UDC 621.882.211 October 1989

High-strength hexagon head bolts
with large widths across flats for structural steel bolting

DIN 6914

Sechskantschrauben mit großen Schlüsselweiten;
HV-Schrauben in Stahlkonstruktionen

Supersedes March 1979 edition.

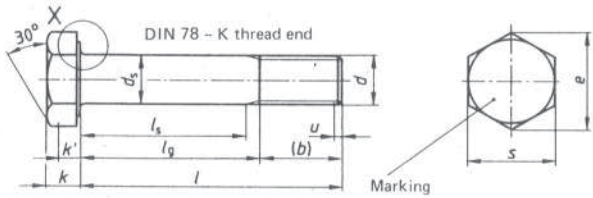
In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

Dimensions in mm

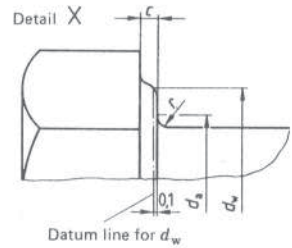
1 Scope and field of application

High-strength hexagon head bolts are intended for use in GV and SL structural steel bolting in accordance with DIN 18800 Part 1, together with DIN 6915 hexagon nuts and DIN 6916, DIN 6917 or DIN 6918 washers.

2 Dimensions



$u = 2P$ maximum; incomplete thread.



Continued on pages 2 to 6

Table.

Thread size (d)			M12		M16		M20		M22		M24		M27		M30		M36	
P [1]			1,75		2		2,5		2,5		3		3		3,5		4	
b	(auxiliary [2] dimension) [3]		21		26		31		32		34		37		40		48	
			23		28		33		34		37		39		42		50	
c	min.		0,4		0,4		0,4		0,4		0,4		0,4		0,4		0,4	
	max.		0,6		0,6		0,8		0,8		0,8		0,8		0,8		0,8	
d_a	max.		15,2		19,2		24		26		28		32		35		41	
d_s	Nominal size		12		16		20		22		24		27		30		36	
	min.		11,3		15,3		19,16		21,16		23,16		26,16		29,16		35	
	max.		12,7		16,7		20,84		22,84		24,84		27,84		30,84		37	
d_w [4]	min.		20		25		30		34		39		43,5		47,5		57	
e	min.		23,91		29,56		35,03		39,55		45,20		50,85		55,37		66,44	
k	Nominal size		8		10		13		14		15		17		19		23	
	min.		7,55		9,25		12,1		13,1		14,1		16,1		17,95		21,95	
	max.		8,45		10,75		13,9		14,9		15,9		17,9		20,05		24,05	
k'	min.		5,28		6,47		8,47		9,17		9,87		11,27		12,56		15,36	
r	min.		1,2		1,2		1,5		1,5		1,5		2		2		2	
s	max. = nominal size		22		27		32		36		41		46		50		60	
	min.		21,16		26,16		31		35		40		45		49		58,8	
Nominal size	l		Shank lengths, l_s *) and l_g **)															
	min.	max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.
30	28,95	31,05	3,75	9														
35	33,75	36,25	8,75	14														
40	38,75	41,25	13,75	19	8	14												
45	43,75	46,25	16,75	22	13	19	6,5	14										
50	48,75	51,25	21,75	27	18	24	11,5	19	10,5	18								
55	53,5	56,5	26,75	32	23	29	16,5	24	15,5	23								
60	58,5	61,5	31,75	37	28	34	21,5	29	20,5	28	17	26						
65	63,5	66,5	36,75	42	33	39	26,5	34	25,5	33	22	31						
70	68,5	71,5	41,75	47	38	44	31,5	39	30,5	38	27	36	24	33				
75	73,5	76,5	46,75	52	41	47	36,5	44	35,5	43	32	41	29	38	24,5	35		
80	78,5	81,5	51,75	57	46	52	41,5	49	40,5	48	37	46	34	43	29,5	40		
85	83,25	86,75	56,75	62	51	57	46,5	54	45,5	53	42	51	39	48	34,5	45	25	37
90	88,25	91,75	61,75	67	56	62	49,5	57	48,5	56	44	53	44	53	39,5	50	30	42
95	93,25	96,75	66,75	72	61	67	54,5	62	53,5	61	49	58	49	58	44,5	55	35	47
100	98,25	101,75			66	72	59,5	67	58,5	66	54	63	52	61	47,5	58	40	52
105	103,25	106,75			71	77	64,5	72	63,5	71	59	68	57	66	52,5	63	43	55
110	108,25	111,75			76	82	69,5	77	68,5	76	64	73	62	71	57,5	68	48	60
115	113,25	116,75			81	87	74,5	82	73,5	81	69	78	67	76	62,5	73	53	65
120	118,25	121,75			86	92	79,5	87	78,5	86	74	83	72	81	67,5	78	58	70
125	123	127			91	97	84,5	92	83,5	91	79	88	77	86	72,5	83	63	75
130	128	132			96	102	89,5	97	88,5	96	84	93	82	91	77,5	88	68	80
135	133	137					94,5	102	93,5	101	89	98	87	96	82,5	93	73	85
140	138	142					99,5	107	98,5	106	94	103	92	101	87,5	98	78	90
145	143	147					104,5	112	103,5	111	99	108	97	106	92,5	103	83	95
150	148	152					109,5	117	108,5	116	104	113	102	111	97,5	108	88	100
155	151	159					114,5	122	113,5	121	109	118	107	116	102,5	113	93	105
160	156	164							118,5	126	114	123	112	121	107,5	118	98	110
165	161	169							123,5	131	119	128	117	126	112,5	123	103	115
170	166	174									124	133	122	131	117,5	128	108	120
175	171	179									129	138	127	136	122,5	133	113	125
180	176	184									134	143	132	141	127,5	138	118	130
185	180,4	189,6									139	148	137	146	132,5	143	123	135
190	185,4	194,6									144	153	142	151	137,5	148	128	140
195	190,4	199,6									149	158	147	156	142,5	153	133	145
200	195,4	204,6											152	161	147,5	158	138	150

Commercial sizes of hexagon head bolts are those for which shank lengths have been specified.

*) $l_{s\,min} = l_{g\,max} - 3P$.

**) $l_{g\,max} = l_{nominal\ size} - b$.

1) P = pitch of thread (coarse thread).

2) For lengths above the continuous stepped line.

3) For lengths below the continuous stepped line.

4) The maximum value of d_w shall not exceed the actual width across flats.

3 Technical delivery conditions

Material		Steel
General requirements		As specified in DIN 267 Part 1.
Thread	Tolerance	6 g
	As specified in	DIN 13 Parts 12 and 15.
Mechanical properties	Property class	10.9
	As specified in	ISO 898 Part 1.
Limit deviations and geometrical tolerances	Product grade	C
	As specified in	ISO 4759 Part 1.
Surface finish		As processed. DIN 267 Part 10 shall apply with regard to hot dip galvanizing.
Acceptance inspection		As specified in DIN 267 Part 5.

4 Designation

Designation of an M 20 hexagon head bolt with large width across flats, of nominal length, l = 100 mm:

Hexagon head bolt DIN 6914 – M 20 × 100

The DIN 4000 - 2 - 1 tabular layout of article characteristics shall apply for bolts covered in this standard.

5 Marking

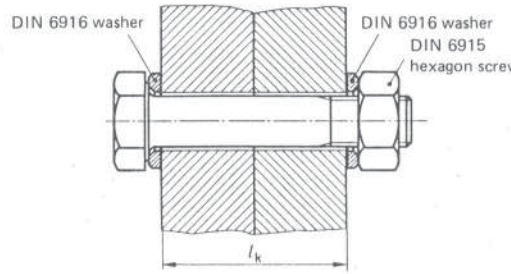
Bolts shall be marked in accordance with ISO 898 Part 1 and shall additionally bear the symbol 'HV'.

6 Mass

The values given should be regarded as guideline values.

Thread size (d)	M 12	M 16	M 20	M 22	M 24	M 27	M 30	M 36
Nominal length, l	Mass (7,85 kg/dm^3), in kg per 1000 units, ≈							
30	49,1							
35	53,6							
40	58,0	105						
45	62,1	113	188					
50	66,6	121	200	257				
55	71,0	129	212	272				
60	75,4	137	225	286	362			
65	79,9	145	237	301	380			
70	84,3	153	249	316	398	532		
75	88,8	160	262	331	415	554	701	
80	93,2	168	274	346	433	576	728	
85	97,6	176	286	361	451	599	756	1184
90	102	184	298	375	467	621	784	1224
95	107	192	310	390	485	644	812	1264
100		199	322	405	503	665	838	1304
105		207	335	420	520	688	865	1336
110		215	347	435	538	710	893	1376
115		223	359	450	556	732	921	1415
120		231	372	465	574	755	949	1455
125		239	384	479	591	777	976	1495
130		247	396	494	609	800	1004	1535
135			409	509	627	822	1032	1575
140			421	524	645	845	1059	1615
145			433	539	662	867	1087	1655
150			446	554	680	890	1115	1695
155			458	569	698	912	1143	1735
160				584	716	935	1170	1775
165				599	733	957	1198	1815
170					751	979	1226	1855
175					769	1002	1254	1895
180					787	1024	1281	1935
185					804	1047	1309	1974
190					822	1069	1337	2014
195					840	1092	1365	2054
200						1114	1392	2094

7 Grip lengths



Thread size (d)	M12	M16	M20	M22	M24	M27	M30	M36
Nominal length, l	Grip length, l_k							
30	6 to 10							
35	11 to 15							
40	16 to 20	10 to 14						
45	21 to 23	15 to 19	10 to 14					
50	24 to 28	20 to 24	15 to 19	14 to 18				
55	29 to 33	25 to 29	20 to 24	19 to 23				
60	34 to 38	30 to 34	25 to 29	24 to 28	22 to 26			
65	39 to 43	35 to 39	30 to 34	29 to 33	27 to 31			
70	44 to 48	40 to 44	35 to 39	34 to 38	32 to 36	28 to 32		
75	49 to 53	45 to 47	40 to 44	39 to 43	37 to 41	33 to 37	29 to 33	
80	54 to 58	48 to 52	45 to 49	44 to 48	42 to 46	38 to 42	34 to 38	
85	59 to 63	53 to 57	50 to 54	49 to 53	47 to 51	43 to 47	39 to 43	31 to 35
90	64 to 68	58 to 62	55 to 57	54 to 56	52 to 53	48 to 52	44 to 48	36 to 40
95	69 to 73	63 to 67	58 to 62	57 to 61	54 to 58	53 to 57	49 to 53	41 to 45
100		68 to 72	63 to 67	62 to 66	59 to 63	58 to 60	54 to 56	46 to 48
105		73 to 77	68 to 72	67 to 71	64 to 68	61 to 65	57 to 61	49 to 53
110		78 to 82	73 to 77	72 to 76	69 to 73	66 to 70	62 to 66	54 to 58
115		83 to 87	78 to 82	77 to 81	74 to 78	71 to 75	67 to 71	59 to 63
120		88 to 92	83 to 87	82 to 86	79 to 83	76 to 80	72 to 76	64 to 68
125		93 to 97	88 to 92	87 to 91	84 to 88	81 to 85	77 to 81	69 to 73
130		98 to 102	93 to 97	92 to 96	89 to 93	86 to 90	82 to 86	74 to 78
135			98 to 102	97 to 101	94 to 98	91 to 95	87 to 91	79 to 83
140			103 to 107	102 to 106	99 to 103	96 to 100	92 to 96	84 to 88
145			108 to 112	107 to 111	104 to 108	101 to 105	97 to 101	89 to 93
150			113 to 117	112 to 116	109 to 113	106 to 110	102 to 106	94 to 98
155			118 to 122	117 to 121	114 to 118	111 to 115	107 to 111	99 to 103
160				122 to 127	119 to 123	116 to 120	112 to 116	104 to 108
165				128 to 131	124 to 128	121 to 125	117 to 121	109 to 113
170					129 to 133	126 to 130	122 to 126	114 to 118
175					134 to 138	131 to 135	127 to 131	119 to 123
180					139 to 143	136 to 140	132 to 136	124 to 128
185					144 to 148	141 to 145	137 to 141	129 to 133
190					149 to 153	146 to 150	142 to 146	134 to 138
195					154 to 158	151 to 155	147 to 151	139 to 143
200						156 to 160	152 to 156	144 to 148

The tolerances on length have been taken into consideration when calculating the grip lengths.

Standards referred to

DIN	13 Part 12	ISO metric screw threads; coarse and fine pitch threads from 1 to 300 mm diameter; selection of diameters and pitches
DIN	13 Part 15	ISO metric screw threads; fundamental deviations and tolerances for screw threads of 1 mm diameter and larger
DIN	78	Thread ends and lengths of projection of bolt ends for ISO metric screw threads in accordance with DIN 13
DIN	267 Part 1	Fasteners; technical delivery conditions; general requirements
DIN	267 Part 5	Fasteners; technical delivery conditions; acceptance inspection (modified version of ISO 3269, 1984 edition)
DIN	267 Part 10	Fasteners; technical delivery conditions; hot dip galvanized components
DIN	4000 Part 2	Tabular layout of article characteristics for bolts, screws and nuts
DIN	6915	High-strength hexagon nuts with large widths across flats for structural steel bolting
DIN	6916	Round washers for high-strength structural steel bolting
DIN	6917	Square taper washers for high-strength structural steel bolting of steel I sections
DIN	6918	Square washers for high-strength structural bolting of steel U sections
DIN	18 800 Part 1	Steel structures; dimensions and design
ISO	898 Part 1	Mechanical properties of fasteners; bolts, screws and studs
ISO	4759 Part 1	Tolerances for fasteners; bolts, screws and nuts with thread diameters $\geq$1,6 and $\leq$150 mm and product grades A, B and C

Previous editions

DIN 6914: 08.62, 12.70, 03.79.

Amendments

The following amendments have been made to the March 1979 edition:

a) A datum line for determining the bearing face diameter, d_w, has been included.

b) Shank diameter d_s is now specified.

c) Limits of size are now specified.

d) Shank lengths l_s and l_g are now specified.

e) A surface finish as specified in DIN 267 Part 9 is no longer specified.

f) The standard has been editorially revised.

International Patent Classification

E 04 B 1/38
F 16 B 35/00
F 16 B 5/02
F 16 B 23/00