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**Fasteners — Hexagon head bolts —  
Product grades A and B**

*Fixations — Vis à tête hexagonale partiellement filetées — Grades A  
et B*

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ISO 4014:2022

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ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

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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](http://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](http://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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 11, *Fasteners with metric external thread*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 185, *Fasteners*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fifth edition cancels and replaces the fourth edition (ISO 4014:2011), which has been technically revised.

The main changes are as follows:

- tables for dimensions have been entirely restructured, so that the user can find the specified values in a reliable manner (no risk of picking the wrong dimension), see [Clause 4](#) and [Annex A](#);
- M7 has been added;
- $d_{w,min}$  has been changed for sizes  $d \leq M5$  from  $s_{min} - IT16$  to  $s_{min} - IT15$ , in order to have a larger bearing surface area and thus less contact pressure;
- the rules for the shortest and greatest standard lengths have been added, and they have been amended accordingly;
- for steel bolts, property classes 4.8 and 12.9/12.9 have been added;
- for stainless steel bolts, grades D4 and D6 and property class 80 have been added;
- property class 9.8 and non-ferrous metal bolts have been deleted;
- specifications for marking and labelling have been added as [Clause 6](#).

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](http://www.iso.org/members.html).

# Fasteners — Hexagon head bolts — Product grades A and B

## 1 Scope

This document specifies the characteristics of hexagon head bolts, in steel and stainless steel, with metric coarse pitch threads M1,6 to M64, and with product grades A and B.

If in certain cases other specifications are requested, property classes and stainless steel grades can be selected from ISO 898-1 or ISO 3506-1, 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 3506-1, *Fasteners — Mechanical properties of corrosion-resistant stainless steel fasteners — Part 1: Bolts, screws and studs with specified grades and property classes*

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 6157-3, *Fasteners — Surface discontinuities — Part 3: Bolts, screws and studs for special 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:

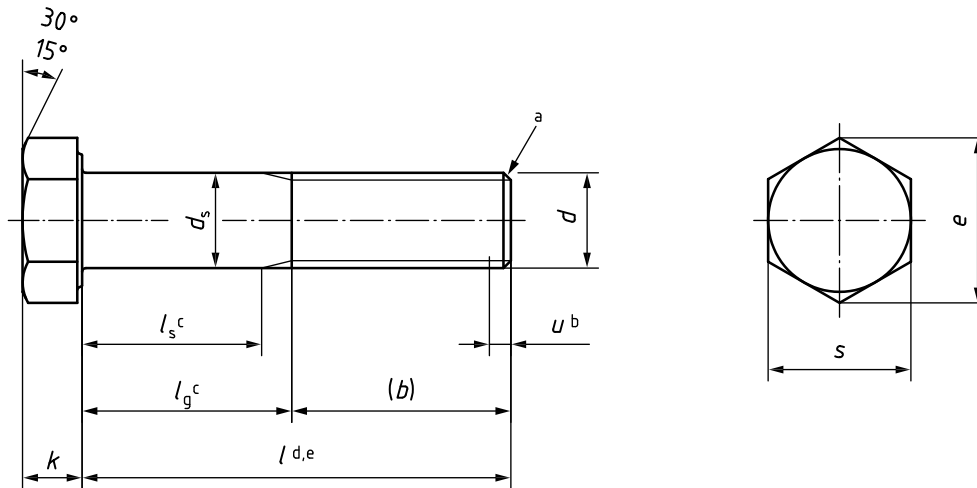
— ISO Online browsing platform: available at <https://www.iso.org/obp>

— 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 [6](#).

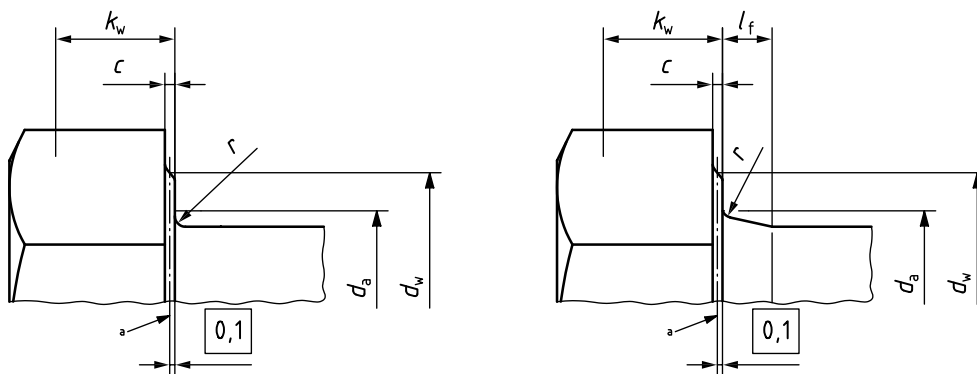
Symbols and descriptions of dimensions are defined in ISO 225.



- a In accordance with ISO 4753: chamfered end (CH), but for sizes  $\leq M4$  as-rolled end (RL) is also allowed.
- b Incomplete thread  $u \leq 2P$ .
- c  $l_{g,max} = l_{nom} - b$  and  $l_{s,min} = l_{g,max} - 5P$ .
- d Shortest standard length  $l_{nom}$  determined with  $5d$  for M5 to M8,  $4,5d$  for M10,  $4d$  for M12 to M22,  $3,75d$  for M24 to M60, and rounded (if necessary) to the nearest standard length; shortest standard length  $l_{nom} = 220$  mm for M64.
- e Greatest standard length  $l_{nom} \leq 10d$  or 500 mm, whichever is the shorter.

**Figure 1 — Hexagon head bolt**

Dimensions in millimetres



**a) Minimum underhead fillet**

**b) Maximum underhead fillet**

- a Reference datum for  $d_w$ .

**Figure 2 — Head details and permissible shapes**

**Table 1 — Dimensions for product grade A – M1,6 to M4**

Dimensions in millimetres

Thread, <i>d</i>			M1,6	M2	M2,5	M3	(M3,5)	M4						
<i>p</i> <sup>a</sup>			0,35	0,4	0,45	0,5	0,6	0,7						
<i>b</i>	ref.	<sup>b</sup>	9	10	11	12	13	14						
<i>c</i>	max.		0,25	0,25	0,25	0,40	0,40	0,40						
	min.		0,10	0,10	0,10	0,15	0,15	0,15						
<i>d</i> <sub>a</sub>	max.		2,0	2,6	3,1	3,6	4,1	4,7						
<i>d</i> <sub>s</sub>	nom. = max.		1,60	2,00	2,50	3,00	3,50	4,00						
	min.		1,46	1,86	2,36	2,86	3,32	3,82						
<i>d</i> <sub>w</sub>	min.		2,54	3,34	4,34	4,84	5,34	6,20						
<i>e</i>	min.		3,41	4,32	5,45	6,01	6,58	7,66						
<i>k</i>	nom.		1,1	1,4	1,7	2	2,4	2,8						
	max.		1,225	1,525	1,825	2,125	2,525	2,925						
	min.		0,975	1,275	1,575	1,875	2,275	2,675						
<i>k</i> <sub>w</sub>	min.		0,68	0,89	1,10	1,31	1,59	1,87						
<i>l</i> <sub>f</sub>	max.		0,6	0,8	1,0	1,0	1,0	1,2						
<i>r</i>	min.		0,10	0,10	0,10	0,10	0,10	0,20						
<i>s</i>	nom. = max.		3,20	4,00	5,00	5,50	6,00	7,00						
	min.		3,02	3,82	4,82	5,32	5,82	6,78						
<i>l</i>			<b>Range of standard lengths between the stepped bold lines</b>											
nom.	min.	max.	<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.	<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.	<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.	<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.	<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.	<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.
<b>12</b>	11,65	12,35	1,25	3,0	<b>Fully threaded screws specified in ISO 4017</b>									
<b>16</b>	15,65	16,35	5,25	7,0										
<b>20</b>	19,58	20,42			8,0	10,0	6,75	9,0	5,5	8,0	4,0	7,0		
<b>25</b>	24,58	25,42					11,75	14,0	10,5	13,0	9,0	12,0	7,5	11,0
<b>30</b>	29,58	30,42							15,5	18,0	14,0	17,0	12,5	16,0
<b>35</b>	34,50	35,50									19,0	22,0	17,5	21,0
<b>40</b>	39,50	40,50											22,5	26,0
—	—	—												
NOTE Size shown in brackets is a non-preferred dimension.														
<sup>a</sup> <i>P</i> is the pitch of the thread.														
<sup>b</sup> For <i>l</i> <sub>nom</sub> ≤ 125 mm.														

Table 2 — Dimensions for product grade A - M5 to M12

Dimensions in millimetres

Thread, <i>d</i>	M5	M6	(M7)	M8	M10	M12								
<i>p</i> <sup>a</sup>	0,8	1	1	1,25	1,5	1,75								
<i>b</i> ref. <sup>b</sup>	16	18	20	22	26	30								
<i>c</i>	max.	0,50	0,50	0,60	0,60	0,60								
	min.	0,15	0,15	0,15	0,15	0,15								
<i>d</i> <sub>a</sub>	max.	5,7	6,8	7,8	9,2	11,2								
<i>d</i> <sub>s</sub>	nom. = max.	5,00	6,00	7,00	8,00	10,00								
	min.	4,82	5,82	6,78	7,78	9,78								
<i>d</i> <sub>w</sub>	min.	7,20	8,88	9,63	11,63	14,63								
<i>e</i>	min.	8,79	11,05	12,12	14,38	17,77								
	nom.	3,5	4,0	4,8	5,3	6,4								
	max.	3,65	4,15	4,95	5,45	6,58								
<i>k</i>	min.	3,35	3,85	4,65	5,15	6,22								
	max.	3,35	3,85	4,65	5,15	6,22								
<i>k</i> <sub>w</sub>	min.	2,35	2,70	3,26	3,61	4,35								
<i>l</i> <sub>f</sub>	max.	1,2	1,4	1,4	2,0	2,0								
<i>r</i>	min.	0,20	0,25	0,25	0,40	0,40								
<i>s</i>	nom. = max.	8,00	10,00	11,00	13,00	16,00								
	min.	7,78	9,78	10,73	12,73	15,73								
<b>Range of standard lengths between the stepped bold lines</b>														
<i>l</i>			<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.	<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.	<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.	<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.	<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.	<i>l</i> <sub>s</sub> min.	<i>l</i> <sub>g</sub> max.
nom.	min.	max.	5,0	9,0	7,0	12,0	<b>Fully threaded screws specified in ISO 4017</b>							
25	24,58	25,42	10,0	14,0	12,0	17,0								
30	29,58	30,42	15,0	19,0	17,0	22,0								
35	34,5	35,5	20,0	24,0	20,0	25,0								
40	39,5	40,5	25,0	29,0	22,0	27,0								
45	44,5	45,5	30,0	34,0	25,0	30,0								
50	49,5	50,5	32,0	37,0	26,75	33,0								
55	54,4	55,6	37,0	42,0	31,75	38,0								
60	59,4	60,6	40,0	45,0	36,75	43,0								
65	64,4	65,6	45,0	50,0	41,75	48,0								
70	69,4	70,6	51,75	58,0	46,5	54,0								
80	79,4	80,6	<b>Product grade B in Annex A</b>				56,5	64,0	51,25	60,0				
90	89,3	90,7					66,5	74,0	61,25	70,0				
100	99,3	100,7					71,25	80,0						
110	109,3	110,7					81,25	90,0						
120	119,3	120,7												
—	—	—												

NOTE Size shown in brackets is a non-preferred dimension.

<sup>a</sup> *P* is the pitch of the thread.

<sup>b</sup> For *l*<sub>nom</sub> ≤ 125 mm.



**Table 3 — Dimensions for product grade A – M14 to M24**

Dimensions in millimetres

Thread, <i>d</i>		(M14)	M16	(M18)	M20	(M22)	M24																	
<i>p</i> <sup>a</sup>		2	2	2,5	2,5	2,5	3																	
<i>b</i>	ref. b	34	38	42	46	50	54																	
	c	40	44	48	52	56	60																	
<i>c</i>	max.	0,60	0,80	0,80	0,80	0,80	0,80																	
	min.	0,15	0,20	0,20	0,20	0,20	0,20																	
<i>d<sub>a</sub></i>	max.	15,7	17,7	20,2	22,4	24,4	26,4																	
<i>d<sub>s</sub></i>	nom. = max.	14,00	16,00	18,00	20,00	22,0	24,00																	
	min.	13,73	15,73	17,73	19,67	21,67	23,67																	
<i>d<sub>w</sub></i>	min.	19,64	22,49	25,34	28,19	31,71	33,61																	
<i>e</i>	min.	23,36	26,75	30,14	33,53	37,72	39,98																	
<i>k</i>	nom.	8,8	10	11,5	12,5	14	15																	
	max.	8,98	10,18	11,715	12,715	14,215	15,215																	
	min.	8,62	9,82	11,285	12,285	13,785	14,785																	
<i>k<sub>w</sub></i>	min.	6,03	6,87	7,90	8,60	9,65	10,35																	
<i>l<sub>f</sub></i>	max.	3	3	3	4	4	4																	
<i>r</i>	min.	0,6	0,6	0,6	0,8	0,8	0,8																	
<i>s</i>	nom. = max.	21,00	24,00	27,00	30,00	34,00	36,00																	
	min.	20,67	23,67	26,67	29,67	33,38	35,38																	
<i>l</i>		Range of standard lengths between the stepped bold lines																						
nom.	min.	max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.										
55	54,4	55,6	11,0	21,0	Fully threaded screws specified in ISO 4017																			
60	59,4	60,6	16,0	26,0																				
65	64,4	65,6	21,0	31,0											17,0	27,0								
70	69,4	70,6	26,0	36,0											22,0	32,0	15,5	28,0						
80	79,4	80,6	36,0	46,0											32,0	42,0	25,5	38,0	21,5	34,0				
90	89,3	90,7	46,0	56,0											42,0	52,0	35,5	48,0	31,5	44,0	27,5	40,0	21,0	36,0
100	99,3	100,7	56,0	66,0											52,0	62,0	45,5	58,0	41,5	54,0	37,5	50,0	31,0	46,0
110	109,3	110,7	66,0	76,0											62,0	72,0	55,5	68,0	51,5	64,0	47,5	60,0	41,0	56,0
120	119,3	120,7	76,0	86,0											72,0	82,0	65,5	78,0	61,5	74,0	57,5	70,0	51,0	66,0
130	129,2	130,8	80,0	90,0											76,0	86,0	69,5	82,0	65,5	78,0	61,5	74,0	55,0	70,0
140	139,2	140,8	90,0	100,0	86,0	96,0	79,5	92,0	75,5	88,0	71,5	84,0	65,0	80,0										
150	149,2	150,8	Product grade B in Annex A		96,0	106,0	89,5	102,0	85,5	98,0	81,5	94,0	75,0	90,0										
> 150			Product grade B in Table 4																					
NOTE Sizes shown in brackets are non-preferred dimensions.																								
<sup>a</sup> <i>P</i> is the pitch of the thread.																								
<sup>b</sup> For <i>l<sub>nom</sub></i> ≤ 125 mm.																								
<sup>c</sup> For 125 mm < <i>l<sub>nom</sub></i> ≤ 200 mm.																								

**Table 4 — Dimensions for product grade B – M16 to M27**

Dimensions in millimetres

Thread, <i>d</i>		M16	(M18)	M20	(M22)	M24	(M27)													
<i>p</i> <sup>a</sup>		2	2,5	2,5	2,5	3	3													
<i>b</i>	ref. b	—	—	—	—	—	60													
	c	44	48	52	56	60	66													
	d	—	—	—	69	73	79													
<i>c</i>	max.	0,8	0,8	0,8	0,8	0,8	0,8													
	min.	0,2	0,2	0,2	0,2	0,2	0,2													
<i>d<sub>a</sub></i>	max.	17,7	20,2	22,4	24,4	26,4	30,4													
<i>d<sub>s</sub></i>	nom. = max.	16,00	18,00	20,00	22,0	24,00	27,00													
	min.	15,57	17,57	19,48	21,48	23,48	26,48													
<i>d<sub>w</sub></i>	min.	22,00	24,85	27,70	31,35	33,25	38,00													
<i>e</i>	min.	26,17	29,56	32,95	37,29	39,55	45,20													
<i>k</i>	nom.	10	11,5	12,5	14	15	17													
	max.	10,29	11,85	12,85	14,35	15,35	17,35													
	min.	9,71	11,15	12,15	13,65	14,65	16,65													
<i>k<sub>w</sub></i>	min.	6,80	7,81	8,51	9,56	10,26	11,66													
<i>l<sub>f</sub></i>	max.	3	3	4	4	4	6													
<i>r</i>	min.	0,6	0,6	0,8	0,8	0,8	1,0													
<i>s</i>	nom. = max.	24,00	27,00	30,00	34,00	36,00	41,00													
	min.	23,16	26,16	29,16	33,00	35,00	40,00													
<i>l</i>		<b>Range of standard lengths between the stepped bold lines</b>																		
nom.	min.	max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.	<i>l<sub>s</sub></i> min.	<i>l<sub>g</sub></i> max.						
100	98,25	101,75	ISO 4014:2022 Product grade A in Table 3										25,0	40,0						
110	108,25	111,75											35,0	50,0						
120	118,25	121,75											45,0	60,0						
130	128,0	132,0											49,0	64,0						
140	138,0	142,0											59,0	74,0						
150	148,0	152,0											69,0	84,0						
160	158,0	162,0	106	116	99,5	112	95,5	108	91,5	104	85,0	100	79,0	94,0						
180	178,0	182,0	<b>Length by agreement                      in accordance with ISO 888</b>		119,5	132	115,5	128	111,5	124	105	120	99,0	114						
200	197,7	202,3			<b>Length by agreement                      in accordance with ISO 888</b>		<b>Length by agreement                      in accordance with ISO 888</b>		135,5	148	131,5	144	125	140	119	134				
220	217,7	222,3							<b>Length by agreement                      in accordance with ISO 888</b>		<b>Length by agreement                      in accordance with ISO 888</b>		138,5	151	132	147	126	141		
240	237,7	242,3											<b>Length by agreement                      in accordance with ISO 888</b>		<b>Length by agreement                      in accordance with ISO 888</b>		152	167	146	161
260	257,4	262,6															<b>Length by agreement                      in accordance with ISO 888</b>		<b>Length by agreement                      in accordance with ISO 888</b>	
—	—	—	<b>Length by agreement                      in accordance with ISO 888</b>		<b>Length by agreement                      in accordance with ISO 888</b>		<b>Length by agreement                      in accordance with ISO 888</b>		<b>Length by agreement                      in accordance with ISO 888</b>											
NOTE Sizes shown in brackets are non-preferred dimensions.																				
<sup>a</sup> <i>P</i> is the pitch of the thread.																				
<sup>b</sup> For <i>l<sub>nom</sub></i> ≤ 125 mm.																				
<sup>c</sup> For 125 mm < <i>l<sub>nom</sub></i> ≤ 200 mm.																				
<sup>a</sup> For <i>l<sub>nom</sub></i> > 200 mm.																				