IEC 60947-5-7

Edition 2.0 2024-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Low- voltage switchgear and controlgear – Part 5-7: Control circuit devices and switching elements – Proximity devices with analogue output

Appareillage à basse tension – Partie 5-7 : Appareils et éléments de commutation pour circuits de commande – Détecteurs de proximité à sortie analogique

IEC 60947-5-7:2024-04(en-fr)

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CONTENTS

FOREWORD 5
1 Scope 7
2 Normative references 8
3 Terms, definitions and list of abbreviated terms 8
3.1 Basic definitions 8
3.2 Operation of a proximity device 9
3.3 Output element characteristics 12
3.4 List of abbreviated terms 15
4 Classification 16
4.1 General 16
5 Analog characteristics 16
5.1 General 16
5.3 Rated and limiting values for the proximity device and output elements 16
5.3.1 Voltages 16
5.3.2 Currents 16
5.3.3 Load conditions 17
5.3.4 Linearity 17
6 Product information 17
6.1 Nature of information – Identification 17
6.1.1 Adding information 17
6.1.2 Specific information of 6.1.1 bc) Output characteristics 18
6.4 Environmental information 18
6.4.1 Environmentally conscious design process (ECD process) 18
6.4.2 Procedure to establish material declaration 18
7 Normal service, mounting and transport conditions 18
8 Constructional and performance requirements 19
8.1 General 19
8.1.1 Load conditions 19
8.1.18 Security aspects 19
8.1.19 Embedded software 19
8.2 Performance requirements 19
8.2.1 Acceptance criteria 19
8.5 Analog output limit values 19
8.5.1 General 19
8.5.2 Environmental test conditions 20
9 Tests 21
9.1 General 21
9.3.1 Test sequences 21
9.6 Verification of the electromagnetic compatibility 22
9.6.1 General 22
9.8 Additional requirements for proximity switches with analog output 22
9.8.1 Requirements for test programs and proper functioning verification procedures (PFVPs) 22
9.8.2 Verification of analog output 23
9.8.3 Accuracy and related factors 24

9.9 Testing of detection capabilities of physical sizes like operating distance, speed, rotation speed, frequency, etc. 25
9.9.1 General 25
Annex A (informative) Example of the determination of the conformity 27
A.1 Example 1 of the determination of the conformity of an angle sensor, with linear output characteristics 27
A.2 Example 2 of the determination of the conformity of a position sensor, with nonlinear output characteristics 30
A.3 Test report and technical documentation 32
A.3.1 Test report 32
A.3.2 Technical documentation 32
A.3.3 Total probable error TPE 32
Annex B (informative) Overview tests and influence quantities 34
B.1 Tests at the standard reference conditions 34
B.2 Tests at ambient and process reference conditions for influence quantities 36
Annex C (normative) Additional requirements for proximity switches with analog output incorporating a built-in communication interface complying with IEC 61131-9 37
C.1 General 37
C.5 Analog Characteristics 37
C.5.1 Rated and limiting values for SDCI 37
C.6 Product information 37
C.8 Constructional and performance requirements 37
C.8.1 Constructional requirements 37
C.8.2 Electromagnetic compatibility (EMC) 37
C.9 Tests 38
C.9.1 Kinds of tests 38
Annex D (informative) Main characteristics for proximity devices with analog output 39
D.1 Properties of proximity devices with analog output 39
D.2 Library of product properties and value lists 41
D.2.1 Library of properties used in the device classes 41
D.2.2 Value lists of properties 44
Bibliography 46

Figure 1 – Proximity device with analog output (PDAO), schematic block diagram structure 7
Figure 2 – Principle diagram of time values and their meanings 14
Figure 3 – Principle diagram of limit values and their ranges 15
Figure 4 – limit values of analog output signals 20
Figure A.1 – Output values diagram corresponding to example of Table A.1 28
Figure A.2 – Error curves corresponding to example of Table A.1 29
Figure A.3 – Non-linearity error curves corresponding to the example of Table A.1 30
Figure A.4 – Output values diagram corresponding to example of Table A.2 31
Figure A.5 – Error curves corresponding to example of Table A.2 32

Table 1 – Range of analog voltage signals 16
Table 2 – Range of analog current signals 17
Table 3 – Load conditions 17

Table 4 – Analog output signal static characteristics 18
Table 5 – Analog output dynamic characteristics 18
Table 6 – Analog output overload immunity test 24
Table 7 – Number of measurement cycles and number and position of test points 24
Table A.1 – Example table for the errors of a linear sensor 27
Table A.2 – Example table for the errors of a nonlinear sensor 31
Table B.1 – Summary of the tests at the reference conditions 34
Table B.2 – Summary of tests for influence quantities at the operating conditions 36
Table D.1 – proximity sensing devices with analog output 39
Table D.2 – Library of properties used in the device classes 41
Table D.3 – Value lists of properties 44

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 5-7: Control circuit devices and switching elements – Proximity devices with analog output

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IEC 60947-5-7 has been prepared by subcommittee 121A: Low-voltage switchgear and controlgear, of IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage. It is an International Standard.

This second edition cancels and replaces the first edition published in 2003. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) New structure;
b) Update and expansion of definitions on analog output properties;
c) Expanded performance requirements on analog output;

d) Update and new normative references;

e) Update of EMC requirements;

f) Harmonization with IEC 62828 series;

g) Harmonization with IEC 62683 and IEC 61987 definitions;

h) Harmonization with IEC 61131-2 requirements;

i) Update of the Annex A (former Annex G), Example of the determination of the conformity;

j) New Annex B, Overview tests and influence quantities;

k) New Annex C, Additional requirements for proximity switches with analog output incorporating a built-in communication interface complying with IEC 61131-9;

l) New Annex D, Main characteristics for proximity devices with analog output.

This International Standard is to be read in conjunction with IEC 60947-5-2:2019.

The text of this International Standard is based on the following documents:

Draft	Report on voting
121A/592/FDIS	121A/604/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all the parts in the IEC 60947 series, under the general title *Low-voltage switchgear and controlgear*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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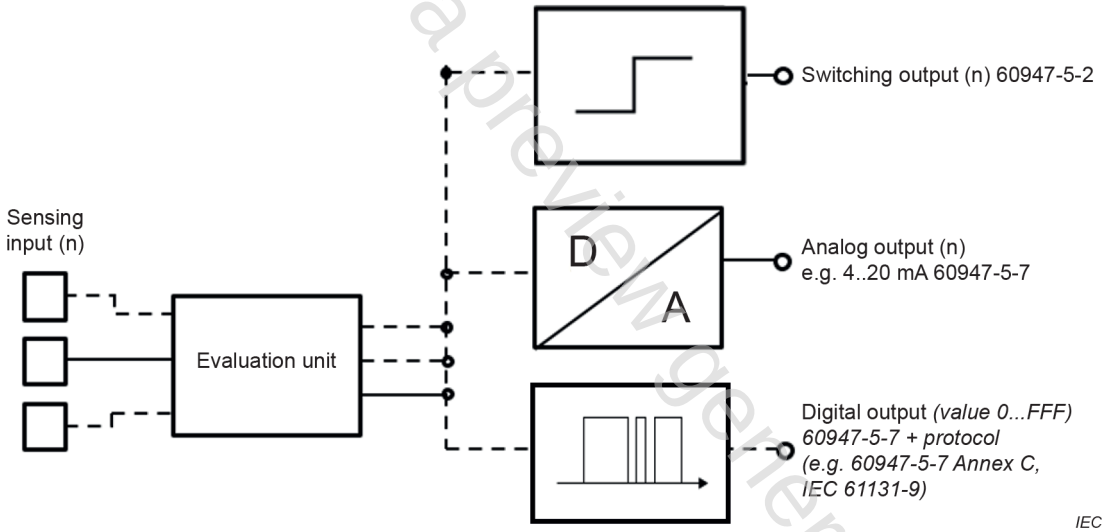
LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 5-7: Control circuit devices and switching elements – Proximity devices with analog output

1 Scope

This part of IEC 60947 states the requirements for proximity devices that correspond to the scope of IEC 60947-5-2:2019 with analog output (PDAO) and/or a digital output to transmit a corresponding digital value representing the detected sensing input. These devices can provide additional parameters. Figure 1 shows the schematic principle of such a device. They might consist of one or more parts.

The requirements of IEC 60947-5-2, *Low-voltage switchgear and controlgear – Part 5-2: Control circuit devices and switching elements – Proximity switches,* apply with the additions and modifications as stated in this document. The clause numbering in this document follows the clause numbering of IEC 60947-5-2, modified where necessary.



Key

evaluation unit Evaluating electronic circuitry, e.g. MCU, ASIC component...

Figure 1 – Proximity device with analog output (PDAO), schematic block diagram structure

This document does not apply to industrial process measurement transmitters according to IEC 62828 series.

Examples of typical applications for in-scope products:

- factory automation and machinery industry;
- logistic and packaging industry;
- conveyor belts, lifts;
- process industry;
- power plants.

Special applications (e.g. corrosive atmosphere) can cause additional requirements.

Products covered by the scope of this document are expected to be selected, installed, and maintained by skilled personnel only.

NOTE 1 Analog proximity devices can be linear or non linear.

NOTE 2 The specific requirements, characteristics, and test procedures for an analog output interface which are described in Clauses 5, 6 and 9 of this document, are based on requirements written in IEC 61131-2:2017.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60947-5-2:2019, *Low-voltage switchgear and controlgear – Part 5-2: Control circuit devices and switching elements – Proximity switches*

IEC 61131-9:2022, *Programmable controllers – Part 9: Single-drop digital communication interface for small sensors and actuators (SDCI)*

IEC 62443 (all parts), *Industrial communication networks – Network and system security*

IEC TS 63208:2020, *Low-voltage switchgear and controlgear – Security aspects*

3 Terms, definitions and list of abbreviated terms

For the purposes of this document, the terms and definitions given in IEC 60947-5-2:2019 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1 Basic definitions

3.1.1
proximity device with analog output
PDAO
device producing an output signal which varies continuously depending on the physical quantity (e.g. distance, speed, rotation, etc.) detected/calculated by the proximity device in relation to its target object(s)

3.1.2
lower range value
minimum stated input value above which the output signal varies continuously

3.1.3
upper range value
maximum stated input value below which the output signal varies continuously