

General requirements for rotating electrical machines —

Part 141: Specification for standard dimensions

ICS 29.160.30

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PEL/2, Rotating electrical machinery, upon which the following bodies were represented:

Association of Consulting Engineers
Association of Electrical and Mechanical Trades
Association of Manufacturers of Power Generating Systems
Electrical Insulation Association
Electricity Association
GAMBICA Association Limited
Institution of Incorporated Executive Engineers
Ministry of Defence — UK Defence Standardization
Rotating Electrical Machines Association (BEAMA Ltd.)
Society of Operations Engineers
UK Offshore Operators Association Limited

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Foreword

This part of BS 4999 has been prepared by Technical Committee PEL/2. Together with BS EN 50347:2001 it supersedes BS 4999-141:1987, which is withdrawn.

BS 4999-141:2004+A1:2010 supersedes BS 4999-141:2004, which is withdrawn.

The start and finish of text introduced or altered by Amendment No. 1 is indicated in the text by tags **A1** and **A1**.

The dimensions of general purpose three-phase induction motors with frame sizes up to 315 are now specified in BS EN 50347. This new edition of BS 4999-141 specifies the dimensions of skirt-mounted motors, pad-mounted motors, slide rails, shaft extensions with two tapped holes, and foot-mounted frames for d.c. machines, all of which are outside the scope of BS EN 50347. It also specifies the dimensions of foot-mounted motors, flange-mounted motors, shaft ends and keyways, and shaft extensions with single tapped holes, all of which are above the size range covered by BS EN 50347.

This new edition of BS 4999-141 incorporates changes necessitated by the publication of BS EN 50347. It does not represent a full review or revision of the standard, which will be undertaken in due course.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot 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 13 and a back cover.

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1 Scope

This part of BS 4999 specifies the dimensions of rotating electrical machines which are outside the scope of BS EN 50347. It specifies the dimensions of skirt-mounted motors, pad-mounted motors, slide rails, shaft extensions with two tapped holes, and foot-mounted frames for d.c. machines. It also specifies the dimensions of foot-mounted motors, flange-mounted motors, shaft ends and keyways, and shaft extensions with single tapped holes, all of which are above the size range covered by BS EN 50347.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS EN 50347, *General purpose three-phase induction motors having standard dimensions and outputs — Frame numbers 56 to 315 and flange numbers 65 to 740.*

3 General

3.1 Tolerances

Where tolerance grades are quoted, they have the meanings defined in BS 4500 and BS EN 20286.

3.2 Run-outs

Where appropriate, shaft extension and spigot run-outs and the squareness of the flange face to the shaft shall not exceed the values specified in Table 1, Table 7, Table 8 and Table 9.

Measurements shall be made in accordance with BS EN 50347.

4 Shaft end dimensions

Motors shall have shaft dimensions as specified in the appropriate line in Table 1. The meaning of the symbols is given in BS 4999-103 and BS EN 50347.

Each size of shaft is identified by a shaft number in the second column and the number is the nominal diameter of the shaft in millimetres.

The keyway corner radius, *FB* and/or *FC* shall be in accordance with the dimensions given in Table 2, which were abstracted from BS 4235-1.

When a single tapped hole is required in the shaft extension in a shaft of diameter greater than or equal to 95 mm up to and including 150 mm, the dimensions of the hole shall be in accordance with Table 3. The depth of thread shall be not less than 1.5 diameters, and there shall be a 60° angle at the centre.

If the purchaser specifies two tapped holes in the shaft extension, as an alternative to the single tapped hole, the dimensions of the holes shall be in accordance with Table 4. The depth of thread shall be not less than 1.75 diameters.

NOTE 1 The provision of a tapped hole or holes is primarily for the attachment of shaft fittings including couplings, and is not intended for the attachment of devices for lifting or handling either the motor or the rotor.

NOTE 2 The dimensions *DH* are selected from BS 3643-2 with tolerance class 6H.

Table 1 — Dimensions of shaft ends and keyways for shafts greater than 90 mm diameter

Shaft number	Diameter <i>D</i>		Length <i>E</i>	Limit of shaft extension run-out (See Note 1)	Width of keyway <i>F</i>		<i>G</i>		<i>EB</i> and/or <i>EC</i> min.	<i>ED</i> and/or <i>EE</i>
	Nominal	Tolerance			Nominal	Tolerance	Nominal	Tolerance		
95	95	m6 +0.035 +0.013	170	0.07	25	N9 +0 −0.052	86.0	+0 −0.2	140	8
100	100	m6 +0.035 +0.013	210	0.07	28	N9 +0 −0.052	90.0	+0 −0.2	160	8
110	110	m6 +0.035 +0.013	210	0.07	28	N9 +0 −0.052	100	+0 −0.2	160	8
120	120	m6 +0.035 +0.013	210	0.07	32	N9 +0 −0.062	109.0	+0 −0.2	160	10
125 ^a	125	m6 +0.040 +0.015	210	0.07	32	N9 +0 −0.062	114.0	+0 −0.2	160	10
130	130	m6 +0.040 +0.015	250	0.07	32	N9 +0 −0.062	119.0	+0 −0.2	200	10
140	140	m6 +0.040 +0.015	250	0.07	36	N9 +0 −0.062	128.0	+0 −0.3	200	10
150	150	m6 +0.040 +0.015	250	0.07	36	N9 +0 −0.062	138.0	+0 −0.3	200	10
NOTE 1 The limits of shaft extension run-out apply only to flange-mounted and skirt-mounted motors and refer to the full indicator measurement at a point mid-way along the shaft extension <i>E</i> .										
NOTE 2 The parallelism tolerance is the permitted difference in height above the base plane of two points on the axis of the shaft. The difference should be less than 0.1 mm per 100 mm of shaft length between the two points. If it is desired to limit the parallelism tolerance to a lower value, special agreement should be made.										
NOTE 3 When using indirect drives such as belts, ropes and pinions to couple motors to their loads, there is a danger that excessive stress may be imposed on the motor shafts and bearings by the side loading inherent in these methods of power transmission. It is advisable to consult the motor manufacturer when such drives are being designed.										
NOTE 4 Purchasers may require shafts shorter than those listed in this table. In such cases it is recommended that the length should be in accordance with the short series of Table 1 in BS 4506:1970. <i>F</i> and <i>G</i> should remain unchanged, but <i>EB</i> and/or <i>EC</i> reduced as appropriate.										
a. This is a non-preferred ISO size.										