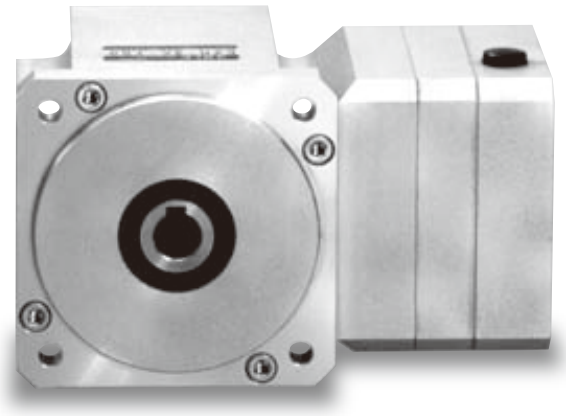
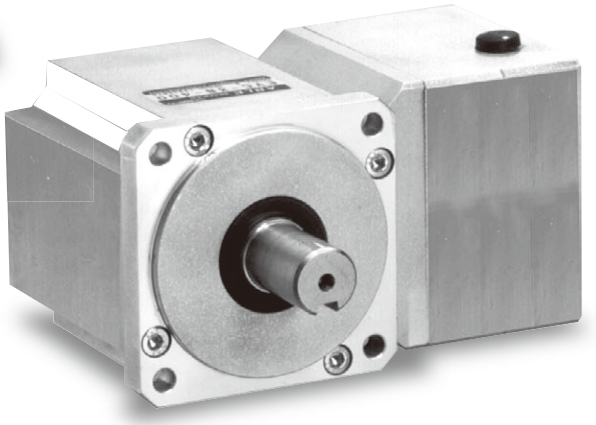
Right angle type responding to jointing to narrow spaces

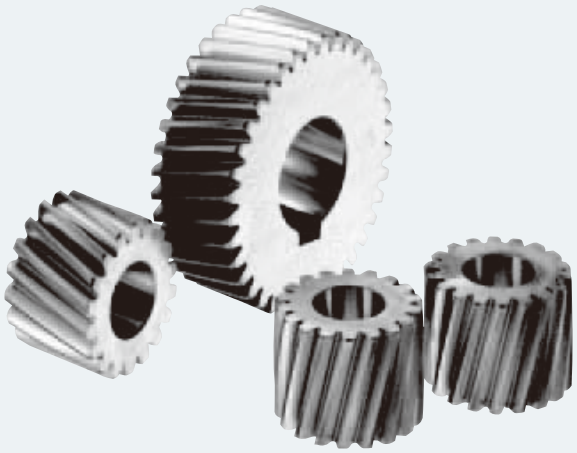


Hollow shaft



Solid shaft

Maximum noise reduction effects realized, which could not be gained from existing reducers



* The helical gear is tilted to the engaging shaft as shown in the left figure(parallel for existing gears).
This makes engagement of the gear smoother compared to existing parallel gears, reducing the noise.

Response to narrow space

Available to narrow space, the characteristics of a compact servo motor are maximized.

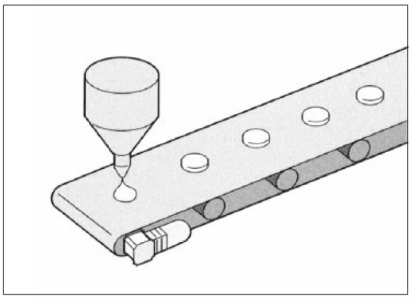
Compact of 96mm full length (hollow shaft)

Available to narrow space, the characteristics of a compact servo motor are maximized, as compact design of right angle type.

Reduction ratio: 1/3~1/105, Motor capacity 100W~4KW into series

Maintenance free & free assembling

Using high-grade grease of long life as lubricant, there is no need of replacement. In addition, it is seal-filled and thus the combining and attaching position is free changeable.



Attachable to compact servo motors of each supplier

Attachable to servo motors of the following makers:

● PANASONIC ● FANUC ● NIKKI DENSO ● YASKAWA ELECTRIC ● SHIMPONIA TECHNOLOGY
● MIKI PULLEY ● MITSUBISHI ELECTRIC ● TOSHIBA MACHINE ● HITACHI INDUSTRIAL EQUIPMENT SYSTEMS
● OMRON ● SANYO DENKI ● KEYENCE ● TAMAGAWA SEIKI ● FUJI ELECTRIC SYSTEMS ● SANMEI
● ALLEN-BRADLEY ● DELTA

Assembling may be impossible according to motor series of each supplier, in some cases. (For ※ details, contact us.)

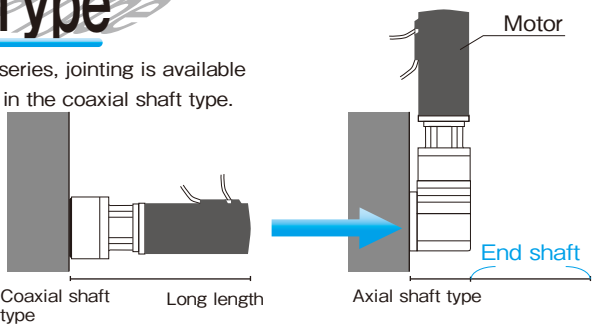
Model & Type Symbol

Low Noise

With a helical gear instead of previous spur gears, lower noise is realized compared to existing ones.

Space Saving Type

In case of right angle shaft type NEV series, jointing is available even in a space uncapable of storage in the coaxial shaft type.



The reducer output shaft is in the center of the combination side, so combination type is free changeable.

Model & type symbol

ABLE REDUCER | Servo motor

NEV S C - 3 B - 100 - [ ] - [ ]

- NEV: Name of the ABLE REDUCER right angle shaft backlash0.5° (30min)
- S: Input part type / S : Clamp fastening type (compatible irrespective of key slot of the motor shaft<D cut, unavailable>)※1
  - ■ Attachment available:
  - K : Coupling(straight shaft, key slot attachment)※2
- C: Output shaft type / C : Solid shaft type H : Shallow shaft type (penetrating type)
- 3: Reduction ratio / 3,5,9,15,27,45,75,105 ※ The reduction ratios are actual ones.
- B: Reducer type no. / B, C, D, and E types
- 100: Applicable servo motor capacity (W)
- [ ]: Manufacturer name
- [ ]: Type No. — Designate type no. of the motor manufacturer, certainly.

※1 D cut only responds to K type.
※2 Response to a special order. For more details, contact us.

Reduction ratio & type no.

■ If input speed is 3000rpm

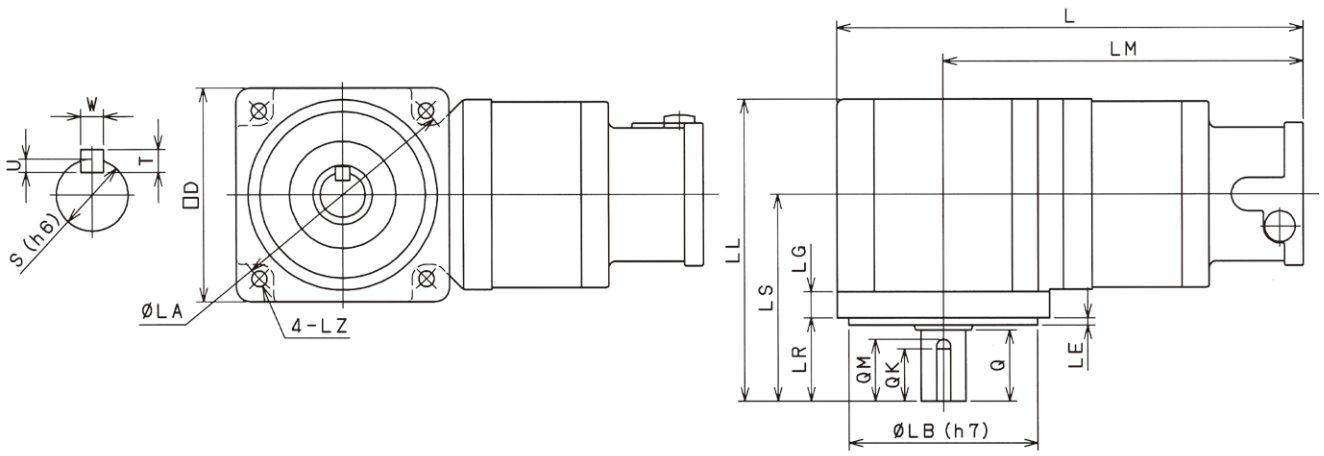
Capacity(W) \ Reduction ratio	1/3	1/5	1/9	1/15	1/27	1/45	1/75	1/105
100	B					C	D	
200			C				E	
400		C		D		E	—	
750	C							
1000			E					
1500	D							
2000								
2500			—					
3000	E							
3500								
4000								

■ About lubricant

- Lubrication : Multitemp GM greaseS (perpendicular reduction part)
  Multitemp AC-D (planet reduction part)
- Replacement : Unnecessary

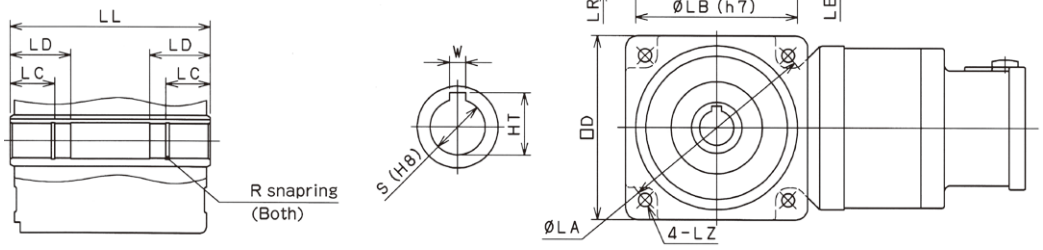
Reduction ratio	Type				Output shaft speed	Rated output torque	Max. instantaneous output torque	Permissible radial load	Permissible thrust load	Internal moment of inertia of input shaft conversion	Permissible output torque	Max. instantaneous permissible output torque
	Model	Reduction ratio	Type no.	Motor cap.	[rpm]	[Nm]	[Nm]	[N]	[N]	[10^{-4} × kgm^2]	[Nm]	[Nm]
1/3	NEVS □	-3	B	-100	1000	0.48	1.43	784	392	0.377	5.00	15.0
	NEVS □	-3	B	-200	1000	1.34	4.01	784	392	0.510	5.00	15.0
	NEVS □	-3	B	-400	1000	3.25	9.74	784	392	0.504	5.00	15.0
	NEVS □	-3	C	-750	1000	6.44	19.3	784	392	0.978	8.83	26.5
	NEVS □	-3	C	-1000	1000	8.59	25.8	784	392	1.77	9.02	27.1
	NEVS □	-3	D	-1500	1000	11.9	35.8	980	490	3.90	22.6	67.7
	NEVS □	-3	D	-2000	1000	16.7	50.1	980	490	3.90	22.6	67.7
	NEVS □	-3	D	-2500	1000	21.5	64.4	980	490	3.90	22.6	67.7
	NEVS □	-3	E	-3000	1000	24.8	74.5	1176	588	6.61	36.1	108
	NEVS □	-3	E	-3500	1000	29.6	88.8	1176	588	6.61	36.1	108
	NEVS □	-3	E	-4000	1000	34.4	103	1176	588	6.61	36.1	108
1/5	NEVS □	-5	B	-100	600	0.99	2.96	980	490	0.144	1.34	4.03
	NEVS □	-5	B	-200	600	2.58	7.73	980	490	0.539	4.57	13.7
	NEVS □	-5	C	-400	600	5.15	15.4	980	490	0.555	5.40	16.2
	NEVS □	-5	D	-750	600	9.66	28.9	1176	588	1.68	10.1	30.4
	NEVS □	-5	E	-1000	600	9.86	29.6	1470	735	2.97	27.1	81.2
	NEVS □	-5	E	-1500	600	17.8	53.5	1470	735	2.97	27.1	81.2
	NEVS □	-5	E	-2000	600	25.8	77.3	1470	735	2.97	27.1	81.2
1/9	NEVS □	-9	B	-100	333	2.32	6.96	1176	588	0.0978	2.41	7.25
	NEVS □	-9	C	-200	333	4.64	13.9	1176	588	0.493	8.83	26.5
	NEVS □	-9	D	-400	333	7.37	22.1	1176	588	0.629	9.73	29.2
	NEVS □	-9	D	-750	333	17.4	52.1	1176	588	1.42	18.2	54.7
	NEVS □	-9	E	-1000	333	17.8	53.3	1470	735	2.35	48.7	146
	NEVS □	-9	E	-1500	333	32.1	96.2	1470	735	2.35	48.7	146
	NEVS □	-9	E	-2000	333	46.4	139	1470	735	2.35	48.7	146
1/15	NEVS □	-15	B	-100	200	3.87	11.6	1470	735	0.0535	4.07	12.2
	NEVS □	-15	C	-200	200	7.73	23.1	1470	735	0.323	8.83	26.5
	NEVS □	-15	D	-400	200	15.4	46.3	1470	735	0.365	16.2	48.6
	NEVS □	-15	E	-750	200	28.9	86.9	1764	882	0.962	29.2	87.6
	NEVS □	-15	E	-1000	200	38.7	116	1764	882	1.75	40.6	122
1/27	NEVS □	-27	B	-100	111	6.96	20.9	1470	735	0.0357	7.31	21.9
	NEVS □	-27	D	-200	111	10.7	32.0	1470	735	0.228	29.1	79.1
	NEVS □	-27	D	-400※	111	27.8	79.1	1470	735	0.228	29.1	79.1
	NEVS □	-27	E	-750	111	52.2	157	1764	882	0.599	54.6	164
1/45	NEVS □	-45	C	-100	66	11.6	34.8	1764	885	0.608	12.1	36.5
	NEVS □	-45	D	-200	66	23.2	69.6	1764	885	0.749	29.1	79.1
	NEVS □	-45	E	-400	66	46.4	139	2070	1035	1.38	56.8	170
1/75	NEVS □	-75	D	-100	40	19.3	58.0	2070	1035	0.507	29.1	79.1
	NEVS □	-75	E	-200	40	38.7	116	2370	1185	0.809	56.8	170
1/105	NEVS □	-105	D	-100※	28	27.1	79.1	2370	1185	0.462	29.1	79.1
	NEVS □	-105	E	-200	28	54.1	162	2670	1335	0.694	56.8	170

Note 1) The moment of inertia of input shaft conversion is only a numerical value for the reducer and thus does not include that of the motor.
Note 2) Set the maximum input speed to 5000rpm and 3000rpm or less at usual times.
Note 3) Radial load is an indication at the center of the output shaft.
Note 4) Types indicated with may become an overload state if load is given by max. instantaneous time torque of the motor, so please use it to the extent ※ of max. permissible instantaneous output torque of the reducer.

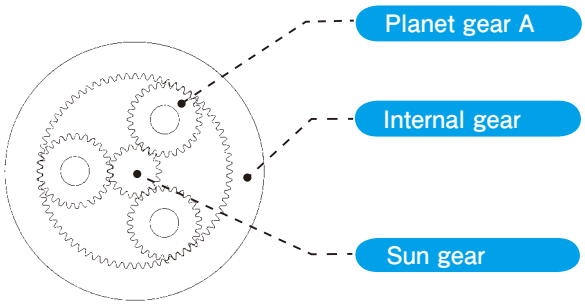


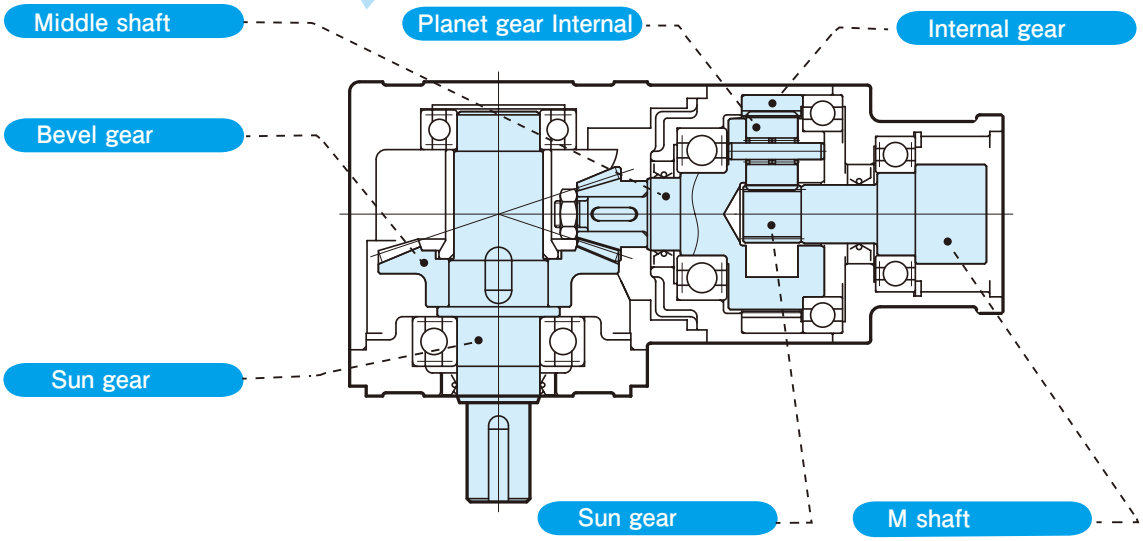
Type No.	Reduction ratio	Motor capacity	Length						Output shaft						Flange				
		W	L	LM	LL	LS	LR	LG	Q	QM	QK	S	W×U	T	D	LB	LA	LE	LZ
B	3	100	144.5	105.5	124	85	35	10	30	26	22	19	6×3.5	6	78	70	90	3	6.5
	3	200	149.5	110.5	124	85	35	10	30	26	22	19	6×3.5	6	78	70	90	3	6.5
	3	400	149.5	110.5	124	85	35	10	30	26	22	19	6×3.5	6	78	70	90	3	6.5
	5	100	163.5	124.5	124	85	35	10	30	26	22	19	6×3.5	6	78	70	90	3	6.5
	5	200	168.5	129.5	124	85	35	10	30	26	22	19	6×3.5	6	78	70	90	3	6.5
	9	100	163.5	124.5	124	85	35	10	30	26	22	19	6×3.5	6	78	70	90	3	6.5
	15	100	163.5	124.5	124	85	35	10	30	26	22	19	6×3.5	6	78	70	90	3	6.5
	27	100	163.5	124.5	124	85	35	10	30	26	22	19	6×3.5	6	78	70	90	3	6.5
C	3	750	171.5	126.5	127	87	35	11	30	26	22	19	6×3.5	6	90	80	100	3	6.5
	3	1000	171.5	126.5	127	87	35	11	30	26	22	19	6×3.5	6	90	80	100	3	6.5
	5	400	197.5	152.5	127	87	35	11	30	26	22	19	6×3.5	6	90	80	100	3	6.5
	9	200	197.5	152.5	127	87	35	11	30	26	22	19	6×3.5	6	90	80	100	3	6.5
	15	200	197.5	152.5	127	87	35	11	30	26	22	19	6×3.5	6	90	80	100	3	6.5
	45	100	208	163	127	87	35	11	30	26	22	19	6×3.5	6	90	80	100	3	6.5
D	3	1500	211.5	154	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
	3	2000	211.5	154	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
	3	2500	211.5	154	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
	5	750	229	171.5	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
	9	400	225	167.5	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
	9	750	229	171.5	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
	15	400	225	167.5	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
	27	200	225	167.5	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
	27	400	225	167.5	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
	45	200	235.5	178	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
	75	100	235.5	178	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
	105	100	235.5	178	164	114	48	14	40	35	30	24	8×4	7	115	110	130	5	8.8
E	3	3000	239.5	167	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	3	3500	239.5	167	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	3	4000	239.5	167	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	5	1000	282.5	210	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	5	1500	282.5	210	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	5	2000	282.5	210	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	9	1000	282.5	210	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	9	1500	282.5	210	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	9	2000	282.5	210	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	15	750	264	191.5	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	15	1000	282.5	210	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	27	750	264	191.5	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	45	400	270.5	198	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	75	200	270.5	198	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11
	105	200	270.5	198	183	133	63	14	55	52	45	32	10×5	8	145	130	165	5	11

Type no.	Suitable R snap ring	LL	LD	LC
B	R13	96	30	22
C	R17	99	30	22
D	R24	127	45	22
E	R32	131	50	22



Type no.	Reduction ratio	Motor cap.	Length						Output shaft			Flange				
		W	L	LM	LL	LS	LR	LG	S	W	HT	D	LB	LA	LE	LZ
B	3	100	144.5	105.5	96	55	5	10	13	5	15	78	70	90	3	6.5
	3	200	149.5	110.5	96	55	5	10	13	5	15	78	70	90	3	6.5
	3	400	149.5	110.5	96	55	5	10	13	5	15	78	70	90	3	6.5
	5	100	163.5	124.5	96	55	5	10	13	5	15	78	70	90	3	6.5
	5	200	168.5	129.5	96	55	5	10	13	5	15	78	70	90	3	6.5
	9	100	163.5	124.5	96	55	5	10	13	5	15	78	70	90	3	6.5
	15	100	163.5	124.5	96	55	5	10	13	5	15	78	70	90	3	6.5
	27	100	163.5	124.5	96	55	5	10	13	5	15	78	70	90	3	6.5
C	3	750	171.5	126.5	99	57	5	11	17	5	19	90	80	100	3	6.5
	3	1000	171.5	126.5	99	57	5	11	17	5	19	90	80	100	3	6.5
	5	400	197.5	152.5	99	57	5	11	17	5	19	90	80	100	3	6.5
	9	200	197.5	152.5	99	57	5	11	17	5	19	90	80	100	3	6.5
	15	200	197.5	152.5	99	57	5	11	17	5	19	90	80	100	3	6.5
	45	100	208	163	99	57	5	11	17	5	19	90	80	100	3	6.5
D	3	1500	211.5	154	127	74	8	14	24	8	27	115	110	130	5	8.8
	3	2000	211.5	154	127	74	8	14	24	8	27	115	110	130	5	8.8
	3	2500	211.5	154	127	74	8	14	24	8	27	115	110	130	5	8.8
	5	750	229	171.5	127	74	8	14	24	8	27	115	110	130	5	8.8
	9	400	225	167.5	127	74	8	14	24	8	27	115	110	130	5	8.8
	9	750	229	171.5	127	74	8	14	24	8	27	115	110	130	5	8.8
	15	400	225	167.5	127	74	8	14	24	8	27	115	110	130	5	8.8
	27	200	225	167.5	127	74	8	14	24	8	27	115	110	130	5	8.8
	27	400	225	167.5	127	74	8	14	24	8	27	115	110	130	5	8.8
	45	200	235.5	178	127	74	8	14	24	8	27	115	110	130	5	8.8
	75	100	235.5	178	127	74	8	14	24	8	27	115	110	130	5	8.8
	105	100	235.5	178	127	74	8	14	24	8	27	115	110	130	5	8.8
E	3	3000	239.5	167	131	78	8	14	32	10	35	145	130	165	5	11
	3	3500	239.5	167	131	78	8	14	32	10	35	145	130	165	5	11
	3	4000	239.5	167	131	78	8	14	32	10	35	145	130	165	5	11
	5	1000	282.5	210	131	78	8	14	32	10	35	145	130	165	5	11
	5	1500	282.5	210	131	78	8	14	32	10	35	145	130	165	5	11
	5	2000	282.5	210	131	78	8	14	32	10	35	145	130	165	5	11
	9	1000	282.5	210	131	78	8	14	32	10	35	145	130	165	5	11
	9	1500	282.5	210	131	78	8	14	32	10	35	145	130	165	5	11
	9	2000	282.5	210	131	78	8	14	32	10	35	145	130	165	5	11
	15	750	264	191.5	131	78	8	14	32	10	35	145	130	165	5	11
	15	1000	282.5	210	131	78	8	14	32	10	35	145	130	165	5	11
	27	750	264	191.5	131	78	8	14	32	10	35	145	130	165	5	11
	45	400	270.5	198	131	78	8	14	32	10	35	145	130	165	5	11
	75	200	270.5	198	131	78	8	14	32	10	35	145	130	165	5	11
	105	200	270.5	198	131	78	8	14	32	10	35	145	130	165	5	11





1step reduction part

Motor~input gear~planet gear~middle shaft

Rotation from the motor is delivered by the input gear attached to the M shaft. The input gear makes the planet gear A contacting the internal gear A go in gear. This transmits orbital motion to the planet gear A and rotates the 2step sun gear through the carrier.

The rotating direction is same as input otation.

2step reduction part

Middle shaft~sun gear~planet gear~output shaft

Rotation of the middle shaft is delivered by the sun gear attached to the bevel gear. This transmission rotates the output shaft by making the bevel gear rotate in gear.

The rotating direction is same as input otation.

The above mention is explanation for the 2step reducer.
The 1step reducer runs only under the operating mechanism of the 2step reduction part.

Examples of type selection

1 [Operating pattern]

At operation : $T_1 = 50$ (Nm) $t_1 = 0.5$ (sec) $n_1 = 50$ (rpm)
At normal operation : $T_2 = 20$ (Nm) $t_2 = 5$ (sec) $n_2 = 100$ (rpm)
At reduction : $T_3 = -40$ (Nm) $t_3 = 1$ (sec) $n_3 = 50$ (rpm)
At stop : $T_4 = 0$ (Nm) $t_4 = 10$ (sec) $n_4 = 0$ (rpm)

[Max. number of revolutions]

Max. output speed : $n_{OUT} = 300$ (rpm)
Max. input speed : $n_{IN} = 5000$ (rpm) (モータにより制限)

OK

2 Calculate mean load torque given to the output shaft from the load torque pattern. Mean load torque : T_a (N・m)

$$T_a = \sqrt[3]{\frac{50 \times 0.5 \times |50|^3 + 100 \times 5 \times |20|^3 + 50 \times 1 \times |-40|^3 + 0}{50 \times 0.5 + 100 \times 5 + 50 \times 1 + 0}}$$

$= 26.2$ (Nm)

Calculate mean output speed from the load torque pattern..
Mean output speed : n_{aOUT} (rpm)

$$n_{aOUT} = \frac{50 \times 0.5 + 100 \times 5 + 50 \times 1 + 0}{0.5 + 5 + 1 + 10} = 34.8 \text{ (rpm)}$$

OK

3 Provisionally select the type.

$26.2 \leqq 29.2$ (Nm)

(Select 15E-750 from the performance table)

OK

4 Determine reduction ratio (R) from max. output speed (n_{OUT}) and max. input speed (n_{IN}).

$$\frac{5000}{300} = 16.7 \geqq 15$$

Calculate max. input speed (n_{IN}) from max. output speed (n_{OUT}) and reduction ratio (R).

$n_{IN} = 300 \times 15 = 4{,}500$ (rpm)

OK

5 Calculate mean input speed n_{aIN} from mean output speed n_{aOUT} and reduction ratio (R).

$n_{aIN} = 34.8 \times 15 = 522 \leqq 3{,}000$ (rpm)

OK

6 Ensure that max. input speed is less than the fixed max. input speed.

$n_{IN} = 4{,}500 \leqq 5{,}000$ (rpm)

OK

7 Ensure that T_1 and T_3 are within the numerical values of max. instant time permissible output torque in the performance table.

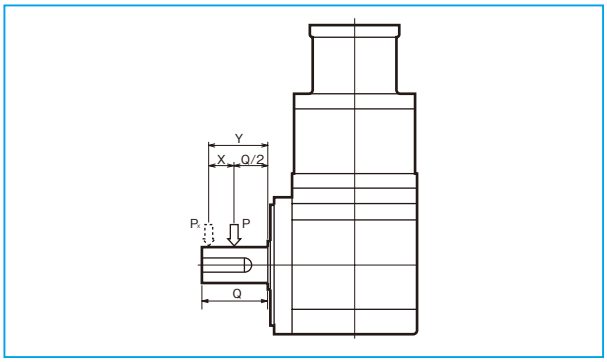
$T_1 = 50 \leqq 87.6$ (Nm)
$T_3 = 40 \leqq 87.6$ (Nm)

OK

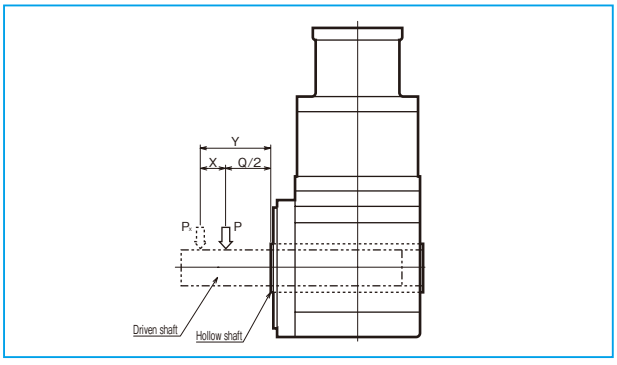
Fixed to 25E-750

Permissible radial load

■Solid shaft radial



■Hollow shaft radial



※被動軸の強度についてはお客様にてご確認ください。

If radial load is beyond the center of the output shaft, calculate using the following equation and positive numbers:

$P_X = \{K/(K+X)\} \times P$
$X = Y - Q / 2$

P : Permissible radial load(N)
Q : Positive number

K : Positive number
X : Load point displacement distance(mm)
Y : Load point(mm)
Px : Permissible shaft load(N)

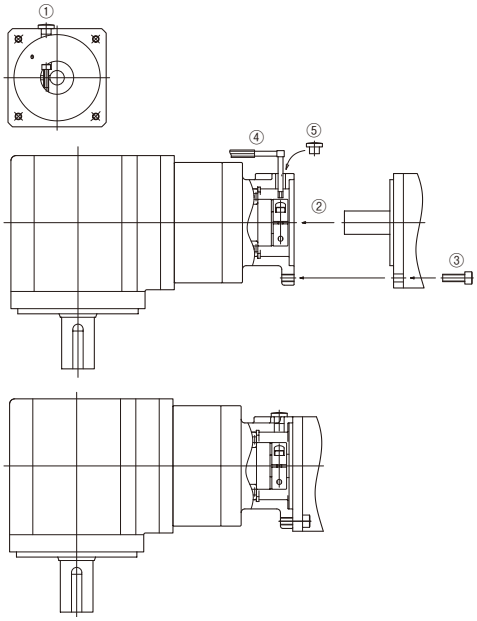
Type No.	Positive No.:Q	Positive No.:K
B	30	94.5
C	30	97.5
D	40	128
E	55	138.5

1. Insertion into motor

If a customer personally assembles the servo motor and reducer please use the following tip. The reducer flange to which the servo motor is attached has different dimensions based on the motor specified. Therefore, assembly may be impossible for any other motor. Make sure the correct motor is specified before ordering the reducer.

[In case of jointing the motor without key]

① Take off the rubber cap, turn the input shaft, and match the head of the bolt to the hole of the rubber cap. Make sure that the set bolt is loosened.
② Gradually put the motor shaft into the input shaft (Ensure that it is smoothly put in without jam.) Be careful not to be inserted with the motor tilted.
③ Attach the motor to the reducer and fasten the bolt with designated fastening torque. See Table 1.
④ Fasten the set bolt of the input shaft with designated fastening torque using torque wrench, etc. See Table 2.
⑤ Attach a rubber cap. It is the end of assembling.



■ Table 1

Motor jointing bolt	Fastening torque	
	N・m	kgf・cm
M3	1.0	10
M4	2.9	30
M5	5.9	60
M6	9.8	100
M8	19.6	200
M10	39.2	400
M12	68.6	700
M16	162	1650

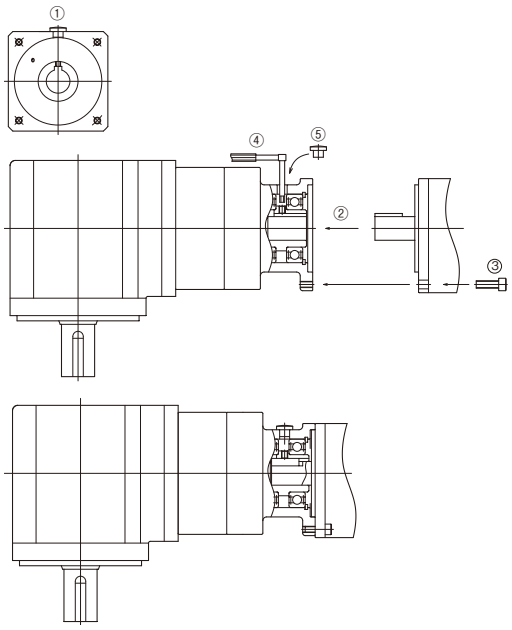
■ Table 2

Motor jointing bolt	Fastening torque	
	N・m	kgf・cm
M3	1.5	15
M4	3.5	36
M5	7.1	72
M6	12	122
M8	30	306

If the key of the motor of key attachment type is eliminated, motor jointing without the above-mentioned key may be followed. There is no risk of deviation.

[In case of jointing the motor with key]

① Take off the rubber cap, turn the input shaft, and match the head of the bolt to the hole of the rubber cap.
② Coat carbon formation inhibitors (molybdenum dioxide etc.) onto the motor shaft, match the key to the key slot, and gradually put it in the input shaft (Ensure that it is smoothly put in without jam.). Be careful not to be inserted with the motor tilted.
③ Combine the motor with the reducer and fasten with the designated fastening bolt. See Table 1.
④ For set bolt of the input shaft, fasten using torque wrench with the designated fastening torque with the key firmly pressed. See Table 3.
⑤ Attach a rubber cap. The is the end.



■ Table 3

Motor jointing bolt	Fastening torque	
	N・m	kgf・cm
M4	2.0	20
M5	4.3	44
M6	7.3	74
M8	16.8	171

2. Jointing with reducer

Whenever jointing the reducer with a device, ensure that the jointing side is flat without protrusion, and then fasten the bolt with designated fastening torque using torque wrench. See Table 4.

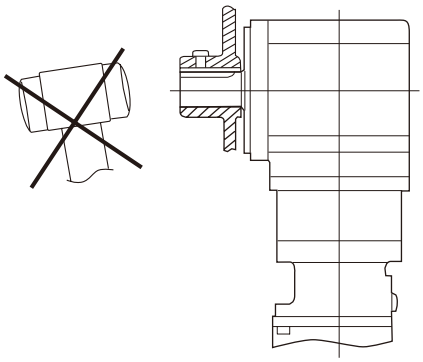
■ Table 4

Reducer jointing bolt		Fastening torque	
		N・m	kgf・cm
B,C types	M6	9.8	100
D types	M8	19.6	200
E types	M10	39.2	400

3. Jointing to the output shaft

Precautions

- When attaching a coupling, free, etc. onto the output shaft, make sure that excessive thrust load not be given to the output shaft.
- In case of strongly hitting the shaft with a hammer, the shaft inlet or the inside of the reducer may be damaged, therefore it shall be prohibited.
- If the shaft or key of a coupling to be attached is large, it may cause carbonization, so be careful when assembling.
- For assembling of a coupling, fix the key with a set bolt.
- When connecting the shaft, ensure that the connecting shaft fully goes out.



Jointing to NEV-series hollow shaft type

Whenever inserting the driven shaft into the hollow shaft, coat carbon formation inhibitors (molybdenum dioxide etc.) onto the shafts, and carefully insert the key in a set. If the shaft is inserted with a strong hit, the axis or the inside of the reducer may be damaged, so such a behavior is prohibited.

If there is a need to fix the driven shaft to the hollow shaft, the following fixing methods are available:

1） If there is differential on the driven shaft
- Attach a snap ring onto the hollow shaft, insert the collar, and then fix the driven shaft with a bolt (Figure A).
- Insert the collar using the cross section of the hollow shaft and fix the driven shaft with a bolt. (Figure B).

2） If there is no differential on the driven shaft
Attach a snap ring onto the hollow shaft, put the collars in both sides of the snap ring, and then fix the driven shaft with a bolt (Figure C).

3） How to eliminate from the hollow shaft
Make sure that excessive pressure is not applied between the casing and the hollow shaft.
As shown in Figure D, it is possible to conveniently remove it using Jig. Design the driven shaft as short as possible according to thickness of the collar.

Note) Customers must prepare jointing, fixing, and removing parts.