SVENSK STANDARD
SS-ISO 3408-2:2021

Verktygsmaskiner – Kulskruvar –
Del 2: Nominella diametrar och stigningar – Metriska serier
(ISO 3408-2:2021, IDT)

Ball screws —
Part 2: Nominal diameters, leads, nut dimensions and mounting bolts — Metric series (ISO 3408-2:2021, IDT)

Svenska Institutet för Standarder

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Den internationella standarden ISO 3408-2:2021 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 3408-2:2021.

Denna standard ersätter SS-ISO 3408-2, utgåva 1

The International Standard ISO 3408-2:2021 has the status of a Swedish Standard. This document contains the official English version of ISO 3408-2:2021.

This standard supersedes the SS-ISO 3408-2, edition 1

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LÄSANVISNINGAR FÖR STANDARDER

I dessa anvisningar behandlas huvudprinciperna för hur regler och yttre begränsningar anges i standardiseringsprodukter.

Krav
Ett krav är ett uttryck i ett dokuments innehåll som anger objektivt verifierbara kriterier som ska uppfyllas och från vilka ingen avvikelse tillåts om efterlevnad av dokumentet ska kunna åberopas.
Krav uttrycks med hjälpverbet ska (eller ska inte för förbud).

Rekommendation
En rekommendation är ett uttryck i ett dokuments innehåll som anger en valmöjlighet eller ett tillvägagångssätt som bedöms vara särskilt lämpligt utan att nödvändigtvis nämna eller utesluta andra.
Rekommendationer uttrycks med hjälpverbet bör (eller bör inte för avrådanden).

Instruktion
Instruktioner anges i imperativ form och används för att ange hur något görs eller utförs. De kan underordnas en annan regel, såsom ett krav eller en rekommendation. De kan även användas självständigt, och är då att betrakta som krav.

Förklaring
En förklaring är ett uttryck i ett dokuments innehåll som förmedlar information. En förklaring kan uttrycka tillåtelse, möjlighet eller förmåga. Tillåtelse uttrycks med hjälpverbet får (eller motsatsen behöver inte). Möjlighet och förmåga uttrycks med hjälpverbet kan (eller motsatsen kan inte).

READING INSTRUCTIONS FOR STANDARDS

These instructions cover the main principles for the use of provisions and external constraints in standardization deliverables.

Requirement
A requirement is an expression, in the content of a document, that conveys objectively verifiable criteria to be fulfilled, and from which no deviation is permitted if conformance with the document is to be claimed. Requirements are expressed by the auxiliary shall (or shall not for prohibition).

Recommendation
A recommendation is an expression, in the content of a document, that conveys a suggested possible choice or course of action deemed to be particularly suitable, without necessarily mentioning or excluding others. Recommendations are expressed by the auxiliary should (or should not for dissuasion).

Instruction
An instruction is expressed in the imperative mood and is used in order to convey an action to be performed. It can be subordinated to another provision, such as a requirement or a recommendation. It can also be used independently and is then to be regarded as a requirement.

Statement
A statement is an expression, in the content of a document, that conveys information. A statement can express permission, possibility or capability. Permission is expressed by the auxiliary may (its opposite being need not). Possibility and capability are expressed by the auxiliary can (its opposite being cannot).

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 39, *Machine tools*, in collaboration with Technical Committee ISO/TC 4, *Rolling bearings*, Subcommittee SC 11, *Linear motion rolling bearings.*

This second edition cancels and replaces the first edition (ISO 3408-2:1991), which has been technically revised.

The main changes compared to the previous edition are as follows:

— the technical state of the art has been substantially reviewed;

— three series of ball screws reflecting different international standards have been defined;

— dimensions reflecting current market situations have been added; and

— different types of flanges reflecting state of the art have been defined.

A list of all parts in the ISO 3408 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Ball screws —

Part 2: Nominal diameters, leads, nut dimensions and mounting bolts — Metric series

1 Scope

This document specifies the nominal diameters and nominal leads, mounting dimensions for ball screw nuts and mounting bolts for metric ball screws. It also gives preferred combinations of nominal diameter and nominal lead and a general plan which includes the additional combinations to be used when it becomes necessary to deviate from the preferred combinations.

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 3408-1, *Ball screws — Part 1: Vocabulary and designation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3408-1 apply.

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

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

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

4 Symbols

Symbol	Description	Units
d_0	Nominal diameter	mm
D_1	Ball screw nut outer diameter	mm
D_4	Mounting bolt pitch circle diameter	mm
D_5	Flange mounting bolt diameter	mm
D_6	Flange outer diameter	mm
D_7	Screw head counter bore diameter	mm
$F_{a\,max}$	Axial load at the opening limit of the nut flange	kN
L_1	Centring diameter length	mm
L_3	Collar length	mm
L_7	Flange length	mm

L_8	Flat flange width	mm
L_9	Counter bore depth	mm
L_{10}	Lubrication port thread length	mm
P_{ho}	Nominal lead	mm
Q	Thread for lubrication port	
T_a	Tightening torque of one bolt	Nm

5 Nominal diameters, nominal leads and their combinations

Nominal diameters, nominal leads and their combinations are shown in Table 1. Preferred combination of nominal diameter and lead are highlighted in grey and bold.

Table 1 — Nominal diameters, nominal leads and their combinations

Nominal diameter d_0 [mm]	**Nominal lead P_{ho}** [mm]																		
	1	1,5	2	2,5	3	4	5	6	8	10	12	15	16	20	25	30	32	40	50
4	**1**																		
5	**1**	1,5																	
6	**1**	1,5	**2**	2,5															
8	**1**	1,5	**2**	2,5	3	4	**5**	6	8	**10**	12								
10	**1**	1,5	**2**	2,5	3	4	**5**	6	8	**10**	12								
12			**2**	2,5	3	4	**5**	6	8	**10**	12	15	16	**20**	25	30			
14			**2**	2,5	3	4	**5**	6	8	**10**	12	15	16	**20**	25	30			
16			**2**	2,5	3	4	**5**	6	8	**10**	12	15	16	**20**	25	30			
20					3	4	**5**	6	8	**10**	12	15	16	**20**	25	30	32	**40**	50
25						4	**5**	6	8	**10**	12	15	16	**20**	25	30	32	**40**	50
28						4	**5**	6	8	**10**	12	15	16	**20**	25	30	32	**40**	50
32						4	**5**	6	8	**10**	12	15	16	**20**	25	30	32	**40**	50
36						4	**5**	6	8	**10**	12	15	16	**20**	25	30	32	**40**	50
40							**5**	6	8	**10**	12	15	16	**20**	25	30	32	**40**	50
45							**5**	6	8	**10**	12	15	16	**20**	25	30	32	**40**	50
50							**5**	6	8	**10**	12	15	16	**20**	25	30	32	**40**	50
63							**5**	6	8	**10**	12	15	16	**20**	25	30	32	**40**	50
80								6	8	**10**	12	15	16	**20**	25	30	32	**40**	50
100										**10**	12	15	16	**20**	25	30	32	**40**	50
125										**10**	12	15	16	**20**	25	30	32	**40**	50
160											12	15	16	**20**	25	30	32	**40**	50

6 Mounting dimensions for ball screw nuts, type B6, B8 and B4, A6 and C6

There are three series of standardized ball screw nut dimensions. In Tables 2, 3 and 4, different types of ball screw nuts are shown. The following list shows these series of ball screws along with the corresponding figures and dimension tables.

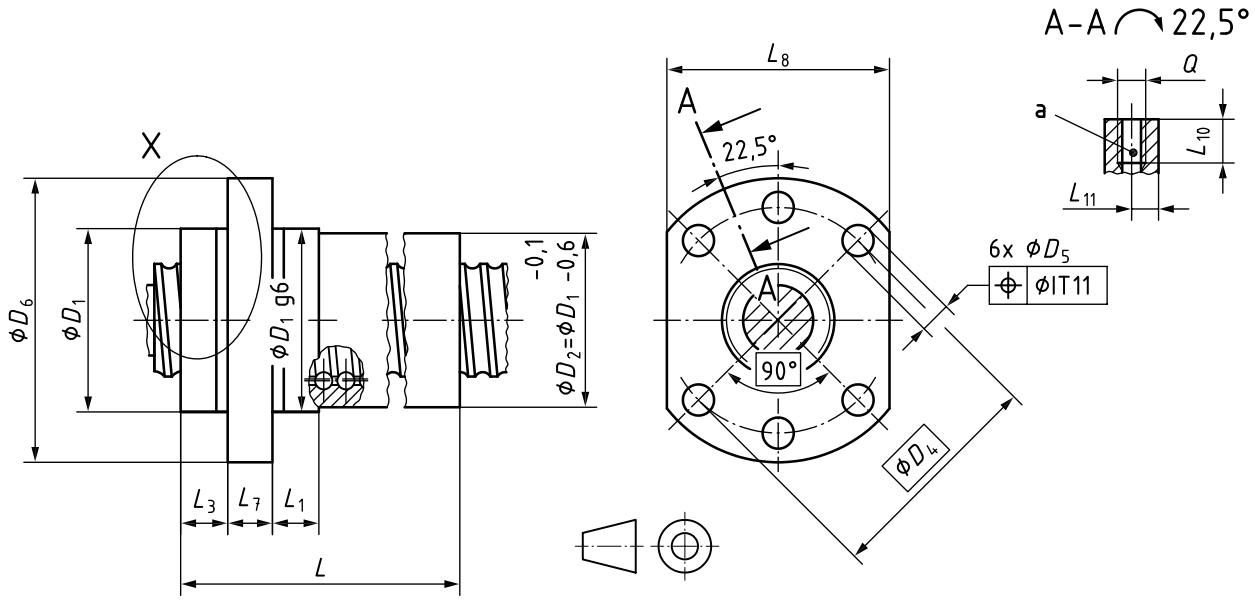
— Series 1 (internal recirculation): depicted in Figure 1 to 3; dimensions are shown in Table 2;

— Series 2 (internal recirculation): depicted in Figure 3 to 5; dimensions are shown in Table 3;

— Series 3 (external recirculation): depicted in Figure 3 to 5; dimensions are shown in Table 4.

Further design detail alternatives are given in Figure 6.

NOTE The character B in the type description, e.g. B4, represents the flange type and is based on the previous definition, where A represents round type, B two flats and C one flat flange type. The corresponding numbers represent the number of mounting holes on the flange (e.g. two flats flange type with 4 holes would be B4).



Key

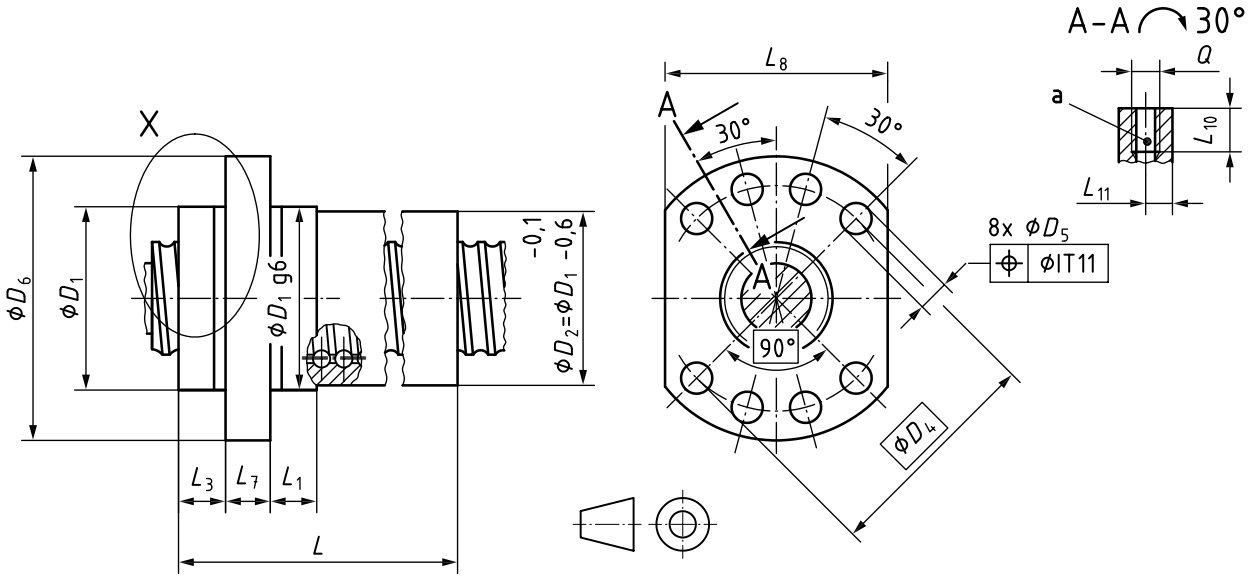
a If the position of the lubrication port is not sufficient, it can be sealed and replaced by a new axial hole on either side of the flange. Details need to be defined separately.

L manufacturer-specific length of the ball screw nut

L_{11} manufacturer-specific position of the thread for the lubrication port of the ball screw nut

NOTE See Figure 6 for detail X and all dimensions in Table 2.

Figure 1 — Mounting dimensions for ball screw nuts, type B6



Key

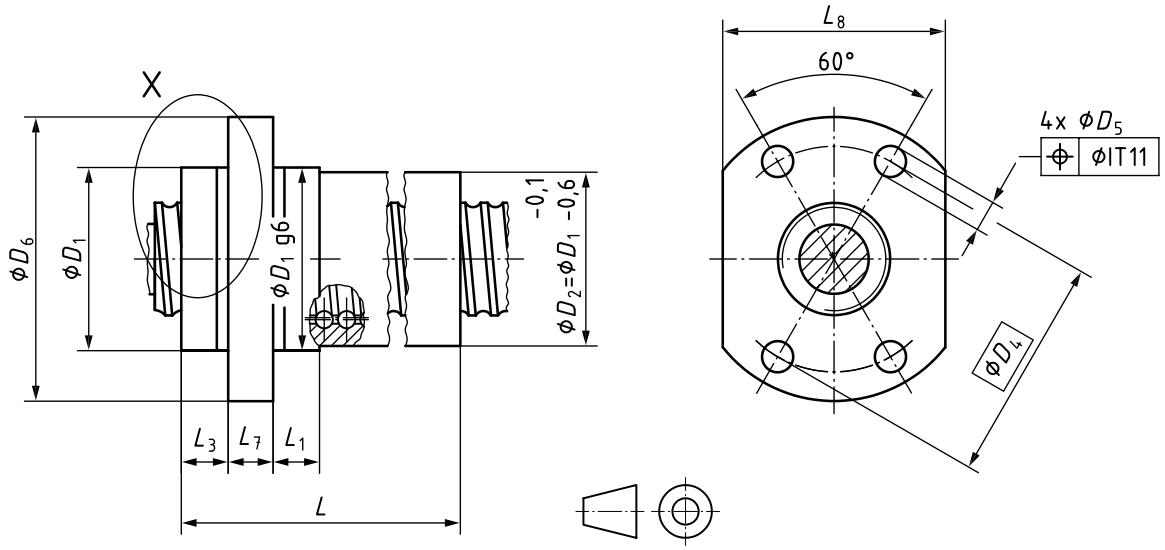
a If the position of the lubrication port is not sufficient, it can be sealed and replaced by a new axial hole on either side of the flange. Details need to be defined separately.

L manufacturer-specific length of the ball screw nut

L_{11} manufacturer-specific position of the thread for the lubrication port of the ball screw nut

NOTE See Figure 6 for detail X and all dimensions in Table 2.

Figure 2 — Mounting dimensions for ball screw nuts, type B8



Key

L manufacturer-specific length of the ball screw nut

NOTE See Figure 6 for detail X and all dimensions in Table 2, Table 3 and Table 4.

Figure 3 — Mounting dimensions for ball screw nuts, type B4