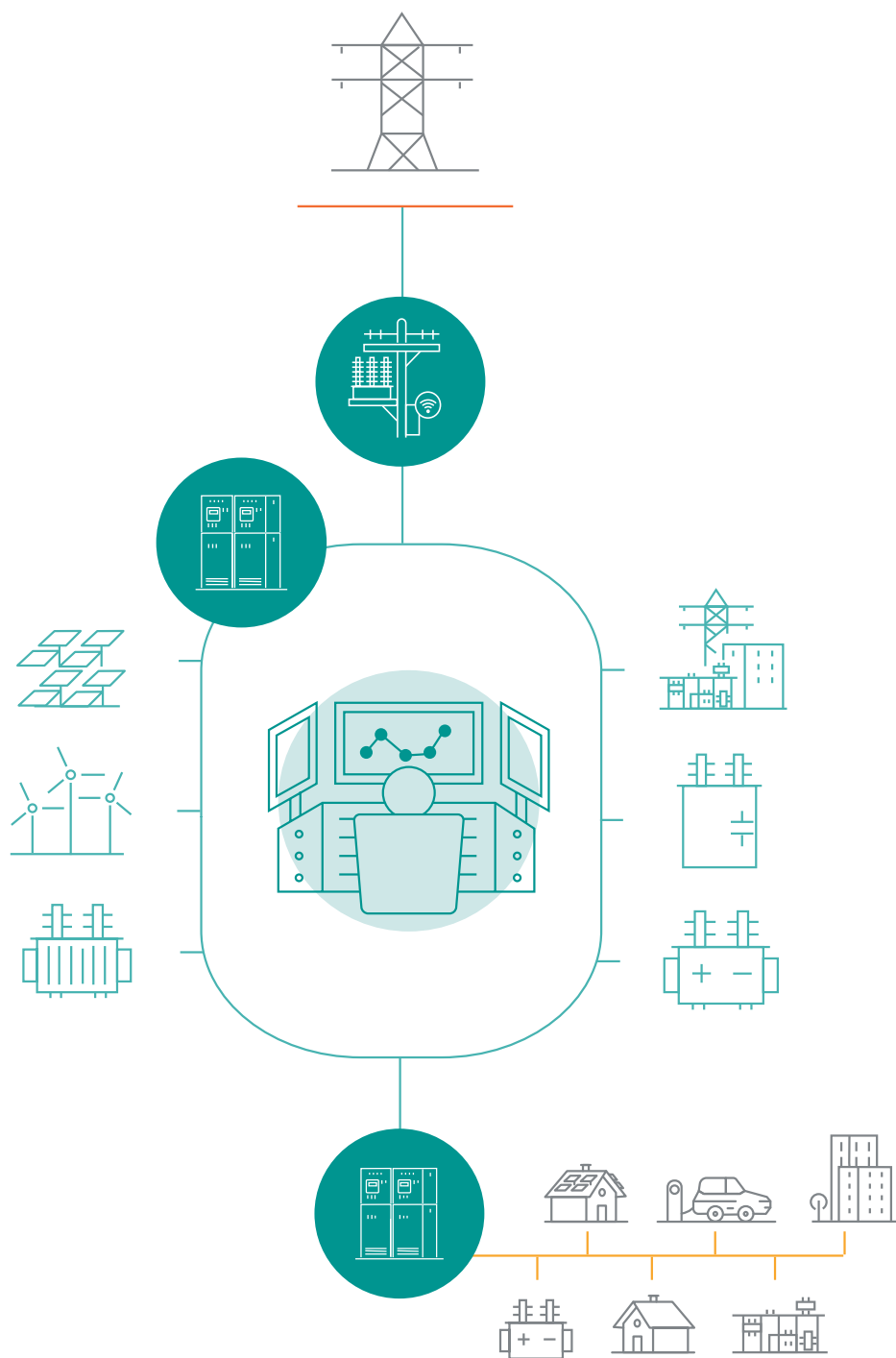
** Only for model with voltage sensors

¹ Only available in the model with VTs

ADDITIONAL FUNCTIONS

CNT	Counters
RTC	Real Time Clock
ALRM	Alarm panel
PGC	Programmable Logic Control
HMI	Human Machine Interface
SER	Sequential Event Recording
DFR	Disturbance Fault Recording
LDP	Load Data Profiling
MET	Metering
STTG	Settings Groups
CMMD	Commands

DISTRIBUTION GRID



SIA-B Standard CT's

OC&EF
DUAL & SELF POWERED
PROTECTION RELAY

PM I SP 0.075 xIn CI Std. CTs /1



FANOX | Overview

Secondary Distribution Protection

RMUS, MRMUS, AND SF6 INSULATED SWITCHGEARS



Transformer



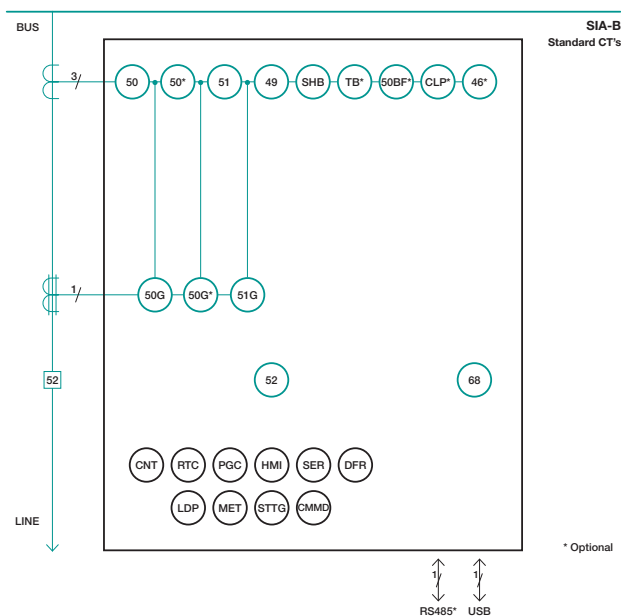
Wind Power



Solar Power

Key Features:

- **Self-powered** via three /1 CTs (<2VA).
- **Auxiliary supply:** 24–230 V AC/DC, USB (with KITCOM) or power bank.
- **Optional internal battery** (20-year lifetime) for commissioning.
- Very low **start-up** currents: **75 mA (3-phase), 160 mA (1-phase).**
- **Metallic enclosure**, high EMC, wide temperature range.
- **Trip test menu** available before system energization.
- Four **configurable LEDs** and **self-diagnostics** (WATCHDOG).
- Front **USB** and optional **RS485** (Modbus RTU/ DNP3.0) communication ports.
- **Trip output** (24 Vdc – 135 mJ), 3 configurable inputs, 3 outputs.
- **Records load data** (168 circular records, configurable intervals).
- Stores 1024 events, 20 fault reports, 10 oscillographic records (COMTRADE format) with internal RTC.
- Oscillography downloadable via SICom software.
- **No external batteries needed**, lower operation Cost.
- **Compact and lightweight**, easy installation and transport.



LEGEND

PM	PROTECTION & MEASUREMENT FUNCTIONS	SP	SELF POWERING LEVEL
I	CURRENT	CI	CURRENT INPUT
V	VOLTAGE	VI	VOLTAGE INPUT
f	FREQUENCY		

50
DFR

ANSI PROTECTION CODES
CONSULT PAGE 6

* Optional

RELAY MODEL SELECTION

SIA-B Standard CT's

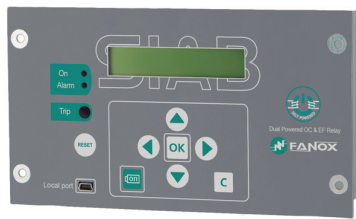
Overcurrent & Earth Fault Protection Relay – Dual & Self-powered

1										PHASE CURRENT MEASUREMENT 1 A
	1									NEUTRAL CURRENT MEASUREMENT 1 A
		0								NET FREQUENCY Defined by General Settings
			A F							POWER SUPPLY Self-powered + Commissioning battery Self-powered + 24-230 Vac/dc (Dual) + Commissioning battery
				C D						ADDITIONAL FUNCTIONS + 49 + SHB + 4 Settings groups + LDP + DFR + 52 + 49 + SHB + 4 Settings groups + LDP + DFR + 52 + 46 + Trip Block + 50_2 + 50G_2 + CLP + 50BF
					0 2					COMMUNICATIONS USB (Modbus RTU) USB (Modbus RTU) + RS485 (Modbus RTU or DNP3.0 Serial)
						3				INPUTS AND OUTPUTS 4 LEDs + Trip (Striker) + 3 Outputs + 3 Inputs
							2 6 7 8			MECHANICAL ASSEMBLY 2: Extended Horizontal Assembly 6: Extended Horizontal Assembly with anticorrosive treatment 7: Extended Horizontal Assembly with red LED for IRF and with barrier block with ring lug current terminals 8: Extended Horizontal Assembly with barrier block with ring lug current terminals
								A B C D F		LANGUAGE English, Spanish and German English, Spanish and Turkish English, Spanish and French English, Spanish and Russian English, French and Dutch
									C U	ADAPTATION 50_1 + 51 + 50G_1 + 51G + PGC 50_1 + 51 + 50G_1 + 51G + PGC + UL certification

Example of ordering code:

1	1	0	F	C	0	3	2	A	C	SIAB110FC032AC
SIA-B										

CI Spec. CTs



KEMA Labs



Solar Power

RELAY MODEL SELECTION

SIA-B Specific CT's

Overcurrent & Earth Fault Protection Relay – Dual & Self-powered

0											PHASE CURRENT MEASUREMENT Defined by General Settings
	0										NEUTRAL CURRENT MEASUREMENT Internal measurement
		0									NET FREQUENCY Defined by General Settings
			0 A 5 F								POWER SUPPLY Self powered Self powered + Commissioning battery Self powered + 24-230 Vac/dc (Dual) Self powered + 24-230 Vac/dc (Dual) + Commissioning battery
				0 1 2 3 B							ADDITIONAL FUNCTIONS - + 49 + SHB + 49 + SHB + Trip block for switch disconnecter + Trip Block for switch disconnecter
					0 1						COMMUNICATIONS USB (Modbus RTU) USB (Modbus RTU) + RS485 (Modbus RTU)
						0 1 2					INPUTS AND OUTPUTS Trip (striker) Trip (striker) + External trip input (49T) + 1 magnetic indicator Trip (striker) + External trip input (49T) + 1 magnetic indicator + 2 outputs
							A B C D E F G H				MECHANICAL ASSEMBLY Vertical Assembly with screw type plug connector Horizontal Assembly with screw type plug connector Vertical Assembly with screw type plug connector and anticorrosive treatment Horizontal Assembly with screw type plug connector and anticorrosive treatment Vertical Assembly with push-in spring plug connector Horizontal Assembly with push-in spring plug connector Vertical Assembly with push-in spring plug connector and anticorrosive treatment Horizontal Assembly with push-in spring plug connector and anticorrosive treatment
								A B C D			LANGUAGE English, Spanish and German English, Spanish and Turkish English, Spanish and French English, Spanish and Russian
									B T		ADAPTATION 50 + 51 + 50N + 51N + fast SOTF + microUSB port 50 + 51 + 50N + 51N + fast SOTF + microUSB port + UL Certification

Example of ordering code:

0	0	0	F	0	0	1	B	D	B	SIA B 0 0 0 F 0 0 1 B D B
SIA-B										

SIA-C

OC&EF
DUAL AND SELF-POWERED
PROTECTION RELAYS

Secondary Distribution Protection RMUS, MRMUS, AND SF6 INSULATED SWITCHGEARS



Transformer



Wind Power



Solar Power

PM I

SP 0.075 xIn

CI Std. CTs /1/5



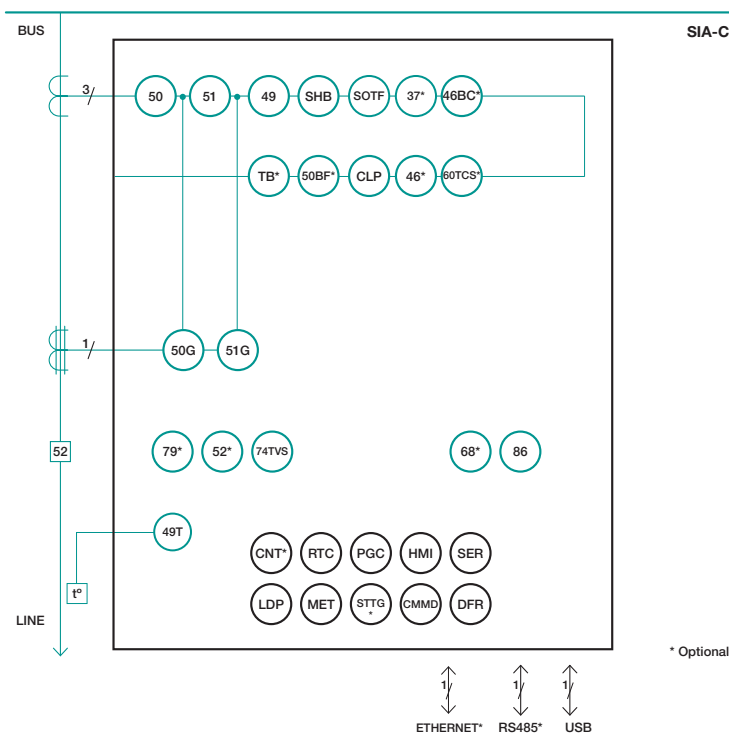
Key Features:

- **Self-powered** via standard CTs (/5 or /1).
- **Universal auxiliary supply: 24–230 V AC/DC**, USB, or power bank.
- **Optional internal battery** (20-year lifetime) for commissioning.
- **Very low start-up levels:** 0.075xIn (3-phase), 0.16xIn (1-phase).
- **Metal enclosure**, high EMC, wide temperature range.
- **Front keypad**, configurable LEDs, and magnetic trip indicator.
- **Self-diagnostics** and **test menu** before energizing.
- **Communication ports:** front USB, optional RS485 and Ethernet.
- **Trip output** for low-power coil (24 Vdc – 135 mJ).
- **I/O options:** up to 7 outputs + 10 inputs.
- **Load Data Profiling:** 168 circular records; sampling interval configurable 1–60 min.
- **Non-volatile RAM** stores up to **1024 event** and disturbance fault recordings (DFR) with internal RTC; multiple COMTRADE/ data recording options with pre/post-fault cycles.
- **Oscillography in COMTRADE**, downloaded via **SiCom**.
- **Withdrawable and fixed versions**, no external batteries needed.
- Eliminates the need for installing and maintaining external batteries, reducing operating costs of the facility.



SELF-POWERED
TECHNOLOGY

KEMA Labs



LEGEND

PM	PROTECTION & MEASUREMENT FUNCTIONS	SP	SELF POWERING LEVEL
CI	CURRENT	CI	CURRENT INPUT
VI	VOLTAGE	VI	VOLTAGE INPUT
FI	FREQUENCY		

50
DFR

ANSI PROTECTION CODES
CONSULT PAGE 6

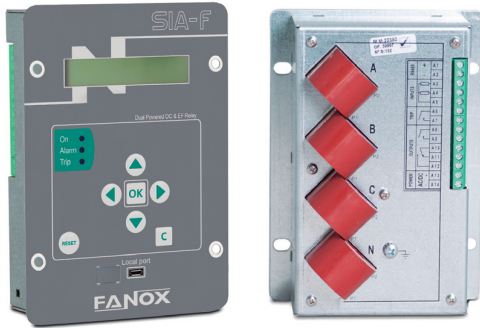
* Optional

1 5										PHASE CURRENT MEASUREMENT 1 A 5 A (Only for mechanics digit G and H)
	0									NEUTRAL CURRENT MEASUREMENT 1 A or 5 A (Only for phase current measurement digit 5)
		0								NET FREQUENCY 50 Hz or 60 Hz (selectable by general settings)
			5 F							POWER SUPPLY Self-powered + 24-230 Vac/dc (Dual) Self-powered + 24-230 Vac/dc (Dual) + Commissioning battery
				0 1 2						ADDITIONAL FUNCTIONS - + 50-2 + 50G-2 + 37 + 46 + 46BC + 50BF + 60CTS + TB + 79 (Only for "inputs and outputs" digit 2 and 3) + 50-2 + 50G-2 + 37 + 46 + 46BC + 50BF + 60CTS + TB (Only for "inputs and outputs" digit 4)
				0 2 3						COMMUNICATIONS 0: USB Port (Modbus RTU) 2: USB Port (Modbus RTU) + Rear Serial Port (Modbus RTU, DNP3.0 or IEC60870-5-103) 3: USB Port (Modbus RTU) + Rear Serial Port (Modbus RTU, DNP3.0 or IEC60870-5-103) + rear Ethernet Port (RJ45) RJ45 (Modbus TCP) (Only for "inputs and outputs" digits 4 and 5)"
					2 3 4					INPUTS AND OUTPUTS 1 Trip output (Striker) + 4 Outputs + 4 Inputs 3 Trip outputs (Striker) + 2 Outputs + 4 Inputs 1 Trip output (Striker) + 7 Outputs + 10 Inputs
						F G H				MECHANICS Withdrawable vertical assembly Non-withdrawable vertical assembly Non-withdrawable front-back welded vertical assembly
							A B			LANGUAGE English, Spanish, French and German English, Spanish, Turkish and Russian
							D			ADAPTATION 50 + 51 + 50G + 51G + SHB + CLP + 49 + 52 + 74TVS + 49T + PGC + SOTF

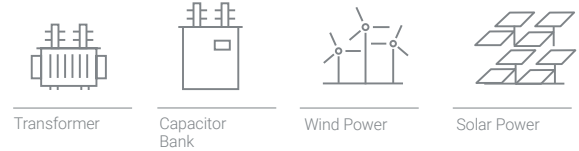
SIA-F

OC&EF
PROTECTION RELAY

PM I CI Std. CTs /1/5

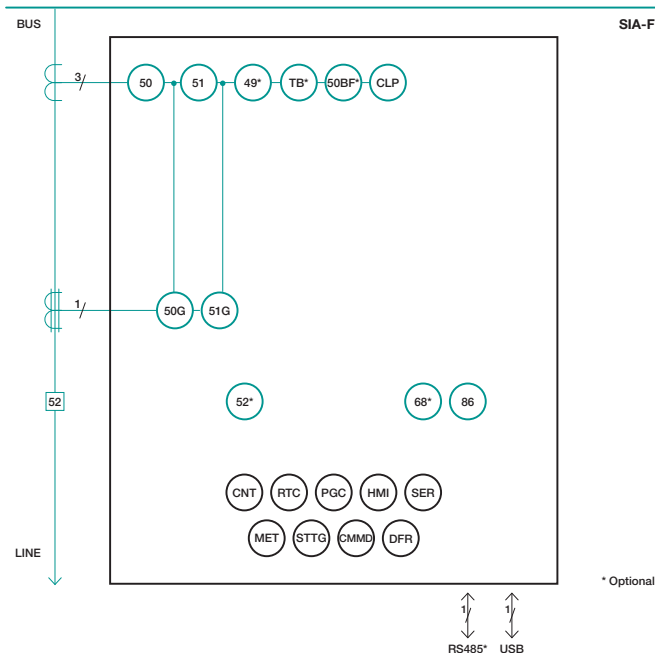


Secondary Distribution Protection



Key Features:

- **Auxiliary power supply** from 24–230 V AC/DC.
- **Four current inputs** for conventional /1 and /5 CTs.
- **Metal housing** with high EMC and wide operating temperature range.
- **Zone selection interlocking (ZSI – 68 function)** available via configurable I/Os and programmable logic.
- **Communication** through front micro-USB and rear serial port with Modbus RTU or DNP3.0 (depending on model).
- **Up to 2 configurable inputs** and **3 configurable outputs** (depending on model).
- **Non-volatile memory** stores up to 200 events, 4 fault reports, and 1 oscillographic record in COMTRADE format.
- **Internal RTC** maintains date and time even without power.
- **Oscillography** downloadable using SiCom software.



LEGEND

PM	PROTECTION & MEASUREMENT FUNCTIONS	SP	SELF POWERING LEVEL
I	CURRENT	CI	CURRENT INPUT
V	VOLTAGE	VI	VOLTAGE INPUT
F	FREQUENCY		
50	ANSI PROTECTION CODES		
DFR	CONSULT PAGE 6		

* Optional

RELAY MODEL SELECTION

SIA-F

Overcurrent & Earth Fault Protection Relay

1 5										PHASE CURRENT MEASUREMENT 1 A 5 A
	1 5 B									NEUTRAL CURRENT MEASUREMENT 1 A 5 A 0.2 A
		0								NET FREQUENCY Defined by General Settings
			C							POWER SUPPLY 24-230 Vdc/ac
				0 1 B C						ADDITIONAL FUNCTIONS - + 49 + 52 + 50BF + Trip block for switch disconnector + Trip block for switch disconnector + 49 + 52 + 50BF
					0 1 2					COMMUNICATIONS USB (Modbus RTU) USB (Modbus RTU) + RS485 (Modbus RTU) USB (Modbus RTU) + RS485 (DNP3.0 Serial)
						0 1				INPUTS AND OUTPUTS Trip Trip + 2 Inputs + 2 outputs
							0			MECHANICAL ASSEMBLY Vertical Assembly
								A B C D		LANGUAGE English, Spanish and German English, Spanish and Turkish English, Spanish and French English, Spanish and Russian
									A	ADAPTATION 50 + 51 + 50G + 51G + 86 + CLP + PGC

Example of ordering code:

1	1	0	C	0	1	1	0	C	A	SIA F 1 1 0 C 0 1 1 0 C A
SIA-F										

SIL-A

OC&EF
FEEDER PROTECTION
RELAY

PM I CI Std. CTs /1 /5 VI Conv. VTs (neutral)



Primary & Secondary Distribution Protection



Feeder



Transformer



Capacitor Bank



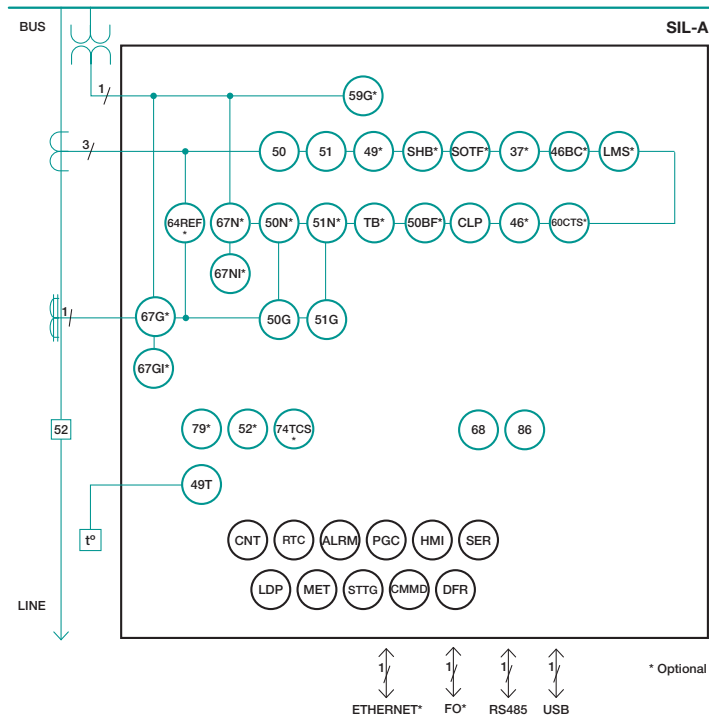
Wind Power



Solar Power

Key Features:

- **Auxiliary supply 24–230 V AC/DC.**
- **4 current channels** for conventional /1 and /5 CTs; optional **1 voltage channel** for conventional VTs.
- **Metal enclosure** with high EMC and wide operating temperature range.
- Signaling/control for **circuit breaker (52)** and **recloser (79)** functions.
- **Front keypad with 7 keys** (including RESET), **4 programmable hotkeys** by default (CB open/close, recloser block/unblock), 2 configurable **control LEDs**, and 6 programmable **alarm LEDs**.
- **Zone Selective Interlocking (ZSI 68)** via configurable I/O and **programmable logic (PGC)**.
- **SOTF function** for fast fault clearing after manual CB closing.
- **Communication:** front micro-USB; rear serial port (IEC60870-5-103, Modbus RTU, DNP3.0 selectable); rear Ethernet RJ45 and FO-LC (Modbus TCP/IP, DNP3.0 TCP/IP, IEC60870-5-104, IEC61850 + SNTP + Web Server).
- **Alarms panel** available.
- **Multiple configurable I/O options** depending on model.
- **Load Data Profiling (LDP):** 744 circular records; sampling interval configurable 1–60 min.
- **Non-volatile RAM** stores up to **2048 events** and disturbance fault recordings (DFR) with internal RTC; multiple COMTRADE/data recording options with pre/post-fault cycles.
- Each **oscillographic record** includes 4 analog and up to 96 configurable digital channels; downloadable via communication port using **SiCom** software in **COMTRADE** format.



LEGEND

PM	PROTECTION & MEASUREMENT FUNCTIONS	SP	SELF POWERING LEVEL
I	CURRENT	CI	CURRENT INPUT
V	VOLTAGE	VI	VOLTAGE INPUT
f	FREQUENCY		
50	ANSI PROTECTION CODES		
DFR	CONSULT PAGE 6		

RELAY MODEL SELECTION

SIL-A

Overcurrent & Earth Fault Protection Relay for Primary & Secondary Distribution

0											PHASE CURRENT MEASUREMENT 1 A or 5 A 1 A (For short-circuitable terminals: Mechanics options 3, 5, 6 and 7)
1											NEUTRAL CURRENT MEASUREMENT 1 A or 5 A 1 A (For short-circuitable terminals: Mechanics options 3, 5, 6 and 7)
	0										NET FREQUENCY Defined by General Settings
	1										POWER SUPPLY 24-230 Vdc / 100-230Vac
		0									ADDITIONAL FUNCTIONS 0: - 2: + 49 + 60CTS + 37 + 46BC + Trip Block (Only for adaptation "B") 4: + SHB + 49 + 46BC (Only for adaptation "C") 5: + 52 + 50BF + Trip Block (Only for adaptation "A") 6: + 60CTS + 37 + 46BC + Trip block (Only for Adaptation "D") 8: + 60CTS + 37 + 46BC + Trip block + (2) 59G + (2) 67G/51G + 67GI + 67NI (Only for Adaptation "D") 9: + 60CTS + 37 + 46BC + Trip block + LMS (Only for Adaptation "D")
			C								COMMUNICATIONS E: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) F: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45) (Modbus TCP, DNP3 TCP or IEC 60870-5-104) + Web Server + SNTP protocol H: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45) (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server + SNTP protocol J: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear FO-LC Port (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server + SNTP protocol
											INPUTS AND OUTPUTS 3 Inputs + 3 Outputs 6 Inputs + 4 Outputs 6 Inputs + 6 Outputs 5 Inputs + 7 Outputs 9 Inputs + 5 Outputs 5 Inputs + 6 Outputs
											MECHANICAL ASSEMBLY 2: Vertical Assembly 3: Vertical Assembly and short-circuitable current terminals 4: Vertical Assembly with anticorrosive treatment 5: Vertical Assembly with anticorrosive treatment and short-circuitable current terminals 6: Vertical Withdrawable Assembly and short-circuitable current terminals 7: Vertical Withdrawable Assembly with anticorrosive treatment and short-circuitable current terminals R: Vertical Assembly + UL certification T: Vertical Assembly with anticorrosive treatment + UL certification
											LANGUAGE English, Spanish, German and French English, Spanish, Turkish and Russian English, Spanish, German and Portuguese
											ADAPTATION A: Default Functions: 50 + 50G + 51 + 51G + CLP + SHB + 49 + 86 + 49T B: Default functions: (2) 50 + (2) 50G + 51 + 51G + CLP + SHB + 46 + 52 + 50BF + 79 + 74TCS + 86 + 49T C: Default functions: 50 + 50G + 51 + 51G + CLP + 46 + 52 + 79 + 74TCS + 86 + 49T D: Default functions: (2) 50 + (2) 50N + (2) 50G + (2) 51 + (2) 51N + (2) 51G + SOTF + 64REF + CLP + SHB + 49 + 46 + 52 + 50BF + 79 + 74TCS + 86 + 49T

Example of ordering code:

0	0	0	C	6	F	2	2	A	D	SIL A 0 0 0 C 6 F 2 2 A D
SIL-A										

(*) ANSI 67G can be converted into ANSI 51G by setting the "Directionality" parameter to NO.

SIL-G

LINE, FEEDER & GENERATOR
PROTECTION RELAY

PM I V f

CI Std. CTs /1/5

VI Conv. VTs



Primary & Secondary Distribution Protection



Feeder



Capacitor Bank



Arc Flash



Wind Power



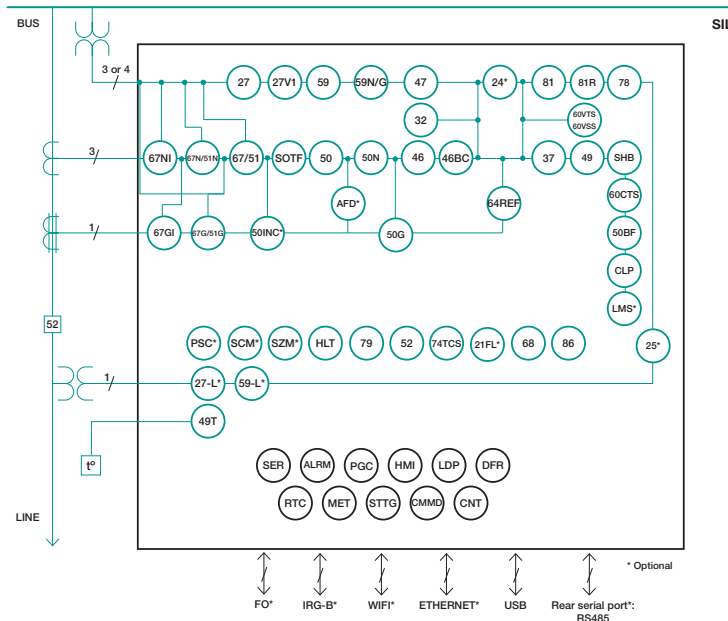
Solar Power



Grid Interconnection

Key Features:

- **Auxiliary power supply from 24–230 V AC/DC.**
- **4 current inputs** for /1 and /5 CTs and **5 voltage inputs** for conventional VTs.
- **Measures up to 1,000 V** when connected directly to low voltage lines.
- **Metal housing** with high EMC and wide operating temperature range.
- **Protection against decoupling, load shedding, and Loss of Main (islanding)** using voltage, frequency, and ROCOF methods.
- Controls and signals **circuit breaker (52) and recloser (79)** functions.
- **Front keypad** with **7 navigation keys**, **6 programmable hot keys** for CB and recloser control, plus 3 configurable control LEDs and 8 programmable **alarm LEDs**.
- Includes **SOTF function** for fast fault clearing after manual CB closing.
- **Communication via front micro-USB and rear ports** supporting Modbus RTU, DNP3.0, IEC60870-5-103, Ethernet with Modbus TCP/IP, DNP3.0 TCP/IP, IEC60870-5-104, IEC61850, SNTP, and Web Server.
- Optional **wireless (Wi-Fi) communication** and **IRIG-B** synchronization.
- Available **alarms panel**.
- **Configurable I/O options:** 8 inputs + 7 outputs or 11 inputs + 5 outputs, depending on model.
- **Load Data Profiling (LDP)** with **2160 circular records**; configurable sampling intervals (1–60 min).
- **Non-volatile RAM** stores up to **3072 events** and disturbance fault records with internal RTC for date/time.
- Multiple **oscillographic recording** options in COMTRADE format with up to 10 analog and 96 digital channels.
- **Oscillography** downloadable via communication port using SiCom software.



Example with VTs. Voltage sensors are available depending on model.

SIL-G

0									PHASE CURRENT MEASUREMENT 1 A or 5 A
	0 1								NEUTRAL CURRENT MEASUREMENT 1 A or 5 A 1 A or 0.1 A
		0 1 2 3 4							VOLTAGE MEASUREMENT Up to 1000 V (direct connection) or 250 V (with VTs) 8 Vrms LEA maximum, 1 MOhm 5.2 Vrms LEA maximum, 2 MOhm 16 Vrms LEA maximum, 2 MOhm 2.8 Vrms LEA maximum, 20 MOhm
			A B C						POWER SUPPLY 24-48 Vdc 48-230 Vac/dc 24-230 Vac/dc
				0 1 2 3 4					ADDITIONAL FUNCTIONS - +25 + 27-L + 59-L + LMS ¹ + 21FL ³ + 50INC ³ + 21FL ³ + 50INC ³ + LMS
					A B E G O P Q R				COMMUNICATIONS A: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) B: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45)(Modbus TCP or DNP3.0 TCP or IEC60870-5-104) + Web Server + SNTP Protocol + IRIG-B E: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + PRP – (*) SFP Cage (IEC61850, Modbus TCP, DNP3.0 TCP or IEC60870-5-104) + Web Server + SNTP Protocol + IRIG-B G: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45)(Modbus TCP, DNP3.0 TCP or IEC60870-5-104) + Web Server + SNTP Protocol + IRIG-B O: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45)(Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server + SNTP Protocol + IRIG-B P: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45)(Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server + SNTP Protocol + IRIG-B Q: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (FO-LC)(Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server + SNTP Protocol + IRIG-B R: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (FO-LC)(Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server + SNTP Protocol + IRIG-B
				0 5 6 7 A B					INPUTS AND OUTPUTS 8 Inputs + 7 Outputs 24 Inputs + 7 Outputs 8 Inputs + 18 Outputs 16 Inputs + 11 Outputs 8 Inputs + 7 Outputs + 4 AFD Inputs + 4 High-speed Outputs 8 Inputs + 7 Outputs + 4 AFD Inputs + 4 High-speed Outputs with high breaking capacity at 24-48Vdc ³
					4 5				MECHANICAL ASSEMBLY Vertical Assembly Vertical Assembly with tropicalization
						A E F			LANGUAGE English, Spanish, German and French English, Spanish, Turkish and Russian English, Spanish, German and Portuguese
							B		ADAPTATION (2) 50 + SOTF + 50G + 50N + (4) 67/51 + (2) 67G/51G + (2) 67N/51N + 67GI + 67NI + 64REF + 46 + 46BC + 49 + 49T + 37 + (2) 27+ 27V1 + (2) 59 + (2) 59N/G ¹ + 47 + (4) 32 + (4) 81U/O_ ₆ 81U/O ² + (4) 81R_ ₂ 81R ² + 78 + (2) 24 ¹ + 79 + 74TCS + 60CTS + 60VTS/VSS ² + 50BF + SHB + CLP + 52 + 86 + SCM ² + SZM ² + HLT + Power Supply Control ²

0	0	0	C	1	F	0	4	A	B	SILG000C1F04AB
SIL-G										

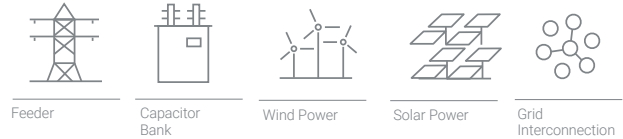
- » ANSI 67, ANSI 67G and ANSI 67N can be converted into ANSI 51, ANSI 51G and ANSI 51N respectively by setting the “Directionality” parameter to NO.
- » ANSI 50G, ANSI 67G and ANSI 67Gi will be converted into ANSI 50GS, ANSI 67GS and ANSI 67GSI in the model with neutral current measurement digit 1 (IN = 0.1A or 1A).
- » Not all combinations are possible. Please, confirm with Fanox chosen model.
- » ¹ Available in models with conventional VTs (50G not available for voltage sensors).
- » ² Only for the models with voltage sensors (“voltage measurements” digits 1, 2, 3, 4). Available from fw version 1.21.00 onwards.
- » ³ Available from FW version 1.21.00 onwards for models with voltage sensors and from 3.00.00 onwards for models with conventional CTs.

FANOX | Overview

SIL-C

LINE, FEEDER & GENERATOR
PROTECTION RELAY

Primary & Secondary Distribution Protection



PM I V f CI Std. CTs /1/5 VI Conv. VTs

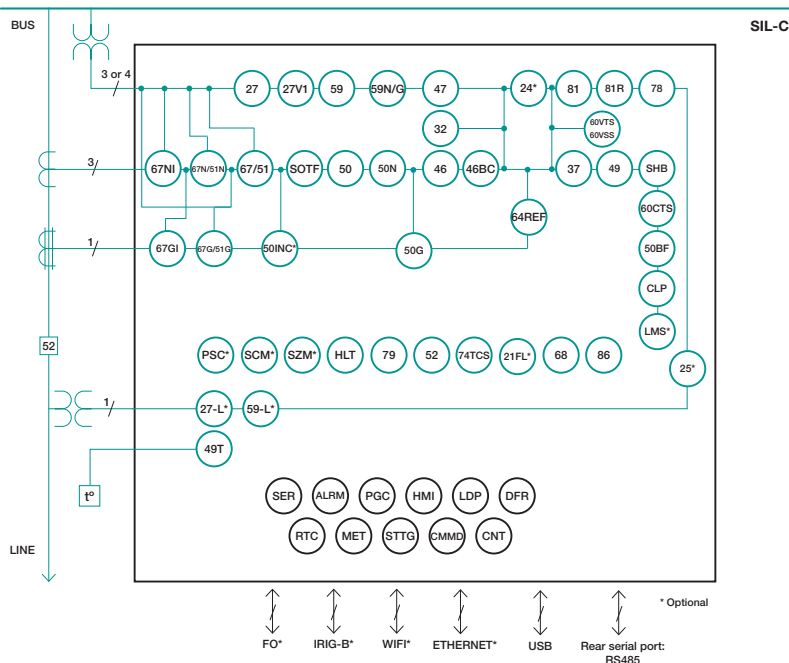
Key Features:

- **Auxiliary power supply from 24–230 V AC/DC.**
- **4 current inputs** for /1 and /5 CTs and **5 voltage inputs** for conventional VTs.
- **Measures up to 1,000 V** when connected directly to low voltage lines.
- **Metal housing** with high EMC and wide operating temperature range.
- **Protection against decoupling, load shedding, and Loss of Main (islanding)** using voltage, frequency, and ROCOF methods.
- Controls and signals **circuit breaker (52)** and **recloser (79)** functions.
- **Front keypad** with **7 navigation keys**, **6 programmable hot keys** for CB and recloser control, plus 3 configurable control LEDs and 8 programmable **alarm LEDs**.
- Includes **SOTF function** for fast fault clearing after manual CB closing.
- **Communication via front micro-USB and rear ports** supporting Modbus RTU, DNP3.0, IEC60870-5-103, Ethernet with Modbus TCP/IP, DNP3.0 TCP/IP, IEC60870-5-104, IEC61850, SNTP, and Web Server.
- Optional **wireless (Wi-Fi) communication** and **IRIG-B** synchronization.
- Available **alarms panel**.
- **Configurable I/O options:** 8 inputs + 7 outputs or 11 inputs + 5 outputs, depending on model.
- **Load Data Profiling (LDP)** with **2160 circular records**; configurable sampling intervals (1–60 min).
- **Non-volatile RAM** stores up to **3072 events** and disturbance fault records with internal RTC for date/time.
- Multiple **oscillographic recording** options in COMTRADE format with up to 10 analog and 96 digital channels.
- **Oscillography** downloadable via communication port using SiCom software.



KEMA Labs

G99
Compliant



LEGEND

PM	PROTECTION & MEASUREMENT FUNCTIONS	SP	SELF POWERING LEVEL
I	CURRENT	CI	CURRENT INPUT
V	VOLTAGE	VI	VOLTAGE INPUT
f	FREQUENCY		
50	ANSI PROTECTION CODES		
DFR	CONSULT PAGE 6		

RELAY MODEL SELECTION

SIL-C

Feeder & Generator Protection Relay

0										PHASE CURRENT MEASUREMENT 1 A or 5 A
	0 1									NEUTRAL CURRENT MEASUREMENT 1 A or 5 A 1 A or 0.1 A
		0 1 2 3 4								VOLTAGE MEASUREMENT Up to 1000 V (direct connection) or 250 V (with VTs) 8 Vrms LEA maximum, 1 MOhm 5.2 Vrms LEA maximum, 2 MOhm 16 Vrms LEA maximum, 2 MOhm 2.8 Vrms LEA maximum, 20 MOhm
			C							POWER SUPPLY 24-230 Vac/dc
				0 1 2 3 4						ADDITIONAL FUNCTIONS - +25 + 27-L + 59-L + LMS ¹ + 21FL ³ + 50INC ³ + 21FL ³ + 50INC ³ + LMS
					A B G O P Q R					COMMUNICATIONS A: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) B: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45)(Modbus TCP or DNP3.0 TCP or IEC60870-5-104) + Web Server + SNTP Protocol + IRIG-B G: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45)(Modbus TCP, DNP3.0 TCP or IEC60870-5-104) + Web Server + SNTP Protocol + IRIG-B O: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45)(Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server + SNTP Protocol + IRIG-B P: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45)(Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server + SNTP Protocol + IRIG-B Q: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (FO-LC)(Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server + SNTP Protocol + IRIG-B R: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (FO-LC)(Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server + SNTP Protocol + IRIG-B
						0 1				INPUTS AND OUTPUTS 8 Inputs + 7 Outputs 11 Inputs + 5 Outputs
							C D E F			MECHANICAL ASSEMBLY Vertical Assembly Horizontal Assembly Vertical Assembly with anticorrosive treatment Horizontal Assembly with anticorrosive treatment
								A E F		LANGUAGE English, Spanish, German and French English, Spanish, Turkish and Russian English, Spanish, German and Portuguese
									B	ADAPTATION (2) 50 + SOTF + 50G + 50N + (4) 67/51 + (2) 67G/51G + (2) 67N/51N + 67GI + 67NI + 64REF + 46 + 46BC + 49 + 49T + 37 + (2) 27+ 27V1 + (2) 59 + (2) 59N/ G ¹ + 47 + (4) 32 + (4) 81U/O ² + (4) 81R ₂ + 78 + (2) 24 ¹ + 79 + 74TCS + 60CTS + 60VTS/VSS ² + 50BF + SHB + CLP + 52 + 86 + SCM ² + SZM ² + HLT + Power Supply Control ²

Example of ordering code:

0	0	0	C	0	A	1	C	A	B	SIL C 0 0 0 C 0 A 1 C A B
SIL-C										

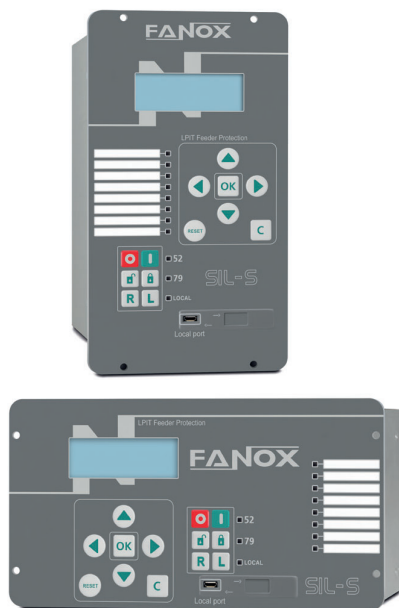
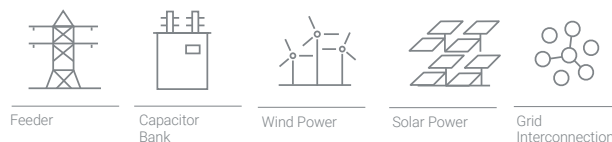
NOTES:

- » ANSI 67, ANSI 67G and ANSI 67N can be converted into ANSI 51, ANSI 51G and ANSI 51N respectively by setting the "Directionality" parameter to NO.
- » ANSI 50G, ANSI 67G and ANSI 67GI will be converted into ANSI 50GS, ANSI 67GS and ANSI 67GSI in the model with neutral current measurement digit 1 (IN = 0.1A or 1A).
- » ¹ Available in models with conventional VTs (50G not available for voltage sensors).
- » ² Only for the models with voltage sensors ("voltage measurements" digits 1, 2, 3, 4). Available from fw version 1.21.00 onwards.
- » ³ Available from FW version 1.21.00 onwards for models with voltage sensors and from 3.00.00 onwards for models with conventional CTs.

Not all combinations are possible. Please, confirm with Fanox chosen model.

FEEDER PROTECTION RELAY WITH CURRENT & VOLTAGE SENSORS

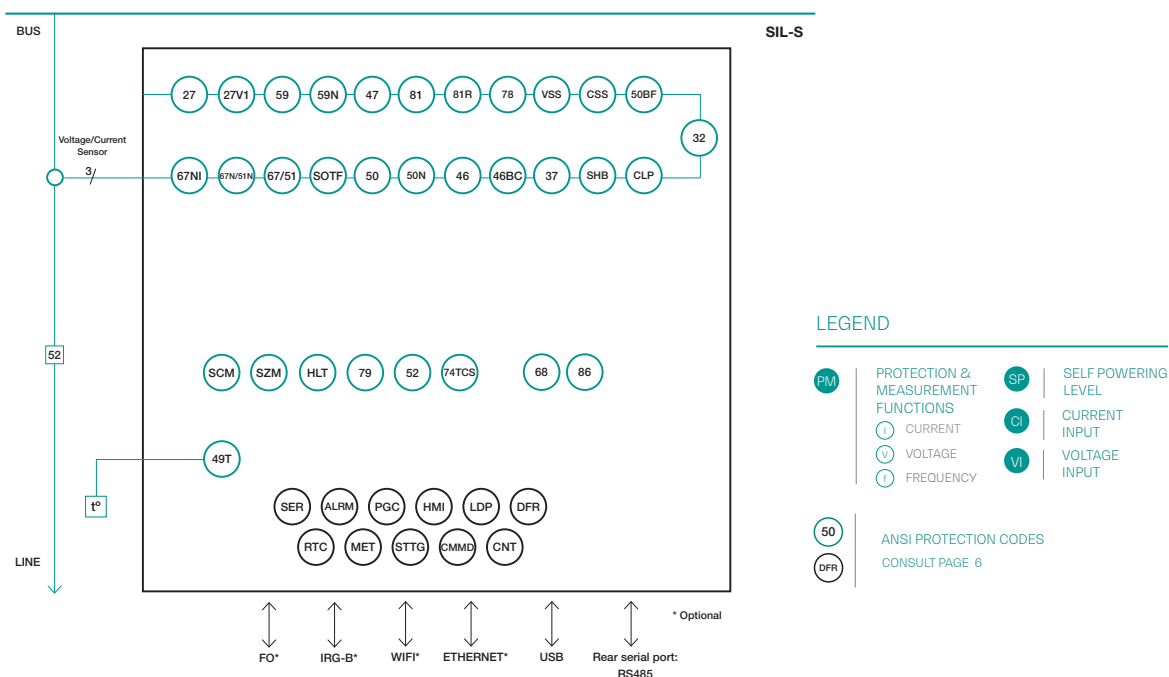
Primary & Secondary Distribution Protection



KEMA Labs

Key Features:

- With **current, voltage and frequency functions**.
- For **primary/secondary distribution, LPIT tech** (Low Power Instrument Transformers).
- **Auxiliary supply 24–230 V DC/AC**.
- **3 combined current/voltage channels** for LPCT, Rogowski, capacitive/resistive sensors.
- **Metal enclosure** with high EMC and wide operating temperature range.
- Decoupling protection, load shedding, islanding via voltage, frequency, ROCOF.
- **Circuit breaker (52) and recloser (79)** signaling/control.
- **SOTF function** for fast fault clearing on manual breaker close.
- **Communication:** front micro-USB; rear RS485 (Modbus RTU, DNP3.0, IEC60870-5-103); Ethernet (Modbus TCP/IP, DNP3.0 TCP/IP, IEC60870-5-104, IEC61850); SNTP, Web Server.
- Optional **IRIG-B synchronization**.
- **Configurable I/O:** 8 inputs + 7 outputs or 11 inputs + 5 outputs.
- **Load Data Profiling:** 2160 circular records; sampling 1–60 min configurable.
- **Alarms panel** available.
- **Non-volatile RAM:** 3072 events & DFR; internal RTC; multiple pre/post-fault recording options in data and COMTRADE formats.
- Oscillography: 10 analogue + up to 96 digital channels; **downloadable via SiCom software in COMTRADE format**.

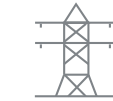


(*) ANSI 67 and ANSI 67N can be converted into ANSI 51 and ANSI 51N respectively by setting the “Directionality” parameter to NO.

SIU-C

VOLTAGE & FREQUENCY
PROTECTION RELAY

Primary & Secondary Distribution Protection



Feeder



Capacitor
Bank



Grid
Interconnection

PM I V f CI Current sensors VI Voltage sensors

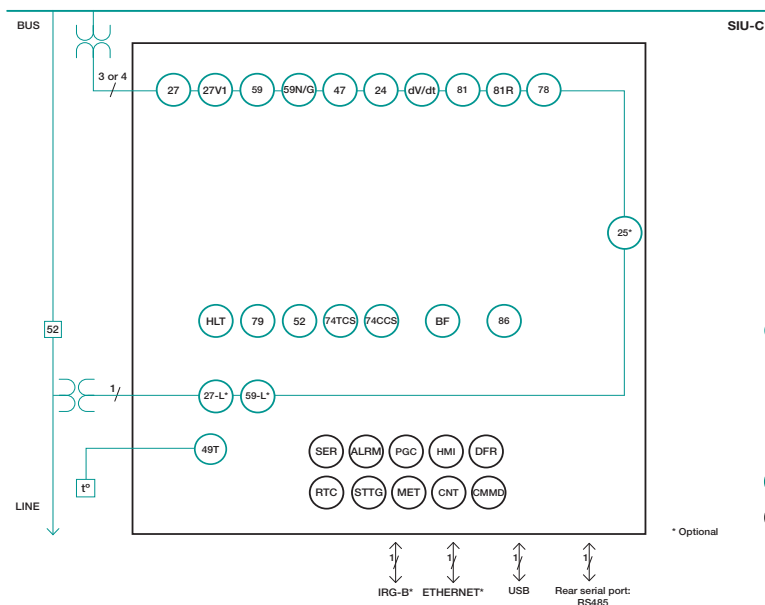
Key Features:

- **Voltage and frequency** protection relay.
- For transformers and electrical machines in **HV, MV, and LV** systems.
- **Auxiliary supply 24–230 V DC/AC.**
- **5 voltage channels** for conventional VTs; measures **up to 1,000 V** direct on LV line.
- **Metallic housing** with high EMC and wide operating temperature range.
- Protection against **decoupling, load shedding, and Loss of Main (islanding)** via voltage, frequency, and **ROCOF** method.
- **Circuit breaker (52)** and **recloser (79)** signaling/control.
- **Front navigation keypad:** 7 keys (including RESET), 6 programmable hot keys for CB control, recloser block/unblock, local/remote mode; 3 configurable control LEDs; 8 programmable alarm LEDs.
- **Communication:** front micro-USB; rear serial port (IEC60870-5-103, Modbus RTU, DNP3.0 selectable); rear Ethernet port (Modbus TCP/IP, DNP3.0 TCP/IP, IEC60870-5-104, IEC61850 selectable) + SNTP + Web Server.
- Optional **Wi-Fi** and **IRIG-B synchronization**.
- **Configurable I/O:** 8 inputs + 7 outputs or 11 inputs + 5 outputs (model dependent).
- **Non-volatile RAM** stores up to 3072 events and DFR; internal RTC; configurable pre/post-fault recording options (5, 25, 50, 100 records) in data and COMTRADE formats.
- **Oscillography:** 9 analogue + up to 96 digital channels; **downloadable via SICom software in COMTRADE format.**



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LEGEND

PM	PROTECTION & MEASUREMENT FUNCTIONS	SP	SELF POWERING LEVEL
I	CURRENT	CI	CURRENT INPUT
V	VOLTAGE	VI	VOLTAGE INPUT
f	FREQUENCY		
50	ANSI PROTECTION CODES		
DFR	CONSULT PAGE 6		

* Optional

RELAY MODEL SELECTION

SIU-C

Voltage & Frequency Protection Relay

0											PHASE MEASUREMENT Up to 1000 V (direct connection) or 250 V (with VTs)
	0										NEUTRAL MEASUREMENT Defined by General Settings
		0									NET FREQUENCY Defined by General Settings
			C								POWER SUPPLY 24-230 Vac/dc
				0 1							ADDITIONAL FUNCTIONS - + 25 + 27-L + 59-L
					A B G O P Q R						COMMUNICATIONS A: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) B: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45) (Modbus TCP or DNP3.0 TCP or IEC60870-5-104) + Web Server + SNTP Protocol + IIRIG-B G: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45) (Modbus TCP, DNP3.0 TCP or IEC60870-5-104) + Web Server SNTP Protocol + IIRIG-B O: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45) (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B P: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45) (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B Q: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (FO-LC) (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B R: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (FO-LC) (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B
						0 1					INPUTS AND OUTPUTS 8 Inputs + 7 Outputs 11 Inputs + 5 Outputs
							C D E F				MECHANICAL ASSEMBLY Vertical Assembly Horizontal Assembly Vertical Assembly with anticorrosive treatment Horizontal Assembly with anticorrosive treatment
								A E F			LANGUAGE English, Spanish, German and French English, Spanish, Turkish and Russian English, Spanish, German and Portuguese
									B		ADAPTATION (4) 27 + (2) 27V1 + (4) 59 + (3) 59N/G + (2) 47 + (2) dV/dt + (8) 81U/O + (6) 81R + (2) 78 + (2) 24 + 74TCS + 74CCS + BF + 52 + 79 + 86 + 49T + HLT

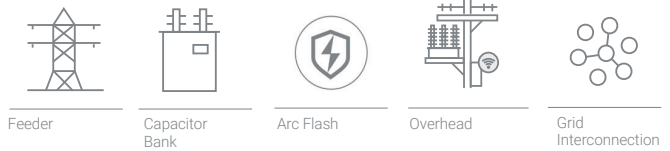
Example of ordering code:

0	0	0	C	1	A	1	D	A	B	SIU-C 0 0 0 C 1 A 1 D A B
SIU-C										

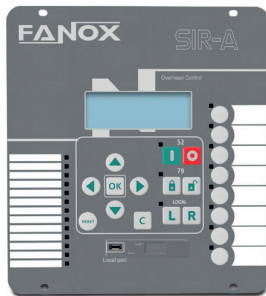
SIR-A

RECLOSER CONTROL & FEEDER PROTECTION RELAY

Primary & Secondary Distribution Protection



PM I V f Cl Std. CTs /1/5 VI Voltage sensors

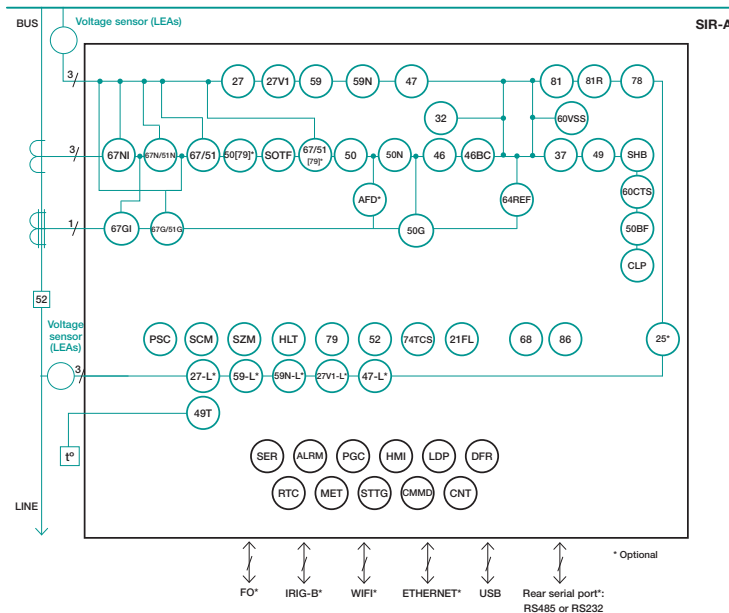


Key Features:

- **Overhead control** and **feeder protection** relay.
- With **current, voltage, and frequency** functions.
- **Auxiliary power supply:** 24–230 Vdc/ac, 48–230 Vdc/ac, or 24–48 Vdc (depending on model).
- **4 current channels** (/1 and /5 CTs) and **6 voltage channels** (capacitive and resistive LPVTs).
- **Metal housing** with high EMC and wide operating temperature range.
- Protection against **decoupling, load shedding, and Loss of Main** (ROCOF-based).
- **Circuit breaker** (52) and **recloser** (79) control and signaling.
- **Front keypad** with 7 navigation keys, 6 hotkeys, configurable LEDs (depending on model).
- **Arc Flash Detection** (4 AFD inputs + 4 high-speed outputs, depending on model).
- **SOTF function** for fast fault clearing on manual CB closing.
- **Communication:** Front micro-USB; Rear serial: Modbus RTU, DNP3.0 Serial, IEC60870-5-103; Rear Ethernet (RJ45/FO-LC): Modbus TCP/IP, DNP3.0 TCP/IP, IEC60870-5-104, IEC61850, SNTP, Web Server.
- Optional **Wi-Fi** and **IRIG-B synchronization**.
- **Alarms panel** available.
- **Multiple configurable I/O combinations** depending on model.
- **Load Data Profiling (LDP):** 2160 records, circular, 1–60 min sampling interval.
- **Non-volatile RAM** stores up to 3072 events and DFR with internal RTC, COMTRADE format (pre/post-fault configurable).
- **Oscillography:** Each DFR record 10 analogue + up to 96 digital channels, downloadable via SICom software.



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LEGEND

PM	PROTECTION & MEASUREMENT FUNCTIONS	SP	SELF POWERING LEVEL
I	CURRENT	Cl	CURRENT INPUT
V	VOLTAGE	VI	VOLTAGE INPUT
f	FREQUENCY		

50 ANSI PROTECTION CODES
DFR CONSULT PAGE 6

RELAY MODEL SELECTION

SIR-A

Feeder Protection & Recloser Control

0										PHASE CURRENT MEASUREMENT 1 A or 5 A
	0 1									NEUTRAL CURRENT MEASUREMENT 1 A or 5 A 1 A or 0.1 A
		1 2 3 4								VOLTAGE MEASUREMENT 8 Vrms LEA maximum, 1 MOhm 5.2 Vrms LEA maximum, 2 MOhm 16 Vrms LEA maximum, 2 MOhm 2.8 Vrms LEA maximum, 20 MOhm
			A B C							POWER SUPPLY 24-48 Vdc (Only for Adaptation B) 48-230 Vac/dc (Only for Adaptation B) 24-230 Vdc/Vac
				0 1 2 3 4 5 6						ADDITIONAL FUNCTIONS + (1) 50 + (3) 67/51 + (1) 50 + (3) 67/51 + LMS + (1) 50 + (3) 67/51 + 25 + 27-L + 59-L + 47-L + 27V1-L + 59N-L + 50P79 + 67P79 + 50P79 + 67P79 + 25 + 27-L + 59-L + 47-L + 27V1-L + 59N-L + (1) 50 + (3) 67/51 + 50INC + (1) 50 + (3) 67/51 + 50INC + LMS
					A B G O P Q R					COMMUNICATIONS A: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) (Only for Adaptation B) B: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45)(Modbus TCP or DNP3.0 TCP or IEC60870-5-104) + Web Server + SNTP Protocol + IIRIG-B G: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45)(Modbus TCP, DNP3.0 TCP or IEC60870-5-104) + Web Server SNTP Protocol + IIRIG-B O: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45)(Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B (Only for Adaptation B) P: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (RJ45) (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B (Only for Adaptation B) Q: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (FO-LC)(Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B (Only for Adaptation B) R: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + Rear Ethernet Port (FO-LC) (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B (Only for Adaptation B)
						0 5 6 7 A				INPUTS AND OUTPUTS 8 Inputs + 7 Outputs (Only for adaptation digit B) 24 Inputs + 7 Outputs (Only for adaptation digit B) 8 Inputs + 18 Outputs (Only for adaptation digit B) 16 Inputs + 11 Outputs 8 Inputs + 7 Outputs + 4 AFD Inputs + 4 High-speed Outputs (Only for adaptation digit B)
							4 5 6 7			MECHANICAL ASSEMBLY Vertical Assembly (Only for adaptation digit B) Vertical Assembly with tropicalization (Only for adaptation digit B) Advanced Vertical Assembly (Only for adaptation digit C) Advanced Vertical Assembly with tropicalization (Only for adaptation digit C)
								A E F		LANGUAGE English, Spanish, German and French English, Spanish, Turkish and Russian English, Spanish, German and Portuguese
									B C	ADAPTATION B: 50 + SOTF + 50G + 50N + 67/51 + (2) 67G/51G + (2) 67N/51N + 67GI + 67NI + 64REF + 46 + 46BC + 49 + 49T + 37 + (2) 27 + 27V1 + (2) 59 + (2) 59N + 47 + (4) 32 + (6) 81U/O + (2) 81R + 78 + 79 + 74TCS + 60CTS + 60VSS + 50BF + SHB + CLP + 52 + 86 + SCM+ SZM + HLT + 21FL + Power Supply Control + Power Flow C: 50 + SOTF + 50G + 50N + 67/51 + (2) 67G/51G + (2) 67N/51N + 67GI + 67NI + 64REF + 46 + 46BC + 49 + 49T + 37 + (2) 27 + 27V1 + (2) 59 + (2) 59N + 47 + (4) 32 + (6) 81U/O + (2) 81R + 78 + 79 + 74TCS + 60CTS + 60VSS + 50BF + SHB + CLP + 52 + 86 + SCM+ SZM + HLT + 21FL + Power Supply Control

Example of ordering code:

0	0	1	B	2	C	0	4	A	B	SIR A 0 0 1 B 2 C 0 4 A B
SIR-A										

NOTES:

- » ANSI 67, ANSI 67G and ANSI 67N can be converted into ANSI 51, ANSI 51G and ANSI 51N respectively by setting the "Directionality" parameter to NO.
- » ANSI 50G, ANSI 67G and ANSI 67GI will be converted into ANSI 50GS, ANSI 67GS and ANSI 67GSI in the model with neutral current measurement digit 1 (IN = 0.1A or 1A)
- » Not all combinations are possible. Please, confirm with Fanox the chosen model.
- » Communication digit A is not available for the model with 16 Inputs and 11 Outputs (Inputs and Outputs digit 7).

SIR-C

OVERHEAD CONTROL & FEEDER PROTECTION RELAY

Primary & Secondary Distribution Protection



Feeder



Capacitor Bank



Overhead



Grid Interconnection

PM I V f CI Std. CTs /1 /5 VI Voltage sensors

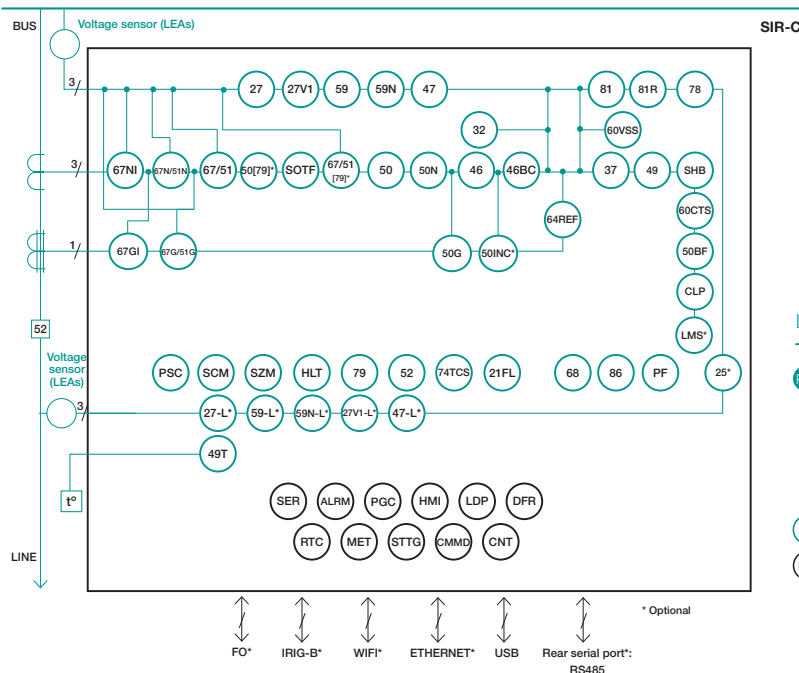
Key Features:

- **Overhead control and feeder protection** relay with **compact size**.
- With **current, voltage, and frequency** functions for primary and secondary distribution.
- **Auxiliary power supply: 24-230 Vdc/ac**.
- 4 **current channels** for /1 and /5 CTs and 6 **voltage channels** for LEA sensors.
- **Metal housing** with high EMC level and wide operating temperature range.
- Protection against **decoupling, load shedding, and Loss of Main** (ROCOF-based).
- **Circuit breaker (52)** and **recloser (79)** control and signaling.
- **Front navigation keypad**: 7 keys (including RESET), 6 programmable hot keys (CB open/close, recloser block/unblock, local/remote mode), 3 configurable control LEDs, and 8 programmable alarm LEDs.
- **SOTF function** for fast fault clearing after manual CB closing.
- **Communication**: Front local micro-USB port; Rear communication options: Serial (Modbus RTU, DNP3.0 Serial, IEC60870-5-103) and Ethernet (RJ45 or FO-LC) with Modbus TCP/IP, DNP3.0 TCP/IP, IEC60870-5-104, IEC61850 + SNTP + Web Server.
- Optional **Wi-Fi** and **IRIG-B synchronization**.
- **Alarms panel** available.
- **Multiple configurable I/O combinations** depending on model.
- **Load Data Profiling (LDP)** with 2160 records in circular mode and configurable sampling rate (1-60 min) through communications.
- **Non-volatile RAM** stores up to 3072 events and DFR with internal RTC, 5/25/50/100 records in COMTRADE format (300/60/30/15 cycles).
- **Oscillography**: Each record with 10 analog and up to 96 configurable digital channels, downloadable via **SICOM** software.



KEMA Labs

G99 Compliant



LEGEND

PM	PROTECTION & MEASUREMENT FUNCTIONS	SP	SELF POWERING LEVEL
I	CURRENT	CI	CURRENT INPUT
V	VOLTAGE	VI	VOLTAGE INPUT
f	FREQUENCY		

50 ANSI PROTECTION CODES
DFR CONSULT PAGE 6

RELAY MODEL SELECTION

SIR-C

Feeder & Recloser Control									
0									PHASE CURRENT MEASUREMENT 1 A or 5 A
	0 1								NEUTRAL CURRENT MEASUREMENT 1 A or 5 A 1 A or 0.1 A
		1 2 3 4							VOLTAGE MEASUREMENT 8 Vrms LEA maximum, 1 MOhm 5.2 Vrms LEA maximum, 2 MOhms 16 Vrms LEA maximum, 2 MOhms 2.8 Vrms LEA maximum, 20 MOhms
			C						POWER SUPPLY 24-230 Vdc/Vac
				0 1 2 3 4 5 6					ADDITIONAL FUNCTIONS + (1) 50 + (3) 67/51 + (1) 50 + (3) 67/51 + LMS + (1) 50 + (3) 67/51 + 25 + 27-L + 59-L + 47-L + 27V1-L + 59N-L + 50[79] + 67[79] + 50[79] + 67[79] + 25 + 27-L + 59-L + 47-L + 27V1-L + 59N-L + (1) 50 + (3) 67/51 + 50INC + (1) 50 + (3) 67/51 + 50INC + LMS
					A B G O P Q R				COMMUNICATIONS A: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) B: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + RJ45 (Modbus TCP or DNP3.0 TCP or IEC60870-5-104) + Web Server + SNTP Protocol + IIRIG-B G: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + RJ45 (Modbus TCP, DNP3.0 TCP or IEC60870-5-104) + Web Server SNTP Protocol + IIRIG-B O: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + RJ45 (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B P: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + RJ45 (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B Q: USB (Modbus RTU) + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + FO-LC (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B R: USB (Modbus RTU) + WiFi + Rear Serial Port (Modbus RTU, IEC60870-5-103 or DNP3.0 Serial) + FO-LC (Modbus TCP, DNP3 TCP, IEC 60870-5-104 or IEC61850) + Web Server SNTP Protocol + IIRIG-B
						0 1			INPUTS AND OUTPUTS 8 Inputs + 7 Outputs 11 Inputs + 5 Outputs
							C D E F		MECHANICAL ASSEMBLY Vertical Assembly Horizontal Assembly Vertical Assembly with anticorrosive treatment Horizontal Assembly with anticorrosive treatment
								A E F	LANGUAGE English, Spanish, German and French English, Spanish, Turkish and Russian English, Spanish, German and Portuguese
								B	ADAPTATION 50 + SOTF + 50G + 50N + 67/51 + (2) 67G/51G + (2) 67N/51N + 67GI + 67NI + 64REF + 46 + 46BC + 49 + 49T + 37 + (2) 27 + 27V1 + (2) 59 + (2) 59N + 47 + (4) 32 + (6) 81U/O + (2) 81R + 78 + 79 + 74TCS + 60CTS + 60VSS + 50BF + SHB + CLP + 52 + 86 + SCM+ SZM + HLT + 21 FL + Power Supply Control + Power Flow

Example of ordering code:

0	0	2	C	0	A	0	C	A	B	SIR C 0 0 2 C 0 A 0 C A B
SIR-C										

(*) ANSI 67, ANSI 67G, and ANSI 67N can be converted into ANSI 51, ANSI 51G, and ANSI 51N, respectively, by setting the "Directionality" parameter to NO.

NOTE: ANSI 50G, ANSI 67G, and ANSI 67GI will be converted into ANSI 50GS, ANSI 67GS, and ANSI 67GSI in the model with neutral current measurement digit 1 (IN = 0.1A or 1A)

Current Transformers

STANDARD PROTECTION CT'S FOR AUXILIARY SUPPLIED OR FOR SELF POWERED RELAYS - CT-MTS

- /1 or /5 secondary protection. Taped or epoxy resined (Installation around the wire or on the bushings).
- Wire or terminals at secondary connection. With simple or dual core (Different cores for measurement and power).
- Transformation ratio single or multitap.
- 5P10, 5P20, 10P5 or 10P10 protection class.
- From 0.12 VA to 5 VA or higher.
- Isolation level 0.72 Kv / 3 Kv.

SPECIFIC CT'S FOR SELF POWERED RELAYS - CT-MTB

- Special cores are used to get higher burden and getting energy in case of self powered protection relays.
- Taped or epoxy resined (Installation around the wire or on the bushings).
- Wire or terminals at secondary connection.
- Test winding for secondary testing.
- 5P80 and 10P80 protection class.
- Specific dimensions in case installation conditions are really restrictive.



Fanox offers complete solutions providing, not only highest quality electronic protection relays, also required current transformers to get protection and measuring capability. Based on relays, different types of current transformers can be used, adapted to customer requirements, both mechanical and functional.

Regarding technical features, all required values that define a CT, as transformation ratio, burden, accuracy class, protection class, frequency, isolation level,are adapted to be completely compatible with Fanox electronic Relays.

Furthermore, in case customer has mechanical limitations or a specific CT Type is required, we can study customized production.

Voltage Sensors

RESISTIVE VOLTAGE SENSORS - PVS

- Voltage sensors apply to voltage measurement of connecting busbar screened cable connector in medium voltage gas insulation switchgear of smart grid.
- Low-power voltage sensors provide a reliable alternative to protecting, measuring and monitoring medium voltage distribution networks. Its high performance and compact size make it ideal for optimal design of medium voltage switches.
- Designed for voltage measurement on MV cabinets and SF6 switchgears up to 24 KV.



Trip Capacitors

TRIP CAPACITORS -TCM FOR SELF POWERED RELAYS

- Connecting trip coil module to the potential-free trip contact of the relay it supplies necessary energy to trip the coil (30J).
- Its main functions is to adapt the relay to installations where the line opening system is activated by a coil, instead of a striker.
- The TCM (Trip Coil Module) is specifically designed to be used with SELF POWERED relays (SIA-C, SIA-B).



Strikers

STRIKER – PRT

- This is a single effect solenoid. The striker is spring operated.
- The striker is activated by low-power polarised electrical signal supplied by the relay in case of a fault.
- The striker is reset to its starting position manually.



Coils

COILS - BNS

- BNS serie electromagnets are simple effect linear solenoids.
- The stroke movement from initial to final position is made by electromagnetic forces.
- The return to initial position is made by external force or by a spring incorporated to the solenoid.



Arc Flash Sensors

ARC FLASH SENSORS - AFS

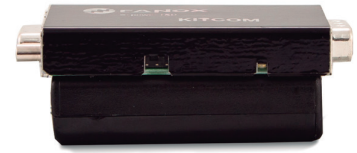
- Arc-flash detection technology significantly decreases the time it takes a relay to trip in response to an arc fault, which reduces hazardous arc-flash incident energy. FANOX combination of light-sensing technology with fast overcurrent protection allows high-speed tripping during arc-flash events without overtripping for external faults or adverse light conditions.



Auxiliary Battery

AUXILIARY BATTERY POWER SUPPLY – KITCOM

- The KitCom is an adapter to supply SIA relays through the front communication port, allowing the communication with the computer simultaneously.
- This adapter is very useful in the commissioning processes of the transformation centres, allowing full verification of the centre, without any auxiliary power supply.
- The equipment has a microswitch that feeds the power supply with a LED (ON) when the voltage is adequate.
- In addition to all the necessary to give the power supply, this device has two LED associated with the Rx and Tx lines of communication, and they are used to verify that there is data traffic between the PC and the SIA relay.



Communication Software

SICOM COMMUNICATION SOFTWARE – SICOM

- The SiCom program works with the Windows® 2000/XP, Windows 7 and Windows 10 operating system and can be used to gain access to all of the relays information, to modify the settings and to save events using a graphic user interface.



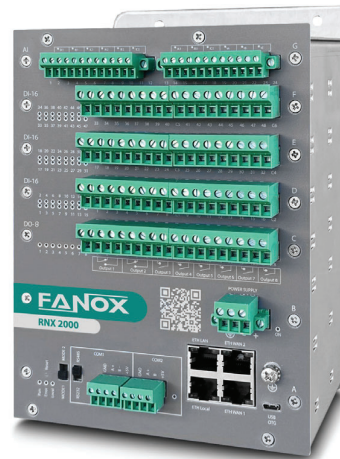
Communications & Automation Solutions for Grid Digitalisation



RNX-2000

REMOTE CONTROL
UNIT | RTU

Primary & Secondary Distribution



Key Features:

- RNX-2000 is a flexible and compact remote-control unit (RTU) for primary and secondary distribution suitable for low and medium voltage switchgears, being an optimal solution for Ring Main Units monitoring and control thanks to its compact size.
- RNX-2000 is provided with 24-48 Vdc power supply.
- Wide variety of interfaces for analogue measurements depending on model, including:
 - » Current:
 - 9 current channels for current sensors (LPCT or Rogowski).
 - » Voltage:
 - 3 voltage channels for resistive or capacitive low voltage sensors (LEAs)

Upcoming different combinations of current and voltage channels.
- RNX-2000 includes the following communication ports:
 - » Serial Ports:
 - 1x RS485 Port.
 - 1x RS232/RS485 Port selectable by switch.
 - » Ethernet ports:
 - 2x WAN (10/100/1000 Base Tx) Ports (RJ45 connectors).
 - 1x LAN (10/100/1000 Base Tx) Port (RJ45 connector).
 - 1x Service LAN (10/100 Base Tx) Port (RJ45 connector).
- RNX-2000 will support all the standard protocols enhancing cyber security requirements to fulfil IEC62351:
 - » IEC60870-5-104 and Modbus, NTP, SNTP.
 - » Master/Client: IEC60870-5-101/104, IEC60870-5-103, Modbus (TCP/IP and Serial), DNP3 (TCP/IP and Serial), IEC61850. (Upcoming)
 - » Slave/Server: IEC60870-5-101/104, IEC60870-5-103, Modbus (TCP/IP and Serial), DNP3 (TCP/IP and Serial), IEC61850, NTP, SNTP. (Upcoming)
- RNX-2000 includes different modules of I/O available to support:
 - » 32, 48 or 64 inputs.
 - » 8, 16 or and 32 outputs with associated LED indicators.
- Metallic box with high electromagnetic compatibility level (EMC) and wide range of operating temperature.
- Advanced logic configuration and automation capability thanks to the programmable logic.
- Sequential Events Recording (SER) in non-volatile RAM memory maintaining the date & time thanks to its internal RTC (Real Time Clock).
- Integrated Web server for configuration and diagnostics.

RTU MODEL SELECTION

RNX 2000

Ring Terminal Unit

00 9P								PHASE CURRENT MEASUREMENT Without measurement 9xLPCT (xxA/225 mV)
	00 3L							VOLTAGE MEASUREMENT Without measurement 3xLEA: 3.25/ $\sqrt{3}$ Vrms
		A						POWER SUPPLY 24-48 Vdc
			A					COMMUNICATION PORTS RS485 + RS232/RS485 + 4 x Ethernet (10/100/1000 Base Tx)
				1 2 3 4				INPUTS 1 x 16 Inputs 2 x 16 Inputs 3 x 16 Inputs 4 x 16 inputs
					0 1 2 3 4 5			OUTPUTS 1 x 8 Outputs 1 x 16 Outputs 2 x 8 Outputs 3 x 8 Outputs 4 x 8 Outputs 5 x 8 Outputs
						5 7 8		MECHANICS 7 Slots modular assembly (2 fixed + 5 modular) 7 Slots (compact structure only) 10 Slots modular assembly (2 fixed + 8 modular)
							A B C D	ADAPTATION - + (2) 50 + (2) 50N + (2) 21FL + (2) 50INC + (2) 50 + (2) 50N + (2) 50 + (2) 50N+ SZM + 52

Example of ordering code:

9P	3L	A	A	3	0	7	A	RNX 2000 9P3LAA307A
RNX 2000								

NOTE: When the part number is selected, the admissible maximum number of inputs and outputs are:

Maximum 64 inputs.

Maximum 40 outputs.

SIC-A

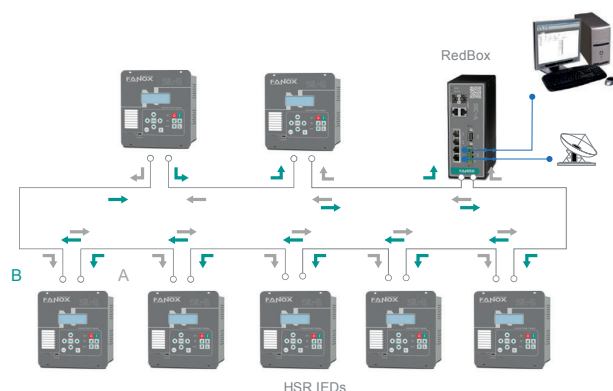
REDUNDANCY PROTOCOLS GATEWAY (PRP/HSR)



Key Features:

- SIC-A is provided with any-to-any protocol conversion that permits the integration of the device with proprietary and legacy protocols in a modern infrastructure with the most recent protocols and redundant topologies.
- SIC-A can work as a multi-protocol converter, as an unmanaged Redbox, or as a redundant protocol gateway.
- SIC-A can manage up to 3000 data points of the most common protocols (Modbus, IEC 60870, DLMS, DNP3, ...) or up to 800 data points of advanced protocols such as IEC 61850.
- The device is provided with HSR (High-availability Seamless Redundancy) optimal redundancy protocol for the substation automation as per the IEC 61850 standard. This redundancy is the evolution of the existing Parallel Redundancy Protocol (PRP), which is also available in the device.
- SIC-A is provided with 4 digital inputs and 4 digital outputs.
- It is especially suited for applications that demand high availability and very short switchover time because it provides zero recovery time in case of the failure of any component. A good example of an application may be the protection of automatized electrical substations or the control of synchronized drives, for instance.

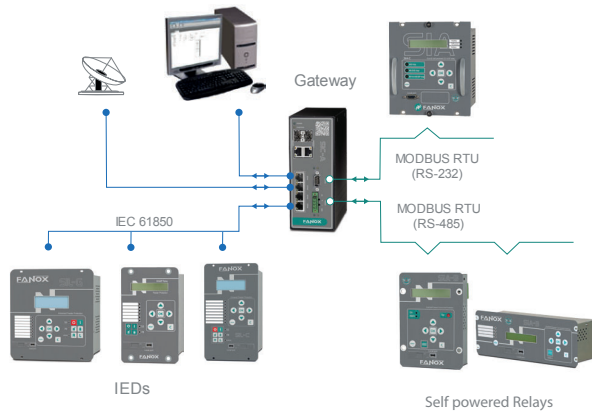
REDBOX



SIC-A Working as a Redbox allows the connection of HSR networks with traditional ones.

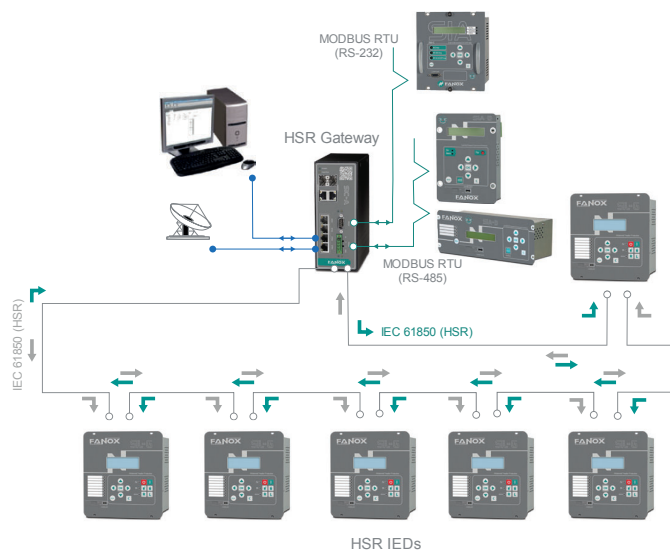
In case of PRP redundancy, SIC-A is not denominated Redbox, it would be a device that allows the integration into 2 independent networks through a 3rd Ethernet port.

PROTOCOL GATEWAY



SIC-A device is able of communicating through serial communication RS-232 or RS-485 with multiple equipment with a Master serial protocol (ModBus, IEC69870-5-101, IEC60870-5-103, DLMS...) and dispose the information into a Ethernet protocol as IEC 61850 or IEC 60870-5-104. This way, devices with conventional protocols can be integrated in Ethernet networks with advanced protocols.

REDUNDANT PROTOCOL GATEWAY



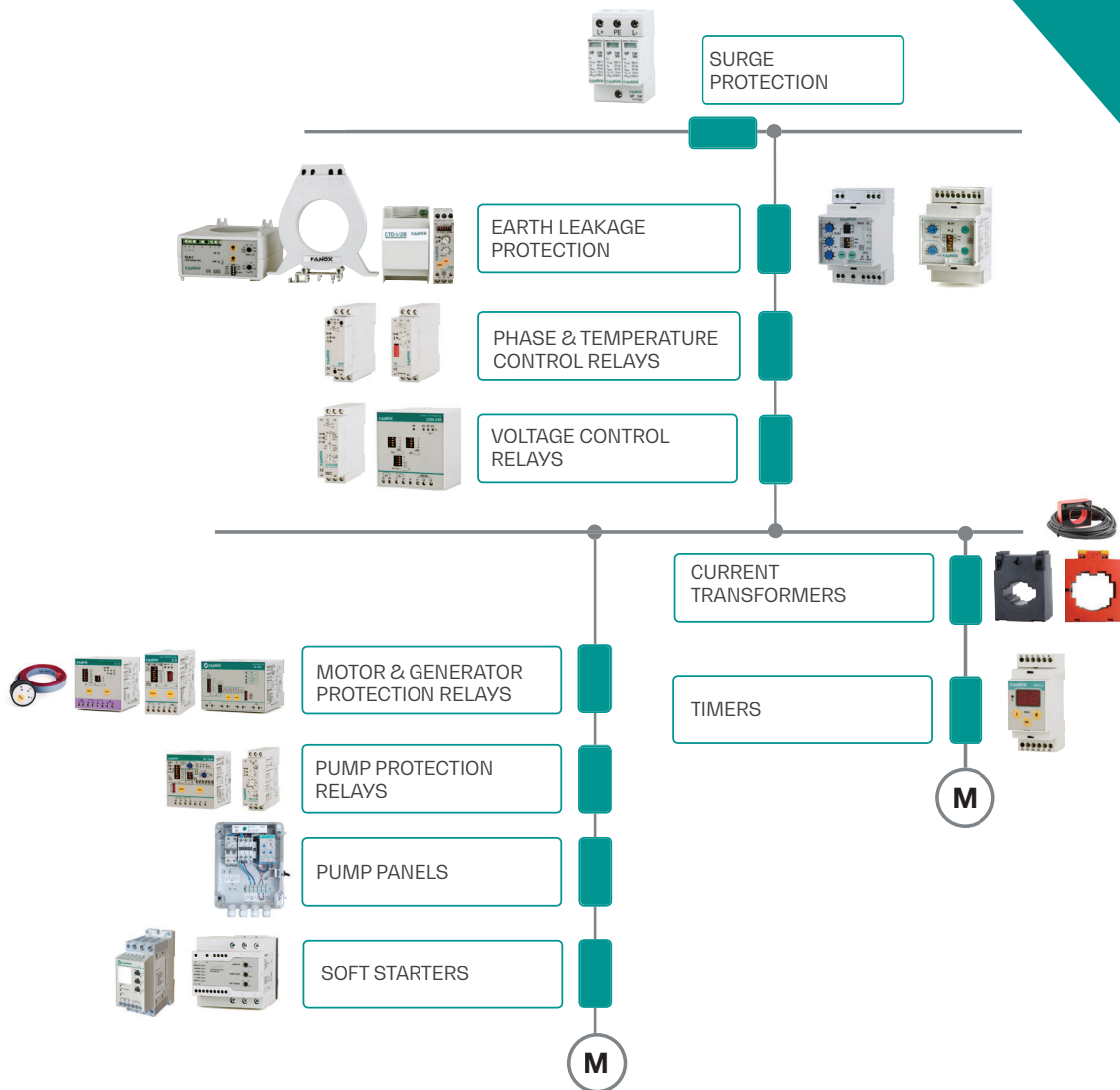
It is the result of the combination of the functionality of a Gateway and the HSR redundancy. With this configuration, SIC-A allows the integration of equipment with serial communications in a HSR redundant network with an advanced protocol as IEC 61850 or IEC 60870-5-104.

Protection & Control

Low Voltage Products

3
YEARS
WARRANTY

FANOX | Overview



Protection & Control of Motors, Generators and Pumps

Motor & Generator Protection Relays

C / GL / GEN

- For 3-phase equipment from 1 to 630 A and higher up to 1.000 V.
- Their different trip classes and thermal memory, for modelling heating and cooling cycles of the motor, are ideal for any type of motor starts and long cycle operations.
- The motor or generator cables pass through the relay sensors and integrated CT's.
- Identification and visualisation of trip cause.
- External display module accesory for panel door mounting.
- For EEx e motors and in potentially explosive atmospheres, according to Atex directive.
- Protection of generators with specific trip curves.
- Easy and quick trip test for phase failure.



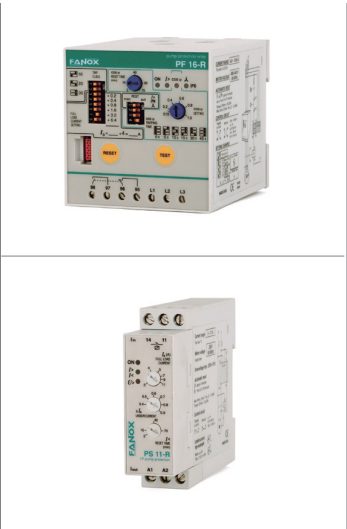
PROTECTIONS

- $I >$ Overload
-  Phase imbalance or phase failure
-  Phase sequence
-  Overheating protection (PTC sensor)

Pump Protection Relays

PF-R / PS-R / P

- For 3-phase and 1-phase submersible pumps. Protection against dry running without requiring level sensors.
- With thermal memory, for modelling heating and cooling cycles of the motor.
- Identification and visualisation of trip cause.
- Manual, remote and automatic reset. (Adjustable from 2 to 240 minutes for well filling).
- Easy and quick trip test for phase failure.



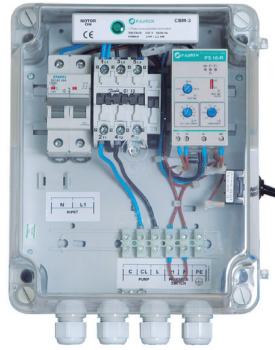
PROTECTIONS

- $I >$ Overload
- $I <$ Underload
- $\cos \varphi$ Underload
- $U >$ Overvoltage
-  Phase imbalance or phase failure
-  Phase sequence

Panels for Submersible Pumps

CBT / CBM / CBS

- Panels for submersible pumps. Maximum protection without level electrodes or level relay.
- Electronic relay incorporated.
- Quick and easy installation, maintenance free.
- Installation cost are significantly reduced.
- Adaptable to installations already in service, without removing the pump.



PROTECTIONS

$I >$	Overload
$I <$	Underload
$\cos \varphi$	Underload
$U >$	Overvoltage
	Phase imbalance or phase failure
	Phase sequence
$I >>$	Short-circuit
	Soft start
	Soft stop

Soft Starters & Motor Controllers

ES

- They reduce the starting current and eliminate the mechanical blows and pulses when electric motors start and stop.
- They reduce surges.
- Built in heat dissipater and electro-mechanical bypass relay..
- For 3-phase motors from 3 to 45 A (1.1 to 22 kW) / 400 V.
- Substitutes the conventional contactors: One in direct start-up and three in star-delta start-up cycle. Offers greater life cycle.



PROTECTIONS

	Soft start
	Soft stop
	Phase imbalance or phase failure
	Overheating protection (PTC sensor)
	Phase sequence

Control & Measurement

Control Relays

S / ST / T / TST-24 / MT2

- 22,5 mm sized relays signalling trip cause. Self powered. DIN rail mounting.
- Phase and/or Temperature. Thermally protected by use of PTC sensors. Temperature control in the electric panels of lifts in accordance with standard EN 81-1 to comply with the European Lift Directive (95/16/CE).



PROTECTIONS

	Overtemperature
	Phase imbalance or phase failure
	Phase sequence
	Termistor short-circuit
	Temperature variation

U1 / U3-S / U3-N

- Voltage.
- Control for three-phase and single-phase devices. Adjustable minimum and maximum thresholds. Adjustable trip time delay.



PROTECTIONS

$U >$	Overvoltage
$U <$	Undervoltage
	Phase imbalance or phase failure
	Phase sequence
	Loss of neutral

Timers

MTR-10

- Multifunctional digital timer.
- Up to 9 different timings from 0.1s to 99h.
- With built-in battery which allows timer to be programmed without connecting to auxiliary voltage. Complete battery discharge does not affect operation or adjustment settings.
- Programmable parameters: Initial state of output relays, working mode, number of different times per program, time setting range, command contact.



Earth Leakage Protection

Multirange Earth Leakage Relays

D30 / DM30 / DR30 / ELR

- Electronic relays with adjustable delay time and sensitivity. Multirange.
- With or without built-in transformers, combinable with external transformers.
- Suitable for direct pulse current.
- Immune to external disturbances and modular size 45 mm.
- Superimmunized versions size 45 and 22,5 mm, suitable for Motor Control Centres (MCC), electrical distribution boards and control panels in general.
- Model with automatic reclosing up to 3 attempts with defined (1 min) or adjustable time (1 to 60s).



Current Transformers for Leakage Relays

CT-1 / CTB-1

- The transformer and relay assembly is fixed by the relay.
- Model with DIN rail mounting,



Protection Against Transient Overvoltage

SPD Surge Arresters

VP

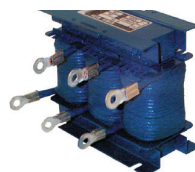
- For Low Voltage distribution networks and electrical equipment against overvoltages caused by lightning strikes, switching manoeuvres or electro-static discharges.
- Models with high, medium and low discharge capacity.
- Visual indication of a fault in the equipment. Remote signalling of the protection status.
- For all kind of electrical systems (L-L, L-N, L-G, N-G).
- For power supply systems and installations, photovoltaic and wind power applications. Type B (Class I), Type VP B+C (Class I+II) and Type C (Class II).
- Ensures maximum protection of critical facilities, 365 days / 24 hours a day.



Low Voltage Transformers

Current & Potential Transformers

- Protection and measurement transformers up to 5.000A of primary current. Transformer ratio /5. One piece core or split core models.
- Toroidal transformers for earth leakage.
- Electric Energy Measurement transformers for remote management in Low Voltage openable and/or extended range. For INSIDE and OUTSIDE.
- Current limitant input reactor. To absorb line spikes, switching voltage dips, to eliminate harmonics or decrease the di/dt that semiconductors are affected.
- Potential transformer, encapsulated in poliuretane.





More than 400.000
Self powered Relays
in the field

FANOX
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Parque Tecnológico de Bizkia
Astondo bidea, Edificio 604
48160 DERIO (Spain)
Tel.: (+34) 94 471 14 09
fds_fanox@wabtec.com
fanox.com

