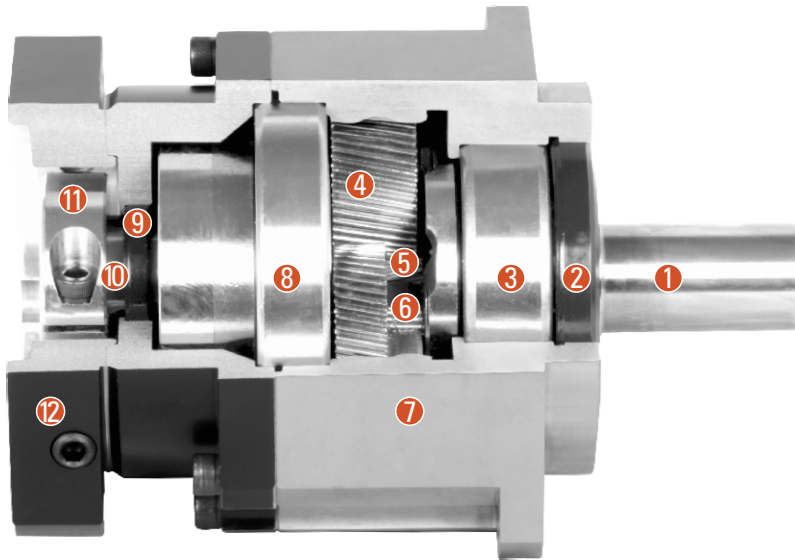


# SB SERIES GEARBOX

## Sectional View



- ① Output shaft
- ② Oil seal
- ③ Output shaft front bearing
- ④ Planetary gear
- ⑤ Solar wheel
- ⑥ Full needle bearing
- ⑦ Front cover
- ⑧ Output shaft rear bearing
- ⑨ Oil seal
- ⑩ Coupling
- ⑪ Lock ring
- ⑫ Rear cover

## Type and Model Number Explanation

SB Reducers				Servo Motor		
090	SB	20	( )	(S1)	- 750	<input type="text"/>
①	②	③	④	⑤	⑥	⑦
① Gearbox frame size: 090 (See P04)						
② Gearbox series code: SB						
③ Gear ratio: 20, (See P04)						
④ Precision (See P04) Precision type P1, high precision type P0 Output shaft load is $\pm 5\%$ of allowable output torque						
⑤ Input shaft type S1: Locking with locking ring (Omission) (Can be used regardless whether the motor has a keyway, but "D" type is not applicable) S2: Locking with keyway (Input shaft with key) A: Other adapters (Please contact our company)						
⑥ Applicable servo motor power (W)						
⑦ Servo motor model						

# PRODUCT SPECIFICATIONS

## Reducer Performance Data

Specifications		Node Number	Reduction Ratio	042SB	060SB	060(A)SB	090SB	090(A)SB	115SB	142SB	180SB	220SB
Rated Output Torque $T_{2N}$	Nm	1	3	-	55	-	130	-	208	342	588	1140
			4	19	50	-	140	-	290	542	1050	1700
			5	22	60	-	160	-	330	650	1200	2000
			6	20	55	-	150	-	310	600	1100	1900
			7	19	50	-	140	-	300	550	1100	1800
			8	17	45	-	120	-	260	500	1000	1600
			9	14	40	-	100	-	230	450	900	1500
			10	14	40	-	100	-	230	450	900	1500
			15	-	55	55	130	130	208	342	588	1140
			20	19	50	50	140	140	290	542	1050	1700
		25	22	60	60	160	160	330	650	1200	2000	
		30	20	55	55	150	150	310	600	1100	1900	
		35	19	50	50	140	140	300	550	1100	1800	
		40	17	45	45	120	120	260	500	1000	1600	
		45	14	40	40	100	100	230	450	900	1500	
		50	22	60	60	160	160	330	650	1200	2000	
		60	20	55	55	150	150	310	600	1100	1900	
		70	19	50	50	140	140	300	550	1100	1800	
		80	17	45	45	120	120	260	500	1000	1600	
		90	14	40	40	100	100	230	450	900	1500	
100	14	40	40	100	100	230	450	900	1500			
Emergency Stop Torque $T_{2NOT}^2$	Nm	1,2	3 Times of Output Rated Torque									
Rated Input Speed $n_{1H}$	rpm	1,2	3~100	3000	3000	3000	3000	3000	3000	3000	3000	2000
Rated Input Speed $n_{1B}$	rpm	1,2	3~100	6000	6000	6000	6000	6000	6000	6000	6000	4000
Super Precision Backlash PO	arcmin	1	3~10	-	-	-	-	-	≤1	≤1	≤1	≤1
		2	15~100	-	-	-	-	-	≤3	≤3	≤3	≤3
Precision Backlash P1	arcmin	1	3~10	≤3	≤3	-	≤3	-	≤3	≤3	≤3	≤3
		2	15~100	≤5	-	≤5	≤5	≤5	≤5	≤5	≤5	≤5
Standard Backlash P2	arcmin	1	3~10	≤5	≤5	-	≤5	-	≤5	≤5	≤5	≤5
		2	15~100	≤7	-	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Torsional Stiffness	Nm/arcmin	1,2	3~100	2	7	7	14	14	25	50	145	225
Allowable Radial Force $F_{2RB}^3$	N	1,2	3~100	780	1530	1530	3250	3250	6700	9400	14500	50000
Allowable Axial Force $F_{2AB}^3$	N	1,2	3~100	390	765	765	1625	1625	3350	4700	7250	25000
Service Life	hr	1,2	3~100	20000*								
Efficiency $\eta$	%	1	3~10	≥97%								
		2	15~100	≥94%								
Weight	Kg	1	3~10	0.6	1.3	-	3.7	-	7.8	14.5	29	48
		2	15~100	0.8	1.5	1.9	4.1	5.3	9	17.5	33	60
Operating Temperature	°C	1,2	3~100	-10°C~+90°C								
Lubrication		1,2	3~100	Synthetic Lubricating Grease								
Protection Class		1,2	3~100	IP65								
Mounting Position		1,2	3~100	Any Direction								
Noise Level at 1m Distance ( $n_1=3000$ rpm, No Load)	dB(A)	1,2	3~100	≤56	≤58	≤60	≤60	≤63	≤63	≤65	≤67	≤70

## Moment of Inertia of The Reducer

Specifications		Node Number	Reduction Ratio	042SB	060SB	060(A)SB	090SB	090(A)SB	115SB	142SB	180SB	220SB
Moment Of Inertia $J_1$	Kg·cm <sup>2</sup>	1	3	-	0.16	-	0.61	-	3.25	9.21	28.98	69.61
			4	0.03	0.14	-	0.48	-	2.74	7.54	23.67	54.37
			5	0.03	0.13	-	0.47	-	2.71	7.42	23.29	53.27
			6	0.03	0.13	-	0.45	-	2.65	7.25	22.75	51.72
			7	0.03	0.13	-	0.45	-	2.62	7.14	22.48	50.97
			8	0.03	0.13	-	0.44	-	2.58	7.07	22.59	50.84
			9	0.03	0.13	-	0.44	-	2.57	7.04	22.53	50.63
			10	0.03	0.13	-	0.44	-	2.57	7.03	22.51	50.56
			15	-	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29
			20	0.03	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29
		25	0.03	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29	
		30	0.03	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29	
		35	0.03	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29	
		40	0.03	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29	
		45	0.03	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29	
		50	0.03	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51	
		60	0.03	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51	
		70	0.03	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51	
		80	0.03	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51	
		90	0.03	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51	
100	0.03	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51			

1. Gear ratio ( $i=N_1/N_{out}$ )

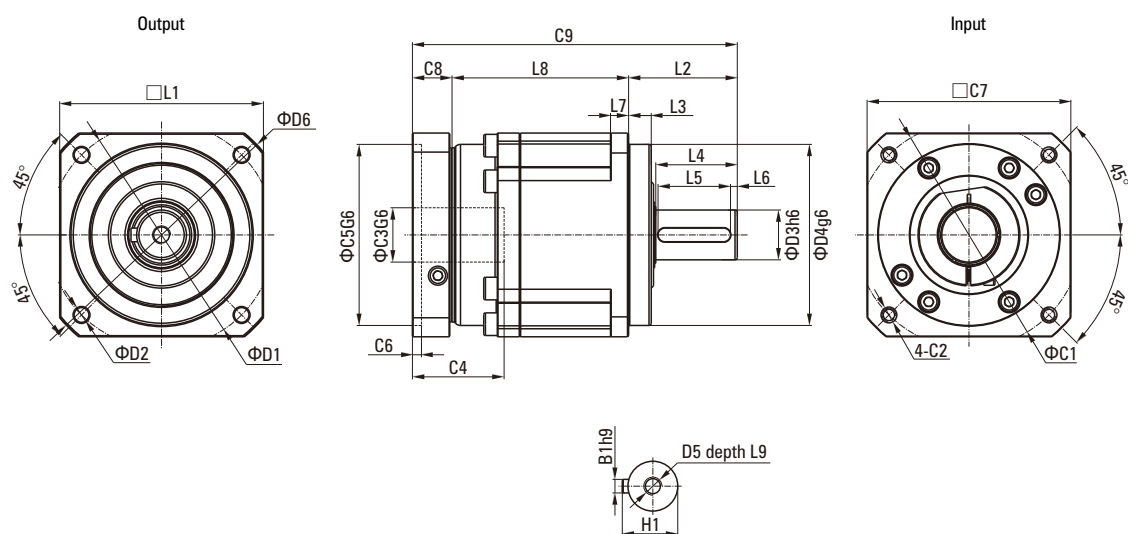
2. Maximum acceleration torque  $T_{2B}=60\%$  of  $T_{2NOT}$

3. When the output speed is 100rpm, it will act on the central position of the output shaft.

\*Continuous operation, service life is 10000hrs

# DIMENSIONS (SINGLE STAGE, REDUCTION RATIO $i=3\sim 10$ )

## Dimensional Drawing



## Dimensional Table

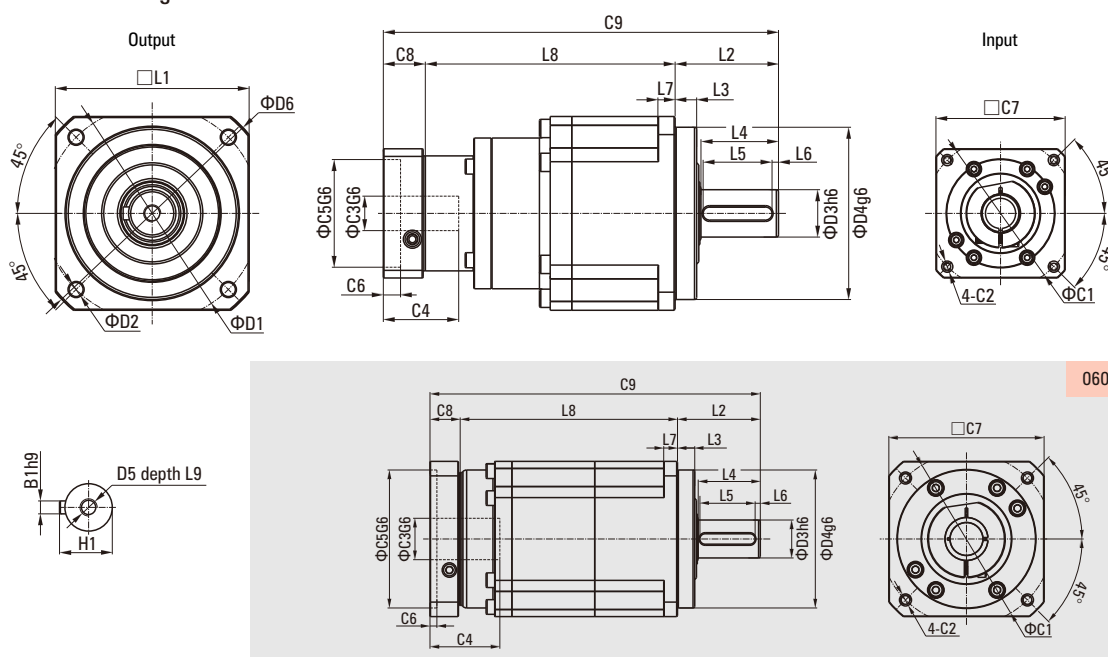
Unit: mm

Size	042SB	060SB	090SB	115SB	142SB	180SB	220SB
D1	50	70	100	130	165	215	250
D2	3.4	5.5	6.6	9	11	13	17
D3 <sup>h6</sup>	13	16	22	32	40	55	75
D4 <sup>g6</sup>	35	50	80	110	130	160	180
D5	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2P	M20×2.5P	M20×2.5P
D6	56	80	116	152	185	240	292
L1	42	60	90	115	142	180	220
L2	26	37	48	65	97	105	138
L3	5.5	7	10	12	15	20	30
L4	1	28	35.5	51	79	82	105
L5	16	25	32	40	70	70	90
L6	2	2	2	5	4	6	7
L7	4	6	8	10	15	20	25
L8	31	65.5	78	101.5	119.5	154	163.5
L9	4.8	12.5	19	28	36	42	42
C1	46	70	100	130	165	215	235
C2	M4×0.7P	M5×0.8P	M6×1P	M8×1.25P	M10×1.5P	M12×1.75P	M12×1.75P
C3	*≤11/≤12	*≤14/≤16	≤19/≤24	≤32	≤35/≤38	≤42/≤48	≤55
C4	25	35	40.5	51	60	85	116
C5 <sup>g6</sup>	30	50	80	110	130	180	200
C6	3.5	8	4	5	6	6	6
C7	42	60	90	115	142	190	220
C8	29.5	19.5	17.5	20	22.5	29	63
C9	114	122	143.5	186.5	239	288	364.5
B1 <sup>h9</sup>	5	5	6	10	12	16	20
H1	15	18	24.5	35	43	59	79.5

\*060SB 5,10 Reduction ratio provides C3≤16 to choose from.

# DIMENSIONS (TWO STAGE, REDUCTION RATIO $i=15\sim 100$ )

## Dimensional Drawing



## Dimensional Table

Unit: mm

Size	042SB	060(A)SB	090SB	090(A)SB	115SB	142SB	180SB	220SB
D1	50	70	100	130	165	215	250	
D2	3.4	5.5	6.6	9	11	13	17	
D3 <sup>h6</sup>	13	16	22	32	40	55	75	
D4 <sup>g6</sup>	35	50	80	110	130	160	180	
D5	M4×0.7P	M5×0.8P	M8×1.25P	M12×1.75P	M16×2P	M20×2.5P	M20×2.5P	
D6	56	80	116	152	185	240	292	
L1	42	60	90	115	142	180	220	
L2	26	37	48	65	97	105	138	
L3	5.5	7	10	12	15	20	30	
L4	1	28	36	51	79	82	105	
L5	16	25	32	40	70	70	90	
L6	2	2	3	5	4	6	7	
L7	4	6	8	10	15	20	25	
L8	58.5	102.5	116	126	143	169.5	207.5	246
L9	10	12.5	19	28	36	42	42	
C1	46	70	70	100	100	130	165	215
C2	M4×0.7P	M5×0.8P	M5×0.8P	M6×1P	M6×1P	M8×1.25P	M10×1.5P	M12×1.75P
C3	≤11/≤12	≤14/≤16	≤14/≤15.875/≤16	≤19/≤24	≤19/≤24	≤32	≤35/≤38	≤42/≤48
C4	25	35	35	40.5	40	50	60	85
C5 <sup>g6</sup>	30	50	50	80	80	110	130	180
C6	3.5	8	8	4	4	5	6	6
C7	42	60	60	90	90	115	142	190
C8	29.5	19.5	19.5	17.5	17.5	12.5	22.5	29
C9	114	159	183.5	191.5	225.5	283.5	335	409
B1 <sup>h9</sup>	5	5	6	10	12	16	20	
H1	15	18	24.5	35	43	59	79.5	