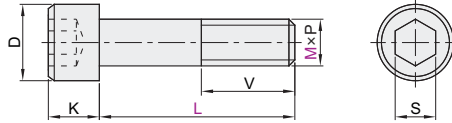


Hex Socket Head Cap Screws

Full Thread/Non-Full Thread Standard

Code	Type		Material		Surface Treatment	Strength Class
			GB	Equiv.		
TAC01	Standard	Full Thread/	ML40Cr		Black Oxide	12.9
TAC21		Non-Full Thread	0Cr18Ni9	SUS304		



Applicable Standards: DIN 912-1983
GB/T 70.1-2000



ML40Cr

Part Number	L						V	P Pitch	D	K	S	
Code	M											
TAC01	10	16 18 20 22 25 30 35 40					Full Thread	32	1.5	16	10	8
		45 50 55 60 65 70 75 80 85 90 95 100										
	12	16 20 25 30 35 40 45 50					Full Thread	36	1.75	18	12	10
		55 60 65 70 75 80 85 90 95 100										
14	14	25 30 35 40 45 50 55					Full Thread	40	2.0	21	14	12
		60 65 70 75 80 85 90 95 100										
16	16	25 30 35 40 45 50 55 60					Full Thread	44	2.0	24	16	14
		65 70 75 80 85 90 95 100										

SUS304

Part Number	L						V	P Pitch	D	K	S	
Code	M											
TAC21	10	16 18 20 25 30 35 40					Full Thread	32	1.5	16	10	8
		45 50 55 60 65 70 75 80 85 90 100										
	12	20 25 30 35 40 45 50					Full Thread	36	1.75	18	12	10
		55 60 65 70 75 80 85 90 100										
14	14	25 30 35 40 45 50 55					Full Thread	40	2.0	21	14	12
		60 65 70 75 80 85 90 100										
16	16	25 30 35 40 45 50 55 60					Full Thread	44	2.0	24	16	14
		65 70 75 80 90 100										

ML40Cr

Part Number	M	L	V
TAC01	10	16 18 20	Full Thread
	12	16 20 25	Full Thread

TAC01—M10—L50

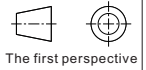
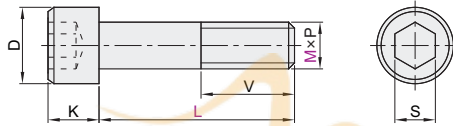


Discount price

Per	1~199	200~
Price	100%	Additional quotation



Code	Type		Sales Unit	Material		Surface Treatment	Strength Class
	Standard	Full Thread/ Non-Full Thread		GB	Equiv.		
BOX-TAC01	Standard	Full Thread/	Box	ML40Cr		Black Oxide	12.9
BOX-TAC21		Non-Full Thread		0Cr18Ni9	SUS304		



Applicable Standards: DIN 912-1983

The first perspective

Part Number	L	Pcs./Box	V	P	D	K	S	Part Number	L	Pcs./Box	V	P	D	K	S
Code	M			Pitch				Code	M			Pitch			
ML40Cr BOX-TAC01	6	2000	Full Thread	0.5	5.5	3	2.5	SUS304 BOX-TAC21	6	7000	Full Thread	0.5	5.5	3	2.5
	8								2950						
	10								5500						
	12								4800						
	16	4000													
	18	2220													
	20	3000													
	25	2400													
	30	2000													
	6	3500	20	Full Thread	0.7	7	4		6	1500					
	8	2750													
	10	2500													
	12	2000													
	16	2000													
	18	2000													
	20	1600													
	25	1500													
	30	1100													
	8	2000	22	Full Thread	0.8	8.5	5		8	2000					
	10	1700													
	12	1500													
	16	1200													
	18	1200													
	20	1100													
25	850														
30	750														
10	1100	500	Full Thread	1.0	10	6	10	1100							
12	1000														
16	800														
18	750														
20	700														
25	600														
30	500														
12	500	250	Full Thread	1.25	13	8	12	500							
16	425														
20	375														
25	300														
30	275														



Part Number	M	L
BOX-TAC01	6 8 10	16 18 20
BOX-TAC01—M3—L18		



Discount price
Per 1~30 31~
Price 100% Additional quotation.



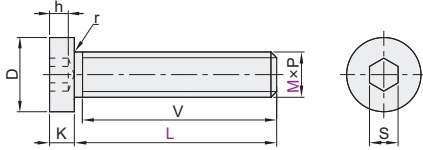
Delivery
12

Hex Socket Low Head Cap Screws Shoulder Bolts

Hex Socket Low Head Cap Screws

Code	Type	Material	Surface Treatment	Strength Class
TAF02	Low Head Type	SUS304	—	A2-70

Features: Can be used without modification in locations where the heads of conventional hexagon socket head cap screws would cause an obstruction.



Inventory



Code	Tensile Strength (N/mm ²)	0.2% Proof Stress (N/mm ²)	Corrosion Resistance	Nonmagnetic
TAF02	800	640	Excellent	Excellent



Applicable Standards: DIN 7984-2002

Part Number	L											P Pitch	V	D	K	S	h	r (min)					
Code	M																						
TAF02	3	4	5	6	8	10	12	14	16	20	0.5	Full Thread	8.5	10	13	16	18	2	2.5	1.5	0.1		
	4	6	8	10	12	0.7	2.8	3	2.3	0.2													
	5	6	8	10	12	0.8	3.5	4	2.7	0.2													
	6	8	10	12	1.0	4	5	3	3	0.25													
	8	10	12	1.25	5	6	7	4	3.8	0.4													
	10	16	20	25	30	35	40	45	1.5	7	8											4.5	0.4
	12	16	20	25	30	35	1.75	8	5	0.6													



Part Number	M	L
Code	3	6 8 10
(TAF02)	4	8 10 12
	5	8 10 12

TAF02 — M5 — L12

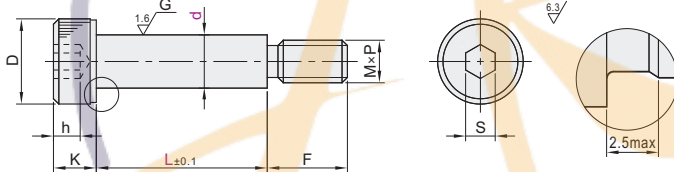


Discount price
per 1~199 200~
Price 100% Additional quotation



Shoulder Bolts

Code	Type	Tolerance Class	Material		Hardness	Strength Class
			GB	Equiv.		
TBH01	Short Head Type	—	35CrMo	SCM435	26~35HRC	9.8 Equiv.
TBH11	Standard	e9	—	—	30~39HRC	10.9 Equiv.



Inventory



Applicable Standards:
ISO 7379-1983
GB/T 5281-1985
JIS B 1175-1988



Short Head Type

Part Number	L											M	P Pitch	D	S	h	K	F							
Code	d																								
TBH01	6	10	12	16	20	25	30	35	40	45	50	55	60	70	5	0.8	10	3	2.4	4.5	9.75				
	6.5	-0.013	10	16	20	25	30	35	40	45	50	55	60	70	6	1.0	13	4	3.3	5.5	11.25				
	8	-0.049	10	12	16	20	25	30	35	40	45	50	55	60								70	80	90	
	10	16	20	25	30	35	40	45	50	55	60	70	80	90								100	110		
	13	-0.016	16	20	25	30	35	40	45	50	55	60	70	80								90	100	110	120
	16	-0.059	20	25	30	35	40	45	50	55	60	70	80	90								100	110	120	
	20	-0.020	25	30	35	40	45	50	55	60	70	80	90	100								110	120	130	
20	-0.072	40	50	60	70	80	90	100	110	120	130														

Standard

Part Number	L											M	P Pitch	D	S	h	K	F		
Code	d _{e9}																			
TBH11	4	10	15	20	25	30	35	40	45	2.5	0.45	6.5	2.5	1.6	3	5				
	4.5	10	15	20	25	30	35	40	45	50	3	0.5					7	8	3.5	6
	5	-0.020	10	15	20	25	30	35	40	45			50	4	0.7	9				
	5.5	-0.050	10	15	20	25	30	35	40	45	50	55								
	6	10	15	20	25	30	35	40	45	50	55	60	65	70						
	6.5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80				
	8	-0.025	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	100
	10	-0.061	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	100	
	12	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	100		
	13	-0.032	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	100	
	16	-0.075	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	100		
20	-0.040	40	50	60	70	80	90	100	16	2.0	27	14	9	18	24					

Short Head Type

Part Number	d	L	M
Code	6	10 12 16 20 25	5
TBH01	6.5	10 16 20 25	

TBH01 — d6 — L16



Discount price
Per 1~199 200~
Price 100% Additional quotation



TBH01

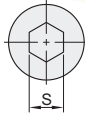
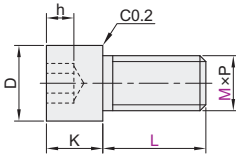
TBH11



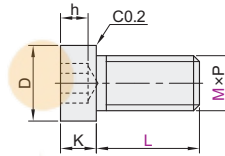
Code	Type		Material		Surface Treatment	Strength Class
			GB	Equiv.		
TBH14	Small Head Type	Full Thread	0Cr18Ni9	SUS304	—	A2-70
TBH18	Low Small Head Type	Full Thread	0Cr18Ni9	SUS304	—	A2-70



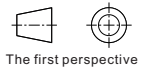
Small Head Type
TBH14



Low Small Head Type
TBH18



ⓘ The head is not knurled.



Small Head Type

Part Number		L										P Pitch	D	K	S	h
Code	M															
TBH14	3	5	6	8	10							0.5	4.5	3	2.5	1.5
	4		6	8	10	12	16	20				0.7	5.5	4	3	2
	5			8	10	12	16	20				0.8	7	5	4	2.5
	6			8	10	12	16	20	25			1.0	8.5	6	5	3
	8				10	12	16	20	25	30		1.25	10	8	6	4
	10					16	20	25	30	35		1.5	13	10	8	5
	12						20	25	30			1.75	16	12	10	6

Low Small Head Type

Part Number		L										P Pitch	D	K	S	h
Code	M															
TBH18	3	5	6	8	10							0.5	4.5	2	2	1.5
	4		6	8	10	12	16	20				0.7	5.5	2.8	2.5	2
	5			8	10	12	16	20				0.8	7	3.5	3	2.5
	6			8	10	12	16	20	25			1.0	8.5	4	4	3
	8				10	12	16	20	25	30		1.25	10	5	5	4
	10					16	20	25	30	35		1.5	13	6	6	4.5
	12						20	25	30			1.75	16	7	8	5

Small Head Type

Part Number		L									
Code	M										
TBH14	3	5	6	8							
	4		6	8	10						
	5			8	10	12					

TBH14—M3—L6



Discount price
Per 1~20 21~
Price 100% Additional quotation



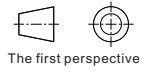
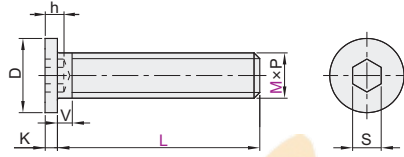
Hex Socket Head Cap Screws

- ◀ Extra Low Head Type
- ◀ Ultra Low Head Type

Extra Low Head Type

Code	Type		Material		Surface Treatment	Strength Class
			GB	Equiv.		
TAF52	Extra Low Head Type	Full Thread	0Cr18Ni9	SUS304	—	—

Features: Can be used without modification in locations while the heads of conventional hexagon socket head cap screws would cause an obstruction.



Part Number		L										P Pitch	D	K(Max)	S	h	V
Code	M																
TAF52	2	3	4	5	6	8	10	12	0.4	4	1.5	1.3	1.2	1.2			
	2.5	3	4	5	6	8	10	0.45	5	1.5	1.3	1.5	1.5				
	3	4	5	6	8	10	12	14	16	0.5	6	1.5	1.5	2	1.6		
	4	5	6	8	10	12	14	16	18	20	0.7	8	1.5	2	2.5	1.6	
	5	6	8	10	12	14	16	18	20	25	0.8	9	1.5	3	3	1.6	
	6	6	8	10	12	14	16	18	20	25	30	1.0	10	1.5	3	4	2.0
	8	8	10	12	14	16	18	20	25	30	1.25	13	1.5	4	5	2.5	
10	8	10	12	14	16	18	20	25	30	1.5	15	1.5	5	5	3.0		



Part Number	L	
Code	M	
TAF52	2.5	3 4 5 6 8 10
	3	4 5 6 8 10

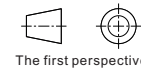
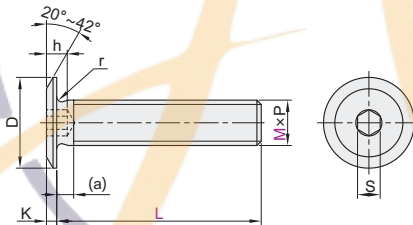
TAF52—M2.5—L6

Discount price	Per	
	1~49	80~
Price	100%	Additional quotation

Delivery
10

Ultra Low Head Type

Code	Type	Material		Surface Treatment	Strength Class
		GB	Equiv.		
TAR11	Ultra Low Head Type	0Cr18Ni9	SUS304	—	A2-70



Part Number		L										P Pitch	D	K	S	h	(a)	r min
Code	M																	
TAR11	2	3	4	5	6	8	10	0.4	4	0.5	1.27	1.2	1.2					
	2.5	3	4	5	6	0.45	5	0.6	1.27	1.5	1.2	0.1						
	3	5	6	8	10	12	16	0.5	6	0.8	1.5	2	1.4					
	4	5	6	8	10	12	16	20	25	0.7	8	0.9	2	2.5	1.5	0.2		
	5	6	8	10	12	16	20	25	0.8	9	1	2.5	3	1.8				
	6	8	10	12	16	20	25	1.0	10	1.2	3	4	2.2	0.25				



Part Number	L	
Code	M	
TAR11	4	5 6 8 10 12 16
	6	6 8 10 12 16
	6	8 10 12 16

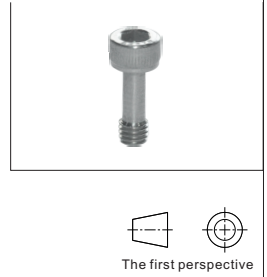
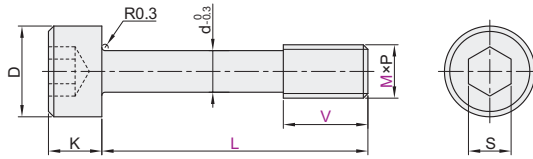
TAR11—M5—L8

Discount price	Per	
	1~19	20~
Price	100%	Additional quotation

Delivery
10

Cover Screws

Code	Type	Material		Strength Class
		GB	Equiv.	
TBH32	Cover Screws	0Cr18Ni9	SUS304	A2-70



Part Number Code	M	V	L	P Pitch	D	S	d	K
TBH32	2	2.5	4 6 8 10 12 16	0.4	3.8	1.5	1.5	2
	3	2	4 6 8 10 12 16	0.5	5.5	2.5	2.2	3
		4	8 10 12 16 20					
	4	3	6 8 10 12 16	0.7	7	3	3	4
		5	10 12 16 20					
	5	3	8 10 12 16 20	0.8	8.5	4	3.9	5
		6	12 16 20 25					
	6	4	8 10 12 16 20	1	10	5	4.5	6
		8	12 16 20 25 30					
	8	5	8 10 12 16 20	1.25	13	6	6.3	6
		10	20 25 30 40					

Please order as shown

Part Number Code	M	V	L
TBH32	2	2.5	4 6 8 10 12 15
	3	4	4 6 8 10 12 15
	4	8	8 10 12 15 20
	5	10	10 12 15 20

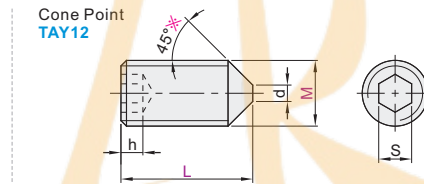
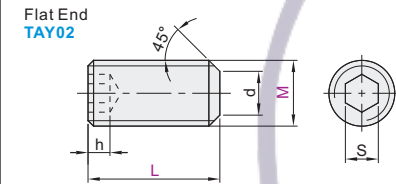
TBH32 — M3 — V4 — L8

Discount price
Per 1~99 100~
Price 100% Additional quotation

Delivery 12

Hex Socket Set Screws

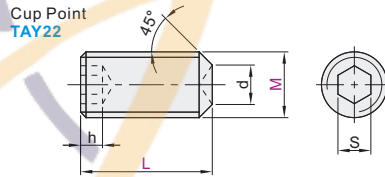
Code	Material		
	Flat End	Cone Point	Cup Point
TAY02	TAY12	TAY22	0Cr18Ni9
			SUS304



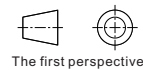
Inventory
* When M = L, the cone end angle of TAY12 is 60°.

Applicable Standards: DIN 913-1980

Applicable Standards: DIN 914-1980



Applicable Standards: DIN 916-1980



Flat End

Part Number Code	M	L	S	h	d
TAY02	2	2 3 4 5 6 8 10 12	0.8	0.8	1
	2.5	2.5 3 4 5 6 8 10 12	1.2	1.2	1
	3	3 4 5 6 8 10 12 16 20 25	1.5	1.2	2
	4	3 4 5 6 8 10 12 16 20 25 30 35 40	2	1.5	2.5
	5	3 4 5 6 8 10 12 14 16 20 25 30 35 40	2.5	2	3.5
	6	4 5 6 8 10 12 16 20 25 30 35 40 45 50	3	2	4
	8	5 6 8 10 12 16 20 25 30 35 40 45 50 60	4	3	5.5
	10	6 8 10 12 16 20 25 30 35 40 45 50 55 60	5	4	7
	12	8 10 12 16 20 25 30 35 40 45 50 55	6	4.8	8
	16	12 16 20 25 30 35 40 45 50	8	6.4	12

Cone Point

Part Number Code	M	L	S	h	d
TAY12	3	5 6 8 10 12 16 20	1.5	1.2	—
	4	3 4 5 6 8 10 12 16 20 25 30	2	1.5	—
	5	4 5 6 8 10 12 16 20 25 30 35 40	2.5	2	—
	6	4 5 6 8 10 12 16 20 25 30 35 40 45 50	3	2	1.5
	8	6 8 10 12 16 20 25 30 35 40 45 50	4	3	2
	10	8 10 12 16 20 25 30 35 40 45 50	5	4	2.5
	12	10 12 16 20 25 30 35 40 45 50	6	4.8	3
	16	12 16 20 25 30 35 40 45 50	8	6.4	3.5

Cup Point

Part Number Code	M	L	S	h	d
TAY22	2	2 3 4 5 6 8 10 12	0.9	0.8	1
	2.5	2.5 3 4 5 6 8	1.3	1.2	1.2
	3	3 4 5 6 8 10 12 16 20 25	1.5	1.2	1.4
	4	3 4 5 6 8 10 12 16 20 25 30	2	1.5	2
	5	3 4 5 6 8 10 12 16 20 25 30 35 40	2.5	2	2.5
	6	4 5 6 8 10 12 16 20 25 30 35 40 45 50	3	2	3
	8	5 6 8 10 12 16 20 25 30 35 40 45 50	4	3	5
	10	6 8 10 12 16 20 25 30 35 40 45 50	5	4	6
	12	8 10 12 16 20 25 30 35 40 45 50 55	6	4.8	8
	16	12 16 20 25 30 35 40 45 50	8	6.4	10

Please order as shown

Part Number Code	M	L
TAY02	3	3 4 5 6 8 10
	4	3 4 5 6 8 10
	5	3 4 5 6 8 10

TAY02 — M5 — L10

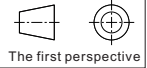
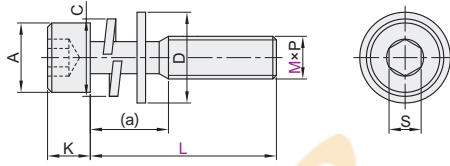
Discount price
Per 1~99 100~
Price 100% Additional quotation

Delivery 8

Washer Assembled Hexagon Socket Head Cap Screws Hex Nuts

Washer Assembled Hexagon Socket Head Cap Screws

Code	Type	Material		Surface Treatment	Strength Class
		GB	Equiv.		
TAM02	Washer Assembled Hexagon Socket Head Cap Screws	0Cr18Ni9	SUS304	—	A2-70



Part Number		L						P Pitch	A	K	S	C	D	a
Code	M													
TAM02	3	8	10	12			0.5	5.5	3	2.5	5.5	7	3	
	4	10	12	16			0.7	7	4	3	7	9	4.4	
	5	12	16	20			0.8	8.5	5	4	8.5	10	5.4	
	6	16	20	25	30		1	10	6	5	11.5	12.5	6.9	
	8	20	25	30	35		1.25	13	8	6	14.5	17	8.4	
	10	25	30	35	40		1.5	16	10	6	18	21	10	



Part Number	L						
Code	M						
TAM02	3	8	10	12			
	4	10	12	16			
	5	12	16	20			

TAM02—M3—L8



Discount price	Per	1~99	100~
Price	100%	Additional quotation	

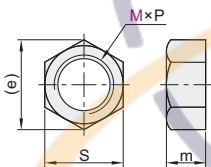


Hex Nuts

Code	Type	Thread	Material		Surface Treatment	Applicable Standards
			GB	Equiv.		
TBK55	Standard	Coarse	0Cr18Ni9	SUS304	—	DIN 934-1987
TBK01	Thin Type	Coarse	0Cr18Ni9	SUS304	—	GB/T 6172.1-2000

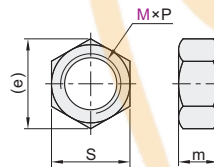


Standard
TBK55

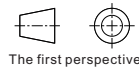


Applicable Standards:
DIN 934-1987

Thin Type
TBK01



Applicable Standards:
GB/T 6172.1-2000
ISO 4035-2001
DIN 439-2-1987
JIS B 1181-2004



Standard

Part Number		P Pitch	m	S	e
Code	M				
Coarse Thread TBK55	2	0.4	1.6	4	4.6
	2.5	0.45	2	5	5.8
	3	0.5	2.4	5.5	6.4
	4	0.7	3.2	7	8.1
	5	0.8	4	8	9.2
	6	1.0	5	10	11.5
	8	1.25	6.5	13	15.0
	10	1.5	8	17	19.6
	12	1.75	10	19	21.9
	16	2.0	13	24	27.7
	20	2.5	16	30	34.6
	24	3.0	19	36	41.6

Thin Type

Part Number		P Pitch	m	S	e
Code	M				
Coarse Thread TBK01	4	0.7	2.2	7	7.66
	5	0.8	2.7	8	8.79
	6	1.0	3.2	10	11.05
	8	1.25	4	13	14.38



Part Number	P Pitch			m
Code	M			
TBK01	4	0.7	2.2	
	5	0.8	2.7	
	6	1.0	3.2	

TBK01—M4



Discount price	Per	1~99	100~
Price	100%	Additional quotation	

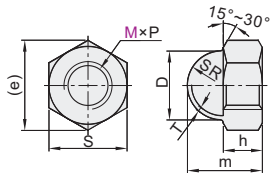


Hex Nuts ◀ Domed/U-Nut

Code	Type	Thread	Material		Surface Treatment	
			GB	Equiv.		
TBK11	Domed Nut	Coarse	0Cr18Ni9	SUS304	—	
TBK42	U-Nut					Metal Friction Ring
TBK44	U-Nut					Plastic Friction Ring

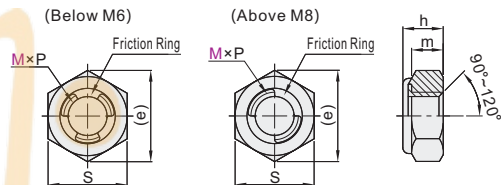


Domed Nut
TBK11



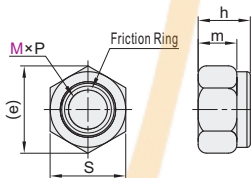
- Applicable Standards: DIN 1587-1987
- Hexagon nut section and the dome section are welded together.

U-Nut(Metal Friction Ring)
TBK42

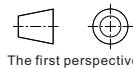


- Applicable Standards: DIN980-1987

U-Nut(Plastic Friction Ring)
TBK44



- Applicable Standards: DIN985-1987



Domed Nut

Part Number	M	P	m	h	S	D	T	e(Approx.)	SR
Code		Pitch				(max)	(min)		
TBK11	3	0.5	6	2.4	5.5	4.6	2	6.1	—
	4	0.7	8	3.2	7	6.5		7.66	3.25
	5	0.8	10	4	8	7.5		8.79	3.75
	6	1.0	12	5	10	9.5		11.05	4.75
	8	1.25	15	6.5	13	12.5	14.38	6.25	
	10	1.5	18	8	17	16	18.9	8	
	12	1.75	22	10	19	18	21.1	9	
	16	2.0	28	13	24	23	26.75	11.5	
	20	2.5	34	16	30	28	33.53	14	
	24	3.0	42	19	36	34	39.98	17	

U-Nut(Metal Friction Ring)

Part Number	M	P	S	h	m	e	Tightening Torque
Code		Pitch		(max)		(e)	N/m
TBK42	4	0.7	7	4.2	3	8.1	1.9
	5	0.8	8	5.1	3.9	9.2	3.8
	6	1.0	10	6	4.2	11.5	6.5
	8	1.25	13	8	6.1	15	16
	10	1.5	17	10	7.1	19.6	31
	12	1.75	19	12	9	21.9	55
	16	2.0	24	16	13	27.7	135

U-Nut(Plastic Friction Ring)

Part Number	M	P	m	h	S	e
Code		Pitch				(min)
TBK44	3	0.5	2.4	4	5.5	6.01
	4	0.7	2.9	5	7	7.66
	5	0.8	3.2	8	8	8.79
	6	1.0	4	6	10	11.05
	8	1.25	5.5	8	13	14.38
	10A	1.50	6.5	10	17	18.9
	12A	1.75	8	12	19	21.1
	14	2.0	9.5	14	22	24.49
	16		10.5	16	24	26.75
	18	2.5	13	18.5	27	29.56
	20		14	20	30	32.95
	24		15	24	36	39.55

Domed Nut

Part Number	M	P
Code		Pitch
TBK11	3	0.5
	4	0.7
	5	0.8

TBK11—M3



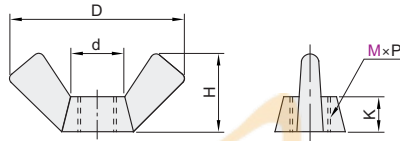
Discount price
Per 1~99 100~
Price 100% Additional quotation



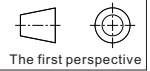
Wing Nuts/Wing Screws

Wing Nuts

Code	Type	Material		Surface Treatment
		GB	Equiv.	
TBC12	Wing Nuts	0Cr18Ni9	SUS304	—



Applicable Standards: DIN314-1999



Part Number	M	P Pitch	d (min)	K (min)	D (min)	H (min)
TBC12	4	0.7	5.5	3.2	21	11
	5	0.8	7.5	4.0	21	11
	6	1.0	9	5.0	27	13
	8	1.25	10.5	6.5	31	16
	10	1.5	14	8	36	18
	12	1.75	17	10	48	23



Part Number	M	P Pitch
TBC12	4	0.7
	5	0.8
	6	1.0

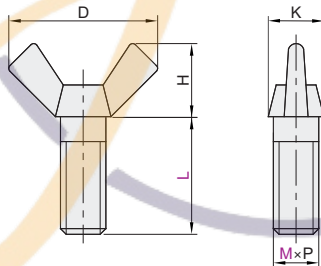
TBC12—M4

Discount price
Per 1~99 100~
Price 100% Additional quotation

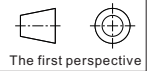
Delivery
8

Wing Screws

Code	Type	Material		Surface Treatment
		GB	Equiv.	
TBC02	Wing Screws	0Cr18Ni9	SUS304	—



Applicable Standards: JIS B 1184-1994



Part Number	M	L	P Pitch	K (max)	D	H
TBC02	3	6 8 10 12	0.5	3	17	9
	4	8 10 12 16 20 25 30	0.7	8	21	11
	5	8 10 12 16 20 25 30 35	0.8	11	21	11
	6	10 12 16 20 25 30 35 40 50	1.0	13	27	13
	8	12 16 20 25 30 35 40 50	1.25	16	31	16
	10	20 30 40 50	1.5	20	36	18



Part Number	M	L
TBC02	4	6 8 10 12
	5	8 10 12 15 20 25 30
	6	10 12 15 20 25 30 35

TBC02—M3—L10

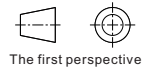
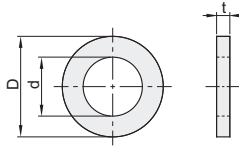
Discount price
Per 1~99 100~
Price 100% Additional quotation

Delivery
8

Flat Washers/Spring Washers

Flat Washers

Code	Type	Material		Surface Treatment	Applicable Standards
		GB	Equiv.		
TBN02	Standard	0Cr18Ni9	SUS304	—	DIN 125-1900



Part Number		d	D	t
Code	Nominal Diameter			
TBN02	2	2.2	5	0.3
	2.5	2.7	6	
	2.6	2.8	7	
	3	3.2	7	0.5
	3.5	3.7	8	
	4	4.3	9	0.8
	5	5.3	10	1
	6	6.4	12	
	8	8.4	16	1.6
	10	10.5	20	2
	12	13	24	
	14	15	28	2.5
	16	17	30	
	18	19	34	
	20	21	37	3
	22	23	39	
24	25	44	4	



Part Number		d	D
Code	Nominal Diameter		
TBN02	2	2.2	5
	2.5	2.7	6
	2.6	2.8	7

TBN02-2



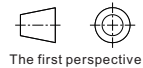
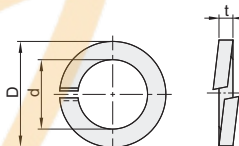
Discount price

Per	1~99	100~
Price	100%	Additional quotation



Spring Washers

Code	Type	Material		Surface Treatment	Applicable Standards
		GB	Equiv.		
TBN42	Standard	0Cr18Ni9	SUS304	—	DIN 127-1987



Part Number		d	D	t
Code	Nominal Diameter			
TBN42	2	2.1	4.4	0.5
	2.5	2.6	5.1	0.6
	3	3.1	6.2	0.8
	4	4.1	7.6	0.9
	5	5.1	9.2	1.2
	6	6.1	11.8	1.6
	8	8.1	14.8	2.0
	10	10.2	18.1	2.2
	12	12.2	21.1	2.5
	16	16.2	27.4	3.5
	20	20.2	33.6	4
	24	24.5	40.0	5
	30	30.5	48.2	6



Part Number		d	D
Code	Nominal Diameter		
TBN42	2	2.1	4.4
	2.5	2.6	5.1
	3	3.1	6.2

TBN42-2

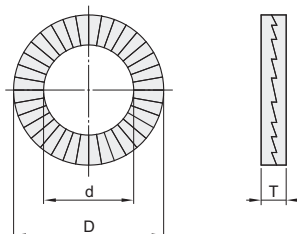


Discount price

Per	1~99	100~
Price	100%	Additional quotation

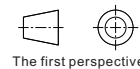


Code	Type	Material	Hardness	Heat-resistant Temperature
TBQ01	Lock Washers	Stainless Steel	HRC49~	-160~500°C



I This product is to be used in pairs.

I Applicable Standards: DIN25201



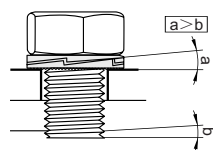
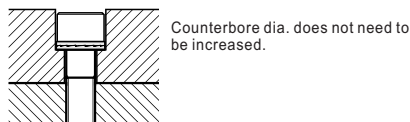
Part Number Code	No.	Applicable Screw	d	D	T Thickness
	4	M4	4.4	7.6	
	5	M5	5.4	9	
	6	M6	6.5	10.8	
	8	M8	8.7	13.5	2.0
	10	M10	10.7	16.6	
	11	M11	11.4	18.5	2.2
	12	M12	13.0	19.5	2.0
	14	M14	15.2	23	3.0
	16	M16	17.0	25.4	
	18	M18	19.5	29	3.2
	20	M20	21.4	30.7	3.0
	22	M22	23.4	34.5	
	24	M24	25.3	39	3.2
	27	M27	28.4	42	6.8
	30	M30	31.4	47	

Principle of Lock Washers

A pair of washers with wedge cams on one side and radial ribs on the other side each to compose a self-locking arrangement. Cam angle(a) is set to be larger than the thread lead angle(b). When the screw begins to rotate loose, a force is generated by a cam member to push up and separate from the opposite cam member. The rotation is blocked by the wedge effect and the cams will not be separated by more than one thread pitch.

Proper installation and Cautions on Repeated Use.

Upon reusing, please confirm the cams are not worn or cracked, and follow the installation instructions below. Do not use together with other washers. When using it again, it is recommended to use lubricating oil.



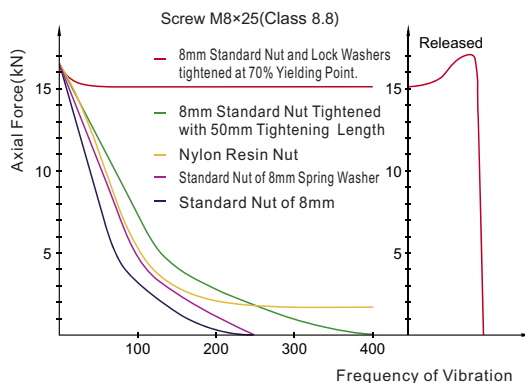
Q Recommended Tightening Torque and Tightening Force
please refer to the values listed below as guidelines when securing a screw with a lock washer. There is no self-locking effect when the values are far below recommended values. If the tightened torque exceeds the recommended values, loosening the screws may become impossible or Lock Washers may be broken.

Q Recommended Tightening Torque and Tightening Force. GTP600=Lubricant

No.	Applicable Screw (M×Pitch)	Screw Strength Class A2-50, A4-50 G _F =0.65 μ _{th} =0.14, μ _b =0.15		Screw Strength Class A2-70, A4-70 G _F =0.65 μ _{th} =0.14, μ _b =0.15		Screw Strength Class A2-80, A4-80 G _F =0.65 μ _{th} =0.14, μ _b =0.15	
		Torque (Nm)	Tightening Force (kN)	Torque (Nm)	Tightening Force (kN)	Torque (Nm)	Tightening Force (kN)
		3	3×0.5	0.4	0.7	0.9	1.5
4	4×0.7	0.9	1.2	2	2.6	2.7	3.4
5	5×0.8	1.8	1.9	3.9	4.1	5.3	5.5
6	6×1.0	3.2	2.7	6.9	5.9	9.2	7.8
8	8×1.25	7.7	5	17	11	22	14
10	10×1.5	15	8	33	17	43	23
12	12×1.75	26	12	56	25	75	33
14	14×2.0	42	16	89	34	119	45
16	16×2.0	64	21	136	46	181	61
18	18×2.5	89	26	191	56	254	75
20	20×2.5	125	33	267	72	356	95
22	22×2.5	170	41	364	89	485	118
24	24×3.0	214	48	460	103	613	137
27	27×3.0	313	63	671	134	895	179
30	30×3.5	427	77	915	164	1220	219

G_F=Coefficient at the Yield Point μ_{th}=Coefficient of Friction at Screw Thread
μ_b=Coefficient of Friction in Washer
1N=0.2251B 1Nm=0.738ft·lb

Junker Test Result



Part Number	
Code	No.
TBQ01	3
	4
	5

TBQ01-4



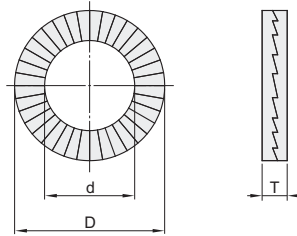
Discount price		
Per	1~99	100~
Price	100%	Additional quotation



Delivery
8

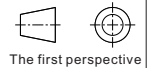
Lock Washers ← Carbon Steel

Code	Type	Material	Surface Treatment	Hardness	Heat-resistant Temperature
TBQ11	Lock Washers	Carbon Steel	Dacromet Plating	HRC44~	20~200°C



T This product is to be used in pairs.

T Applicable Standards : DIN25201



Part Number		Applicable Screw	d	D	T Thickness
Code	No.				
TBQ11	3	M3	3.4	7	1.8
	4	M4	4.4	7.6	
	5	M5	5.4	9	
	6	M5	6.5	10.8	
	8	M8	8.7	13.5	2.5
	10	M10	10.7	16.6	
	12	M12	13.0	19.5	
	14	M14	15.2	23	
	16	M16	17.0	25.4	3.4
	18	M18	19.5	29	
	20	M20	21.4	30.7	
	22	M22	23.4	34.5	
	24	M24	25.3	39	5.8
	27	M27	28.4	42	
30	M30	31.4	47		

Recommended Tightening Torque and Tightening Force

No.	Applicable Screw (M×Pitch)	Screw Strength Class:10.9 with Carbon Steel Washer Recommended Tightening Torque and Tightening Force				Screw Strength Class:12.9 with Carbon Steel Washer Recommended Tightening Torque and Tightening Force			
		Lubricant Oil, GF=71% $\mu_{th}=0.13, \mu_b=0.14$		GTP600, GF=75% $\mu_{th}=0.08, \mu_b=0.13$		Lubricant Oil, GF=71% $\mu_{th}=0.13, \mu_b=0.12$		GTP600, GF=75% $\mu_{th}=0.08, \mu_b=0.11$	
		Torque (Nm)	Tightening Force (kN)	Torque (Nm)	Tightening Force (kN)	Torque (Nm)	Tightening Force (kN)	Torque (Nm)	Tightening Force (kN)
3	3×0.5	1.8	3.2	1.6	3.4	2.0	3.9	1.7	4.1
4	4×0.7	4.1	5.6	3.6	5.9	4.6	6.7	4.0	7.1
5	5×0.8	8.1	9.1	7	9.6	9.1	10.9	7.7	11.5
6	6×1.0	14.1	12.9	12.3	13.6	15.8	15.4	13.5	16.3
8	8×1.25	34	23	30	25	38	28	32	30
10	10×1.5	67	37	58	39	75	44	64	47
12	12×1.75	115	54	99	57	128	65	109	68
14	14×2.0	183	74	158	78	204	89	174	94
16	16×2.0	279	100	240	106	311	120	263	127
18	18×2.5	391	123	337	130	437	148	370	156
20	20×2.5	547	156	470	165	610	188	515	198
22	22×2.5	745	194	639	205	831	233	699	246
24	24×3.0	942	225	809	238	1052	270	887	286
27	27×3.0	1375	294	1176	310	1533	352	1288	372
30	30×3.5	1875	358	1608	378	2091	430	1761	454

GTP600=Lubricant 1Nm=0.2251b

GF=Coefficient at the Yield Point 1Nm=0.738ft-1b

μ_{th} =Coefficient of Friction at Screw Thread

μ_b =Coefficient of Friction in Washer



Part Number	Applicable Screw
TBQ11	M3
TBQ11	M4
TBQ11	M5

TBQ11-4



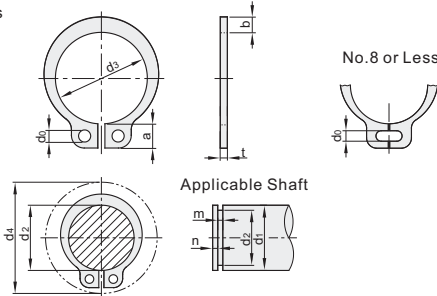
Discount price
Per 1~99 100~
Price 100% Additional quotation



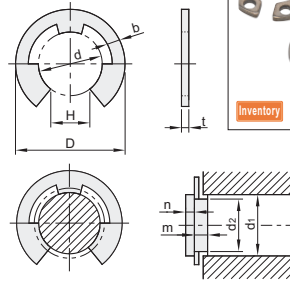
Delivery
8

Code		Material		Hardness	Surface Treatment
C-Rings	E-Rings	GB	Equiv.		
TBP02	TBP12	3Cr13	SUS420J2	34~42HRC	—

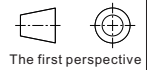
C-Rings
TBP02



E-Rings
TBP12



Inventory



The first perspective

① d4: Maximum outer diameter when retaining ring is fitted on d1 (Clearance outer diameter).

② Applicable Standards: JIS B 2804-2001

③ Applicable Standards: JIS B 2804-2001
GB/T 896-1986

C-Rings

Part Number Code	No.	Retaining Ring							Applicable Shaft(Reference)						
		d _s	t	b(≈)	a(≈)	d _o (min.)	d ₄	d ₁	d ₂	m	n(min.)				
TBP02	5	4.7	+0.04 -0.15	0.6		1.1	2.4	0.8	10.5	5	4.8	0	0.7		0.3
	6	5.6		0.7		1.3	2.8		12	6	5.7	-0.04	0.8	+0.1 0	
	7	6.5	+0.06 -0.20	0.8	±0.04	1.4	3		14	7	6.7		0.9		0.5
	8	7.4				1.6	3	1	15	8	7.6	0			
	9	8.4					3.2		16	9	8.6	-0.06			0.6
	10	9.3					3		17	10	9.6	-0.09			
	11	10.2	±0.15			2	3.1		18	11	10.5				
	12	11.1		1	±0.05	2.1	3.2		19	12	11.5		1.15		
	13	12				2.1	3.3	1.5	20	13	12.4				
	14	12.9					3.4		22	14	13.4				
	15	13.8				2.2	3.5		23	15	14.3	0			1.5
	16	14.7	±0.18				3.6		24	16	15.2	-0.11			
	17	15.7					3.7		25	17	16.2				
	18	16.5				2.6	3.8		26	18	17				
	19	17.5							27	19	18				
	20	18.5							28	20	19				
	21	19.5		1.2		2.7	3.9		30	21	20		1.35		
	22	20.5				2.7	4		31	22	21				
	24	22.2				2.9	4.1		33	24	22.9				
	25	23.2					4.2		34	25	23.9	0	+0.14 0	1.7	
	26	24.2	±0.2		±0.06	3.1	4.3		35	26	24.9	-0.21			
	28	25.9					4.4		38	28	26.6				
	29	26.9					4.6		39	29	27.6				2.1
	30	27.9				3.5	4.7		40	30	28.6		(1.75)		
	32	29.6		(1.6)			4.8		43	32	30.3				
	34	31.5					5		45	34	32.3				2.6
	35	32.2				4	5.3		46	35	33				
	36	33.2	±0.25				5.4		47	36	34				
	38	35.2					5.6		50	38	36				3
	40	37					5.8		53	40	38				
	42	38.5		1.8		4.5	6.2		55	42	39.5	0	1.95		
	45	41.5				4.5	6.3		58	45	42.5	-0.25			
	47	43.4				4.8	6.6		61	47	44.5				3.8
	48	44.5					6.5		62	48	45.5				
	50	45.8					6.7		64	50	47				
52	47.8					6.8		66	52	49					
55	50.8				5	7		70	55	52		2.2			
56	51.8		2					71	56	53					
58	53.8						5.5	7.1		73	58	55			
60	55.8					7.2		75	60	57	0	+0.14 0			
65	60.8	±0.45				7.4		81	65	62	-0.3				
68	63.5		2.5	±0.08	6.4	7.8		84	68	65		2.7			
70	65.5				6.4	7.8		86	70	67					
80	74.5				7.4	8.2		97	80	76.5				5.3	
105	98	±0.55	4	±0.09	9.5	9.8	4	125	105	101	0 -0.54	4.2	+0.18 0	6	

① () Thickness (t) = 1.6mm, for the time being it can be regarded as 1.5mm, at this time m = 1.65.

E-Rings

Part Number Code	No.	Retaining Ring							Applicable Shaft(Reference)								
		d	D	H	t	d ₁ Class	d ₂	m	n (min.)								
TBP12	1.2	1.2		3	±0.1	1		0.3	±0.025	1.4	2	1.23		0.4		0.6	
	1.5	1.5		4		1.3				2	2.5	1.53		+0.05 0		0.8	
	2	2	0	5		1.7	0	0.4	±0.03	2.5	3.2	2.05	+0.06 0	0.5		1	
	2.5	2.5		6		2.1				3.2	4	2.55				1	
	3	3		7		2.6				4	5	3.05				1	
	4	4		9		3.5				5	7	4.05		0.7		1.2	
	5	5	0	11	±0.2	4.3	0	0.6	±0.04	6	8	5.05	+0.075 0				
	6	6	-0.12	12		5.2	0	-0.30			7	9	6.05		+0.1 0		1.2
	7	7		14		6.1					8	11	7.1				1.5
	8	8	0	16		6.9	0	-0.35	0.8		9	12	8.1	+0.09 0	0.9		1.8
9	9	-0.15	18		7.8					10	13	9.1				2.1	

☎ Please order as shown

☑ C-Rings
Part Number
Code No.
TBP02 5
TBP02 — 6

☑ E-Rings
Part Number
Code No.
TBP12 5
TBP12 — 1.5

💰 Discount price
Per 1~499 500~
Price 100% Additional quotation

🚚 Delivery
8

Internal Retaining Rings

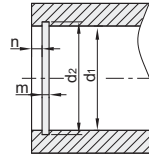
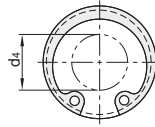
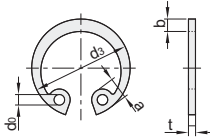
◀ C-Rings
Japanese Standard



Inventory

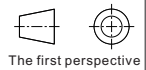
Retaining Rings Size

Applicable Hole



① d4: Minimum circumferential diameter when retaining ring fits inside d1 (Clearance inner diameter).

② Applicable Standards: JIS B 2804-2001



Part Number		Retaining Ring						Reference	Applicable Bore (Reference)				
Code	No.	d ₃	t	b (≈)	a (≈)	d ₀ (min.)	d ₄	d ₁	d ₂	m	n (min.)		
TBP22	6	6.7	0.4	±0.03	0.7	1.6	0.8	2.5	6	6.25	+0.04	0.5	+0.10 0
	7	7.7			0.8	1.7		3	7	7.3			
	8	8.8			0.9	1.7		3.5	8	8.4			
	9	9.8	0.6	±0.04	1.1	2.2	1.2	4	9	9.4	0.7	0.6	
	10	10.7			1.5	2.8		4	10	10.4			
	11	11.8			±0.18	1.5		3	4	11			11.4
	12	13	1	±0.05	1.7	3.1	1.7	5	12	12.5	1.15		
	13	14.1			1.7	3.1		6	13	13.6		+0.11 0	
	14	15.1			1.9	3.6		7	14	14.6			
	15	16.2	±0.2	±0.05	1.9	3.6	2	8	15	15.7	1.35		
	16	17.3			1.9	3.7		8	16	16.8			
	17	18.3			1.9	3.8		9	17	17.8			
	18	19.5	±0.25	±0.06	2.4	4	2.5	10	18	19	1.95		
	19	20.5			2.5	4		11	19	20		+0.21 0	
	20	21.5			2.5	4		12	20	21			
	22	23.5	(1.6)	±0.06	2.5	4.1	2.5	13	22	23	(1.75)	+0.14 0	
	24	25.9			2.5	4.3		15	24	25.2			
	25	26.9			3	4.4		16	25	26.2			
	26	27.9	±0.4	±0.07	3	4.6	2.5	16	26	27.2	2		
	28	30.1			3	4.6		18	28	29.4			
	30	32.1			3	4.7		20	30	31.4			
	32	34.4	±0.45	±0.08	3.5	5.2	3	21	32	33.7	2.7	2.5	
	34	36.6			3.5	5.2		23	34	35.7			
	35	37.8			3.5	5.2		24	35	37			
	36	38.8	±0.55	±0.09	3.5	5.2	3	25	36	38	3.2	+0.18 0	
	37	39.8			3.5	5.2		26	37	39			
	38	40.8			4	5.3		27	38	40			+0.25 0
	39	42.5	4	5.4	27	39	41.2						
	40	43.5	±0.08	±0.08	4	5.7	3	28	40	42.5	2.2		
	42	45.5			4	5.7		30	42	44.5			
45	48.5	4.5			5.7	33		45	47.5				
46	49.5	±0.08	±0.08	4.5	5.7	3	33	46	48.5	1.95			
47	50.5			4.5	6.1		34	47	49.5				
48	51.5			4.5	6.1		35	48	50.5				
50	54.2	±0.45	±0.07	4.5	6.5	2.5	37	50	53	2.2			
52	56.2			5.1	6.5		39	52	55				
55	59.2			5.1	6.5		41	55	58				
56	60.2	±0.08	±0.08	5.1	6.6	3	42	56	59	2.2			
58	62.2			5.1	6.6		44	58	61				
60	64.2			5.5	6.8		46	60	63		+0.30 0		
62	66.2	5.5	6.9	48	62	65							
63	67.2	±0.08	±0.08	5.5	6.9	3	49	63	66	2.7			
65	69.2			6	7.4		50	65	68				
68	72.5			6	7.4		53	68	71				
70	74.5	±0.55	±0.09	6	7.4	3	55	70	73	3.2			
72	76.5			6.6	7.4		57	72	75				
75	79.5			6.6	7.8		60	75	78				
80	85.5	±0.08	±0.08	7	8	3	64	80	83.5	2.5			
85	90.5			7	8		69	85	88.5				
90	95.5			7.6	8.3		73	90	93.5		+0.35 0		
95	100.5	8	8.5	77	95	98.5							

① () Thickness (t) = 1.6mm, for the time being it can be regarded as 1.5mm, at this time m = 1.65.



Please order as shown

Part Number	No.
Code	6
(TBP22)	7
	8

TBP22 — 6



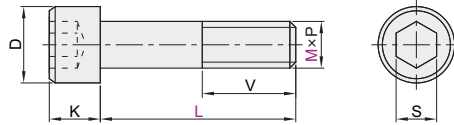
Discount price
Per 1~499 500~
Price 100% Additional quotation



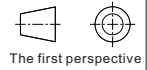
Delivery
8

Resin Hex Socket Head Cap Screws

Code	Type	Material
TAB01	Resin Hex Socket Head Cap Screws	PEEK (Polyetheretherketone)
TAB02		PPS (Polyphenylenesulfide)
TAB03		RENY (Glassfiber Reinforced Polyamide MXD6)



Applicable Standards: DIN 912-1983
GB/T 70.1-2000



Part Number		L					V	P Pitch	D	K	S	
Code	M											
(PEEK)TAB01	3	8	10	16	20	Full Thread	0.5	5.5	3	2.5		
	4	10	16	20	25		30	0.7	7	4	3	
	5	10	16	20	25		30	0.8	8.5	5	4	
	6	10	16	20	25		30	35	1.0	10	6	5
	8	16	20	25	30		35	40	1.25	13	8	6
	10	30	35	40	45		50	1.5	16	10	8	

Part Number		L					V	P Pitch	D	K	S		
Code	M												
(PPS)TAB02	3	6	8	10	12	16	20	Full Thread	0.5	5.5	3	2.5	
	4	6	8	10	12	16	20		0.7	7	4	3	
	5	8	10	12	16	20	25		30	0.8	8.5	5	4
(RENY)TAB03	6	10	12	16	20	25	30	35	40	1.0	10	6	5
	8	16	20	25	30	35	40	1.25	13	8	6		

Performance of Resinous Screws

Strength	RENY>PPS>PEEK>PPS Non-Glassfiber
Heat Resistance	PPS+PPSNon-Glassfiber>PEEK>RENY
Chemical Resistance	PEEK>PPS+PPS Non-Glassfiber>RENY

Technical Data

Material	RENY	PPS+PPS Non-Glassfiber	PEEK
Operating Temperature(°C)	105	200	180
Combustion Performance	UL94HB	UL94V-0	UL94V-0

RENY&PPS contain Glassfiber



Part Number		L					V
Code	M						
(TAB0)	3	10	16	20		Full Thread	
	4	10	16	20			
	5	10	16	20			

TAB01—M3—L16



Discount price	
Per	1~99 100~
Price	100% Additional quotation



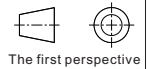
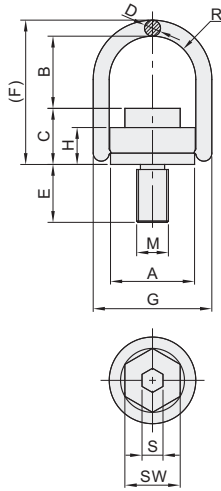
Delivery
10

Flexible Eye Bolt

Code	Type	Material	Surface Treatment
TCC16	Flexible Eye Bolt	Alloy Steel	Baked Paint



Inventory



The first perspective

Part Number	Safety Coefficient	Locking Torque (N/m)	M	A	B	C	D	E	F	G	H	R	S	SW	Net Weight (kg)		
TCC16	4	30	8		42	28		12						13	0.3		
		60	10	33	41	29	11	15	80	58	23	17	6	17			
		100	12		40	31			18					8		19	
		120	14		56	45		21								22	
		150	16	51	54	46	17	24	117	90	36	27	10	24		0.9	
		200	18	65	78	57	20	27	153	108	44	34				30	1.9
		250	20	51	52	49	17	30	117	90	36	27	12			1	
		400	24	72	81	59	22	36	162	125	44	37	14			36	2.6

Working Load Limit

Part Number	Code	No.	Thread	Working Load Limit (T)									
				1	2	1	2	2	2	2	3~4	3~4	3~4
TCC16	4	0.5T	M8	0.8	1.6	0.5	1	0.7	0.5	0.5	1.1	0.8	0.5
		0.7T	M10	1.2	2.4	0.7	1.4	1	0.7	0.7	1.5	1.1	0.7
		1.0T	M12	2	4	1	2	1.4	1	1	2.1	1.5	1
		1.5T	M14	2.4	4.8	1.5	3	2.1	1.5	1.5	3.2	2.3	1.5
		2.0T	M16	3.2	6.4	2	4	2.8	2	2	4.2	3	2
		2.5T	M18	5	10	2.5	5	3.5	2.5	2.5	5.3	3.8	2.5
		3.0T	M20	5.6	11.2	3	6	4.2	3	3	6.3	4.5	3
		5.0T	M24	9.2	18.4	5	10	7	5	5	10.5	7.5	5



Part Number	Safety Coefficient
TCC16	4



Discount price
Per 1~19 Price 100%
20~ Additional quotation

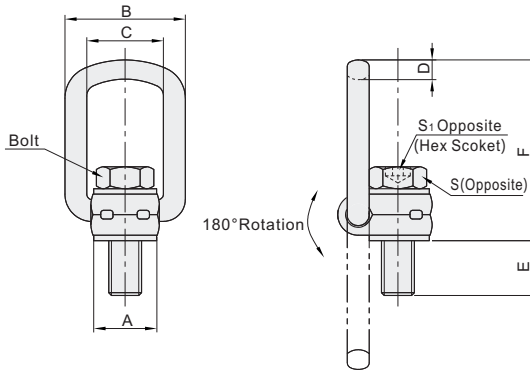


Delivery
8

TCC16-0.5T

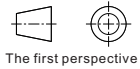
Load Ring

Code	Type	Material	Surface Treatment
TCC51	Load Ring	Alloy Steel	Baked Paint



Features

- The forged alloy steel used on the lifting ring has been quenched and tempered; the lifting ring can rotate 360° in a full circumference, and has the function of rotating around the axis with a 180° fulcrum.
- Verify that the load is 2.5 times the working load limit, and relevant certification has been obtained;
- Carry out 20,000 fatigue limit tests with 1.5 times the working load limit;
- Vertical flip up to 100%, the maximum angle of limit is 90 degrees;
- The product has been tested by 100% magnetic particle inspection.



The first perspective

Part Number		Safety Coefficient	Locking Torque (N/m)	Bolt Dimensions	C	E	A	B	D	F	S ₁	S	Net Weight (kg)
Code	No.												
TCC51	0.3T	4	30	M8-L40	35	11	30	55	10	85	6	13	0.2
	0.63T		60	M10-L45		16						17	0.3
	1T		100	M12-L60		18						19	
	1.2T		120	M14-L60	37	21	33	57	13.5	98	10	22	0.5
	1.5T		150	M16-L60		24						24	
	2T		200	M18-L60	26							27	
	2.5T		250	M20-L80	54	30	50	82	16.5	140	12	30	1.3
	4T		400	M24-L80		36							

Working Load Limit

Hanging Ring Way To Install	G		A		G		A		B		G		B		G	
	1	2	1	2	2	2	2	2	3~4	3~4	3~4	3~4	3~4	3~4	3~4	
Number of Legs	1	2	1	2	2	2	2	2	2	3~4	3~4	3~4	3~4	3~4	3~4	
Load Direction	0°	0°	90°	90°	0~45°	45~60°	Asymmetry	Asymmetry	0~45°	45~60°	Asymmetry	Asymmetry	Asymmetry	Asymmetry	Asymmetry	
Part Number		Thread	Working Load Limit(T)													
Code	No.															
TCC51	0.3T	M8	0.3	0.6	0.3	0.6	0.42	0.3	0.3	0.63	0.45	0.3				
	0.63T	M10	0.63	1.26	0.63	1.26	0.88	0.63	0.63	1.32	0.95	0.63				
	1T	M12	1	2	1	2	1.4	1	1	2.1	1.5	1				
	1.2T	M14	1.2	2.4	1.2	2.4	1.7	1.2	1.2	2.5	1.8	1.2				
	1.5T	M16	1.5	3	1.5	3	2.1	1.5	1.5	3.1	2.2	1.5				
	2T	M18	2	4	2	4	2.8	2	2	4.2	3	2				
	2.5T	M20	2.5	5	2.5	5	3.5	2.5	2.5	5.2	3.7	2.5				
	4T	M24	4	8	4	8	5.6	4	4	8.4	6	4				



Part Number		Safety Coefficient
Code	No.	
0.3T		4
0.63T		

TCC51 - 0.3T



Discount price	
Per	1~19 20~
Price	100% Additional quotation.

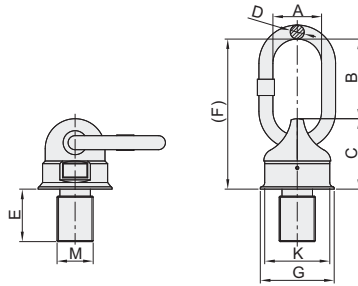


Delivery	
	8

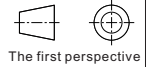
Hanging Ring With Bearing/Lifting Eye Bolts

❑ Hanging Ring With Bearing

Code	Type	Material	Surface Treatment
TCF32	Hanging Ring With Bearing	Alloy Steel	Baked Paint



Inventory



The first perspective

Part Number		M	A	B	C	D	E	F	G	K	Net Weight (kg)
Code	No.										
TCF32	0.4T	8	29	32	40	8	12	72	35	30	0.2
	0.6T	10					15				0.3
	0.7T	12	35		45	10	18	95	40	36	0.84
	1.5T	16		50	54		24	104	46	41	1.3
	2.5T	20	38		68	13	30	122	62	55	1.4
	4T	24	40	66	88	19	36	154	78	70	2.6

❑ Working Load Limit

Hanging Ring Way To Install	Working Load Limit (T)											
	1	2	1	2	2	2	2	3~4	3~4	3~4		
Number of Legs	1	2	1	2	2	2	2	3~4	3~4	3~4		
Load Direction	0°	0°	90°	90°	0~45°	45~60°	Asymmetry	0~45°	45~60°	Asymmetry		
Part Number	Working Load Limit (T)											
Code	No.	Thread										
TCF32	0.4T	M8	0.6	1.2	0.4	0.8	0.4	0.3	0.3	0.6	0.4	0.3
	0.6T	M10	0.9	1.8	0.6	1.2	0.6	0.4	0.4	0.9	0.6	0.4
	0.7T	M12	1.2	2.4	0.7	1.5	0.8	0.6	0.6	1.2	0.9	0.6
	1.5T	M16	2.6	5.2	1.5	3	1.8	1.3	1.3	2.7	1.9	1.3
	2.5T	M20	4	8	2.5	5	2.8	2	2	4.2	3	2
	4T	M24	7	14	4	8	4.9	3.5	3.5	7.3	5.2	3.5



Please order as shown

Part Number	
Code	No.
TCF32	0.4T
	0.6T

TCF32 — 0.4T



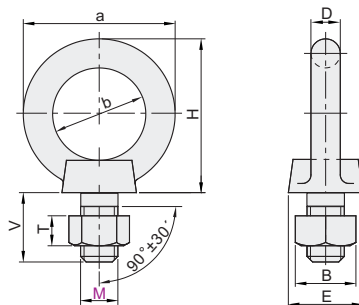
Discount price	
Per	Additional quotation
1~19	20~
Price 100%	



Delivery 8

❑ Lifting Eye Bolts

Code	Type	Material		Surface Treatment	Accessories
		GB	Equiv.	Zinc-plated	
TBF01	Lifting Eye Bolts	Q235	SS400	Zinc-plated	Nut 1 pc.
TBF02		0Cr18Ni9	SUS304	—	



Inventory

❑ Applicable standards of this product:
GB/T 825-1988
DIN 580-2010
JIS B 1168-1994



The first perspective

Part Number	Load (T)	P Pitch	a	b	D	E	H	V	Nut	
									B	T
TBF01 TBF02	6	0.14	1.0	36.3	19.7	8.3	20.3	36	10	5
	8		1.25					37.5	13	6.5
	10	0.23	1.5	45.3	24.7	10.3	25.3	46.5	17	8
	12	0.34	1.75	54.3	29.7	12.3	30.3	55	20.5	10
	16	0.7	2.0	63.3	34.7	12.5	35.3	64.5	27	13
	20	1.2	2.5	72.3	39.7	16.3	40.3	75	30	17



Please order as shown

Part Number	
Code	M
TBF01	8
TBF02	10
	12

TBF01 — M8



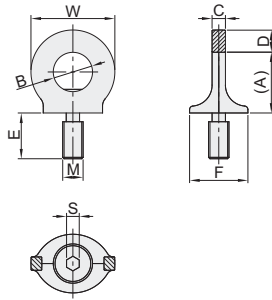
Discount price	
Per	Additional quotation
1~49	50~
Price 100%	



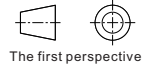
Delivery 8

Rotary Eye Bolt

Code	Type	Material	Surface Treatment
TCF42	Rotary Eye Bolt	Alloy Steel	Baked Paint



Inventory



Part Number		M	A	B	C	D	E	F	S	W	Net Weight (kg)
Code	No.										
TCF42	0.3T	8	36	25	8	9	12	25	6	44	0.1
	0.4T	10					15				
	0.75T	12	45	30	10	11	18	33	8	52	0.2
	1.5T	16	52	35	14	13	24	35	10	61	0.3
	2.3T	20	60	40	16	15	30	44	12	70	0.6
3.2T	24	72	48	19	18	36	52	14	84	1.0	

Working Load Limit

Hanging Ring Way To Install	Number of Legs		Load Direction		Working Load Limit(T)							
	Code	No.	Thread									
TCF42	0.3T	M8	1	2	0.3	0.6	0.42	0.3	0.3	0.63	0.45	0.3
	0.4T	M10	1	2	0.4	0.8	0.56	0.4	0.4	0.8	0.6	0.4
	0.75T	M12	2	4	0.75	1.5	1	0.75	0.75	1.5	1.1	0.75
	1.5T	M16	4	8	1.5	3	2.1	1.5	1.5	3.1	2.2	1.5
	2.3T	M20	6	12	2.3	4.6	3.2	2.3	2.3	4.8	3.4	2.3
3.2T	M24	8	16	3.2	6.4	4.5	3.2	3.2	6.7	4.8	3.2	



Part Number	
Code	No.
TCF42	0.3T
	0.4T

TCF42 - 0.3T



Discount price

Per	1~19	20~
Price	100%	Additional quotation



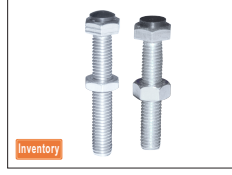
Delivery

8

Screws, Nuts, Washers
Lifting Operations
C2

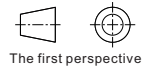
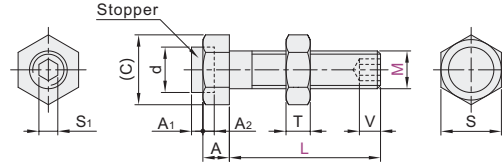
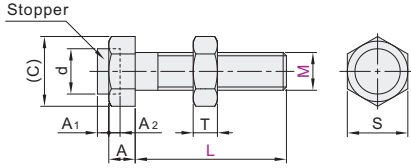
Stopper Bolts ◀ with Bumpers

Code	Type	Main Body			Stopper			Accessory (Hex Nut)	
		Material	Surface Treatment	Strength Class	Material	Color	Hardness	Material	Surface Treatment
TDB71	Standard	SUS304	—	—	Urethane	Black	Shore A90	SUS304	—
TDB86					Silicon	Light Gray	Shore A70		
TDC11	Hex Socket Type				Urethane	Black	Shore A90	Equiv.	



Standard
TDB71/86

Hex Socket Type
TDC11



Part Number		L						d	A	A ₁	A ₂	S	S ₁	(C)	T	V	
Code	M	15	20	25	30	35	40										
Standard	3*	15	20	25	30	35	40	3.5	2			5.5	—	6.4	2.4	—	
	4	15	20	25	30	35	40	5	2.8	1.5	0.7	7	2	8.1	3.2	2.2	
	5	15	20	25	30	35	40	45	50	6	3.5	1.5	8	2.5	9.2	4.5	2.8
	6	20	25	30	35	40	45	50	60	8	4		10	3	11.5	5	3
Hex Socket Type	8	20	25	30	35	40	45	50	60	10	5.5		13	4	15	6.5	4
	10	20	25	30	35	40	45	50	60	70	13	7	17	5	19.6	8	5
	12*	30	40	45	50	60	70	15	8			19	—	21.9	10.5	—	

□ M dimensions with * are not for Hex Socket Type.



Part Number		L					
Code	M	15	20	25	30	35	40
TDB71	3	15	20	25	30	35	40
TDB86	5	15	20	25	30	35	40

TDB86 — M4 — L15



	Discount price	
Per	1~49	50~
Price	100%	Additional quotation



Delivery
12

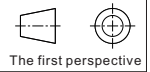
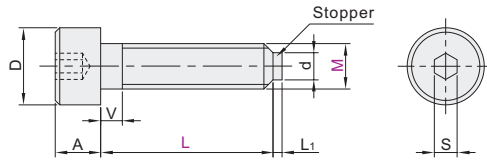
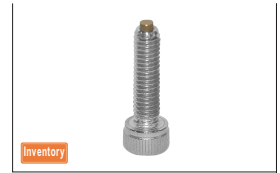
Soft Tips/Soft Tips,with Nuts ▶

Hex Socket Head Cap Screw Type

Stopper Bolts

Soft Tips

Code	Type	Main Body		Stopper	
		Material	Surface Treatment	Material	Color
TDB11	Soft Tips	SUS304	—	Polyacetal	White
TDB16		Equiv.	—	Free-cutting Brass(C3604BD)	—



Part Number		L	L ₁	A	D	d	S	V
Code	M							
TDB11 TDB16	3	10 15 20	0.5	3	5.5	1.5	2.5	0.5
	4	10 15 20	1	4	7	2	3	0.6
	5	15 20 30	1	5	8.5	3	4	0.6
	6	15 20 30	1	6	10	4	5	0.7
	8	20 30 40	2	8	13	6	6	1



Part Number	M	L
TDB11	3	10 15 20
TDB16	4	15 20 30

TDB16 — M5 — L15



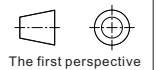
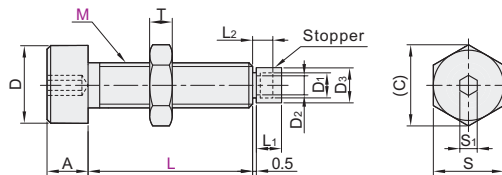
Discount price		
Per	1~49	50~
Price	100%	Additional quotation



Delivery	
10	

Soft Tips,With Nuts

Code	Type	Main Body		Stopper		
		Material	Surface Treatment	Material	Hardness	Color
TDB21	Soft Tips,with Nuts	SUS304	—	Urethane	Shore A90	Black



Part Number		L	D	D ₁	D ₂	D ₃	S	S ₁	A	(C)	L ₁	L ₂	T
Code	M												
TDB21	4	10 12 15 20	7	2.1	1.6	3.1	7	3	4	8.1			3.2
	5	12 15 20 25	8.5	2.6	2.2	4	8	4	5	9.2	4.5	3	4
	6	15 20 25 30	10	3	2.6	4.8	10	5	6	11.5			5
	8	20 25 30 40	13	5.5	5.1	6.5	13	6	8	15	5.5	4	6.5
	10	25 30 40 50	16	7.3	6.9	8.3	17	8	10	19.6			8



Part Number	M	L
TDB21	4	10 12 15 20
	5	12 15 20 25
	6	15 20 25 30

TDB21 — M4 — L15



Discount price		
Per	1~49	50~
Price	100%	Additional quotation



Delivery	
12	

Stopper Bolts with Bumpers

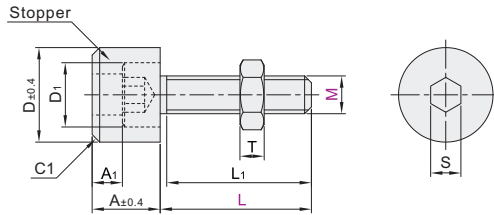
Head Hex Socket

Code	Type	Main Body			Stopper			Accessory (Hex Nut)		
		Material	Surface Treatment	Strength Class	Material	Hardness	Color	Material	Surface Treatment	Qty.
TDC66	Head Hex Socket	SUS304	—	—	Low Repulsion Urethane	Shore A70	Gray	SUS304	—	1 Pc.
TDC71					Low Elastic Rubber	Shore A57	Black			

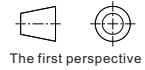
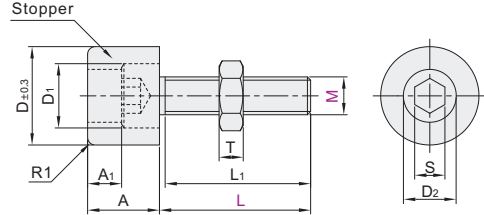
Inventory



Low Repulsion Urethane
TDC66



Low Elastic Rubber
TDC71



The first perspective

Part Number		L								L ₁	A	A ₁	D	D ₁	S	T			
Code	M																		
Low Repulsion Urethane TDC66	3	10	15						Full Thread	6	3	7.5	5.5	2.5	2.4				
	4	10	15	20	25	30	※		Full Thread(20)	7	3	10	7	3	3.2				
	5	10	15	20	25	30	40	※		Full Thread(22)	9	4	12.5	8.5	4	4.5			
	6	10	15	20	25	30	40	※	50	※		10	15	10	5	5			
	8	10	15	20	25	30	40	※	50	※	60	※		20	13	6	6.5		
	10	10	15	20	25	30	40	※	50	※	60	※	70	※		25	16	8	8
	12		15	20	25	30	40			Full Thread	18	5	30	18	10	10			
16		20	25	30	40				Full Thread	22	6	40	24	14	14.5				

① L dimension for ※ marked L₁ dimension is in ().

Part Number		L								L ₁	A	A ₁	D	D ₁	D ₂	S	T	Shock Absorption Amount (kgf·cm)	Withstand Load (kgf)	
Code	M																			
Low Elastic Rubber TDC71	4	10	15	20	25	30	※		Full Thread(20)	8.2	4.2	11	7	5	3	3.2		0.055	2.4	
	5		15	20						Full Thread	9.5	4.5	13	8.5	7	4	4		0.072	3
	6		15	20	25	30	40	※		Full Thread(24)	11	5	18	10	8	5	5		0.197	7.4
	8		25	30					Full Thread	13.7	5.7	20	13	9	6	6.5		0.272	8.8	
			30	40	50	※		Full Thread(32)	15.6	5.6	25	16	12	8	8			0.444	14.4	

① L dimension for ※ marked L₁ dimension is in ().



Part Number		L							
Code	M								
4	10	15	20	25	30				
(TDC71)	5	15	20						
	6	15	20	25	30	40			

TDC71—M4—L15



Discount price	
Per	1~49
Price	50~ Additional quotation

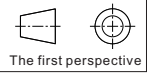
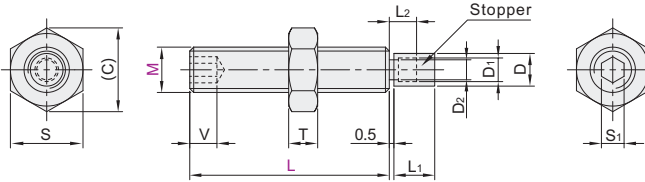


Stopper Bolts with Bumpers Stopper Bolts with Bumpers Shock Absorption Stoppers

- ◀ Straight Type
- ◀ With Wrench Flats

Stopper Bolts with Bumpers

Code	Type	Main Body		Stopper			Accessory (Hex Nut 1 Pc.)	
		Material	Surface Treatment	Material	Color	Hardness	Material	Surface Treatment
TDA61	Straight Type	SUS304	—	Urethane	Black	Shore A90	SUS304 Equiv.	—



Part Number	M	L					L1	L2	T	D	D1	D2	S	S1	(C)	V		
TDA61	4	10	15	20	25	30	35			2.4	3.1	2.1	1.6	7	2	8.1	2.2	
	5	10	15	20	25	30	35	4.5	3	3.2	4	2.6	2.2	8	2.5	9.2	2.8	
	6	15	20	25	30	35	40	45	50	60	3.6	4.8	3	2.6	10	3	11.5	3
	8	25	30	35	40	45	50	60			5	6.5	5.5	5.1	13	4	15	4
	10	30	35	40	45	50	60	70	5.5	4	6	8.3	7.3	6.9	17	5	19.6	5
	12	30	40	50	60	70			6	4.5	7	10	8.6	8	19	6	21.9	6



Part Number	M	L							
TDA61	4	10	15	20	25	30	35		
	5	10	15	20	25	30	35	40	
	6	15	20	25	30	35	40	45	50

TDA61—M5—L20



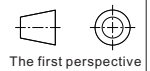
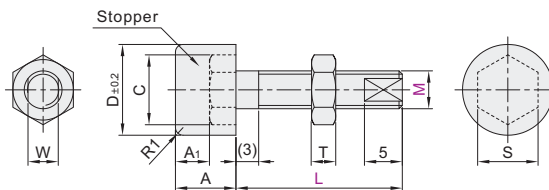
Discount price
Per 1~49 50~
Price 100% Additional quotation



Delivery
12

Stopper Bolts with Bumpers Shock Absorption Stoppers

Code	Type	Main Body		Stopper			Accessory (Hex Nut 1 Pc.)	
		Material	Surface Treatment	Material	Color	Hardness	Material	Surface Treatment
TDD01	With Wrench Flats	SUS304	—	Low Elastic Rubber	Black	Shore A57	SUS304	—



Part Number	M	L					D	C	S	A	A1	T	W	Shock Absorption Amount (kgf·cm)	Withstand Load (kgf)
TDD01	3	10	15	20		8	6.15	5.5	6	4	2.4	2	0.045	2.2	
	4	10	15	20	30	10	7.7	7	7	4.2	3.2	3	0.069	3.4	
	5	20	30	40		12	8.8	8	8	4.5	4.5	4	0.112	5.4	
	6	20	30	40		15	11.1	10	9	5	5	4.5	0.207	9.4	
	8	30	40	50		18	14.4	13	11	5.7	6.5	6.5	0.35	14.2	
	10	30	40	50		21	17.8	16	12	5.6	8	8	0.517	23.4	



Part Number	M	L				
TDD01	3	10	15	20	25	
	4	10	15	20	30	

TDD01—M4—L20



Discount price
Per 1~49 50~
Price 100% Additional quotation



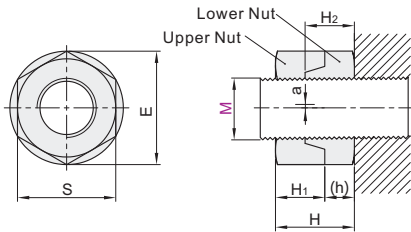
Delivery
12

Double Locking Nuts

Code	Type	Material	Surface Treatment
TBL90	Double Locking Nuts	SS400	Trivalent Chromate
TBL91		SUS304	—

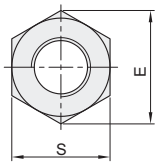


M6~12 with flanged



ⓐ a: Eccentricity

M14/16 is not flanged



Structure and Function of Double Locking Nuts

Screw Center of Bolt and Nut

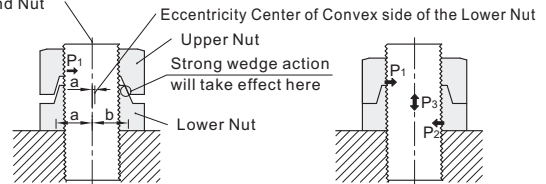
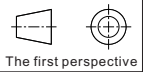


Figure 1

Figure 2

ⓐ Cautions

- Screws or shafts should be made to JIS6g (Grade 2) in thread precision, or Hard Lock Nuts may not fit well. Although outer diameter of the upper nut and the lower nut may become eccentric or clearance may occur during assembling caused by its structure, it does not affect the operation.
- (Figure 1): When upper nut is tightened, stress is automatically applied in P1 arrow direction. Horizontal stress continues to increase with tightening until upper nut closely contacts lower nut as shown in Fig. 2. The nuts are fully locked by the wedge effect.
- (Figure 2): After nuts are tightened, internal stress remains distributed as composite stress of $P_1+P_2+P_3$ to resist external impact.



The first perspective

Part Number Code	M	Pitch	S	E	Upper Nut		Lower Nut		Pair Height H	(h)	Weight per Set (g)
					H ₁	Tolerance	H ₂	Tolerance			
TBL90 TBL91	6	1.0	10	11.5	5	$0_{-0.32}$	5	$0_{-0.32}$	8	3	5
	8	1.25	13	15	6.5		6.5		10.6	4.1	9
	10	1.5	17	19.6	8	$0_{-0.6}$	8	$0_{-0.6}$	13.2	5.2	18
	12	1.75	19	21.9	9.3		10		16	7	26
	14	2.0	22	25.4	11	$0_{-0.7}$	11	$0_{-0.7}$	18.5	7.5	39
	16		24	27.7			13	$0_{-0.7}$	22.5	9.5	53

ⓐ Tightening Torque Chart(Reference Value)

M	Lower Nut					Upper Nut
	Tightening Torque Chart(Reference Value)(N·m)					All Materials
	SS400	S45C	SCM435	SUS304		Tightening Torque
	4.8(320N/mm ²)	8.8(640N/mm ²)	10.9(900N/mm ²)	50(210N/mm ²)	70(450N/mm ²)	(N·m)
6	2.3~6	—	—	1.5~4	3.3~9	4~5
8	5.6~15	11.2~30	15.8~42	3.7~10	7.9~21	9~13
10	11~30	22~59	31~84	7~20	16~42	18~24
12	19~52	39~104	55~146	13~34	27~73	27~39
14	31~82	62~165	87~232	20~54	44~116	40~58
16	48~129	97~257	136~362	32~84	68~181	70~100



Please order as shown

Part Number	Code	M
TBL90	6	6
TBL91	8	8
	10	10

TBL90—M8



Discount price
Per 1~19
Price 100% Additional quotation



Delivery
12