

MAGNELAB RCS SERIES THREE-PHASE INTEGRATOR AND AMPLIFIER INSTALLATION INSTRUCTIONS

1. **Intended use of the equipment** -The Magnelab RCS Series three-phase integrator and amplifier (referred to as signal conditioner in this document) is designed to take a sinusoidal AC voltage input and integrate and amplify that signal. The typical input voltage is up to 0.5V AC RMS. The output voltage is typically up to 6.5 V AC RMS. The device is designed to be used with flexible sense coils with suitable rating and outputs



This symbol indicates that caution must be taken when installing or using this device. All external connections should provide Class 2 circuit and basic insulation to ground as required by UL61010-1.

Also note that if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



Use UL Listed Energy Monitoring Current Transformers

2. **Technical specification**
 - a. Input 0 to 0.5V AC RMS on three phases
 - b. Output 0.333 V AC RMS at rated current (up to 5 V AC RMS output rating available) on three phases
 - c. Accuracy $\pm 1\%$
 - d. Phase angle < 0.5 degrees measured at 50% rated current
 - e. Power supply required for operation, see 4.a (Class 2 required)
 - f. Input and output screw terminals rated for up to 16 AWG leads
3. **Name and address of manufacturer**

Magnelab, Inc.
600 Weaver Park Rd.
Longmont, CO 80501
4. **Equipment ratings**
 - a. **Supply voltage**
 - i. **Voltage range** - 9-36V DC
 - ii. **Frequency range** – DC only
 - iii. **Current rating** – 50mA nominal, 174mA max
 - b. **Description of all input and output connections** - screw terminal blocks suitable for wire gauges up to 16 AWG. Terminal Torque Rating for all terminals 2.7 Lb In.
 - i. **Input (6 terminals)** – for connection of up to 3 Rogowski coil type current sensors or similar devices, nominal input 70mV AC RMS, max input 0.5 V AC RMS. These units should provide Class 2 circuit and basic insulation to ground as required by UL61010-1.

- ii. **Output (6 terminals)** – for connection to metering device, nominal output 0.333 V RMS, max output 6.5V AC RMS
 - iii. **Power (2 terminals)** – for connection to Class 2 power supply, 9-36 V DC, 174 mA max current
- c. **Rating of insulation of external circuits** – All external circuits must provide isolation of 600V AC RMS to the terminal of the device.
- d. **Environmental conditions** –
 - i. Open Type for use inside overall enclosure.
 - ii. Altitude up to 2 000 m
 - iii. Temperature 5 °C to 55 °C Ambient
 - iv. Maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C
 - v. Pollution Degree 2 or 3
- e. **Operation Requirements** – RCS is only for use with Rope type CT's.

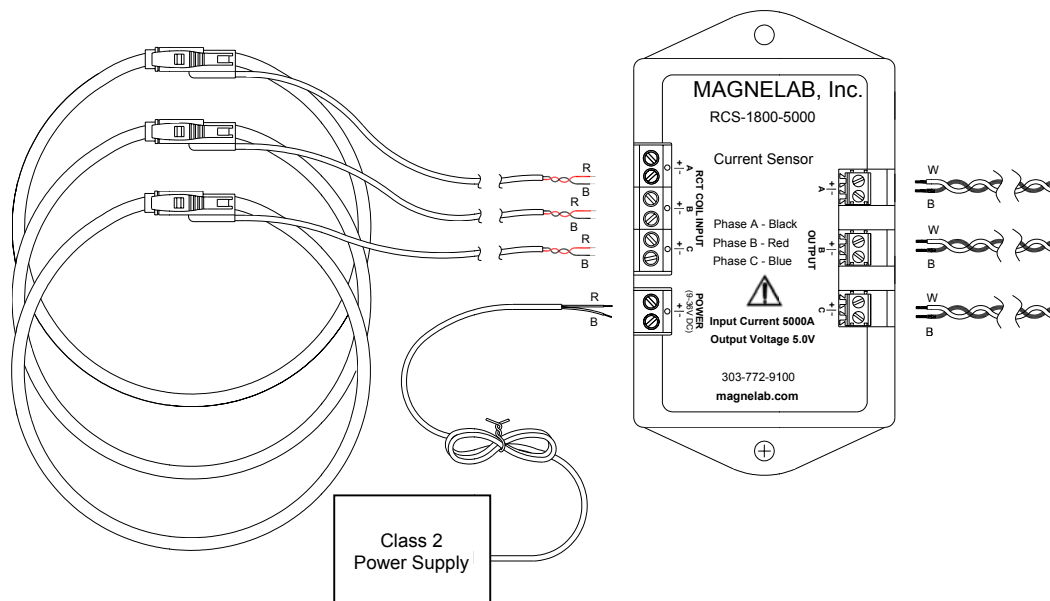
5. Equipment installation

This document provides general guidelines for the installation of the MagneLab RCS Series Three-Phase Integrator and Amplifier. This is a signal conditioner that is designed to be installed and used with Rogowski coil type devices. This shall act as a reference only and a working knowledge of the equipment being installed is required for safety.

DANGER! – Installing any current transformer or signal conditioner onto an energized circuit can result in severe injury or death. Installation should be performed by qualified personnel only. Disconnect all power sources before attempting installation of current transformers or signal conditioners. For the safest installation, properly connect all input and output leads to the signal conditioner to before installing it onto the conductor to be measured.

- Open the CT and place the conductor through the center opening. Securely close the CT ensuring you do not damage the connector and outer jacket.
- Allow the CT to hang or lay in an area that will allow the leads to be dressed safely away from any potential damaging sharp edges or voltage sources.
- Secure in place as needed with nonconductive materials only.
- Repeat the above steps for all three phases to be monitored (A, B, and C)
- Connect output of device (phase A, B, and C) with suitable lead wire to meter or monitoring device.
- Connect Class 2 power supply to power terminals according to polarity indicators. Power supply should be deactivated during connection.

Install the RCS series regardless of current rating per drawing below. The label on the connector indicates the orientation CT in relation to the current source. All installations are subject to inspection and approval by authorized personnel before operation of the device.



6. Equipment Operation

- a.** Install Rogowski coils and Magnelab RCS Series Three-Phase Integrator and Amplifier as described in Section 5.
- b.** Activate power supply that is connected to the Magnelab RCS.
- c.** If you are using the signal conditioner with current sensors, energize the center conductor that the current sensors are attached to. Otherwise, energize the AC signal source that the signal conditioner is connected to.
- d.** The output terminals for each phase (A, B, and C) should produce an AC voltage that varies linearly with the current passing through the corresponding center conductors. This should be detectible by the meter or monitoring device connected to the output.

7. Equipment maintenance and service

- a.** Occasionally inspect for damage to insulation on sensors or lead wires to and from the RCS integrator. Contact manufacturer for replacement materials in case of damage.
- b.** There are no components within the device that can be serviced by the end user. Please contact the manufacturer if there are issues with the output of the RCS.
- c.** If it is necessary to replace the power supply, be sure to use a Class 2 device that meets the power requirements of the RCS.