

Self aligning and Correction Device

CENTER MASTER

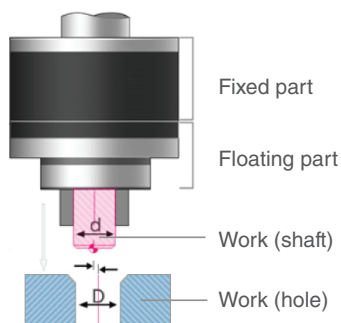
Center Master compensates for errors (position and/or angular) occurring during the assembly of various precision parts which are pressed or loose fitted into the holes, reducing assembly failure, enhances product quality, and shortens the cycle time in production line.



► Principal of correcting inaccurate position

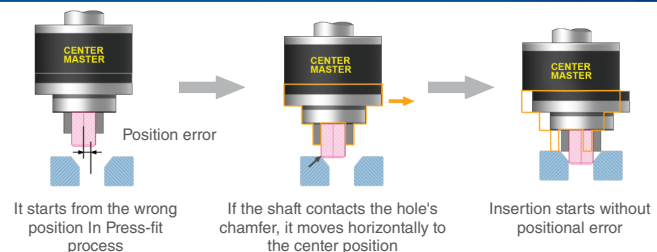
Center Master compensates for positional and/or angular errors which are major causes of poor Press-fit

Process of Center Error Correction

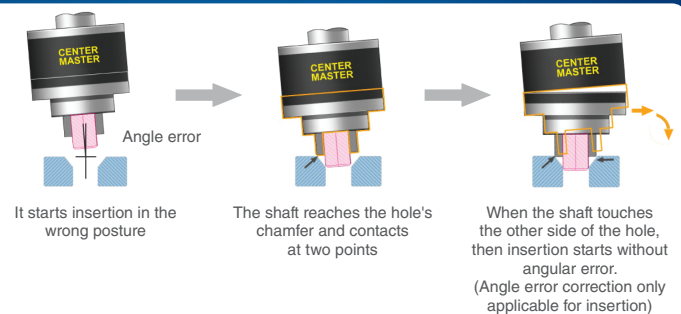


Nonforced insertion : $D > d$
Forced Insertion : $d \geq D$

Automatic Compensation of Positional Error



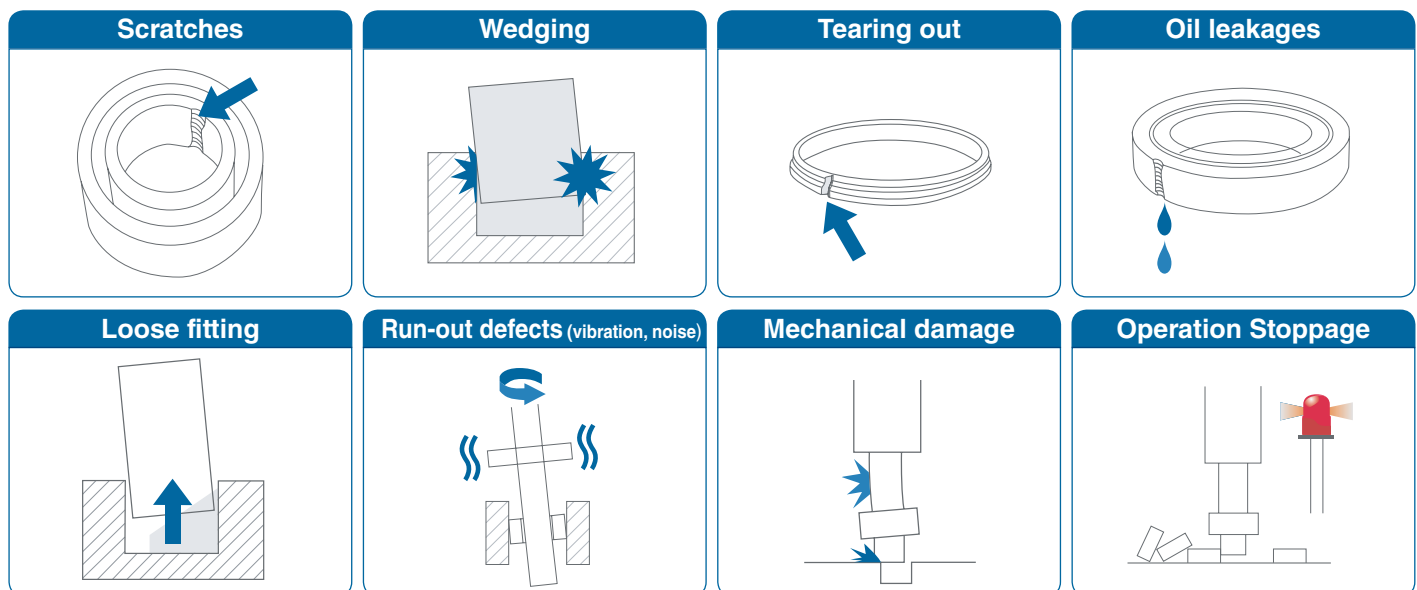
Automatic Compensation of Angular Error



► Effects of CENTER MASTER



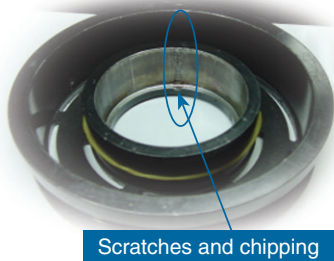
► Examples of nonconforming insertion process : Resolved with CENTER MASTER



► Application

CENTER MASTER Application Case 01

Air conditioner compressor pulley and bearing press fitting



Problem

- Bearing was assembled in skewed position due to center misalignment
- Internal of pulley is scratched and the chip is accumulated
- Recalled after 2-month release due to noise / vibration
- Defect can not be scanned by checking only Press-fit force.

Improvement

- Cost reduction due to zero bearing defects
- Protect Bearing damaged by reducing pressing force
- Reduced noise and vibration
- Reduced line stops and increased productivity



CENTER MASTER Application Case 02

Transmission case and oil seal assembly



Problem

- The misalignment of the center point caused by increasing the power of Press-fit resulted in oil seal breakdown and oil leak

Improvement

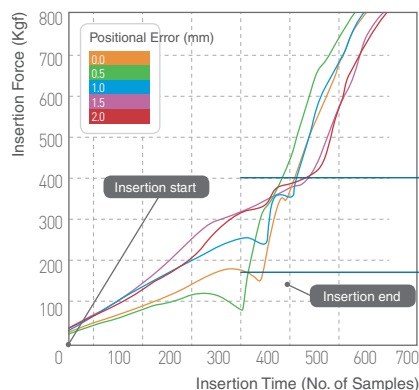
- Reduced insertion load (400 -> 150kgf) -> no oil leakage
- Uniformed insertion quality
- Reduced line stops and increased productivity



THE EFFECT OF CENTER MASTER IN PRESS-FIT TASK

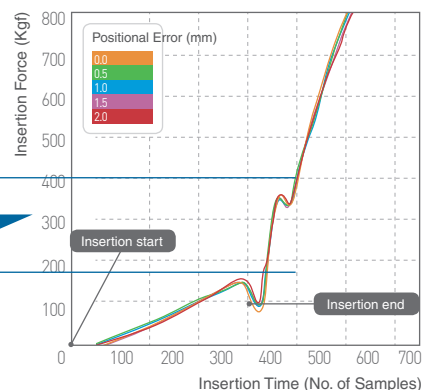
(Automatic transmission : press-fit of oil seal)

Without CENTER MASTER



- Maximum insertion force and its dispersion increase along with positional errors
- Quality is uneven; high probability of defects

With CENTER MASTER

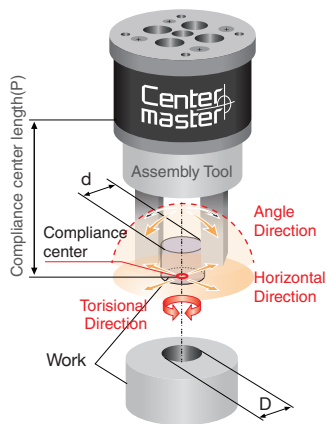


- Consistent maximum insertion force regardless of positional errors
- Uniform insertion graph
- Low degree of dispersion



► CENTER MASTER LINE UP

Series	B	BS	S	SS	T	TS	A	LA
Position Compensation	○	○	○	○	○	○	○	○
Angular Compensation(Inserting)	(○)	(○)	(○)	(○)	(○)	(○)	○	○
Torsion Compensation	○	○	○	○			○	○
Embedded load cell			○	○				
Torque pressure operation					○	○		
Lock up function for moving assembly								○
Flange Type	○		○		○			
Flangeless Type		○		○		○		



- Compliance center length (P)**
 The allowable tolerance of the P value is within $\pm 5\text{mm}$. If the P value exceeds the tolerable limit, the compensation function to correct misalignment may not work properly.
- Payload**
 Payload means the total weight of an assembly tool and a work piece. Improper payload may effect the device's performance or lifetime.

Characteristics of B-BS series and T-TS series



Rotation and Torsion



Rotation only

Lock up function of LA series



Robot arm mounted



Moving : LOCK



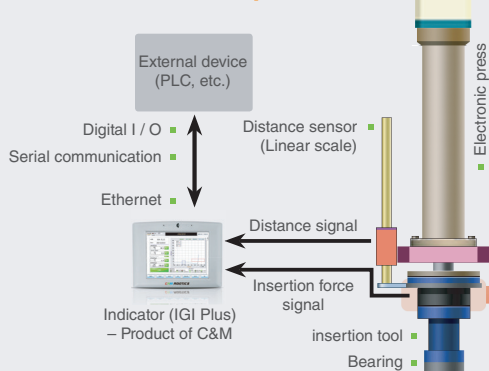
Insertion : UNLOCK

S-SS series with Built-in Load cell function

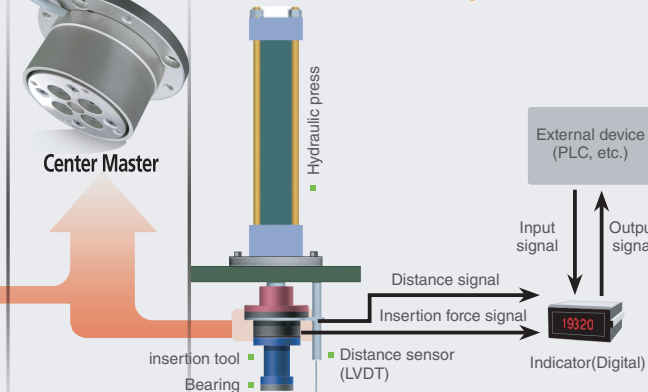
Application example : Bearing Press-fit

-> S-SS Series Center Master with built-in load cell can not only compensate eccentric errors by simple mounting to any hydraulic or electric servo press but also transfer the measured electrical signals to the connected controlling devices via the Indicator in order to monitor insertion quality in real-time. the average value calculated until stopper inside the centering device starts operating

Example 1



Example 2



B-Series



Model ⁽¹⁾	Allowable maximum force [kN] (Kg ^l)	Compliance center length P[mm]	Payload ⁽²⁾ [N] (Kg ^l)	Compensation range		Elasticity Coefficient ⁽³⁾				Product Weight (kg)
				Position [mm]	Angle [deg.]	Axial [N/mm] (Kg/mm)		Horizontal Direction [N/mm] (Kg/mm)	Torsional direction [N/mm] (Kg/mm)	
						Compressional	Tensile			
B6-040-048	6.0 (610)	40	14.7 (1.5)	±2	±7.7	625.2 (63.8)	143.1 (14.6)	9.5 (1.0)	2.4 (24.5)	0.6
B6-050-054	7.5 (770)	50	19.6 (2.0)	±2	±7.3	1180.9 (120.5)	143.1 (14.6)	11.8 (1.2)	3.0 (30.6)	0.9
B6-060-060	8.5 (870)	60	19.6 (2.0)	±2	±6.0	1180.9 (120.5)	143.1 (14.6)	11.8 (1.2)	3.0 (30.6)	1.0
B6-070-065	15.0 (1530)	70	26.5 (2.7)	±2	±6.6	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	4.2 (42.9)	1.1
B6-080-070	25.0 (2550)	80	26.5 (2.7)	±2	±6.2	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	4.2 (42.9)	1.2
B6-090-078	25.0 (2550)	90	37.3 (3.8)	±2	±5.5	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (62.2)	1.8
B6-100-084	40.0 (4080)	100	37.3 (3.8)	±2	±5.0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (62.2)	2.0
B6-110-088	40.0 (4080)	110	37.8 (3.9)	±2	±4.6	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)	2.2
B6-120-095	45.0 (4590)	120	37.8 (3.9)	±2	±5.1	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)	2.4
B6-130-099	50.0 (5100)	130	37.8 (3.9)	±2	±5.1	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)	2.6
B6-140-108	55.0 (5610)	140	78.0 (8.0)	±2	±4.8	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	7.7 (78.6)	3.2
B6-150-130	60.0 (6120)	150	78.0 (8.0)	±2	±4.2	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	7.7 (78.6)	4.7

BS-Series



Model ⁽¹⁾	Allowable maximum force [kN] (Kg ^l)	Compliance center length P[mm]	Payload ⁽²⁾ [N] (Kg ^l)	Compensation range		Elasticity Coefficient ⁽³⁾				Product Weight (kg)
				Position [mm]	Angle [deg.]	Axial [N/mm] (Kg/mm)		Horizontal Direction [N/mm] (Kg/mm)	Torsional direction [N/mm] (Kg/mm)	
						Compressional	Tensile			
BS6-040-048	6.0 (610)	40	14.7 (1.5)	±2	±7.7	625.2 (63.8)	143.1 (14.6)	9.5 (1.0)	2.4 (24.5)	0.5
BS6-050-054	7.5 (770)	50	19.6 (2.0)	±2	±7.3	1180.9 (120.5)	143.1 (14.6)	11.8 (1.2)	3.0 (30.6)	0.7
BS6-060-060	8.5 (870)	60	19.6 (2.0)	±2	±6.0	1180.9 (120.5)	143.1 (14.6)	11.8 (1.2)	3.0 (30.6)	0.8
BS6-070-065	15.0 (1530)	70	26.5 (2.7)	±2	±6.6	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	4.2 (42.9)	0.9
BS6-080-070	25.0 (2550)	80	26.5 (2.7)	±2	±6.2	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	4.2 (42.9)	1.0
BS6-090-078	25.0 (2550)	90	37.3 (3.8)	±2	±5.5	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (62.2)	1.5
BS6-100-084	40.0 (4080)	100	37.3 (3.8)	±2	±5.0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (62.2)	1.6
BS6-110-088	40.0 (4080)	110	37.8 (3.9)	±2	±4.6	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)	1.8
BS6-120-095	45.0 (4590)	120	37.8 (3.9)	±2	±5.1	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)	2.0
BS6-130-099	50.0 (5100)	130	37.8 (3.9)	±2	±5.1	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)	2.1
BS6-140-108	55.0 (5610)	140	78.0 (8.0)	±2	±4.8	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	7.7 (78.6)	2.7
BS6-150-130	60.0 (6120)	150	78.0 (8.0)	±2	±4.2	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	7.7 (78.6)	4.2

S-Series



Model ⁽¹⁾	Capacity [kN] (Kg ^l)	Compliance center length P[mm]	Payload ⁽²⁾ [N] (Kg ^l)	Compensation range		Elasticity Coefficient ⁽³⁾				Product Weight (kg)
				Position [mm]	Angle [deg.]	Axial [N/mm] (Kg/mm)		Horizontal Direction [N/mm] (Kg/mm)	Torsional direction [N/mm] (Kg/mm)	
						Compressional	Tensile			
S4D-070-065-02	19.6 (2)	70	30 (3)	±2	±6.6	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	4.2 (42.9)	1.4
S4D-070-065-04	39.2 (4)									
S4D-070-065-06	58.8 (6)									
S4D-090-078-02	19.6 (2)	90	40 (4.1)	±2	±5.5	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (62.2)	2.1
S4D-090-078-04	39.2 (4)									
S4D-090-078-06	58.8 (6)									
S4D-110-088-03	29.4 (3)	110	40 (4.1)	±2	±4.6	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (71.4)	2.7
S4D-110-088-06	58.8 (6)									
S4D-110-088-10	98.1 (10)									
S4D-140-108-03	29.4 (3)	140	80 (8.2)	±2	±4.8	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	7.7 (78.6)	4.1
S4D-140-108-06	58.8 (6)									
S4D-140-108-10	98.1 (10)									
S4D-150-130-04	39.2 (4)	150	80 (8.2)	±2	±4.2	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	7.7 (78.6)	6.0
S4D-150-130-07	68.6 (7)									
S4D-150-130-12	117.7 (12)									

SS-Series



Model ⁽¹⁾	Capacity [kN] (Kg ^l)	Compliance center length P[mm]	Payload ⁽²⁾ [N] (Kg ^l)	Compensation range		Elasticity Coefficient ⁽³⁾				Product Weight (kg)
				Position [mm]	Angle [deg.]	Axial [N/mm] (Kg/mm)		Horizontal Direction [N/mm] (Kg/mm)	Torsional direction [N/mm] (Kg/mm)	
						Compressional	Tensile			
SS4D-070-065-02	19.6 (2)	70	30 (3)	±2	±6.6	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	4.2 (42.9)	1.2
SS4D-070-065-04	39.2 (4)									
SS4D-070-065-06	58.8 (6)									
SS4D-090-078-02	19.6 (2)	90	40 (4.1)	±2	±5.5	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (62.2)	1.7
SS4D-090-078-04	39.2 (4)									
SS4D-090-078-06	58.8 (6)									
SS4D-110-088-03	29.4 (3)	110	40 (4.1)	±2	±4.6	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (71.4)	2.3
SS4D-110-088-06	58.8 (6)									
SS4D-110-088-10	98.1 (10)									
SS4D-140-108-03	29.4 (3)	140	80 (8.2)	±2	±4.8	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	7.7 (78.6)	3.5
SS4D-140-108-06	58.8 (6)									
SS4D-140-108-10	98.1 (10)									
SS4D-150-130-04	39.2 (4)	150	80 (8.2)	±2	±4.2	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	7.7 (78.6)	5.4
SS4D-150-130-07	68.6 (7)									
SS4D-150-130-12	117.7 (12)									

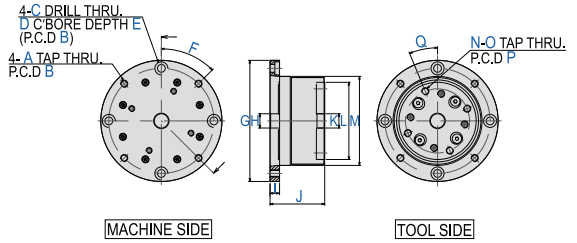
T-Series



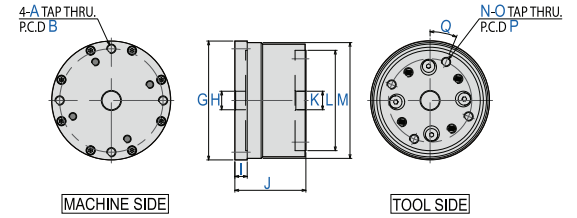
Model ⁽¹⁾	Allowable maximum force [kN] (Kg ^l)	Compliance center length P[mm]	Payload ⁽²⁾ [N] (Kg ^l)	Compensation range			Elasticity Coefficient ⁽³⁾					Product Weight (kg)
				Position [mm]	Angle [deg.]	Torsional [deg.]	Axial [N/mm] (Kg/mm)		Horizontal Direction [N/mm] (Kg/mm)	Torsional direction [N/mm] (Kg/mm)		
							Compressional	Tensile				
T6-040-048	6.0 (610)	40	14.7 (1.5)	±2	0	625.2 (63.8)	143.1 (14.6)	9.5 (1.0)	58.8 (6.0)	±0.3	0.7	
T6-050-054	7.5 (770)	50	19.6 (2.0)	±2	0	1180.9 (120.5)	143.1 (14.6)	11.8 (1.2)	70.6 (7.2)	±0.3	0.9	
T6-060-060	8.5 (870)	60	19.6 (2.0)	±2	0	1180.9 (120.5)	143.1 (14.6)	11.8 (1.2)	78.5 (8.0)	±0.2	1.1	
T6-070-065	15.0 (1530)	70	26.5 (2.7)	±2	0	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	117.7 (12.0)	±0.2	1.2	
T6-080-070	25.0 (2550)	80	26.5 (2.7)	±2	0	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	126.5 (12.9)	±0.2	1.4	
T6-090-078	25.0 (2550)	90	37.3 (3.8)	±2	0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	201.0 (20.5)	±0.2	2.0	
T6-100-084	40.0 (4080)	100	37.3 (3.8)	±2	0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	216.7 (22.1)	±0.15	2.3	
T6-110-088	40.0 (4080)	110	37.8 (3.9)	±2	0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	231.4 (23.6)	±0.15	2.4	
T6-120-095	45.0 (4590)	120	37.8 (3.9)	±2	0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	247.1 (25.2)	±0.1	2.6	
T6-130-099	50.0 (5100)	130	37.8 (3.9)	±2	0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	265.8 (27.1)	±0.1	2.7	
T6-140-108	55.0 (5610)	140	78.0 (8.0)	±2	0	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	495.2 (50.5)	±0.1	3.8	
T6-150-130	60.0 (6120)	150	78.0 (8.0)	±2	0	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	962.0 (98.1)	±0.1	5.2	

(1) Model : Custom orders are available.

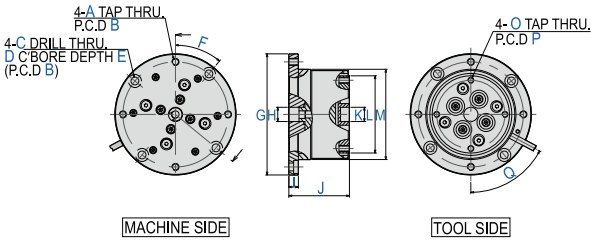
Model	Dimension																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
B6-040-048	M6	71.5	ø6.6	ø11	4	45°	ø85	ø12 ^{+0.02} ₋₀	8	37	ø12 ^{+0.02} ₋₀	ø48	ø58	3	M6	36	22.5°
B6-050-054	M6	77.5	ø6.6	ø11	4	45°	ø91	ø12 ^{+0.02} ₋₀	8	46	ø12 ^{+0.02} ₋₀	ø54	ø64	3	M6	43	22.5°
B6-060-060	M6	83.5	ø6.6	ø11	4	45°	ø97	ø12 ^{+0.02} ₋₀	8	46	ø12 ^{+0.02} ₋₀	ø60	ø70	3	M6	48	22.5°
B6-070-065	M6	88.5	ø6.6	ø11	4	45°	ø102	ø12 ^{+0.02} ₋₀	8	46	ø12 ^{+0.02} ₋₀	ø65	ø75	4	M6	54	22.5°
B6-080-070	M6	93.5	ø6.6	ø11	4	45°	ø107	ø12 ^{+0.02} ₋₀	8	46	ø12 ^{+0.02} ₋₀	ø70	ø80	4	M6	58	22.5°
B6-090-078	M8	104.5	ø9.0	ø14	5	45°	ø121	ø16 ^{+0.02} ₋₀	10	52	ø16 ^{+0.02} ₋₀	ø78	ø88	4	M8	65	22.5°
B6-100-084	M8	110.5	ø9.0	ø14	5	45°	ø127	ø16 ^{+0.02} ₋₀	10	52	ø16 ^{+0.02} ₋₀	ø84	ø94	4	M8	70	22.5°
B6-110-088	M8	114.5	ø9.0	ø14	5	45°	ø131	ø16 ^{+0.02} ₋₀	10	52	ø16 ^{+0.02} ₋₀	ø88	ø98	4	M8	75	22.5°
B6-120-095	M8	121.5	ø9.0	ø14	5	45°	ø138	ø16 ^{+0.02} ₋₀	10	52	ø16 ^{+0.02} ₋₀	ø95	ø105	4	M8	80	22.5°
B6-130-099	M8	125.5	ø9.0	ø14	5	45°	ø142	ø16 ^{+0.02} ₋₀	10	52	ø16 ^{+0.02} ₋₀	ø99	ø109	4	M8	86	22.5°
B6-140-108	M8	134.5	ø9.0	ø14	5	45°	ø151	ø16 ^{+0.02} ₋₀	10	56	ø16 ^{+0.02} ₋₀	ø108	ø118	4	M10	88	22.5°
B6-150-130	M8	155.0	ø9.0	ø14	5	45°	ø171	ø16 ^{+0.02} ₋₀	10	56	ø16 ^{+0.02} ₋₀	ø130	ø141	6	M10	114	17.5°



Model	Dimension																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
BS6-040-048	M6	50	-	-	-	-	ø60	12 ^{+0.02} ₀	8	37	12 ^{+0.02} ₀	ø48	ø58	3	M6	36	0°
BS6-050-054	M6	58	-	-	-	-	ø66	12 ^{+0.02} ₀	8	46	12 ^{+0.02} ₀	ø54	ø64	3	M6	43	22.5°
BS6-060-060	M6	62	-	-	-	-	ø72	12 ^{+0.02} ₀	8	46	12 ^{+0.02} ₀	ø60	ø70	4	M6	48	22.5°
BS6-070-065	M6	67	-	-	-	-	ø77	12 ^{+0.02} ₀	8	46	12 ^{+0.02} ₀	ø65	ø75	4	M6	54	22.5°
BS6-080-070	M6	72	-	-	-	-	ø82	12 ^{+0.02} ₀	8	46	12 ^{+0.02} ₀	ø70	ø80	4	M6	58	22.5°
BS6-090-078	M8	78	-	-	-	-	ø90	16 ^{+0.02} ₀	10	52	16 ^{+0.02} ₀	ø78	ø88	4	M8	65	22.5°
BS6-100-084	M8	84	-	-	-	-	ø96	16 ^{+0.02} ₀	10	52	16 ^{+0.02} ₀	ø84	ø94	4	M8	70	22.5°
BS6-110-088	M8	88	-	-	-	-	ø100	16 ^{+0.02} ₀	10	52	16 ^{+0.02} ₀	ø88	ø98	4	M8	75	22.5°
BS6-120-095	M8	95	-	-	-	-	ø107	16 ^{+0.02} ₀	10	52	16 ^{+0.02} ₀	ø95	ø105	4	M8	80	22.5°
BS6-130-099	M8	99	-	-	-	-	ø111	16 ^{+0.02} ₀	10	52	16 ^{+0.02} ₀	ø99	ø109	4	M8	86	22.5°
BS6-140-108	M8	108	-	-	-	-	ø120	16 ^{+0.02} ₀	10	56	16 ^{+0.02} ₀	ø108	ø118	4	M10	88	22.5°
BS6-150-130	M8	130	-	-	-	-	ø143	16 ^{+0.02} ₀	10	56	16 ^{+0.02} ₀	ø130	ø141	6	M10	114	-7.5°



Model	Dimension																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
S4D-070-065-02	M6	88.5	ø6.6	ø11	4	39.5°	ø102	ø12 ^{+0.02} ₋₀	8	51	ø12 ^{+0.02} ₋₀	ø65	ø76	-	M5	57.5	62°
S4D-070-065-04																	
S4D-070-065-06	M8	104.5	ø9	ø14	5	40.5°	ø121	ø12 ^{+0.02} ₋₀	10	53	ø12 ^{+0.02} ₋₀	ø78	ø89	-	M6	68	-27°
S4D-090-078-02																	
S4D-090-078-04	M8	104.5	ø9	ø14	5	40.5°	ø121	ø12 ^{+0.02} ₋₀	10	53	ø12 ^{+0.02} ₋₀	ø78	ø89	-	M6	68	-27°
S4D-090-078-06																	
S4D-110-088-03	M8	114.5	ø9	ø14	5	40.5°	ø131	ø12 ^{+0.02} ₋₀	11	54.2	ø12 ^{+0.02} ₋₀	ø88	ø99	-	M8	74	-27°
S4D-110-088-06																	
S4D-110-088-10	M8	114.5	ø9	ø14	5	40.5°	ø131	ø12 ^{+0.02} ₋₀	11	54.2	ø12 ^{+0.02} ₋₀	ø88	ø99	-	M8	74	-27°
S4D-140-108-03																	
S4D-140-108-06	M8	134.5	ø9	ø14	5	40.5°	ø151	ø16 ^{+0.02} ₋₀	11	57.55	ø16 ^{+0.02} ₋₀	ø108	ø119	-	M8	91	-27°
S4D-140-108-10																	
S4D-150-130-04	M8	155	ø9	ø14	6	22.5°	ø171	ø16 ^{+0.02} ₋₀	12	59.7	ø16 ^{+0.02} ₋₀	ø130	ø141	-	M8	112	-22.5°
S4D-150-130-07																	
S4D-150-130-12	M8	155	ø9	ø14	6	22.5°	ø171	ø16 ^{+0.02} ₋₀	12	59.7	ø16 ^{+0.02} ₋₀	ø130	ø141	-	M8	112	-22.5°
S4D-150-130-12																	



Model	Dimension																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
SS4D-070-065-02	M6	57.5	-	-	-	-	ø78	ø12 ^{+0.02} ₋₀	8	51	ø12 ^{+0.02} ₋₀	ø65	ø76	-	M5	57.5	62°
SS4D-070-065-04																	
SS4D-070-065-06	M8	68	-	-	-	-	ø91	ø12 ^{+0.02} ₋₀	10	53	ø12 ^{+0.02} ₋₀	ø78	ø89	-	M6	68	-27°
SS4D-090-078-02																	
SS4D-090-078-04	M8	74	-	-	-	-	ø101	ø12 ^{+0.02} ₋₀	11	54.2	ø12 ^{+0.02} ₋₀	ø88	ø99	-	M8	74	-27°
SS4D-090-078-06																	
SS4D-110-088-03	M8	91	-	-	-	-	ø121	ø16 ^{+0.02} ₋₀	11	57.55	ø16 ^{+0.02} ₋₀	ø108	ø119	-	M8	91	-27°
SS4D-110-088-06																	
SS4D-110-088-10	M8	112	-	-	-	-	ø143	ø16 ^{+0.02} ₋₀	12	59.7	ø16 ^{+0.02} ₋₀	ø130	ø141	-	M8	112	-22.5°
SS4D-140-108-03																	
SS4D-140-108-10	M8	112	-	-	-	-	ø143	ø16 ^{+0.02} ₋₀	12	59.7	ø16 ^{+0.02} ₋₀	ø130	ø141	-	M8	112	-22.5°
SS4D-150-130-04																	
SS4D-150-130-07	M8	112	-	-	-	-	ø143	ø16 ^{+0.02} ₋₀	12	59.7	ø16 ^{+0.02} ₋₀	ø130	ø141	-	M8	112	-22.5°
SS4D-150-130-12																	

TS-Series



Model ⁽¹⁾	Allowable maximum force [kN] (Kg)	Compliance center length P[mm]	Payload ⁽²⁾ [N] (Kg)	Compensation range			Elasticity Coefficient ⁽³⁾					Product Weight (kg)
				Position [mm]	Angle [deg.]	Torsional [deg.]	Axial [N/mm] (Kg/mm)		Horizontal Direction [N/mm] (Kg/mm)	Torsional direction [N/mm] (Kg/mm)		
							Compressional	Tensile				
TS6-040-048	6.0 (610)	40	14.7 (1.5)	±2	0	625.2 (63.8)	143.1 (14.6)	9.5 (1.0)	58.8 (6.0)	±0.3	0.5	
TS6-050-054	7.5 (770)	50	19.6 (2.0)	±2	0	1180.9 (120.5)	143.1 (14.6)	11.8 (1.2)	70.6 (7.2)	±0.3	0.7	
TS6-060-060	8.5 (870)	60	19.6 (2.0)	±2	0	1180.9 (120.5)	143.1 (14.6)	11.8 (1.2)	78.5 (8.0)	±0.2	0.9	
TS6-070-065	15.0 (1530)	70	26.5 (2.7)	±2	0	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	117.7 (12.0)	±0.2	1.0	
TS6-080-070	25.0 (2550)	80	26.5 (2.7)	±2	0	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	126.5 (12.9)	±0.2	1.1	
TS6-090-078	25.0 (2550)	90	37.3 (3.8)	±2	0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	201.0 (20.5)	±0.2	1.6	
TS6-100-084	40.0 (4080)	100	37.3 (3.8)	±2	0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	216.7 (22.1)	±0.15	1.9	
TS6-110-088	40.0 (4080)	110	37.8 (3.9)	±2	0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	231.4 (23.6)	±0.15	2.0	
TS6-120-095	45.0 (4590)	120	37.8 (3.9)	±2	0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	247.1 (25.2)	±0.1	2.1	
TS6-130-099	50.0 (5100)	130	37.8 (3.9)	±2	0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	265.8 (27.1)	±0.1	2.3	
TS6-140-108	55.0 (5610)	140	78.0 (8.0)	±2	0	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	495.2 (50.5)	±0.1	3.3	
TS6-150-130	60.0 (6120)	150	78.0 (8.0)	±2	0	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	962.0 (98.1)	±0.1	4.7	

A-Series



Model ⁽¹⁾	Allowable maximum force [N] (Kg)	Compliance center length P[mm]	Payload ⁽²⁾ [N] (Kg)	Compensation range			Elasticity Coefficient ⁽³⁾					Product Weight (kg)
				Position [mm]	Angle [deg.]	Torsional [deg.]	Axial [N/mm] (Kg/mm)		Horizontal Direction [N/mm] (Kg/mm)	Torsional direction [N/mm] (Kg/mm)		
							Compressional	Tensile				
A6-030-040	186 (19)	30	14.7 (1.5)	±2	±2	-	625.2 (63.8)	100.0 (10.2)	9.5 (1.0)	2.2 (22.4)	0.1	
A6-040-048	255 (26)	40	14.7 (1.5)	±2	±2	±7.7	625.2 (63.8)	143.1 (14.6)	9.5 (1.0)	2.4 (24.5)	0.1	
A6-050-054	353 (36)	50	19.6 (2.0)	±2	±2	±7.3	1180.9 (120.5)	143.1 (14.6)	11.8 (1.2)	3.0 (30.6)	0.2	
A6-060-060	353 (36)	60	19.6 (2.0)	±2	±2	±6.0	1180.9 (120.5)	143.1 (14.6)	11.8 (1.2)	3.0 (30.6)	0.2	
A6-070-065	471 (48)	70	26.5 (2.7)	±2	±2	±6.6	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	4.2 (42.9)	0.2	
A6-080-070	471 (48)	80	26.5 (2.7)	±2	±2	±6.2	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	4.2 (42.9)	0.3	
A6-090-078	363 (37)	90	37.3 (3.8)	±2	±2	±5.5	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (62.2)	0.4	
A6-100-084	363 (37)	100	37.3 (3.8)	±2	±2	±5.0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (62.2)	0.4	
A6-110-088	363 (37)	110	37.8 (3.9)	±2	±2	±4.6	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)	0.4	
A6-120-095	363 (37)	120	37.8 (3.9)	±2	±2	±5.1	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)	0.5	
A6-130-099	363 (37)	130	37.8 (3.9)	±2	±2	±5.1	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)	0.5	
A6-140-108	549 (56)	140	78.0 (8.0)	±2	±2	±4.8	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	7.7 (78.6)	0.7	

LA-Series



Model ⁽¹⁾	Allowable maximum force [N] (Kg)	Compliance center length P[mm]	Payload ⁽²⁾ [N] (Kg)	Compensation range			Elasticity Coefficient ⁽³⁾				Allowable maximum Torque [MPa]	Tube External Diameter [mm]	Product Weight (kg)
				Position [mm]	Angle [deg.]	Torsional [deg.]	Axial [N/mm] (Kg/mm)		Horizontal Direction [N/mm] (Kg/mm)	Torsional Direction [Nm/rad] (kgf.cm/rad)			
							Compressional	Tensile					
LA6-060-060	-	60	19.6 (2.0)	±2	±2	±6.0	1180.9 (120.5)	143.1 (14.6)	11.8 (1.2)	3.0 (30.6)	0.5	ø4	0.2
LA6-070-065	-	70	26.5 (2.7)	±2	±2	±6.6	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	4.2 (42.9)			0.3
LA6-080-070	-	80	26.5 (2.8)	±2	±2	±6.2	1573.9 (160.6)	191.1 (19.5)	11.8 (1.2)	4.2 (42.9)			0.3
LA6-090-078	-	90	37.3 (3.8)	±2	±2	±5.5	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (62.2)			0.4
LA6-100-084	-	100	37.3 (3.9)	±2	±2	±5.0	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	6.1 (62.2)			0.5
LA6-110-088	-	110	37.8 (3.9)	±2	±2	±4.6	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)			0.5
LA6-120-095	-	120	37.8 (3.9)	±2	±2	±5.1	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)			0.6
LA6-130-099	-	130	37.8 (3.9)	±2	±2	±5.1	1217.2 (124.2)	225.4 (23.0)	12.4 (1.3)	7.0 (71.4)			0.6
LA6-140-108	-	140	78.0 (8.0)	±2	±2	±4.8	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	7.7 (78.6)			0.8
LA6-150-130	-	150	78.0 (8.0)	±2	±2	±4.2	1840.4 (187.8)	407.7 (41.6)	15.1 (1.5)	7.7 (78.6)			1.6

(1) Model : Custom orders are available.

(2) Elasticity coefficient indicates the elasticity of the compliance center(P) - the average value calculated until stopper inside the centering device starts operating.

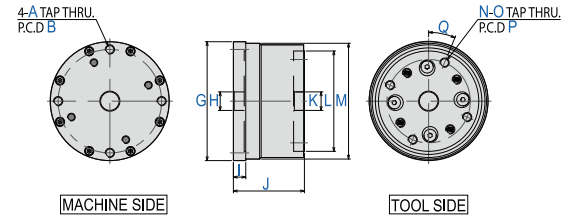
(3) Payload & Allowable maximum force : Please contact us if this values are exceeded.

* Center Master™ compensates maximum ±2mm of positional error, but this value is changed according to the chamfer value.

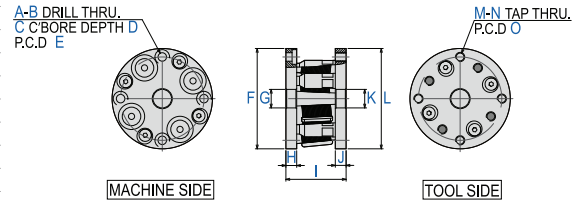
► Electrical Specification for S-SS-Series

Model Name	Refer to the mechanical specification	
Rated Capacity(R.C.)	Refer to the capacity in the mechanical specification	
Rated Output(R.O.)	Refer to each model's detailed specification	
Non-Linearity	< 1.0% R.O.	
Non-Repeatability	< 0.5% R.O.	
Zero Balance	< ±1% R.O.	
Compensated Temp. Range	0~40°C	
Operating Temp. Range	0~70°C	
Temp. Effect on Rated Output	< ±0.1% LOAD/10°C	
Temp. Effect on Zero Balance	< ±0.1% R.O./10°C	
Thermal Resistance, Input/Output	700±10ohms/700±10ohms	
Insulation Resistance (Min.)	2000M ohms/50V DC	
Recommended Excitation Voltage	10V DC	
Cable Length (4 Core, Shielded)	5m (standard)	
Cable Connection	Brown	EXC+
	Yellow	SIG-
	White	EXC-
	Green	SIG+

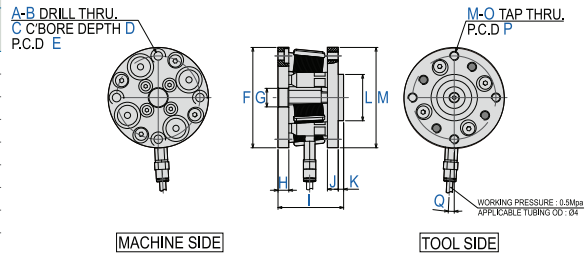
Model	Dimension																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
TS6-040-048	M6	50	-	-	-	-	ø60	$\phi 12^{+0.02}_{-0}$	8	37	$\phi 12^{+0.02}_{-0}$	ø48	ø58	3	M6	36	0°
TS6-050-054	M6	58	-	-	-	-	ø66	$\phi 12^{+0.02}_{-0}$	8	46	$\phi 12^{+0.02}_{-0}$	ø54	ø64	3	M6	43	22.5°
TS6-060-060	M6	62	-	-	-	-	ø72	$\phi 12^{+0.02}_{-0}$	8	46	$\phi 12^{+0.02}_{-0}$	ø60	ø70	4	M6	48	22.5°
TS6-070-065	M6	67	-	-	-	-	ø77	$\phi 12^{+0.02}_{-0}$	8	46	$\phi 12^{+0.02}_{-0}$	ø65	ø75	4	M6	54	22.5°
TS6-080-070	M6	72	-	-	-	-	ø82	$\phi 12^{+0.02}_{-0}$	8	46	$\phi 12^{+0.02}_{-0}$	ø70	ø80	4	M6	58	22.5°
TS6-090-078	M8	78	-	-	-	-	ø90	$\phi 16^{+0.02}_{-0}$	10	52	$\phi 16^{+0.02}_{-0}$	ø78	ø88	4	M8	65	22.5°
TS6-100-084	M8	84	-	-	-	-	ø96	$\phi 16^{+0.02}_{-0}$	10	52	$\phi 16^{+0.02}_{-0}$	ø84	ø94	4	M8	70	22.5°
TS6-110-088	M8	88	-	-	-	-	ø100	$\phi 16^{+0.02}_{-0}$	10	52	$\phi 16^{+0.02}_{-0}$	ø88	ø98	4	M8	75	22.5°
TS6-120-095	M8	95	-	-	-	-	ø107	$\phi 16^{+0.02}_{-0}$	10	52	$\phi 16^{+0.02}_{-0}$	ø95	ø105	4	M8	80	22.5°
TS6-130-099	M8	99	-	-	-	-	ø111	$\phi 16^{+0.02}_{-0}$	10	52	$\phi 16^{+0.02}_{-0}$	ø99	ø109	4	M8	86	22.5°
TS6-140-108	M8	108	-	-	-	-	ø120	$\phi 16^{+0.02}_{-0}$	10	56	$\phi 16^{+0.02}_{-0}$	ø108	ø118	4	M10	88	22.5°
TS6-150-130	M8	130	-	-	-	-	ø143	$\phi 16^{+0.02}_{-0}$	10	56	$\phi 16^{+0.02}_{-0}$	ø130	ø141	6	M10	114	-7.5°



Model	Dimension														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
A6-030-040	3	ø4	ø8	2	30	ø40	-	5	30	5	-	ø40	3	M5	30
A6-040-048	3	ø5.5	ø9.5	2	36	ø48	$\phi 12^{+0.02}_{-0}$	5	30	5	$\phi 12^{+0.02}_{-0}$	ø48	3	M6	36
A6-050-054	3	ø5.5	ø9.5	3	43	ø54	$\phi 12^{+0.02}_{-0}$	7	38	7	$\phi 12^{+0.02}_{-0}$	ø54	3	M6	43
A6-060-060	3	ø5.5	ø9.5	3	48	ø60	$\phi 12^{+0.02}_{-0}$	7	39	7	$\phi 12^{+0.02}_{-0}$	ø60	3	M6	48
A6-070-065	4	ø5.5	ø9.5	3	54	ø65	$\phi 12^{+0.02}_{-0}$	7	39	7	$\phi 12^{+0.02}_{-0}$	ø65	4	M6	54
A6-080-070	4	ø5.5	ø9.5	4	58	ø70	$\phi 12^{+0.02}_{-0}$	7	39	8	$\phi 12^{+0.02}_{-0}$	ø70	4	M6	58
A6-090-078	4	ø6.6	ø11	4	65	ø78	$\phi 16^{+0.02}_{-0}$	8	43	8	$\phi 16^{+0.02}_{-0}$	ø78	4	M8	65
A6-100-084	4	ø6.6	ø11	4	70	ø84	$\phi 16^{+0.02}_{-0}$	8	43	8	$\phi 16^{+0.02}_{-0}$	ø84	4	M8	70
A6-110-088	4	ø6.6	ø11	4	75	ø88	$\phi 16^{+0.02}_{-0}$	8	43	8	$\phi 16^{+0.02}_{-0}$	ø88	4	M8	75
A6-120-095	4	ø6.6	ø11	4	80	ø95	$\phi 16^{+0.02}_{-0}$	8	43	8	$\phi 16^{+0.02}_{-0}$	ø95	4	M8	80
A6-130-099	4	ø6.6	ø11	4	85	ø99	$\phi 16^{+0.02}_{-0}$	8	43	8	$\phi 16^{+0.02}_{-0}$	ø99	4	M8	85
A6-140-108	4	ø9	ø14	5	88	ø108	$\phi 16^{+0.02}_{-0}$	10	47	10	$\phi 16^{+0.02}_{-0}$	ø108	4	M10	88



Model	Dimension																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
LA6-060-060	3	ø5.5	ø9.5	3	48	ø60	ø12 ^{+0.02} ₀	7	43	7	4	ø26 ⁺⁰ _{-0.02}	ø60	3	M6	48	70°
LA6-070-065	4	ø5.5	ø9.5	3	54	ø65	ø12 ^{+0.02} ₀	7	42.5	7	3.5	ø30 ⁺⁰ _{-0.02}	ø65	4	M6	54	3°
LA6-080-070	4	ø5.5	ø9.5	3	58	ø70	ø12 ^{+0.02} ₀	7	42.5	7	3.5	ø30 ⁺⁰ _{-0.02}	ø70	4	M6	58	2°
LA6-090-078	4	ø6.6	ø11	4	65	ø78	ø16 ^{+0.02} ₀	8	46.5	8	3.5	ø35 ^{+0.02} _{-0.02}	ø78	4	M8	65	3°
LA6-100-084	4	ø6.6	ø11	4	70	ø84	ø16 ^{+0.02} ₀	8	46.5	8	3.5	ø35 ^{+0.02} _{-0.02}	ø84	4	M8	70	3°
LA6-110-088	4	ø6.6	ø11	4	75	ø88	ø16 ^{+0.02} ₀	8	48	8	5	ø38 ^{+0.02} _{-0.02}	ø88	4	M8	75	12°
LA6-120-095	4	ø6.6	ø11	4	80	ø95	ø16 ^{+0.02} ₀	8	48	8	5	ø45 ^{+0.02} _{-0.02}	ø95	4	M8	80	5°
LA6-130-099	4	ø6.6	ø11	4	85	ø99	ø16 ^{+0.02} ₀	8	48	8	5	ø45 ^{+0.02} _{-0.02}	ø99	4	M8	85	5°
LA6-140-108	4	ø9	ø14	5	88	ø108	ø16 ^{+0.02} ₀	10	52	10	5	ø45 ^{+0.02} _{-0.02}	ø108	4	M10	88	-5°
LA6-150-130	6	ø9	ø14	5	114	ø130	ø16 ^{+0.02} ₀	18	67	18	14	ø55 ^{+0.02} _{-0.02}	ø130	6	M10	114	57.5°



* The above specifications are subject to change without prior notice.

* Drawings can be downloaded by Clicking Dimensions the model name on the website: www.cnmrobotics.com.