BS 764:1990

Specification for

Automatic change-over contactors for emergency lighting systems

UDC 621.316.53

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Power Electrical Engineering Standards Policy Committee (PEL/-) to Technical Committee PEL/10, upon which the following bodies were represented:

ASTA Certification Services

Association of Manufacturers Allied to the Electrical and Electronic Industry (BEAMA Ltd.)

British Gas plc

ERA Technology Ltd.

Electrical Contractors' Association

Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)

Electricity Supply Industry in England and Wales

Electronic Components Industry Federation

GAMBICA (BEAMA Ltd.)

Health and Safety Executive

Institution of Electrical Engineers

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Contents

Foreword

This new edition of BS 764 has been prepared under the direction of the Power Electrical Engineering Standards Policy Committee. It introduces technical changes to bring the standard up-to-date and includes references to new materials to eliminate the use of asbestos and asbestos products. This new edition does not reflect a full review of the standard which will be undertaken in due course. This British Standard replaces BS 764:1954 which is withdrawn.

Assessed capability. Users of this British Standard are advised to consider the desirability of assessment and registration of a supplier's quality systems against the appropriate Part of BS 5750 by a third party certification body.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover 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.

1 Scope

This British Standard specifies d.c. and single-phase a.c. automatic double-pole change-over contactors for low voltages up to 250 V employed in conjunction with storage batteries or other alternative source of supply, to provide a means of automatically changing the current supplied to safety lights from the normal source to the alternative source when the normal source fails, and of reconnecting the safety lights to the normal source when this source is restored.

This standard does not apply to three-phase a.c. automatic change-over contactors.

NOTE 1 Appendix B lists information to be supplied to the manufacturer with the enquiry and/or order.
NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard, the following definitions apply.

2.1
automatic change-over contactor

a complete apparatus for effecting automatic change-over of the safety lights from the normal supply to the alternative supply when the normal supply fails, and for returning the safety lights to the normal supply when this supply is restored. The return operation may be effected through the agency of a relay which, if employed, is an integral part of the contactor

2.2
safety lights

lights which are normally connected to normal supply and are changed over to the alternative supply when the normal supply fails, e.g. the safety lights specified under the Cinematograph Regulations

2.3
main contactor

apparatus constructed in accordance with this specification, excepting the relay if employed. Where the complete automatic change-over contactor is intended, this is made clear in relevant clauses

2.4
relay

a voltage dependent relay, the function of which is to cause the main contactor to change from the emergency to the normal position when the main supply voltage has recovered to a particular value

2.5
contactor coil

the shunt connected coil energized from the normal supply, which causes the main contactor either to change to, or to remain in, the normal position

2.6
relay coil

the shunt connected coil, energized from the normal supply, which causes the relay contacts to move to one of their two positions

2.7
load carrying contacts

contacts on the main contactors which in either normal or emergency conditions carry the current for supplying the safety lights

2.8
"silver" contact

a contact composed of or faced with not less than 0.4064 mm of fine silver or other material of equivalent performance

2.9
normal position of main contactor

the position of the main contactor when it is connecting the safety lights to the normal supply

2.10
emergency position of main contactor

the position of the main contactor when it is connecting the safety lights to the emergency supply

2.11
dust-protecting enclosure

an enclosure constructed to prevent the ready ingress of dust

3 Characteristics

3.1 Rating

The complete apparatus shall be rated in terms of its current-carrying capacity and voltage and also in terms of frequency if a.c.

3.2 Sizes

The following current ratings shall apply:

a) 15 A at 30 V;

b) 15 A, 30 A, 60 A and 100 A at voltages not exceeding 250 V.

Where a total load in excess of 100 A applies, it should be divided over two or more separate circuits, each controlled by an independent automatic change-over contactor.

4 Design, construction and marking

4.1 General principles

The apparatus shall operate on the principle that the contacts of the main contactor are closed to the normal position by an electro-magnet or electro-magnets, energized from the normal supply, the direct pull of which is the only force preventing the main contactor from closing to its emergency position under the action of gravity or springs, or both.

Every operating spring used shall be so fitted that in the event of breakage, it shall not foul the mechanism and shall not come into contact with live parts. The use of a relay is permitted in conjunction with the main contactor.

NOTE The principles above do not refer to contact springs.

The following types of contactor are beyond the scope of this British Standard:

a) automatic change-over contactors in which the connection of the normal and alternative supplies is separately effected by two distinct contactors interlocked mechanically or electrically, or mechanically and electrically;

b) contactors dependent on electrical energy to force them into or maintain them in the emergency position;

c) contactors dependent on the application of electrical energy to release them from their normal position, or any switch employing toggles, latches, triggers, locks or similar devices, toothed gearing or ratchet action, to hold them in any position.

4.2 Mounting

The contactor shall be suitably insulated and mounted on bars or a panel. The bars or panel shall be of ample stiffness and strength. Where a panel is used, it shall be of phenolic resin bonded laminate in accordance with BS 2572.

4.3 Spacing

The spacing between the various poles of the main contactor shall be adequate for the voltage and current which are to be interrupted when tested in accordance with **5.2.5**.

4.4 Contacts

Contacts, including auxiliary contacts (see **4.11**) shall be of such a type that they do not exert, by reason of their construction or design, any force opposing the movement of the contact in the direction of breaking contact from either the normal or emergency position.

NOTE Contacts of the knife-switch type do not comply with the above requirements, and contactors using knife-switch type contacts are therefore beyond the scope of this British Standard. Where "silver" contacts are fitted on contactors with ratings not exceeding 30 A, the double break bridge type of contact may be used.

4.5 Contact force

4.5.1 *Hinged or pivoted contacts.* With the contactor fully closed in each position the force required to pull any contact finger off the fixed contact, as measured by a spring balance attached at the line of contact, in the direction of motion of the moving contact at the moment it is moving away from the stationary contact, shall be not less than the values given in the appropriate column, 3 or 4, of Table 1.

4.5.2 *Double break bridge contacts.* Where the double break bridge type of contact is used, the pressure on each contact of any one pole shall be sensibly equal, and the total force exerted by the common spring, with the contactor fully closed in each position, shall be not less than the values given in column 5 of Table 1.

4.6 Change-over voltage

4.6.1 The main contactor shall operate so that the poles of the safety lighting load are automatically disconnected from the normal supply and connected to the alternative supply when the voltage of the normal supply has failed or has fallen below 60 % of the nominal voltage of the normal supply with the contactor coil at its normal working temperature.

4.6.2 The automatic change-over contactor (including relay if any) shall require not more than 85 % of the nominal voltage of the normal supply to bring about reconnection of the safety lights to the normal supply.

4.6.3 Operation of the contactor in accordance with **4.6.1** and **4.6.2** shall be proved by testing in accordance with **5.2.7** and **5.2.8**.

4.6.4 The contactor shall remain fully closed in either position as determined by **4.6.1** and **4.6.2** until change-over occurs and the contactor changes to the alternative fully closed position. The pressure between the contacts, closed in the above manner, shall be maintained at a value not less than that specified in **4.5.1** or **4.5.2** whatever the voltage of the normal supply may be, i.e. no matter how slowly the voltage of the normal supply may rise or fall, there shall not, in either position, be a weakening of contact pressure below the minimum required by **4.5.1** or **4.5.2**, as appropriate.

4.7 Sequences of operation

Both poles of the supply shall, by the action of the main contactor, be disconnected from the safety lights before these are connected to the alternative supply, conversely, it is essential that the safety lights be disconnected from the alternative supply before being reconnected to the normal supply.

Table 1 — Minimum contact force

1	2	3	4	5
Rated voltage	Rated current	Minimum force		
		Hinged or pivoted contacts (see **4.5.1**)		Total force on double break bridge contacts (see **4.5.2**)
		Copper contacts	"Silver" contacts	"Silver" contacts
V	A	N	N	N
above 24 and up to 250	15	2.2	1.1	1.1
any voltage up to 250	30	3.3	2.2	2.2
	60	9.0	3.3	—
	100	18.0	6.6	—

When the normal source of supply is d.c. and the alternative source is a battery, the latter may be connected to it (through a resistance, if desired) for trickle or other charging, providing that by the action of the automatic contactor the normal supply is effectively disconnected from both battery and lights on both poles when the normal supply has failed or has decreased in voltage as described in **4.6.1**.

4.8 Polarity of contacts

If both the normal supply and the alternative supply are d.c., the polarities of the terminals shall be suitably marked to ensure that the positive and negative load connections retain the same polarity on either supply.

4.9 Contact separation

There shall be an effective break on each pole of the main contactor to ensure compliance with the test prescribed in **5.2.5**.

4.10 Stability of operation

The main contactor shall be free from chattering, and shall change over without appreciable bounce of the contacts which are closing.

The design shall be such that there shall be no possibility of hunting upon rise and fall of voltage, however slowly such change may take place.

When the armature of the main contactor is in the closed position, and the full voltage at normal frequency is applied to the coil (in series with associated economy resistances if any), the contactor shall not give out more noise than the hum associated with any properly constructed laminated core having tightly clamped laminations and carrying an a.c. flux.

NOTE The noise of the main contactor is governed to a considerable extent by the particular method used for its installation or enclosure. If it is desired to reduce the noise, rectified a.c. may be used for energizing the coil or coils, or other means may be adopted provided that they in no way conflict with the terms of this specification.

4.11 Auxiliary contacts

In addition to the load-carrying contacts of the main contactor carrying the safety lighting load, there may be auxiliary contacts for:

a) use with the economy resistor of the contactor coil;

b) an alarm signal;

c) disconnecting charging circuits;

d) operation of other external circuits not part of the safety lighting load.

4.12 Voltage relay

If a voltage relay is used to form part of the complete change-over contactor, it shall comply with the following.

a) The relay shall be so connected that its coil is energized from the normal supply, and shall be so arranged and connected that its contacts permit the operating coil of the main contactor to be effectively energized only when the normal supply has been restored to the value specified in **4.6.2**. The coil of the main contactor may, however, be partially energized through the economy resistance before being fully energized, subject to compliance with **4.6.4**.

b) When the main contactor has moved into the normal position, the coil of the relay shall be de-energized, the relay not being required to operate until the automatic change-over contactor is once more in the emergency position with the condition a) above applying.

c) The relay used shall be of substantial and sound design and shall be capable of passing the relevant tests specified in clause **5**.

4.13 Springs, pivots, fixings and enclosures

4.13.1 Springs shall be of suitable non-rusting metal or effectively plated with a non-corrosive metal, or provided with a suitable lasting surface as a protection against corrosion.

4.13.2 Where pivots and bearings are used, they shall be of such material as to guard against rusting up or seizing. No pivoted joint in the contactor shall be required to pass current and a durable flexible connection having sufficient current-carrying capacity shall be provided in parallel with any such joint.

4.13.3 All nuts, bolts and screws shall be effectively locked.

4.13.4 Main contactors and relays shall be mounted in dust-protecting enclosures.

4.14 Temperature rise limits

4.14.1 *General.* The temperature rise limits (in K) specified in **4.14.2** and **4.14.3** are based on an ambient temperature having a peak value not exceeding 40 °C and an average value not exceeding 35 °C measured over a 24 h period. If the contactor is required to operate under higher ambient temperature conditions, the permissible temperature rise shall be correspondingly reduced.

4.14.2 *Contacts and conductors.* Continuously rated contacts and conductors on the completely assembled contactor shall be capable of sustaining the rated full-load current continuously without injury to themselves and without causing damage to any adjacent parts.

The limit of temperature rise of the various parts when left in circuit continuously at rated voltage or current, or both, and frequency if a.c., shall not exceed the values given in Table 2 when measured by thermometer or by thermocouple on the surface.

Table 2 — Limits of temperature rise for contacts and conductors

Parts	Temperature rise
	K
Solid copper contacts in air	45
"Silver" contacts in air	50
Busbars, connecting bars and terminals	45

4.14.3 *Contactor or relay coils.* The temperature rise of coils left continuously in service shall not exceed the limits given in Table 3 when measured by thermometer or thermocouple on the surface, when energized from the normal supply, at the normal supply voltage in series with their resistances, if any, and enclosed as in service.

If measured by the self-resistance method, the limits of temperature rise shall be 20 K higher than those specified in Table 3.

When the minimum voltage of the normal supply which causes change-over of the complete automatic change-over contactor from the emergency to the normal position has been applied to the main contactor coil circuit (or the relay coil circuit if a relay is used) for a period of 1 h, the temperature rise of the coil shall not exceed by more than 5 K the permissible limit for continuously rated shunt coils specified in column 2 of Table 3.

4.15 Additional requirement for 15 A, 30 V contactors

All load-carrying contacts for 15 A, 30 V contactors shall be of "silver".

4.16 Additional requirements for contactors other than 15 A, 30 V contactors

4.16.1 *General principle.* If springs alone are used, they shall be of the compression type and at least two springs shall be provided. If gravity and springs are used, only one spring need be provided. If gravity and springs, or springs alone are used to secure the full contact pressure, the failure of one spring shall not reduce the contact pressure below that required to carry the rated current for 3 h without damage to the contact or any adjacent parts. Springs, where used, shall exert a direct push or pull, e.g. they shall not be used as part of a toggle or over-centre mechanism.

4.16.2 *Moving parts.* The contact carriers shall be adequately insulated and rigidly mounted on a pivoted member which is directly driven from the operating magnet, i.e. without intermediate gearing links.

4.16.3 *Contacts.* All load-carrying contacts shall be easily renewable. Where the load-carrying contacts are of copper, there shall be a self-cleaning action between the fixed and moving contacts when they close either to the normal or the emergency position.

Where the load-carrying contacts are of "silver", they need not be self-cleaning providing that in the circumstances in which they are to be used, the requirements of this specification can be met without self-cleaning action.

Where the double break bridge contact is not employed (see **4.4**), the contacts shall be of the hinged or pivoted type in which of each pair of load-carrying contacts comprising a fixed and a corresponding moving member, one member shall have a hinged or pivoted contact tip constrained by a spring which is put into greater compression by the contacts coming together.

4.16.4 *Arc suppression*. If the rated current exceeds 15 A at any rated voltage, or if the rated voltage exceeds 50 V irrespective of the rated current, magnetic blow-out devices, or other effective means in the case of a.c., with effective arc shields, shall be provided for each of the load-carrying stationary contacts, capable of extinguishing the arcs when the load is switched over from the normal supply to the alternative supply or vice versa.

4.17 Marking

Contactors shall be indelibly marked with the following:

a) rated voltage;

b) rated current;

c) rated frequency (if applicable);

d) the number and year of this British Standard[1)].

5 Tests

5.1 General

Tests shall be made to prove compliance with all the requirements of this specification.

It is not intended or recommended that complete tests shall be made on all contactors supplied. Type tests shall be made on a representative sample of each particular class of contactor. Routine (individual) tests shall be made on each contactor manufactured in accordance with this specification.

Table 3 — Limits of temperature rise for coils

1	2	3	4
Insulating materials (see note)	**Maximum surface temperature rise**		
	Continuously rated shunt coils	**Intermittently rated shunt coils**	**Series coils**
	K	K	K
Class Y (formerly "O")	40	45	55
Class A	70	75	85
Class E (materials possessing a degree of thermal stability higher than Class A)	85	90	95
Class B	100	105	115
Class F (as Class B but with superior bonding substance)	120	125	130
Class H	145	150	155
NOTE BS 2757 describes a method for determining the thermal classification of electrical insulation.			

[1)] Marking BS 764:1990 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

5.2 Type tests

5.2.1 *Record of type tests*

5.2.1.1 Unless otherwise specified, the purchaser shall accept as evidence of compliance with the general requirements of this standard, type tests on contactors identical in essential aspects with that purchased.

Certificates of all type tests, with certified detailed drawings of the contactor tested, and winding specifications of all coils which may be fitted, shall be held available by the manufacturer, together with a record of any alterations which have been made to the contactor since any type test was carried out.

It is not intended that a type test should be made on coils of every voltage rating, but manufacturers should furnish, on request, evidence that any coil supplied has a performance equivalent to that of the coil that has been type-tested.

5.2.1.2 Type tests shall be made by a recognized authority, who may be the manufacturer, unless the purchaser specifies otherwise before the order is placed, and shall be made on the completely assembled equipment.

5.2.2 *Sequence of type tests*. The type tests shall be made in the following sequence:

a) mechanical endurance test;

b) temperature rise test;

c) tests on shunt coils;

d) making and breaking capacity test;

e) test for stability of operation;

f) operation test.

5.2.3 *Mechanical endurance test*. The mechanical endurance test shall be made by operating the contactor by means of its own operating mechanism, without current through the main contacts, on and off for 100 000 cycles, after which all mechanical working parts (excluding contacts) shall be in order and without permanent distortion and undue wear. No mechanical adjustment shall be permissible during or after the test until the completion of the operation test specified in **5.2.7**, except that the contactor coil and relay coil (if fitted) may be changed if they have been overheated during the mechanical endurance test.

NOTE It may be necessary to operate the contactor more rapidly on test than envisaged in normal service, and this may lead to overheating of the contactor coil and relay coil (if fitted). It is permissible to replace such coils during or after the endurance test and prior to the performance test.

5.2.4 *Temperature rise tests*

5.2.4.1 *General*. Tests shall be carried out to prove compliance with **4.14**. The methods to be used for measurement of ambient temperature and temperature rise are detailed in Appendix A.

5.2.4.2 *Temperature rise tests on contactors and conductors*. Tests shall be carried out on main current-carrying parts to prove compliance with **4.14.2** as follows:

a) for d.c. contactors with a d.c. supply at any convenient voltage;

b) for a.c. contactors with an a.c. supply at any convenient voltage at rated frequency.

Connections shall be of reasonable size and a suitable interval for cooling shall be allowed after the mechanical endurance test.

5.2.4.3 *Tests on contactor or relay coils*. Voltage tests shall be carried out on shunt coils to prove compliance with **4.14.3** as follows:

a) for d.c. contactors with a d.c. supply at the rated voltage;

b) for a.c. contactors with an a.c. supply at the rated voltage and frequency.

The following particulars shall be recorded and held available:

1) current in the coil at room temperature;

2) ohmic resistance of the coil (in d.c.) at room temperature;

3) final temperature rise.

5.2.5 *Making and breaking capacity test*

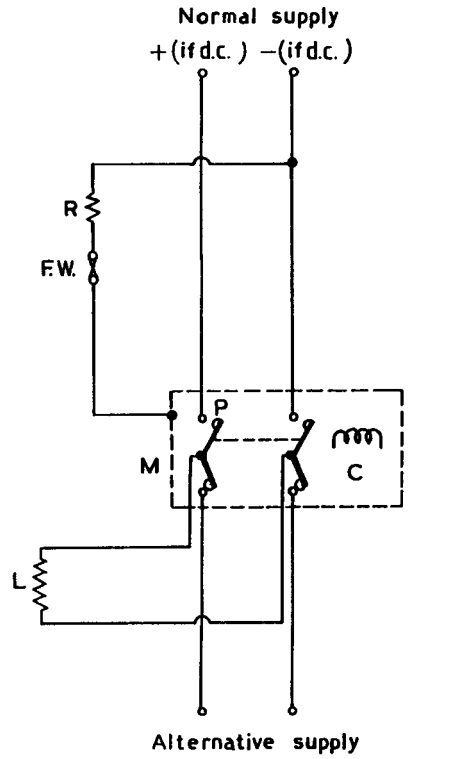
5.2.5.1 The contactor shall make and break satisfactorily using 1.5 × rated current at rated voltage for 50 cycles at intervals not exceeding 10 s on a non-inductive load with both supplies connected under either condition a) or b) below.

Enclosures of metal or partly metal shall not be directly earthed but shall be connected to one pole of one supply through a non-inductive resistance of 0.5 Ω (approximately) in series with a fine-wire fuse, wired with copper wire not greater than 0.1219 mm diameter with a break not less than 76.20 mm.

The enclosure shall be connected to the negative pole where a d.c. normal supply is used, or to either pole where a normal a.c. supply is used. The pole of the contactor having the smallest clearance to earth shall be connected to the pole of the normal supply which is not already connected to the case (see Figure 1).

a) Where both poles of both supplies are intended to be insulated from earth, there shall be no connection between the two supplies on test.

b) Where the change-over contactor is for use with normal and emergency supplies, one or both of which will normally have one pole connected to earth, e.g. the normal earthed neutral of a standard phase-to-neutral single phase supply, the test shall be carried out with one pole of each supply connected to earth.



Key
C Contactor on test
F.W. Fine-wire fuse
L Load resistor
M Metal case
P Pole of contactor having least clearance to earth
R Resistor, 0.5 Ω

Figure 1 — Diagram of typical circuit for test for making and breaking capacity

5.2.5.2 The contactor shall make a current of 7 × full-load current at any convenient voltage without welding, and the current shall be interrupted by another device immediately after the contactor has closed. The test shall be repeated for 10 cycles at intervals not exceeding 2 min.

5.2.6 *Test for stability of operation*. The contactor shall be connected to a suitable supply and the voltage of this shall be varied to check that the operation of the contactor is in accordance with **4.10**.

5.2.7 *Operation test*. The coil or coils of the main contactor or relay (if fitted) shall be subjected for 1 h to the minimum value of the supply voltage which causes reconnection of the safety light to the normal supply. During this period the main contactor or relay (if fitted) shall by suitable means be held in the emergency position. Immediately after the end of this period, the contactor shall be restored to its normal mechanical condition and a voltage of 85 % of the rated voltage of the contactor shall be applied to the contactor which shall then cause reconnection of the safety lights to the normal supply.

5.3 Routine (individual) tests

5.3.1 *High-voltage tests*. Contactors shall be tested with the cover closed following a period of exposure of 24 h prior to the test with the cover open to the atmosphere.

The test voltage for 15 A, 30 V contactors shall be 1 500 V r.m.s. and for all other contactors it shall be 2 000 V r.m.s. This voltage shall be applied:

a) between the circuits of the contactor and the earthed frame with all the contactor circuits completed;

b) between the main terminals with the potential circuits connected at one pole only;

c) across any breaks;

d) between any live parts forming portions of independent circuits.

Instruments supplied with the contactor shall be disconnected during this test and tested separately in accordance with the relevant British Standards.

The test voltage shall be alternating and of any frequency between 25 Hz and 100 Hz and approximately of sine-wave form.

The test voltage shall be measured by means of a suitable instrument connected to the output levels. The full test voltage shall be withstood for 1 min without flashover or breakdown occurring.

NOTE An insulation resistance test is not specified, as it is not practicable to set down limits for the contactors covered by this specification. Further it is considered that the high-voltage test is sufficient to determine whether the insulation is satisfactory or otherwise.

5.3.2 *Operating coils*. The automatic change-over contactor shall be proved by test to operate satisfactorily at the limiting voltages specified in **4.6.1**. The current in the coil at room temperature when the contactor is supplied at rated voltage and frequency, and the ohmic resistance of the coil, shall be in reasonable agreement with the values in the type test **5.2.1.1**.

Appendix A Methods for measurement of temperature

A.1 Thermometer method

Three types of thermometer may be used:

a) bulb thermometers containing mercury;

b) bulb thermometers containing alcohol;

c) resistance thermometers.

When bulb thermometers are used in locations where there is any varying or moving magnetic field, those containing alcohol should be used, as eddy currents in those containing mercury may produce sufficient heat to give rise to misleading results.

When a thermometer is used to measure the temperature of a surface, e.g. of a coil, the bulb shall be surrounded by a single wrapping of tin foil of minimum thickness 0.0254 mm. The foil shall be turned up at the end to form a complete covering for the bulb, which shall then be secured in contact with the surface under test. The exposed part of the wrapped bulb shall be completely covered with a pad of heat-insulating material which is asbestos-free, or by putty or plasticine compounds suitable for the temperatures involved, without unduly shielding the test surface from normal cooling.

When a thermometer is used to measure the temperature of a resistor, the tin foil wrapping for the bulb shall be omitted.

A.2 Thermocouple method

The two conductors between which the thermo-electric effect is produced shall be soldered or welded at both the hot and cold junctions. Soft solder is adequate for copper and copper-nickel alloys, but silver solder should be used for iron.

When applied to the surface of live conductors, the hot junction is insulated and shall be wrapped in tin foil as described in **A.1**. The thermocouple circuit should be earthed to minimize the possibility of capacity current.

The protecting pad of heat-insulating material specified in **A.1** shall be employed whether the junction is insulated or not.

The cold junction shall be immersed in oil, preferably contained in a vacuum flask, the temperature of which is measured by means of a thermometer.

When a thermocouple is used to measure the temperature of a resistor, both the tin foil wrapping and the pad shall be omitted.

A.3 Measurement of ambient temperature

The temperature of the surrounding air shall be measured by means of at least two thermometers, so placed as to take account of the maximum and minimum ambient temperature, and the mean reading shall be adopted. Each thermometer shall be immersed in oil contained in, and sufficient to fill, a bottle having an approximate capacity of 0.25 L.

Appendix B Information to be supplied to the manufacturer with enquiry and/or order

B.1 Information relating to the contactor

The following information relating to the contactor should be supplied with the enquiry and/or order:

a) maximum continuous safety lighting load, in A, which the contactor is required to carry;

b) details of auxiliary contacts required, including number of contacts, current to be carried, and maximum circuit voltage (see **4.11**);

c) details of mounting proposed;

d) type of cable entry to the enclosure.

B.2 Information relating to the supply circuits

The following information relating to the supply circuits should be supplied with the enquiry and/or order:

a) normal supply, as connected at the contactor[2)] :

1) whether d.c. or a.c.;

2) if d.c., voltage of supply (2-wire or 3-wire), and whether any point in the system is connected to earth;

3) if a.c., voltage between lines, frequency, neutral earthing conditions;

b) alternative supply:

1) if from storage battery, the normal voltage at the terminals of the battery and whether any part is purposely maintained at earth potential;

2) if from some alternative public supply or emergency generating plant, information to be provided as under a).

B.3 Other information

The following other information should be supplied with the enquiry and/or order:

a) ambient temperature, if higher than that stated in **4.14.1**;

b) recognized authority for type tests, if other than the manufacturer (see **5.2.1.2**);

c) if type tests on apparatus identical in essential respects with that purchased are not acceptable (see **5.2.1.1**).

[2)] The supply at the contactor is not necessarily at the same voltage as the public supply to the building, since a stepping down or up converting device may be interposed.

Publications referred to

BS 2572, *Specification for phenolic laminated sheet and epoxide cotton fabric laminated sheet.*
BS 2757, *Method for determining the thermal classification of electrical insulation.*
BS 5750, *Quality systems.*

BSI — British Standards Institution

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