

Rules for the preparation of detail specifications for all-or-nothing electromechanical relays of assessed quality primarily intended for telecommunication applications —

Full and basic assessment levels

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 16 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Amendments issued since publication

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1 Introduction

An all-or-nothing relay is one intended to be energized by a quantity having a value either higher than that at which it pulls in (or operates) or lower than that at which it drops out (or releases).

This British Standard should be read and used in conjunction with Section 2 of BS 9150:1971 “*Electrical relays of assessed quality*”, which gives the general rules for the preparation of detail specifications for relays.

The object of all general rules given in Section 2 of BS 9150:1971 is to ensure that detail specifications for relays are broadly similar as regards their subject matter and presentation.

The object of this rules document is to ensure the close similarity of all detail specifications written for the particular range of relays which are the subject of this standard.

2 Scope

This British Standard lists the ratings, characteristics, inspection requirements and supplementary information particularly for enclosed (e.g. dust protected) all-or-nothing telecommunication relays, which are to be included as minimum mandatory requirements, in accordance with the general rules given in Section 2 of BS 9150, in any detail specification for these relays. A complete detail specification is, therefore, a combination of the requirements of both documents. Its purpose is to describe fully the particular relay so that the detail specification can be used for contractual purposes in the procurement of relays, for acceptance test purposes and for circuit design and equipment maintenance purposes. Requirements for both full and basic assessment levels are covered in this standard.

It is written to allow, if so required, structurally similar relays with differing coil resistance values to be covered by a single detail specification in which the actual nominal value of coil resistance is unspecified.

It is also written to allow, if required, structurally similar relays with differing contact actions and/or materials to be included in the same detail specification.

The inspection schedule for the full assessment level also contains tests categorized “(if required)”. These tests may be included in the appropriate subgroup of the detail specification if required for a particular relay type or circuit application.

3 Ratings (see 2.1.5 of BS 9150)

The following ratings shall be given.

3.1 Coil(s) (as in 2.1.5 of BS 9150)

3.1.1 Rated coil voltage (see 1.1.12.2 of BS 9150), at 20 °C or as otherwise specified, or rated current for the coil (or each winding if more than one) for each relay variant.

Optionally this may take the form of rated coil power/burden for each different contact action, from which the rated coil voltage and/or current may be calculated by use of the nominal coil resistance/impedance. If so, it shall be stated whether the coils are designed for voltage or current application.

These ratings are given on individual relay design sheets or a master record and these shall form part of the detail specification.

3.1.2 Rated range of coil voltage and/or current associated with the rated values given in 3.1.1.

These ratings are given on individual relay design sheets or a master record and shall form part of the detail specification.

3.1.3 Coil resistance and/or impedance with tolerances, at 20 °C or as otherwise specified.

3.1.4 Frequency for a.c. relays.

3.1.5 Insulation resistance of windings with respect to mutually insulated parts, and measurement voltage.

3.1.6 Voltage proof test voltages (see BS 9150, Procedure 1002).

3.2 Contacts (resistive load) (as in 2.1.5 of BS 9150). For each different contact material the following shall be given.

3.2.1 Number and description of contact units.

3.2.2 Minimum and maximum switched contact voltages.

3.2.3 Minimum and maximum switched contact currents.

3.2.4 Maximum rated loads at which 3.2.2 and 3.2.3 apply: in W for d.c. and V.A for a.c.

3.2.5 Minimum number of operations, with all the contacts carrying the maximum rated loads at a declared intermittent duty and duty cycle and at a stated temperature.

3.2.6 Minimum number of operations, with all the contacts carrying the minimum switched contact current and voltage at a declared intermittent duty and duty cycle and at a stated temperature.

3.2.7 Insulation resistance and measurement voltage.

3.2.8 Voltage proof test voltages (see BS 9150, Procedure 1002).

3.3 Special operating circuit conditions, if any

Maximum contact carrying current (not switched), if called for in the detail specification, a.c. or d.c. to be specified.

3.4 Environmental limitations (as required by tests in Table 1 or Table 2)

3.4.1 Climatic category, if required.

3.4.2 Any other limitations.

4 Characteristics (see 2.1.6 of BS 9150)

The following characteristics, at 20 °C or as otherwise specified, shall be given.

4.1 Performance values and limits as required (see BS 9150, Procedure 1005). These may be coil voltages and/or currents for each coil variant.

Optionally these may take the form of rated coil powers/burdens for each different contact action, from which the coil voltages and/or currents may be calculated by use of the nominal coil resistance/impedance. If so, it shall be stated whether the coils are designed for voltage or current applications.

These characteristics may be given on individual relay design sheets or a master record and shall form part of the detail specification.

4.2 Pull-in plus bounce time and drop-out plus bounce time.

4.3 Minimum number of operations.

4.4 Maximum frequency and duty cycle.

4.5 Mass.

4.6 Mechanical endurance, when applicable.

5 Related documents

The related generic specification, BS 9150:1971, shall be listed together with any other specifications to which the relay is to conform.

6 Ordering information (see 2.1.9 of BS 9150)

Orders for components shall include the following minimum information:

- a) quantity;
- b) relay code number (see 6.1);
- c) BS detail specification number, issue number and date.

6.1 Relay code number. A code, which by reference to either individual relay design sheets or to a master record or to a system, given in the detail specification, shall identify variants of:

- a) coil(s);
- b) contact material(s);

c) contact action(s);

d) terminations;

e) mounting.

6.2 The information contained in 6.1 shall be clearly stated in the detail specification; an example shall be given.

7 Marking of relays and package

Relays and their package shall be marked as follows.

7.1 Relays

- a) manufacturer's factory code;
- b) relay code number;
- c) coded date of manufacture, to at least the nearest month;
- d) any further necessary marking.

7.2 Package

- a) detail specification number;
- b) manufacturer's factory code;
- c) relay code number;
- d) manufacturer's batch identification code;
- e) quantity;
- f) any further necessary marking.

8 Additional information (see 2.1.8 of BS 9150)

The following supplementary information may be given in order to clarify the detail specification:

- a) drawings;
- b) application data and notes.

Such information is not required to be verified by inspection and test procedures.

9 Inspection requirements (see 2.2 of BS 9150)**9.1 General requirements**

9.1.1 Tests in subgroup A0 may be carried out in any order appropriate to the production line requirements of a manufacturer. All tests in other subgroups shall be carried out in the order stated in this standard.

9.1.2 For the electrical endurance tests the samples shall be taken periodically from production, representing in proportion the different contact materials made in that period. The samples may have any suitable contact action.

9.1.3 Any rejected batch shall be 100 % rectified for any observed failure and when resubmitted shall be checked to a tightened inspection.

9.1.4 A sample submitted to tests which are marked “(D)” shall not be accepted for release under BS 9000 (see **20.2** of BS 9000-1:1981¹⁾).

9.1.5 The inspection levels (ILs) and acceptable quality levels (AQLs) to be quoted in the detail specification shall be as stated in Table 1 and Table 2 of this specification, which cover full and basic assessment levels respectively.

9.1.6 The inspection requirements for the fixed sample size procedure for qualification approval at the full assessment level are given in Table 1A. In the event of a test failure in group 0, all the tests in that group may be repeated on a further specimen taken from the same production batch. There shall be no further failures in group 0. For subsequent groups, accept on one failure and reject on two failures. The sets of specimens of each contact material variant in groups 3 and 4 comprise separate groups for the accept/reject criterion.

9.1.7 The inspection requirements for the fixed sample size procedure for qualification approval at the basic assessment level are given in Table 2A. In the event of a test failure in group 0, all the tests in that group may be repeated on a further specimen taken from the same production batch. There shall be no further failures in group 0. For subsequent groups, accept on one failure and reject on two failures. The sets of specimens for each contact material variant in groups 3 and 4 comprise separate groups for the accept/reject criterion.

9.1.8 Where tests which are specified in a detail specification have already been performed during the production process, the results of such production tests may, at the request of the manufacturer, be accepted in lieu of those called for in the detail specification (see **20.3** of BS 9000-1:1981²⁾). The chief inspector shall satisfy the supervising inspectorate that the tests being performed are such that those requirements in the specification would have been satisfied had samples been tested on completion of manufacture. If this procedure is adopted, the qualification approval test report shall state to which tests it is applicable.

¹⁾ Previously **2.6.5** of BS 9000-1:1971.

²⁾ Previously **2.6.3** of BS 9000-1:1971.