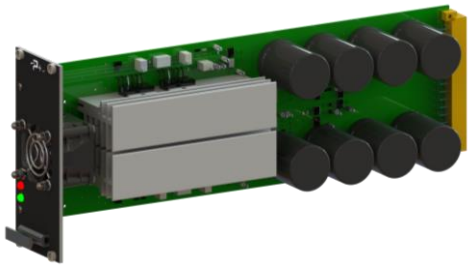
DIFFERENTIAL CURRENT GENERATOR "POCDIF" AC/DC - 26A – 28V - 12 ranges)



PERFORMANCES

- 12 ranges of AC current from 16 mA to 128 A peak
- AC permanent current up to 26 ARMS (sine wave)
- Nine ranges of DC permanent current from 16 mA to 12 A
- DC current ± 6mA or ± 10 mA stackable to AC current
- Integrated timer function
- Full insulation
- Compliance voltage remaining in the field of TBT voltage (less than or equal to 28 VRMS)

CE *RS232-485*

APPLICATIONS

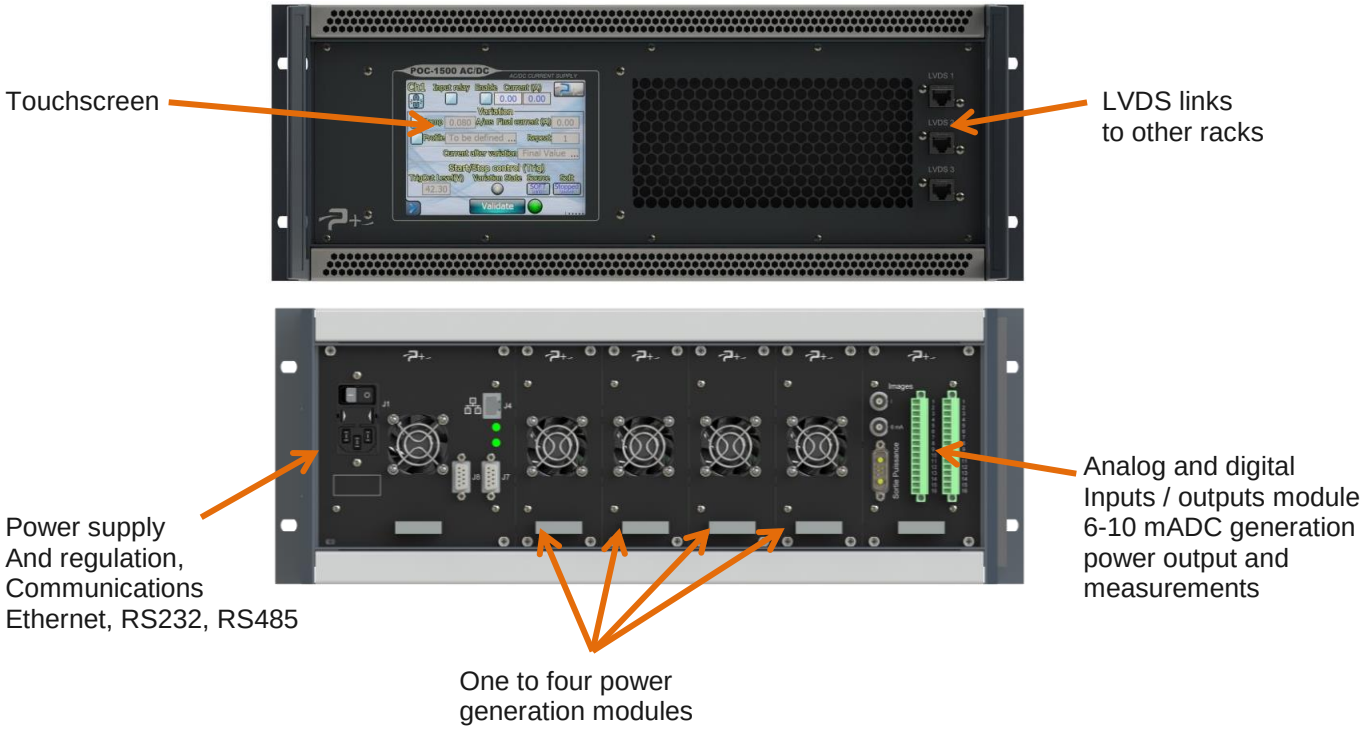
- Tests of differential circuit breakers
- Tests of differential switches
- Insulated current generator
- Tests according to IEC61008, IEC61009, NF62411/62412,
  NF EN 62423 (type F, B),
  DIN VDE 0664-400 (type B+),
  ÖVE/ÖNORM E 8601 (type G)
  IEC 62752, IEC62955

DESCRIPTION

- **"POCDIF"** is a versatile current generator. It can be used in qualification or production process, for the test of differential circuit breakers, differential switches, circuit breakers, breakers, current relays, fuses (slow, fast, or ultra-fast), current sensors, and other equipment requiring a great quality in current generation, both in its waveform and its accuracy.
- To optimize performance and industrial efficiency, the system is modular. The architecture separates the functions on different modules installed in a rack which width is 19 inches. They are easily interchangeable. The basic version includes:
  - A timer for measurement of trip, merge, move... which takes into account internal events (level of voltage or current) as well as external events (trigger).
  - An acquisition system to measure current and voltage as well on a stabilized current as on a stealth event with, for example, the ability to achieve a measure of RMS value (or peak value) on the last period before trip of the product under test.
  - A waveform generator for normative profiles but also user's profiles using files.
- Completely autonomous using its local control by touchscreen, it can be controlled remotely from a supervisor system via an Ethernet, RS232 or RS485 link.
- Several racks can be synchronized through digital links to increase the output current or provide a three-phase system.

DIFFERENTIAL CURRENT GENERATOR "POCDIF" AC/DC - 26A – 28V - 12 ranges)

COMPLETE GENERATOR



The basic version is supplied with a single power generation module. Three other modules can be added to increase its capacity to 128 A peak.
The current generator ±6 or ±10 mADC is separated. It can be added to the main current for tests according to IEC61008 test 9.9.3.4, IEC61009 test 9.9.1.3 or EN62423 the standards.

For easier maintenance, the different power modules can be provided separately as spare parts. They are directly interchangeable by the maintenance teams.

MECHANICS AND ENVIRONMENT	Touchscreen	
	Width	483 mm (19 inches)
	Height	185 mm (4U)
	Depth (without connectors)	435 mm
	Weight (with a map generator)	15 kg
	Generator board	
	Dimensions	278 x 130 x 71 mm
	Weight	0.65 kg
	Temperature and humidity	
	Storage temperature	-10°C to + 55°C
	Operating temperature	+0°C to + 40°C
	Relative humidity	10% - 90% non-condensing
	Marking	
	Marking	CE
	Index of protection	IP20

DIFFERENTIAL CURRENT GENERATOR "POCDIF" AC/DC - 26A – 28V - 12 ranges)

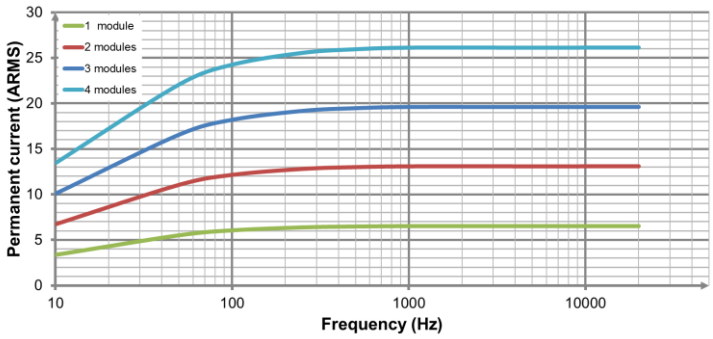
FUNCTION "POWER GENERATOR"

OUTPUT	Rated power	
	By module	180 W
	Maximum per rack	720 W
	Currents with a single power module installed	
	Maximum permanent AC current	6.5 ARMS (sine)
	Maximum permanent DC current	8 ADC
	Maximum peak current	32.5 A peak
	Current with four power modules installed	
	Maximum permanent AC current	26 ARMS (sine)
	Maximum permanent DC current	12 ADC
	Maximum peak current	128 A peak
	Maximum compliance voltage	
	By module / rack	28 V
	Accuracy	
	Regardless of the range	0.05% of range + 0.05% of programmed value
	Bandwidth	
	Full scale	0.1 Hz - 20 kHz
	Small signals at -3dB	50 kHz
	Isolation of the output compared to the chassis	
	Measured at 500 VDC	> 100 M Ω

PERMANENT USE IN AC

The maximum current per module varies:

- from 3.4 ARMS at 10 Hz,
- to 5.5 ARMS at 50 Hz,
- and 6.5 ARMS at 20 kHz (full-wave)

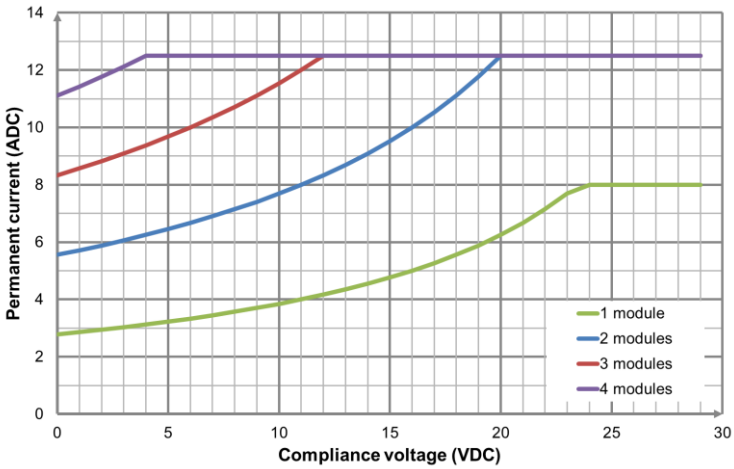


PERMANENT USE IN DC

The maximum current per module varies:

- from 2.8 ADC on a short circuit,
- to 8 ADC under 29 V.

The total current of a rack equipped with two cards or more is however limited to 12ADC in permanent mode.



DIFFERENTIAL CURRENT GENERATOR "POCDIF" AC/DC - 26A – 28V - 12 ranges)

FUNCTION "SUPERIMPOSED 6-10 mADC GENERATOR"

OUTPUT 6-10 mADC	Current	
	Continuous current DC	± 6.0 mADC or ± 10.0 mADC
	Precision	
	Amplitude	± 2%
	Proofreading	
	Measurement shunt	10 Ω measurement isolated on BNC (1)
	Isolation of the output compared to the chassis	
	Measured at 500 VDC	> 100 MΩ

Note (1) The obtained signal is available on an insulated BNC socket.

FUNCTION "POWER OUTPUT"

OUTPUT CURRENT	Outputs	
	Number	2(AC/DC and ±6 / ±10 mADC not connected together)
	Output connector	
	Power AC / DC and 6-10 mA	Socket SUB-D female mixed size 2 7W2
	Protection of the outputs	
	Short circuit relay	
	Surge protection (2)	
	Isolation of outputs from the chassis	
	Measured at 500 VDC	> 100 M Ω

Note (2) **USING POCDIF ON A VOLTAGE DEPENDANT DEVICE**
In case of overvoltage, the output of the generator is protected by a high-speed device to short it. The minimum impedance of the voltage source must be:

- 100 Ω under 230 VRMS,
- 200 Ω under 400 VRMS.

to prevent permanent damage on protection circuit.

MEASURES

CURRENT MEASUREMENT

MEASURE	Ranges	
	Number	12
	Selection	Automatic (3)
	Accuracy of measurement ranges	
	All ranges	0.2%

Note (3) the available ranges depend on the quantity of power modules installed.

TIMER

The regulation card includes a timer function with a resolution of one micro second and a depth up to 30 days.

This function allows to measure time intervals between two internal or external events:

- Appearance or disappearance of a current or voltage,
- Exceeding of a precise value,
- Event on the "Trigger" input,
- ...

FUNCTION DIGITAL INPUTS / OUTPUTS

DIGITAL INPUTS AND OUTPUTS	Digital input	
	Type	Opto insulated
	Operating voltages	24 VDC
	Maximum tension	30 VDC
	Maximum current	8 mA under 24 VDC
	Measured at 500 VDC	> 100 M Ω
	Digital output	
	Type	Opto insulated
	Operating voltages	24 VDC
	Maximum tension	50 VDC
	Maximum current	50 mADC
	Measured at 500 VDC	> 100 MΩ

"TRIGGER" INPUT AND OUTPUT

- TRIGGER input starts or stops the generation. It is particularly used for testing circuit on fault (test IEC61008 9.9.2.2) to detect closing of the poles,
- TRIGGER output allows to control other racks and devices.

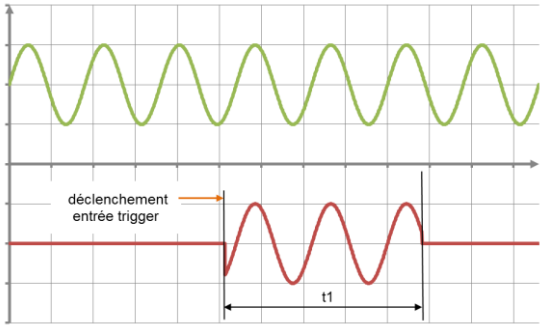
"SYNCHRO" INPUT AND OUTPUT

- SYNCHRO input synchronizes the generation with other equipment (voltage generator for example),
- SYNCHRO output allows to synchronize the generation of other devices.

"SYNCHRO" input receives a signal to synchronize the current (red curve) to the voltage (green curve).

Power generation starts at the closing of the breaker under test.

After a 't1' delay, the breaker trips.



CONTROL BY A PROGRAMMABLE LOGIC CONTROLLER (PLC)

For a static control by the digital inputs / outputs of a programmable logic controller, the generator is equipped with the following inputs and outputs:

- Inputs:
  - Cycle selection (defined on 4 inputs)
  - Start of the selected cycle
  - Immediate stop of the actual cycle
  - Self-calibration
  - Results request

- Outputs: they are refreshed after the activation of "Results request" input
  - Generator ready
  - Circuit opened
  - Trip
  - End of cycle without trip
  - Used range (defined on 4 outputs)

FUNCTION "ANALOG INPUTS / OUTPUTS"

ANALOG INPUTS AND OUTPUTS	Analog input "EXT PILOT"	
	Type	±10V peak
	Scale factor	+10V for 100% of the selected range
	Insulation	Referenced to case ground
	Analog output 'IMAGE'.	
	Type	±10V peak
	Scale factor	+10V for 100% of the selected range
	Insulation	Referenced to case ground
	Analog output "INSULATED PILOT"	
	Type	±10V peak
	Scale factor	+10V for 100% of the selected range
	Insulation	Referenced to case ground

PILOT

- The input "EXT PILOT" receives an analog signal which has the form of the current to generate. The amplitude of the current generated depends of the selected range:
  - a current equal to 10% of the selected range selected for an input value of one volt

- The output "INSULATED PILOT" delivers an analog signal to the "EXT PILOT" input of another rack or other equipment. This signal is either:
  - identical to the signal "EXT PILOT" received (copy),
  - an amplitude of one volt for a current equal to 10% of the selected range.

IMAGE

- The output "IMAGE" delivers an analog signal that has the form of the generated current. Its amplitude depends of the used range:
  - an amplitude of one volt for a current equal to 10% of the selected range.

MAINS AND COMMUNICATION

POWER COMMUNICATION	Mains	
	Type	One-phase: Phase + Neutral + Earth
	Voltage (VRMS)	230 ± 10% or 115 ± 10%
	Frequency	47 to 63 Hz
	Rated current	6 ARMS under 230 VRMS
	Inrush current at startup	< 70A
	Protection	Time delay fuse
	Communication (4)	
	Ethernet	TCP/IP on RJ45
	Serial RS232	SCPI on 9 pins SUBD
	RS485 series	SCPI on 9 pins SUBD

Note (4) Specific communication protocols can be created on demand on these three media for direct management of the equipment from your system.

WAVEFORMS

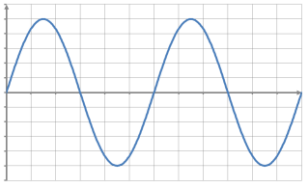
Waveforms can be generated. They are of two kinds:

- Basic waveforms, already recorded in the device,
- Customized waveforms.

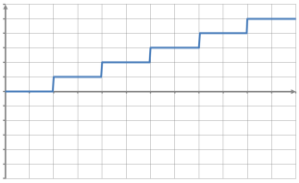
BASIC WAVEFORMS

They can be generated by setting their frequency, amplitude and duration.
(non-exhaustive list of these waveforms; X axis for time, Y axis for current)

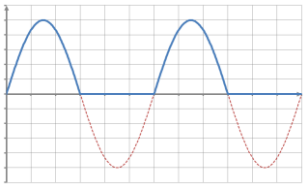
SINE

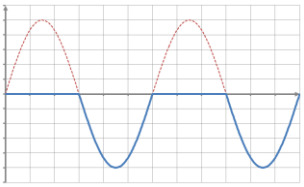


DC (steps)

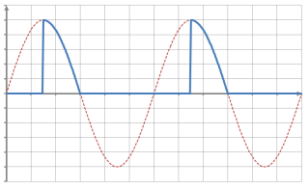


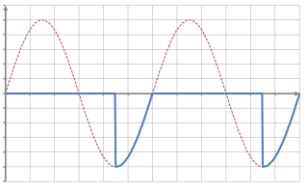
CURRENT DELAYED 0° (IEC61008 test 9.9.3.1)



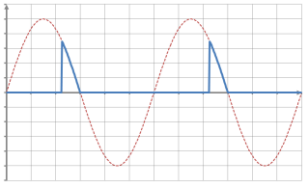


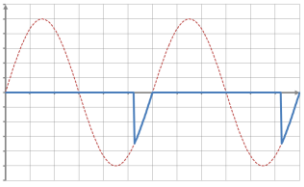
CURRENT DELAYED 90° (IEC61008 test 9.9.3.1)





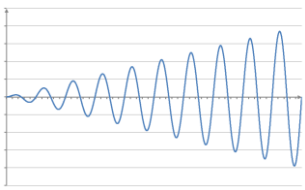
CURRENT DELAYED 135° (IEC61008 test 9.9.3.1)



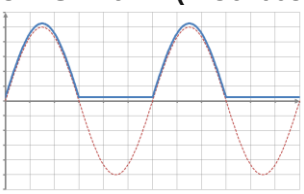


For these two waveforms, the peak amplitude is limited to 100 A with 4 power modules.

RAMP

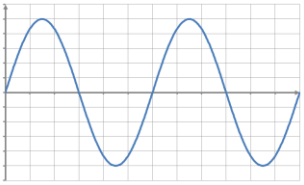


OFFSET 6mA (IEC61008 test 9.9.3.4)



BASIC WAVEFORMS FOR B, B+, F AND G BREAKERS

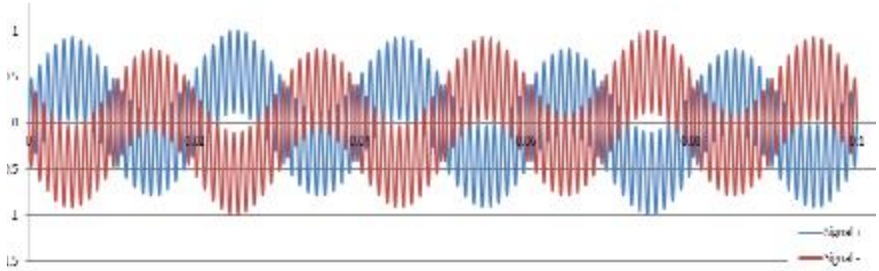
Sine with various frequencies



In accordance with DIN VDE 0664-400: 100 Hz, 200 Hz, 1 kHz, 20 kHz

In accordance with IEC 62423: 150 Hz, 400 Hz, 1 kHz

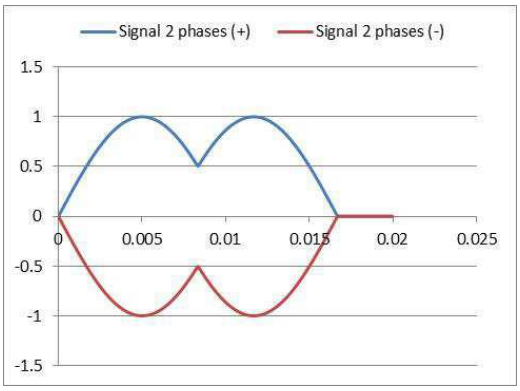
Combination of three sine frequencies



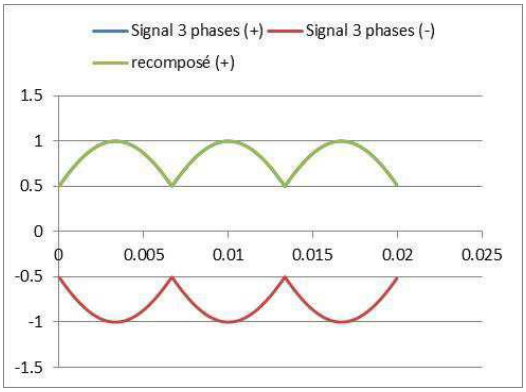
In accordance with IEC 62423
For types B and F

10 Hz + 1000 Hz + 50/60 Hz

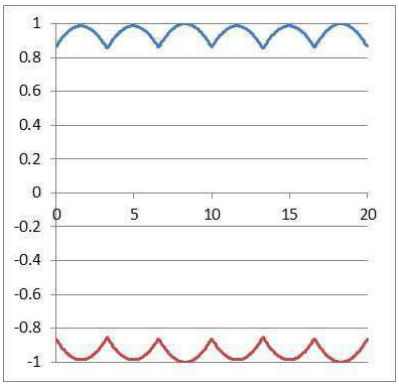
Rectifiers using two or three phases (types B and B+)



IEC 62423 part 9.2.1.5



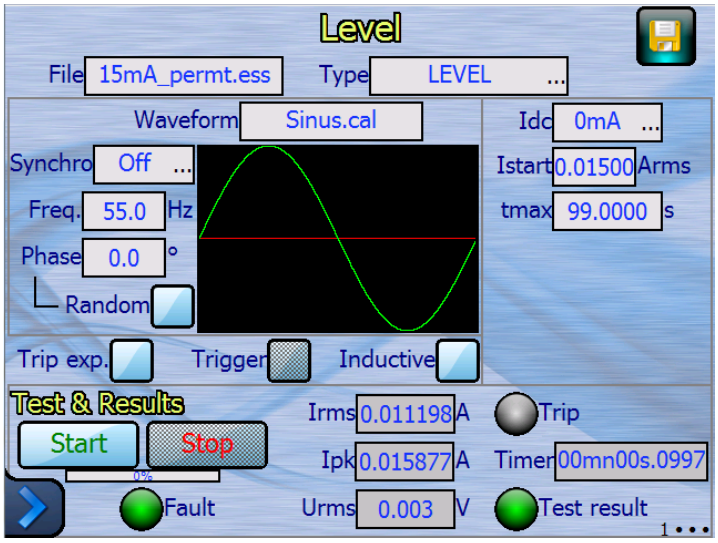
IEC 62423 part 9.2.1.6



DIN VDE 0664-400 part 9.21.2.2

DIFFERENTIAL CURRENT GENERATOR "POCDIF" AC/DC - 26A – 28V - 12 ranges)

HOW TO PROGRAM CURRENT GENERATOR



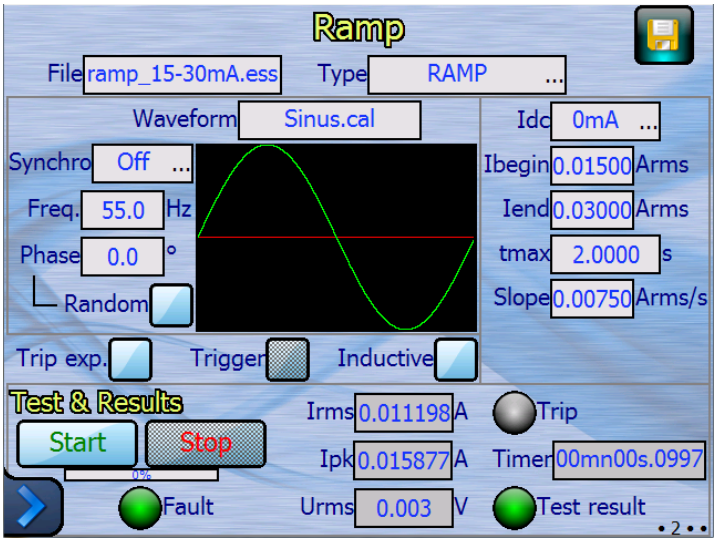
Three screens are to build and verify "basic tests".

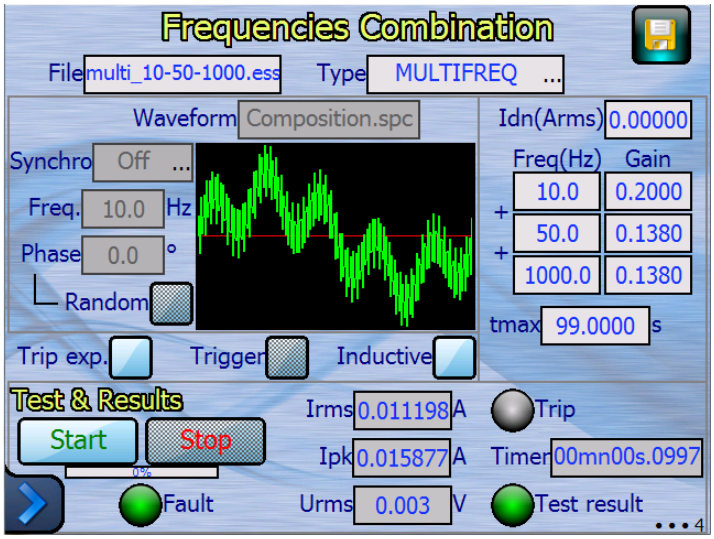
Echelon:

Continuous generation of an AC or DC current, during a limited time

Ramp:

Evolution of a waveform from A value to B value in a programmed time or a programmed ramp

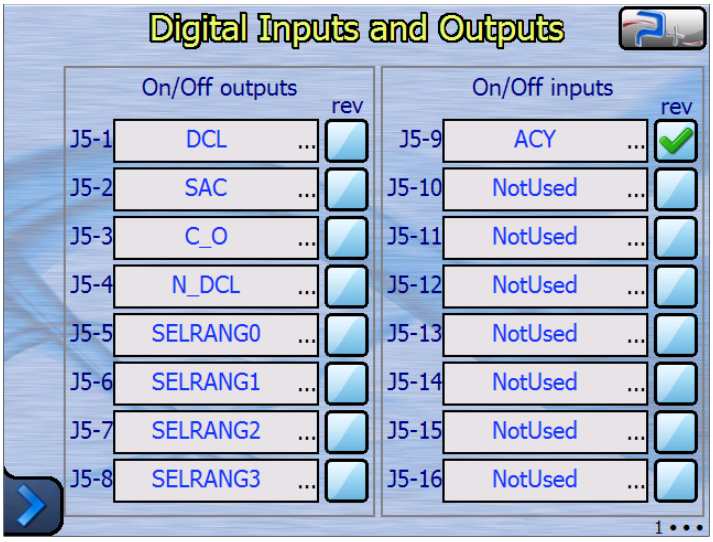




Multi Frequency:

Generation of a frequency combination during a limited time, all amplitudes and frequencies can be programmed separately

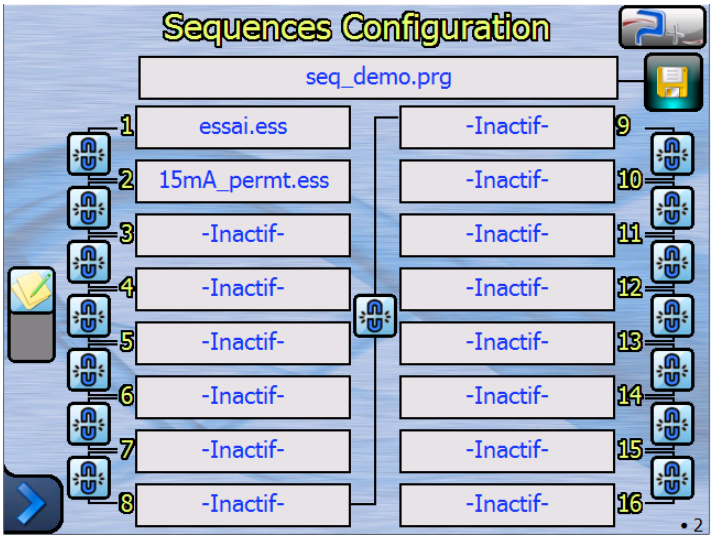
DIFFERENTIAL CURRENT GENERATOR "POCDIF" AC/DC - 26A – 28V - 12 ranges)

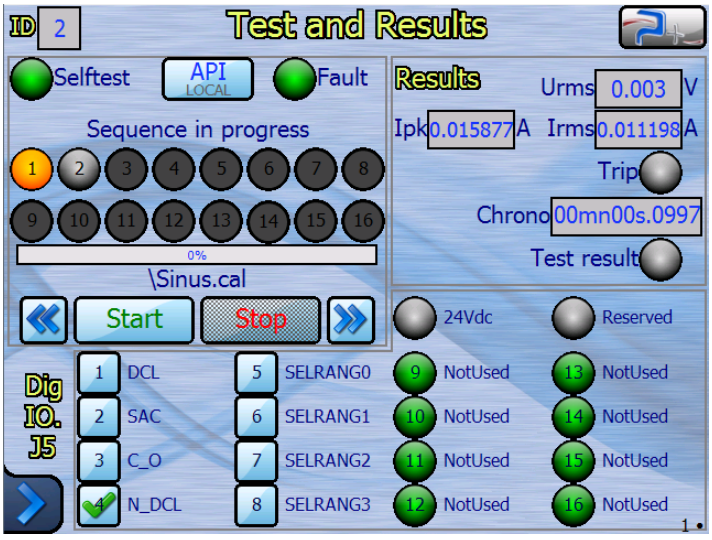


To control the generator using an external device, the eight inputs and the eight outputs can be affected to a specific action.

All the tests can be chained or not with the others to create a real complete test sequence.

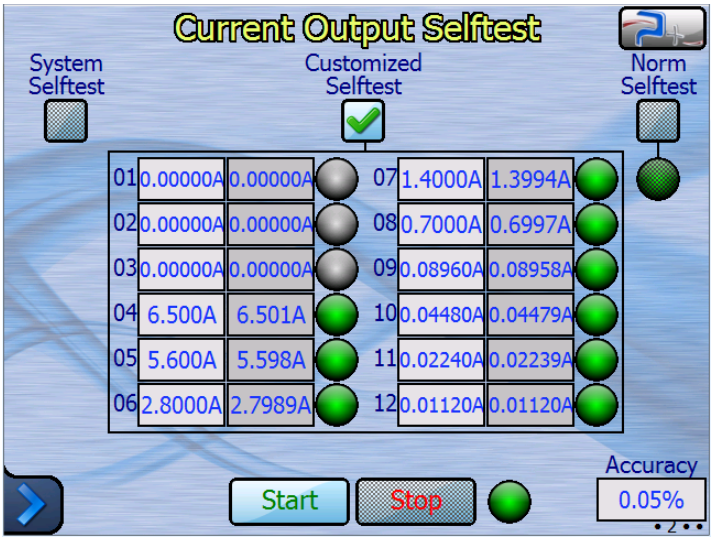
This sequence can be recorded to allow different configurations for different users





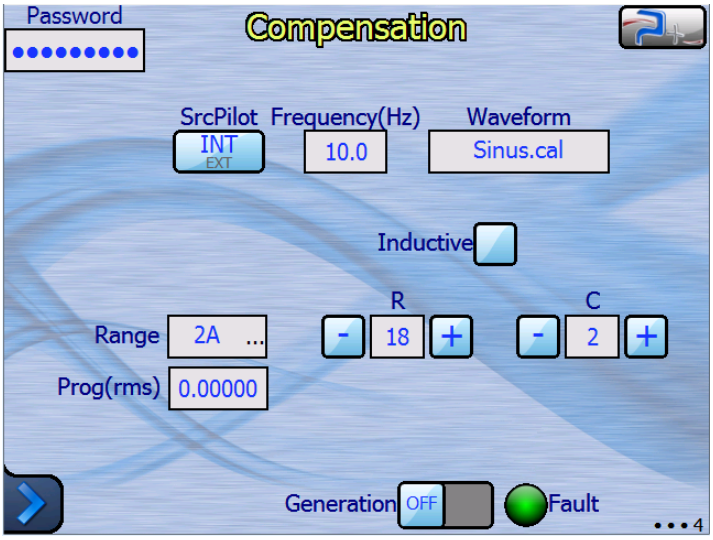
On start screen user can follow tests results, switch from one to another, upload test results like current amplitude or time.

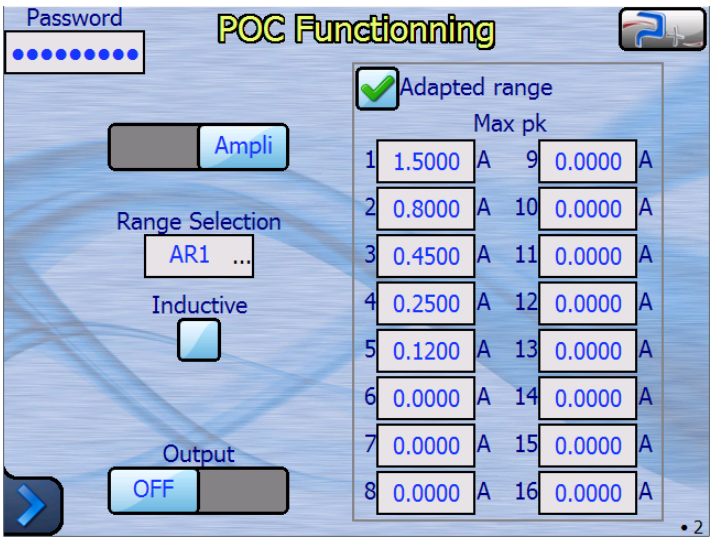
DIFFERENTIAL CURRENT GENERATOR "POCDIF" AC/DC - 26A – 28V - 12 ranges)



The generator has an integrated selftest making it possible to check its integrity on start or on any request of the user.

In order to adapt generator to receivers with complex impedance, user can customize internal compensation networks to guarantee measurements stability.

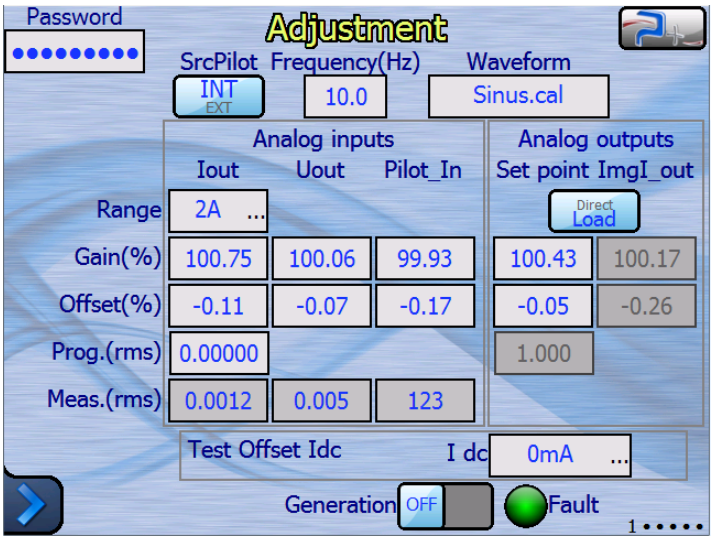




POCDIF generator can be used as an amplifier to replace old equipment without having to modify the existing supervisory system.
The user thus has the possibility to create his own virtual ranges, the internal digital regulation device undertakes the setting at the level of the setup.

DIFFERENTIAL CURRENT GENERATOR "POCDIF" AC/DC - 26A – 28V - 12 ranges)

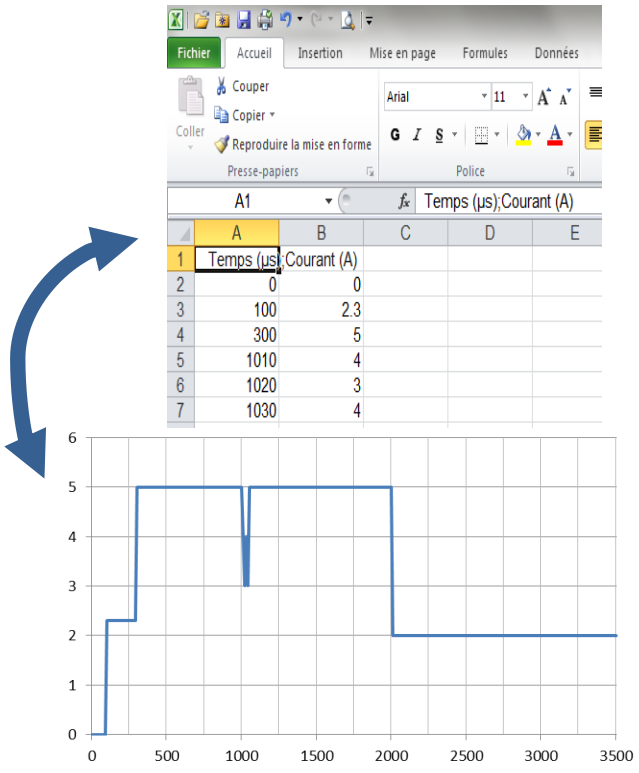
The calibration of the equipment is carried out using a electrical network analyzer with high accuracy. Protected by password, these parameters make it possible to guarantee high efficiencies of the product.



CUSTOMIZED WAVEFORMS

The equipment is able to generate custom current waveforms.
In CSV format, files describe the waveform point by point. They can be easily downloaded in the equipment using a provided software tool.

The minimum duration of a sample is 1.2 µs, its maximum is 12 seconds.
The maximum size of a file is 1000 points.
The same waveform can be repeated once to infinity.



COMMERCIAL REFERENCES

Complete generator ready to use with a single power generator module

POCDIF-EU Power supply 230V
Complete Generator with power supply 230V
Technical reference POC-1500-AC/DC-26A-28V-12G-EU

POCDIF- PCR200
Additional power module
Technical reference PCR-200-AC/DC - 6.5 A - 28V

The information in this document may be changed without notice

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