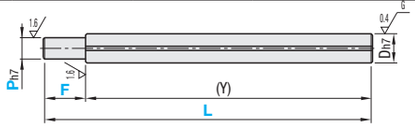
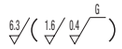
### ■One End Stepped

RoHS10

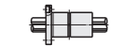
| One End Stepped | Spline Shafts M SUJ2 Equivalent Nut M SCM415 Equivalent H Hardness: 58HRC ~ | | Spline Shaft, Nut M Material: SUS440C Equivalent H Hardness: 55HRC ~ |
|---|---|---|---|
| | Nut 1 pc. | Nut 2 pcs. | Nut 1 pc. |
| With Round Flange Nut | BSDM | BSD2M | BSDMS |
| With Compact Flange Nut | BSDN | BSD2N | - |
| With Straight Nut | BSDS | BSD2S | - |



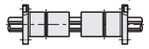




**Flanged Nut Orientation**

- 1 Nut Type



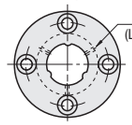
- 2 Nut Type (When Alteration NTW is specified)



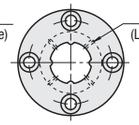
When selecting Overall Length (L Dimension), check the Annealing Range. P.339
Accuracy P.339 For the included nut, please select a shape from below.

### ■Round Flange Nuts

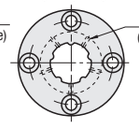
**No.6, 8**

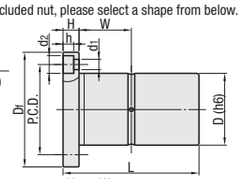



**No.10, 13**



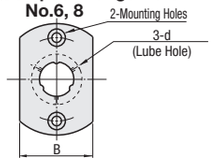

**No.16, 20, 25, 30**



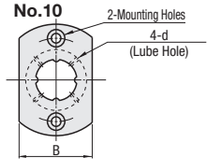



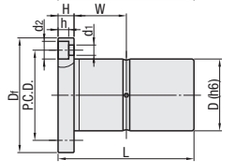

### ■Compact Flange Nuts

**No.6, 8**



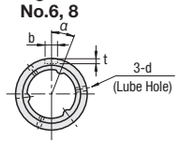

**No.10**



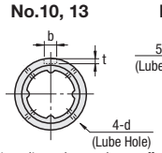




### ■Straight Nuts

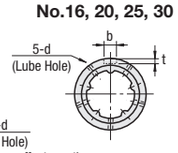
**No.6, 8**

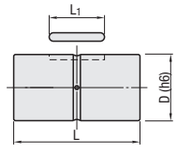



**No.10, 13**



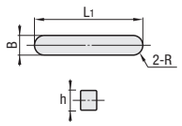

**No.16, 20, 25, 30**




* The key is press-fit into the nut.

**A Dimension of Included Key**




* Please refrain from machining the nuts as it may have adverse effects on the accuracy.

### ■Spline Shafts

| Part Number Type | No. | 1mm Increment L 1-Nut Type | L 2-Nut Type | F | P Selection | D | (Y) 1-Nut Type min~max | (Y) 2-Nut Type min~max | Mass (kg/m) |
|---|---|---|---|---|---|---|---|---|---|
| BSDM BSDN BSDS BSD2M BSD2N BSD2S BSDMS | *6 | 60~400(190) | 60~400 | When P=3 2≤F≤9 When P=4 2≤F≤16 When P≥5 2≤F≤Px5 | 3 4 5 | 6 | 58~398(188) | 58~398 | 0.23 |
| | *8 | 60~400(190) | 60~400 | | 4 5 6 | 8 | 58~398(188) | 58~398 | 0.39 |
| | *10 | 60~600(390) | 90~600 | | 4 5 6 8 | 10.4 | 58~598(388) | 88~598 | 0.65 |
| | *13 | 60~600(390) | 100~600 | | 5 6 8 10 | 13.4 | 58~598(388) | 98~598 | 1.11 |
| | *16 | 70~600(390) | 110~600 | | 5 6 8 10 12 13 | 16.6 | 68~598(388) | 108~598 | 1.65 |
| | 20 | 80~ 700 | 130~700 | | 8 10 12 13 15 16 | 20.6 | 78~898 | 128~698 | 2.57 |
| | 25 | 90~ 900 | 150~900 | | 8 10 12 13 15 16 20 | 25.8 | 88~898 | 148~898 | 4.04 |
| | 30 | 100~1150 | 170~1150 | | 10 12 13 15 16 20 25 | 30.8 | 98~1148 | 168~1148 | 5.85 |

For BSDMS, only * marked sizes are available, and the Max. L and Y dimensions are in ( ).
For BSDN and BSD2N, only No. 6, 8 and 10 are available.

### ■Round Flange Nuts, Compact Flange Nuts

| No. | D (h6) | L | Df | H | P.C.D. | d1 | d2 | h | W | d | B | Basic Rated Torque Dynamic Ct (N·m) | Basic Rated Torque Static Cot (N·m) | Basic Load Rating Dynamic C (kN) | Basic Load Rating Static Co (kN) | Allowable Static Moment M01 (N·m) | Allowable Static Moment M02 (N·m) | Mass (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 14 | 25 | 30 | 6 | 22 | 3.5 | 6 | 3.1 | 6.5 | 1.5 | 18 | 3.8 | 7 | 1.2 | 2.1 | 5 | 36 | 0.03 |
| 8 | 16 | | 32 | | 24 | | | | | | 21 | 4.8 | 8.7 | 1.2 | 2.1 | 5 | 36 | 0.04 |
| 10 | 21 | 40(33) | 42(41) | 6(8) | 32(30) | 4.5 | 8 | 4.4(5.3) | 14(8.5) | | 25 | 19(11) | 34(21) | 3.8(2.4) | 6.9(4.3) | 26(15) | 181(102) | 0.09 |
| 13 | 24 | 44(36) | 44(45) | 7(8) | 33(34) | | | | 15(10) | | - | 28(20) | 52(37) | 4.6(3.3) | 8.3(5.9) | 36(22) | 251(148) | 0.11 |
| 16 | 31 | 50 | 51 | 7 | 40 | | | 4.4 | 18 | | | 51 | 93 | 6.2 | 11.1 | 56 | 386 | 0.2 |
| 20 | 35 | 63 | 58 | 9 | 45 | 5.5 | 9.5 | 5.4 | 22.5 | 2 | | 85 | 154 | 8.5 | 15.3 | 83 | 611 | 0.3 |
| 25 | 42 | 71 | 65 | | 52 | | | | 26.5 | | | 193 | 348 | 15.4 | 27.7 | 173 | 1248 | 0.4 |
| 30 | 47 | 80 | 75 | 10 | 60 | 6.6 | 11 | 6.5 | 30 | 2.5 | | 272 | 490 | 18.5 | 33.3 | 212 | 1581 | 0.57 |

Dimensions in ( ) are for SUS440C Equivalent. Allowable static moment M01 is a value measured when a single nut is used, and M02 is a value measured when two nuts are used.

### ■Straight Nuts

| No. | D (h6) | L | b | Tolerance | t +0.05 0 | d | α | Basic Rated Torque Dynamic Ct (N·m) | Basic Rated Torque Static Cot (N·m) | Basic Load Rating Dynamic C (kN) | Basic Load Rating Static Co (kN) | Allowable Static Moment M01 (N·m) | Allowable Static Moment M02 (N·m) | Mass (kg) | Dimensions of Key (Included) B | Tolerance | h | Tolerance | L1 | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 14 | 25 | 2.5 | +0.014 0 | 1.2 | 1.5 | 15° | 3.8 | 7 | 1.2 | 2.1 | 5 | 36 | 0.012 | 2.5 | +0.016 +0.006 | 2.5 | 0 -0.025 | 10.5 | 1.25 |
| 8 | 16 | | | | | | 25° | 4.8 | 8.7 | 1.2 | 2.1 | 5 | 36 | 0.013 | | | | | 10.5 | |
| 10 | 21 | 40(33) | 3 | | 1.5 | | - | 19(11) | 34(21) | 3.8(2.4) | 6.9(4.3) | 26(15) | 181(102) | 0.06 | 3 | | 3 | | 17(14) | 1.5 |
| 13 | 24 | 44(36) | | | | | | 28(20) | 52(37) | 4.6(3.3) | 8.3(5.9) | 36(22) | 251(148) | 0.07 | | | | | 17(14) | |
| 16 | 31 | 50 | 3.5 | +0.018 0 | 2 | 2 | | 51 | 93 | 6.2 | 11.1 | 56 | 386 | 0.15 | 3.5 | +0.024 +0.012 | 3.5 | 0 -0.030 | 18 | 1.75 |
| 20 | 35 | 63 | 4 | | 2.5 | | | 85 | 154 | 8.5 | 15.3 | 83 | 611 | 0.2 | 4 | | 4 | | 29 | 2 |
| 25 | 42 | 71 | | | | | | 193 | 348 | 15.4 | 27.7 | 173 | 1248 | 0.29 | | | | | 33 | |
| 30 | 47 | 80 | | | | 2.5 | | 272 | 490 | 18.5 | 33.3 | 212 | 1581 | 0.37 | | | | | 42 | |

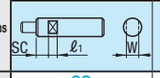
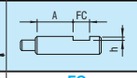
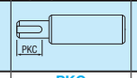
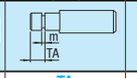
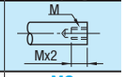
Dimensions in ( ) are for SUS440C Equivalent. Allowable static moment M01 is a value measured when a single nut is used, and M02 is a value measured when two nuts are used.

| Part Number Type | No. | Unit Price Min. L ~150 | L151 ~200 | L201 ~300 | L301 ~400 | L401 ~500 | L501 ~600 | L601 ~700 | L701 ~800 | L801 ~900 | L901 ~1000 | L1001 ~1150 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BSDM BSD2M Price of BSD2M = BSDM + Additional price shown below | 6 | | | | | - | - | - | - | - | - | - |
| | 8 | | | | | - | - | - | - | - | - | - |
| | 10 | | | | | | | - | - | - | - | - |
| | 13 | | | | | | | - | - | - | - | - |
| | 16 | | | | | | | - | - | - | - | - |
| | 20 | | | | | | | | - | - | - | - |
| | 25 | | | | | | | | | | - | - |
| | 30 | | | | | | | | | | | |
| BSDN BSD2N Price of BSD2N = BSDN + Additional price shown below | 6 | | | | | - | - | - | - | - | - | - |
| | 8 | | | | | - | - | - | - | - | - | - |
| | 10 | | | | | | | - | - | - | - | - |
| BSDS BSD2S Price of BSD2S = BSDS + Additional price shown below | 6 | | | | | - | - | - | - | - | - | - |
| | 8 | | | | | - | - | - | - | - | - | - |
| | 10 | | | | | | | - | - | - | - | - |
| | 13 | | | | | | | - | - | - | - | - |
| | 16 | | | | | | | - | - | - | - | - |
| | 20 | | | | | | | | - | - | - | - |
| | 25 | | | | | | | | | | - | - |
| | 30 | | | | | | | | | | | |

| Part Number Type | No. | Unit Price Min. L ~150 | L151 ~200 | L201 ~250 | L251 ~300 | L301 ~350 | L351 ~390 |
|---|---|---|---|---|---|---|---|
| BSDMS | 6 | | | - | - | - | - |
| | 8 | | | - | - | - | - |
| | 10 | | | | | | |
| | 13 | | | | | | |
| | 16 | | | | | | |

| No. | Additional Price for 2-Nut Type Round Flange Nuts | Compact Flange Nuts | Straight Nuts |
|---|---|---|---|
| 6 | | | |
| 8 | | | |
| 10 | | | |
| 13 | | - | |
| 16 | | - | |
| 20 | | - | |
| 25 | | - | |
| 30 | | - | |

Alterations: Part Number - L - F - P - (SC, FC···etc)
BSDN10 - 300 - F20 - P8 - SC15

| Alterations | Wrench Flats | Set Screw Flat | Keyway on Shaft End | Retaining Ring Groove | Tapping |
|---|---|---|---|---|---|
| |   |   |   |   |   |
| Code | SC | FC | PKC | TA | MC |
| Spec. | Adds a wrench flat. SC=1mm Increment SC+ℓ1≤Y | Adds a set screw flat. Ordering Code FC10-A8 FC, A=1mm Increment FC≤3xD 1.5xD<FC >> FC≤Y/2 A=0 or A≥2 | Adds a keyway on the shaft end P. Ordering Code PKC10 P≥8 PKC=1mm Increment PKC≤Px3 PKC≤F-1 Keyway Details P.340 | Adds retaining ring grooves. Ordering Code TA10 TA=1mm Increment P≥6 4≤TA<F/2 For Retaining Ring Groove Details P.340 | Machines tapped hole on the right end face. |

SC: No. 6: W 5, ℓ1 8; 8: W 7, ℓ1 8; 10: W 8, ℓ1 8; 13: W 11, ℓ1 10; 16: W 14, ℓ1 10; 20: W 17, ℓ1 10; 25: W 22, ℓ1 15; 30: W 27, ℓ1 15

FC: No. 6, 8, 10, 13: h 1; 16, 20, 25, 30: h 2

MC: No. 6: M 3; 8: M 3, 4; 10: M 3, 4, 5; 13: M 5, 6; 16: M 6, 8; 20: M 6, 8, 10; 25: M 6, 8, 10, 12; 30: M 8, 10, 12

When selecting multiple alteration additions, more than 2mm is needed between each feature to be added.

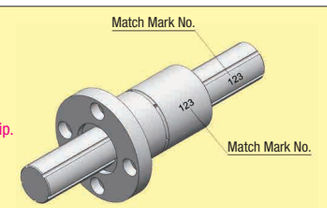
Ordering Example: Part Number - L - F - P
BSDN10 - 300 - F20 - P6
BSDN10G - 300 - F20 - P6
BSDN10L - 300 - F20 - P6

Alternative grease types available.
For Days to Ship, Price and Performance, see P.340

## Cautions for Ball Spline Assembly

### ■Check Assembly Position

Match Mark No.'s are entered on nuts and spline shafts (see diagram on right).
When re-assembling, match the character orientations of Match Mark No.'s, and positional relationship.

### ■Tolerance for Mating Bores

An H7 tolerance is recommended for mating bores for the spline nuts.