

Electricity meters —

Part 8: Specification for impulse operated multiple registers for use with induction electricity meters

Committees responsible for this British Standard

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- BEAMA Meter Association
- Department of Energy (Electricity Division)
- Electricity Supply Industry in England and Wales
- Institution of Electrical Engineers

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Foreword

This British Standard has been prepared under the direction of the Power Electrical Engineering Standards Policy Committee.

Impulse operated multiple registers may be housed in the meter case or separately. Where they are housed in the meter case BS 5685-1 will need to be referred to in addition to this standard.

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 12, 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 Part of BS 5685 specifies requirements for multiple registers (hereinafter referred to as multi-rate units or MRUs) attached to or separate from electricity meters, as specified in all Parts of BS 5685, used for the measurement of electrical active or reactive energy of a frequency in the range 45 Hz to 65 Hz. These registers may be with or without integral time control, visual display, or interrogation and programming interface. The requirements for input and output switching or logic arrangements for these registers are specified in BS 5685-5.

NOTE 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 definitions given in BS 5685-1 apply together with the following.

2.1

memory

an element which stores digital information

2.2

display

a device which visibly displays the contents of a memory(ies)

2.3

operating conditions

a set of specified measuring ranges for performance characteristics and specified operating ranges for influence quantities, within which the variations or operating errors of a meter are specified and determined

2.4

specified operating range

a range of values of a single influence quantity which forms a part of the operating conditions

2.5

limit range of operation (limiting conditions)

the extreme conditions which an operating meter can withstand without damage and without degradation of its metrological characteristics when it is subsequently operated under its operating conditions

2.6

storage and transport conditions

the extreme conditions which a non-operating meter can withstand without damage and without degradation of its metrological characteristics when it is subsequently operating under its operating conditions

3 Units

The units employed in this standard are in accordance with BS 5775-5.

4 Standard electrical values

4.1 Standard reference voltages

Standard reference voltages shall be as stated in BS 5685-1.

4.2 Standard frequency

The MRU shall be designed for a reference frequency of 50 Hz or 60 Hz.

5 Mechanical requirements

5.1 General

MRUs shall be designed and constructed in such a way as to avoid introducing any danger in normal use, so as to ensure especially the following:

- a) personal safety against electric shock;
- b) personal safety against effects of excessive temperature;
- c) safety against spread of fire;
- d) protection against solid objects, dust and water.

All parts which are subject to corrosion in normal use shall be effectively protected. Any protective coating shall not be liable to damage by ordinary handling nor injuriously affected by exposure to air, under normal working conditions.

The MRU shall have adequate mechanical strength (see 12.3) and shall withstand the elevated temperatures which are likely to occur in normal use.

The components shall be reliably fastened and secured against loosening.

The security of the electrical connections shall be such as to prevent any accidental opening of a circuit.

The construction of the MRU shall be such as to minimize the risks of short circuiting of the insulation between live parts and accessible conducting parts due to accidental loosening or unscrewing of the component parts.

NOTE For MRUs for special use in corrosive atmospheres additional requirements should be specified in the purchase contract (e.g. salt mist test according to BS 2011-2.1Ka).

5.2 Case

If the cover of the MRU is removable, the internal parts shall only be accessible after breaking the seal(s).

The cover shall not be removable without the use of a tool.

The case shall be so constructed and arranged that any non-permanent deformation shall not prevent satisfactory operation of the MRU when tested in accordance with **12.3.1**.

5.3 Window

Where the MRU is fitted with a display one or more windows shall be fitted for reading the display. These windows shall be of transparent material which shall not be removable without breaking of the seal(s).

5.4 Adaptor plates

NOTE Where the MRU is offered as a multirate attachment suitable adaptor plates or other means may be provided to enable the attachment to be fitted to more than one meter type.

Where adaptor plates are fitted no access to the main meter terminals or the terminals of the attachment shall be possible without the breaking of the seal(s).

5.5 Terminals, terminal block(s), connectors, protective earth terminal

Terminals which are grouped in a terminal block(s) shall have adequate insulating properties and mechanical strength. In order to satisfy such requirements, when choosing insulating materials for the terminal block(s), adequate testing of materials shall be taken into account.

The holes in the insulating material which form an extension of the terminal holes shall be of sufficient size to accommodate also the insulation of the conductors.

The manner of fixing the conductors to the terminals shall ensure adequate and durable contact such that there is no risk of loosening or undue heating. Screw connections transmitting contact force and screw fixings which may be loosened and tightened several times during the life of the meter shall screw into metal.

All parts of every terminal shall be such that the risk of corrosion resulting from contact with any other metal part is minimized.

Electrical connections shall be so designed that contact pressure is not transmitted through insulating material.

Terminals with different potentials which are grouped close together shall be protected against accidental short-circuiting.

NOTE 1 Protection may be obtained by insulating barriers. The terminals, the conductor fixing screws, or the external or internal conductors shall not be liable to come into contact with metal terminal covers.

Where connections are made using pluggable connectors the above requirements shall be taken into account when choosing the connector.

Additionally, unless the pluggable connector is protected by the main or terminal cover sealing it shall be fitted with its own security seal.

The protective earth terminal, if any, shall comply with the following.

- a) It shall be electrically bonded to the accessible metal parts.
- b) It shall, if practicable, form part of the base.
- c) It shall accommodate a conductor having a cross section lower limit of 2.5 mm^2 and a maximum of 16 mm^2 . Where the MRU is designed to be protected by an external fuse it shall be such as to allow the connection of a cable adequate to meet the fuse rating.
- d) It shall be clearly identified by the earthing symbol.

NOTE 2 The protective earth terminal should preferably be located adjacent to its terminal block.

After installation, it shall not be possible to loosen the protective earth terminal without the use of a tool.

5.6 Terminal cover(s)

The terminals of a MRU if grouped in a terminal block and if not protected by any other means, shall have a separate cover which can be sealed independently of the main cover. The terminal cover shall enclose the actual terminals, the conductor fixing screws and, unless otherwise specified, a suitable length of the external conductors and their insulation.

When the MRU is panel mounted, no access to the terminals shall be possible without breaking the seal(s) of the terminal cover(s).

5.7 Clearance and creepage distances

The clearance and creepage distances of the terminal block and those between the terminals and the surrounding parts of the metal enclosure shall be in accordance with Table 1 of BS 5685-1:1979.

The clearance between the terminal cover, if made of metal, and the upper surface of the screws when screwed down to the maximum applicable conductor shall be not less than the relevant values indicated in Table 1 of BS 5685-1:1979.

The requirements of the impulse voltage test shall be met (see **12.8.2**).

5.8 Resistance to heat and fire

The MRU shall be in accordance with BS 6458-2.1. Testing shall be in accordance with **12.4** of this standard.