

Space-saving Screws Overview

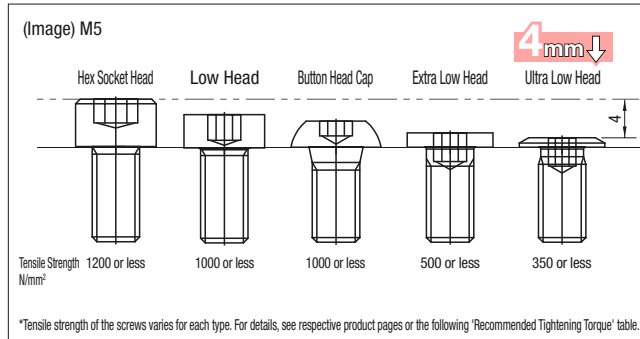
Advantages of Space-saving Screws

- Total weight of the machine is reduced due to space saved in joining parts.
- Provides shock-absorption for screw head after the design.

(Image)When changing from Hex Socket Head Cap Screws to Ultra Low Head screws, in case of M5, height of the head becomes 1mm from 5mm and thus, saves 4mm (80%) of the space.

Disadvantages of Space-saving Screws

- Reduces strength due to reduction in height of the head part.



Height of the head part (Standard E) comparison table

Product lineup	Hex Socket Head Cap Screws	Low Head Cap Screws	Button Head Cap Screws	Extra Low Head Cap Screws	Ultra Low Head Cap Screws
Photo of outer appearance					
Page	P.172, 174, 175	P.194	P.185	P.195	P.196
M Dia.	2, 2.5, 3, 4, 5, 6, 8, 10, 12	1.3, 1.6, 2, 2.8, 3.5, 4, 5, 6, 7	1.3, 1.5, 1.65, 2.2, 2.75, 3.3, 4.4, 5.5	1.1 (Min.*), 1.3 (Min.*), 1.5, 1.5, 1.5, 1.5	0.5, 0.6, 0.8, 0.9, 1, 1.2, -, -

* Height of the head part vary as per the material.

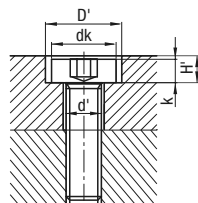
Recommended Tightening Torque (Reference)

Product lineup	Low Head Cap Screws			Extra Low Head Cap Screws		Ultra Low Head Cap Screws	
	Steel (High Strength)	Steel, Stainless Steel (High Strength)	Stainless Steel	Steel	Stainless Steel	Hex Sockets	Hexalobular
Strength Class	10.9	8.8 - A4-80	A2-50	5.8(M10 4.8)	-	-	-
Tensile Strength (N/mm ²)	1040	800	500	500(M10 400)	400	350(M2 200)	350(M2 200)
M Dia.	2, 2.5, 3, 4, 5, 6, 8, 10, 12	-, -, 0.9, 1.8, 3.6, 7.2, 10.8, 31.5	0.25, 0.42, 0.8, 1.6, 3.2, 6.5, 9.7, 28.4	0.25, 0.82, 0.9, 1.8, 3.2, 5.2, 9.0, 16.2	0.25, 0.42, 0.8, 1.6, 3.0, 5.0, 8.6, 15.4	0.178, 0.35, 0.63, 1.5, 5.2	-, -, 0.63, 1.5, 5.2

• These values are for reference. Suitable tightening torque vary according to the environment of usage.

Dimensions of counter boring and screw hole

Thread (d)	Low Head				Extra Low Head (*)				Low Head (Hex Sockets)				Ultra Low Head (Hexalobular)							
	d'	dk	k	H'	d'	dk	D'	H'	d'	dk	D'	k	H'	d'	dk	D'	k	H'		
M2	2.5	3.8	5	1.3	1.5	2.5	4	5	1.1 (1.5)	1.3 (1.7)	2.5	4	5	0.5	0.7	2.5	4	5	0.5	0.7
M2.5	3	4.5	5.5	1.6	1.8	3	5	6	1.3 (1.5)	1.5 (1.7)	3	5	6	0.6	0.8	-	-	-	-	-
M3	3.5	5.5	6.5	2	2.3	3.5	6	7	1.3 (1.5)	1.6 (1.8)	3.5	6	7	0.8	1.1	3.5	7	8	0.8	1.1
M4	4.5	7	8	2.8	3.2	4.5	8	9	1.5	1.9	4.5	8	9	0.9	1.3	4.5	8	9	0.9	1.3
M5	5.5	8.5	9.5	3.5	3.9	5.5	9	10	1.5	1.9	5.5	9	10	1	1.4	5.5	9	10	1	1.4
M6	6.5	10	11	4	4.5	6.5	10	11	1.5	2	6.5	10	11	1.2	1.7	6.5	10	11	1.2	1.7
M8	9	13	14	5	5.6	9	13	14	1.5	2.1	-	-	-	-	-	-	-	-	-	-
M10	11	16	17.5	6	6.8	11	16	17.5 (16.5)	1.5	2.3	-	-	-	-	-	-	-	-	-	-
M12	14	18	20	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



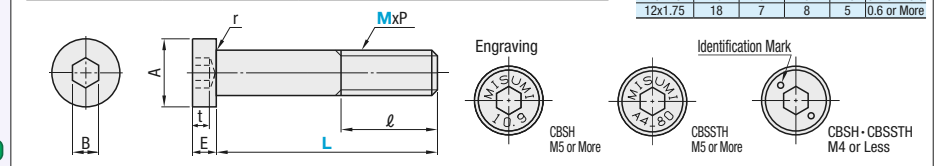
Hex Socket Low Head Cap Screws

Hex Socket Low Head Cap Screws



Type	Material	Hardness	Surface Treatment	Strength Class
CBSH (High Strength)	EN 1.7220 Equiv.	32~39HRC	Black Oxide	10.9
CBS	EN 1.1191 Equiv.(M3-8 • M12) EN 1.7220 Equiv.(M10)	22~32HRC	Black Oxide	8.8
CBSSTH (High Strength)	EN 1.4404 Equiv.	-	-	A4-80 (8.8 Equiv.)
CBSST	EN 1.4301 Equiv.	-	-	A2-50
BOX-CBSST				

MxP	A	E	B	t max.	r
2x0.4	3.8	1.3	1.3	1	0.1 or More
2.5x0.45	4.5	1.6	1.5	1.3	0.1 or More
3x0.5	5.5	2	2	1.5	0.1 or More
4x0.7	7	2.8	2.5	2.3	0.2 or More
5x0.8	8.5	3.5	3	2.7	0.2 or More
6x1.0	10	4	4	3	0.25 or More
8x1.25	13	5	5	3.8	0.4 or More
10x1.5	16	6	6	4.5	0.4 or More
12x1.75	18	7	8	5	0.6 or More



Available in Single item

Part Number	Type	Unit Price		
		M-L	Unit Price	
CBSST	2-4	-	-	
	5	-	-	
	6	-	-	
	2.5-4	-	-	
	5	-	-	
	6	-	-	
	8	-	-	
	10	-	-	
	CBSH	3-4	-	-
		5	-	-
6		-	-	
8		-	-	
10		-	-	
12		-	-	
16		-	-	
20		-	-	
CBS		4-5	-	-
		6	-	-
	8	-	-	
	10	-	-	
	12	-	-	
	16	-	-	
	20	-	-	
	25	-	-	
	CBSSTH	5-5	-	-
		6	-	-
8		-	-	
10		-	-	
12		-	-	
16		-	-	
20		-	-	
25		-	-	
CBSST		6-8	-	-
		10	-	-
	12	-	-	
	16	-	-	
	20	-	-	
	25	-	-	
	30	-	-	
	CBS	8-10	-	-
		12	-	-
		16	-	-
20		-	-	
25		-	-	
30		-	-	
35		-	-	
40		-	-	
45		-	-	
50		-	-	

Part Number	Type	Unit Price		
		M-L	Unit Price	
CBS	10-16	-	-	
	20	-	-	
	25	-	-	
	30	-	-	
	35	-	-	
	40	-	-	
	45	-	-	
	50	-	-	
	CBSST	12-20	-	-
		25	-	-
30		-	-	
35		-	-	
40		-	-	
45		-	-	
50		-	-	

Box

Part Number	Type	M-L	Unit Price		Pcs./Box.	
			Price per pkg.	1 Box		
CBS	3-6	-	-	-	-	
	8	-	-	-	-	
	10	-	-	-	1000 pcs./Box	
	12	-	-	-	-	
	16	-	-	-	-	
	20	-	-	-	-	
	CBSST	4-6	-	-	-	-
		8	-	-	-	-
		10	-	-	-	1000 pcs./Box
		12	-	-	-	-
16		-	-	-	-	
20		-	-	-	-	
CBSSTH		5-8	-	-	-	-
		10	-	-	-	-
		12	-	-	-	500 pcs./Box
		16	-	-	-	-
	20	-	-	-	-	
	BOX-CBSST (Stainless Steel)	6-8	-	-	-	-
		10	-	-	-	-
		12	-	-	-	500 pcs./Box
		16	-	-	-	-
		20	-	-	-	-
25		-	-	-	300 pcs./Box	
CBS		8-10	-	-	-	-
		12	-	-	-	300 pcs./Box
		16	-	-	-	250 pcs./Box
		20	-	-	-	200 pcs./Box
	25	-	-	-	-	
	30	-	-	-	150 pcs./Box	

Ordering Example: CBSST4-10

Mechanical Properties (Reference)

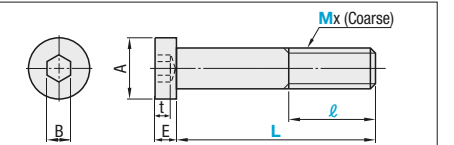
Type	Tensile Strength (N/mm ²)	0.2% Proof Stress (N/mm ²)	Corrosion Resistance	Nonmagnetic
CBSH	1040	900	△	×
CBS	800	640	△	×
CBSSTH	800	640	○	○
CBSST	500	210	○	○

○: Excellent △: Good △: Questionable ×: Inferior

Length Configurable Hex Socket Low Head Cap Screws



Type	Material	Surface Treatment	Strength Class
FCBS	EN 1.1191 Equiv.	Black Oxide	8.8
FCBSM	EN 1.1191 Equiv.	Electroless Nickel Plating	8.8
FCBSST	EN 1.4301 Equiv.	-	A2-50



Part Number	Type	M (Coarse)	L 1mm Increment	l 1mm Increment	A	E	B	t max.	Unit Price					
									L10~50			51~L Max.		
									FCBS	FCBSM	FCBSST	FCBS	FCBSM	FCBSST
FCBS FCBSM FCBSST	4	10~50	10~40	7	2.8	2.5	2.3	-	-	-	-	-	-	-
	5	10~60	10~40	8.5	3.5	3	2.7	-	-	-	-	-	-	-
	6	10~80	10~40	10	4	4	3	-	-	-	-	-	-	-
	8	10~90	10~40	13	5	5	3.8	-	-	-	-	-	-	-

• When $\ell=L$, there will be incomplete threads (2 pitches Max.) below the screw head

Ordering Example: FCBS8 - L - 38 - 10

Hex Socket Extra Low Head Cap Screws

- **Features** - Developed to reduce the screw head height space.
- They require no countersinking unlike flat head screws.

Type	Material	Hardness	Surface Treatment	Strength Class	Head Strength Class
CBSS	EN 1.7220 Equiv.	32~39HRC	Black Oxide	10.9	5.8 (M104.8)
CBSM			Bright Chromate Plating		
CBSA			Trivalent Chromate		
CBSR			Cr/Cr ₂ O ₃ Plating		
CBSTS	EN 1.4301 Equiv.	-	-	(Note 1)	-
BOX-CBSTS	-	-	-	-	-

Ⓜ CBSM is not RoHS compliant. (Note. 1) Tensile Strength of CBSTS 400N/mm²

Ⓜ The dimensions of CBSTS is shown in ().
 * The dimension for M2 Type of CBSS and CBSA is 1.1, and M2.5 Type is 1.3.
 * The dimension for M3 Type of CBSS, CBSM, CBSA and CBSR is 1.3.

Available in Single item

Type	M-L	CBSS		CBSM		CBSA		CBSR		CBSTS	
		Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate
2-3	2	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-
2.5-3	2.5	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-
3-4	3	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
4-5	4	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-
5-6	5	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-
6-6	6	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-
	14	-	-	-	-	-	-	-	-	-	-
8-6	8	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-
	14	-	-	-	-	-	-	-	-	-	-
	16	-	-	-	-	-	-	-	-	-	-
10-10	10	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-
	14	-	-	-	-	-	-	-	-	-	-
	16	-	-	-	-	-	-	-	-	-	-
	18	-	-	-	-	-	-	-	-	-	-

Available in Box

Type	M-L	Unit Price		Pcs./Box
		Price per pkg.	1 ~ 10 Box(es)	
3-5	3	-	-	500 pcs./box
	4	-	-	
	5	-	-	
	6	-	-	
	8	-	-	
	10	-	-	
	12	-	-	
	14	-	-	
	16	-	-	
	18	-	-	
4-5	4	-	-	500 pcs./box
	5	-	-	
	6	-	-	
	8	-	-	
	10	-	-	
	12	-	-	
	14	-	-	
	16	-	-	
	18	-	-	
	20	-	-	
5-6	5	-	-	500 pcs./box
	6	-	-	
	8	-	-	
	10	-	-	
	12	-	-	
	14	-	-	
	16	-	-	
	18	-	-	
	20	-	-	
	25	-	-	
6-8	6	-	-	200 pcs./box
	8	-	-	
	10	-	-	
	12	-	-	
	14	-	-	
	16	-	-	
	18	-	-	
	20	-	-	
	25	-	-	
	30	-	-	
8-10	8	-	-	150 pcs./box
	10	-	-	
	12	-	-	
	14	-	-	
	16	-	-	
	18	-	-	
	20	-	-	
	25	-	-	
	30	-	-	

Ⓜ For orders larger than indicated quantity, please check with WOS.

Ordering Example: Part Number CBSA6-12

CBSS
CBSM
CBSA
CBSR
CBSTS

Ultra Low Head Cap Screws / Dedicated Wrenches

Hex Sockets, Hexalobular

- Ⓜ Head is extremely thin. Most suitable for machine and equipment locations without clearance.

Ultra Low Head Cap Screws Hex Sockets

CBSTR

M	r (Min.)
2	0.1
2.5	0.1
3	-
4	0.2
5	0.2
6	0.25

Ⓜ Material: EN 1.4301 Equiv.

Part Number	M-L	M x P	A	B	E	t max.	(e) max.	CBSTR	
								Unit Price	Volume Discount Rate
2-3	2	2	4	1.3	0.5	1.2	1.2	-	-
	3	3	4	1.3	0.6	1.5	1.2	-	-
	4	4	5	1.3	0.6	1.5	1.2	-	-
	5	5	5	1.3	0.6	1.5	1.2	-	-
	6	6	5	1.3	0.6	1.5	1.2	-	-
	8	8	5	1.3	0.6	1.5	1.2	-	-
	10	10	5	1.3	0.6	1.5	1.2	-	-
	12	12	5	1.3	0.6	1.5	1.2	-	-
	14	14	5	1.3	0.6	1.5	1.2	-	-
	16	16	5	1.3	0.6	1.5	1.2	-	-
2.5-3	2.5	2.5	5	1.3	0.6	1.5	1.2	-	-
	3	3	5	1.3	0.6	1.5	1.2	-	-
	4	4	5	1.3	0.6	1.5	1.2	-	-
	5	5	5	1.3	0.6	1.5	1.2	-	-
	6	6	5	1.3	0.6	1.5	1.2	-	-
	8	8	5	1.3	0.6	1.5	1.2	-	-
	10	10	5	1.3	0.6	1.5	1.2	-	-
	12	12	5	1.3	0.6	1.5	1.2	-	-
	14	14	5	1.3	0.6	1.5	1.2	-	-
	16	16	5	1.3	0.6	1.5	1.2	-	-
3-5	3	3	6	1.5	0.8	2	1.4	-	-
	4	4	6	1.5	0.8	2	1.4	-	-
	5	5	6	1.5	0.8	2	1.4	-	-
	6	6	6	1.5	0.8	2	1.4	-	-
	8	8	6	1.5	0.8	2	1.4	-	-
	10	10	6	1.5	0.8	2	1.4	-	-
	12	12	6	1.5	0.8	2	1.4	-	-
	14	14	6	1.5	0.8	2	1.4	-	-
	16	16	6	1.5	0.8	2	1.4	-	-
	18	18	6	1.5	0.8	2	1.4	-	-
4-5	4	4	8	2	0.9	2.5	1.5	-	-
	5	5	8	2	0.9	2.5	1.5	-	-
	6	6	8	2	0.9	2.5	1.5	-	-
	8	8	8	2	0.9	2.5	1.5	-	-
	10	10	8	2	0.9	2.5	1.5	-	-
	12	12	8	2	0.9	2.5	1.5	-	-
	14	14	8	2	0.9	2.5	1.5	-	-
	16	16	8	2	0.9	2.5	1.5	-	-
	18	18	8	2	0.9	2.5	1.5	-	-
	20	20	8	2	0.9	2.5	1.5	-	-
5-6	5	5	9	2.5	1	3	1.8	-	-
	6	6	9	2.5	1	3	1.8	-	-
	8	8	9	2.5	1	3	1.8	-	-
	10	10	9	2.5	1	3	1.8	-	-
	12	12	9	2.5	1	3	1.8	-	-
	14	14	9	2.5	1	3	1.8	-	-
	16	16	9	2.5	1	3	1.8	-	-
	18	18	9	2.5	1	3	1.8	-	-
	20	20	9	2.5	1	3	1.8	-	-
	25	25	9	2.5	1	3	1.8	-	-
6-8	6	6	10	3	1.2	4	2.2	-	-
	8	8	10	3	1.2	4	2.2	-	-
	10	10	10	3	1.2	4	2.2	-	-
	12	12	10	3	1.2	4	2.2	-	-
	14	14	10	3	1.2	4	2.2	-	-
	16	16	10	3	1.2	4	2.2	-	-
	18	18	10	3	1.2	4	2.2	-	-
	20	20	10	3	1.2	4	2.2	-	-
	25	25	10	3	1.2	4	2.2	-	-
	30	30	10	3	1.2	4	2.2	-	-

Ⓜ For orders larger than indicated quantity, please check with WOS.

Ordering Example: Part Number CBSKE5-16, CBSTR3-8

Thread	Tightening Torque	
	N·m	N/mm ²
M2	0.16	200
M2.5	0.35	200
M3	0.6	200
M4	1.1	200
M5	2.2	200
M6	5	200

Hex Wrench

CME-□

Ⓜ Material: Tool Steel
 Ⓜ Hardness: 45~52HRC

Part Number	(L1)	(L2)	d	Unit Price	
				1 ~ 9 pc(s)	10 ~ 50 pcs.
CME-0.9	32	10	0.9	-	-
CME-1.3	41	12	1.3	-	-

Ⓜ Use CME-1.3 wrench for CBSTR M2, 2.5.
 Ⓜ For orders larger than indicated quantity, please check with WOS.

Ordering Example: Part Number CMM-5, CME-1.3

Ultra Low Head Cap Screws Hexalobular

Type	Material	Hardness	Surface Treatment
CBSSE	Cold Forged Carbon Steel Wire	HV400	Nickel Plating
CBSKE	JIS-SWCH12-18A	-	Black Nickel Plating
CBSTSE	EN 1.4301 Equiv.	-	-

M	r (Max.)
2	0.3
2.6	0.3
3	0.4
4	0.5
5	0.6
6	0.7

Ⓜ Ultra Low Head Cap Screws are fully threaded.

* Not available for L8, 10 and 12.