



# RN200

Control device for renewable sources

## DESCRIPTION

**RN200** is a device for the protection and control of the inverters for the production of electricity from renewable sources (wind, photovoltaic etc.).

It allows a simple integration of renewable sources with generators and/or mains. It allows to maximize the penetration of renewable sources, while ensuring maximum safety on the power supply of the loads and maximum efficiency of the generators.

It communicates via a CAN BUS interface with the SICES genset controllers (GC600, DST4602 Evolution) and with the mains controllers (MC200), ensuring a simple integration of all components (both from the logical point of view and for the wirings).

Each **RN200** manages up to maximum 16 inverters (and maximum 16 **RN200** are managed per system); communicates with them through the Modbus protocol, using without limitation all its communication interfaces (RS232, RS485, ETHERNET). The inverters can also be of different types. From each inverter, it acquires the rated and current powers, as well as the diagnostic alarm codes. It is able to start/stop the inverters, as well as to control their active/reactive powers.

Control functions included:

- Automatic start/stop of the inverters, according to the presence of voltage on the common bars.
- Automatic management of a circuit breaker (RNCB), connecting the inverters to the common bars.
- Limitation of the active power of the inverters, to ensure the operation of the generators at a configurable minimum power (to avoid wear related to prolonged work at low power).
- Setting of a power reserve (SPINNING RESERVE) for the generators, so that they can compensate for sudden drops in the production of renewable sources (clouds) without causing blackouts on the loads.
- Two ways of managing the reactive power of the inverters:
  - Fixed power factor on the generators (and all the rest is supplied/absorbed by the inverters).
  - Sharing of reactive power with generators, based on nominal powers.
- Possibility of working OFF-GRID (island mode) and ON-GRID (in parallel to the grid).
- Percentage sharing of active/reactive powers among inverters.
- Percentage sharing of active/reactive powers among the **RN200**.

It also allows manual control of both the inverters and the RNCB circuit breaker.

The setting of the parameters can be managed directly from the front panel of the controller, or from the free **BOARDPRG3** programming software.

A complete and configurable historical recording system is available, which makes "on event" and periodic recordings (maximum 523 recordings for each archive with the default configuration). The historical archives can be viewed on the display of the controller or via the **HISVIEW PC** software.

The device includes a fully configurable PLC, in addition to the AND/OR logic that can be combined with timers: in this way it is able to satisfy specific customer or application requests. The **SICESPLCEDITOR** software allows you to create and test the PLC program.

## INPUTS, OUTPUTS AND AUXILIARY FUNCTIONS



18 digital inputs



18 digital outputs



7 analogue inputs



2 analogue outputs



PLC logics



AND/OR logics



16 calendars



History logs



USB port



RS232



RS485



Ethernet

- 18 configurable opto-insulated digital inputs.
- 18 configurable digital outputs.
- 7 configurable analogue inputs (6 x 0...10Vdc, 1x 0...32 Vdc).
- 2 configurable insulated analogue outputs.

### Communication:

- 1 USB port (Modbus RTU slave).
- 1 RS232 port (Modbus RTU slave).
- 1 RS485 insulated port (Modbus RTU slave).
- 1 Ethernet RJ45 port (Modbus TCP slave).

**Renewable/common bars voltage:** L1-N, L2-N, L3-N, L1-L2, L2-L3, L3-L1  
True RMS.  
Maximum L-N voltage < 300Vac CAT. IV.  
Rated voltage 100/400V with automatic selection.

**Renewable/common bars frequency:** Resolution = 0.1 Hz.  
Accuracy=  $\pm 50\text{ppm}$ ,  $\pm 35\text{ppm}/^{\circ}\text{C}$  (typical).

**Currents:** L1, L2, L3, N  
True RMS.  
Rated current: 5Aac e 1Aac.  
Integrated current transformers.

**Power supply voltmeter:** Resolution = 0.1V.

**Powers (total and on each phase)** Active power.  
Reactive power.  
Apparent power.  
Power factor.  
Load type.

## PROTECTIONS

List of protections with ANSI/IEEE codes

**Protections for renewable sources**

- 27 Under voltage (2 stages).
- 46 Voltage unbalance.
- 50 Instantaneous over current.
- 51 Time-dependant over current.
- 50V Voltage-restrained instantaneous over current.
- 51V Voltage-restrained time-dependant over current.
- 59 Over voltage (2 stages).
- 81O Over frequency (2 stages).
- 81U Under frequency (2 stages).

**Protections for the common bars**

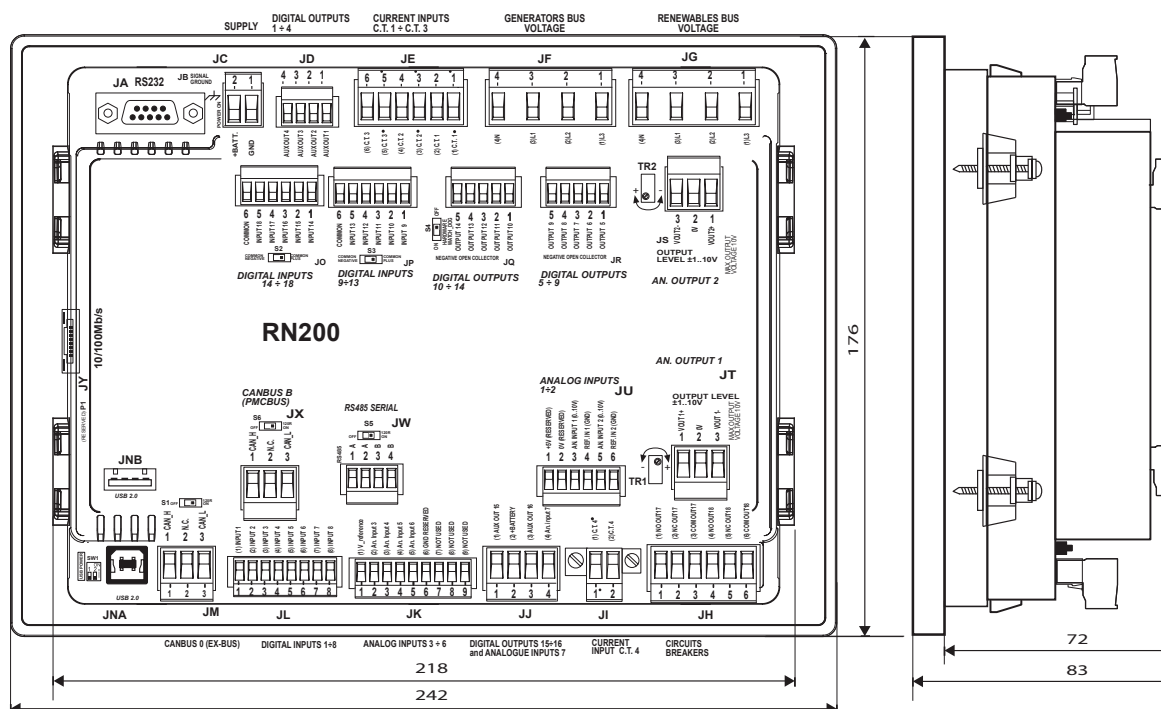
- 27 Under voltage.
- 46 Voltage unbalance.
- 47 Wrong phases sequence
- 59 Over voltage.
- 81O Over frequency.
- 81U Under frequency.

**Protections for power supply**

- 27 Under voltage.
- 59 Over voltage.

## TECHNICAL DATA

- > Power supply voltage: 7...32Vdc.
- > Power supply consumption: less than 6 W (225mA @ 27 VDC).
- > Rated frequency: 50Hz or 60Hz
- > Operating temperature: -25°...+60 °C.
- > Storage temperature: -30...+80 °C.
- > Humidity: 10-90% (non-condensing).
- > Dimensions: 244 (L) x 178 (H) x 83 (P) mm.
- > Panel cut-out: 218 (L) x 159 (H) mm.
- > Weight: 1100.
- > Protection degree: IP65 with provided gasket.
- > Graphic colour display TFT 4.3" 480 x 272 pixel with backlight.
- > EMC: compliant to EN61326-1.
- > Safety: compliant to EN61010-1.



[sices.eu](http://sices.eu)

**S.I.C.E.S. SRL**

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