



SLOVENSKI STANDARD

SIST EN 50025:1998

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Low-voltage switchgear and controlgear for industrial use - Inductive proximity switches - Form C, for direct current, 3 or 4 terminals

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Industrielle Niederspannung-Schaltgeräte - Induktive Näherungsschalter - Form C, für Gleichspannung, 3 oder 4 Anschlüsse

Appareillage industriel à basse tension - Détecteurs de proximité inductifs - Forme C, pour courant continu, 3 ou 4 bornes

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Ta slovenski standard je istoveten z: EN 50025:1988

ICS:

29.130.20	Nizkonapetostne stikalne in krmilne naprave	Low voltage switchgear and controlgear
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50 025

October 1987

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Key words: electrical switchgear and controlgear; industrial use; low voltage; proximity switches; inductive proximity switches; operating distance; operating frequency

English version

Low voltage switchgear and controlgear for industrial use. Inductive proximity switches. Form C, for direct current, 3 or 4 terminals

Appareillage industriel à basse tension. Détecteurs de proximité inductifs. Forme C, pour courant continu, 3 ou 4 bornes

Industrielle Niederspannung-Schaltgeräte. Induktive Näherungsschalter. Form C, für Gleichspannung, 3 oder 4 Anschlüsse

This European Standard was ratified by CENELEC on 3 December 1985. CENELEC members are bound to comply with the requirements of the 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 CENELEC General Secretariat or to any CENELEC member.

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 CENELEC General 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

General Secretariat: rue Bréderode 2, B-1000 Brussels

This European Standard has been prepared by the CENELEC Technical Committee 17B. Dimensions in mm.

1 Scope

This standard specifies only inductive proximity switches for direct current, in rectangular form, with a square cross-section, with 3 or 4 terminals for rated voltage not exceeding 48 V.

These proximity switches are not embeddable in metal.

Two types are included:

With front sensing face: C21●1

With upper sensing face: C21●2

2 Definitions

Definitions are given in European Standard EN 50 032.

3 Dimensions

The dimensions to be observed are shown in figure 1.

Apart from these dimensions, the design of the proximity switch is not restricted.

Within the overall dimensions are included the fixing means but not the cable entry.

4 Installation (see figure 2)

The dimensions are given for proximity switches installed in mild steel, Fe 360, according to Euronorm 27¹⁾.

5 Designation

Example of designation of a proximity switch Form C●●.

Not embeddable●2●●● Size ●●1●●

Front sensing face ●●●●1.

Proximity switch EN 50 025 – C21.1

Additionally, the following are to be given:

- the rated voltage;
- the polarity of the output signal when current flows;
- the output current;
- the function (make or break).

6 Characteristics

The characteristics of the proximity switch shall be achieved even when mounted as shown in figure 2 of clause 4.

These characteristics are valid over the whole ambient temperature (T_a) and the supply voltage (U_b) ranges except when otherwise specified.

Requirements concerning the nature of the load and the corresponding tests are under consideration.

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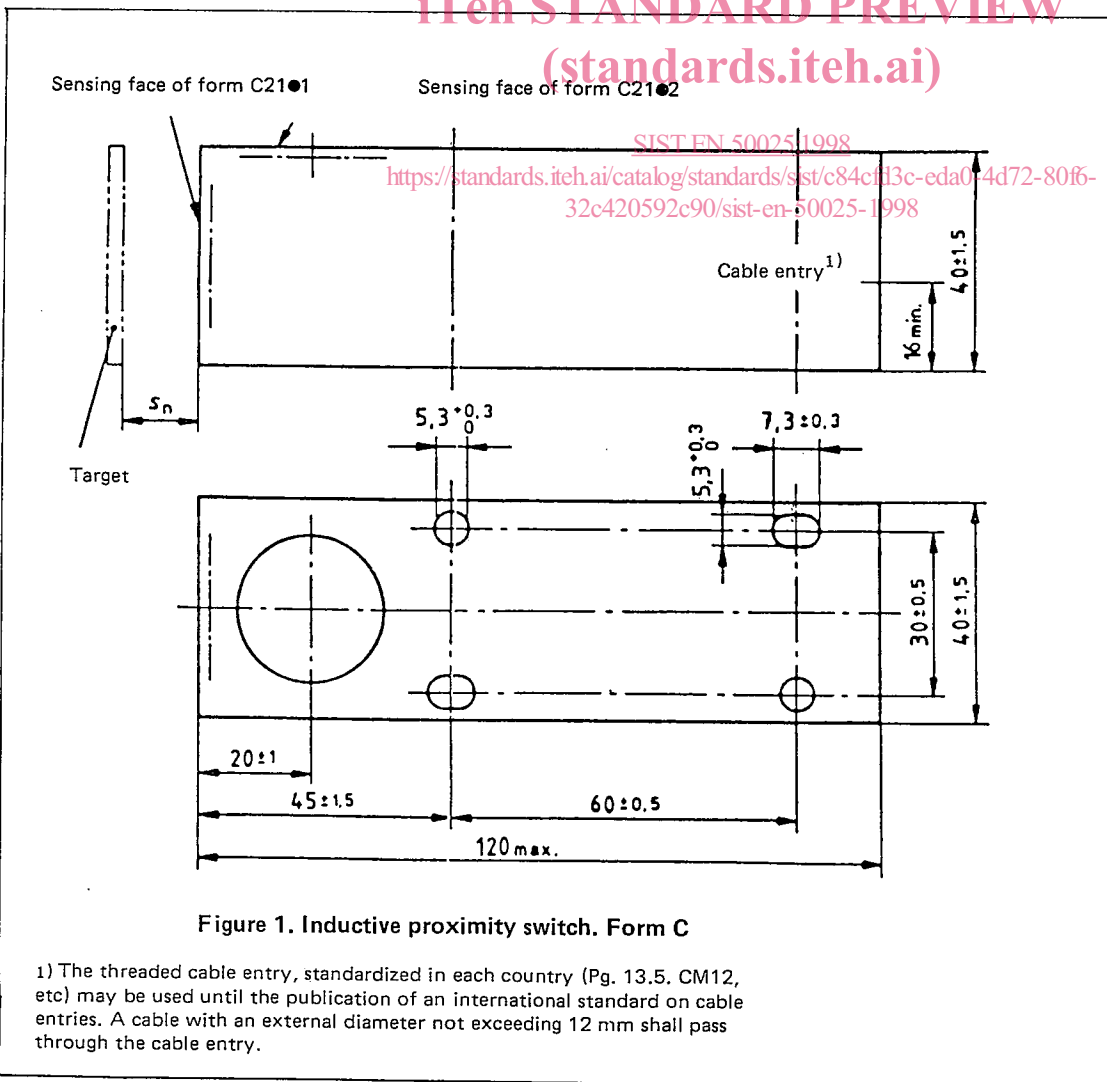
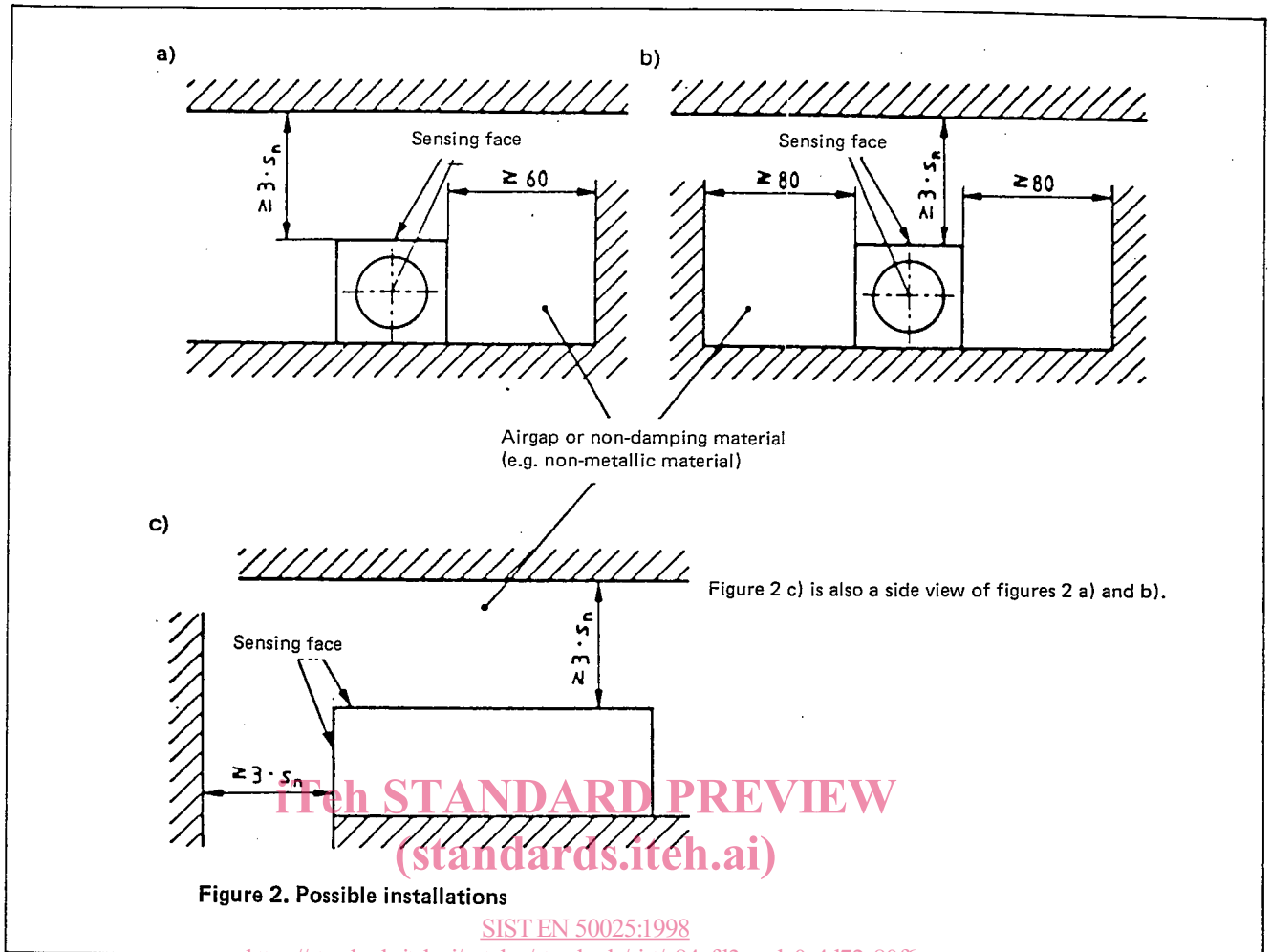


Figure 1. Inductive proximity switch. Form C

1) The threaded cable entry, standardized in each country (Pg. 13.5. CM12, etc) may be used until the publication of an international standard on cable entries. A cable with an external diameter not exceeding 12 mm shall pass through the cable entry.

1) Each national committee may indicate its own symbol.



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6.1 Operating distance s

The operating distances are measured according to EN 50 010.

6.1.1 Rated operating distance s_n

The rated operating distance is 15 mm:

$$s_n = 15 \text{ mm}$$

6.1.2 Effective operating distance s_r

The effective operating distance is measured at rated voltage (U_n) and rated ambient temperature (T_n). It shall be between 90 % and 110 % of the rated operating distance (s_n):

$$0,9 s_n \leq s_r \leq 1,1 s_n$$

6.1.3 Usable operating distance s_u

The usable operating distance is measured with the ambient temperature (T_a) and the supply voltage (U_b) being within the limits prescribed. It shall be between 90 % and 110 % of the effective operating distance s_r :

$$0,9 s_r \leq s_u \leq 1,1 s_r$$

6.1.4 Actuation distance s_a

The actuation distance is between 0 and 81 % of the rated operating distance (s_n):

$$0 \leq s_a \leq 0,9 \cdot 0,9 s_n$$

6.2 Repeat accuracy R

The repeat accuracy of the usable operating distance (s_u) is measured over an 8-hour period with an enclosure temperature between 15 °C and 30 °C and with a supply voltage between $U_n + 5\%$ and $U_n - 5\%$. The difference between any two measurements shall not exceed 10 % of the rated operating distance (s_n):

$$R \leq 0,1 s_n$$

6.3 Differential travel H

The differential travel is given as a percentage of the effective operating distance (s_r). It shall be between 3 % and 20 % of the effective operating distance (s_r).

The measurement is made in accordance with European Standard EN 50 010 at rated ambient temperature (T_n) and rated voltage (U_n):

$$0,03 s_r \leq H \leq 0,20 s_r$$

6.4 Voltages U

6.4.1 Rated voltage U_n

The rated voltage shall not exceed 48 V:

$$U_n \leq 48 \text{ V}$$

6.4.2 Supply voltage U_b

The instantaneous value of the supply voltage shall be between 80 % and 115 % of the rated voltage (U_n):

$$0,8 U_n \leq U_b \leq 1,15 U_n \text{ (instantaneous value)}$$

6.4.3 Ripple voltage σ

The maximum value of the ripple voltage (peak to peak) shall not exceed 0,1 U_n :

$$\sigma \leq 0,1 U_n$$

6.5 Output**6.5.1 Voltage drop U_d**

The voltage drop, measured across the proximity switch when closed and carrying the maximum permanent current (I_a) at the minimum ambient temperature (T_a) and supplied with the maximum supply voltage (U_b) shall not exceed 3,5 V:

$$U_d \leq 3,5 \text{ V}$$

6.5.2 Output operation

The output operation shall be snap action (for break and make function).

6.5.3 Currents I **6.5.3.1 Permanent current I_a**

A proximity switch shall perform correctly for a permanent current between 1 mA and 50 mA:

$$1 \text{ mA} \leq I_a \leq 50 \text{ mA}$$

6.5.3.2 Residual current I_r

The residual current shall not exceed 0,5 mA:

$$I_r \leq 0,5 \text{ mA}$$

6.6 Time characteristics**6.6.1 Operating frequency f**

The operating frequency is measured in accordance with the European Standard EN 50 010. The values obtained shall be not less than 100 Hz:

$$f \geq 100 \text{ Hz}$$

6.6.2 Time delay before availability t_v

The time delay before availability shall not exceed 50 ms:

$$t_v \leq 50 \text{ ms}$$

During this time, the output shall not give any false signal longer than 2 ms when the distance between the target and the sensing face is greater than $3s_n$ for make output function or less than $2/3s_n$ for break output function proximity switches.

6.7 Temperatures T **6.7.1 Rated ambient temperature T_n**

The rated ambient temperature is 20 °C:

$$T_n = 20 \text{ °C}$$

6.7.2 Ambient temperature T_a

The permissible range of ambient temperature is - 25 °C to +70 °C:

$$-25 \text{ °C} \leq T_a \leq +70 \text{ °C}$$

6.8 Degree of protection

The degree of protection is indicated and measured in accordance with CENELEC Harmonization Document HD 365-S3 (IEC Publication 529*).

This shall be IP 65.

6.9 Shock and vibration tests

The measurements are made in accordance with IEC Publications 68-2-27 and 68-2-6 or harmonized national standards. The operating characteristics of the proximity switch shall be maintained during the measurements.

6.9.1 Shock tests

The conditions of the shock tests shall be as follows:

Pulse shape: half-sine;

Peak acceleration: $\leq 30 g_n$;

Duration of the pulse: 11 ms.

6.9.2 Vibration tests

The conditions of vibration tests shall be as follows:

Frequency: 10 Hz to 55 Hz;

Amplitude: $\leq 1 \text{ mm}$;

Sweep cycle duration: 5 minutes;

Duration at resonant frequency or at 55 Hz: 30 minutes in each of the 3 axes (90 minutes in all).

* or IEC Publication 144 when this is revised.