



SLOVENSKI STANDARD SIST EN 50556:2011

01-december-2011

Nadomešča:

SIST HD 638 S1:2002

SIST HD 638 S1:2002/A1:2007

Sistemi prometne signalizacije

Road traffic signal systems

Straßenverkehrs-Signalanlagen

Systèmes de signaux de circulation routière

ITEH STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 50556:2011](http://standards.iteh.ai/catalog/standards/sist/en-50556-2011/c29-42af-83f8-75bc1f838a48/sist-en-50556-2011)

Ta slovenski standard je istoveten z: **EN 50556:2011**

<http://standards.iteh.ai/catalog/standards/sist/en-50556-2011/c29-42af-83f8-75bc1f838a48/sist-en-50556-2011>

ICS:

| | | |
|-----------|----------------------------------|----------------------------------|
| 93.080.30 | Cestna oprema in pomožne naprave | Road equipment and installations |
|-----------|----------------------------------|----------------------------------|

SIST EN 50556:2011

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 50556:2011](#)

<https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50556

February 2011

ICS 93.080.30

Supersedes HD 638 S1:2001 + A1:2006

English version

Road traffic signal systems

Systèmes de signaux de circulation
routière

Straßenverkehrs-Signalanlagen

STANDARD PREVIEW
This European Standard was approved by CENELEC on 2011-01-02. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

<https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-751c1f38-0000/en-50556-2011>

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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

This European Standard was prepared by CENELEC Task Force BTTF 69-3, Road traffic signal systems.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50556 on 2011-01-02.

This document supersedes HD 638 S1:2001 + A1:2006.

The main changes with respect to HD 638 S1:2001 + A1:2006 are the following:

- update of the normative-references;
- editorial revision;
- reduction of the classes;
- adaptation to the level of technology.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

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) 2012-01-02
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2014-01-02

SIST EN 50556:2011

<https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011>

Contents

| | |
|--|-----------|
| Introduction | 5 |
| 1 Scope | 6 |
| 2 Normative references | 6 |
| 3 Terms and definitions | 7 |
| 4 Electrical supply and limits | 10 |
| 4.1 Nominal voltages..... | 10 |
| 4.2 Operating voltage range..... | 10 |
| 4.3 Low voltage..... | 11 |
| 4.4 Overvoltage..... | 11 |
| 4.5 Voltage dip..... | 11 |
| 4.6 Mains frequency..... | 11 |
| 5 Safety | 12 |
| 5.1 Electrical safety..... | 12 |
| 5.2 Traffic safety..... | 14 |
| 6 Testing | 19 |
| 6.1 General..... | 19 |
| 6.2 Organisation of testing..... | 19 |
| 6.3 Environmental tests..... | 20 |
| 6.4 Electrical tests..... | 22 |
| 6.5 Electrical safety tests..... | 23 |
| 6.6 Traffic safety tests..... | 24 |
| 6.7 Electromagnetic compatibility testing..... | 25 |
| 7 Electrical interfaces | 26 |
| 7.1 General..... | 26 |
| 7.2 Detector interface..... | 26 |
| 8 Installation | 26 |
| 8.1 General..... | 26 |
| 8.2 Tests carried out during installation..... | 26 |
| 8.3 Test of cables following the installation of cables..... | 27 |
| 8.4 Inspection of terminations following the installation and termination of all equipment and cables..... | 27 |
| 8.5 Test of impedance..... | 27 |
| 8.6 Insulation of live parts to earth..... | 28 |
| 8.7 RCD (residual current detector / earth leakage breaker)..... | 28 |
| 8.8 Fuses..... | 28 |
| 8.9 Voltage and polarity of supply..... | 28 |
| 8.10 Connections between controllers, signals and ancillary equipment..... | 29 |
| 8.11 Safety covers..... | 29 |
| 8.12 Functional check of road traffic signal systems..... | 29 |
| 9 Maintenance | 29 |
| 9.1 General..... | 29 |

ITeH STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 50556:2011](https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011)

<https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011>

| | | |
|-----------|---|-----------|
| 9.2 | Types of maintenance..... | 29 |
| 9.3 | Documentation required for maintenance..... | 29 |
| 9.4 | Equipment not covered by this standard..... | 30 |
| 9.5 | Safety testing procedures | 30 |
| 9.6 | Maintenance testing procedures..... | 30 |
| 10 | Marking and labelling | 32 |
| 11 | Classification of environmental test conditions..... | 33 |

Figure

Figure 1 – Failure consideration of a Road Traffic Signal System – Protection against accidents caused by technical failures18

Tables

| | |
|--|----|
| Table 1 – Classification according to voltage dip..... | 11 |
| Table 2 – Requirements for maintenance measures (intervals (PTI) in months)..... | 31 |
| Table 3 – Environmental testing | 33 |

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 50556:2011](#)

<https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011>

Introduction

To satisfy the legal and regulatory requirements and specific provisions of each CENELEC country, certain characteristics in this standard contain a range which is defined by a number of discrete classes. The class to be used in the country will be selected by the Standards Authority of the CENELEC member of that country from the range specified.

Thus this European Standard contains the essential electrotechnical requirements of all CENELEC countries and permits through the class selection procedure, countries to incorporate their own requirements.

It is believed that this first step will allow, over a period of time, a gradual alignment of Road Traffic Signal Systems in Europe.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 50556:2011](https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011)

<https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011>

1 Scope

This European Standard specifies requirements for Road Traffic Signal Systems, including their development, design, testing, installation and maintenance.

In particular, it forms the electrotechnical part of the following two standards issued by CEN:

- EN 12368, *Traffic control equipment — Signal heads*
- EN 12675, *Traffic signal controllers — Functional safety requirements*

Each of these standards above should be used with this standard either singly or together to define an operational equipment or system. This should be achieved by using the electrotechnical methods and testing defined in this standard.

Where Road Traffic Signal Systems are to be used with other systems, e.g. public lighting or railway signalling and communication, this standard should comply with the other respective standard to ensure that overall safety is not compromised.

Only permanently or temporarily installed Road Traffic Signal Systems are included in this standard. Central office and portable signalling systems are not covered.

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) applies.

| | |
|------------------|--|
| EN 12368 | Traffic control equipment - Signal heads |
| EN 12675:2000 | Traffic signal controllers - Functional safety requirements |
| EN 50102 | Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code) |
| EN 50110-1 | Operation of electrical installations |
| EN 50129 | Railway applications - Communication, signalling and processing systems - Safety related electronic systems for signalling |
| EN 50293 | Electromagnetic compatibility - Road traffic signal systems - Product standard |
| EN 60529 | Degrees of protection provided by enclosures (IP Code) (IEC 60529) |
| EN 60950-1:2006 | Information technology equipment - Safety - Part 1: General requirements (IEC 60950-1:2005, mod.) |
| EN 61008 series | Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's) (IEC 61008 series) |
| EN 61009 series | Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) (IEC 61009 series) |
| EN ISO 9001:2008 | Quality management systems - Requirements (ISO 9001:2008) |
| HD 384.4 series | Electrical installations of buildings - Part 4: Protection for safety (IEC 60364-4 series) |
| HD 60364-5-54 | Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements, protective conductors and protective bonding conductors (IEC 60364-5-54) |
| EN 60068-2-1 | Environmental testing - Part 2-1: Tests - Test A: Cold (IEC 60068-2-1) |
| EN 60068-2-2 | Environmental testing - Part 2-2: Tests - Test B: Dry heat (IEC 60068-2-2) |
| EN 60068-2-5 | Environmental testing - Part 2: Tests - Test Sa: Simulated solar radiation at ground level (IEC 60068-2-5) |

| | |
|----------------------|---|
| EN 60068-2-14 | Environmental testing - Part 2-14: Tests - Test N: Change of temperature (IEC 60068-2-14) |
| EN 60068-2-30 | Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle) (IEC 60068-2-30) |
| EN 60068-2-64 | Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance (IEC 60068-2-64) |
| EN 61140 | Protection against electric shock - Common aspects for installation and equipment (IEC 61140) |
| CLC/TS 50509 | Use of LED signal heads in road traffic signal systems |
| IEC 60050-191 | International Electrotechnical Vocabulary - Chapter 191: Dependability and quality of service |
| IEC 60050-826 | International Electrotechnical Vocabulary - Part 826: Electrical installations |
| IEC 60183 | Guide to the selection of high-voltage cables |
| IEC 60417 (database) | Graphical symbols for use on equipment |

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 General

3.1.1

Road Traffic Signal Systems

include systems and devices, provided they are affiliated to them in terms of circuitry

- NOTE They may consist of the following elements which is not in itself a complete list:
<https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011>
- Controllers;
 - Signal heads, signalling devices and traffic signs
 - e.g. signal heads for traffic signals;
 - acoustic signal generators;
 - mechanical signal generators;
 - traffic signs connected to the Road Traffic Signal System;
 - Traffic sensors and detectors
 - e.g. request push buttons;
 - vehicle detectors / Pedestrian Detectors;
 - Monitoring equipment
 - e.g. photographic monitoring devices;
 - Equipment Enclosures;
 - Electrical Supply;
 - Cables;
 - Interconnections;
 - Supports.

3.1.2

Failure Mode Analysis

means of examining all failure modes to ensure that signal states endangering the road users and/or risk of electrical hazard cannot occur during normal conditions of operation of a Road Traffic Signal System or if they do occur as a result of or whilst a failure (failure mode) exists that they signal states endangering the road users are detected and prevented from continuing

3.1.3

Signal Safeguarding Facility

facilities intended to prevent states of signals endangering the traffic

3.1.4 monitoring element

device that signals electrical and mechanical states of equipment, preferably for signal circuits, and which converts the obtained information in such a manner that it can be processed in signal safeguarding facilities

3.1.5 hardware

complete Road Traffic Signal System or a (material) part of it

3.1.6 hardware fault

failures of components and any influence that will cause the equipment to fail

NOTE Systematic hardware faults constitute either design faults or systematic production faults.

3.1.7 software

all or part of the sequence instructions for a Road Traffic Signal System including the affiliated documentation

NOTE Software is exclusively immaterial, so that it is subject to no wear or failure mechanisms. Once implemented, software cannot be falsified on its own.

3.1.8 software error

deviation between the realised and intended functional contents of the software

NOTE All errors in the software are systematic errors. They are caused by:
 – invalid specification (incorrect formulation of intention);
 – incorrect programming (incorrect translation of the specification to sequential instructions).

Apparent program falsification in memories is produced by hardware faults or failures or is caused by inadmissible influencing.

3.2 Traffic engineering

[SIST EN 50556:2011](https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011)

<https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011>

3.2.1 controllers (traffic)

electrical device to control signals

3.2.2 signal group

sequence of conditions applied to a group of signal heads, which always received identical signal light indications

3.2.3 Operating System

principle software that allows a computer to operate, and which establishes the basic foundations, protocols and functions that the computer can perform, including communication with internal and external resources

3.2.4 Application Program

software that determines specific tasks that a computer can perform, i.e. operate as a traffic controller

NOTE Application software rests on and extends the capabilities of the operating system to meet customer needs.

3.2.5 Traffic Data

data which specifies how the application program will perform in the particular circumstances of one traffic system

NOTE This may be considered to be in two parts.

3.2.5.1 Traffic Safety Data

all Traffic Data stored in non-volatile memory that has a direct impact on the safety of road users

3.2.5.2

Traffic Non Safety Data

all the remainder of the data which will not cause an unacceptable danger to the road user if the data is changed

3.2.6

Design Authority

Design Responsible

individual or group (organisation) responsible for the safe design and manufacturing, including the instructions for safe use, installation and maintenance of the equipment or system

3.3 Electrotechnical

3.3.1

live part

see IEC 60050-826

3.3.2

enclosure (EN 50102)

part providing protection of equipment against certain external influences and, in any direction, protection against contact

NOTE This definition from the existing International Electrotechnical Vocabulary (IEC 60050-826) needs the following explanations under the scope of this standard:

- a) Enclosures provide protection of equipment against harmful effects of mechanical impacts and protection of persons and livestock against access to hazardous parts.
- b) Barriers, shapes of openings or any other means - whether attached to the enclosure or formed by the enclosed equipment - suitable to prevent or limit the penetration of the specified test probes are considered as part of the enclosure, except when they can be removed without the use of a tool.

3.3.3

complete protection

protection that achieves [https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-](https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011)

- a) effective and durable prevention of contact with live parts by the attachment of obstacles at least conforming to type of protection IP2x as defined in EN 60529;
or
- b) complete enclosure of live parts by insulating material that can be removed only by destruction (protection by insulating envelopment)

3.3.4

partial protection

protection that prevents the possibility of accidental contact by persons or by objects usually handled by them in one of the following ways:

- a) by placing live parts at a distance that the possibility of accidental contact by persons or objects usually handled by them is excluded (protection against accidental contact by a safety clearance);
or
- b) by attaching obstacles conforming at least to type of protection IP1x as defined in EN 60529 (protection against accidental contact by the attachment of obstacles)

3.3.5

reinforced insulation

see EN 60529

3.3.6

nominal voltages

see IEC 60050-826

3.3.7

earthed systems

see IEC 60050-826

3.3.8**Class 0 equipment**

see EN 61140

3.3.9**Class I equipment**

see EN 61140

3.3.10**Class II equipment**

see EN 61140

3.3.11**Class III equipment**

see EN 61140

3.3.12**safety extra-low voltage****SELV**

see EN 61140

3.3.13**protective conductor (symbol PE)**

see IEC 60050-826

3.3.14**earthing conductor**

see IEC 60050-826

iTeh STANDARD PREVIEW
(standards.iteh.ai)

3.3.15**RCD**

see EN 61008 series and EN 61009 series

[SIST EN 50556:2011](https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011)<https://standards.iteh.ai/catalog/standards/sist/74493595-1c29-42af-83f8-75bc1f838a48/sist-en-50556-2011>**3.3.16****voltage dip**

see IEC 60050-161

3.3.17**insulation**

see EN 60950-1:2006, 1.2.9

4 Electrical supply and limits**4.1 Nominal voltages**

The standard nominal voltage for connection to the public supply shall be taken to be 230 V AC_{r.m.s.} Other nominal voltages shall be permitted.

4.2 Operating voltage range

The system shall be classified according to its mains voltage range within which the Road Traffic Signal System shall work as defined by EN 12675, as follows:

nominal voltage - 13 % ...+ 10 %

The system shall not display signals which contravene EN 12675 when the supply voltage is outside the above voltage ranges.