

Bolt Size Chart (Hex Bolts M1.6–M64)

Metric hex head bolt dimensions M1.6–M64: width across flats s, width across corners e, head height k and fillet radius r, in product grade A and grade B, with the thread length b by nominal length for partially threaded bolts (GB/T 5783 / 5782) and the fine pitch options of GB/T 5785, plus a page for each size.

M1.6–M64 · d nominal thread · P coarse pitch · s width across flats (= max) · e min across corners · k head height · r min fillet ·
GB/T 5783-2025 fully threaded · GB/T 5782-2025 partially threaded (same head) · GB/T 5785-2025 fine pitch ·
Product grade A and B side by side · Row-level standards · Nominal (= max) values

Metric bolt size chart M1.6–M64 (mm)

The two standards share the same hex head: GB/T 5783 (fully threaded) and GB/T 5782 (partially threaded) give identical s, e, k and r for a size, so only the thread length differs. Switch the thread form to add the b columns, and the product grade to see the A-grade or B-grade tolerance band.

Partially threaded: the standard gives b as a reference value in three nominal-length bands ($b \approx 2d + 6$ at $l \leq 125$ mm, $\approx 2d + 12$ at $125 < l \leq 200$ mm, $\approx 2d + 25$ at $l > 200$ mm). A dash means that band is not applicable for the size.

Size	Coarse pitch P (mm) mm	Width across flats s (mm, nominal = max)	s min (mm)	Width across corners e min (mm)	Head height k (mm, nominal)	Fillet radius r min (mm)	b at l ≤ 125 mm	b at 125 < l ≤ 200 mm	b at l > 200 mm
M1.6	0.35	3.2	2.9	3.28	1.1	0.1	9	15	28
M2	0.4	4	3.7	4.18	1.4	0.1	10	16	29
M2.5	0.45	5	4.7	5.31	1.7	0.1	11	17	30
M3	0.5	5.5	5.2	5.88	2	0.1	12	18	31
M3.5	0.6	6	5.7	6.44	2.4	0.1	13	19	32
M4	0.7	7	6.64	7.5	2.8	0.2	14	20	33
M5	0.8	8	7.64	8.63	3.5	0.2	16	22	35
M6	1	10	9.64	10.89	4	0.25	18	24	37
M7	1	11	10.57	11.94	4.8	0.25	20	26	39
M8	1.25	13	12.57	14.2	5.3	0.4	22	28	41
M10	1.5	16	15.57	17.59	6.4	0.4	26	32	45
M12	1.75	18	17.57	19.85	7.5	0.6	30	36	49
M14	2	21	20.16	22.78	8.8	0.6	34	40	53
M16	2	24	23.16	26.17	10	0.6	—	44	—
M18	2.5	27	26.16	29.56	11.5	0.6	—	48	—
M20	2.5	30	29.16	32.95	12.5	0.8	—	52	—
M22	2.5	34	33	37.29	14	0.8	—	56	69
M24	3	36	35	39.55	15	0.8	—	60	73
M27	3	41	40	45.2	17	1	60	66	79
M30	3.5	46	45	50.85	18.7	1	66	72	85
M33	3.5	50	49	55.37	21	1	72	78	91
M36	4	55	53.8	60.79	22.5	1	—	84	97
M39	4	60	58.8	66.44	25	1	—	90	103
M42	4.5	65	63.1	71.3	26	1.2	—	96	109
M45	4.5	70	68.1	76.95	28	1.2	—	102	115
M48	5	75	73.1	82.6	30	1.6	—	108	121
M52	5	80	78.1	88.25	33	1.6	—	116	129
M56	5.5	85	82.8	93.56	35	2	—	—	137
M60	5.5	90	87.8	99.21	38	2	—	—	145
M64	6	95	92.8	104.86	40	2	—	—	153

Grade A and grade B are dimensional tolerance grades, not quality grades: the nominal s and k are the same, only the tolerance band differs (s min, e min, k max). Grade A applies to d ≤ M24 with l ≤ 10d or l ≤ 150 mm; grade B covers every size in this table.

Metric bolt size chart M1.6–M64 (mm) · Grade A

Grade A is tabulated for M1.6 to M24. Rows marked with a dash for M27 and above are in grade B only — switch the product grade to see them.

Size	Coarse pitch P (mm) mm	Width across flats s (mm, nominal = max)	s min (mm)	Width across corners e min (mm)	Head height k (mm, nominal)	Fillet radius r min (mm)	b at l ≤ 125 mm	b at 125 < l ≤ 200 mm	b at l > 200 mm
M1.6	0.35	3.2	3.02	3.41	1.1	0.1	9	—	—
M2	0.4	4	3.82	4.32	1.4	0.1	10	—	—
M2.5	0.45	5	4.82	5.45	1.7	0.1	11	—	—
M3	0.5	5.5	5.32	6.01	2	0.1	12	—	—
M3.5	0.6	6	5.82	6.58	2.4	0.1	13	—	—
M4	0.7	7	6.78	7.66	2.8	0.2	14	—	—
M5	0.8	8	7.78	8.79	3.5	0.2	16	—	—
M6	1	10	9.78	11.05	4	0.25	18	—	—
M7	1	11	10.73	12.12	4.8	0.25	20	—	—
M8	1.25	13	12.73	14.38	5.3	0.4	22	—	—
M10	1.5	16	15.73	17.77	6.4	0.4	26	—	—
M12	1.75	18	17.73	20.03	7.5	0.6	30	—	—
M14	2	21	20.67	23.36	8.8	0.6	34	40	—
M16	2	24	23.67	26.75	10	0.6	38	44	—
M18	2.5	27	26.67	30.14	11.5	0.6	42	48	—
M20	2.5	30	29.67	33.53	12.5	0.8	46	52	—
M22	2.5	34	33.38	37.72	14	0.8	50	56	—
M24	3	36	35.38	39.98	15	0.8	54	60	—
M27	—	—	—	—	—	—	—	—	—
M30	—	—	—	—	—	—	—	—	—
M33	—	—	—	—	—	—	—	—	—
M36	—	—	—	—	—	—	—	—	—
M39	—	—	—	—	—	—	—	—	—
M42	—	—	—	—	—	—	—	—	—
M45	—	—	—	—	—	—	—	—	—
M48	—	—	—	—	—	—	—	—	—
M52	—	—	—	—	—	—	—	—	—
M56	—	—	—	—	—	—	—	—	—
M60	—	—	—	—	—	—	—	—	—
M64	—	—	—	—	—	—	—	—	—

Thread length b on partially threaded bolts (GB/T 5782)

A partially threaded hex bolt carries thread over part of the shank, so the threaded length b depends on the nominal length l as well as on the diameter. GB/T 5782 tabulates b as a reference value in three nominal-length bands; the same M-size therefore has up to three different thread lengths.

b ≈ 2d + 6 at l ≤ 125 mm, b ≈ 2d + 12 at 125 < l ≤ 200 mm, b ≈ 2d + 25 at l > 200 mm; the tabulated figure is that value rounded to a whole millimetre. Grade A tables carry the shorter bands only; grade B carries the band that applies to each size.

A dash means the standard does not tabulate that band for the size — the size's standard length range does not reach that length band (large sizes start above 125 mm) or the table carries only the bands in use.

Thread length b by length band, grade B (mm)

Size	b at l ≤ 125 mm	b at 125 < l ≤ 200 mm	b at l > 200 mm
M1.6	9	15	28
M2	10	16	29

Size	b at l ≤ 125 mm	b at 125 < l ≤ 200 mm	b at l > 200 mm
M2.5	11	17	30
M3	12	18	31
M3.5	13	19	32
M4	14	20	33
M5	16	22	35
M6	18	24	37
M7	20	26	39
M8	22	28	41
M10	26	32	45
M12	30	36	49
M14	34	40	53
M16	—	44	—
M18	—	48	—
M20	—	52	—
M22	—	56	69
M24	—	60	73
M27	60	66	79
M30	66	72	85
M33	72	78	91
M36	—	84	97
M39	—	90	103
M42	—	96	109
M45	—	102	115
M48	—	108	121
M52	—	116	129
M56	—	—	137
M60	—	—	145
M64	—	—	153

Thread length b by length band, grade A (mm)

Size	b at l ≤ 125 mm	b at 125 < l ≤ 200 mm	b at l > 200 mm
M1.6	9	—	—
M2	10	—	—
M2.5	11	—	—
M3	12	—	—
M3.5	13	—	—
M4	14	—	—
M5	16	—	—
M6	18	—	—
M7	20	—	—
M8	22	—	—
M10	26	—	—
M12	30	—	—
M14	34	40	—
M16	38	44	—

Size	b at l ≤ 125 mm	b at 125 < l ≤ 200 mm	b at l > 200 mm
M18	42	48	—
M20	46	52	—
M22	50	56	—
M24	54	60	—
M27	—	—	—
M30	—	—	—
M33	—	—	—
M36	—	—	—
M39	—	—	—
M42	—	—	—
M45	—	—	—
M48	—	—	—
M52	—	—	—
M56	—	—	—
M60	—	—	—
M64	—	—	—

Quote the diameter and the length together: b follows l, so only "M12×100" pins the thread length down.

Fine pitch hex bolts (GB/T 5785): fine thread against coarse thread

GB/T 5785-2025 tabulates the same hex head with a fine pitch thread on nominal diameters from 8 mm to 64 mm. The head does not change — s, e, k and r stay exactly as in the coarse table above — so a fine thread must be called out with its pitch: M12×1.5 is not M12, whose coarse pitch is 1.75 mm.

One diameter, one head: every fine pitch of the same d shares the same s, e, k and r, so the socket size does not change with the pitch.

Nominal diameter d (mm)	Fine pitch P (mm)	Coarse pitch P (mm)
M8	1	1.25
M10	1.25 / (1)	1.5
M12	1.5 / (1.25)	1.75
M14	(1.5)	2
M16	1.5	2
M18	(2) / (1.5)	2.5
M20	2 / (1.5)	2.5
M22	(2) / (1.5)	2.5
M24	2	3
M27	(2)	3
M30	2	3.5
M33	(2)	3.5
M36	3	4
M39	(3)	4
M42	3	4.5
M45	(3)	4.5
M48	3	5
M52	(4)	5
M56	4	5.5
M60	(4)	5.5
M64	4	6

A pitch in brackets is the non-preferred fine pitch of that diameter in GB/T 5785-2025; diameters not listed have no fine thread series in that standard.

Metric to inch bolt sizes (approximate, not interchangeable)

Cross-reference by nominal diameter only. The inch column is a straight millimetre-to-inch conversion of d; the last column is the inch hex bolt whose nominal diameter is closest to it.

Metric size	Nominal d (mm)	Nominal d (in)	Closest inch hex bolt
M1.6	1.6	0.063	1/4 in6.35 mm
M2	2	0.079	1/4 in6.35 mm
M2.5	2.5	0.098	1/4 in6.35 mm
M3	3	0.118	1/4 in6.35 mm
M3.5	3.5	0.138	1/4 in6.35 mm
M4	4	0.157	1/4 in6.35 mm
M5	5	0.197	1/4 in6.35 mm
M6	6	0.236	1/4 in6.35 mm
M7	7	0.276	1/4 in6.35 mm
M8	8	0.315	5/16 in7.938 mm
M10	10	0.394	3/8 in9.525 mm
M12	12	0.472	1/2 in12.7 mm
M14	14	0.551	1/2 in12.7 mm
M16	16	0.630	5/8 in15.875 mm
M18	18	0.709	3/4 in19.05 mm
M20	20	0.787	3/4 in19.05 mm
M22	22	0.866	7/8 in22.225 mm
M24	24	0.945	1 in25.4 mm
M27	27	1.063	1-1/8 in28.575 mm
M30	30	1.181	1-1/8 in28.575 mm
M33	33	1.299	1-1/4 in31.75 mm
M36	36	1.417	1-3/8 in34.925 mm
M39	39	1.535	1-1/2 in38.1 mm
M42	42	1.654	1-3/4 in44.45 mm
M45	45	1.772	1-3/4 in44.45 mm
M48	48	1.890	2 in50.8 mm
M52	52	2.047	2 in50.8 mm
M56	56	2.205	2-1/4 in57.15 mm
M60	60	2.362	2-1/4 in57.15 mm
M64	64	2.520	2-1/2 in63.5 mm

matched by nominal diameter only

Do not substitute. Both series use a 60° thread form, but the diameters and thread counts differ, so a near-diameter inch bolt starts and then jams and damages the thread. Use these rows to read which callout a drawing means, not to interchange parts.

Which number do you need: s, e or k?

"Bolt size" means three different numbers depending on the job, and order codes use a fourth. Buying a tool uses s, checking a head that will not go into a socket uses e, and a counterbore or a flush-head check uses k.

- **s — width across flats (nominal = max)** — M12 is s = 18 mm. This is the socket, spanner or ring size, and the number stamped on the tool. It is the same in grade A and grade B and the same in GB/T 5783 and GB/T 5782, because the two standards share the hex head.
- **e — width across corners (min)** — M12 is e min = 20.03 mm in grade A and 19.85 mm in grade B. This is the diagonal between two opposite corners of the head, the dimension that decides whether a 12-point socket or a ring spanner passes over the head. Most published bolt size charts leave this column out; it is also what you can still measure with a caliper once the flats have been rounded off.
- **k — head height (nominal, with a max)** — M12 is k = 7.5 mm nominal and 7.79 mm max in grade B. It sets how deep a counterbore or recess has to be and how far the head stands above the part. When the head must not protrude, k is the number to check, not s.
- **d — nominal thread diameter** — The number in the callout: M12 is a 12 mm thread, not a 12 mm head. The head is always wider, 18 mm across the flats here, which is where ordering by "size" alone goes wrong.
- **r — fillet radius under the head (min)** — r min = 0.6 mm at M12. The washer face has to clear this radius, so it matters when the bolt sits in a corner, against a shoulder or in a slotted hole rather than on a flat face.

References

- GB/T 5783-2025 Hexagon head bolts, fully threaded - width across flats s, s min, width across corners e min, head height k and fillet radius r min, product grades A and B; thread length rule b = l – a — https://openstd.samr.gov.cn/bzgk/gb/std?std_no=GB%2FT%205783-2025
- GB/T 5782-2025 Hexagon head bolts, partially threaded - the same head dimensions, plus the thread length b in three nominal-length bands ($l \leq 125$ mm, $125 < l \leq 200$ mm, $l > 200$ mm) — https://openstd.samr.gov.cn/bzgk/gb/std?std_no=GB%2FT%205782-2025
- GB/T 5785-2025 Hexagon head bolts with fine pitch thread - fine pitch options per nominal diameter and the same hex head (s, e, k unchanged) — https://openstd.samr.gov.cn/bzgk/gb/std?std_no=GB%2FT%205785-2025
- Table values are the nominal (= max) or minimum figures of the standard editions above, checked row by row against the official text. No table values are reproduced from third-party dimension tables, and every row is labelled with the standard it comes from.

Disclaimer: this table is a selection and quotation reference built from the standard editions named on this page, not a design basis or an acceptance standard.

Bolt Size Chart (Hex Bolts M1.6–M64) — Yaxiio full-range reference PDF, pack v1 · generated 2026-09-17 · data source: yaxiio-customer/utis/boltSizeDims.ts (single source of truth) · methodology matches the online tool pages · <https://www.yaxiio.com/en/tools/bolt-size-chart>