

Information



SIRIUS89N is a complete model to perform all tests according to VDE 0413, it measures the environmental parameters and analyses the network power quality of single phase and three phases balanced systems. RCDs which suddenly trip out, transformers which overheat, motors which burn out, voltage sags and surges which create problems, all these problems could be easily solved with SIRIUS89N. This instrument integrates the possibility to perform the loop impedance measurement at high resolution (0.1mOhm) with the use of IMP57 (optional accessory) and some predefined recording settings to help the user on the most common recordings of the network parameters. SIRIUS89N can perform current measurements up to 3000A AC also by using a flexible clamp. This is a very important feature which permits to perform measurements on big cables or bars also. Thanks to the PC interface and the powerful software you will create accurate documents qualifying your professionalism more and more

Function

- Continuity test on potential equalising circuits with 200mA
- Insulation resistance
- Tripping time and current of RCDs type A, AC, general and selective
- Loop/Line impedance measurement
- Loop/Line impedance at high resolution (with IMP57 optional accessory)
- Short circuit current measurements
- Global earth resistance without tripping the RCD
- Earth resistance with rods
- Ground resistivity
- Leakage current with optional transducer clamp
- Phase sequence indication
- Frequency measurement
- TRMS measurement and recording of electrical parameters
- Harmonics measurement and recording
- Voltage anomalies (sags, surges)
- Selection of 5 predefined settings to record the network parameters.
- Temperature/humidity measurement (with HT52/05 optional accessory)
- Illuminance measurement (with HT53/05 optional accessory)
- RS 232 output for PC connection
- Auto Power Off
- Backlight

Accessories

STANDARD

C2033X : Cable 3 wires with Shuko plug
 KITGSC5 : Set 4 cables + 4 alligator clips + 2 test leads
 KITERRNE : Set 4 cables + 4 metal probes
 HTFLEX33D : AC 3000A flexible transducer clamp
 TOPVIEW2006 : Windows software + optical/USB cable C2006
 A0050 : External adapter 230V AC/12VDC
 BORSA2051 : Soft carrying bag
 ISO9000 calibration certificate
 User manual

OPTIONAL

HT96U : Rigid clamp 1-100-1000A AC, diameter 54mm
 HT97U : Rigid clamp 10-100-1000A AC, diameter 54mm
 HP30C2 : Rigid clamp 200-2000A AC, diameter 70mm
 HP30C3 : Rigid clamp 3000A AC, diameter 70mm
 IMP57 : Accessory for high resolution Loop/Line Impedance
 HT52/05 : Air temperature/humidity probe
 HT53/05 : Illuminance (Lux) probe
 A0053 : External adapter 110VAC 60Hz/12VDC
 CN0050 : Set of straps for use of meter on neck
 606-IECN : Connector with magnetic test lead
 1066-IECN : Connector for banana cables, black colour
 1066-IECR : Connector for banana cables, red colour

Standards

EMC 2004/108/CE Directive
 16th edition
 CE MARK
 EN 61008
 IEC/EN61557-1
 IEC/EN61557-2
 IEC/EN61557-3

IEC/EN61557-4
 IEC/EN61557-5
 IEC/EN61557-6
 IEC/EN61557-7
 LVD 2006/95/CE Directive
 VDE 0100

1. ELECTRICAL SPECIFICATIONS – VERIFY TESTS

Accuracy is indicated as \pm (% readings + no. of digits) at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, con relative humidity $<60\%$ UR.

Continuity test on protective and equalizing conductors

Range (Ω)	Resolution (Ω)	Accuracy (*)
0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
10.0 ÷ 99.9	0.1	

(*) after the calibration of the cables which eliminates their resistance

Test current: $>200\text{mA}$ DC for $R \leq 5\Omega$ (calibration included), resolution: 1mA

Open-circuit voltage: $4\text{V} \leq V_0 \leq 24\text{V}$

Insulation Resistance (DC voltage)

Test voltage(V)	Range (M Ω)	Resolution (M Ω)	Accuracy
50	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 49.9	0.1	
	50.0 ÷ 99.9	0.1	$\pm(5.0\%rdg + 2dgt)$
100	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 99.9	0.1	
	100.0 ÷ 199.9	0.1	$\pm(5.0\%rdg + 2dgt)$
250	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 199.9	0.1	
	200 ÷ 249	1	$\pm(5.0\%rdg + 2dgt)$
	250 ÷ 499	1	
500	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 199.9	0.1	
	200 ÷ 499	1	$\pm(5.0\%rdg + 2dgt)$
	500 ÷ 999	1	
1000	0.01 ÷ 9.99	0.01	$\pm(2.0\%rdg + 2dgt)$
	10.0 ÷ 199.9	0.1	
	200 ÷ 999	1	$\pm(5.0\%rdg + 2dgt)$
	1000 ÷ 1999	1	

Open-circuit voltage: $<1.3 \times$ nominal test voltage

Short circuit current: $<6.0\text{mA}$ at 500V test voltage

Nominal test current: $>2.2\text{mA}$ on 230k Ω load (500V); $>1\text{mA}$ on 1k Ω per Vnom (others)

Measurement limits fitted: 0.05, 0.10, 0.23, 0.25, 0.50, 1.00, 100M Ω

RCDs Tripping time

Range (ms)		Resolution (ms)	Accuracy
0.5I _{dn} , I _{dn}	1÷999	1	$\pm(2.0\%rdg + 2dgt)$
2I _{dn}	1÷200 general 1÷250 selective		
5I _{dn}	1÷ 50 general 1÷160 selective		

Nominal trip-out currents: 10mA, 30mA, 100mA, 300mA, 500mA

RCDs type: AC, A, general and selective

P-PE voltage: 100V ÷ 265V

Frequency: 50Hz \pm 0.5Hz

Contact voltage Ut

Range (V)	Resolution (V)	Accuracy
0 ÷ 2U _{lim}	0.1	-0%, +(10.0% rdg + 3dgt)

U_{lim} (UI): 25V , 50V

Tripping current of RCDs

RCD type	$I_{\Delta N}$	Range $I_{\Delta N}$ (mA)	Resolution (mA)	Accuracy $I_{\Delta N}$
AC	$I_{\Delta n} \leq 10\text{mA}$	$(0.5 \div 1.4) I_{\Delta n}$	0.1 $I_{\Delta n}$	-0%, +10% $I_{\Delta n}$
A		$(0.5 \div 2.4) I_{\Delta n}$		
AC	$I_{\Delta n} > 10\text{mA}$	$(0.5 \div 1.4) I_{\Delta n}$		
A		$(0.5 \div 2.0) I_{\Delta n}$		

Line Impedance (Phase-Phase, Phase-Neutral)

Range (Ω)	Resolution (Ω) (*)	Accuracy
0.01 \div 9.99	0.01	$\pm(5.0\% \text{ rdg} + 3\text{dgt})$
10.0 \div 199.9	0.1	

(*) Resolution: 0.1 m Ω , range: 0.0 \div 199.9 m Ω (with IMP57 optional accessory)

Maximum peak current: 3.65A (at 127V); 6.64A (at 230V); 11.5A (at 400V)

Test voltage: 100 \div 265V (Phase-Neutral) / 100 \div 460V (Phase-Phase); 50Hz \pm 0.5Hz

Fault Loop Impedance (Phase-Ground)

Range (Ω)	Resolution (Ω) (*)	Accuracy (*)
0.01 \div 19.99	0.01	$\pm(5.0\% \text{ rdg} + 3\text{dgt})$
20.0 \div 199.9	0.1	
200 \div 1999	1	

(*) Resolution: 0.1 m Ω , range: 0.0 \div 199.9 m Ω (with IMP57 optional accessory)

Maximum peak current: 3.65A (at 127V); 6.64A (at 230V)

Test voltage: 100 \div 265V (Phase-Ground); 50Hz \pm 0.5Hz

Fault Loop Resistance R_A without RCDs tripping

Range (Ω)	Resolution (Ω)	Accuracy
1 \div 1999	1	-0%, +(5.0% rdg + 3dgt)

Test current: 0.5 $I_{\Delta N}$ set on U_t test, 15mA on $R_{a15\text{mA}}$ test

Earth Resistance with rods

Range (Ω)	Resolution (Ω)	Accuracy (*)
0.01 \div 19.99	0.01	$\pm(5.0\% \text{ rdg} + 3\text{dgt})$
20.0 \div 199.9	0.1	
200 \div 1999	1	

Test current: <10mA – 77.5Hz

Open-circuit voltage: < 20V rms

Earth resistivity

Range ρ (d=10m)	Resolution	Accuracy (d=10m)
0.06 \div 19.99 Ωm	0.01 Ωm	$\pm(5.0\% \text{ rdg} + 3\text{dgt})$
20.0 \div 199.9 Ωm	0.1 Ωm	
200 \div 1999 Ωm	1 Ωm	
2.00 \div 99.99 $\text{k}\Omega\text{m}$	0.01 $\text{k}\Omega\text{m}$	
100.0 \div 125.5 $\text{k}\Omega\text{m}$	0.1 $\text{k}\Omega\text{m}$	

Distance range d: 1 \div 10m

Test current: <10mA – 77.5Hz

Open-circuit voltage: < 20V rms

Voltage (RCD, LOOP, Phase Sequence)

Range (V)	Resolution (V)	Accuracy
15 \div 460	1	$\pm(3.0\% \text{ rdg} + 2\text{dgt})$

Frequency

Range (Hz)	Resolution (Hz)	Accuracy
47.0 \div 63.6	0.1	$\pm(0.1\% \text{ rdg} + 1\text{dgt})$

2. ELECTRICAL SPECIFICATIONS – ANALYZER AND AUX

Accuracy is indicated as \pm (% readings + no. of digits) at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, con relative humidity <60%UR.

Voltage – Single phase system (Autorange)

Range (V)	Resolution (V)	Accuracy	Input Impedance
15 ÷ 310	0.2	$\pm(0.5\% \text{rdg} + 2\text{dgt})$	300 k Ω (Phase-Neutral)
310 ÷ 600	0.4		300 k Ω (Phase-Phase)

Voltage Anomalies – Single system (Manual range)

Range (V)	Resolution Voltage (V)	Resolution Time	Accuracy Voltage	Accuracy Time (ref. 50Hz)
15 ÷ 310	0.2	10ms	$\pm(1.0\% \text{rdg} + 2\text{dgt})$	$\pm 10\text{ms}$
30 ÷ 600	0.4			

Input Impedance: 300 k Ω (Phase-Neutral and Phase-Phase)

Current by external clamp transducer – STD

Range (*)	Resolution (mV)	Accuracy	Input Impedance	Overload protection
0.005 ÷ 0.26V	0.1	$\pm(0.5\% \text{rdg} + 2\text{dgt})$	400k Ω	5V
0.26 ÷ 1V	0.4			

(*) Example: by using a clamp whose range is 1000A/1V, the instrument measures currents higher than 5A

Current by external clamp transducer – FlexINT (1000A AC range)

Range (A)	Voltage input	Resolution	Accuracy
10.0 ÷ 19.9	950.0 $\mu\text{V} \div 1.691\text{mV}$	8.5 μV	$\pm(4.0\% \text{rdg} + 8.5\mu\text{V})$
20.0 ÷ 99.9	1.7mV ÷ 8.491mV		$\pm(1.0\% \text{rdg} + 8.5\mu\text{V})$
100.0 ÷ 999.9	8.5mV ÷ 84.99mV		$\pm(1.0\% \text{rdg} + 85\mu\text{V})$

1A = 85 μV ; Rinput = 400k Ω

Current by external clamp transducer – FlexINT (3000A AC range)

Range (A)	Voltage input	Resolution	Accuracy
30.0 ÷ 999.9	2.55mV ÷ 84.99mV	8.5 μV	$\pm(1.0\% \text{rdg} + 17\mu\text{V})$
1000 ÷ 3000	85.0mV ÷ 255mV	85 μV	$\pm(0.5\% \text{rdg} + 85\mu\text{V})$

1A = 85 μV ; Rinput = 400k Ω

Power factor (Cos ϕ) - Single phase system

Range (cos ϕ)	Resolution	Accuracy (°)
0.20 ÷ 0.50	0.01	1.0
0.50 ÷ 0.80		0.7
0.80 ÷ 1.00		0.6

Leakage current (by optional clamp transducer)

Range (mA)*	Resolution (mA)	Accuracy	Input Impedance	Overload protection
0.5 ÷ 999.9	0.1	$\pm(5.0\% \text{rdg} + 2\text{dgt})$	400k Ω	5V

(*) While recording the instrument stores only current values > 5mA with 1mA resolution
Maximum stored value is the peak value calculated with response time of 1ms

Power – Single phase system

Measures type	Range	Resolution	Accuracy
ACTIVE POWER	100.0 ÷ 999.9W	0.1W	±(1.0% rdg + 2dgt)
	1.000 ÷ 9.999kW	0.001kW	
	10.00 ÷ 99.99kW	0.01kW	
	100.0 ÷ 999.9kW	0.1kW	
	1.000 ÷ 9.999MW	0.001MW	
	10.00 ÷ 99.99MW	0.01MW	
	100.0 ÷ 999.9MW	0.1MW	
REACTIVE POWER	100.0 ÷ 999.9VAR	0.1VAR	
	1.000 ÷ 9.999kVAR	0.001kVAR	
	10.00 ÷ 99.99kVAR	0.01kVAR	
	100.0 ÷ 999.9kVAR	0.1kVAR	
	1.000 ÷ 9.999MVAR	0.001MVAR	
	10.00 ÷ 99.99MVAR	0.01MVAR	
	100.0 ÷ 999.9MVAR	0.1MVAR	
APPARENT POWER	100.0 ÷ 999.9VA	0.1VA	
	1.000 ÷ 9.999kVA	0.001kVA	
	10.00 ÷ 99.99kVA	0.01kVA	
	100.0 ÷ 999.9kVA	0.1kVA	
	1.000 ÷ 9.999MVA	0.001MVA	
	10.00 ÷ 99.99MVA	0.01MVA	
	100.0 ÷ 999.9MVA	0.1MVA	
ACTIVE ENERGY (Class 2 EN61036)	100.0 ÷ 999.9Wh	0.1Wh	
	1.000 ÷ 9.999kWh	0.001kWh	
	10.00 ÷ 99.99kWh	0.01kWh	
	100.0 ÷ 999.9kWh	0.1kWh	
	1.000 ÷ 9.999MWh	0.001MWh	
	10.00 ÷ 99.99MWh	0.01MWh	
	100.0 ÷ 999.9MWh	0.1MWh	
REACTIVE ENERGY (Class 3 IEC1268)	100.0 ÷ 999.9VARh	0.1VARh	
	1.000 ÷ 9.999kVARh	0.001kVARh	
	10.00 ÷ 99.99kVARh	0.01kVARh	
	100.0 ÷ 999.9kVARh	0.1kVARh	
	1.000 ÷ 9.999MVARh	0.001MVARh	
	10.00 ÷ 99.99MVARh	0.01MVARh	
	100.0 ÷ 999.9MVARh	0.1MVARh	

Harmonics - Single phase system

Range	Maximum resolution	Base accuracy
DC ÷ 25 ^a	0.1V / 0.1 A	±(5.0% rdg + 2dgt)
26 ^a ÷ 33 ^a		±(10% rdg + 2dgt)
34 ^a ÷ 49 ^a		±(15% rdg + 2dgt)

Environmental parameters (AUX function)

Parameter	Range	Resolution	Accuracy
Temperature [°C]	-20°C ÷ 80°C	0.1 °C	±(2.0%rdg+2dgt)
Temperature [°F]	-4°F ÷ 176°F	0.1 °F	
Relative humidity [%HR]	0 ÷ 100%HR	0.1% UR	
DC output voltage	0.1mV ÷ 1.0V	0.1mV	
Illuminance [Lux]	0.001Lux ÷ 20.00 Lux (*)	0.001 ÷ 0.02 Lux	
	0.1 Lux ÷ 2000 Lux (*)	0.1 ÷ 2 Lux	
	1 Lux ÷ 20 kLux (*)	1 ÷ 20 Lux	

(*) Accuracy of HT53 luxmeter accessory according to Class AA

3. GENERAL SPECIFICATIONS

SINGLE PHASE RECORDING:

STORED PARAMETERS:

- Phase and delta voltage, Phase current, neutral current, Active, Reactive, Apparent power, Active energy (Class 2 EN61036), Reactive energy (Class 3 IEC1268), Power factor $\cos\phi$, Voltage, current harmonics (DC, 1, 2, ... 49), Voltage anomalies (sags, swells), Predefined settings (EN50160, Voltage anomalies, Harmonics, Start up, Power & Energy)
- Max selectable parameters: 63 or 1 AUX (environmental and/or leakage)
- Integration period: $5 \div 3600$ sec.
- Recording: > 30 days with 15 minutes integration period
- Memory size: 2Mbyte

DISPLAY AND MEMORY:

Features:	Dot matrix with backlight
Resolution:	128x128 dots
Memory:	999 measures

POWER SUPPLY:

Batteries:	6 batteries 1.5V type LR6-AA-AM3-MN 1500
External power supply adapter:	A0050 or A0053 (AUX e ANALYZER functions only)

MECHANICAL FEATURES:

Sizes:	225 (W)x165(L)x105(D) mm
Weight (batteries included):	about 2.0 kg

WORKING ENVIRONMENTAL CONDITIONS:

Reference temperature:	$23^{\circ}\text{C} \pm 5^{\circ}\text{C}$
Working temperature:	$0^{\circ} \div 40^{\circ}\text{C}$
Allowed relative humidity:	$< 80\%$ HR
Storage temperature:	$-10 \div 60^{\circ}\text{C}$
Storage humidity:	$< 80\%$ HR

TEST VERIFIES REFERENCE STANDARDS:

Continuity test with 200mA:	IEC 61557-4
Insulation resistance:	IEC 61557-2
Earth resistance:	IEC 61557-5
Fault Loop Impedance:	IEC 61557-3
RCDs test:	IEC 61557-6
Phase sequence:	IEC 61557-7

POWER/ENERGY MEASUREMENTS REFERENCE STANDARDS:

Active energy static counters for AC current	EN61036 (Class 2)
Reactive energy static counters for AC current	IEC1268 (Class 3)

GENERAL REFERENCE STANDARDS:

Safety of measuring instruments:	EN61010-1 + A2(1997)
Product type standard:	IEC61557-1, 2, 3, 4, 5, 6
Insulation:	class 2 (double insulation)
Pollution degree:	2
Overvoltage category:	CAT II 600V~ / 350V~ (to ground) CAT III 600V~ / 300V~ (to ground)
Max altitude of use:	2000m

This instrument complies with the requirements of the European Low Voltage Directives 2006/95/EEC (LVD) and EMC 2004/108/EEC