भारतीय मानक

Indian Standard

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ISO 15241 : 2012

रोलिंग बियरिंग्स — भौतिक मात्राओं के लिए प्रतीक

Rolling Bearings — Symbols for Physical Quantities

ICS 01.075, 21.100.20

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Bearing Sectional Committee, PGD 13

NATIONAL FOREWORD

This Indian Standard which is identical to ISO 15241 : 2012 'Rolling bearings — Symbols for physical quantities' issued by the International Organization for Standardization (ISO), was adopted by the Bureau of Indian Standards on the recommendation of the Bearing Sectional Committee and approval of the Production and General Engineering Division Council.

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated.

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 281 Rolling bearings — Dynamic load ratings and rating life	IS 3824 : 2014/ISO 281 : 2007 Rolling bearings — Dynamic load ratings and rating life (*third revision*)	Identical
ISO 1132-1 Rolling bearings — Tolerances — Part 1: Terms and definitions	IS 11027 (Part 1) : 2019/ ISO 1132-1 : 2000 Rolling bearing — Tolerances: Part 1 Terms and definitions (*first revision*)	Identical
ISO 5593 Rolling bearings — Vocabulary	IS 2399 : 2024/ISO 5593 : 2023 Rolling Bearings — Vocabulary (*third revision*)	Identical
ISO 80000-1 Quantities and units — Part 1: General	IS/ISO 80000-1 : 2022 Quantities and units: Part 1 General (*first revision*)	Identical
ISO 80000-2 Quantities and units — Part 2: Mathematics	IS/ISO 80000-2 : 2019 Quantities and units: Part 2 Mathematics (*first revision*)	Identical

Technical Corrigendum/Amendment published in 2020 to the above International Standard has been given at the end of this publication.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*).' The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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Indian Standard

ROLLING BEARINGS — SYMBOLS FOR PHYSICAL QUANTITIES

1 Scope

This International Standard establishes the presentation of symbols for physical quantities (dimensions, dimensional tolerances, accuracy, load ratings, life, etc.) in the field of rolling bearings. These symbols are primarily intended for use in International Standards and ISO documents relating to rolling bearings, but they are also suitable for use in other printed materials, such as handbooks, illustrations/drawings and pamphlets.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are dispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 281, *Rolling bearings — Dynamic load ratings and rating life*

ISO 1132-1, *Rolling bearings — Tolerances — Part 1: Terms and definitions*

ISO 5593, *Rolling bearings — Vocabulary*

ISO 80000-1, *Quantities and units — Part 1: General*

ISO 80000-2, *Quantities and units — Part 2: Mathematical signs and symbols to be used in the natural sciences and technology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 281, ISO 1132-1 and ISO 5593 apply.

4 Symbols for physical quantities

4.1 Principles of the system of symbols

The following principles apply in this International Standard.

— Generally, the principles of the system of symbols shall be in accordance with ISO 80000-1 and ISO 80000-2.

— Symbols for physical quantities used in the field of rolling bearings are defined as quantities in physics. Symbols for dimensionless values such as coefficients, factors and parameters are thus also involved. Mathematical variables, e.g. probability (n), are also included.

— Subscripts of subscripts shall not be adopted; for example the subscript letters "$d$mp" of $V_{d\mathrm{mp}}$ shall be reproduced in the same point size. The form $V_{d_{\mathrm{mp}}}$ should not be used (see Figure 1).

— Superscripts shall not be used.

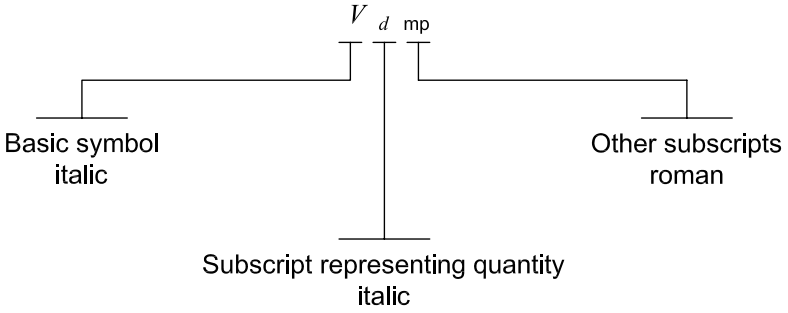

Figure 1 — Principle of symbols

4.2 Symbols — Composition

The symbols for physical quantities shall be shown as basic symbols, which are single letters from the Latin or Greek alphabet, or basic symbols with subscripts, composed of one or more letters of the accepted Latin or Greek alphabet or Arabic numerals. They shall not be followed by a full stop.

4.3 Basic symbols

Basic symbols represent physical quantities and may sometimes represent different physical quantities. The typical basic symbols are shown in Table 1.

4.4 Subscripts

Subscripts appended to a basic symbol modify the basic physical quantity with respect to properties, feature, numbering, etc. The subscripts used are shown in Table 2. Subscripts representing physical quantities have the same typography as the basic symbols (e.g. $V_{\underline{d}\mathrm{mp}}$, $\Delta_{\underline{d}\mathrm{s}}$).

4.5 Style of printing/reproduction of symbols

Basic symbols shall be printed/reproduced in italic (sloping) typeface with serifs. Subscripts representing physical quantities shall be printed/reproduced in italic typeface with serifs. Subscripts representing numbers and other symbols shall be printed/reproduced in roman (upright) typeface, e.g. e (with respect to outer ring), r (radial), d (with respect to bore). All subscript characters shall be of the same point size.

EXAMPLE 1 In $V_{d\mathrm{mp}}$ (variation of mean bore diameter), subscript "d" represents "bore diameter" and is printed/reproduced in italic typeface. Subscripts "m" representing "mean" and "p" representing "in a single plane" are printed/reproduced in roman typeface. The subscript characters have the same point size.

EXAMPLE 2 In S_{d} (perpendicularity of inner ring face with respect to the bore), "d" represents "per bore surface" and is reproduced/printed in roman typeface.

5 Classification of symbols for physical quantities

Symbols are classified as follows in Tables 3 to 10:

— dimensions and features for bearings, rings and washers (see Table 3);

— dimensions and tolerances for bearings, rings and washers (see Table 4);

— running accuracy for bearings, rings and washers (see Table 5);

— dimensions and tolerances for subunits (see Table 6);

— dimensions and tolerances for rolling elements (see Table 7);

— dimensions for shafts and housings (see Table 8);

— bearing loads and load ratings (see Table 9);

— bearing life (see Table 10).

6 Definitions of physical quantities

Definitions of physical quantities shall be in accordance with ISO 5593 and ISO 1132-1; in certain cases, definitions of physical quantities shall conform to other relevant International Standards concerning rolling bearings.

7 Use of square brackets

If two closely related physical quantities in Tables 3 to 10 are defined by the same text, apart from a few words, the physical quantities and their descriptions shall be grouped in a single entry. The words that are substituted for those which precede them in order to obtain the different meanings shall be placed in square brackets, i.e. “[ ]”.

8 Presentation of symbols for physical quantities

The symbols used in the field of rolling bearings are presented in Tables 1 to 10.

Table 1 — Basic symbols

Property	Basic symbol	Physical quantity
Dimension	A	width of housing
	B	width
		height of shaft washer
	C	width of outer ring
		height of housing washer
	D	outside diameter
		diameter of outer ring or housing washer except diameter of raceway
		diameter of bearing seat
	d	bore diameter
		diameter of inner ring or shaft washer except diameter of raceway
	E	diameter of raceway for outer ring
	F	diameter of raceway for inner ring
	G	designation of a screw thread
	H	eccentricity
		centre height of housing
	J	centre distance between bolt holes
	L	length of housing or roller
	l	length of screw thread
	N	dimension of bolt hole
	r	chamfer dimension
		(groove) radius
	s	(washer) thickness
	T	(assembled) width
		height
Tolerance and running accuracy	K	radial runout
		variation in thickness
	S	axial runout
		variation in thickness (thrust bearing)
	V	variation of dimension
	Δ	deviation from nominal dimension
Load and life	C	load rating
	F	bearing load
	L	life
	P	equivalent load
	Q	load on rolling element
Others	G	internal clearance
	i	number of rows of rolling elements
	Z	number of rolling elements per row
	α	contact angle or angle of taper

Table 2 — Subscripts

Property	Subscript	Definition
General	e	effective
	m	arithmetical mean
	max	maximum or greatest limit
	min	minimum or least limit
	p	plane in which measurement is made
	s	single or actual
	0	static (zero)
Direction	a	axial
	r	radial
Part or feature	a	assembled
	a, b, c, . . .	identification symbol where there is more than one diameter applied to closely associated parts (e.g. shaft, housing, spacer, collar)
	c	cage
	D	per outside surface
	d	per bore surface
	e	outer ring or housing washer
	i	inner ring or shaft washer
	w	rolling element
	1, 2, 3, . . .	identification number where there is more than one diameter, width or height, applied to primarily associated parts (e.g. aligning housing ring, aligning seat washer, locating snap ring and loose rib)
Life	a	adjusted
	h	time, hours
	m	modified
	n	probability of failure, related to (100 – n) % reliability
	10	90 % reliability ($n = 10$)
	50	50 % reliability ($n = 50$)
Others	L	lot or gauge lot

NOTE For subscripts, see 4.4.

Table 3 — Dimensions and features for bearings, rings and washers

Item No.	Symbol	Physical quantity	Reference No. ISO 5593
1.01	A	centre height of aligning surface	04.03.15
1.02	a	distance specifying the location of a bearing load centre	—
1.03	B	bearing width	04.03.04
1.04		inner ring width	04.04.05
1.05		shaft washer height	04.04.06
1.06	B_1, B_2, . . .	axial dimension of inner ring [shaft washer]	—
1.07		axial dimension of part primarily associated with an inner ring [shaft washer]	
1.08	b	snap ring groove width	04.03.12
1.09	C	outer ring width	04.04.05
1.10		housing washer height	04.04.06
1.11	C_1	outer ring flange width	04.03.09
1.12	C_1, C_2, . . .	axial dimension of outer ring [housing washer]	—
1.13		axial dimension of part primarily associated with an outer ring [housing washer]	
1.14	D	bearing outside diameter	04.03.03
1.15		outside diameter of outer ring [housing washer]	—
1.16		outside diameter of thrust washer	
1.17	D_1	outside diameter of outer ring flange	—
1.18	D_1, D_2, . . .	outer ring [housing washer] diameter (except raceway diameter)	—
1.19	d	bearing bore diameter	04.03.02
1.20		bore diameter of inner ring [shaft washer]	—
1.21		bore diameter of thrust washer	
1.22	d_G	nominal diameter of screw thread (external or internal)	—
1.23	d_{G1}, d_{G2}, . . .	diameter of part primarily associated with a screw thread	—
1.24	d_1, d_2, . . .	inner ring [shaft washer] diameter (except raceway diameter)	—
1.25	E_w	outside diameter of ball complement	04.04.14
1.26		outside diameter of roller complement	04.04.15
1.27	e	snap ring section height	—
1.28	F_w	bore diameter of ball complement	04.04.14
1.29		bore diameter of roller complement	04.04.15
1.30	f	snap ring thickness	—
1.31	G	designation of a screw thread[a]	—
1.32	i	number of rows of rolling elements	—
1.33	l_G	length of screw thread	—
1.34	l_{G1}, l_{G2}, . . .	axial dimension associated with a screw thread	—
1.35	r	chamfer dimension	04.03.06
1.36	r_e	groove radius of outer ring [housing washer] raceway	—
1.37	r_i	groove radius of inner ring [shaft washer] raceway	—
1.38	r_1, r_2, . . .	chamfer dimension	04.03.06
1.39	s	thickness of thrust washer	—
1.40	T	(assembled) bearing width	04.03.04
1.41		bearing height	04.03.05

Table 3 *(continued)*

Item No.	Symbol	Physical quantity	Reference No. ISO 5593
1.42	T_1, T_2, . . .	axial dimension of (assembled) bearing	—
1.43	Z	number of rolling elements per row	—
1.44	α	contact angle	04.02.10
1.45		angle of taper (half the cone angle) of inner ring bore	—

[a] The designation of a screw thread comprises the thread form symbol, the nominal diameter and, if it is needed, the thread pitch, e.g. M16 × 1,5.

Table 4 — Dimensions and tolerances for bearings, rings and washers

Item No.	Symbol	Physical quantity	Reference No.	
			ISO 5593	ISO 1132-1
2.01	B	nominal bearing width	05.02.06	5.3.10
2.02		nominal inner ring width	05.02.01	5.3.1
2.03		nominal shaft washer height	—	—
2.04	B_m	mean inner ring width	05.02.05	5.3.5
2.05		mean shaft washer height	—	—
2.06	B_s	single inner ring width	05.02.02	5.3.2
2.07		single shaft washer height	—	—
2.08	C	nominal bearing width	05.02.06	5.3.10
2.09		nominal outer ring width	05.02.01	5.3.1
2.10		nominal housing washer height	—	—
2.11	C_m	mean outer ring width	05.02.05	5.3.5
2.12		mean housing washer height	—	—
2.13	C_s	single outer ring width	05.02.02	5.3.2
2.14		single housing washer height	—	—
2.15	C_1	nominal outer ring flange width	—	5.3.6
2.16	C_{1s}	single outer ring flange width	—	5.3.7
2.17	D	nominal outside diameter	05.01.01	5.2.1
2.18	D_m	mean outside diameter	05.01.05	5.2.6
2.19	D_{mp}	mean outside diameter in a single plane	05.01.07	5.2.8
2.20	D_s	single outside diameter	05.01.02	5.2.2
2.21	D_{sp}	single outside diameter in a single plane	—	5.2.3
2.22	d	nominal bore diameter	05.01.01	5.1.1
2.23	d_m	mean bore diameter	05.01.05	5.1.6
2.24	d_{mp}	mean bore diameter in a single plane	05.01.07	5.1.8
2.25	d_s	single bore diameter	05.01.02	5.1.2
2.26	d_{sp}	single bore diameter in a single plane	—	5.1.3
2.27	G_a	axial internal clearance	05.08.03	8.2.1
2.28	G_r	radial internal clearance	05.08.01	8.1.1
2.29	r	nominal chamfer dimension	05.03.01	5.4.1
2.30	r_s	single chamfer dimension	—	5.4.2
2.31		radial single chamfer dimension	05.03.02	5.4.2
2.32		axial single chamfer dimension	05.03.03	5.4.2
2.33	$r_{s\,max}$	largest single chamfer dimension	05.03.05	5.4.4

Table 4 *(continued)*

Item No.	Symbol	Physical quantity	Reference No.	
			ISO 5593	ISO 1132-1
2.34	$r_{s\,min}$	smallest single chamfer dimension	05.03.04	5.4.3
2.35	s	thickness of thrust washer	—	—
2.36	T	nominal (assembled) bearing width	05.02.06	5.3.10
2.37		nominal bearing height	05.02.06	5.3.13
2.38	T_s	actual (assembled) bearing width	05.02.07	5.3.11
2.39		actual bearing height	05.02.09	5.3.14
2.40	V_{Bs}	variation of inner ring width	05.02.04	5.3.4
2.41		variation of shaft washer height	—	—
2.42	V_{Cs}	variation of outer ring width	05.02.04	5.3.4
2.43		variation of housing washer height	—	—
2.44	V_{C1s}	variation of outer ring flange width	—	5.3.9
2.45	V_{Dmp}	variation of mean outside diameter	05.01.10	5.2.11
2.46	V_{Ds}	variation of outside diameter	05.01.04	5.2.5
2.47	V_{Dsp}	variation of outside diameter in a single plane	05.01.09	5.2.10
2.48	V_{dmp}	variation of mean bore diameter	05.01.10	5.1.11
2.49	V_{ds}	variation of bore diameter	05.01.04	5.1.5
2.50	V_{dsp}	variation of bore diameter in a single plane	05.01.09	5.1.10
2.51	α	nominal contact angle	04.02.10	—
2.52		angle of taper (half the cone angle) of inner ring bore	—	—
2.53	Δ_{Bs}	deviation of a single inner ring width	05.02.03	5.3.3
2.54		deviation of a single shaft washer height	—	—
2.55	Δ_{Cs}	deviation of a single outer ring width	05.02.03	5.3.3
2.56		deviation of a single housing washer height	—	—
2.57	Δ_{C1s}	deviation of a single outer ring flange width	—	5.3.8
2.58	Δ_{Dm}	deviation of mean outside diameter	05.01.06	5.2.7
2.59	Δ_{Dmp}	deviation of mean outside diameter in a single plane	05.01.08	5.2.9
2.60	Δ_{Ds}	deviation of a single outside diameter	05.01.03	5.2.4
2.61	Δ_{D1s}	deviation of a single outside diameter of outer ring flange	—	—
2.62	Δ_{dm}	deviation of mean bore diameter	05.01.06	5.1.7
2.63	Δ_{dmp}	deviation of mean bore diameter in a single plane	05.01.08	5.1.9
2.64	Δ_{ds}	deviation of a single bore diameter	05.01.03	5.1.4
2.65	Δ_{Ts}	deviation of the actual (assembled) bearing width	05.02.08	5.3.12
2.66		deviation of the actual bearing height	05.02.10	5.3.15

Table 5 — Running accuracy for bearings, rings and washers

Item No.	Symbol	Physical quantity	Reference No.	
			ISO 5593	ISO 1132-1
3.01	K_{e}	variation in thickness between outer ring raceway and outside surface	05.07.11	6.4.2
3.02	K_{ea}	radial runout of outer ring of assembled bearing	05.07.02	7.1.2
3.03	K_{i}	variation in thickness between inner ring raceway and bore	05.07.10	6.4.1
3.04	K_{ia}	radial runout of inner ring of assembled bearing	05.07.01	7.1.1
3.05	K_{iaa}	asynchronous radial runout of inner ring of assembled bearing[a]	—	7.1.3
3.06	S_{D}	perpendicularity of outer ring outside surface with respect to the face	05.07.09	6.3.2
3.07	S_{D1}	perpendicularity of outer ring outside surface with respect to the flange back face	—	6.3.3
3.08	S_{d}	perpendicularity of inner ring face with respect to the bore	05.07.07	6.3.1
3.09	S_{dr}	perpendicularity of inner ring bore with respect to the face	—	—
3.10	S_{e}	parallelism of outer ring raceway with respect to the face	05.07.08	6.2.2
3.11		variation in thickness between housing washer raceway and back face	05.07.12	6.4.4
3.12	S_{ea}	axial runout of outer ring of assembled bearing (radial groove ball bearing)	05.07.05	7.2.3
3.13		axial runout of outer ring of assembled bearing (tapered roller bearing)	05.07.06	7.2.4
3.14	S_{ea1}	axial runout of outer ring flange back face of assembled bearing (radial groove ball bearing)	—	7.2.5
3.15		axial runout of outer ring flange back face of assembled bearing (tapered roller bearing)	—	7.2.6
3.16	S_{i}	parallelism of inner ring raceway with respect to the face	05.07.08	6.2.1
3.17		variation in thickness between shaft washer raceway and back face	05.07.12	6.4.3
3.18	S_{ia}	axial runout of inner ring of assembled bearing (radial groove ball bearing)	05.07.03	7.2.1
3.19		axial runout of inner ring of assembled bearing (tapered roller bearing)	05.07.04	7.2.2

[a] Asynchronous radial runout is non-repetitive.

Table 6 — Dimensions and tolerances for subunits

Item No.	Symbol	Physical quantity	Reference No.	
			ISO 5593	ISO 1132-1
4.01	B_{c}	cage width of a radial ball and cage assembly	—	—
4.02		cage width of a radial roller and cage assembly		
4.03	D_{c}	outside diameter of a thrust ball and cage assembly	04.04.19	—
4.04		outside diameter of a thrust roller and cage assembly		
4.05		outside diameter of a thrust needle roller and cage assembly		
4.06	D_{pw}	pitch diameter of a ball set	04.04.10	—
4.07		pitch diameter of a roller set	04.04.11	—

Table 6 *(continued)*

Item No.	Symbol	Physical quantity	Reference No.	
			ISO 5593	ISO 1132-1
4.08	d_c	bore diameter of a thrust ball and cage assembly	04.04.18	—
4.09		bore diameter of a thrust roller and cage assembly		
4.10		bore diameter of a thrust needle roller and cage assembly		
4.11	E	raceway diameter of outer ring	—	—
4.12		outer ring small inside diameter (tapered roller bearing)	04.04.03	—
4.13	E_w	nominal outside diameter of ball complement	04.04.12 04.04.14	5.2.12
4.14		nominal outside diameter of roller complement	04.04.13 04.04.15	
4.15	E_{wm}	mean outside diameter of ball complement	—	5.2.15
4.16		mean outside diameter of roller complement		
4.17	E_{ws}	single outside diameter of ball complement	—	5.2.13
4.18		single outside diameter of roller complement		
4.19	$E_{ws\ max}$	largest single outside diameter of ball complement	—	5.2.14
4.20		largest single outside diameter of roller complement		
4.21	F	raceway diameter of inner ring	—	—
4.22	F_w	nominal bore diameter of ball complement	04.04.12 04.04.14	5.1.12
4.23		nominal bore diameter of roller complement	04.04.13 04.04.15	
4.24	F_{wm}	mean bore diameter of ball complement	—	5.1.15
4.25		mean bore diameter of roller complement		
4.26	F_{ws}	single bore diameter of ball complement	—	5.1.13
4.27		single bore diameter of roller complement		
4.28	$F_{ws\ min}$	smallest single bore diameter of ball complement	—	5.1.14
4.29		smallest single bore diameter of roller complement		
4.30	H	eccentricity of an eccentric locking collar	—	—
4.31		eccentricity of an inner ring eccentric extension		
4.32	T_1	nominal effective width of inner subunit (tapered roller bearing)	—	5.3.16
4.33	T_{1s}	actual effective width of inner subunit (tapered roller bearing)	—	5.3.17
4.34	T_2	nominal effective width of outer ring (tapered roller bearing)	—	5.3.19
4.35	T_{2s}	actual effective width of outer ring (tapered roller bearing)	—	5.3.20
4.36	Δ_{Ewm}	deviation of mean outside diameter of ball complement	—	5.2.16
4.37		deviation of mean outside diameter of roller complement		
4.38	Δ_{Fwm}	deviation of mean bore diameter of ball complement	—	5.1.16
4.39		deviation of mean bore diameter of roller complement		
4.40	Δ_{T1s}	deviation of the actual effective width of inner subunit (tapered roller bearing)	—	5.3.18
4.41	Δ_{T2s}	deviation of the actual effective width of outer ring (tapered roller bearing)	—	5.3.21

Table 7 — Dimensions and tolerances for rolling elements

Item No.	Symbol	Physical quantity	Reference No. ISO 5593
5.01	D_{w}	nominal ball diameter	05.04.01
5.02		nominal roller diameter	05.05.01
5.03	D_{we}	roller diameter applicable in the calculation of load ratings	—
5.04	D_{wm}	mean ball diameter	05.04.03
5.05	D_{wmL}	mean diameter of ball lot	05.04.06
5.06	D_{wmp}	mean roller diameter in a single plane	05.05.03
5.07	D_{ws}	single ball diameter	05.04.02
5.08		single roller diameter	05.05.02
5.09	L_{w}	nominal roller length	05.05.05
5.10	L_{we}	effective roller length	—
5.11	L_{ws}	actual roller length	05.05.06
5.12	S	ball gauge	05.04.09
5.13		roller gauge	05.05.07
5.14	S_{Dw}	axial runout of roller end face with respect to the roller axis	—
5.15	V_{DwL}	variation of ball lot diameter	05.04.07
5.16		variation of roller gauge lot diameter	05.05.09
5.17	V_{Dwmp}	variation of mean roller diameter[a]	—
5.18	V_{Dwsp}	variation of roller diameter in a single plane	05.05.04
5.19	V_{Dws}	variation of ball diameter	05.04.04
5.20	V_{LwL}	variation of roller gauge lot length	—
5.21	Δ_{Lws}	deviation of a single roller length	—
5.22	Δ_{Rw}	deviation from circular form of roller outside surface	05.06.01
5.23	Δ_{S}	deviation of a ball lot from ball gauge	05.04.10

[a] Applies to the cylindrical part of the outside surface diameter only.

Table 8 — Dimensions for shafts and housings

Item No.	Symbol	Physical quantity	Reference No. ISO 5593
6.01	A	overall width of housing	—
6.02	A_1, A_2, . . .	width of base	—
6.03	D_a	seating diameter of housing	—
6.04	D_a, D_b, . . .	diameter of housing shoulder	—
6.05		diameter of part primarily associated with an outer ring [housing washer]	
6.06	d_a, d_b, . . .	diameter of shaft shoulder	—
6.07		diameter of part primarily associated with an inner ring [shaft washer]	
6.08	d_G	nominal diameter of screw thread (external or internal)	—
6.09	d_{G1}, d_{G2}, . . .	diameter of part primarily associated with a screw thread	—
6.10	G	designation of a screw thread (external or internal)[a]	—
6.11	H	distance from mounting face to centreline of seating diameter of housing	—
6.12	H_1	height of feet	—
6.13	H_1, H_2, . . .	height of part primarily associated with a housing	—
6.14	h	height of shaft and housing shoulder	—
6.15	J	centre distance between bolt holes (length)	—
6.16	J_1	centre distance between bolt holes (width)	—
6.17	L	length of base	—
6.18		overall housing length	
6.19		length of shaft	
6.20	L_1, L_2, . . .	length of part primarily associated with a housing or a shaft	—
6.21	l_G	length of screw thread	—
6.22	l_{G1}, l_{G2}, . . .	axial dimension of part primarily associated with a screw thread	—
6.23	N	width of bolt hole (in shaft direction)	—
6.24		diameter of bolt hole	
6.25	N_1, N_2, . . .	length of bolt hole	—
6.26	r_a, r_b, . . .	fillet radius of shaft and housing	—

[a] The designation of a screw thread comprises the thread form symbol, the nominal diameter and, if it is needed, the thread pitch, e.g. M16 × 1,5.

Table 9 — Bearing loads and load ratings

Item No.	Symbol	Physical quantity	Reference No. ISO 5593
7.01	b_m	rating factor	—
7.02	C	basic dynamic load rating	—
7.03	C_a	basic dynamic axial load rating	06.04.02
7.04	C_r	basic dynamic radial load rating	
7.05	C_0	basic static load rating	—
7.06	C_{0a}	basic static axial load rating	06.04.01
7.07	C_{0r}	basic static radial load rating	
7.08	D_{pw}	pitch diameter of ball set	04.04.10
7.09		pitch diameter of roller set	04.04.11
7.10	e	limiting value of F_a/F_r for the applicability of different values of factors X and Y	—
7.11	F	load on bearing	—
7.12	F_a	axial load	06.02.02
7.13	F_r	radial load	06.02.01
7.14	f_c	factor for calculation of basic dynamic load rating	—
7.15	f_0	factor for calculation of basic static load rating	—
7.16	n	speed of rotation	—
7.17	n_e	speed of rotation of an outer ring [housing washer]	—
7.18	n_i	speed of rotation of an inner ring [shaft washer]	—
7.19	P	equivalent load	06.03.01
7.20		dynamic equivalent load	
7.21	P_a	dynamic equivalent axial load	06.03.03
7.22	P_r	dynamic equivalent radial load	
7.23	P_0	static equivalent load	—
7.24	P_{0a}	static equivalent axial load	06.03.02
7.25	P_{0r}	static equivalent radial load	
7.26	Q	load on rolling element	—
7.27	Q_{max}	maximum load on rolling element	—
7.28	X	(dynamic) radial load factor	06.06.01
7.29	X_0	(static) radial load factor	
7.30	Y	(dynamic) axial load factor	
7.31	Y_0	(static) axial load factor	

Table 10 — Bearing life

Item No.	Symbol	Physical quantity	Reference No. ISO 5593
8.01	a	life modification factor	06.06.05
8.02	a_{ISO}	life modification factor, based on systems approach of life calculation	—
8.03	a_1	life modification factor for reliability	—
8.04	f_{h}	life factor	06.06.03
8.05	f_n	speed factor	06.06.04
8.06	L	rating life	06.05.04
8.07	L_{h}	rating life in hours	
8.08	L_n	rating life, adjusted for reliability	06.05.06
8.09	$L_{n\mathrm{m}}$	modified rating life, adjusted for reliability and modified for the influence on life of bearing properties and operating conditions with the aid of a systems approach of life calculation	—
8.10	L_{10}	basic rating life	06.05.05
8.11	$L_{10\mathrm{h}}$	basic rating life in hours	06.05.05
8.12	$L_{10\mathrm{m}}$	basic rating life, associated with 90 % reliability and modified for the influence on life of bearing properties and operating conditions with the aid of a systems approach of life calculation	—
8.13	L_{50}	median rating life	06.05.07
8.14	$L_{50\mathrm{h}}$	median rating life in hours	
8.15	n	probability of failure	—
Rating life conforms to ISO 281.			

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K_{ea}	3.02
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K_{ia}	3.04
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