

SIR-A

RECLOSER CONTROL & FEEDER
PROTECTION RELAY

Primary & Secondary Distribution Protection



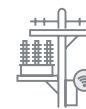
Feeder



Capacitor
Bank



Arc Flash



Overhead



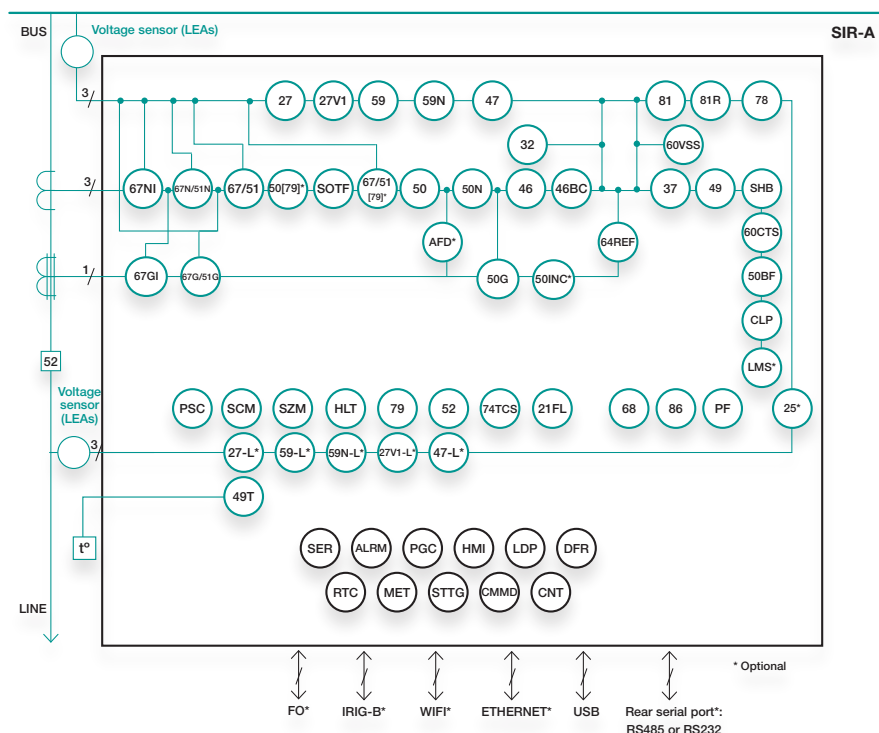
Grid
Interconnection

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



- The SIR-A is an overhead control and feeder protection relay which includes current, voltage, and frequency functions for primary and secondary distribution, fitted with an auxiliary power supply of 24-230 Vdc/ac, 48-230 Vdc/ac or 24-48 Vdc (depending on model).
- 4 current channels for conventional /1 and /5 current transformers and 6 voltage channels for capacitive and resistive low power voltage sensors (LEAs).
- Metal housing with a high electromagnetic compatibility level (EMC) and a wide range of operating temperature.
- Protection against decoupling, load shedding, and Loss of Main (islanding). Loss of Main (islanding) occurs when a part of the public utility network loses connection with the rest of the system. In case this situation is not detected, a network safety hazard can be present if the generator remains connected since an automatic reconnection of the generator may occur, causing damage to the generator and the network. SIR-A relay detects this hazardous situation thanks to its voltage and frequency functions based on the Rate Of Change Of Frequency (ROCOF) method.
- Signalling and control of the circuit breaker (52 function) and the recloser (79 function).
- The front part of the SIR-A relays is provided with a navigation keypad made of 7 keys (including the RESET key), 6 programmable hot keys that by default are configured: two (2) keys to open and close the CB, two (2) keys to block and unblock the recloser and two (2) keys to put the relay in local or remote mode with their associated three (3) configurable control LEDs. Besides, depending on the model:
 - Adaptation B: Eight (8) programmable alarm LEDs
 - Adaptation C: Thirteen (13) programmable alarm LEDs + 8 configurable keys with their associated configurable LED.
- Arc Flash detection (AFD) with 4 AFD inputs and 4 high-speed outputs (available depending on the model). This functionality, in addition to Wi-Fi communication, allows the users to set and configure the relay through the SiCom free software of Fanox and operate the relay remotely far away from the installation, thus prioritizing the health and safety of workers.
- In case a CB is manually closed, a switch on to an existing fault may occur. This fault condition is critical if the overcurrent protection function does not clear the fault until the adjusted time delay is finished. It is necessary, in those cases, to clear the fault quickly through the SOTF function.
- To allow the communication, the SIR-A relays are provided with a local micro-USB front port and with remote communication options (ports and protocols) on the rear side:
 - » Rear Serial Port: Modbus RTU, DNP3.0 Serial or IEC60870-5-103 (selectable by general settings).
 - Adaptation B: Rear RS485 port.
 - Adaptation C: Rear RS485 or RS232 port (selectable by the user; both ports are not available simultaneously).
 - » Rear Ethernet Port (RJ45 or FO-LC): Modbus TCP/IP, DNP3.0 TCP/IP, IEC60870-5-104 or IEC61850 (selectable by general settings) + SNMP Protocol + Web Server.
- Wireless communication (Wi-Fi) and synchronization through IIRIG-B are optional (depending on the model).
- Alarms panel is available.
- The SIR-A is provided with (depending on the model):
 - » 8 configurable inputs and 7 configurable outputs.
 - » 24 configurable inputs and 7 configurable outputs.
 - » 8 configurable inputs and 18 configurable outputs.
 - » 16 configurable inputs and 11 configurable outputs.
 - » 8 configurable inputs, 7 configurable outputs, 4 AFD inputs, and 4 High-Speed outputs.
- SIR-A is fitted with demand of power (LDP – Load Data Profiling) with the following characteristics:
 - » Number of records: 2160.
 - » Circular recording mode.
 - » Sampling rate (interval): configurable through communications (1-60 min).
- SIR-A is provided with non-volatile RAM memory in order to store up to 3072 events and the disturbance fault recording (DFR), maintaining date & time thanks to its internal RTC (Real Time Clock). The configurable options are:
 - » 5 records in data and COMTRADE format (300 cycles each record): 1 to 8 pre-fault cycles + 292 to 299 post-fault cycles.
 - » 25 records in data and COMTRADE format (60 cycles each record): 1 to 8 pre-fault cycles + 52 to 59 post-fault cycles.
 - » 50 records in data and COMTRADE format (30 cycles each record): 1 to 8 pre-fault cycles + 22 to 29 post-fault cycles.
 - » 100 records in data and COMTRADE format (15 cycles each record): 1 to 8 pre-fault cycles + 7 to 14 post-fault cycles.
- Each oscillographic record contains 10 analogue channels and up to 96 configurable digital channels. The oscillography is downloaded by a communications port. The SiCom communications program allows the oscillography record to be downloaded and saved in COMTRADE format (IEEE C37.111-1991).

FUNCTIONS DIAGRAM SIR-A



ANSI CODE PROTECTIONS

50	Instantaneous phase overcurrent
67/51	Inverse time directional* phase overcurrent
50[79] (*)	Instantaneous phase overcurrent – Adjustment by reclosing cycle
67/51[79] (*)	Inverse time directional* phase overcurrent - Adjustment by reclosing cycle
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
SOTF	Switch On To Fault
46	Phase balance current protection
46BC	Broken Conductor Detection
64REF	Restricted Earth Fault
50INC (*) ⁽¹⁾	Incipient/Intermittent Fault detection
37	Instantaneous phase undercurrent
49	Thermal overload
49T	External trip
SHB	Second Harmonic Blocking
59	Instantaneous phase overvoltage (Bus bar)
59N	Instantaneous calculated neutral overvoltage (Bus bar)
59-L	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)
27-L	Instantaneous phase undervoltage (Line)
27V1	Instantaneous positive sequence undervoltage (Bus bar)

ADDITIONAL FUNCTIONS

CNT	Counters
RTC	Real Time Clock
ALRM	Alarm panel
PGC	Programmable Logic Control
HMI	Human Machine Interface
SER	Sequential Event Recording

27V1-L	Instantaneous positive sequence undervoltage (Line)
32	Directional overpower
81O/U	Under/Overfrequency
81R	Rate of Change of Frequency (ROCOF)
78	Out of Step (Vector Shift)
SCM	Sequence Coordination Mode
SZM	Sectionalizer Mode
CLP	Cold Load Pickup
79	AC Reclosing device
52	Breaker wear monitoring
25	Synchro Check
HLT	Hot Line Tag
50BF	Circuit Breaker Failure
74TCS	Trip Circuit Supervision
60CTS	Phase CT Supervision
60VSS	Phase LPVT Supervision
AFD	Arc Flash Detection
21FL	Fault Locator
LMS (*) ⁽¹⁾	Load Management System
PF ⁽¹⁾	Power Flow
86	Trip lockout
68	Zone Selection Interlocking (ZSI)
PR ⁽²⁾	Phase Rotation
PSC	Power Supply Control
PGC	Programmable logic control

(*) Optional depending on the model

(1) Available from version 1.22.00 onwards.

(2) Available from version 1.23.00 onwards.

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)

DFR	Disturbance Fault Recording
LDP	Load Data Profiling
MET	Metering
STTG	Settings Groups
CMMD	Commands

TECHNICAL PARAMETERS SIR-A

Function 50-1 Function 50-2	Function enable: No/Alarm/Trip/SHB Trip
	Current tap: 0.010 to 30.000 xIn (step 0.001xIn)
	Time delay: 0.000 to 300.000 s (step 0.001 s)
	Activation level: 100%
	Deactivation level: 95%
	Temporized deactivation
Function 50N	Timing accuracy: ± 35 ms or $\pm 0.5\%$ (greater of both)
	Function enable: No/Alarm/Trip/SHB Trip
	Current tap: 0.050 to 30.000 xIn (step 0.001xIn)
	Time delay: 0.000 to 300.000 s (step 0.001 s)
	Activation level: 100%
	Deactivation level: 95%
Function 50G	Temporized deactivation
	Timing accuracy: ± 35 ms or $\pm 0.5\%$ (greater of both)
	Function enable: No/Alarm/Trip/SHB Trip
	Current tap: 0.010 to 30.000 xIn (step 0.001xIn)
	Time delay: 0.000 to 300.000 s (step 0.001 s)
	Activation level: 100%
Function 67/51-1 Function 67/51-2 Function 67/51-3 Function 67/51-4	Deactivation level: 95%
	Temporized deactivation
	Timing accuracy: ± 35 ms or $\pm 0.5\%$ (greater of both)
	Function enable: No/Alarm/Trip/SHB Trip
	Curve Type: IEC60255-151 (Definite time, standard inverse, very inverse, extremely inverse, long-time inverse, short time inverse), IEEE (Moderately inverse, very inverse, extremely inverse), U, SMU, and RC curves.
	User defined curves (curve 1, curve 2, curve 3, curve 4) ⁽²⁾
	For IEC Definite time curve, time delay: 0.000 to 300.000 s (step 0.001 s)
	Time dial (TMS): 0.01 to 25.00 (step 0.01)
	If Curve type IEC: 0.01 to 1.00 (step 0.01)
	If Curve type IEEE: 0.01 to 25.00 (step 0.01)
	If Curve type U: 0.05 to 15.00 (step 0.01)
	If Curve type RC: 0.10 to 2.00 (step 0.01)
	Current tap: 0.010 to 20.000 xIn (step 0.001xIn)
	Directionality: No/Forward/Reverse
	Polarization voltage: 0.04 to 2.00 xUn (step 0.01xUn)
	Operating angle: 0 to 359° (step 1°)
	Halfcone angle: 10 to 170° (step 1°)
	Curve, current activation level: 110%
	Curve, current deactivation level: 100%
	Definite time, current activation level: 100%
	Definite time, current deactivation level: 95%
Function 67N/51N-1 Function 67N/51N-2	Voltage activation level: 100%
	Voltage deactivation level: 95%
	Temporized deactivation
	Timing accuracy for IEC and IEEE curves selection: ± 30 ms or $\pm 5\%$ (greater of both)
	Timing accuracy for defined time curve selection: ± 35 ms or $\pm 0.5\%$ (greater of both)
	Function enable: No/Alarm/Trip/SHB Trip
	Curve Type: IEC60255-151 (Definite time, standard inverse, very inverse, extremely inverse, long-time inverse, short time inverse), IEEE (Moderately inverse, very inverse, extremely inverse), U, SMU, and RC curves.
	User defined curves (curve 1, curve 2, curve 3, curve 4) ⁽²⁾
	For IEC Definite time curve, time delay: 0.000 to 300.000 s (step 0.001 s)
	Time dial (TMS): 0.01 to 25.00 (step 0.01)
	If Curve type IEC: 0.01 to 1.00 (step 0.01)
	If Curve type IEEE: 0.01 to 25.00 (step 0.01)
	If Curve type U: 0.05 to 15.00 (step 0.01)
	If Curve type RC: 0.10 to 2.00 (step 0.01)
	Current tap: 0.050 to 20.000 xIn (step 0.001xIn)
	Directionality: No/Forward/Reverse
	Polarization voltage: 0.04 to 2.00 xUn (step 0.01xUn)
	Operating angle: 0 to 359° (step 1°)
	Halfcone angle: 10 to 170° (step 1°)
	Curve, current activation level: 110%
	Curve, current deactivation level: 100%
	Definite time, current activation level: 100%
	Definite time, current deactivation level: 95%
	Voltage activation level: 100%
	Voltage deactivation level: 95%
	Temporized deactivation
	Timing accuracy for IEC and IEEE curves selection: ± 30 ms or $\pm 5\%$ (greater of both)
	Timing accuracy for defined time curve selection: ± 35 ms or $\pm 0.5\%$ (greater of both)

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	Function enable: No/Alarm/Trip/SHB Trip
	Curve Type: IEC60255-151 (Definite time, standard inverse, very inverse, extremely inverse, long-time inverse, short time inverse), IEEE (Moderately inverse, very inverse, extremely inverse), U, SMU, and RC curves.
	User defined curves (curve 1, curve 2, curve 3, curve 4) ⁽²⁾
	For IEC Definite time curve, time delay: 0.000 to 300.000 s (step 0.001 s)
	Time dial (TMS): 0.01 to 25.00 (step 0.01)
	If Curve type IEC: 0.01 to 1.00 (step 0.01)
	If Curve type IEEE: 0.01 to 25.00 (step 0.01)
	If Curve type U: 0.05 to 15.00 (step 0.01)
	If Curve type RC: 0.10 to 2.00 (step 0.01)
	Current tap: 0.010 to 20.000 xIn (step 0.001xIn)
	Directionality: No/Forward/Reverse
	Polarization voltage: 0.04 to 2.00 xUn (step 0.01xUn)
	Operating angle: 0 to 359° (step 1°)
	Halfcone angle: 10 to 170° (step 1°)
	Curve, current activation level: 110%
	Curve, current deactivation level: 100%
	Definite time, current activation level: 100%
	Definite time, current deactivation level: 95%
	Voltage activation level: 100%
	Voltage deactivation level: 95%
	Temporized deactivation
	Timing accuracy for IEC and IEEE curves selection:
	± 30 ms or ± 5% (greater of both)
	Timing accuracy for defined time curve selection:
	± 35 ms or ± 0.5% (greater of both)
Function 67G/51G-1	Function enable: No/Alarm/Trip/SHB Trip
	Directionality: No/Forward/Reverse
	Low Current Tap: 0.010 to 30.000 xIn (step 0.001xIn)
	High Current Tap: 0.010 to 30.000 xIn (step 0.001xIn)
	Low Voltage Tap: 0.04 to 2.00 xUn (step 0.01xUn)
	High Voltage tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Time delay: 0.000 to 300.000 s (step 0.001 s)
	Operating angle: 0 to 359° (step 1°)
	Halfcone angle: 10 to 170° (step 1°)
	Activation level: 100%
	Deactivation level: 95%
	Temporized deactivation
	Timing accuracy: ± 30 ms or ± 5% (greater of both)
	Function enable: No/Alarm/Trip/SHB Trip
	Current tap: 0.010 to 30.000 xIn (step 0.001xIn)
	5 independent tap settings for each reclose number (79-0, 79-1, 79-2, 79-3, 79-4)
Function 67G/51G-2	Time delay: 0.000 to 300.000 s (step 0.001 s)
	5 independent time delay settings for each reclose number (79-0, 79-1, 79-2, 79-3, 79-4)
	Activation level: 100%
	Deactivation level: 95%
	Temporized deactivation
	Timing accuracy: ± 35 ms or ± 0.5% (greater of both)
Function 67NI	Function enable: No/Alarm/Trip/SHB Trip
	Directionality: No/Forward/Reverse
	Low Current Tap: 0.010 to 30.000 xIn (step 0.001xIn)
	High Current Tap: 0.010 to 30.000 xIn (step 0.001xIn)
	Low Voltage Tap: 0.04 to 2.00 xUn (step 0.01xUn)
	High Voltage tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Time delay: 0.000 to 300.000 s (step 0.001 s)
	Operating angle: 0 to 359° (step 1°)
	Halfcone angle: 10 to 170° (step 1°)
	Activation level: 100%
	Deactivation level: 95%
	Temporized deactivation
	Timing accuracy: ± 30 ms or ± 5% (greater of both)
	Function enable: No/Alarm/Trip/SHB Trip
	Directionality: No/Forward/Reverse
	Low Current Tap: 0.010 to 30.000 xIn (step 0.001xIn)

Function 67GI	Function enable: No/Alarm/Trip/SHB Trip
	Directionality: No/Forward/Reverse
	Low Current Tap: 0.010 to 30.000 xIn (step 0.001xIn)
	High Current Tap: 0.010 to 30.000 xIn (step 0.001xIn)
	Low Voltage Tap: 0.04 to 2.00 xUn (step 0.01xUn)
	High Voltage tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Time delay: 0.000 to 300.000 s (step 0.001 s)
	Operating angle: 0 to 359° (step 1°)
	Halfcone angle: 10 to 170° (step 1°)
	Activation level: 100%
	Deactivation level: 95%
	Temporized deactivation
	Timing accuracy: ± 30 ms or ± 5% (greater of both)
	Function enable: No/Alarm/Trip/SHB Trip
	Current tap: 0.010 to 30.000 xIn (step 0.001xIn)
	5 independent tap settings for each reclose number (79-0, 79-1, 79-2, 79-3, 79-4)
50[79] (*)	Time delay: 0.000 to 300.000 s (step 0.001 s)
	5 independent time delay settings for each reclose number (79-0, 79-1, 79-2, 79-3, 79-4)
	Activation level: 100%
	Deactivation level: 95%
	Temporized deactivation
	Timing accuracy: ± 35 ms or ± 0.5% (greater of both)

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51/67[79] (*)	Function enable: No/Alarm/Trip/SHB Trip	Function SOTF	Function enable: No/Alarm/Trip/SHB Trip
	Curve Type: IEC60255-151 (Definite time, standard inverse, very inverse, extremely inverse, long-time inverse, short time inverse), IEEE (Moderately inverse, very inverse, extremely inverse), U, SMU, and RC curves.		Current tap: 0.010 to 30.000 xIn (step 0.001xIn)
	User defined curves (curve 1, curve 2, curve 3, curve 4) ⁽²⁾		Time delay: 0.000 to 295.000 s (step 0.001 s)
	5 independent curve type settings for each reclose number (79-0, 79-1, 79-2, 79-3, 79-4)		Safe Time: 0.020 to 300.000 s (step 0.001 s)
	For IEC Definite time curve, time delay: 0.000 to 300.000 s (step 0.001 s)		Activation level: 100%
	5 independent time delay settings for each reclose number (79-0, 79-1, 79-2, 79-3, 79-4)		Deactivation level: 95%
	Time dial (TMS): 0.01 to 25.00 (step 0.01)	Function 50INC (*) ⁽¹⁾	Temporized deactivation
	If Curve type IEC: 0.01 to 1.00 (step 0.01)		Timing accuracy: ± 35 ms or $\pm 0.5\%$ (greater of both)
	If Curve type IEEE: 0.01 to 25.00 (step 0.01)		Function enable: No/Alarm/Trip
	If Curve type U: 0.05 to 15.00 (step 0.01)	Function 49	Phase Current Tap: 0.500 to 20.000 xIn (step 0.001xIn)
	If Curve type RC: 0.10 to 2.00 (step 0.01)		Pickup Peaks number: 1 to 10 (step 1)
	5 independent time dial settings for each reclose number (79-0, 79-1, 79-2, 79-3, 79-4)		Trip Peak number: 1 to 10 (step 1)
	Current tap: 0.010 to 20.000 xIn (step 0.001xIn)		Function enable: No/Alarm/Trip
	5 independent tap settings for each reclose number (79-0, 79-1, 79-2, 79-3, 79-4)		Current tap: 0.100 to 2.400 In (step 0.001xIn)
	Directionality: No/Forward/Reverse		ζ heating: 3 to 600 min (step 1 min)
	Polarization voltage: 0.04 to 2.00 xUn (step 0.01xUn)		ζ cooling: 1 to 6 x ζ heating (step 1)
	Operating angle: 0 to 359° (step 1°)	Function SHB	Alarm: 20 to 99% (step 1%)
	Halfcone angle: 10 to 170° (step 1°)		Trip level: 100%
	Curve, current activation level: 110%		Deactivation level: 95% of alarm level
	Curve, current deactivation level: 100%		Timing accuracy: $\pm 5\%$ respect of theoretical value.
	Definite time, current activation level: 100%		Function enable: No/Yes
	Definite time, current deactivation level: 95%	Function CLP	Current Tap: 5 to 50% (step 1%)
	Voltage activation level: 100%		Reset Time: 0.000 to 300.000 (step 0.001 s)
	Voltage deactivation level: 95%		Block Threshold: 0.010 to 30.000xIn (step 0.001xIn)
	Temporized deactivation		Activation level: 100%
	Timing accuracy for IEC and IEEE curves selection: ± 30 ms or $\pm 5\%$ (greater of both)		Deactivation level: 95%
	Timing accuracy for defined time curve selection: ± 35 ms or $\pm 0.5\%$ (greater of both)		Temporized deactivation
Function 64REF	Function enable: No/Alarm/Trip/ SHB Trip		Function enable: Yes/No
	Current tap: 0.050 to 20.000 xIn (step 0.001xIn)		Settings group: 1 to 6 (step 1)
	Time delay: 0.020 to 300.000 s (step 0.001 s)		No load time: 0.020 to 300.000 s (step 0.001 s)
	Neutral SHB Tap: 5 to 50% (step 1%)		Cold load time: 0.020 to 300.000 s (step 0.001 s)
	Activation level: 100%		Open breaker activation 0.8% In and reset threshold: 1% In
	Deactivation level: 90%		
	Temporized deactivation		
	Timing accuracy: ± 35 ms or $\pm 5\%$ (greater of both)		

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Function 46	Function enable: No/Alarm/Trip/SHB Trip
	Curve Type: IEC60255-151 (Definite time, standard inverse, very inverse, extremely inverse, long-time inverse, short time inverse), IEEE (Moderately inverse, very inverse, extremely inverse), U, SMU, and RC curves.
	User defined curves (curve 1, curve 2, curve 3, curve 4) ⁽²⁾
	For IEC Definite time curve, time delay: 0.000 to 300.000 s (step 0.001 s)
	Time dial (TMS): 0.01 to 25.00 (step 0.01)
	If Curve type IEC: 0.01 to 1.00 (step 0.01)
	If Curve type IEEE: 0.01 to 25.00 (step 0.01)
	If Curve type U: 0.05 to 15.00 (step 0.01)
	If Curve type RC: 0.10 to 2.00 (step 0.01)
	Current tap: 0.010 to 20.000 xIn (step 0.001xIn)
	Curve, current activation level: 110%
	Curve, current deactivation level: 100%
	Definite time, current activation level: 100%
	Definite time, current deactivation level: 95%
Function 46BC	Temporized deactivation
	Timing accuracy for IEC and IEEE curves selection: ± 30 ms or ± 5% (greater of both)
	Timing accuracy for defined time curve selection: ± 35 ms or ± 0.5% (greater of both)
	Function enable: No/Alarm/Trip
	Tap: 15 to 100 % (step 1%)
	Time delay: 0.030 to 300.000 s (step 0.001 s)
Function 37	Activation level: 100%
	Deactivation level: 95%
	Temporized deactivation
	Timing accuracy: ± 30 ms or ± 0.5% (greater of both)
	Function enable: No/Alarm/Trip
	Current tap: 0.010 to 30.000 xIn (step 0.001xIn)
	Minimum level: 0.000 to 1.000 xIn (step 0.001xIn)
Function 27-1 Function 27-2	Time delay: 0.060 to 300.000 s (step 0.001 s)
	Activation level: 100%
	Deactivation level: 105%
	Temporized deactivation
	Timing accuracy: ± 30 ms or ± 0.5% (greater of both)
	Function enable: No/Alarm/Trip
	Voltage tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Minimum level: 0.00 to 1.00 xUn (step 0.01xUn)
	Time delay: 0.060 to 300.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Activation level: 99%
	Deactivation level: 101%
	Temporized deactivation
	Timing accuracy: ± 30 ms or ± 0.5% (greater of both)

Function 27-L (*)	Function enable: No/Alarm/Trip
	Voltage tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Minimum level: 0.00 to 1.00 xUn (step 0.01xUn)
	Time delay: 0.060 to 300.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Activation level: 99%
	Deactivation level: 101%
	Temporized deactivation
Function 27V1	Timing accuracy: ± 30 ms or ± 0.5% (greater of both)
	Function enable: No/Alarm/Trip
	Voltage tap: 0.15 to 2.00 xUn (step 0.01xUn)
	Minimum level: 0.00 to 1.00 xUn (step 0.01xUn)
	Time delay: 0.060 to 300.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Activation level: 99%
	Deactivation level: 101%
Function 27V1-L (*)	Temporized deactivation
	Timing accuracy: ± 30 ms or ± 0.5% (greater of both)
	Function enable: No/Alarm/Trip
	Voltage tap: 0.15 to 2.00 xUn (step 0.01xUn)
	Minimum level: 0.00 to 1.00 xUn (step 0.01xUn)
	Time delay: 0.060 to 300.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Activation level: 99%
Function 59-1 Function 59-2	Deactivation level: 101%
	Temporized deactivation
	Timing accuracy: ± 30 ms or ± 0.5% (greater of both)
	Function enable: No/Alarm/Trip
	Voltage tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Time delay: 0.045 to 300.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Activation level: 101%
Function 59-L (*)	Deactivation level: 99%
	Temporized deactivation
	Timing accuracy: ± 30 ms or ± 0.5% (greater of both)
	Function enable: No/Alarm/Trip
	Voltage tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Time delay: 0.045 to 300.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Activation level: 101%

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Function 59N-1 Function 59N-2	Function enable: No/Alarm/Trip
	Voltage tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Time delay: 0.045 to 300.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Activation level: 101%
	Deactivation level: 99%
	Temporized deactivation
Function 59N-L (*)	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
	Function enable: No/Alarm/Trip
	Voltage tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Time delay: 0.045 to 300.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Activation level: 101%
	Deactivation level: 99%
Function 47	Temporized deactivation
	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
	Function enable: No/Alarm/Trip
	Voltage tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Time delay: 0.045 to 300.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Activation level: 101%
Function 47-L (*)	Deactivation level: 99%
	Temporized deactivation
	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
	Function enable: No/Alarm/Trip
	Voltage tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Time delay: 0.045 to 300.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
Function 32-1 Function 32-2 Function 32-3 Function 32-4	Activation level: 101%
	Deactivation level: 99%
	Temporized deactivation
	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
	Function enable: No/Alarm/Trip
	Activation level: 0.02 to 2.00 xSn (step 0.01xSn)
	Operating angle: 0 to 359° (step 1°)
Function 32-2 Function 32-3 Function 32-4	Time delay: 0.020 to 300.000 s (step 0.001 s)
	Activation level: 100%
	Deactivation level: 95%
	Instantaneous deactivation
	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
	Function enable: No/Alarm/Trip
	Activation level: 0.02 to 2.00 xSn (step 0.01xSn)

Function 81-1 Function 81-2 Function 81-3 Function 81-4 Function 81-5 Function 81-6	Function enable: No/Alarm/Trip
	Type: Underfrequency or overfrequency
	Activation level: 45.000 to 65.000 Hz (step 0.001 Hz)
	Time delay: 0.020 to 300.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Function blocked if phase B voltage is lower than 6% of the LEA Vrms maximum value (Vrms 2.8, 5.2, 8 or 16 Vrms depending on model)
	Activation level: 100%
Function 81R-1 Function 81R-2	Underfrequency reset level: activation level + 50mHz
	Overfrequency reset level: activation level - 50 mHz
	Temporized deactivation
	The frequency measurement is an average value of the frequency measured during 8 cycles. The accuracy of the Time Delay is the adjusted value plus the necessary time to achieve the measurement during 8 cycles.
	Function enable: No/Alarm/Trip
	Type: Increase/Decrease
	Activation level: 0.100 to 5.000 Hz/s (step 0.001 Hz/s)
Function 78	Time delay: 0.060 to 40.000 s (step 0.001 s)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Function blocked if phase B voltage is lower than 6% of the LEA Vrms maximum value (Vrms 2.8, 5.2, 8 or 16 Vrms, depending on model)
	Activation level: 100%
	Temporized deactivation
	The frequency measurement is an average value of the frequency measured during 8 cycles. The accuracy of the Time Delay is the adjusted value plus the necessary time to achieve the measurement during 8 cycles.
	Function enable: No/Alarm/Trip
Function 25 (*)	Activation level: 1 to 25° (step 1°)
	Reset time: 0.020 to 300.000 s (step 0.001 s)
	Function blocked if phase B voltage is lower than 6% of the LEA Vrms maximum value (Vrms 2.8, 5.2, 8 or 16 Vrms, depending on model)
	Temporized deactivation
	Measurement accuracy: $\pm 1^\circ$ or 10% (greater of both)
	Dead tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Live tap: 0.04 to 2.00 xUn (step 0.01xUn)
Function 25 (*)	Voltage supervision time: 0.060 to 300.000 s (step 0.001 s)
	Voltage difference: 0.05 to 2.00 xUn (step 0.01xUn)
	Phase difference: 2 to 90 ° (step 1°)
	Frequency difference: 0.060 to 10.000 Hz (step 0.001 Hz)
	Synchro check time: 0.020 to 300.000 s (step 0.001 s)
	Function enable: No/Alarm/Trip
	Activation level: 1 to 25° (step 1°)

TECHNICAL PARAMETERS SIR-A

Function 79	Number of recloses: 0 to 4 (step 1)
	Reclose times 1, 2, 3, 4: 0.020 to 2000.000 s (step 0.001 s)
	Hold Enable: No/Yes/No Time
	Hold time: 0.020 to 2000.000 s (step 0.001 s)
	Reset time: 0.020 to 2000.000 s (step 0.001 s)
	Safe time: 0.020 to 2000.000 s (step 0.001 s)
	Locking possibilities: pulse inputs, level inputs, commands.
Function SCM	Number of shots: 0 to 4 (step 1)
	Reset time: 0.020 to 2000.000 s (step 0.001 s)
Function SZM	Number of shots: 0 to 4 (step 1)
	Reset time: 0.020 to 2000.000 s (step 0.001 s)
	Max open time: 0.020 to 2000.000 s (step 0.001 s)
	Max close time: 0.020 to 2000.000 s (step 0.001 s)
	Fault current: 0.010 to 20.000 s (step 0.001 xIn)
	Voltage supervision time: 0.000 to 300.000 s (step 0.001 s)
	Dead tap: 0.04 to 2.00 xUn (step 0.01 xUn)
Function 52	Maximum number of openings: 1 to 100,000 (step 1)
	Maximum accumulated amperes: 1 to 100,000 M(A2) (step 1)
	Repetitive number of openings: 1 to 100,000 (step 1)
	Time for repetitive number of openings: 1 to 300 min (step 1 min)
	Maximum opening time: 0.020 to 300.000 s (step 0.001 s)
	Maximum closing time: 0.020 to 300.000 s (step 0.001 s)
	Circuit breaker status monitoring:
	Current measurements: Open breaker activation and reset threshold: 0.8% In (Without using contacts)
Function 74TCS	Using contacts: 52a or 52b and 52a and 52b
	Function enable: No/Yes
	Time delay: 0.020 to 300.000 s (step 0.001 s)
Function 60CTS	Continuity in circuits A and B through configurable inputs
	Function enable: No/Yes
	Time delay: 0.020 to 300.000 s (step 0.001 s)
	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
Function 60VSS	Open breaker activation and reset threshold: 0.8% In
	Detection of the loss of one phase CT
	Function enable: No/Yes
	Time delay: 0.020 to 300.000 s (step 0.001 s)
Function 50BF	V1, V2 and VP Tap: 0.04 to 2.00 xUn (step 0.001xUn)
	I1, I2 and 3I0 Tap: 0.010 to 20.000 xIn (step 0.001xIn)
	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
	Function enable: No/Yes
Function 21FL	Time delay: 0.020 to 1.000 s (step 0.001 s)
	Open breaker activation and reset threshold: 0.8% In
	Function enable: No/Yes
	Line length 0.1 to 100.0 km (step 01 km)
	Z1 line magnitude: 0.001 to 5.000 (step 0.001 Ω /km)
	Z1 line angle: 1 to 90° (step 1°)
	Z0 line magnitude: 0.001 to 5.000 (step 0.001 Ω /km)
	Z0 line angle: 1 to 90° (step 1°)

LMS (*) ⁽¹⁾	Function enable: No/Yes
	No Peak Mode: Alarm/Trip
	Peak mode: Alarm/Trip
	Peak period starting month: January to December
	Peak period starting day: 1 to 31 (step 1)
	Peak period ending month: January to December
	Peak period ending day: 1 to 31 (step 1)
	Peak period starting hour: 0 to 23 (step 1 hour)
	Peak period starting minute: 0 to 59 (step 1 minute)
	Peak period ending hour: 0 to 23 (step 1 hour)
	Peak period ending minute: 0 to 59 (step 1 minute)
	Peak period starting day of week: Monday to Sunday
	Peak period ending day of week: Monday to Sunday
	Reset Time: 0 to 18000 s (step 1 s)
	Peak period Tap: 0.010 to 30.000 xIn (step 0.001xIn)
	Peak trip Time 1: 0 to 18000 s (step 1 s)
	Peak trip Time 2: 0 to 18000 s (step 1 s)
	Peak trip Time 3: 0 to 18000 s (step 1 s)
	Peak trip Time 4+: 0 to 18000 s (step 1 s)
	Peak Number of recloses: 0 to 247 (Step 1)
	Peak Interval Time 1: 0 to 18000 s (Step 1 s)
	Peak Interval Time 2: 0 to 18000 s (Step 1 s)
	Peak Interval Time 3: 0 to 18000 s (Step 1 s)
	Peak Interval Time 4+: 0 to 18000 s (Step 1 s)
Function AFD (*)	No Peak period Tap: 0.010 to 30.000 xIn (step 0.001xIn)
	No Peak trip Time 1: 0 to 18000 s (step 1 s)
	No Peak trip Time 2: 0 to 18000 s (step 1 s)
	No Peak trip Time 3: 0 to 18000 s (step 1 s)
Power supply control	Peak trip Time 4+: 0 to 18000 s (step 1 s)
	No Peak Number of recloses: 0 to 247 (Step 1)
	No Peak Interval Time 1: 0 to 18000 s (Step 1 s)
	No Peak Interval Time 2: 0 to 18000 s (Step 1 s)
Function 49T	No Peak Interval Time 3: 0 to 18000 s (Step 1 s)
	No Peak Interval Time 4+: 0 to 18000 s (Step 1 s)
Power Flow ⁽¹⁾	Function enable: No/Alarm/Trip
	Current tap: 1 to 20xIn (step 1xIn)
	Time delay: 1 to 4 samples (step 1 sample)
	Function enable: No/Yes
Function 86	V supply alarm 1: 19 to 220 Vdc (step 1 V)
	V supply alarm 2: 19 to 220 Vdc (step 1 V)
Function 68	Available through configurable inputs thanks to the programmable logic
	Function enable: No/Yes
Function Phase Rotation ⁽²⁾	Settings Group: 1-6
	Interval Time: 0.02 to 300 s (step 0.001)
	Power Flow Direction: ABC to RST or RST to ABC
	It allows latching (lockout) the contact trip due to programmable logic (PGC: RSFF or SRFF).
	Available through configurable inputs and outputs thanks to the programmable logic (PGC).
	Available by selecting "phase rotation" and "CT polarity" settings in general settings menu.

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Programmable logic control (PGC)	OR, OR_1PULSE, OR_PULSES, OR_BLINKING, OR_TIMER UP, OR_TIMER DOWN NOR, NOR_1PULSE, NOR_PULSES, NOR_BLINKING, NOR_TIMER UP, NOR_TIMER DOWN AND, AND_1PULSE, AND_PULSES, AND_BLINKING, AND_TIMER UP, AND_TIMER DOWN NAND, NAND_1PULSE, NAND_PULSES, NAND_BLINKING, NAND_TIMER UP, NAND_TIMER DOWN XOR, OR_1PULSE, XOR_PULSES, XOR_BLINKING, XOR_TIMER UP, XOR_TIMER DOWN SRFF, SRFF_1PULSE, SRFF_PULSES, SRFF_BLINKING, SRFF_TIMER UP, SRFF_TIMER DOWN and NON-VOLATILE FF. RSFF, RSFF_1PULSE, RSFF_PULSES, RSFF_BLINKING, RSFF_TIMER UP, RSFF_TIMER DOWN and NON-VOLATILE FF R_EDGE, R_EDGE_1PULSE F_EDGE, F_EDGE_1PULSE	Outputs (*)	Depending on Model: - 7 configurable outputs - 18 configurable outputs - 7 configurable outputs + 4 High-Speed Outputs - 11 configurable outputs Model with 7 outputs: 250 V AC – 8 A; 30 V DC – 8 A Model with 11 outputs: Outputs 1 ... Output 9: 250 V AC – 8 A; 30 V DC – 8 A Output 10 and 11: 250 V AC – 16 A; 30 V DC – 16 A (*) Model with 18 outputs: Outputs 1 ... Output 16: 250 V AC – 8 A; 30 V DC – 8 A Output 17 and 18: 250 V AC – 16 A; 30 V DC – 16 A (*) Contact current short duration: 30A – 200ms (*) The activation of Output 10 and 11 (Model with 11 configurable outputs), and Output 17 and 18 (Model with 18 configurable outputs) can be increased by +5ms.
Settings groups	6 settings groups Selectable by input, communications, user commands or general settings.	Frequency	50/60Hz
SER	3072 events	Energizing Quantities	Burden of current inputs: <0.015 VA (1 A) & <0.375 VA (5 A) Burden of voltage inputs (depending on the model): SIR001 (8 Vrms – 1 MOhm)→ Burden= 0.064 mVA SIR002 (5.2 Vrms – 2 MOhms)→ Burden= 0.01352 mVA SIR003 (16 Vrms – 2 MOhms)→ Burden= 0.128 mVA SIR004 (2.8 Vrms – 20 MOhms)→ Burden= 0.000392 mVA Burden of power supply unit: SIRAxXXAxXXXXX & SIRAxXXBXXXXX 24-48 Vdc/48-230 Vac/dc: < 20 VA. SIRAxXXCXXXXX 24-230 Vdc/Vac: < 12 VA. Burden for binary inputs: 24 Vdc: <20 mW 230 Vdc: <200 mW 24 Vac: <50 mW 230 Vac: < 500 mW
Disturbance Fault Recording (DFR)	32 samples/cycle 10 analog channels and 96 configurable digital channels Configurable DFR start Configurable number of records depending on the size: 5 records in data and COMTRADE format (300 cycles each record): 1 to 8 pre-fault cycles + 292 to 299 post-fault cycles. 25 records in data and COMTRADE format (60 cycles each record): 1 to 8 pre-fault cycles + 52 to 59 post-fault cycles. 50 records in data and COMTRADE format (30 cycles each record): 1 to 8 pre-fault cycles + 22 to 29 post-fault cycles. 100 records in data and COMTRADE format (15 cycles each record): 1 to 8 pre-fault cycles + 7 to 14 post-fault cycles.) COMTRADE IEEE C37.111-1991 Up to 100 fault reports (data format) with a maximum 29 events, each one	Current measurements	Phase currents (IA, IB, IC), neutral (IN, 3I0), positive sequence (I1) and negative sequence (I2), I2/I1, maximum current (Imax), thermal image (TI), second harmonic (IA2H, IB2H, IC2H, I-N2H), current total harmonic distortion (THD-A, THD-B and THD-C). Fundamental values (DFT) Sampling: 32 samples/cycle Phase and Neutral (1 A or 5 A): ±2% precision in a band covering ±20% of nominal current and ±4% or ±5 mA in the rest of the range Neutral (0.1 A): ±2% precision in a band covering ±20% of nominal current and ±4% or ±0.5 mA in the rest of the range Current measurement range: From 0.01 to 30 times the nominal current
Load Data Profiling (LDP)	Demand of power with the following characteristics: - Number of records: 2160 - Circular recording mode - Sampling rate (interval): configurable through communications (1-60 min)		
Inputs (*)	Depending on Model: - 8 configurable inputs - 11 configurable inputs - 24 configurable inputs - 8 configurable inputs + 4 AFD inputs - 16 configurable inputs The voltage of the inputs is the same as the auxiliary power supply Burden: 24 Vdc: <20 mW 230 Vdc: <200 mW 24 Vac: <50 mW 230 Vac: < 500 mW		

TECHNICAL PARAMETERS SIR-A

Voltage measurements	Phase voltage (V-A, V-B, V-C), line voltage (VL-A, VL-B, VL-C), phase-phase voltage (UAB, UBC, UCA), neutral voltage (VR, 3-V0), neutral line voltage (3-VL0), positive sequence voltage (V-1) and negative sequence voltage (V-2), line positive sequence (VL-1) and line negative sequence (VL-2), maximum voltage (VMAX) and maximum line voltage (VLMAX).
	Fundamental values (DFT)
	Sampling: 32 samples/cycle
	1% precision in a band covering $\pm 20\%$ of nominal voltage and 4% in the rest of the range
	Voltage sensors: LEA of 2.8Vrms LEA of 8Vrms, LEA of 5.2Vrms or LEA of 16Vrms.
	Voltage measurement range: Measured voltage: From $(0.01282 \times \text{LEA Maximum voltage} \times \text{Ratio})$ to $2.4 \times \text{Un}$ Calculated voltage: From $(0.013 \times \text{LEA Maximum voltage} \times \text{Ratio})$ to $2.4 \times \text{Un}$
Angle measurements	Current Angles: IA, IB, IC, IN and 3I0.
	Voltage Angles: VA, VB, VC, VR, VLA, VLB, VLC, 3V0, UAB, UBC and UCA.
	Power factor: Cos PHI-A, Cos-PHI-B and Cos-PHI-C
Power measurements	Accuracy: $\pm 2^\circ$
	Angle measurement range: From 0 to 359°
	Total and per phase active power
	Total and per phase reactive power
	Total and per phase apparent power
Energy measurement	Power factor: Cos PHI-A, Cos PHI-B and Cos PHI-C
	2% accuracy in rated values with power factor between 1 and 0.7 (phase shift from 0 to $\pm 45^\circ$).
Frequency measurements	Positive and negative active energy
	Positive and negative reactive energy
	Busbar Frequency, Line Frequency, df/dt
	Minimum voltage: 5.77% of the LEA Vrms maximum value (2.8, 5.2, 8 or 16 Vrms depending on model)
Communications	Accuracy: $\pm 0.005 \text{ Hz}$
	Frequency measurement range: From 45 to 65 Hz
	Local port (micro-USB): Modbus RTU
	Wireless communication (Wi-Fi) (*)
	Rear Serial Port (RS485): Modbus RTU, DNP3.0 and IEC60870-5-103 (selectable by general settings) (*) Adaptation B: Rear Serial Port (RS485) (*) Adaptation C: Rear Serial Port (RS485 or RS232) (selectable by the user, both ports are not available simultaneously) (*)
Power supply (*)	Remote Ethernet Port (RJ45 (10/100 Base-Tx) or FO-LC(10/100 Base-Fx)): Modbus TCP/IP, DNP3.0 TCP/IP, IEC60870-5-104 or IEC61850 (selectable by general settings) + SNTP Protocol + Web Server + IRIG-B (*)
	24-48 Vdc (Tolerance: $-20/+10\%$)
	48-230 Vac/dc (48-220 Vdc ($\pm 20\%$) / 100-230 Vac ($\pm 15\%$))
	24-230 Vac/dc (24-220 Vdc ($\pm 20\%$) / 100-230 Vac ($\pm 15\%$))
	Burden: SIRAxXXAxxxxxx & SIRAxXXBxxxxxx 24-48 Vdc/48-230 Vac/dc: < 20 VA. SIRAxXXCxxxxxx 24-230 Vdc/Vac: < 12 VA.

Environmental conditions	Operating temperature: -40 to 70°C
	Storage temperature: -40 to 80°C
	Relative humidity: 95%
Mechanical characteristics	Metallic box
	Panel mounted
	HxWxD: 198x187x153.15 (mm)
	Depth: 153.15 mm
	IP-54
	The required screws to fix the relay should be M4

(*) Optional depending on model

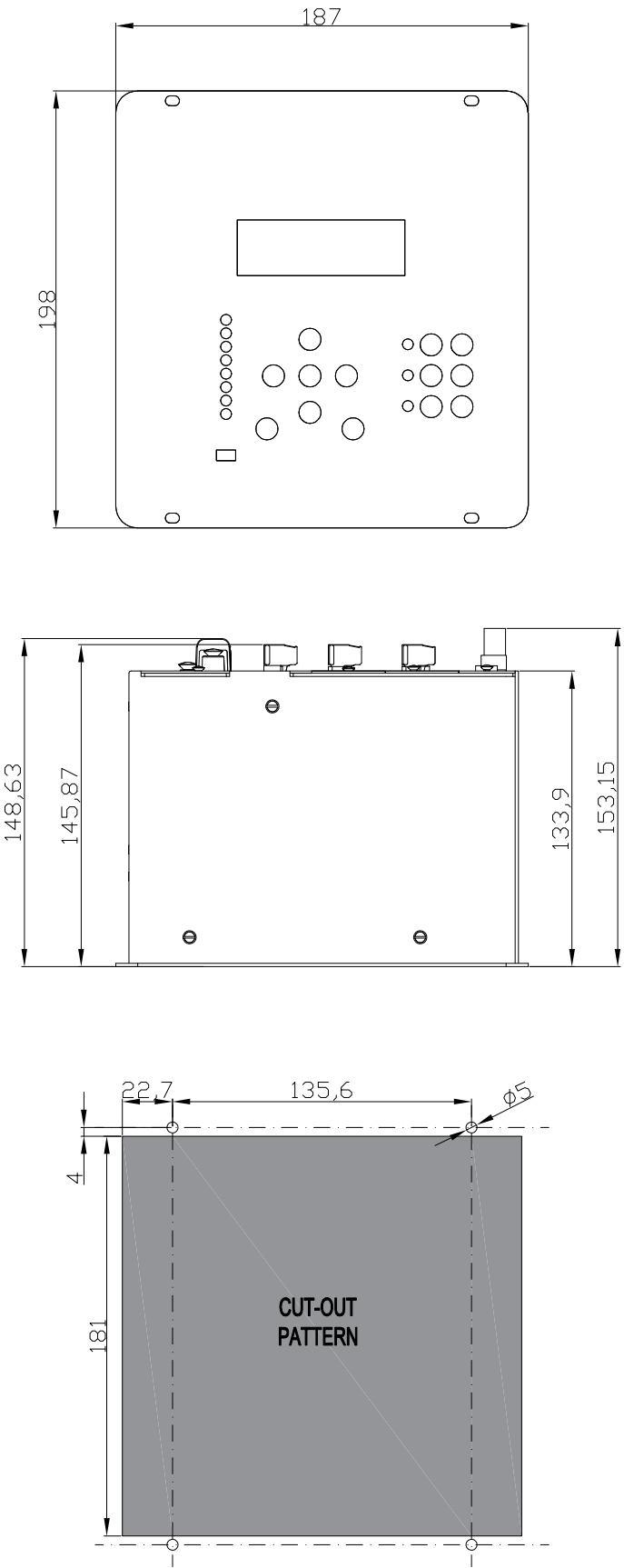
⁽¹⁾ Available from fw version 1.22.00 onwards.

⁽²⁾ Available from fw version 1.23.00 onwards.

NOTE: 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)

DIMENSIONS AND CUTOUT SIR-A

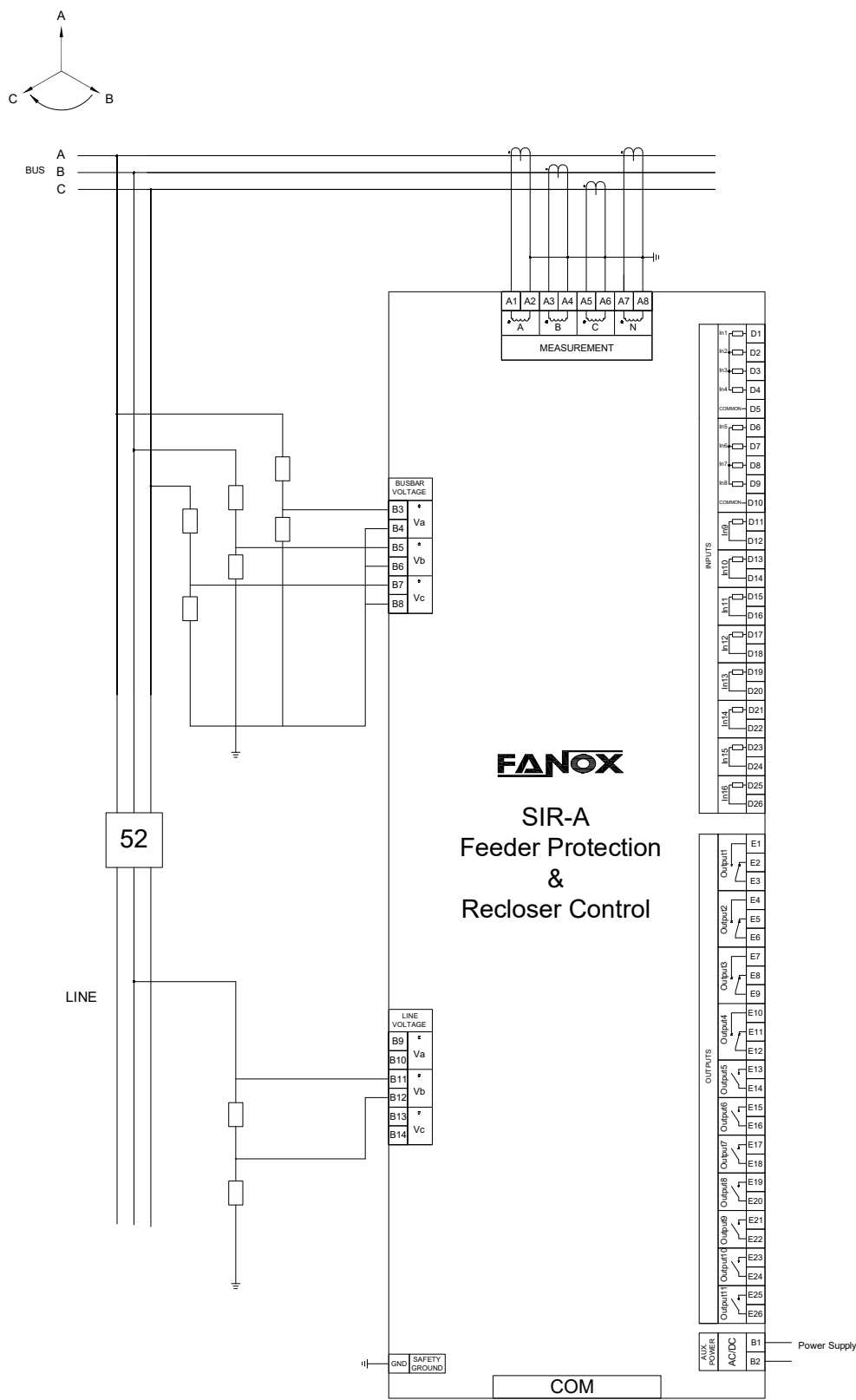


3 resistive sensors + 4 current transformers



CONNECTIONS DIAGRAM SIR-A

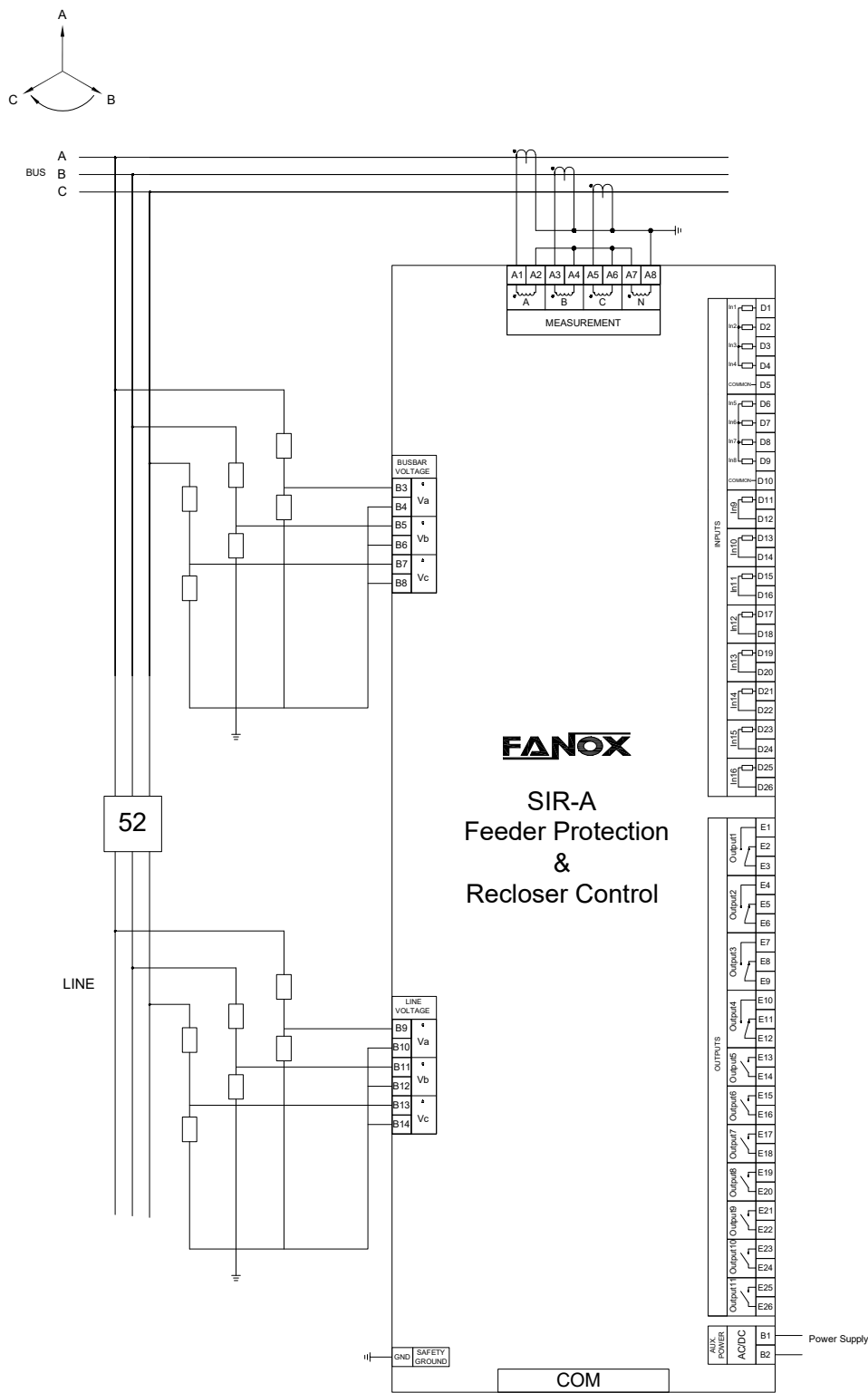
4 resistive sensors + 4 current transformers



(*) Example of connections diagram

CONNECTIONS DIAGRAM SIR-A

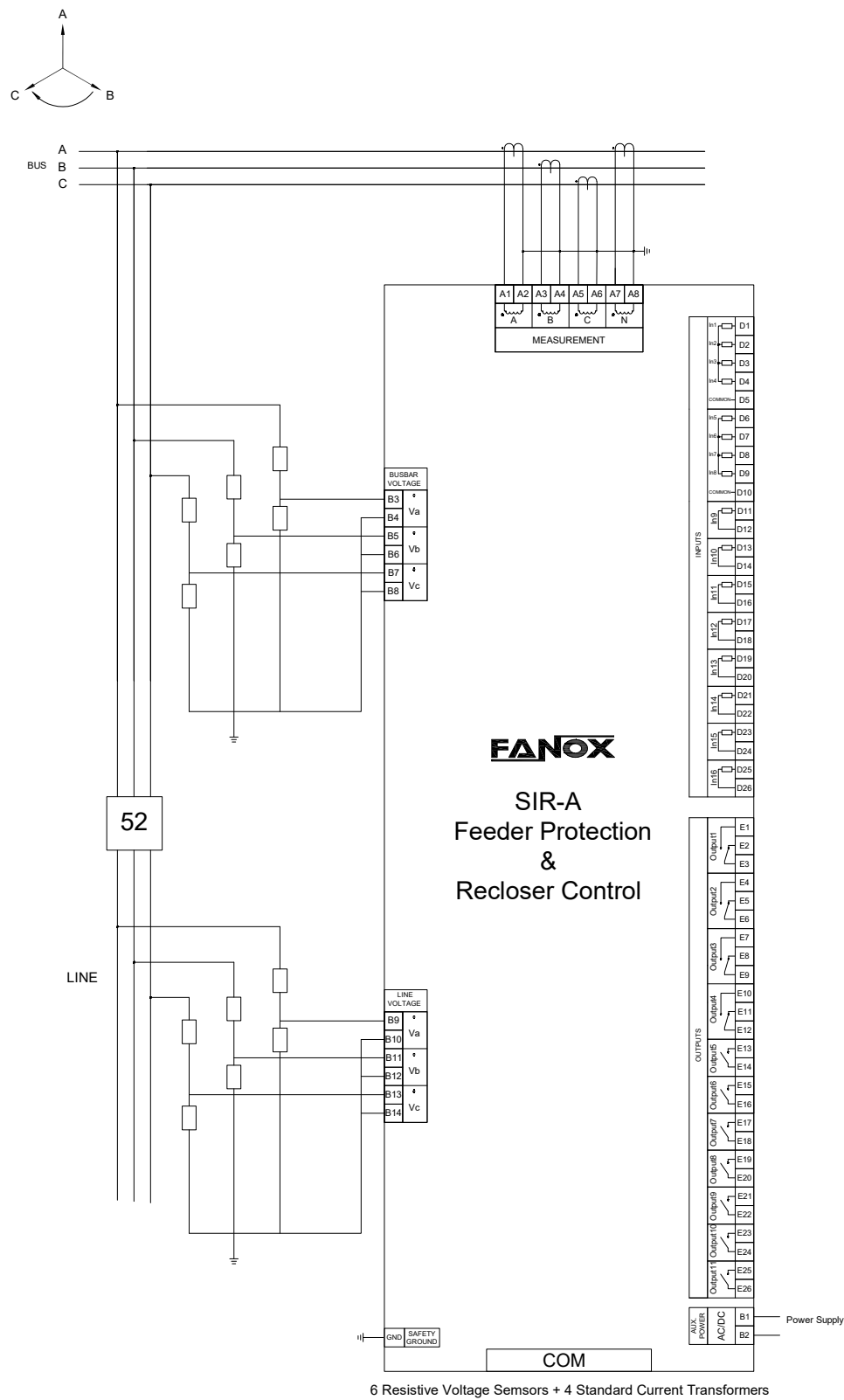
6 resistive sensors + 3 current transformers



(*) Example of connections diagram

CONNECTIONS DIAGRAM SIR-A

6 resistive sensors + 4 current transformers



(*) Example of connections diagram

KEMA STANDARDS TYPE TESTS SIR-A

TEST	TEST STANDARD	LEVEL
1. PRODUCT SAFETY REQUIREMENTS		
1.1. Clearance and creepage	IEC60255-27 Clause 10.6.3	see standard
1.2.1. Accessible parts test	IEC60255-27 Clause 10.6.2.5	IP2X
1.2.2. IP rating	IEC 60255-1, Clause 6.3 IEC60255-27 Clause 10.6.2.6	IP54 (front)
1.3. Impulse voltage	IEC60255-27 Clause 10.6.4.2	5 kV 1 kV
1.4. Dielectric voltage	IEC60255-27 Clause 10.6.4.3	2 kV 0,5 kV
1.5. Insulation resistance	IEC60255-27 Clause 10.6.4.4	500 VDC
1.6. Protective bonding	IEC60255-27 Clause 10.6.4.5	≤ 0,1 Ω
1.7. Flammability (visual inspection)	IEC60255-27 Clause 10.6.5.2	☐ 70/80 °C ☐ 70/80 °C ☐ V-2 ☐ 55/70 °C ☐ 55/70 °C ☐ V-2 ☐ V-1 ☐ V-1 ☐ V-1 ☐ V-1
☐ Housing ☐ Cover ☐ Terminals ☐ Push buttons ☐ Display ☐ PCB boards ☐ (Input) trans-formers ☐ Opto couplers ☐ Output relays ☐ Wires		
1.8. Single fault condition		no fire risk
☐ Power supply circuit		
1.9. Thermal short-time test		☐ 2xUn ☐ 2,4xUn ☐ 4xIn ☐ 100xIn
☐ Overvoltage VT, cont. ☐ Overvoltage VT, 10s. ☐ Overcurrent CT, cont. ☐ Overcurrent CT, 1s		

2. ELECTROMAGNETIC COMPATIBILITY (EMC) tests		
2.1. EMISSION		
2.1.1. Radiated emission	IEC 60255-26 CISPR11 CISPR22 table 1 table 6 table 7	class A class A
2.1.2. Conducted emission	IEC 60255-26 CISPR22 table 2 table 2/4	class A
2.2. IMMUNITY		
2.2.1. Slow damped oscillatory wave (1 MHz)	IEC 60255-26 (IEC 61000-4-18) Clause 7.2.6	2,5 kV CM 1,0 kV DM 1 kV CM 0 kV DM
2.2.2. Electrostatic discharges	IEC 60255-26 (IEC 61000-4-2) Clause 7.2.3	6 kV cont. 8 kV air
2.2.3. Radiated radio frequency magnetic field	IEC 60255-26 (IEC 61000-4-3) Clause 7.2.4	80 - 1000 MHz 10 V/m 1,4 - 2,7 GHz 10 V/m 80, 160, 380, 450, 900, 1850, 2150 MHz 10 V/m
2.2.4. Fast transient/burst	IEC 60255-26 (IEC 61000-4-4) Clause 7.2.5	☒ Zone A 4 kV CM 2 kV CM ☐ Zone B 2 kV CM 1 kV CM
2.2.5. Surge	IEC 60255-26 (IEC 61000-4-5) Clause 7.2.7	☒ Zone A to 4 kV LE to 2 kV LL ☐ Zone B to 2 kV LE to 1 kV LL
2.2.6. Conducted disturbance induced by RF fields	IEC 60255-26 (IEC 61000-4-6) Clause 7.2.8	0,15 - 80 MHz 10 V 27, 68 MHz 10 V
2.2.7. Power frequency voltage	IEC 60255-26 (IEC 61000-4-16) Clause 7.2.9	☒ Zone A 150 V DM 300 V CM ☐ Zone B 100 V DM 300 V CM
2.2.8. Power frequency H- field	IEC 60255-26 (IEC 61000-4-8) Clause 7.2.10	30 A/m cont. 300 A/m 1-3 s

2.2.9 D.C. voltage dips	IEC 60255-26 (IEC 61000-4-29) Clause 7.2.11	100%; 10 – 1000 ms 60%; 200 ms 30%; 500 ms
2.2.10. A.C. voltage dips	IEC 60255-26 (IEC 61000-4-11) Clause 7.2.11	100%; 0,5 – 25 c. 60%; 10/12 c. 30%; 25/30 c.
2.2.11. D.C. voltage interruptions	IEC 60255-26 (IEC 61000-4-29) Clause 7.2.11	100%; 5 s
2.2.12. A.C. voltage interruptions	IEC 60255-26 (IEC 61000-4-11) Clause 7.2.11	100%; 250/300 c
2.2.13. D.C. ripple	IEC 60255-26 (IEC 61000-4-17) Clause 7.2.12	15% Ur dc 100/120 Hz
2.2.14. D.C. gradual shut-down / start-up	IEC 60255-26 Clause 7.2.13	Shut d. ramp 60 s 5 min off St up ramp 60s
2.2.15. Damped oscillatory magnetic field (100 kHz and 1 MHz)	IEC 61000-4-10	100 A/m (peak)
2.2.16. Pulse magnetic field	IEC 61000-4-9	1000 A/m
3. CLIMATIC ENVIRONMENTAL CONDITIONS		
3.1. Dry heat operational	IEC 60255-1 (IEC 60068-2-2, test Bd) Clause 6.12.3.1	+70°C; 72h
3.2. Cold operational	IEC 60255-1 (IEC 60068-2-1, test Ad) Clause 6.12.3.2	-40°C; 72h
3.3. Dry heat storage	IEC 60255-1 (IEC 60068-2-2, test Bb) Clause 6.12.3.3	+80°C; 72h
3.4. Cold storage	IEC 60255-1 (IEC 60068-2-1, test Ab) Clause 6.12.3.4	-40°C; 72h
3.5. Change of temperature	IEC 60255-1 (IEC 60068-2-14, test Nb) Clause 6.12.3.5	-40°C; +70°C 3 hours; 5 cycles
3.6. Damp heat, steady state	IEC 60255-1 (IEC 60068-2-78, test Cab) Clause 6.12.3.6	+40°C; 93% 10 days
3.7. Damp heat, cyclic	IEC 60255-1 (IEC 60068-2-30, test Db) Clause 6.12.3.7	+25°C; 40°C 97%; 93% 6 cycles

4. MECHANICAL ENVIRONMENTAL CONDITIONS		
4.1. Vibration response	IEC 60255-1 (IEC 60255-21-1) Clause 6.13.1	class 1
4.2. Vibration endurance	IEC 60255-1 (IEC 60255-21-1) Clause 6.13.1	class 1
4.3 Shock response	IEC 60255-1 (IEC 60255-21-2) Clause 6.13.2	class 1
4.4. Shock withstand	IEC 60255-1 (IEC 60255-21-2) Clause 6.13.2	class 1
4.5 Bump	IEC 60255-1 (IEC 60255-21-2) Clause 6.13.2	class 1
4.6 Seismic (single axis sweep)	IEC 60255-1 (IEC 60255-21-3) Clause 6.13.3	class 1



SELECTION & ORDERING DATA SIR-A

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/Vdc (Only for Adaptation B) 24-230 Vac/Vdc
				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) (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 + 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 (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 + IRIG-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 + IRIG-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 + IRIG-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)

SELECTION & ORDERING DATA SIR-A

							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 + Phase Rotation 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).