

# Locating and Guide Components

## Locating Guide Components



Product Name	Adjusting Stopper Screws - Hex Socket Head, Wrench Flats, Wrench Flats with Hex Socket, Hex Bolts	Ribbed Type	Locating Bolts	Stopper Bolts	Stopper Screws	Threaded Stopper Blocks
Page	1711, 1712	1712	1713	1714	1714	1715



Brackets for Stopper Screws	Threaded Stopper Blocks - Standard	Counterbored Holes, Counterbored and Tapped Holes, L-Shaped, T-Shaped, Side Counterbored, Two-Hole
1715	1716	1716-1718



Stop Pins - Press-Fit, Screw, Spherical, Press-Fit Urethane, Urethane, Wrench Holes	Stopper Bolts - With Urethane, Polyacetal, Silicon	MC Nylon	Shock Absorption Stoppers
1719, 1720	1721, 1722	1722	1723



Washers, Stoppers with Plates - Urethane Type	Low Elastic Rubber	Stopper Blocks	Stopper Blocks with Urethane	Adjusting Bolts	Blocks for Adjusting Bolts
1724	1724	1725	1726	1727, 1728	1729, 1730



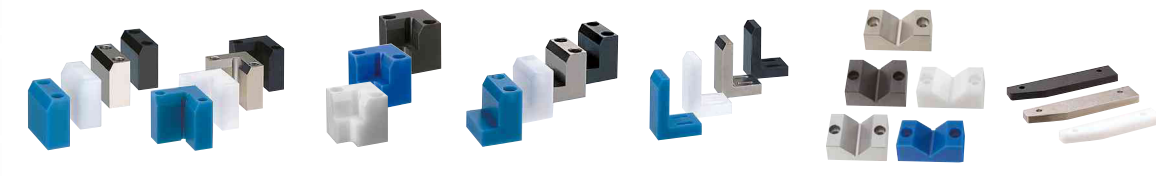
Adjusting Pins	Screw Jacks	Leveling Screws	Large Holes for Adjustment with Wrench Flats	Leveling Bolts	Thick Wrench Flats	Lock Nuts
1730	1731	1731	1731	1732	1732	1732



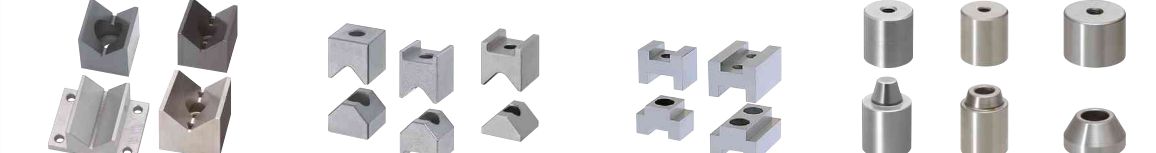
Clamping Screws	High Locked Screws	Clamping Screws	Hex Head Clamping Screws	Grub Screw Sets	Rubber Pads	Flanged Type
1733	1734	1735	1736	1737	1738	1738



Clamp Plates	Shims for Clamp Plates	Basic Guide Pins - Tip Shape Selectable	Eccentric	Basic Guides - Standard	Narrow
1738	1738	1739	1739	1740	1740



Guides - Straight, L-Shaped, Height Adjusting, Pedestal, Angle	V Shaped	Plate Type
1741, 1742	1743	1743



V Blocks - Standard, Precision	V-Shaped Locating Block Sets	U/T-Shaped Locating Block Sets	Tapered Pin Locating Block Sets
1744	1745, 1746	1747	1748



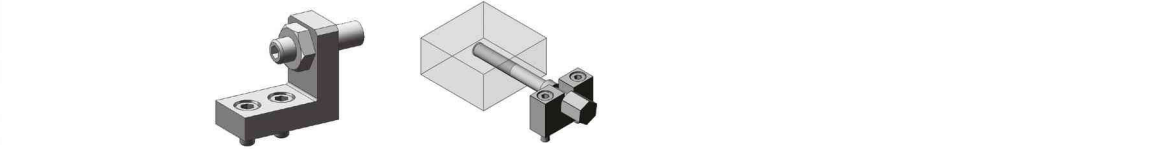
Basic Guides for Welding Fixtures - Rod Type	Plate Type	Ribbed Type	Guide Plates	Round Stoppers, Shims for Round Stoppers	Tapped Holes	Flat Stoppers, Shims for Flat Stoppers
1749	1749	1750	1750	1751	1751	1752



Blocks for Shim Adjustment of Welding Fixtures - Straight, L-Shaped / Shim Sets	Workpiece Detection System	Detection Pins for Weld Nuts	Roller Pushers	Point Pads - Spherical, Suction Hole
1753	1754	1754	1755	1755



Point Pads - Flat, Tapped	Lift Pins	Feed Fingers	Tapered Plunging Locating Pin	Feed Fingers Economy Type	Automatic Latches
1755	1756	1757	1759	1759	1760



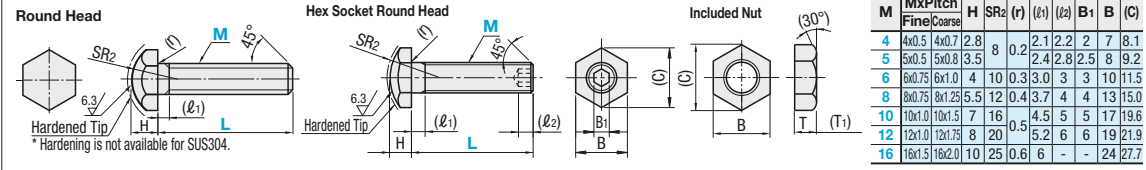
Stopper Module	Adjust Bolts Set
1717	1727



# Locating Bolts

Round Head, Round Tip

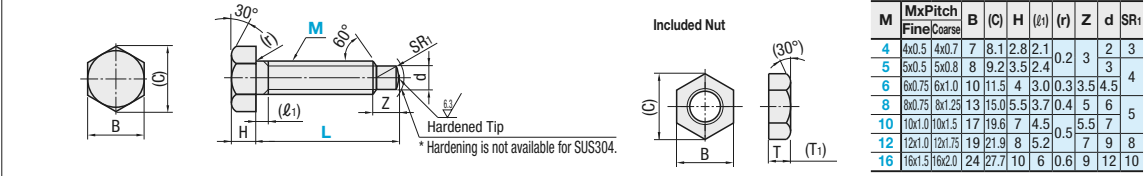
Locating Bolts						Accessory (Nut 1 pc.)		Nut T Dimension		
Round Head	Hex Socket Round Head	Material	Hardness*	Surface Treatment	Material	Surface Treatment	M	T (Coarse)	T <sub>1</sub> (Fine)	
Fine	STCB	EN 1.1191 Equiv.	45HRC~	Black Oxide	EN 1.0038 Equiv.	Bright Chromate Plating	4	3.2	4	
	STCBM	EN 1.4125 Equiv.	45HRC~	Electroless Nickel Plating	EN 1.4301 Equiv.	Trivalent Chromate	5	4	4	
	STCCB	EN 1.1191 Equiv.	45HRC~	Electroless Nickel Plating	EN 1.0038 Equiv.	Bright Chromate Plating (*)	6	5	5	
Coarse	STBB	EN 1.4301 Equiv.	-	Black Oxide	EN 1.0038 Equiv.	Trivalent Chromate	8	6.5	5	
	STBBM	EN 1.4301 Equiv.	-	Electroless Nickel Plating	EN 1.4301 Equiv.	-	10	8	6	
	STBBB	EN 1.4125 Equiv.	45HRC~	-	EN 1.4301 Equiv.	-	12	10	6	
	STTBB	EN 1.4125 Equiv.	45HRC~	-	EN 1.4301 Equiv.	-	16	13	8	



Part Number	Type	M	L Selection								STCB, STBB		STCBM, STBBM		STBBS		SSTCB, SSTBB	
			4	5	6	8	10	12	16	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	
(Fine)	STCB	4	10	15	20	25	30	35	40	20								
(Coarse)	STBB	8	15	20	25	30	35	40	50	20	25	30	40	50				
	STBBM	10									30	40	50	60	70			
	SSTBB	12									30	40	50	60	70			
	SSTBB	16									40	50	60	70	80			

Part Number	Type	M	L Selection								STBC		STCCM, STBCM		SSTCC, SSTBC	
			4	5	6	8	10	12	16	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	
(Fine)	STCCM	4	20													
(Coarse)	STBC	8	25	30	40	50	60									
	STBCM	10														
	SSTBC	12														

Locating Bolts						Accessory (Nut 1 pc.)		Nut T Dimension		
Round Tip	Material	Hardness*	Surface Treatment	Material	Surface Treatment	M	T (Coarse)	T <sub>1</sub> (Fine)		
Fine	STCA	EN 1.1191 Equiv.	45HRC~	Black Oxide	EN 1.0038 Equiv.	Bright Chromate Plating	4	3.2	4	
	STCAM	EN 1.4125 Equiv.	45HRC~	Electroless Nickel Plating	EN 1.4301 Equiv.	Trivalent Chromate	5	4	4	
	STCCA	EN 1.1191 Equiv.	45HRC~	Electroless Nickel Plating	EN 1.0038 Equiv.	Bright Chromate Plating (*)	6	5	5	
Coarse	STBA	EN 1.4301 Equiv.	-	Black Oxide	EN 1.0038 Equiv.	Trivalent Chromate	8	6.5	5	
	STBAM	EN 1.4301 Equiv.	-	Electroless Nickel Plating	EN 1.4301 Equiv.	-	10	8	6	
	STBBA	EN 1.4125 Equiv.	45HRC~	-	EN 1.4301 Equiv.	-	12	10	6	
	SSTBA	EN 1.4125 Equiv.	45HRC~	-	EN 1.4301 Equiv.	-	16	13	8	



Part Number	Type	M	L Selection								STCA, STBA		STCAM, STBAM		STBAS		SSTCA, SSTBA	
			4	5	6	8	10	12	16	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate	
(Fine)	STCA	4	15	20	25	30	35	40	20									
(Coarse)	STBA	8	15	20	25	30	35	40	50	20	25	30	40	50				
	STBAM	10								30	40	50	60	70				
	SSTBA	12								30	40	50	60	70	80			
	SSTBA	16								40	50	60	70	80				

Ordering Example: Part Number - L  
STCB6 - 20  
STBA10 - 50

# Stopper Bolts / Stopper Screws

Features: Less deformation because of the flat contact surface.

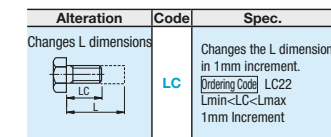
Stopper Bolts	Type		Material	Hardness	Surface Treatment
	Standard	Hex Socket			
Fine	STRCB	STRCC	EN 1.7220 Equiv.	40-45HRC	Black Oxide
	STRCN	STRNCC	EN 1.4006 Equiv.		Electroless Nickel Plating
	SSTRCB	SSTRCC	EN 1.4006 Equiv.		-
Coarse	STRB	STRC	EN 1.7220 Equiv.	40-45HRC	Black Oxide
	STRN	STRNC	EN 1.7220 Equiv.		Electroless Nickel Plating
	SSTRB	SSTRC	EN 1.4006 Equiv.		-

Part Number	Type	M	L 5mm Increment	M		B	(C)	H	(l)	(r)	l1	B1	Unit Price					
				Coarse	Fine								STRCB	STRCN	SSTRCB	STRC	STRNC	SSTRCC
Standard	Hex Socket Type	3	10-30	3x0.5	-	5.5	6.4	2	1	0.1	-	-						
		4	15-60	4x0.7	4x0.5	7	8.1	2.8	2.1	0.2	2.2	2						
(Fine)	(Coarse)	5	15-60	5x0.8	5x0.5	8	9.2	3.5	2.4	0.2	2.8	2.5						
		6	20-60	6x1.0	6x0.75	10	11.5	4	3	0.3	3	3						
(Fine)	(Coarse)	8	25-60	8x1.25	8x0.75	13	15.0	5.5	3.7	0.4	4	4						
		10	30-70	10x1.5	10x1.0	17	19.6	7	4.5	0.5	5	5						
(Fine)	(Coarse)	12	35-80	12x1.75	12x1.0	19	21.9	8	5.2	0.5	6	6						

\* M3 size is available only for STRB and STRN.

Ordering Example: Part Number - L  
STRB6 - 20

Alterations: Part Number - L (LC)  
STRB10 - LC41



Stopper Screws	Type			Material	Hardness	Surface Treatment
	STSCC	STSNCC	SSTSCC			
Fine	STSCC	STSNCC	SSTSCC	EN 1.7220 Equiv.	40-45HRC	Black Oxide
	STSCC	STSNCC	SSTSCC	EN 1.4006 Equiv.		Electroless Nickel Plating
	STSCC	STSNCC	SSTSCC	EN 1.4006 Equiv.		-

Part Number	Type	M	L Selection								MxPitch	B1	l	(d)	Unit Price		
			4	5	6	8	10	12	16	STSCC					STSNCC	SSTSCC	
STSCC STSNCC SSTSCC		4	20	25	30	35	40	4x0.5	2	2.5	2.5						
		5	20	25	30	35	40	5x0.5	2.5	3	3.5						
		6						6x0.75	3	3.5	4						
		8						8x0.75	4	5	4.5						
		10						10x1.0	5	6	7						
		12						12x1.0	6	8	8.5						

Ordering Example: Part Number - L  
STSCC10 - 60

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









# Adjusting Bolts

**Adjusting Bolts**

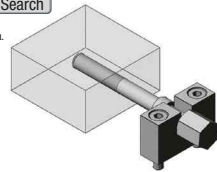
Thread	Type	M Material	S Surface Treatment
Coarse	AJST	EN 1.1191 Equiv.	Black Oxide
	AJSTM	EN 1.1191 Equiv.	Electroless Nickel Plating
	AJSTS	EN 1.4301 Equiv.	-
Fine	AJSTF	EN 1.1191 Equiv.	Black Oxide
	AJSTMF	EN 1.1191 Equiv.	Electroless Nickel Plating
	AJSTFS	EN 1.4301 Equiv.	-

Refer to the price list for applicable M size.

Part Number Type	M	L 5mm Increment	d	T	MxPitch		B	D	C	E	Unit Price						
					Fine	Coarse					Coarse			Fine			
											AJST	AJSTM	AJSTS	AJSTF	AJSTMF	AJSTFS	
(Coarse)	3	10~45	2.5	7	-	3x0.5	3	4.5	6	7							
AJST	4	10~60	3.5	7	4x0.5	4x0.7	3	5.5	5	7							
AJSTM	5	10~70	4.5	9	5x0.5	5x0.8	4.6	7.5	10	8							
AJSTS	6	15~80	5.5	10	6x0.75	6x1.0	8.5	10	10	10							
(Fine)	8	20~100	7.5	12	8x0.75	8x1.25	6	11.5	15	13							
AJSTF	10	25~100	9.5	16	10x1.0	10x1.5	7	15.5	17	17							
AJSTMF	12	25~150	11.5	19	12x1.0	12x1.75	8	17.5	19	19							
AJSTFS	16	25~150	15.5	19	-	16x2.0	8	21.5	24	24							

Ordering Example Part Number - L  
AJST8 - 25

Example Combination of these app. examples can be selected on the Web. Details about Selection Procedure see P.87. For Blocks for Adjusting Bolts, see P.1729. e-Catalog Search Keyword #MA221 Search



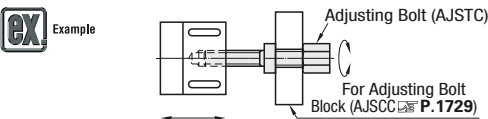
**Adjusting Bolt - T Compact**

Thread	Type	M Material	S Surface Treatment
Coarse	AJSTC	EN 1.1191 Equiv.	Black Oxide
	AJSTCM	EN 1.1191 Equiv.	Electroless Nickel Plating
	AJSTCS	EN 1.4301 Equiv.	-
Fine	AJSTCF	EN 1.1191 Equiv.	Black Oxide
	AJSTCMF	EN 1.1191 Equiv.	Electroless Nickel Plating
	AJSTCFS	EN 1.4301 Equiv.	-

Applicable block for Adjusting Bolts to T Compact Type is T Compact, Side Mounting Type (see P.1729).

Part Number Type	M	L 5mm Increment	d	T	MxPitch		B	D	C	E	Unit Price						
					Fine	Coarse					Coarse			Fine			
											AJSTC	AJSTCM	AJSTCS	AJSTCF	AJSTCMF	AJSTCFS	
(Coarse)	4	10~60	3.5	3	4x0.5	4x0.7	3	5.5	5	7							
AJSTC	5	10~70	4.5	5	5x0.5	5x0.8	4.6	7.5	10	8							
AJSTCM	6	15~80	5.5	5	6x0.75	6x1.0	8.5	10	10	10							
AJSTCS	8	20~100	7.5	7	8x0.75	8x1.25	6	11.5	15	13							

Ordering Example Part Number - L  
AJSTC8 - 25



**Adjusting Bolts - Hex Socket**

Thread	Type	M Material	S Surface Treatment
Coarse	AJSTR	EN 1.1191 Equiv.	Black Oxide
	AJSTMTR	EN 1.1191 Equiv.	Electroless Nickel Plating
	AJSTRS	EN 1.4301 Equiv.	-

The directions of the outer hex head E and the hex socket E1 are not equal.

Part Number Type	M	L 5mm Increment	d	T	MxPitch		B	D	C	E	E1	ℓ	Unit Price		
					Fine	Coarse							Coarse		
													AJSTR	AJSTMTR	AJSTRS
(Coarse)	4	10~50	3.5	7	4x0.7	3	5.5	5	7	2.5	2.5				
AJSTR	5	10~50	4.5	9	5x0.8	4.6	7.5	10	8	3	3				
AJSTMTR	6	15~50	5.5	10	6x1.0	6	8.5	15	10	4	4				
AJSTRS	8	20~50	7.5	12	8x1.25	6	11.5	15	13	5	5				

Ordering Example Part Number - L  
AJSTR4 - 20

**Adjusting Bolts - Hex Socket Knurled Knobs**

Thread	Type	M Material	S Surface Treatment
Coarse	AJKTN	EN 1.1191 Equiv.	Black Oxide
	AJKTNM	EN 1.1191 Equiv.	Electroless Nickel Plating
	AJKTNS	EN 1.4301 Equiv.	-
Fine	AJKTNF	EN 1.1191 Equiv.	Black Oxide
	AJKTNMF	EN 1.1191 Equiv.	Electroless Nickel Plating

Refer to the price list for applicable M size.

Part Number Type	M	L 5mm Increment	d	T	MxPitch		B	D	A	F	E2	ℓ	Unit Price				
					Fine	Coarse							Coarse		Fine		
													AJKTN	AJKTNM	AJKTNS	AJKTNF	AJKTNMF
(Coarse)	3	10~45	2.5	7	-	3x0.5	3	4.5	7	10	5	4					
AJKTN	4	10~60	3.5	7	4x0.5	4x0.7	3	5.5	7	10	5	4					
AJKTNM	5	10~70	4.5	9	5x0.5	5x0.8	4.6	7.5	15	15	8	7					
AJKTNS	6	15~80	5.5	10	6x0.75	6x1.0	8.5	10	15	15	8	7					
(Fine)	8	20~100	7.5	12	8x0.75	8x1.25	6	11.5	25	20	10	9					
AJKTNF	10	25~100	9.5	16	10x1.0	10x1.5	7	15.5	25	20	10	9					
AJKTNMF	12	25~150	11.5	19	12x1.0	12x1.75	8	17.5	25	20	10	9					
	16	25~150	15.5	19	-	16x2.0	8	21.5	25	20	10	9					

Ordering Example Part Number - L  
AJKTN10 - 80

**Adjusting Bolts - Knurled Knobs**

Thread	Type	M Material	S Surface Treatment
Coarse	AJSTK	EN 1.1191 Equiv.	Black Oxide
	AJSTKM	EN 1.1191 Equiv.	Electroless Nickel Plating
	AJSTKS	EN 1.4301 Equiv.	-

Part Number Type	M (Coarse)	L 5mm Increment	d	T	B	D	A	F	Unit Price		
									Coarse		
									AJSTK	AJSTKM	AJSTKS
(Coarse)	3	10~20	2.5	7	3	4.5	4	16			
AJSTK	4	10~30	3.5	7	3	5.5	4	16			
AJSTKM	5	10~40	4.5	9	4.6	7.5	6	20			
AJSTKS	6	15~50	5.5	10	4.6	8.5	6	20			
	8	20~50	7.5	12	6	11.5	6	20			

Ordering Example Part Number - L  
AJSTK4 - 25






# Screw Jacks / Leveling Screws

Standard, Large Holes for Adjustment with Wrench Flats

■ Features: Possible to finely adjust heights without machining a tapped hole on a plate.

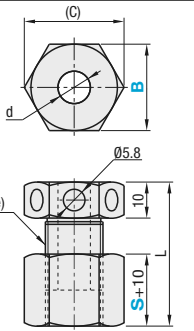
**■ Screw Jacks**



(Alteration NR)

RoHS

Type	Material	Surface Treatment
SJKB	EN 1.1191	Black Oxide
SJKN	Equiv.	Electroless Nickel Plating
SJKS	EN 1.4301 Equiv.	-



Part Number - [S] - (NR)  
SJKS24 - 10 - NR

Alteration Code: Wrench Hole Machining on Nut Side  
NR


Spec. Adds 6 wrench holes on the nut side.

Part Number	Type	B	S Selection (Stroke)	M (Fine)	MxPitch (Fine)	d	S			Applicable Screw	Allowable Load (N)			Unit Price			
							S=10	S=20	S=30		EN 1.1191 Equiv.	EN 1.4301 Equiv.	SJKB	SJKN	SJKS		
SJKB	17	10	20	30	10	10x1.0	5.5	30-40	40-60	50-80	19.6	M5	332	198			
SJKN	19	12	12x1.0	7	12	12x1.0	7				21.9	M6	406	242			
SJKS	24	16	16x1.5	9	16	16x1.5	9				27.7	M8	535	320			
	27	20	20x1.5	11	20	20x1.5	11				31.2	M10	683	408			

⚠ The allowable loads are theoretical reference values and not guaranteed values.

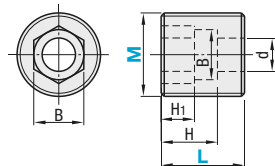
Ordering Example: Part Number - [S]  
SJKB17 - 20

**■ Leveling Screws Standard**



RoHS

Type	Material	Surface Treatment
LVW	EN 1.1191	Black Oxide
LVWM	Equiv.	Electroless Nickel Plating
LVWS	EN 1.4301 Equiv.	-




Example: Hex Wrench, LVW, Base Plate, Mounting Screw

How to Use:  
 • Leveling screws are used to adjust parallelism of a base plate. (The base plate must be tapped.)  
 • Leveling Screw LVW: Loosen the mounting screw first. LVW can then be turned to provide fine adjustments to the base plate.

Part Number	Type	M (Fine)	L		B	MxPitch (Fine)	d	H1	H	Applicable Screw	Unit Price						
			Selectable	Configurable 1mm Increment							L Selectable Type	L Configurable Type	LVWS				
LVW	12	10	15	20	6	12x1.0	3.5	4	8.5	M3	L=10-30	L=35, 40	L=10-30	L=35, 40	LVFW	LVFWM	LVFWS
	16	15	20	30	8	16x1.5	4.5	5	12	M4	-	-	-	-	-	-	-
	20	15	20	25	10	20x1.5	5.5	6	13	M5	-	-	-	-	-	-	-
	24	20	25	30	14	24x1.5	6.5	8	17	M6	-	-	-	-	-	-	-
	30	25	30	40	17	30x1.5	9	10	22	M8	-	-	-	-	-	-	-

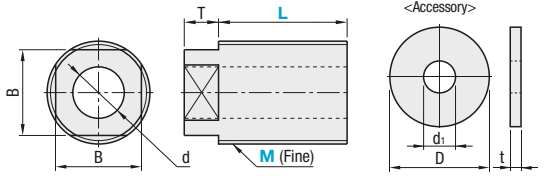
Ordering Example: Part Number - [L]  
LVFW12 - 20

**■ Leveling Screws Large Holes for Adjustment with Wrench Flats**



RoHS

Type	Main Body		Accessory (Washer)	
	Material	Surface Treatment	Material	Surface Treatment
LVGB	EN 1.1191	Black Oxide	EN 1.0330	Trivalent Chromate
LVGM	Equiv.	Electroless Nickel Plating	Equiv.	-
LVGS	EN 1.4301 Equiv.	-	EN 1.4301 Equiv.	-



Example: Washer, LVGB, ANBN P.1447, SNTBM P.1452, Base Plate, Mounting Screw

How to Use:  
 • As the I.D. is larger than the mounting screws, the horizontal movement of the plate is allowable.  
 • As the T dimension part is served for wrench tightening, the clearance can be prevented when tightening the mounting screws.


Part Number	Type	M (Fine)	L Selection	B	MxPitch (Fine)	d	T	Applicable Screw	Accessory			Unit Price									
									LVGB, LVGM	LVGS	LVGB	LVGM	LVGS								
LVGB	12	10	15	20	10	12x1.0	6	6	M4	10	4.5	1.6	10	4.5	1.5	L=10-30	L=35, 40	L=10-30	L=35, 40	L=10-30	L=35, 40
	16	15	20	25	12	16x1.5	8	8	M5	16	5.5	2	12	5.5	2	-	-	-	-	-	-
	20	15	20	30	17	20x1.5	9	10	M6	16	6.5	3.2	13	6.5	3	-	-	-	-	-	-
	24	20	25	35	19	24x1.5	9	10	M6	16	6.5	3.2	13	6.5	3	-	-	-	-	-	-
	30	25	30	40	22	30x1.5	12	12	M8	20	8.5	3	22	8.5	3	-	-	-	-	-	-

Ordering Example: Part Number - [L]  
LVGB20 - 40

# Leveling Bolts / Lock Nuts

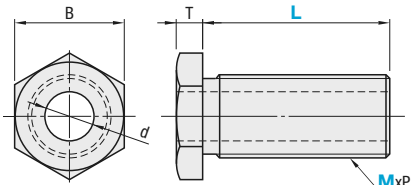
Standard, Thick Wrench Flats

**■ Leveling Bolts Standard**



RoHS

Type	Material	Surface Treatment
LVB	EN 1.1191	Black Oxide
LVBM	Equiv.	Electroless Nickel Plating
LVBS	EN 1.4301 Equiv.	-




Example: Washer, LVB, LVN, Base Plate, Mounting Screw

How to Use:  
 • LVB Leveling Screw: Loosen mounting screw first. LVB can then be turned to provide the adjustments to the base plate. Lock nuts (LVN) are used to prevent rotation.  
 \*When the position of the base plate is decided, tighten the mounting screw again.

Part Number	Type	M (Fine)	L		d	MxPitch (Fine)	T	B	Applicable Screw	Unit Price											
			Selectable	Configurable 1mm Increment						L Selectable Type	L Configurable Type	LVBS									
LVB	8	5	10	15	20	25	30	3.5	8x0.75	4	13	M3	L=5-50	L=60-100	L=5-50	L=60-100	L=5-50	L=60-100	LVFB	LVFBM	LVFBS
	10	10	15	20	25	30	40	50	5.5	10x1.0	4	17	M4, 5	-	-	-	-	-	-	-	-
	12	10	15	20	25	30	40	50	7	12x1.0	4	19	M6	-	-	-	-	-	-	-	-
	16	15	20	25	30	40	50	60	80	9	16x1.5	5	22	M8	-	-	-	-	-	-	-
	20	20	25	30	40	50	60	80	15-100	13	20x1.5	27	M10, 12	-	-	-	-	-	-	-	-
	24	25	30	40	50	60	80	20-100	17	24x1.5	32	M16	-	-	-	-	-	-	-	-	-
	30	30	40	50	80	100	25-120	23	30x1.5	36	M20	-	-	-	-	-	-	-	-	-	-

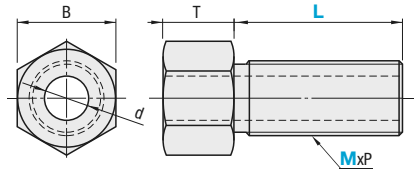
Ordering Example: Part Number - [L]  
LVB12 - 15  
LVFB20 - 60

**■ Leveling Bolts Thick Wrench Flats**



RoHS

Type	Material	Surface Treatment
LLVBB	EN 1.1191	Black Oxide
LLVBM	Equiv.	Electroless Nickel Plating
LLVBS	EN 1.4301 Equiv.	-




Example: LVN, Washer, Base Plate, LLVBB, Mounting Screw

Features: A wrench can be readily used for tightening the screw for the thick T dimensioned parts.

Part Number	Type	M (Fine)	L 1mm Increment	d	MxPitch (Fine)	T	B	Applicable Screw	Unit Price		
									LLVBB	LLVBM	LLVBS
LLVBB	8	5-35	3.5	8x0.75	13	13	M3	-	-	-	
	10	10-55	5.5	10x1.0	16	17	M4, 5	-	-	-	
	12	10-60	7	12x1.0	18	19	M6	-	-	-	
	16	15-70	9	16x1.5	20	22	M8	-	-	-	
	20	15-80	13	20x1.5	24	27	M10, 12	-	-	-	
	24	20-80	17	24x1.5	28	32	M16	-	-	-	
	30	25-80	23	30x1.5	30	36	M20	-	-	-	

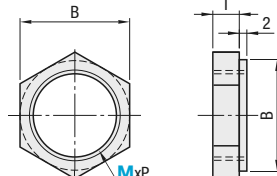
Ordering Example: Part Number - [L]  
LLVBM24 - 30

**■ Lock Nuts**



RoHS

Type	Material	Surface Treatment
LVN	EN 1.1191	Black Oxide
LVNM	Equiv.	Electroless Nickel Plating
LVNS	EN 1.4301 Equiv.	-




Part Number	Type	M (Fine)	MxPitch (Fine)	T	B	Unit Price		
						LVN	LVNM	LVNS
LVN	8	8x0.75	4	13	-	-	-	
	10	10x1.0	4	17	-	-	-	
	12	12x1.0	5	19	-	-	-	
	16	16x1.5	5	22	-	-	-	
	20	20x1.5	7	27	-	-	-	
	24	24x1.5	8	32	-	-	-	
	30	30x1.5	8	36	-	-	-	

Ordering Example: Part Number  
LVN20

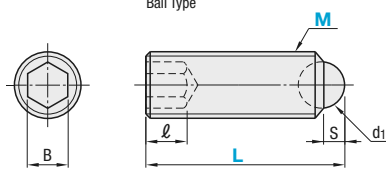
# Clamping Screws

Ball, Angle

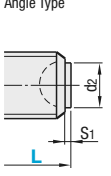


Type		Main Body			Ball	
Ball	Angle	Material	Hardness	Surface Treatment	Material	Hardness
RSM	FSM	EN 1.7220 Equiv.	38~43HRC	Black Oxide	EN 1.3505 Equiv.	55~60HRC
RSU	FSU	EN 1.4301 Equiv.	-	-	EN 1.4125 Equiv.	55HRC~

Ball Type



Angle Type



Ⓜ Screw grade is judged whether or not it can be used with a commercially available nut which is JIS6H equivalent.

**Notes on Clamping Screws**  
 This product is used not to rotate face balls but to clamp workpieces. (The face balls do not necessarily rotate depending on each caulking conditions of face balls.)  
 For Angle Type, a sphere of its hemisphere appears on the face, instead of a flat plane by its rotation. In such a case, return its position using adhesive tape and magnet. Otherwise use Non-reverse Type to avoid rotations. **P17-34**

**RoHS**

**Ball Type**

Part Number Type	M	L Selection	d <sub>1</sub>	B	ℓ	S	Withstand Load (kN)	Mass (g)	Unit Price	
									RSM	RSU
RSM RSU	3	5.2 10.2	1.5	1.5	1.2	0.5	0.5	0.2~0.4		
	4	6.5 10.5 16.5	2.5	2	2	0.8	1.3	0.4~1		
	5	8.6 12.6 20.6	3	2.5		1	1.4	0.8~2.3		
	6	10.8 16.8 20.8 25.8	4	3	3.5	1.3	3.3	1.5~4		
	8	*11.2 13.2 21.2 26.2 31.2	5.6	4	5(2.5)	1.8	3.9	2.5~9		
	10	*13.7 17.7 21.7 26.7 36.7	7.1	5	6(3.5)	2.3	3.4	5~16		
RSM RSU	12	*18 22 32 42	8.7	6	8(3)	2.8	4.8	10~28		
	16	*23.3 38.3 53.3	11.9	8	10(3)	4.3	8.9	22~48		

Ⓜ dimension for \* marked L dimension is in ( ).

**Angle Type**

Part Number Type	M	L Selection	(d <sub>2</sub> )	B	ℓ	S <sub>1</sub>	Withstand Load (kN)	Mass (g)	Unit Price	
									FSM	FSU
FSM FSU	4	6 10 16	2	2	2	0.3	1.3	0.4~1		
	5	8 12 20	2.5	2.5		0.4	1.4	0.8~2.3		
	6	10 16 20 25	3.2	3	3.5	0.5	3.3	1.5~4		
	8	*10 12 20 25 30	4.5	4	5(2.5)	0.6	3.9	2.5~9		
	10	*12 16 20 25 35	6	5	6(3.5)	0.6	3.4	5~16		
	12	*16 20 30 40	7.2	6	8(3)	0.8	4.8	10~28		
FSM	16	*20 25 35 50	10.7	8	10(3)	1.0	8.9	22~48		

Ⓜ dimension for \* marked L dimension is in ( ).

**Ordering Example** Part Number - L  
 RSM4 - 10.5

**EX** Example



kgf=Nx0.101972

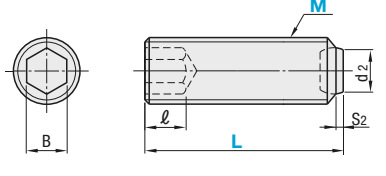
# Clamping Screws / High Locked Screws

Non-Reverse, Serrated

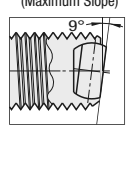
**Clamping Screws**

Type		Main Body		Ball	
Non-Reverse	Non-Reverse Serrated	Material	Surface Treatment	Material	Hardness
FSMB	FSMG	EN 1.7220 Equiv.	Black Oxide	EN 1.3505 Equiv.	55~60HRC
FSUB	FSUG	EN 1.4301 Equiv.	-	EN 1.4125 Equiv.	55~60HRC

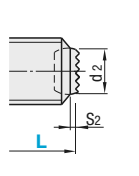
Non-Reverse Type



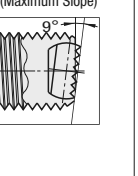
(Maximum Slope)



Serrated Type



(Maximum Slope)



Ⓜ Screw grade is judged whether or not it can be used with a commercially available nut which is JIS6H equivalent.

**Non-Reverse Serrated Type**

Part Number Type	M	L Selection	(d <sub>2</sub> )	B	ℓ	S <sub>2</sub>	Withstand Load (kN)	Mass (g)	Unit Price			
									FSMB	FSUB	FSMG	FSUG
FSMB FSUB FSMG FSUG	6	10 16 20 25	3.2	3	3.5	0.45	3.3	1.5~4				
	8	*10 12 20 25 30	4.5	4	5(2.5)	0.5	3.9	2.5~9				
	10	*12 16 20 25 35	6	5	6(3.5)	0.6	3.4	5~16				
	12	*16 20 30 40	7.2	6	8(3)	0.75	4.8	10~28				
16	*20 25 35 50	10.7	8	10(3)	1	8.9	22.5~48					

Ⓜ dimension for \* marked L dimension is in ( ).

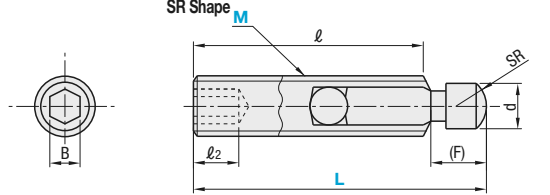
**Ordering Example** Part Number - L  
 FSMB6 - 16

kgf=Nx0.101972

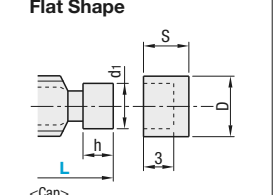
**High Locked Screws**

Type	Tip Shape	Main Body		Ball		Head		Cap
		Material	Surface Treatment	Material	Hardness	Material	Hardness	
BALTAR	SR	EN 1.1191 Equiv.	Black Oxide	EN 1.4125 Equiv.	58~63HRC	EN 1.4125 Equiv.	55~60HRC	-
SALTAR		EN 1.4301 Equiv.	-	EN 1.4125 Equiv.	55~60HRC	-	-	
BALTAN	Flat	-	-	-	-	-	-	Polyacetal (White)

SR Shape



Flat Shape



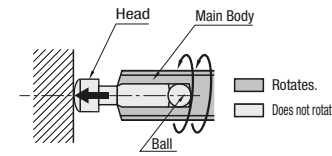
<Cap> \* Included in BALTAN only.

**Ordering Example** Part Number - L  
 BALTAR6 - 30

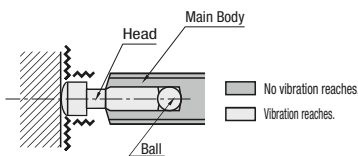
Part Number Type	M	L	B	d	SR	d <sub>1</sub>	(F)	h	ℓ	ℓ <sub>2</sub>	Cap (tpc.)		Unit Price		
											D	S	BALTAR	SALTAR	BALTAN
BALTAR SALTAR BALTAN	6	20	3	4	4	-	4	-	12.8	2.5	-	-	-	-	-
		30							22.8	-	-	-	-	-	
		50							42.8	3.5	4.7	6	-	-	
	8	25	4	5.5	5.5	-	5	-	16.5	3.5	-	-	-	-	-
		40							31.5	-	-	-	-	-	
		60							51.5	5	6.5	8	-	-	
10	30	5	7	7	-	6	-	20.4	4.5	-	-	-	-	-	
	50							40.4	-	-	-	-	-		
	70							60.4	6	8	10	-	-		

**Ordering Example** Part Number - L  
 BALTAR6 - 30

**EX** Example



Rotates.  
Does not rotate.



No vibration reaches.  
Vibration reaches.

**Features:** Although the screw rotates, the screw head contacting the workpiece does not rotate, thus the head will not damage the workpiece.

**Features:** Screws are less likely to loosen due to intervention of a ball absorbing the workpiece vibration.


# Clamping Screws

Ball, Angle

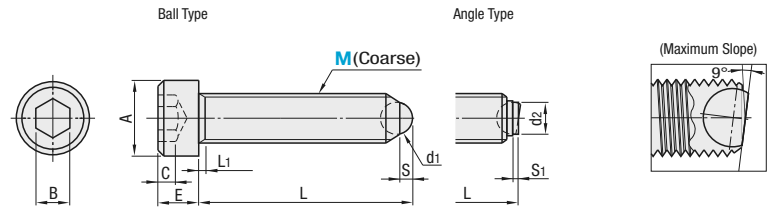
# Clamping Screws / Hex Head Clamping Screws

Non-Reverse, Serrated

Tip / Head Clamp



Type		Main Body		Ball	
Ball	Angle	Material	Surface Treatment	Material	Hardness
HRSM	HFSM	EN 1.7220 Equiv.	Black Oxide	EN 1.3505 Equiv.	55~60HRC
HRSU	HFSU	EN 1.4301 Equiv.	-	EN 1.4125 Equiv.	55~60HRC



**Notes on Clamping Screws**  
 This product is used not to rotate face balls but to clamp workpieces. (The face balls do not necessarily rotate depending on each caulking conditions of face balls.)  
 For Angle Type, a sphere of its hemisphere appears on the face, instead of a flat plane by its rotation. In such a case, return its position using adhesive tape and magnet. Otherwise use Non-reverse Type to avoid rotations. **P:1736**

RoHS Screw grade is judged whether or not it can be used with a commercially available nut which is JIS6H equivalent.

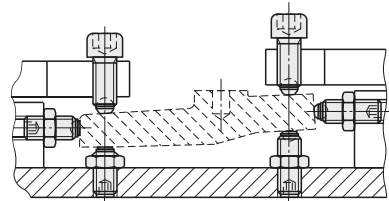

## Ball Type, Angle Type

Part Number	Type	M	Nominal	L		L1	A	E	B	C	d1	(d2)	S	S1	Allowable Load (kN)	Unit Price			
				HRSM	HFSM											HRSU	HFSU	HRSM	HRSU
(Ball) HRSM HRSU	4	4	10	10.5	10	2.1	7	4	3	2	2.5	2	0.8	0.3	1.3				
			12	12.5	12														
			16	16.5	16														
			20	20.5	20														
			25	25.5	25														
(Ball) HRSU	5	5	12	12.6	12	2.4	8.5	5	4	2.5	3	2.5	1	0.4	1.4				
			16	16.6	16														
			20	20.6	20														
			25	25.6	25														
(Ball) HRSU	6	6	25	25.8	25	3	10	6	5	3	4	3.2	1.3	0.5	3.3				
			30	30.8	30														
			40	40.8	40														
(Angle) HFSM HFSU	8	8	20	21.2	20	3.5	13	8	6	4	5.5	4.5	1.8	0.6	3.9				
			30	31.2	30														
			40	41.2	40														
			50	51.2	50														
			50	51.2	50														
(Angle) HFSM HFSU	10	10	25	26.7	25	4.5	16	10	8	5	7	6	2.3	0.6	3.4				
			30	31.7	30														
			40	41.7	40														
(Angle) HFSM HFSU	12	12	30	31.2	30	5	18	12	10	6	8.5	7.2	2.8	0.8	4.8				
			40	41.2	40														
			50	51.2	50														
			80	82	80														
			80	82	80														
(Angle) HFSM HFSU	16	16	40	43.3	40	6	24	16	14	8	12	10.7	4.3	1.0	9.6				
			60	63.3	60														
			80	83.3	80														

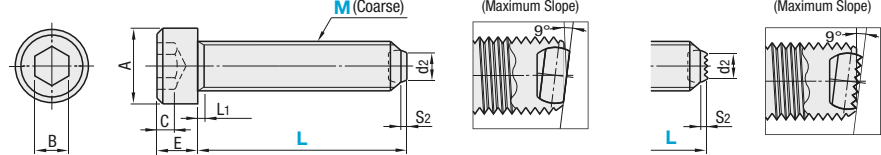
kgf-Nx0.101972



Ordering Example Part Number **HRSM6-16**

Type		Main Body		Ball	
Non-Reverse	Non-Reverse Serrated	Material	Surface Treatment	Material	Hardness
HFMB	HFMG	EN 1.7220 Equiv.	Black Oxide	EN 1.3505 Equiv.	55~60HRC
HFUB	-	EN 1.4301 Equiv.	-	EN 1.4125 Equiv.	55~60HRC




RoHS Screw grade is judged whether or not it can be used with a commercially available nut which is JIS6H equivalent.

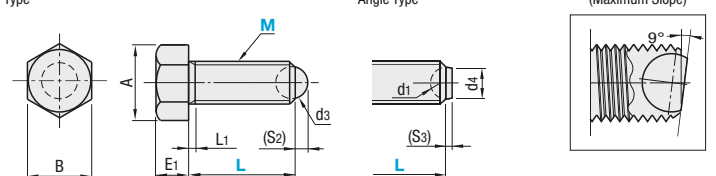
Part Number	Type	M	L Selection						L1	A	E	B	C	d2	S2	Withstand Load (kN)	Unit Price		
			6	8	10	12	16	20									25	30	35
(Non-Reverse) HFMB HFUB (Non-Reverse Serrated) HFMG	6	6	16	20	25	30	40	3	10	6	5	3	3.2	0.45	3.3				
			8	20	30	35	40	50	3.5	13	8	6	4	4.5	0.5	3.9			
			10	25	30	40	50	60	4.5	16	10	8	5	6	0.6	3.4			
			12	30	50	80	5	18	12	10	6	7.2	0.75	4.8					
			16	40	60	80	6	24	16	14	8	10.7	1	9.6					

kgf-Nx0.101972

Ordering Example Part Number **HFMB10** - **L** **30**




Type		Main Body			Ball	
Ball	Angle	Material	Hardness	Surface Treatment	Material	Hardness
BRASM	BFASM	EN 1.7220 Equiv.	32~40HRC	Black Oxide	EN 1.3505 Equiv.	62HRC~



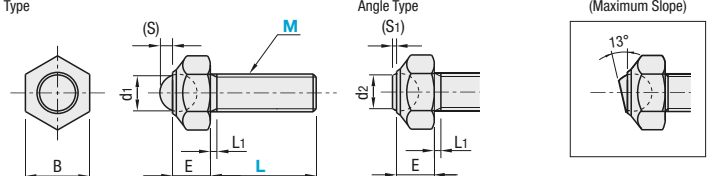
RoHS

Part Number	Type	M	L Selection						L1	A	B	E1	d1	d3	d4	(S2)	(S3)	Unit Price		
			6	8	10	12	16	20										25	30	35
BRASM BFASM	6	6	20	30	40	2	11.5	10	4	5.6	4	3.2	1.3	0.6						
			8	20	30	40	2.5	15	13	5.5	8	5.5	4.5	1.8	0.8					
			10	40	50	3	19.6	17	7	9.5	7.1	6	2.3	0.9						
			12	50	60	3.5	21.9	19	8	12.7	8.7	7.2	2.8	1						
			16	50	60	4	27.7	24	10	15.9	11.9	10.7	4.3	1.3						

Ordering Example Part Number **BFASM6** - **L** **20**



Type		Main Body			Ball	
Ball	Angle	Material	Hardness	Surface Treatment	Material	Hardness
BRSM	BFSM	EN 1.7220 Equiv.	32~40HRC	Black Oxide	EN 1.3505 Equiv.	62HRC~
BRSMS	-	EN 1.4301 Equiv.	-	-	EN 1.4125 Equiv.	55HRC~



RoHS

Part Number	Type	M	L Selection						L1	B	E	d1	d2	(S)	(S1)	Unit Price			
			6	8	10	12	16	20								25	30	35	40
BRSM BRSMS BFSM	6	6	30	40	2	10	6	5.6	4.5	2	0.8								
			8	30	40	2.5	13	8	8	6.7	2.8	1							
			10	40	50	3	17	10	9.5	7.9	3.2	1.2							
			12	50	60	3.5	19	12	12.7	10.8	4.7	1.8							
			16	50	60	4	24	16	15.9	13.3	5.7	2.1							

Ordering Example Part Number **BFSM12** - **L** **50**

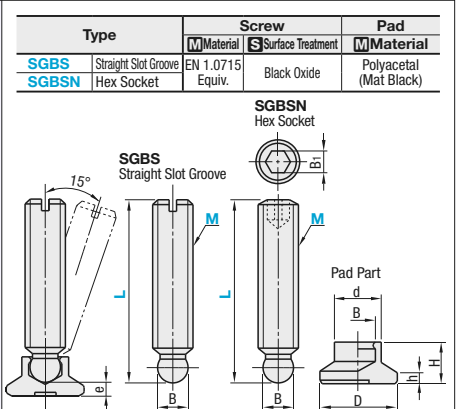
# Grub Screw Sets

## Ball Point, Thrust Point, Stainless Steel

# Grub Screw Sets / Clamp Plates / Shims for Clamp Plates

## Rubber Pads, Flanged

### Ball Point



Part Number Type	M (Coarse)	L	e	D	h	H	d	B	B1	Mass (g)	Unit Price
8	40	2.5	15	2.5	7.6	8.6	6.1	4		12	
	50									15	
	63									19	
10	50	3.4	18	2.5	9.2	11	7.8	5		22	
	63									29	
	80									37	
12	63	3.4	21	3	10	13	9.4	6		41	
	80									53	
	100									68	

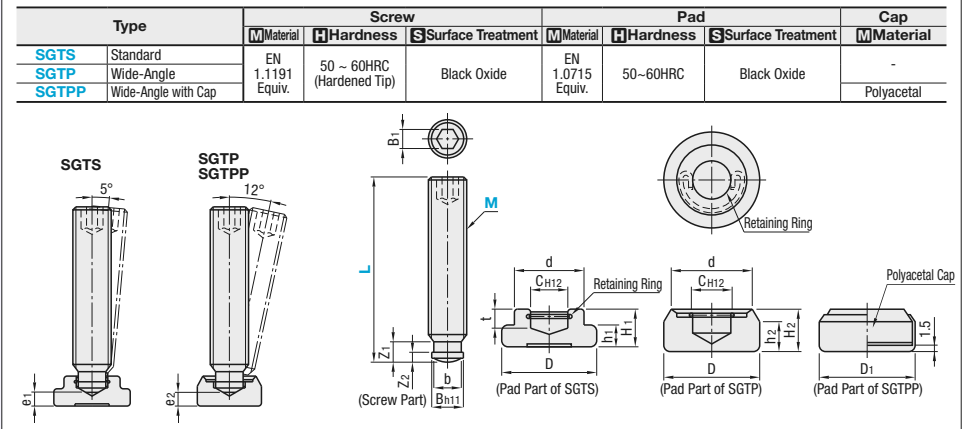
⚠ Screws and pads are not assembled when shipped.

**Example**

**Features**

- Useable to tighten or position the workpiece or as a stopper.
- Clamping Screws can be made easily by assembling with a lever or a knob.
- Pad is made of plastic and doesn't hurt workpieces. It is effective when the workpiece's surface is uneven or tilted.

### Thrust Point



Part Number Type	M (Coarse)	L	SGTS Mass (g)	SGTP Mass (g)	SGTPP Mass (g)	SGTS Unit Price	SGTP Unit Price	SGTPP Unit Price
6	30	9	-	-	-	-	-	-
	40	10	-	-	-	-	-	-
	50	12	-	-	-	-	-	-
8	40	21	25	26	-	-	-	-
	50	24	28	29	-	-	-	-
	60	26	30	31	-	-	-	-
	50	42	48	50	-	-	-	-
	60	49	55	57	-	-	-	-
	80	54	60	62	-	-	-	-
10	60	72	76	79	-	-	-	-
	70	88	92	95	-	-	-	-
	80	98	102	105	-	-	-	-
	100	154	158	161	-	-	-	-
16	70	144	160	162	-	-	-	-
	80	159	175	177	-	-	-	-
	100	259	275	277	-	-	-	-
	125	300	316	318	-	-	-	-
20	90	274	-	-	-	-	-	-
	100	305	-	-	-	-	-	-
	125	355	-	-	-	-	-	-
	150	397	-	-	-	-	-	-

M (Coarse)	Screw Dimension			Pad Dimension										
B	b	Z1	Z2	D	h1	H1	t	d	C	e1	h2	H2	e2	D1
6	4.5	4	5.4	2.5	3	12	2.5	7	4	10	4.6	2.2	-	-
8	6	5.4	6.8	3	4	16	4	9	5	12	6.1	3	7	8
10	8	7.2	8.2	4.5	5	20	5	11	6	15	3.6	8.5	10	2.6
12	12	11	10.6	5	8	25	6	13	7	18	8.1	4.5	8	11
16	12	11	10.6	5	8	32	7	15	7.5	22	12.1	5.3	10	14
20	15.5	14.4	12.4	5.5	10	40	9	16	8	28	15.6	5.6	-	-

⚠ SGTPP is SGTP attached with a polyacetal cap.

⚠ Screws and pads are not assembled when shipped.

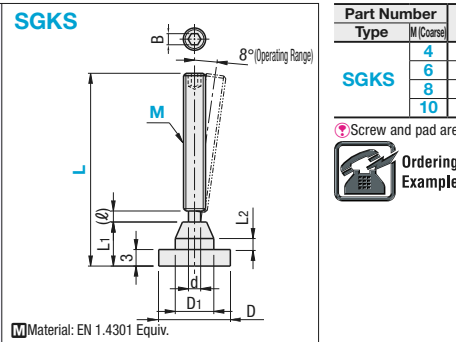
**Example**

**How to Assemble Screw Parts and Pad Parts**

- Insert a tilted grub screw to the open side of the retaining ring set in the thrust pad as shown in Fig.1.
- Pull the grub screw up to fit into the pad as shown in Fig.2.

\*If extra force is applied to the retaining ring, or if the grub screw is inserted into it without being tilted against its open side, the retaining ring may be damaged.

### Stainless Steel



Part Number Type	M (Coarse)	L Selection	D	D1	d	L1	L2	(θ)	B	L30	L50	L80	Unit Price
4	30	13	7	2.2	8	2		2		-	-	-	
	50												
6	30	16	9	3.2	8	3		3		-	-	-	
	50												
8	30	20	11	5.2	9	4		4		-	-	-	
	50												
10	30	25	13	6.2	9	5		5		-	-	-	
	50												

⚠ Screw and pad are swaged for Stainless Steel Type. (Screw and pad cannot be separated.)

**Example**

Part Number - L

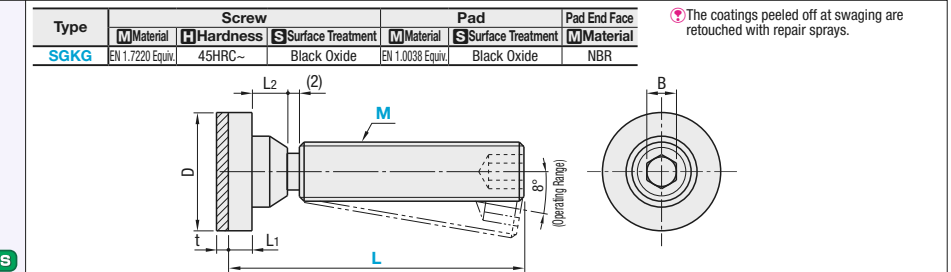
SGBS10 - 50

SGTS8 - 60

SGKS4 - 30

**Features:** The rubber-baked pad prevents the clamped workpieces from being damaged.

### Grub Screw Sets - Rubber Pads



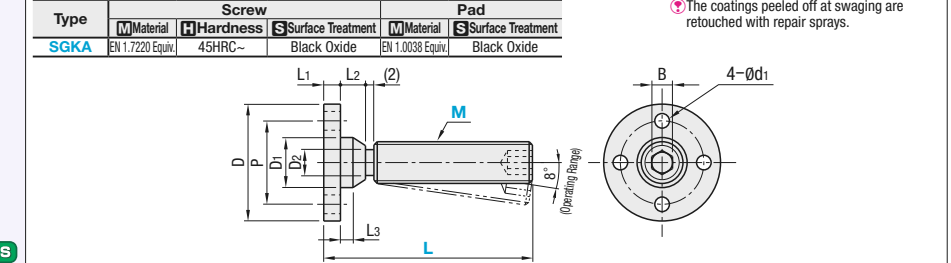
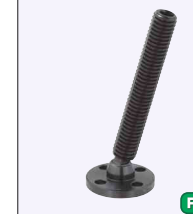
Part Number Type	M (Coarse)	L Selection	D	t	L1	L2	B	Unit Price
								L=30, 40 L=50, 60 L=80~
SGKG	4	30	12				2	
	6	30 40 50	12				3	
	8	40 50 60	16	2	3	5	3	
	10	50 80	20				6 5	
	12	100	24				8 6	
	16	125	30	3	4	11	8	

**Example** Part Number - L

SGKG8 - 60

**Features:** Optional attachments can be mounted using through holes on the pad.

### Grub Screw Sets - Flanged Type

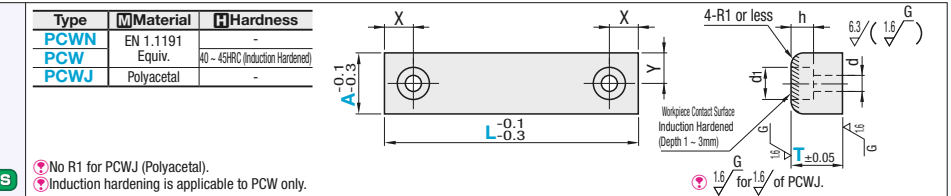


Part Number Type	M (Coarse)	L Selection	D	P	D1	D2	L1	L2	L3	d1	B	Unit Price
												L=30, 40 L=50, 60 L=80~
SGKA	4	30	20	14	7	2.2				2	3.5	
	6	30 40 50	20	14	7	3.2	3	5	2	3		
	8	40 50 60	22	16	9	5.2				4		
	10	50 80	28	20	12	6.2				6 3	5	
	12	100	30	22	14	8.1	4	8	5	6		
	16	125	37	28	18	11.0		11	7	5.5	8	

**Example** Part Number - L

SGKA12 - 100

### Clamp Plates



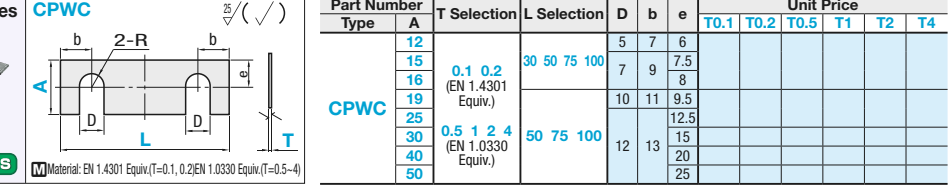
Part Number Type	A	T Selection	L Selection	X	Y	d	d1	h	Unit Price
PCWN PCW PCWJ	12		30	7	6	4.5	8	5	
	15		50	9	7.5	6.6	11	7	
	16		75						
	19		100						
	25		50	11	9.5	9	14	9	
	30		75	13	15				
	40		100						
	50								

**Example**

Panel

PCWN

### Shims for Clamp Plates



Part Number Type	A	T Selection	L Selection	D	b	e	Unit Price
							T0.1 T0.2 T0.5 T1 T2 T4
CPWC	12		30 50 75 100	5	7	6	
	15			7	9	7.5	
	16			10	11	8	
	19			12	13	9.5	
	25					12.5	
	30					15	
40					20		
50					25		

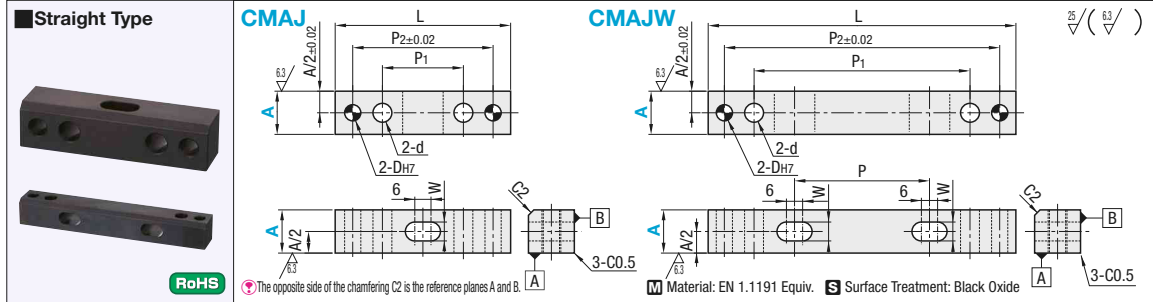
**Example** Part Number - T - L

PCWN50 - 20 - 100

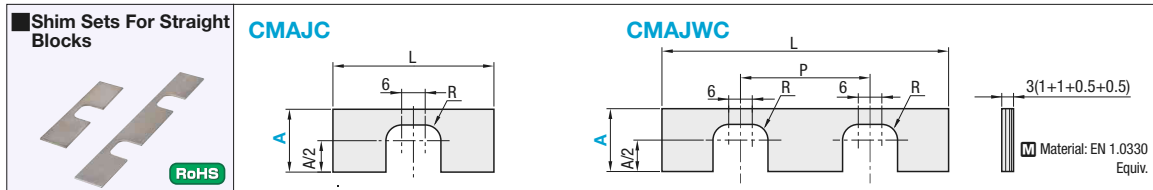
CPWC50 - 2 - 75

# Blocks for Shim Adjustment of Welding Fixtures / Shim Sets

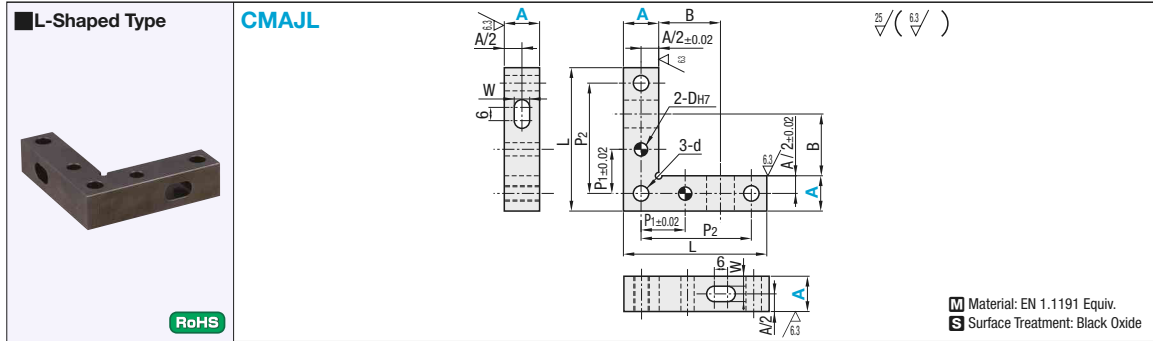
Straight, L-Shaped



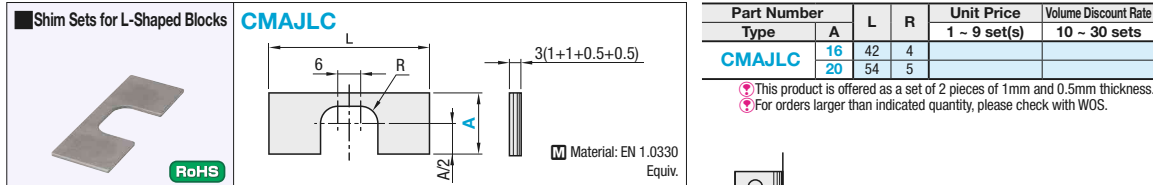
Part Number Type	A	L	D	d	P	P1	P2	W	Unit Price	Volume Discount Rate
									1 - 9 pc(s).	10 - 30 pcs.
CMAJ	16	65	6	7	-	30	52	7		
	20	75	8	9	-	40	62	9		
CMAJW	16	114	6	7	50	80	102	7		
	20	124	8	9	50	90	112	9		



Part Number Type	A	L	R	P	Unit Price	Volume Discount Rate
					1 - 9 set(s)	10 - 30 sets
CMAJC	16	65	4	-		
	20	75	5	-		
CMAJWC	16	114	4	50		
	20	124	5	50		



Part Number Type	A	L	D	d	B	P1	P2	W	Unit Price	Volume Discount Rate
									1 - 9 pc(s).	10 - 30 pcs.
CMAJL	16	65	6	7	28	20	50	7		
	20	100	8	9	53	40	80	9		



Ordering Example: **Part Number** CMAJ16 CMAJC16 CMAJL16 CMAJLC20

Example: This can be utilized to adjust the position of angle plates or brackets for locating pins.

# Workpiece Detection System / Detection Pins for Weld Nuts

**Workpiece Detection System**

Type	Body		Pin		Spring
	Material	Surface Treatment	Material	Surface Treatment	Material
PCPNA	EN AW-6061 Equiv.	Clear Anodize	EN 1.1191 Equiv.	Electroless Nickel Plating	EN 1.4301 (WPS) Equiv.

Accessory: Set Screw M4, 1pc.  
Can be used in combination with Detector Pins for Weld Nuts.

Stroke	0 (min.)	3	8 (max.)
Switch	OFF	ON	ON

Spring	S (Soft)	H (Hard)
Spring Constant (N/mm)	0.3	0.5
O.D. (mm)	12	12
Wire Dia. (mm)	0.65	0.8
I.D. (mm)	10.7	10.4
Free Length (mm)	20	20
Allowable Deflection	12	9

\* Example of an applicable proximity sensor (shield type of 2-Line type)  
- KEYENCE EV-108M  
- OMRON E2E-X2D1-M3G

Part Number Type	D	Spring Selection	L Selection	S (Soft)		H (Hard)		Unit Price
				Load (N) min	Load (N) max	Load (N) min	Load (N) max	
PCPNA	8	S (Soft) H (Hard)	30 50	1.2	3.6	2.0	6.0	kgf=Nx0.101972

Ordering Example: **Part Number** - L  
PCPNA8H - 50

Suitable to confirm existence of workpieces when proximity sensor cannot be placed near target objects.  
For Urethane Pushers (P-1553) or Detector Pins (below), tip parts can be selected depending on the objects to be detected.

**Detection Pins for Weld Nuts**

Type	Material	Hardness	Surface Treatment	MxPitch Fine	MxPitch Coarse
NUTK	EN 1.1191 Equiv.	Hardened Hardness: 45 - 50HRC	Black Oxide	5x0.5	5x0.8
BNUTK				6x0.75	6x1.0
				8x0.75	8x1.25

Reference: sin15°=0.259 sin30°=0.5  
sin45°=0.707 sin60°=0.87  
tan15°=0.267 tan30°=0.577  
tan45°=1 tan60°=1.73

Combination of Workpiece Detecting Unit and Cylinder is available.

Part Number Type	Tip Shape	D	P			A Selection	E (Shape A) 1mm Increment	M			Unit Price	
			0.1mm Increment	1mm Increment	1mm Increment			Coarse	Fine	NUTK	BNUTK	
NUTK	A	12	5.0~10.0	5~30 (B:P4)	15~20	30	1~10	5	5S			
	B	16	10.1~12.0			5		6	5S	6S		
	C	12.1~14.0	5			6		8	5S	6S	8S	

Ordering Example: **Part Number** Type Tip Shape D - P - B - L - A - E - M

NUTK A 12 - P6.0 - B10 - L20 - A30 - E2 - M5 (Shape A)  
 NUTK C 16 - P10.5 - B15 - L20 - A30 - E2 - M6 (Shape C)