

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) + SNTP Protocol + Web Server.
- Wireless communication (Wi-Fi) and synchronization through IRIG-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).

The diagram illustrates the SIR-A board's internal architecture and its connections to a BUS and a LINE. Key components include:

- Voltage sensors (LEAs):** Two sensors are shown, one connected to the BUS and another to the LINE. They monitor various points on the board, including 67NI, 67N/51N, 67/51, 50[79], SOTF, 67/51 [79], 50, 50N, 46, 46BC, 37, 49, SHB, 60CTS, 50BF, CLP, LMS*, and 25*.
- Switches:** A 3-position switch (3/1) is connected to the BUS and LINE. Another switch (3/1) is connected to the LINE and the 67GI/67G/51G sensor.
- Modules:** A row of modules including PSC, SCM, SZM, HLT, 79, 52, 74TCS, 21FL, 68, 86, PF, and 25* is connected to the LINE. Below them are modules for SER, ALRM, PGC, HMI, LDP, DFR, RTC, MET, STTG, CMMB, and CNT.
- Optional Features:** Indicated by asterisks (*), these include FO*, IRIG-B*, WIFI*, ETHERNET*, USB, and Rear serial ports (RS485 or RS232).

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

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

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Function 67G/51G-1 Function 67G/51G-2	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%
Function 67NI	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/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 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%
50[79] (*)	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)
	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)	Function 50INC (*) ⁽¹⁾	Deactivation level: 95%
	Time dial (TMS): 0.01 to 25.00 (step 0.01)		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 49	Function enable: No/Alarm/Trip
	If Curve type U: 0.05 to 15.00 (step 0.01)		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)
Function 64REF	Polarization voltage: 0.04 to 2.00 xUn (step 0.01xUn)	Function SHB	ζ cooling: 1 to 6 x ζ heating (step 1)
	Operating angle: 0 to 359° (step 1°)		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 CLP	Function enable: No/Yes
	Definite time, current deactivation level: 95%		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 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)
Function 27-1 Function 27-2	Minimum level: 0.000 to 1.000 xIn (step 0.001xIn)
	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 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
	Timing accuracy: ± 30 ms or ± 0.5% (greater of both)
	Function enable: No/Alarm/Trip
Function 27V1	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%
	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)
Function 27V1-L (*)	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 59-1 Function 59-2	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)

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
	Timing accuracy: ± 30 ms or ± 0.5% (greater of both)
	Function enable: No/Alarm/Trip
Function 27V1	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%
	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)
Function 27V1-L (*)	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 59-1 Function 59-2	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)

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Function 59N-1	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 59N-2	Activation level: 101%
	Deactivation level: 99%
	Temporized deactivation
	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
Function 59N-L (*)	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
	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
Function 47	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
	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
Function 47-L (*)	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
	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
Function 32-1	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	Time delay: 0.020 to 300.000 s (step 0.001 s)
Function 32-3	Activation level: 100%
	Deactivation level: 95%
Function 32-4	Instantaneous deactivation
	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
Function 81-1	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 81-2	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)
Function 81-3	Activation level: 100%
Function 81-4	Underfrequency reset level: activation level + 50mHz
Function 81-5	Overfrequency reset level: activation level - 50 mHz
Function 81-6	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 81R-1	Function enable: No/Alarm/Trip
	Type: Increase/Decrease
	Activation level: 0.100 to 5.000 Hz/s (step 0.001 Hz/s)
	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 81R-2	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 78	Function enable: No/Alarm/Trip
	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)
Function 25 (*)	Dead tap: 0.04 to 2.00 xUn (step 0.01xUn)
	Live tap: 0.04 to 2.00 xUn (step 0.01xUn)
	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)

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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)
Function 60VSS	Timing accuracy: ± 30 ms or $\pm 0.5\%$ (greater of both)
	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°)
Function 86	Z0 line magnitude: 0.001 to 5.000 (step 0.001 Ω /km)
	Z0 line angle: 1 to 90° (step 1°)
	Function enable: No/Yes

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)
	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)
	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)
	No Peak Interval Time 3: 0 to 18000 s (Step 1 s)
	No Peak Interval Time 4+: 0 to 18000 s (Step 1 s)
Function AFD (*)	Function enable: No/Alarm/Trip
Power supply control	Current tap: 1 to 20xIn (step 1xIn)
	Time delay: 1 to 4 samples (step 1 sample)
Function 49T	Function enable: No/Yes
	V supply alarm 1: 19 to 220 Vdc (step 1 V)
Power Flow ⁽¹⁾	V supply alarm 2: 19 to 220 Vdc (step 1 V)
	Available through configurable inputs thanks to the programmable logic
Function 86	Function enable: No/Yes
	Settings Group: 1-6
	Interval Time: 0.02 to 300 s (step 0.001)
Function 68	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).
Function Phase Rotation ⁽²⁾	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		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.		
SER	3072 events		
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		
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		
Outputs (*)			
Frequency	50/60Hz		
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: SIRAxixAxxxxxx & SIRAxixBxxxxxx 24-48 Vdc/48-230 Vac/dc: < 20 VA. SIRAxixCxxxxxx 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		
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		

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 $2.4 \times U_n$ Calculated voltage: From $(0.013 \times \text{LEA Maximum voltage} \times \text{Ratio})$ to $2.4 \times U_n$
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
	Accuracy: $\pm 2^\circ$ Angle measurement range: From 0 to 359°
Power measurements	Total and per phase active power
	Total and per phase reactive power
	Total and per phase apparent power
	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 $\pm 45^\circ$).
Energy measurement	Positive and negative active energy
	Positive and negative reactive energy
Frequency measurements	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)
	Accuracy: ± 0.005 Hz
	Frequency measurement range: From 45 to 65 Hz
Communications	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 + IIRIG-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

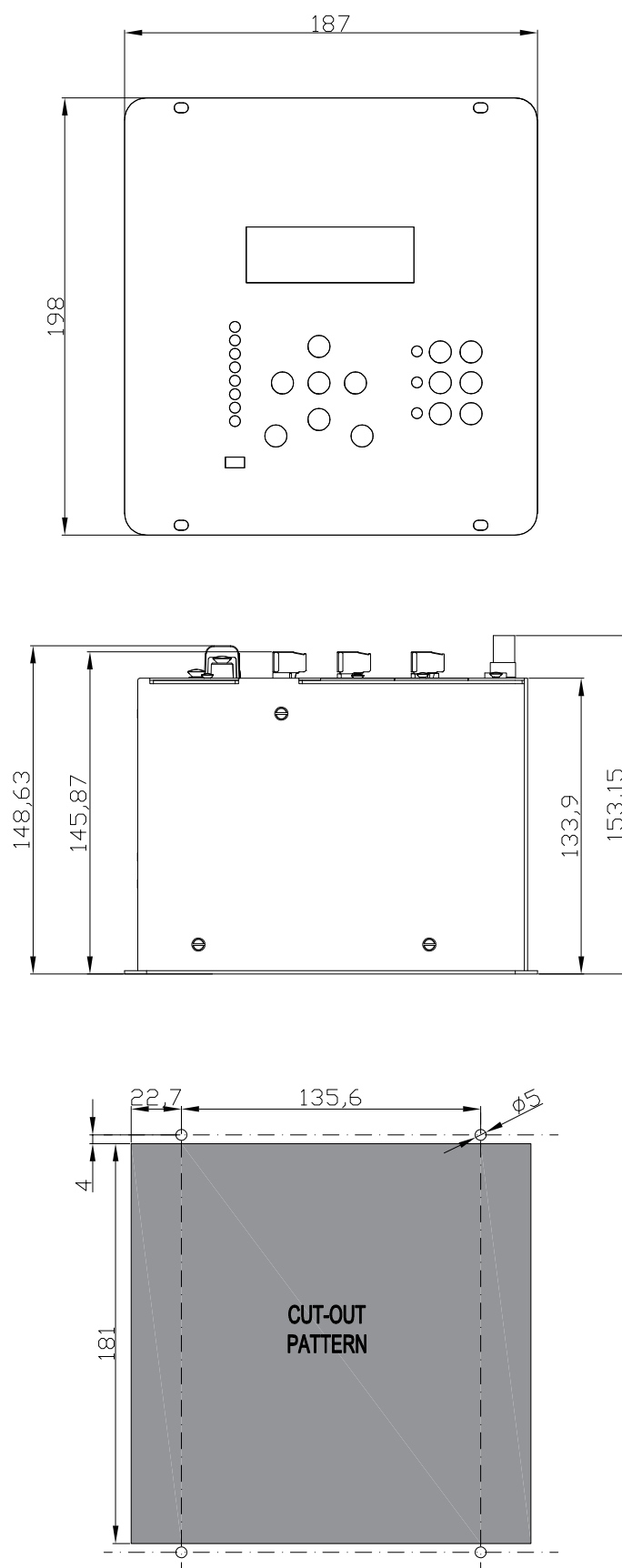
⁽¹⁾ Available from fw version 1.22.00 onwards.

⁽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.

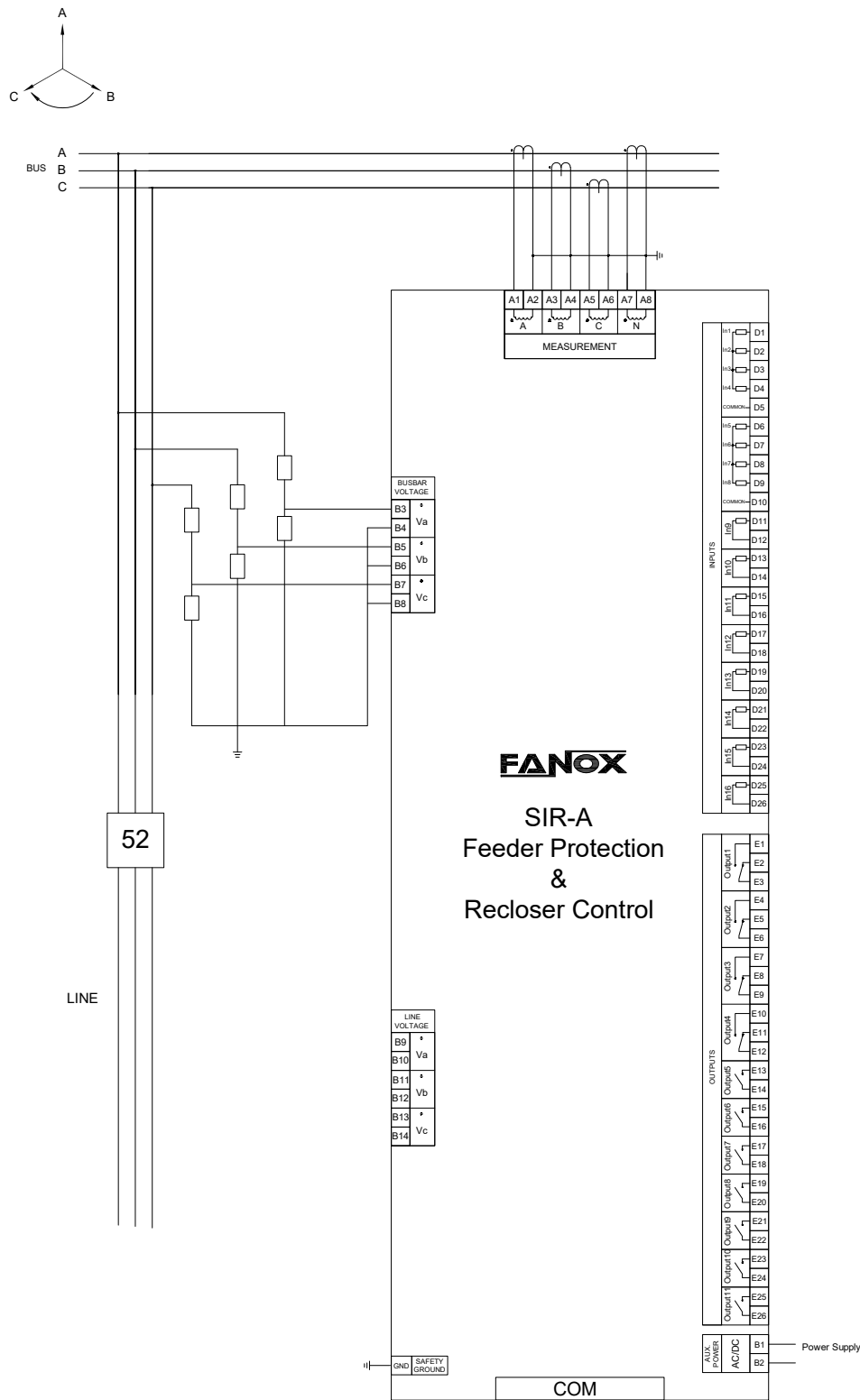
NOTE: ANSI 50G, ANSI 67G and ANSI 67GI will be converted into ANSI 50GS, ANSI 67GS and ANSI 67GSI in the model with neutral current measurement digit 1 (IN = 0.1A or 1A)

DIMENSIONS AND CUTOUT SIR-A



CONNECTIONS DIAGRAM SIR-A

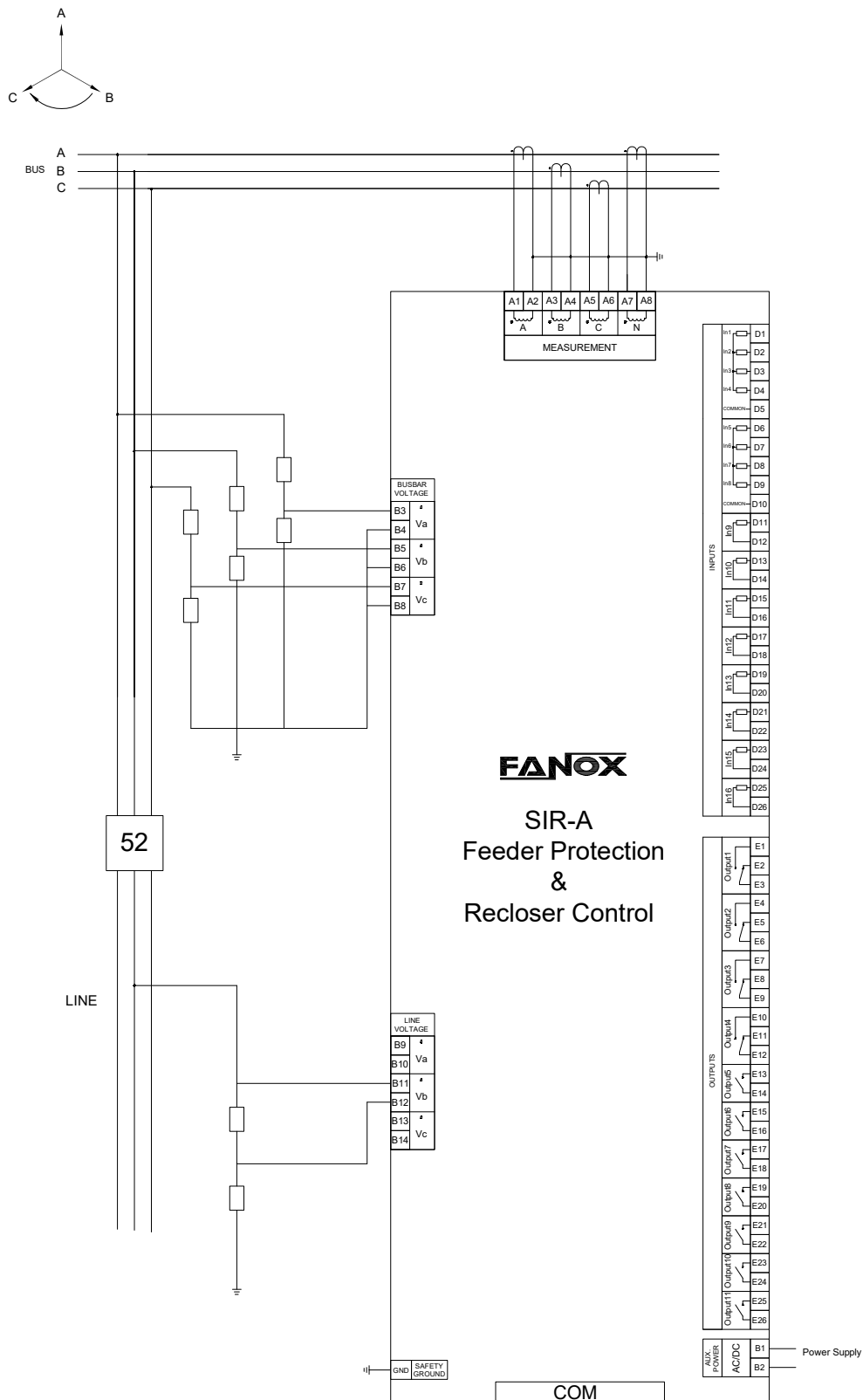
3 resistive sensors + 4 current transformers



(*) Example of connections diagram

CONNECTIONS DIAGRAM SIR-A

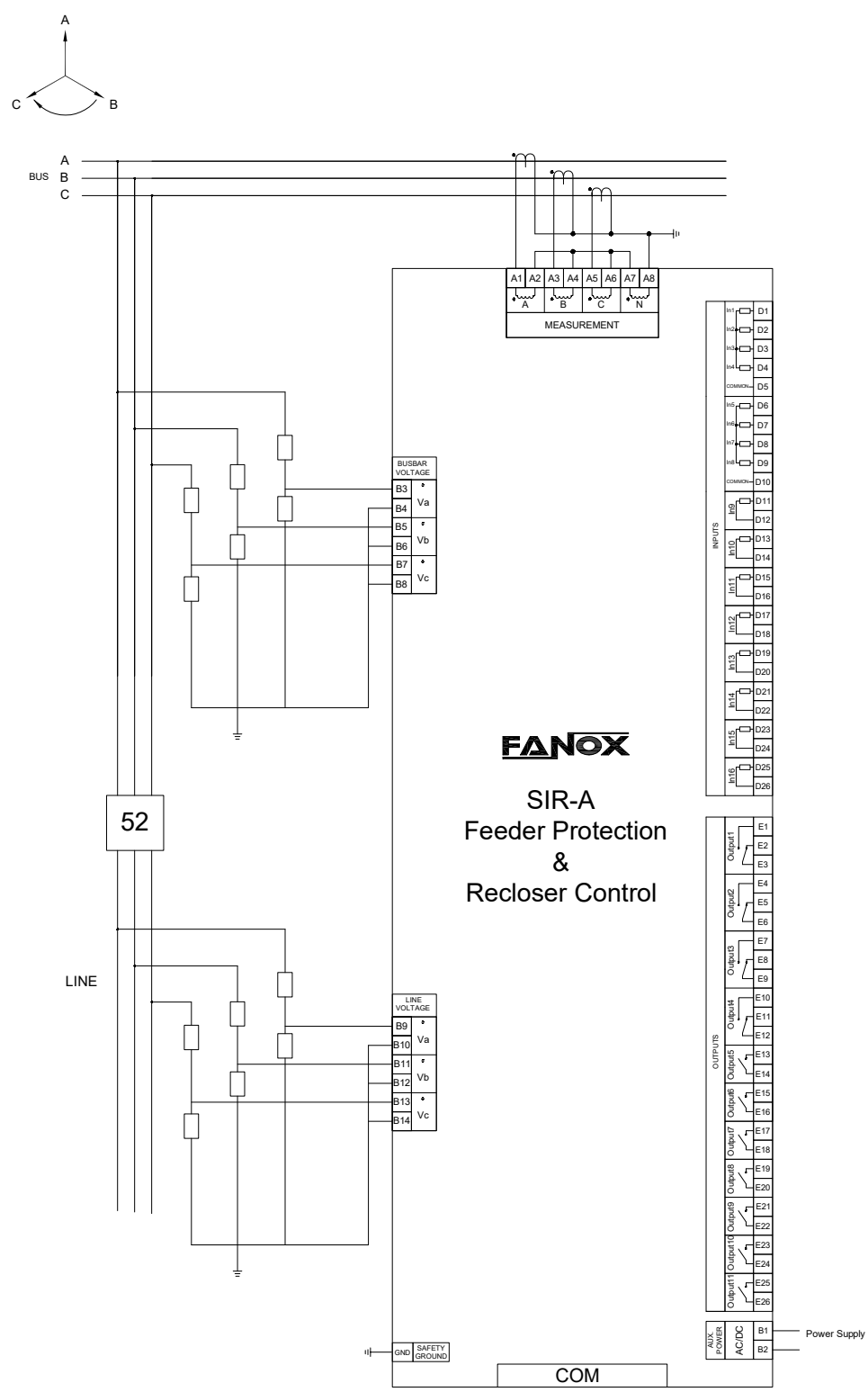
4 resistive sensors + 4 current transformers



(*) Example of connections diagram

CONNECTIONS DIAGRAM SIR-A

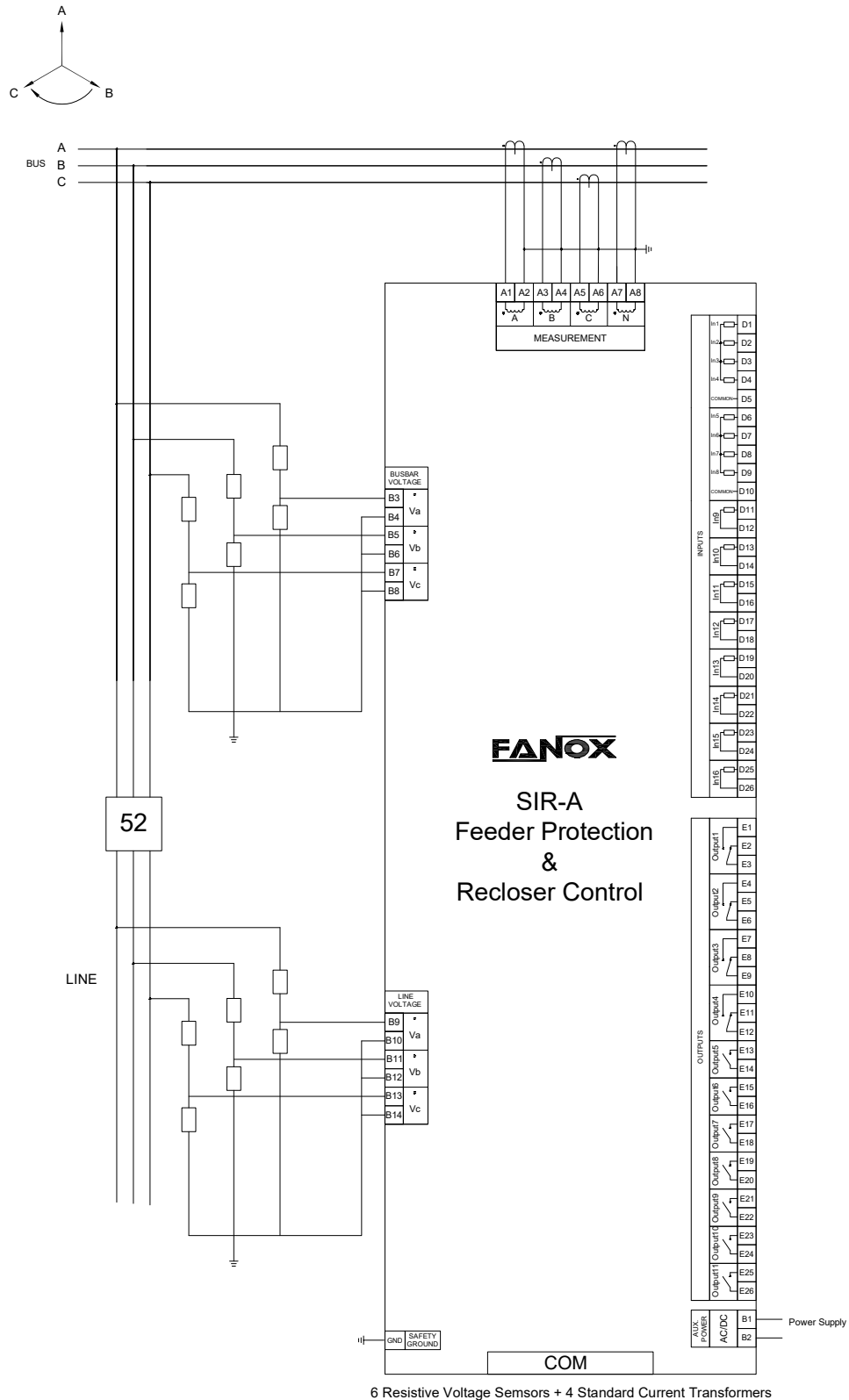
6 resistive sensors + 3 current transformers



(*) 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 cree-page	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
☐ Housing		
☐ Cover		
☐ Terminals		
☐ Push buttons		
☐ Display		
☐ PCB boards		
☐ (Input) trans-formers		
☐ Opto couplers		
☐ Output relays		
☐ Wires		
1.8. Single fault condition	IEC60255-27 Clause 10.6.5.5	no fire risk
☐ Power supply circuit		
1.9. Thermal short-time test	IEC60255-27 Clause 10.6.5.3	☐ 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 (21FL) ³ + (1) 50 + (3) 67/51 + 50INC (21FL) ³ + LMS
					A B 2 E F G 3 J M N O P Q R U V					COMMUNICATIONS A: 1xUSB + 1xRS485 B: 1xUSB + 1xRS485 + 1xRJ45 + IRIG-B 2 : 1xUSB + 1xRS485 + 1xRJ45 + HSR/PRP RJ45 + IRIG-B E: 1xUSB + 1xRS485 + 1xRJ45 + HSR/PRP SFP Cages + IRIG-B F : 1xUSB + 1xRS485/RS232* + 1xRJ45 + IRIG-B (*) G: 1xUSB + WiFi + 1xRS485 + 1xRJ45 + IRIG-B 3 : 1xUSB + WiFi + 1xRS485 + 1xRJ45 + HSR/PRP RJ45 + IRIG-B J: 1xUSB + WiFi + 1xRS485 + 1xRJ45 + HSR/PRP SFP Cages + IRIG-B M: 1xUSB + 1xRS485 + 2xRJ45 + IRIG-B N: 1xUSB + WiFi + 1xRS485 + 2xRJ45 + IRIG-B O: 1xUSB + 1xRS485 + 1xRJ45 + IRIG-B P: 1xUSB + WiFi + 1xRS485 + 1xRJ45 + IRIG-B Q: 1xUSB + 1xRS485 + 1xFO-LC+ IRIG-B R: 1xUSB + WiFi + 1xRS485 + 1xFO-LC + IRIG-B U: 1xUSB + 1xRS485 + 1xRJ45 + 1xSFP Cage + IRIG-B V: 1xUSB + WiFi + 1xRS485 + 1xRJ45 + 1xSFP Cage + IRIG-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

SELECTION & ORDERING DATA SIR-A

									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 ³ + Power Supply Control
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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										

PORTS	PROTOCOLS	
USB	Modbus RTU	
WiFi	Modbus TCP	
RS485	Modbus RTU, IEC60870-5-103 or DNP3.0 Serial	
FO-LC	Modbus TCP, DNP3.0 TCP, IEC60870-5-104 or IEC61850 + SNTP Protocol	
SFP Cage	Modbus TCP, DNP3.0 TCP, IEC60870-5-104 or IEC61850 + SNTP Protocol	
RJ45	Communications digits B and G	Communications digits 2, E, 3, J, M, N, O, P, U and V:
	RJ45: Modbus TCP, DNP3.0 TCP or IEC60870-5-104 + SNTP Protocol	RJ45: Modbus TCP, DNP3.0 TCP, IEC60870-5-104 or IEC61850, SNTP Protocol

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

NOTES:

- » Digital input voltage range of **75-265 Vdc / 55-265 Vac** is available upon request. Please contact us for ordering information.
- » 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).
- » ³ Available from FW version 1.21.00 onwards.
- » For communication digits E, J, U and V, SFP transceivers will be installed by the user, and the following specifications must be fulfilled:
 - Supply: 3.3v.
 - Speed: 100BASE-FX, Fast Ethernet.
 - The SFP module must support SerDes.