



IEEE Guide for Field Testing of Relaying Current Transformers

IEEE Power Engineering Society

Sponsored by the
Power Systems Relaying Committee



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IEEE Guide for Field Testing of Relaying Current Transformers

Sponsor
Power System Relaying Committee
of the
IEEE Power Engineering Society

Approved 16 November 2006
IEEE-SA Standards Board

Abstract: This guide describes field test methods that assure that current transformers are connected properly, are of marked ratio and polarity, and are in a condition to perform as designed both initially and after having been in service for a period of time.

Keywords: current transformers, excitation, field testing, insulation, polarity, ratio, relaying

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Introduction

This introduction is not part of IEEE Std C57.13.1-2006, IEEE Guide for Field Testing of Relaying Current Transformers.
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This project revises the previous guide to keep it current with technological changes in instrument transformers and test equipment.

In the application of protective relays, a widely used input quantity is current. A multiplicity of different protective relays either utilize current directly, combine it with other currents as in differential schemes, or combine it with voltage to make impedance or power measurements. The source of relay input current is from current transformers, which may be located on the bushings of power circuit breakers and power transformers, on the bus bars of metal clad switchgear, or installed as separate items of equipment located as required.

This guide should be used in conjunction with other references, such as IEEE Std C57.13TM, IEEE Standard Requirements for Instrument Transformers^a; IEC Standard 60044-8, Instrument Transformers—Electrical Current Transducers [B2]; and Handbook for Electricity Metering, EEI Publication No. 93-02-03 [B1].^b

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^a Information on references can be found in Clause 2.

^b Information on bibliographical references can be found in Annex D.

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1. Overview

1.1 Scope

The scope of this guide is to describe field test methods that assure current transformers (CTs) are connected properly, are of marked ratio and polarity, and are in a condition to perform as designed both initially and after being in service for a period of time.

Annex A describes wiring integrity checks, uses of test jacks and current shorting switch, and relay test equipment.

Annex B illustrates excitation voltage measurement differences between rms responding voltmeters, commonly used under field conditions, and average responding voltmeters commonly used in laboratory tests and also discusses the effect of the source impedance.

Annex C describes the characteristics, and other pertinent information, for optical current sensor systems used with protective relaying. It provides an overview of the components used in an optical sensor system, discusses the differences from conventional CTs, and provides testing information.

Annex D is the bibliography for this guide.

1.2 Purpose

The purpose of the guide is to provide information on the current technology for field testing of instrument transformers and to more closely coordinate the information with the other industry standards, for example, National Electrical Safety Code® (NESC®).

2. Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

Accredited Standards Committee C2, National Electrical Safety Code® (NESC®).¹

IEEE Std C57.13™, IEEE Standard Requirements for Instrument Transformers.^{2, 3}

IEEE Std C57.13.3™, IEEE Guide for Grounding of Instrument Transformer Secondary Circuits and Cases. IEEE

Std C37.110™, IEEE Guide for Application of Current Transformers Used for Protective Relaying Purposes.