

interpretation of
DD TS 50131-2-6:2004
for opening contacts (magnetic)
recommendations to manufacturers



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1. Introduction

TS 50131-2-x series: Intruder Alarms, Detector Requirements are in the process of being issued. The industry wishes to use these standards as quickly as practical.

This document has been prepared to give guidance on the interpretation of some of the clauses in the standards that have been open to misinterpretation, in need of further clarification or which do not interface correctly with other standards in the EN50131 family – especially TS50131-3.

Whilst prepared initially for use by manufacturers when designing their products to conform to the new requirements, this guideline should also be a useful source of clarification for specifiers, installers and others working with the standard.

Only those items in the TS 50131-2-6 which give concerns are listed below. All other clauses or parts of the standards – most of which are common to the entire TS50131-2-x family - are believed to be self-explanatory.

2. Interpretation of clauses

Introduction

- a. These product standards cover detectors installed in buildings, and therefore there are no requirements for environmental class IV. Products may be given an environmental class IV rating if they meet all the environmental requirements of class III as specified in these component standards at the severity level of class IV as defined in EN 50130-5.

Clause 3.1 alert/set mode

The alert/set mode of a detector is not necessarily the same as the set mode of an alarm system.

Clause 3.8 standby/unset mode

The standby/unset mode of a detector is not necessarily the same as the unset mode of an alarm system. "Alarm signal" is agreed to mean "intrusion signal or message".

Clause 3.11 abbreviations

"BDT basic detection target", as there is no "target" involved in magnetic contacts this is taken to mean "basic test of detection capability".

Clause 4.1 – Indication signals or messages

- a. The first two sentences state that all detectors shall have an alert/set mode. There does not appear to be any requirement for a standby/unset mode. The only reference to "standby/unset mode" is that the intrusion signal is "not required" (see Table 1). However, this would normally be needed so that the CIE can correctly fulfil the prevention of setting requirements.
- b. The fourth sentence refers to "sealed units" these are agreed to mean units where there is no access to the active element or connections.

Table 1 – Indication signals or messages

Table 1 presents several different sets of information including which events shall be processed at different grades and how different events should be signalled. For clarification these are split into the following two separate tables:

Table 1A. Events to be processed by grade

Event	Grade			
	1	2	3	4
Break distance exceeded	M	M	M	M
Inside make distance	M	M	M	M
No stimulus	M	M	M	M
Magnetic interference	Op	Op	M	M
Tamper	Op	M	M	M
Low supply voltage (external) ***	Op	Op	Op	M
Total loss of external power supply *** §	M	M	M	M
M = Mandatory NP = Not permitted Op = Optional				
*** Where external power is required § Table 3 and clause 6.6.5 take precedence. Not required for bus systems Note: For internal power supplies see EN 50131-6				

Table 1B. Generation of indication signals or messages

Event	Signals or messages		
	Intrusion	Tamper	Fault
Break distance exceeded	M*	NP	NP
Inside make distance	NP	NP	NP
No stimulus	NP	NP	NP
Magnetic interference	Op	M†	Op
Tamper	NP	M+	NP
Low supply voltage (external)	Op	Op	M
Total loss of external power supply	M	Op	Op
M = Mandatory NP = Not permitted Op = Optional			
* Not required in detector unset/standby mode; required in alert/set mode and test mode † Required only if the approach and removal distances are greater than twice the distances specified by the manufacturer (See 6.5.3) + Not required for sealed contacts Note: When, in Table 1A, an event may optionally generate signals or messages, they shall be as shown in this table.			

- a. The note at the bottom of Table 1 “For internal power supplies, see EN50131-6” is applicable to both battery powered detectors and to mains powered detectors.
- b. It is agreed that a dedicated bus system can provide all the signal requirements of Table 1.

Clause 4.2.1.1 – Removal/break distance

This is the maximum break distance and should be specified for both ferrous and non-ferrous surfaces.

Clause 4.2.1.2 – Approach/make distance

This is the minimum make distance and should be specified for both ferrous and non-ferrous surfaces.

Clause 4.3.1 – Time interval between intrusion signals/messages.

The reference to an amendment in EN50131-1 does NOT appear to be relevant to prEN50131-1:2004 and therefore should be ignored.

Clause 4.3.4 – Power supply faults

Bus based detectors do not need to signal complete loss of power (see Table 1 and 6.9.5)

Clause 4.4.1, 4.4.2, 6.5.1 and 6.5.2 – Prevention of unauthorised access to the inside of the detector and detection of removal from the mounting surface

According to Table 2, detection of removal from mounting surface is not required for any wired magnetic contacts (only for wireless at Grades 2, 3 & 4). However, wired detectors having access at the back of the detector to connections or components which could adversely affect the operation of the detector should be fitted with a tamper detection device. It is therefore permissible to attempt to remove the detector from the mounting surface as part of test 6.5.1.

Clause 4.4.3 and 6.5.3 – Sensitivity to magnetic field interference

- a. The requirement in 4.4.3 only covers sensitivity of detection of an external magnetic field, whereas the pass/fail criteria of the tests in 6.5.3 also permits immunity to the affects of an external magnetic field. It is agreed that under the influence of any external magnetic field, either the external field is detected and a tamper signal should be produced, or the detector should continue to operate normally but with a permitted reduction in capability such that the approach and removal distances remain less than twice the distance measured in 6.3.1 (not 6.4.1). The test of 6.5.3 is adjusted accordingly, see below.
- b. The magnetic field strengths given in Table 2 are not required and should therefore be ignored. A full definition of the new test magnets is given in the new Annex A1 in this Form 184. Annex A in the published TS should be removed and be replaced with Annex A1.

Clause 4.5.2 – Slow input voltage change and voltage range limits

Ignore reference to the word 'rise' in the title.

This test is included to ensure power up timers on microcontrollers work correctly and that there are no problems when the detector is running from a backup battery that is slowly discharging.

Clause 4.6.2 – Immunity to environmental conditions

- a. In paragraph 1, equipment class means security grade.
- b. The intention of the impact test in paragraph 2 is to test the immunity of the detector housing to accidental impacts not to deliberate attack.

Clause 5.2 – Documentation

Paragraph e) is referring to any settings which may be needed on a device for use in applications outside the scope of an EN50131 I&HAS.

Clause 6 – Testing

The 10% tolerance refers to applied values.

Clause 6.3 – Verification of detection performance

The general test conditions of 6.1 shall apply to all tests in this section.

Clause 6.5 – Tamper security and 6.5.1

Tamper requirements are given in Table 2 not Table 1.

Clause 6.5.3 – Testing for response to magnetic field interference

The description of the test in clause 6.5.3 is lacking in detail, leading to the possibility of inconsistency in results. The following fuller description should be used. This is based upon practical work undertaken as part of the development of the EN version of the standard.

This test shall be performed for grade 3 and grade 4 products only.

The interference test magnets are described in Annex A1.

The switch component of the detector and its corresponding operating magnet should be installed according to the manufacturer's description with a separation distance calculated as 50% of the specified make distance on the y-axis, see Annex B1 for description of axes. If a prohibited area is described by the manufacturer, the distance of this area will be added to the previously calculated separation distance.

The test environment/installation shall support the ability to reproduce by adding and removal of the corresponding magnet without any changes to the original installation distance, to simulate the opening and closing of the monitored object. The interference test magnets shall be applied onto all exposed and accessible housing surfaces when mounted normally.

For detectors designed for use in both surface and flush mounted installations, then all corresponding tests shall be performed.

For detectors designed for installation in a ferromagnetic environment, the tests should be performed in such an environment following the installation instructions and using the installation material (if required) by the manufacturer. For surface mount opening contacts, the test shall be undertaken with the switch component placed on a steel mounting plate based on the material defined in Annex D1, having dimensions of 600 x 600 x 1.6 mm. For flush mount opening contacts the test shall be undertaken using 2 steel mounting plates based on the material defined in Annex D1, having dimensions of 200 x 200 x 1.6 mm, the switch component being mounted in one plate with the corresponding magnet in the other.

Surface mount opening contacts :

The interference test magnets shall be applied in both polarization directions to at least two points randomly chosen on each surface, both parallel and perpendicular to the surface, reference Annex C1. It is not necessary to apply the test magnets to the nominated operating face or a face that is mechanically obstructed due to the alignment of switch and corresponding magnet as this is not normally accessible when mounted with the object in the closed condition. Monitor the outputs of the detector and measure the make and break distances in accordance with clause 6.3.1.

Flush mount opening contacts:

The interference test magnets shall be applied in both polarization directions to at least two points randomly chosen on the exposed surface reference Annex C1. Where the physical size of the corresponding magnet is too large to fit into the gap when the detector is in its closed position, then the independent test magnet may be used in its own. Monitor the outputs of the detector and measure the make and break distances in accordance with clause 6.3.1.

Pass/fail criteria:

Signals or messages shall be generated in accordance with Table 1B (of this Form 184) in the presence of the interference test magnets or the detector shall continue to work normally if the make or break distances do not exceed twice the specified values.

Clause 6.6.2 – Slow input voltage change (rise) and input voltage range limits

The pass/fail criteria for the “slow input voltage change (rise)” test start after the 180s stabilisation. Ignore the reference to the word “rise”.

Clause 6.7 – Environmental classification and conditions

- a. Paragraph two refers to EN50130-4.
- b. Paragraph two refers to tables 4 and 5.
- c. Paragraph four should also monitor for unintentional fault signals (as well as unintentional intrusion and tamper signals).
- d. Table 4 allows unintentional signals during mechanical shock, vibration and impact tests.

Annex A

Annex A is not required, see comments on 4.4.3 and 6.5.3.

Annex B

- a. Ignore reference to BDT in “6.2 + BDT” as 6.2 is the BDT.
- b. Ignore the “*” and corresponding note.
- c. Under electrical tests, second row, read : “slow input voltage change” (not rise).
- d. During the environmental tests the detector signals shall be monitored during the tests with 6.2 being carried out before and after the tests as per TS 50131-2-2.

Annex A1 (normative)

Dimensions & Requirements of standardised interference test magnets

Requirements and normative references

The interference test magnets shall comprise:

- (a) a magnet identical to the corresponding magnet supplied with the detector, and
- (b) one of the following specified independent test magnets according to whether the detector is surface or flush mounted.

The corresponding magnet is the activating part of the detector, comprising one or more components to generate at least one magnetic field. This includes its mechanical housing.

The following norms will form the base for the selection of the independent test magnet:

IEC 60404-8-1, Magnetic materials -- Part 8: Requirements of magnetically materials – hard materials (Permanent magnets) (IEC 60404-8-1:2001 + A1:2004)

IEC 60404-5, Magnetic materials -- Part 5: Methods of measurement of d.c. magnetic properties of magnetically hard materials (IEC 60404-5:1993 + IEC 68/311/CD:2005)

IEC 60404-14, Magnetic materials -- Part 14: Methods of measurement of the magnetic dipole moment of a ferromagnetic material specimen by the withdrawal or rotation method (IEC 60404-14:2002)

The field strength of the magnet determined by the magnetic material, by remanence (B_r) in mT, the product of energy (BH) max in kJ/m^3 and the polarization of the working point in mT.

The relevant value, dimensions and measurement point for the test magnet can be found in the following drawings and tables. For calculations, measurements and calibration of the test magnets, the norms cited above shall be used.

The independent test magnet for surface mount opening magnetic contacts is described in figure A1:

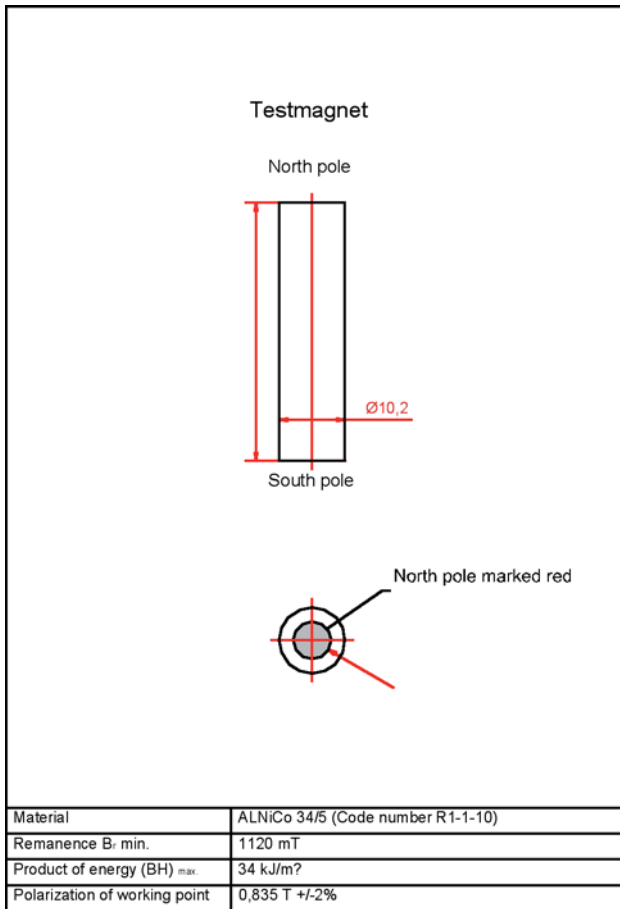


Figure A1.

The independent test magnet for flush mount opening magnetic contacts is described in figure A2:

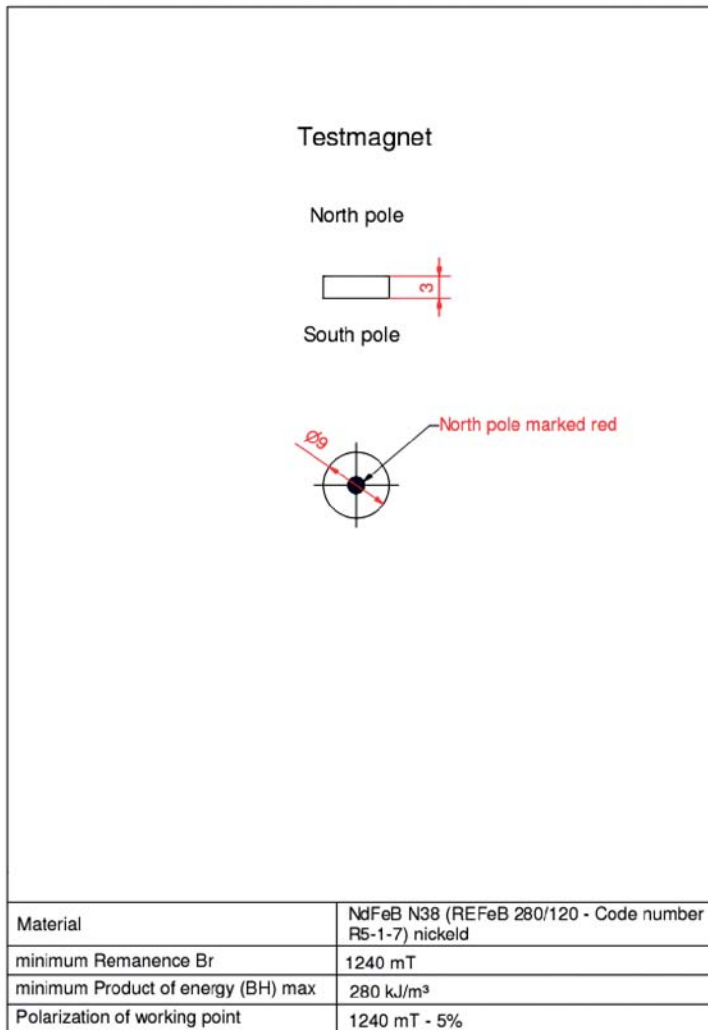


Figure A2

Annex B1 (normative)

Axes of movement

Up to three axes of movement may be defined for a detector: X, Y, Z.

The orientation of these axes for common styles of detector are shown in Figures B1 to B3 below. The manufacturer shall indicate in the product documentation the physical orientation of all axes for which functional performance is declared.

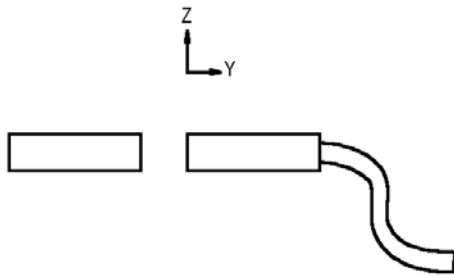


Figure B1 Flush Mount Style

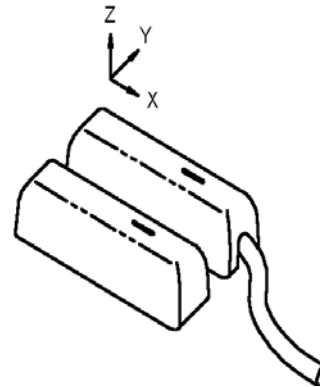


Figure B2 Surface Mount Style

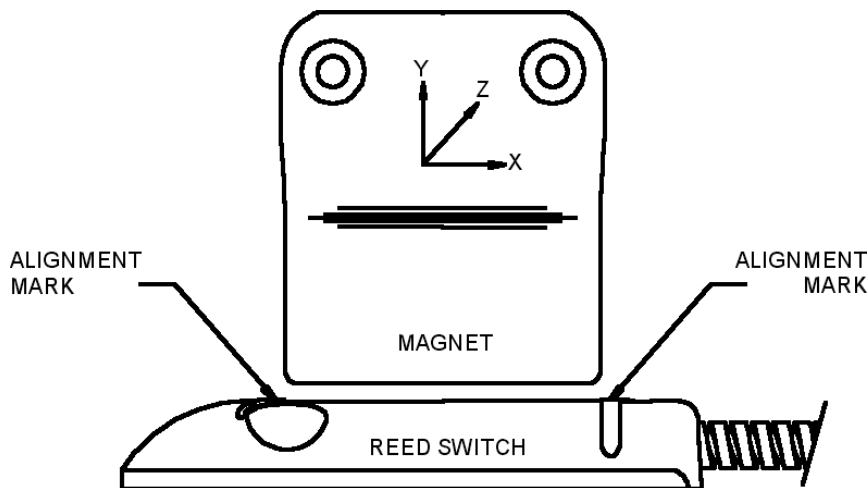


Figure B3 Roller Shutter Style

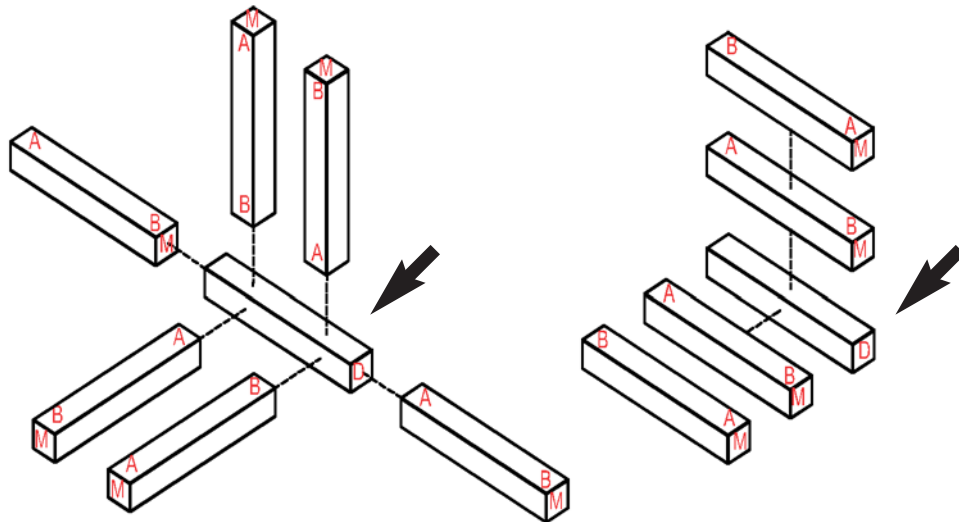
Annex C1 (normative)

Test faces for interference test magnets

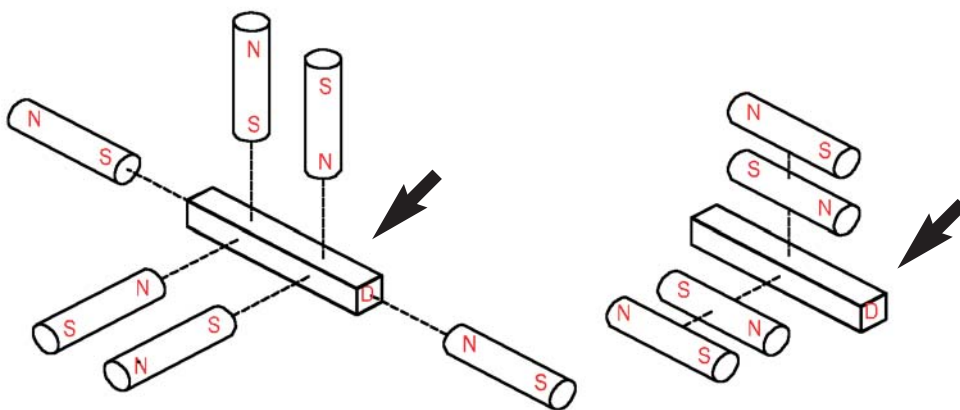
Surface mounted detector (including roller shutter style)

Apply interference test magnets perpendicular and parallel to each non-operating face, in both polarity directions.

(a) Test magnet = corresponding magnet

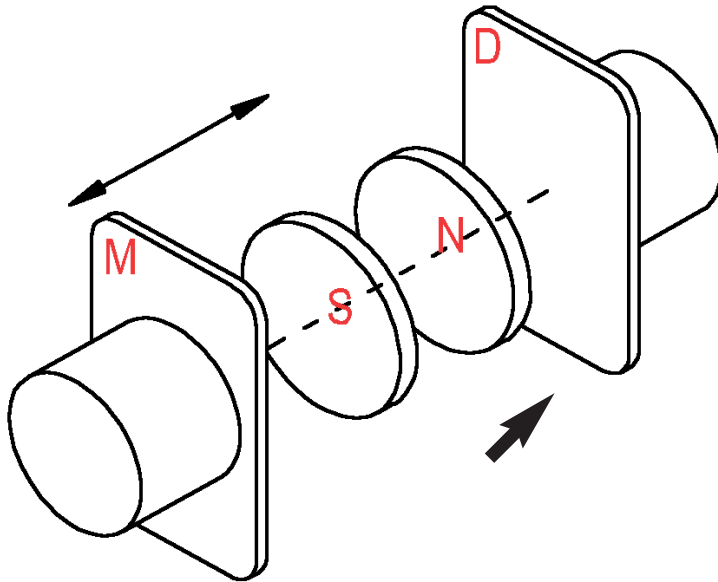



(b) Test magnet = A1 independent magnet



Flush mounted detector

Apply A2 independent interference test magnet parallel to accessible face of detector, in both polarity directions.



 Denotes operating face

Key

D = Switch component of detector

M = test magnet or corresponding magnet

N = North pole of test magnet

S = South pole of test magnet

A, B = indications of opposite ends of corresponding magnet

Annex D1 (normative)

Test surfaces for ferromagnetic material

Low carbon steel conforming to EN 10130 : 1999 + A1; Type DC02-A-m