IMPORTANT SAFETY INFORMATION

Current transformers (CTs) must at all times be installed by trained electricians or technicians. Dangerous voltages are likely to be present in the vicinity of current transformers.

Provision should be made for shorting the current transformers and isolating the meter from the voltage supplies to enable maintenance or removal of the meter.

UNDER NO CIRCUMSTANCES MAY THE SECONDARY CIRCUIT OF A CT BE OPENED WHEN CURRENT IS FLOWING IN THE PRIMARY CIRCUIT.

The voltage in an unterminated secondary winding can reach several thousand volts in a fraction of a second if it is made open-circuit while current is flowing in the primary circuit being metered. Such high voltages can be extremely dangerous to personnel and can cause serious damage to the transformer or equipment connected to it. Such damage may not be immediately obvious, but will certainly lead to incorrect operation of the equipment.
**PRINCIPLES & CONFIGURATION**

A current transformer produces a output signal directly proportional to the magnitude of the current flowing in the conductor around which it is put. The output signal from the current transformer is sent to the meter and the current flow in the primary circuit calculated.

A current transformer is required for each phase.

Polarity must be observed when fitting current transformers. If a current transformer is placed the wrong way round the meter will incorrectly interpret its reading as exporting rather than consuming.

There are Three basic types of current transformers offered through ECOS:

<table>
<thead>
<tr>
<th></th>
<th>Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Solid Core</td>
<td>The conductor to be measured has to be disconnected at one end to enable the fitting of the CT.</td>
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<tr>
<td>2</td>
<td>Split-core</td>
<td>The CT splits into two pieces so that it can be fitted around the conductor. (retro fit)</td>
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<tr>
<td>3</td>
<td>Wound-primary</td>
<td>The conductor is wired into the CT rather than passing through it.</td>
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**TRANSFORMER RATIO**

Current transformers are marked with the ratio between the maximum primary current and the maximum secondary current. For example a ‘200:5A’ CT produces a 5A output signal when 200A is flowing through the primary.

It is best to match the CT primary as closely as possible to the maximum expected current to get the best possible accuracy. This is because CTs are less accurate at low loads than they are at full load.

If using a 200:5A CT you will need to input a figure of 200 into the Eniscope meters settings menu. Information on how to complete this can be found in the Meter Guide, under ‘System Settings’ Setting ‘S08’ (CT Primary).

**POLARITY**

Current transformers are direction sensitive and must be fitted the correct way round. CTs are marked with P1 and P2 to indicate which way they should be fitted around the cable or buss-bar. The side marked P1 must point towards the supply, and P2 must point towards the load. If an arrow is printed on the CT it must point towards the load.

The CT outputs - “secondary’s” - must be connected to the meter the correct way round. Current transformers are supplied with secondary terminals marked S1 and S2 which must be connected to the correct terminals on the meter. The meter will not register correctly if any of the CTs are connected incorrectly.

The CTs must be connected to the correct phase inputs on the meter. The meter will not register correctly if the CT for L1 is connected to the inputs for L3 current, for example.

For wound-primary CTs the section of the conductor nearest the supply is connected to the P1 terminal. The P2 terminal takes the section of the conductor leading to the load. Note that these terminals are at mains potential.

Precautions should be taken to ensure that exposed conductors cannot be accidently touched- please consult with your local wiring regulations.
Solid Core CTs are suitable for general purpose use in many applications. The only limitation is that installation requires the bus bar or cable to be fed through the CT during installation or wired into the CT (wound-primary).

Solid Core CTs are designed for mounting in the following ways: clipped on to a DIN rail, screwed down on to a bus bar or screwed down on a base plate or back panel.

It is essential that the CT is fitted the right way around the cable fitted together tightly and in the correct orientation and fitted firmly so that the CT will not move with respect to the conductor.

**BEFORE BEGINING THE INSTALLATION POWER MUST BE DISCONNECTED ON THE CABLE OR BUS BAR YOU ARE MONITORING (THE PRIMARY CONDUCTOR) FAILURE TO DO SO MAY RESULT IN DEATH.**

The process of fitting a solid-core CT is as follows:

1. Disconnect the power to the cable or bus bar you will be connecting the CT to.
2. Disconnect the cable or Bus Bar from the termination/ connection point.
3. Place the CT over the Primary conductor ensuring that the CT is facing in the correct orientation. P2 Facing the Load and P1 facing the Supply.
4. Mount the CT either to a DIN rail or to a back plate, or adjust the mounting screw so the CT does not move.
5. Connect the Secondary wiring to the Eniscope meter ensuring the correct phase and polarity.

| Phase 1 CT | S1 - 1 | S2 - 2 |
| Phase 2 CT | S1 - 3 | S2 - 4 |
| Phase 3 CT | S1 - 5 | S2 - 6 |

6. Re-connect the Primary conductors.
7. Re-apply power to the primary conductors.
8. Check the meter reads correctly on all phases – if not disconnect the power and check the CT wiring.
Split-core CTs are designed for use in existing installations in which it is not possible to disconnect one end of the cable or bus bar. A split-core CT has two main segments held together with a clip.

It is essential that the CT is fitted the right way around the cable or bus bar, and also that the segments are fitted together tightly and in the correct orientation.

BEFORE BEGINING THE INSTALLATION POWER MUST BE DISCONNECTED ON THE CABLE OR BUS BAR YOU ARE MONITORING (THE PRIMARY CONDUCTOR) FAILURE TO DO SO MAY RESULT IN DEATH.

The process for fitting a split-core CT is as follows:

1. Disconnect the power to the cable or bus bar you will be connecting the CT too.
2. The secondary cables connected to the bottom of the CT Must be connected to the meter first. Ignoring this first Step could result in a high voltage shock. Also ensure the green short circuit link is firmly in place.

| Phase 1 CT | S1 - 1 | S2 - 2 |
| Phase 2 CT | S1 - 3 | S2 - 4 |
| Phase 3 CT | S1 - 5 | S2 - 6 |

3. Undo the two clips and separate the two segments.

4. Fit the main segment around the cable or bus bar. The side labeled P1 must point towards the supply. The side labeled P2 must point towards the load.

5. Fit the small segment around the cable against the main segment.

6. Make sure that no insulation or any other material is trapped between the two segments.

7. Pull both clips down securely snap into place.

8. Once you have insured the CT is securely connected to and the secondary cables are connected to the meter you can re-connect the power to the primary conductor.

9. Now you can remove the green short circuit link at the bottom of the CT, this will now send the current readings to the Eniscope meter. (Please keep in safe place for future use).

10. Check the meter reads correctly on all phases – if not disconnect the power and check the CT wiring.