SLOVENSKI STANDARD
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Ģelezniġke naprave ï Stabilne naprave elektriļne vleke ï Posebne zahteve za stikalne naprave za izmeniļni tok ï 3. del: Merilne, krmilne in zaġļitne naprave za izkljuļno uporabo v izmeniļnih vleļnih sistemih ï 1. oddelek: Navodila za uporabo

Railway applications - Fixed installations - Particular requirements for a.c. switchgear -- Part 3-1: Measurement, control and protection devices for specific use in a.c. traction systems - Application guide

Bahnanwendungen - Ortsfeste Anlagen - Besondere Anforderungen an Wechselstrom-Schalteinrichtungen -- Teil 3-1: Mess-, Steuerungs- und Schutzeinrichtungen für Wechselstrom-Bahnanlagen - Anwendungsleitfaden

Applications ferroviaires - Installations fixes - Prescriptions particulières pour appareillage à courant alternatif -- Partie 3-1: Dispositifs de mesure, de commande et de protection pour usage spécifique dans les systèmes de traction à courant alternatif - Guide d'application

Ta slovenski standard je istoveten z: **EN 50152-3-1:2003**

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29.280	Elektriļna vleļna oprema	Electric traction equipment

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English version

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC
European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This European Standard was prepared by SC 9XC, Electric supply and earthing systems for public transport equipment and ancillary apparatus (fixed installations), of Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50152-3-1 on 2003-10-01.

This European Standard supersedes ENV 50152-3-1:1998.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-10-01

- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-10-01

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Introduction

EN 50152-3 is divided as follows:

- Part 3-1: Application guide;
- Part 3-2: Single-phase current transformers;
- Part 3-3: Single-phase voltage inductive transformers.

This number of parts is subject to future additions as soon as a protection device is considered suitable for standard requirements.

Part 3-1 is a guide. Further parts are normative and apply when the equipment is concerned with the specified characteristics.

1 Scope

EN 50152-3-1 provides assistance, guidance and requirements in the design of protection, control and measuring systems in a.c. installations at traction voltages (see EN 50163) intended to provide a power supply to traction systems. This application guide identifies the characteristics and parameters of equipment used in the measurement, control and protection of a.c. traction systems. Guidance is given in the correct use of protection.

2 Normative references

This application guide makes reference to the other parts of EN 50152 as well as to EN 50163.

3 Measurement

Two types of measurements are made:

a) measurement of current and voltage signals for connecting to instruments and telemetering;

b) current and voltage signals used for operating protection relays on over-current, low impedance, over/under-voltage and short circuit or distance protection.

The class, ratio and burden should be selected from the values in EN 50152-3-2 or EN 50152-3-3. The accuracy and purpose are dependant on the class selected.

4 Closing control systems

4.1 General

The application of the features described below depends on the philosophy of the user's control system.

Closing control systems are usually only those which involve the electrical closing of switchgear devices. Their effect is to permit or inhibit a closure depending on the status of the system (and plant) and the compliance of specified requirements.

4.2 Anti-pumping

This system limits the closing device to effect a single attempt while the signal to close is maintained. If the device fails to complete a satisfactory close operation whilst the close signal is maintained, then attempts at further reclosing (pumping) are inhibited.

An anti-pumping can be achieved in the closing control circuit in various ways, either by using circuit-breaker mechanism auxiliary switches or a timing relay. It only allows a single closing pulse to the closing device, which resets when the initial closing signal is released.

The purchaser should specify the need for anti-pumping feature.

4.3 Auto-reclose with variable reclose time and final lock out

Auto-reclose is only applied to line circuit-breakers and its purpose is to restore the system voltage to the overhead contact line automatically when there is a temporary loss of supply.

On traction systems a temporary loss of supply is not always due to permanent short circuits and an auto-reclose system can enhance the reliability of the system.

Auto-reclose is usually associated with a timing device which gives several attempts at reclosing with varying adjustable intervals of circuit dead time. After a prescribed number of unsuccessful recloses, then a lock out of the reclosing circuit should be instigated. The lock out relay may then be either electrically or manually reset.

The purchaser should specify the need for this requirement and the following information:

a) number of recloses: e.g. 2 recloses then lock out;

b) reclosing time intervals: e.g. 0,3 s, followed by 180 s, followed by 180 s (see 4.104 of EN 50152-1);

c) lock out reset: i.e. local or remote.

4.4 Undervoltage close inhibit

When used and fitted to an incoming circuit-breaker on the secondary side of the traction transformer, the voltage signal is the voltage of the transformer. Unless the supply is available the circuit-breaker cannot be closed.

When fitted to a line circuit-breaker, the voltage signal is that of the busbar. Unless the busbar traction voltage is live, the line circuit-breaker cannot be closed.

The loss of the voltage signal should give an alarm or automatic tripping of all circuits connected thereto. This effect is achieved by undervoltage relays or other suitable voltage detecting devices with accurate pick up and drop off voltage levels, operating on to shunt trip devices and close inhibits.

The purchaser should specify the need for undervoltage close inhibit and the following information:

a) minimum pick up voltage kV;

b) maximum drop off voltage kV.

4.5 Line test device

Line test devices are used on line circuit-breakers before closing, to prevent the line circuit-breaker closing on to a short circuit.

This is achieved by inserting a resistor by means of a suitably rated switch or switch-disconnector between the switchboard busbar and the overhead contact line. The load impedance acts as a footing resistance to the inserted resistor and, by measuring the voltage between feeder and return circuit, it can allow or inhibit a close signal. An example for a line test circuit is shown in Figure 1.

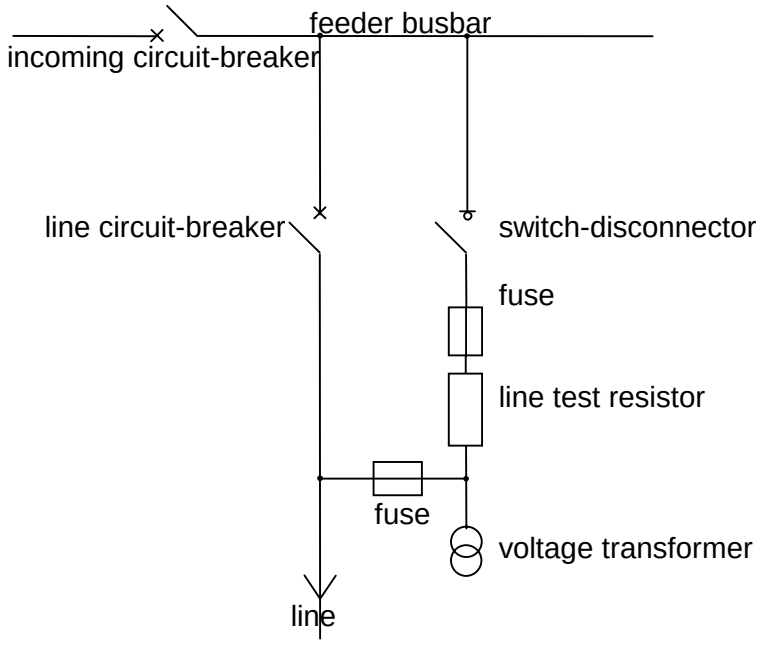

Figure 1 - Example for a line test device

When the measured voltage is low or below a prescribed level, when there is an overload on the line, the close is inhibited. When this voltage is above a prescribed level, then there is probably only a standing vehicle and the close is permitted.

Line test devices may be coupled with auto-reclose schemes, thereby inhibiting a reclose if the original trip was due to a fault which had not cleared itself in the dead time.

Line test devices can be by-passed if the line is already live from the line circuit-breaker at the remote end.

The purchaser should specify the need for a line test device and the following information:

a) value of the resistor and, by consequence, the current value to be chosen from 5 A to 25 A;

b) whether the line test device is combined with auto-reclose.

5 Protection systems

5.1 Protection system of line circuit-breakers

Line circuit-breakers are only required to trip the faults on their own section of line.

The protection relays should be selected to have characteristics and settings which will discriminate between heavy load caused by trains on their section of line and faults of the line itself.

The characteristics may be selected from the following types of relays:

a) high set instantaneous overcurrent, with or without a variable time delay. Usually for close up faults;

b) impedance relay with a specified characteristic (e.g. to protect the overhead contact line);