

Extending CT Cable Length

Revision R22A

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1 SCOPE

1.1 IDENTIFICATION

This document describes the guidelines for extending the length of Current Transformer (CT) cables.

1.2 INTRODUCTION

It is highly recommended that any DTS meter be mounted close to the service being monitored, so that the CT cables can be as short as possible. In general, it is easier to extend communication and I/O cables rather than the CTs cables, because these interfaces were designed for longer lengths and greater noise immunity.

It is difficult to give any exact maximum cable extension lengths for CT cables because many factors are involved. This document discusses the factors to consider for best success when extending the wire cable length for:

- 333mV CT

2 EXTENDING CT CABLES

Most noise that will be induced on the CT cables will be 50/60Hz noise. This noise is at the same frequency as the signals the CTs are measuring, so any induced noise will affect the accuracy of the current measurements, especially at low current levels.

2.1 GENERAL GUIDELINES

General factors to consider when installing CTs:

- Keep the cables as short as possible.
- Route the CT cables through a dedicated conduit.
- Do not route CT cables through the same conduiting as the voltage cables.
- Keep as far away from other power cables, VFDs and other heavy machinery.
- Do not run cables in parallel with other power cables.

2.2 SPECIFIC GUIDELINES & REQUIREMENTS

If you really need to extend the CT cables, please follow these recommendations:

- Use the wire with the same gauge (AWG), voltage (V) and temperature (°C) rating to match the wire that is already fitted to the CTs.
- The extension cable pair must be twisted (about one twist per inch). This twisting of the conductors increases the cable's immunity to induced noise at 50/60Hz.
- Avoid large open loops in the cable at the joint – Maintain the twisting until as close to the joint as possible.
- The best ways to achieve the electrical connection at the joints are:
 1. The best way to join the wires is a solder joint covered and insulated with heat shrink tubing.
 2. [Wago 221 Series of Lever Nuts](#). These are cheap and easy to install without needing any special tools.
 3. [Crimp-On Butt Splices](#) such as those available from McMaster-Carr. These require a special crimping tool, so this method is not always practical.
 4. Do NOT use normal electrical wire nuts as these do not provide a good electrical or mechanical connection with 18 AWG wire.
 5. Definitely, do NOT simply twist the bare wires together.

2.2.1 333mV CTs

The voltage output of these CTs is 333mV at the rated current, so the above guidelines are especially important to reduce noise contamination on these low voltage CT wires.