



OhioSemitronics, Inc.
What Can We Measure for You?

ISO 9001 Certified

OPERATION MANUAL **RPS50**



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1. INTRODUCTION

This manual provides information on the proper installation, configuration and use of the adapter functions. The manual is not intended for general users, but for qualified, professional and skilled technicians, authorised to act in accordance with the safety standards relating to the dangers posed by electric current. This person must have appropriate training and wear suitable Personal Protective Equipment.

WARNING!



It is strictly forbidden for anyone who does not fulfil the above-mentioned requirements to install or use the adapter.

The instrument complies with the European Union directives in force, as well as with the technical standards implementing these requirements, as certified by the CE mark on the device. Using the meter for purposes other than intended ones, understood by the manual content, is strictly forbidden. The information herein contained shall not be shared with third parties. Any duplication of this manual, either partial or total, not authorised in writing by the Manufacturer and obtained by photocopying, duplicating or using any other electronic means, violates the terms of copyright and is punishable by law. Any brands quoted in the publication belong to the legitimate registered owners.



The device complies with European standards 89/336/EEC, 73/23/EEC and their following updating.

1.1 GRAPHIC SYMBOLS

Some instructions in the manual and on the device are highlighted by graphic symbols to draw the reader's attention to the operational dangers. The following graphic symbols are used:



WARNING!

This warning indicates the possible occurrence of an event which may cause a serious accident or considerable damage to the device if suitable precautionary countermeasures are not taken.



NOTE

This warning indicates important information which must be read carefully.

2. PRODUCT DESCRIPTION

The RPS50 is a multiscale Rogowski coil integrator, powered directly from the mains. An integrator is essential to equalize and shift by 90° the output signal from the Rogowski coils. It consists of an active electronic circuit with negligible offset and good linearity.

The RPS50 can be used with either GPC80 or MFC150 series coils, both rigid and flexible. The module is available in the standard configuration with one of the following 3 fullscales: 0.5, 2.5, 10kA; or 2.5, 10, 50kA; or 10, 50, 250kA.

On request, the input value and the output full scale can be customized according to the application. The RPS50 with a Rogowski current transducer is a very flexible system, suitable for high-power load analysis, impulse current monitoring, DC ripple measurement, etc.

Due to their specific features, flexible Rogowski coils are an extremely convenient solution for current measurement and can be used in a number of cases where traditional current transducers are not an adequate solution.

3. PRELIMINARY VERIFICATION



NOTE

When opening the box, check that the instrument has not been damaged during transport. If the instrument appears to be damaged, contact the sales representative.

The box contains:

- the integrator
- the user's manual

4. INSTALLATION



NOTE

The equipment complies with the 89/366/EEC, 73/23/EEC standards and following amendments. However, if not properly installed, it may generate a magnetic field and radio interference.

4.1 ENVIRONMENTAL REQUIREMENTS

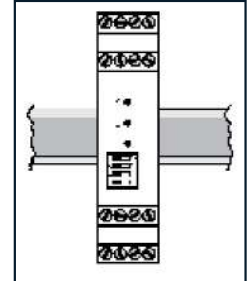
The environment in which the instrument is installed must satisfy the following features:

- no vibrations
- indoor area
- temperature between -10°C and +50°C (+14°F and +122°F)
- storage between -25°C and +70°C (-13°F and +158°F)
- max. humidity 80% (no condensation)



NOTE

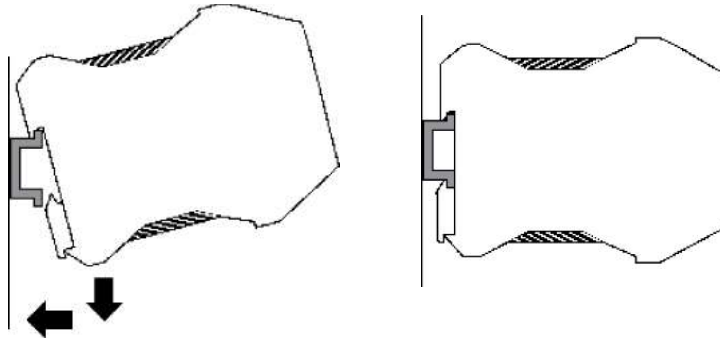
The instrument must not be exposed to sunlight.



4.2 MOUNTING

The instrument is designed for use on DIN EN 50022 rail. To mount the instrument on DIN rail, follow the description below:

- Hang the device from the top of the DIN rail with the metal hook facing down.
- Pull the instrument downward and against the DIN rail until it snaps in place. The instrument will now be fastened to the DIN rail.
- To remove the instrument, use a screwdriver, as a lever, on the metal hook at the base of the instrument.



5. SAFETY MEASURES & ELECTRICAL CONNECTIONS



WARNING!

Electrical instrument connections must be carried out only by qualified technicians aware of the risks involved to the presence of voltage.



WARNING!

Before making any connection, check that the instrument is

NOT POWERED and:

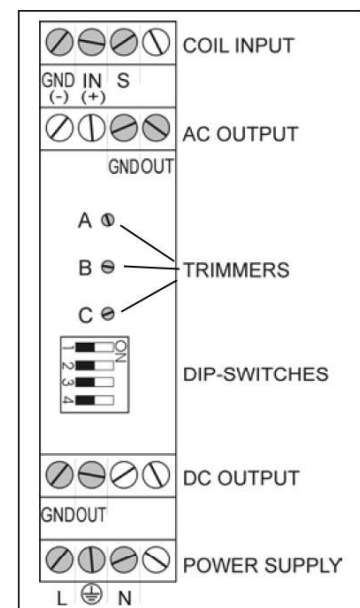
1. the conductor wires are not powered.
2. the power supply corresponds to the values on the instrument label.
3. the instrument has been installed in a vibration-free and a suitable temperature environment (see chapter 4).
4. the wiring is carried out in accordance with the standards in force in the country where the instrument is to be installed.



NOTE

For coil connection, please refer to the following table:

COIL CABLES	
GND(-)	BLUE cable
IN (+)	WHITE cable
S	shield



5.1 POWER SUPPLY



WARNING!

Before connecting the power supply, check if it corresponds to the value on the instrument label (85-250 Vac).

The instrument has no protection fuse on the power supply, therefore the installer must protect it with a circuit breaker and an over-current protection device (315mA delayed fuse, T type).

5.2 ANALOG OUTPUTS

Two different outputs are available:

- the standard AC output representing the instantaneous value, with 3 Vrms fullscale
- an optional DC output representing the RMS value of the measured current. The available values are: 0-20mA, 4-20mA or 0-10V.



WARNING!

Check if the external load parameters comply with RPS50 Technical Specifications.

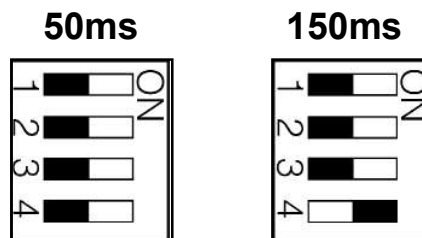
6. FULLSCALE SELECTION

Dip-switches 1, 2 and 3 allow for selection of the fullscale value. The following pictures show the three possibilities for fullscale selection.



7. DC OUTPUT RESPONSE TIME SELECTION

Dip-switch 4 allows selection of the response time only for DC output (optional). The following pictures show the response time selection options.



8. CALIBRATION

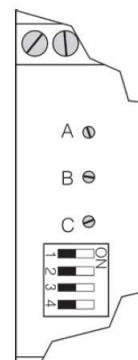


WARNING!

The RPS50 is factory calibrated for best measurement performance. However, it is possible to perform a customized calibration of each measuring scale if needed.

The following picture shows the three calibration trimmers with the relevant fullscale values described in the table (fullscale values expressed in kA). Carry out the calibration following the indications relevant to your instrument's fullscale (1, 2 or 3).

MODEL	RANGE	SWITCH SETTINGS			CALIB. POT USED
		SW1	SW2	SW3	
RPS50-10K	0.5kA	ON	OFF	OFF	A
RPS50-10K	2.5kA	OFF	ON	OFF	B
RPS50-10K	10kA	OFF	OFF	ON	C
RPS50-50K	2.5kA	ON	OFF	OFF	A
RPS50-50K	10kA	OFF	ON	OFF	B
RPS50-50K	50kA	OFF	OFF	ON	C
RPS50-250K	10kA	ON	OFF	OFF	A
RPS50-250K	50kA	OFF	ON	OFF	B
RPS50-250K	250kA	OFF	OFF	ON	C



NOTE: To select response time for dc output models only (optional): SW4 = ON for 150ms
SW4 = OFF for 50ms

9. TECHNICAL SPECIFICATIONS

POWER SUPPLY

Rated Voltage 80-250 Vac 50/60 Hz
Consumption 1.5VA max

ELECTRICAL CHARACTERISTICS

Input 1 for Rogowski coil
Input level (RMS) (1) 100mV / 1kA @ 50 Hz, other values on request
Output 1 3Vrms @ full scale, other values on request
Output 1 permissible load >10kOhm
Output 2 (optional) 0-20mA, 4-20mA, or 0-10V on request
Output 2 DC voltage load 100 kOhm
Output 2 DC current load max 300 Ohm
Available fullscales 1) 0.5, 2.5, 10 kA @ 3VRMS
(on request) 2) 2.5, 10, 50 kA @ 3VRMS
3) 10, 50, 250 kA @ 3VRMS
Accuracy (2) better than $\pm 1\%$ of full scale

ENVIRONMENTAL CONDITIONS

Operating temperature from -10°C to +50°C (from +14°F to +122°F)
Storage temperature from -25°C to +70°C (from -13°F to +158°F)
Relative humidity 80% max. without condensation

MECHANICAL CHARACTERISTICS

Material plastic enclosure
Protection degree IP20
Size / Weight 115 x 100 x 23 mm / approx. 117 gr

STANDARDS COMPLIANCE

Safety 73/23/EEC and 93/68/EEC directives, EN61010.1 safety standard
EMC 89/366/EEC directive and following modifications 93/31/EEC and 93/68/EEC, EN50081-2, EN50082-2, EN61326/A1

- (1) The Rogowski coil output is proportional to the rate of change of current. The calculation formula is: $\text{Amperes}_{\text{RMS}} \times \text{Hertz} \times K \times 10^{-6}$, where K depends on manufacturing. The K value is 2 for 100mV models.
- (2) RPS50 is delivered with the specified accuracy. Moreover, the calibration of each scale is adjustable by the user to achieve the maximum accuracy in conjunction with the coil being used.
- (3) The low limit is approximate and is determined by noise effect on very low signals.