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CEI**

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Second edition
Deuxième édition
2007-06

**Low-voltage switchgear and controlgear –
Controller-device interfaces (CDIs) –**

**Part 1:
General rules**

**Appareillage à basse tension –
Interfaces appareil de commande-appareil (CDI) –**

**Partie 1:
Règles générales**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – CONTROLLER-DEVICE INTERFACES (CDIs) –

Part 1: General rules

FOREWORD

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International Standard IEC 62026-1 has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

This second edition of IEC 62026-1 cancels and replaces the first edition published in 2000.

It represents some general updating without technical changes with regard to the previous edition.

The text of this standard is based on the following documents:

CDV	Report on voting
17B/1505/CDV	17B/1544/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 62026, under the general title *Low-voltage switchgear and controlgear – Controller-device interfaces (CDIs)*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under “<http://webstore.iec.ch>” in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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INTRODUCTION

The class of controller-device interfaces (CDIs) covered in this International Standard includes industrial CDIs for control systems, factory automation and process automation.

Industrial CDIs have proliferated to meet specific user needs, but no single CDI meets all needs. The reason for multiple solutions is the wide range of physical, usage, information content and configuration requirements. The physical requirements have resulted in CDIs with widely differing signal and line conditioning mechanisms in order to meet distance, node count and environmental considerations.

While there is wide variation in CDI technologies, there are common components, interfaces and environmental requirements that are specified by this standard. Standardized definitions of these common CDI requirements assist the user to compare and select technologies to match the distance, node count, throughput and installation requirements for a specific application.

This standard simplifies the CDI selection process by providing a common structure for generating a specific CDI's IEC standard while also allowing specific interface features and capabilities to be included. Clauses 1 to 8 contain the outline of general requirements that the CDI's IEC standard identifies. Clause 9 contains the test specification.

Standardization of CDI aspects also simplifies the task of writing the software for the higher layer functions of industrial control systems, such as supervisory control, operator interface and control strategy programming.

For this standard to be complete and usable, it requires the availability of specific CDI standards, which make up the other parts of the IEC 62026 series.

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – CONTROLLER-DEVICE INTERFACES (CDIs) –

Part 1: General rules

1 Scope

This International Standard applies to interfaces between low-voltage switchgear, controlgear, and controllers (e.g. programmable controllers, personal computers, etc.).

This standard does not apply to higher level industrial communication networks that have become known as fieldbuses and are considered by IEC subcommittee 65C.

The purpose of this standard is to harmonize and define rules, components and requirements of a general nature applicable to industrial CDIs. Those features of the various CDI standards which can be considered as general have therefore been brought together in this part of IEC 62026.

For each CDI, two main documents are necessary to determine all requirements and tests:

- a) this part, referred to as “IEC 62026-1” or “Part 1” in the relevant CDI parts covering the various types of CDIs;
- b) the specific CDI part of the IEC 62026 series.

A specific CDI part may omit a general requirement if it is not applicable, or it may add to it if it is inadequate in the particular case, but it should not deviate from the requirement unless there is substantial technical justification.

NOTE Product-specific requirements for products incorporating a CDI are given in the relevant product standards. These requirements apply in addition to those given in this International Standard.

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.

IEC 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules*

IEC 61000-4-2:1995, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*
Amendment 1 (1998)
Amendment 2 (2000)

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated radio-frequency electromagnetic field immunity test*

IEC 61000-4-4:2004, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2005, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

EC 61000-4-6:2003, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*
Amendment 1 (2004)
Amendment 2 (2006)

IEC 61000-6-2:2005, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments*

CISPR 11:2003, *Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement*
Amendment 1 (2004)
Amendment 2 (2006)

3 Terms and definitions

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

3.1

change of state

process of data exchange which occurs only when a device's or controller's data changes state according to specific change criteria

3.2

controller

programmable controller, personal computer or equivalent computing hardware in which the software controlling the application or process runs

3.3

controller-device communication medium

means (such as two or more wires or fibre optic cable) utilized by devices or controllers to transfer data to other devices or controllers

NOTE A CDI that has "power on the communication medium" architecture uses two wires that also distribute power within the CDI.

3.4

controller-device interface (CDI)

arrangement of nodes and their interconnections that transport information between controllers and devices in an industrial control system

3.5

CDI component

device, controller or other component for which the requirements are specified in a CDI part

3.6

CDI power supply

power supply with characteristics and parameters suitable for the CDI's functionality and capability

3.7

CDI power distribution medium

inter-connecting means used to transfer power within a CDI

NOTE In the case of a CDI that has "power on the communication medium" architecture, the CDI power distribution medium also transfers data within the CDI.

3.8

device

physical unit containing application elements and that may contain communication elements

EXAMPLES: Control circuit device (see 2.2.16 of IEC 60947-1), presence sensing device, pressure sensing device, actuator, annunciator, operator terminal, motor controller, current sensor, valve control, data logger, bar-code scanner, push-button, pilot light, etc.

3.9

device profile

representation of device functionality available to the CDI

3.10

multicast

process of data exchange which occurs when a device or controller produces one message to multiple devices and/or controllers for their appropriate action

3.11

polling

process of data exchange which occurs when a device or a controller sends data to, or requests data from, a specific device or controller

NOTE The receiving device responds to the polling by acting according to the data it receives or by returning its status data. When this transaction is completed, the device polls the next device in a predetermined sequence.

3.12

strobing

process of data exchange which occurs when a device or a controller sends a single request for data from one or more devices and/or controllers

NOTE Each device receiving the message then responds with its requested data in a predetermined sequence.

4 Classifications

This clause in the specific CDI parts shall list the classifications below, where applicable, with appropriate details:

- CDI components;
- interfaces;
- topology;
- information exchanges;
- attributes.

5 Characteristics

This clause in the specific CDI parts shall list the applicable characteristics described below with appropriate details.

5.1 CDI components

Specific CDI parts shall specify requirements for the devices, controllers and other components that may be used.

5.2 Interfaces

Specific CDI parts shall include information on the following, if applicable: