भारतीय मानक

Indian Standard

IS 1363 (Part 2) : 2023
ISO 4018 : 2022

उत्पाद ग्रेड सी के लिए षटकोणीय शीर्ष वाले काबले, पेंच और ढिबरियाँ

भाग 2 षटकोणीय शीर्ष वाले पेंच

(साइज़ रेंज एम 5 से एम 64 तक)

(छठा पुनरीक्षण)

Hexagon Head Bolts, Screws and Nuts of Product Grade 'C'

Part 2 Hexagon Head Screws (Size Range M5 to M64)

(Sixth Revision)

ICS 21.060.10

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
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August 2023 **Price Group 8**

General Engineering and Fasteners Standards Sectional Committee, PGD 37

NATIONAL FOREWORD

This Indian Standard (Part 2) (Sixth Revision) which is identical with ISO 4018 : 2022 'Hexagon head screws — Product grade C' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the General Engineering and Fasteners Standards Sectional Committee and approval of the Production and General Engineering Division Council.

IS 1363 was originally published in 1960 and first revised in 1967. Subsequent to the publication of 1967 edition, many changes had been agreed upon at international level which have been reflected in IS 1367 series of standards covering 'Technical supply conditions for threaded steel fasteners'. Accordingly, the second revision was published in 1984 splitting the standard into 3 parts covering hexagon head bolts, hexagon head screws and hexagon nuts. The third, fourth and fifth revision of this standard were published to align them with latest versions of ISO 4018. The sixth revision of this standard has been undertaken to align it with ISO 4018 : 2022.

The main changes compared to the fifth revision are as follows:

a) The permissible shapes for free formed head and indentation on the head have been added;
b) Tables for dimensions have been restructured;
c) M7 has been added;
d) $d_{w,min}$ has been changed for M5 from s_{min} — IT16 to s_{min} — IT15 (as for hexagon head screws of product grades A and B) in order to have a larger bearing surface area and thus less contact pressure;
e) The rules for the shortest and greatest standard lengths have been added, and they have been amended accordingly; standard greatest lengths have been limited to 200 mm (longer lengths are to be agreed between the purchaser and the manufacturer); and
f) Specifications for marking and labelling have been added as **6**.

Other parts in this series are:

Part 1 Hexagon head bolts (Size range M5 to M64)
Part 3 (Style 1) Hexagon nuts (Size range M5 to M64)

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'.
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 225 Fasteners — Bolts, screws, studs and nuts — Symbols and descriptions of dimensions	IS 8536 : 2021/ISO 225 : 2010 Fasteners — Bolts, screws, studs and nuts — Symbols and descriptions of dimensions (*first revision*)	Identical
ISO 888 Fasteners — Bolts, screws and studs — Nominal lengths and thread lengths	IS 4206 : 2012/ISO 888 : 2012 Dimensions for nominal lengths and thread lengths for bolts, screws and studs (*second revision*)	Identical
ISO 898-1 Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread	IS 1367 (Part 3) : 2017/ISO 8981 : 2013 Technical supply conditions for threaded steel fasteners: Part 3 Mechanical properties of fasteners made of carbon steel and bolts, screws and studs (*fifth revision*)	Identical
ISO 965-1 ISO general-purpose metric screw threads — Tolerances — Part 1: Principles and basic data	IS 14962 (Part 1) : 2018/ ISO 9651 : 2013 ISO general purpose metric screw threads — Tolerances: Part 1 Principles and basic data (*first revision*)	Identical
ISO 3269 Fasteners — Acceptance inspection	IS 1367 (Part 17) : 2005/ISO 3269 : 2000 Technical supply conditions for threaded steel fasteners: Part 17 Inspections, sampling and acceptance procedure (*fourth revision*)	Identical
ISO 4042 Fasteners — Electroplated coatings	IS 1367 (Part 11) : 2020/ISO 4042 : 2018 Technical supply conditions for threaded steel fasteners: Part 11 Electroplated coating systems (*fourth revision*)	Identical
ISO 4753 Fasteners — Ends of parts with external ISO metric thread	IS 1368 : 2018/ISO 4753 : 2011 Dimensions for ends of parts with external ISO metric threads (*fourth revision*)	Identical
ISO 4759-1 Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C	IS 1367 (Part 2) : 2002/ISO 4759-1 : 2000 Technical supply conditions for threaded steel fasteners: Part 2 Tolerances for fasteners — Bolts, screws, studs and nuts — Product grades A, B and C (*third revision*)	Identical

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 6157-1 Fasteners — Surface discontinuities — Part 1: Bolts, screws and studs for general requirements	IS 1367 (Part 9 /Sec 1) : 1993/ ISO 6157-1 : 1988 Technical supply conditions for threaded steel fasteners: Part 9 Surface discontinuities, Section 1 Bolts, screws and studs for general applications (*third revision*)	Identical
ISO 8991 Designation system for fasteners	IS 1367 (Part 16) : 2002/ISO 8991 : 1986 Technical supply conditions for threaded steel fasteners: Part 16 Designation system for fasteners (*third revision*)	Identical
ISO 8992 Fasteners — General requirements for bolts, screws, studs and nuts	IS 1367 (Part 1) : 2014/ISO 8992 : 2005 Technical supply conditions for threaded steel fasteners: Part 1 General requirements for bolts, screws, studs and nuts (*fourth revision*)	Identical
ISO 10683 Fasteners — Non electrolytically applied zinc flake coating systems	IS/ISO 10683 : 2018 Fasteners — Non-electrolytically applied zinc flake coating systems	Identical
ISO 10684 Fasteners — Hot dip galvanized coatings	IS 1367 (Part 13) : 2020/ISO 10684 : 2004 Technical supply conditions for threaded steel fasteners: Part 13 Hot dip galvanized coatings on threaded fasteners *(third revision*)	Identical

The technical committee has reviewed the provisions of the following International Standard referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard:

International Standard	*Title*
ISO 1891- 4	Fasteners — Vocabulary — Part 4: Control, inspection, delivery, acceptance and quality

The standard also makes a reference to the BIS Certification Marking and packaging of the product, details of which are given in National Annex A.

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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HEXAGON HEAD BOLTS, SCREWS AND NUTS OF PRODUCT GRADE 'C'

PART 2 HEXAGON HEAD SCREWS (SIZE RANGE M5 TO M64)

(Sixth Revision)

1 Scope

This document specifies the characteristics of hexagon head screws, in steel, with metric coarse pitch threads M5 to M64, and with product grade C.

If in certain cases other specifications are requested, property classes can be selected from ISO 898-1, and dimensional options from ISO 888 or ISO 4753.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 225, *Fasteners — Bolts, screws, studs and nuts — Symbols and descriptions of dimensions*

ISO 888, *Fasteners — Bolts, screws and studs — Nominal lengths and thread lengths*

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread*

ISO 965-1, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data*

ISO 1891-4, *Fasteners — Vocabulary — Part 4: Control, inspection, delivery, acceptance and quality*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 4042, *Fasteners — Electroplated coating systems*

ISO 4753, *Fasteners — Ends of parts with external ISO metric thread*

ISO 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C*

ISO 6157-1, *Fasteners — Surface discontinuities — Part 1: Bolts, screws and studs for general requirements*

ISO 8991, *Designation system for fasteners*

ISO 8992, *Fasteners — General requirements for bolts, screws, studs and nuts*

ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coating systems*

ISO 10684, *Fasteners — Hot dip galvanized coatings*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

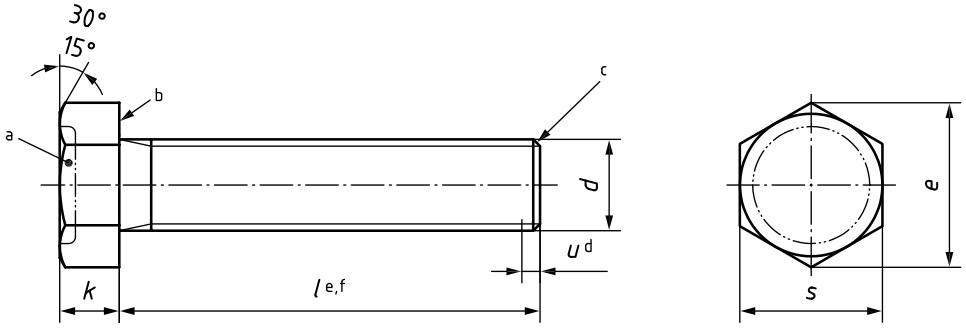
— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Dimensions

Dimensions shall be in accordance with Figures 1 and 2 and with Tables 1 to 3.

Symbols and descriptions of dimensions are defined in ISO 225.



a Indentation at the discretion of the manufacturer, in accordance with Figure 2.

b Washer-face at the discretion of the manufacturer, in accordance with Figure 2.

c End at the discretion of the manufacturer, in accordance with ISO 4753.

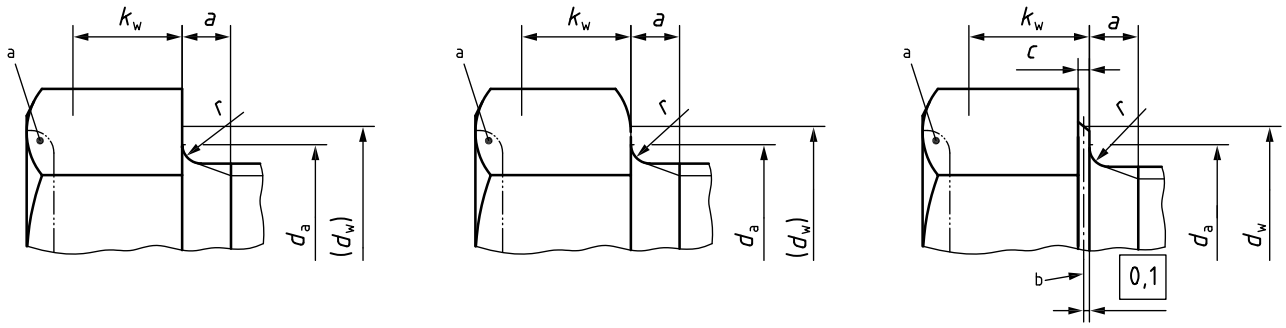
d Incomplete thread $u \leq 2P$.

e Shortest standard length l_{nom} determined with $2d$ and rounded (if necessary) to the nearest standard length; shortest standard length l_{nom} = 120 mm for M64.

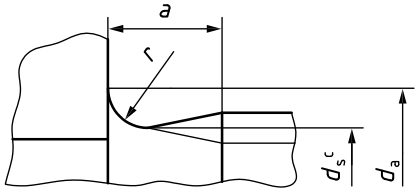
f Greatest standard length $l_{nom} \leq 10d$ or 200 mm, whichever is the shorter.

Figure 1 — Hexagon head screw

Dimensions in millimetres



a) Permissible shapes



b) Optional underhead junction

a Any shape for the optional indentation within a maximum diameter of $0{,}8s$ and a maximum depth of $0{,}2k$.

b Reference datum for d_w.

c $d_s \approx$ pitch diameter.

Figure 2 — Head details

Table 1 — Dimensions – M5 to M16

Dimensions in millimetres

Thread, d			M5	M6	(M7)	M8	M10	M12	(M14)	M16
P [a]			0,8	1	1	1,25	1,5	1,75	2	2
a [b]		max.	2,40	3,00	3,00	3,75	4,50	5,25	6,00	6,00
		min.	0,80	1,00	1,00	1,25	1,50	1,75	2,00	2,00
c		max.	0,5	0,5	0,6	0,6	0,6	0,6	0,6	0,8
d_a		max.	6,0	7,2	8,2	10,2	12,2	14,7	16,7	18,7
d_w		min.	7,06	8,74	9,47	11,47	14,47	16,47	19,15	22,00
e		min.	8,63	10,89	11,94	14,20	17,59	19,85	22,78	26,17
k		nom.	3,5	4	4,8	5,3	6,4	7,5	8,8	10
		max.	3,875	4,375	5,175	5,675	6,85	7,95	9,25	10,75
		min.	3,125	3,625	4,425	4,925	5,95	7,05	8,35	9,25
k_w		min.	2,19	2,54	3,10	3,45	4,17	4,94	5,85	6,48
r		min.	0,20	0,25	0,25	0,4	0,4	0,6	0,6	0,6
s	nom. =	max.	8,00	10,00	11,00	13,00	16,00	18,00	21,00	24,00
		min.	7,64	9,64	10,57	12,57	15,57	17,57	20,16	23,16

l			Range of standard lengths between the stepped bold lines
nom.	min.	max.	
10	9,25	10,75	
12	11,10	12,90	
16	15,10	16,90	
20	18,95	21,05	
25	23,95	26,05	
30	28,95	31,05	
35	33,75	36,25	
40	38,75	41,25	
45	43,75	46,25	
50	48,75	51,25	
55	53,50	56,50	
60	58,50	61,50	
65	63,50	66,50	
70	68,50	71,50	
80	78,50	81,50	
90	88,25	91,75	
100	98,25	101,75	
110	108,25	111,75	
120	118,25	121,75	
130	128,0	132,0	
140	138,0	142,0	
150	148,0	152,0	
160	156,0	164,0	
—	—	—	

Screws with too short length

Length by agreement in accordance with ISO 888

NOTE Sizes shown in brackets are non-preferred dimensions.

[a] P is the pitch of the thread.

[b] $a_{max} = 3P$ and $a_{min} = 1P$.

Table 2 — Dimensions – M18 to M36

Dimensions in millimetres

Thread, d		(M18)	**M20**	(M22)	**M24**	(M27)	**M30**	(M33)	**M36**
P [a]		2,5	2,5	2,5	3	3	3,5	3,5	4
a [b]	max.	7,5	7,5	7,5	9,0	9,0	10,5	10,5	12,0
	min.	2,5	2,5	2,5	3,0	3,0	3,5	3,5	4,0
c	max.	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8
d_a	max.	21,2	24,4	26,4	28,4	32,4	35,4	38,4	42,4
d_w	min.	24,85	27,70	31,35	33,25	38,00	42,75	46,55	51,11
e	min.	29,56	32,95	37,29	39,55	45,20	50,85	55,37	60,79
k	nom.	11,5	12,5	14	15	17	18,7	21	22,5
	max.	12,40	13,40	14,90	15,90	17,90	19,75	22,05	23,55
	min.	10,60	11,60	13,10	14,10	16,10	17,65	19,95	21,45
k_w	min.	7,42	8,12	9,17	9,87	11,27	12,36	13,97	15,02
r	min.	0,6	0,8	0,8	0,8	1,0	1,0	1,0	1,0
s nom. =	max.	27,00	30,00	34,00	36,00	41,0	46,0	50,0	55,0
	min.	26,16	29,16	33,00	35,00	40,0	45,0	49,0	53,8

l			**Range of standard lengths between the stepped bold lines**
nom.	min.	max.	
35	33,75	36,25	
40	38,75	41,25	
45	43,75	46,25	
50	48,75	51,25	
55	53,50	56,50	
60	58,50	61,50	
65	63,50	66,50	
70	68,50	71,50	
80	78,50	81,50	
90	88,25	91,75	
100	98,25	101,75	
110	108,25	111,75	
120	118,25	121,75	
130	128,0	132,0	
140	138,0	142,0	
150	148,0	152,0	
160	156,0	164,0	
180	176,0	184,0	
200	195,4	204,6	
> 200			[c]

Screws with too short length

Bolts specified in ISO 4016, or screws with length by agreement in accordance with ISO 888

NOTE Sizes shown in brackets are non-preferred dimensions.

[a] P is the pitch of the thread.

[b] $a_{max} = 3P$ and $a_{min} = 1P$.

[c] Length by agreement in accordance with ISO 888.

Table 3 — Dimensions – M39 to M64

Dimensions in millimetres

Thread, *d*		(M39)	**M42**	(M45)	**M48**	(M52)	**M56**	(M60)	**M64**
P [a]		4	4,5	4,5	5	5	5,5	5,5	6
a [b]	max.	12,0	13,5	13,5	15,0	15,0	16,5	16,5	18,0
	min.	4,0	4,5	4,5	5,0	5,0	5,5	5,5	6,0
c	max.	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
d_a	max.	45,4	48,6	52,6	56,6	62,6	67,0	71,0	75,0
d_w	min.	55,86	59,95	64,70	69,45	74,20	78,66	83,41	88,16
e	min.	66,44	71,30	76,95	82,60	88,25	93,56	99,21	104,86
k	nom.	25	26	28	30	33	35	38	40
	max.	26,05	27,05	29,05	31,05	34,25	36,25	39,25	41,25
	min.	23,95	24,95	26,95	28,95	31,75	33,75	36,75	38,75
k_w	min.	16,77	17,47	18,87	20,27	22,23	23,63	25,73	27,13
r	min.	1,0	1,2	1,2	1,6	1,6	2,0	2,0	2,0
s nom. =	max.	60,0	65,0	70,0	75,0	80,0	85,0	90,0	95,0
	min.	58,8	63,1	68,1	73,1	78,1	82,8	87,8	92,8

l			**Range of standard lengths between the stepped bold lines**
nom.	min.	max.	
80	78,50	81,50	
90	88,25	91,75	**Screws with too short length**
100	98,25	101,75	
110	108,25	111,75	
120	118,25	121,75	
130	128,0	132,0	
140	138,0	142,0	
150	148,0	152,0	
160	156,0	164,0	
180	176,0	184,0	
200	195,4	204,6	
> 200			**Bolts specified in ISO 4016, or screws with length by agreement in accordance with ISO 888**

NOTE Sizes shown in brackets are non-preferred dimensions.

[a] *P* is the pitch of the thread.

[b] $a_{max} = 3P$ and $a_{min} = 1P$.

5 Requirements and reference International Standards

The requirements specified in the International standards listed in Table 4 shall apply.

Table 4 — Requirements and reference International Standards

Material		Steel	
General requirements	International Standard	ISO 8992	
Thread	Tolerance class	8g [a]	
	International Standard	ISO 965-1	
Mechanical properties	Property class	M5 ≤ d ≤ M39	4.6, 4.8
	Symbol	d > M39	As agreed
	International Standard	ISO 898-1	
Tolerances	Product grade	C (except for size M5 where $d_{w,min} = s_{min}$ – IT15)	
	International Standard	ISO 4759-1	
Surface condition		As processed (no coating) Electroplated coatings as specified in ISO 4042 Non-electrolytically applied zinc flake coatings as specified in ISO 10683 Hot dip galvanized coatings as specified in ISO 10684 Other finishes, coatings and/or additional requirements shall be agreed between the purchaser and the supplier	
Surface integrity		Limits for surface discontinuities as specified in ISO 6157-1	
Acceptability		Acceptance inspection as specified in ISO 3269	

[a] Depending on the type of coating to be applied, another tolerance position of the thread may be specified for the uncoated fastener in accordance with the relevant coating standard.

6 Marking and labelling

6.1 Marking on product

Marking shall be as specified in ISO 898-1.

6.2 Labelling on package

Labelling on the package shall be in accordance with ISO 898-1, and shall include at least:

— the reference to this document, i.e. ISO 4018,

— the thread size d and nominal length l,

— the symbol of the property class,

— the type of surface condition (finish and/or coating),

— the manufacturer's and/or distributor's identification and/or name,

— the manufacturing lot number as specified in ISO 1891-4,

— the quantity of pieces in the package.

7 Designation

The designation requirements as specified in ISO 8991 shall apply for all sizes, with the symbol of the property class as specified in ISO 898-1.

When no specific surface condition (finish and/or coating) is specified in the designation, steel fasteners are delivered in the "as processed" condition.

EXAMPLE A hexagon head screw, with thread size M30, nominal length *l* = 200 mm, product grade C, property class 4.8, as processed, is designated as follows:

Hexagon head screw ISO 4018 – M30 × 200 – 4.8

Bibliography

ISO 4016, *Fasteners — Hexagon head bolts — Product grade C*

NATIONAL ANNEX A

(*National Foreword*)

A-1 PACKAGING

The packaging of hexagon head screws shall be in accordance with IS 1367 (Part 18) : 1996 'Industrial fasteners — Threaded steel fasteners — Technical supply conditions: Part 18 Packaging*'.*

A-2 BIS CERTIFICATION MARKING

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

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Amendments Issued Since Publication

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