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SAFETY INFORMATION

Please read this manual carefully before installation, operation and maintenance of the Rogowski Coil Integrator.

The following symbols in this manual are used to provide warning of danger or risk during the installation and operation of the unit.

- **Electric Shock Symbol:** Carries information about procedures which must be followed to reduce the risk of electric shock and danger to personal health.
- **Safety Alert Symbol:** Carries information about circumstances which if not considered may result in injury or death.
- **This mark indicates that this product is UL listed.**

Installation and maintenance of the Rogowski Coil Integrator should only be performed by qualified, competent professionals who have received training and should have experience with high voltage and current devices.

Accuenergy shall not be responsible or liable for any damages caused by improper meter installation and/or operation.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Reinforced Insulation Icon]</td>
<td>Product is protected by reinforced insulation</td>
</tr>
<tr>
<td>![Application Around and Removal Icon]</td>
<td>Application Around and removal from UNINSULATED HAZARDOUS LIVE conductors is permitted</td>
</tr>
</tbody>
</table>

**WARNING:** Disconnect power supply before making electrical connections.

**WARNING:** Current Transformers (CT's) should be installed by trained electrician or technician.

**WARNING:** The secondary circuit of a CT should not be opened when current is flowing through the primary circuit.
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Chapter 1

1.1 Overview

1.2 What's Included
Chapter 1: Overview

1.1 Overview

The Rogowski Integrator (RIK V) is designed to provide users with an easy to install, plug and play, retrofit solution that can be used with any power meter or equipment with either 0-5Vdc and 0-10Vdc current input from a Current Transformer (CT). The flexibility of the Rogowski Coil CT’s reduces the complexity and allows it to be used for a variety of applications and configurations where special constraints may limit the use of other CT solutions. The RIK is a configurable unit that can measure current from 2.5-60000A making it ideal for any system that operates at both 50Hz and 60Hz further adding to its flexibility.

1.2 What's Included

The Rogowski Coil includes either the single channel or three channel integrator unit which contains the seven configurable CT ratios for each channel. The integrator unit can be surfaced mounted or mounted on a standard DIN rail.

Rogowski coils that will measure the current and the 24Vdc power supply to power the integrator are sold separately.
Chapter 1: Overview

Details:

1. **Rogowski Coil Input**
   Three Channels for flexible rope style CT input.

2. **0-5V/0-10V Output**
   Three Channels, 0-5V/0-10V Output.

3. **Power On Light**
   Indicates that the RIK is powered up.

4. **CT Configurator**
   Seven individual field configurable CT ratios for each channel.

5. **Rogowski Coil**
   CT sizes available from 16-47 inches.

6. **Coil Input Lead**
   Input lead for connection with RIK integrator.

Single Phase Integrator
Chapter 2

2.1 Hardware Overview

2.2 Installation

2.3 Configuration

2.4 Measurements
Chapter 2: Hardware Overview

The installation method is introduced in this chapter. Please read this chapter carefully before beginning installation.

2.1 Hardware Overview

The RIK V is composed of the integrator and the optional power supply which can all be mounted on a DIN rail along with one or three Rogowski coils. Rogowski coil and power supply sold separately.

2.2 Installation

![Three Phase Integrator](image)

![Single Phase Integrator](image)
Dimensions:

Figure 1: Top View

Figure 2: Side View
Chapter 2: Hardware Overview

Figure 3: Front view

Figure 4: Side view of Power Supply unit
The installation of the RIK V integrator requires the user to simply connect the Rogowski coil CT (sold separately) to the integrator and wire the 0-5/0-10V output to the power meter or electrical equipment which will receive the signal. If the system is single phase or there are two phases only the phases that need the CT will need to be connected to the input of the integrator.
Chapter 2: Hardware Overview

The diagram below illustrates how to connect the integrator.

Three Phase Integrator

Single Phase Integrator
**Input:**

The provided Rogowski coils are the input to the integrator. Connect the Rogowski coil leads to the input channel on the integrator. The white leads of the CT are the positive wire and the brown lead is the negative wire.

- Connect the white lead to ‘IN+’ or ‘RCT+’ and the brown lead to ‘IN-’ or ‘RCT-’. The Shield of the Rogowski coil should be left floating. Open the coil by pulling apart the black connector of the CT.
- Open the coil by pulling apart the black connector of the CT.
- Install the CT around the conductor to be measured. Arrow on the Rogowski coil connector should be point to load.
- Re-attach the coil together.
- Repeat above steps if using more than one CT.

Ensure that the CT connected to each channel of the integrator is around the correct phase/line voltage.

**Output:**

Connect each output channel to the meter or equipment with 0-5V/0-10V input.

- ‘OUT+’ is to be connected to the positive input terminal of meter.
- ‘OUT-’ is to be connected to the negative input terminal of meter.

**Power Supply:** (Sold Separately)

The RIK V requires 24Vdc power to operate. There is a 100-240Vac (50/60Hz) power adapter that is included to provide this power.

- Connect the input power supply that is between 100-240Vac to the 'L' and 'N' terminals of the power supply.
- Connect the DC output of power supply to the RIK's '24V+' and '24V-' terminals.
Chapter 2: Hardware Overview

2.3 Configuration

One or three sets of dip switches are used to configure corresponding current ranges with output ratings.

When the dip switch is in the up position the dip switch is considered to be Off. When the dip switch is in the down position the dip switch is considered as On.

Configure each channels dip switches to output the desired range. Dip Switches 1 and 2 will determine the output signal of that channel.

**Note:** Dip Switch #3 is not used.

For example to measure current rated for 1000A with a 0-5V output signal dip switches 1 and 2 will be configured in the 'ON' position whiles dip switches 4 through 8 for the three channels must be configured to be 'OFF', 'ON', 'OFF', 'ON' and 'OFF' respectively.

- Enter this current ratio into the meter or equipment so it can read accurately from the integrator.

<table>
<thead>
<tr>
<th>Output</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5V</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>0-10V</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>500A</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>1000A</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>2500A</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>5000A</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>10000A</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>25000A</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>50000A</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
</tbody>
</table>

Table 1: Three Phase Integrator Current Ratio Table

Table 2 - Three Phase Integrator Sum Output Configuration

<table>
<thead>
<tr>
<th>Output</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5V</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>0-10V</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>
### 2.4 Measurements

For each current range the integrator will be able to measure the current from 0.5% up to 120% of the rated current. That is when the integrator is configured to measure a current rated for 1000A it will measure the current from 5A to 1200A. The integrator will output 5A at the rated current of 1000A and will output its maximum of 6A at 1200A.

The table below provides all the ranges of current that can be measured for each range.

<table>
<thead>
<tr>
<th>Primary Input (A\text{RMS})</th>
<th>Sensing Range (A)</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>2.5 to 600</td>
<td>0-5V or 0-10V @500A</td>
</tr>
<tr>
<td>1000</td>
<td>5 to 1200</td>
<td>0-5V or 0-10V @1000A</td>
</tr>
<tr>
<td>2500</td>
<td>12.5 to 3000</td>
<td>0-5V or 0-10V @2500A</td>
</tr>
<tr>
<td>5000</td>
<td>25 to 6000</td>
<td>0-5V or 0-10V @5000A</td>
</tr>
<tr>
<td>10000</td>
<td>50 to 12000</td>
<td>0-5V or 0-10V @10000A</td>
</tr>
<tr>
<td>25000</td>
<td>125 to 30000</td>
<td>0-5V or 0-10V @25000A</td>
</tr>
<tr>
<td>50000</td>
<td>250 to 60000</td>
<td>0-5V or 0-10V @50000A</td>
</tr>
</tbody>
</table>
Appendix: Key Specifications

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Measurement Range</td>
<td>2.5A - 60000A</td>
</tr>
<tr>
<td>Output Current</td>
<td>0-5V/0-10V (Field Configurable)</td>
</tr>
<tr>
<td>Sensing Range</td>
<td>500A, 1000A, 2500A, 5000A, 10000A, 25000A and 50000A (Field Configurable)</td>
</tr>
<tr>
<td>Measurement Channels</td>
<td>1 or 3 Channel</td>
</tr>
<tr>
<td>Frequency</td>
<td>45Hz to 65Hz</td>
</tr>
<tr>
<td>Accuracy</td>
<td>+1% Full Scale Error</td>
</tr>
<tr>
<td>Channel Cross Talk</td>
<td>&lt; -60dB</td>
</tr>
<tr>
<td>Maximum Operating Temperature</td>
<td>55°C (131°F)</td>
</tr>
</tbody>
</table>