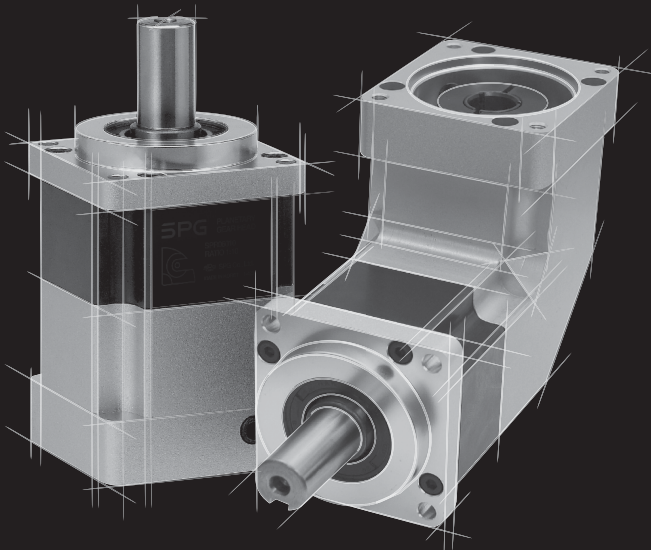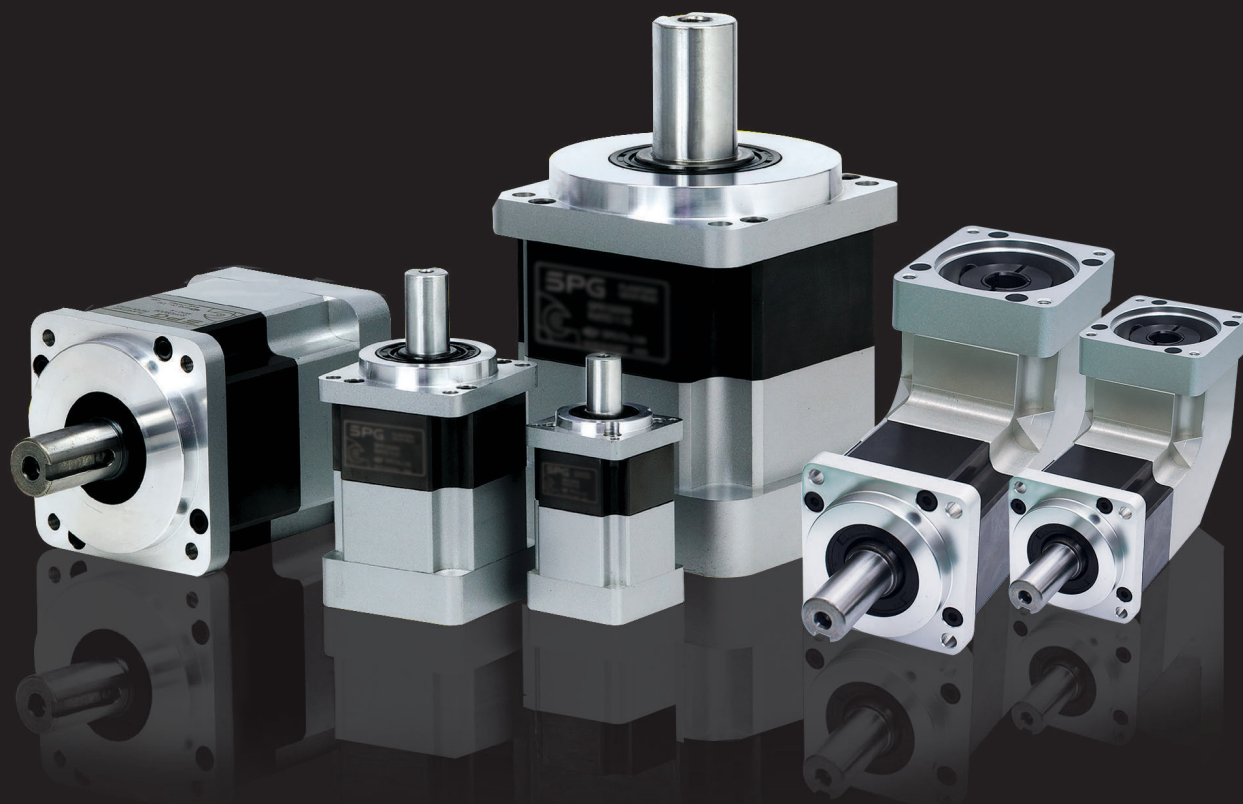# BOHEZ©

LEADING IN MECHATRONICS

powered by SPG

PLANETARY GEARHEADS

Precision Planetary gear Heads – SPI/SPL Series

The development of SPI/SPL series precision planetary gear heads is a result of our experience over three decades in manufacturing a variety of gear heads for demanding and critical application.
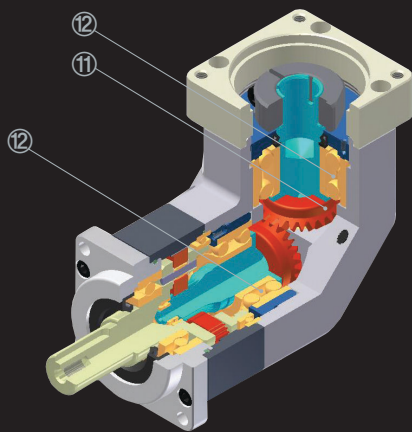
Applicable Servo Motors

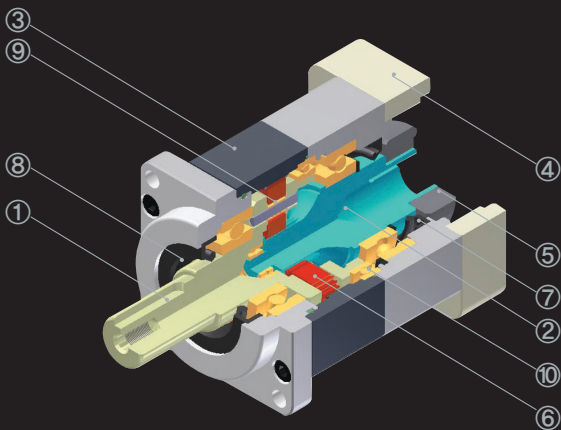- ▶ Nanotec electronics GmbH
- ▶ Crouzet
- ▶ LSIS Co.,Ltd.
- ▶ Metronix Co.,Ltd.
- ▶ Samsung Electronics Co.,Ltd.
- ▶ Mitsubishi Electric Corp.

- ▶ Matsushita Electric Industrial Co.,Ltd.
- ▶ Yaskawa Electric Corp.
- ▶ Fuji Electric Co.,Ltd.
- ▶ Tamagawa Seiki Co.,Ltd.
- ▶ Fanuc Ltd.
- ▶ Nikki Denso Co.,Ltd.

- ▶ Sanyo Denki Co.,Ltd.
- ▶ Omron Corp.
- ▶ Miki Pully Co.,Ltd.
- ▶ Shinano Denki Co.,Ltd.

Salient Features of SPI/SPL Series

The Bohez's precision planetary Gear heads for servo motor application have high precision & high stiffness, providing function & performance of more than the customer's requirements.

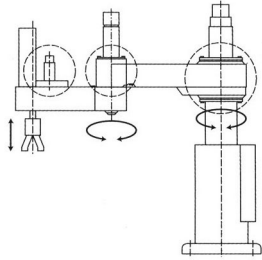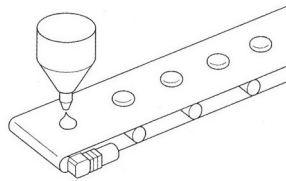### ● SMALL, LIGHTWEIGHT, AND COMPACT DESIGN
Compact design in consideration of small and light-weight servo motor!

● HIGH TORQUE CARRYING CAPACITY
Structurally higher torque capacity compared to existing types, enabling wide downsizing!

● HIGH STIFFNESS SYSTEM
Integrated ring gear and input shaft made of special steel having high stiffness, sun gear both end support, reducer stiffness maximized by the integrated carrier design system of the output shaft!

● LOW INERTIA MOMENT
Control improvement by the low inertia design!

● HIGH EFFICIENCY
High transmission efficiency by more than 90%!

● HIGH PRECISION
Low Backlash(about 10 arcmin) by applying the precision gear!

● LOW NOISE
Under 60dB(A) of noise level!

● LONG LIFE
Service Life should be 10,000 hours based on Continuous operation! (Warranty Period : 1 year after the product is purchased)

● EXCELLENT SEAL SYSTEM
Safety of the use conditions secured with the sealing structure of high protective grade (IP65) by applying input/output shaft oil seal, case bonding surface O-Ring, and input shaft non-contact seal bearing!

● FREE MOUNTING DIRECTION, COMPATIBILITY
Mounting available in all directions such as vertical, horizontal, sloped; mounting improved by the design having compatible mounting dimensions with competing products!

● SIMPLE MOUNTING ONTO VARIOUS SERVO MOTORS
Coping with a range of servo motors of each manufacturer by applying an adapter flange for mounting a servo motor, triple-split collet clamp, and adapter bushing with simple mounting!

① OUTPUT SHAFT
② INPUT GEAR SHAFT
③ OUTPUT CASE
④ INPUT ADAPTER FLANGE
⑤ CLAMP RING
⑥ PLANET GEAR
⑦ OIL SEAL (A)
⑧ OIL SEAL (B)
⑨ NEEDEL BEARING
⑩ BALL BEARING
⑪ SPIRAL BEVEL GEAR
⑫ ANGULAR BALL BEARING

Applications

Scara Robot	Belt Conveyor	Printing Machine
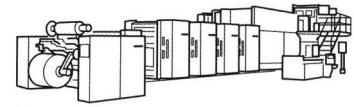
Wafer Transfer Robot	Automated Packing Machine	Gantry Robot
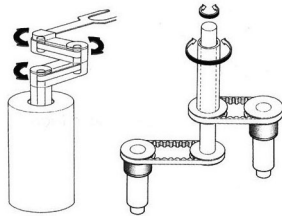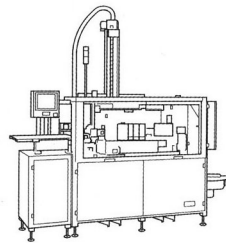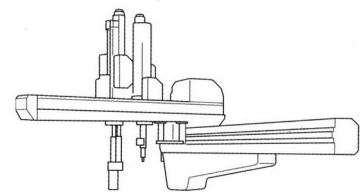
drive shaft of Robot(Rack&Pinion)	Fill Seal Machine(Horizontal Type)	Fill Seal Machine(Vertical Type)
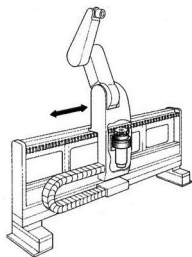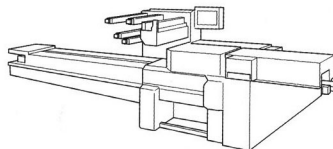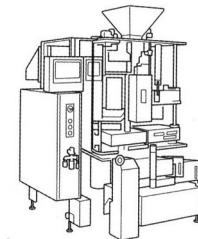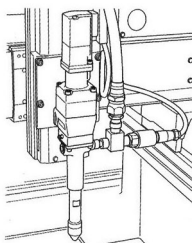
Dispenser Robot	Turret-Head	Loader Robot
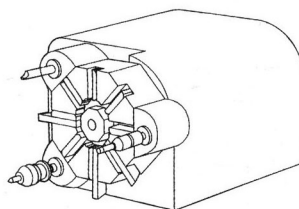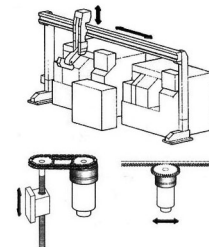
• Transfer robots
• Robot peripherals
• FA units
• Liquid glass return robots
• Semiconductor manufacturing devices
• Machine tools
• Loader drive shafts

• Packing machine
• Woodworking machinery
• Laser processing machinery
• Medical devices(CT)
• Monitoring & security cameras
• Bending Machinery
• Testing devices

• Measuring devices
• Pallet stackers
• Conveyors
• Extrusion machinery, blow-down devices etc.
  blow-down device etc.

The SPI/SPL precision planetary gear head series meets the requirements of the most of the general-purpose servo applications.

BOHEZ ©

HIGH PRECISION PLANETARY GEARHEADS FOR SERVO MOTORS / SPI Series

▶Small-sized, Light, Compact

▶High Precision, High Durability

▶High Efficiency

▶Easy Mounting with various Servo Motors

SPI Series

■ Specifications

Description	Unit	Stage	Ratio (1)	Model No. SPI 042	SPI 060	SPI 090	SPI 115
Nominal Output torque T$_{2N}$ (2)	Nm	1	3	15	46	110	190
			4	14	35	102	205
			5	19	42	112	235
			7	14	38	100	210
			9	14	34	96	160
			10	10	29	80	191
		2	15	15	46	110	190
			20	14	35	102	205
			25	19	42	112	235
			30	15	46	110	190
			35	19	42	112	235
			40	14	35	102	205
			45	14	34	96	160
			50	19	42	115	235
			63	14	38	100	210
			70	14	38	100	210
			81	14	34	96	160
			90	14	34	96	160
			100	10	29	80	191
Max Acceleration torque T$_{2B}$	Nm	1,2	3~100	3 times of Nominal Output torque			
Nominal Input speed n$_1$	rpm	1,2	3~100	3,000	3,000	3,000	3,000
Max. Input speed N$_1$	rpm	1,2	3~100	6,000	6,000	5,000	5,000
Backlash (General Type)	arcmin	1	3~10	≤10	≤10	≤10	≤10
		2	15~100	≤13	≤13	≤13	≤13
Max. Radial load Fr max (2)	N	1,2	3~100	400	1,100	2,400	4,000
Max. Axial load Fa max (2)	N	1,2	3~100	250	550	1,300	2,000
Service life (2)	hr	1,2	3~100	10,000	10,000	10,000	10,000
Noise level (3)	dB(A)	1,2	3~100	≤56	≤58	≤60	≤63
Weight	kg	1	3~10	0.5	1.2	3.2	7.2
		2	15~100	0.7	1.7	4.7	11.0
Moment of inertia (4)	kg·cm²	1	3~10	0.05	0.25	1.1	5.1
		2	15~100	0.03	0.05	0.24	0.72
Operating Temp. (5)	℃	1,2	3~100	−10~+90			
Lubrication		1,2	3~100	High temperature & Extreme pressure Lubricant			
Mounting position		1,2	3~100	All directions			
Efficiency η	%	1	3~10	≥97			
		2	15~100	≥94			
Degree of protection		1,2	3~100	IP 65			

(1) Ratio(reduction gear ratio) = n$_{in}$ / n$_{out}$ **(2)** Output rotation (n$_2$) 100rpm, Load acting in the middle of the output shaft, successive operation(S1), load coefficient(K$_A$) = 1   **(3)** Input rotation : 3,000rpm, measurement 1m distant from the surface to which the reducer is mounted under noload operation (background noise 21dB(A))   **(4)** Based on input shaft, representative value among reduction gear ratios
(5) Surface temperature of the Output Case, range of ambient temperature (−10℃~40℃)
※ Data of the above specification table indicate representative values and the specification may be changed without notice to improve product performance.

■ How to mark type code and ordering code

| SPI | 060 | S$^{(1)}$ | 015 | | S[K] | — | A$^{(2)}$ | — | A01 |

Series Name

SPI	I Type
SPL	L Type

Frame Size

042	□42
060	□60
090	□90
115	□115

Backlash

S	General Class	1 Stage : ≤10 arcmin / 2 Stage : ≤13 arcmin
P	Precision Class	1 Stage : ≤5 arcmin / 2 Stage : ≤7 arcmin

Gear Ratio(i)

1 Stage		2 Stage			
003	1/3	015	1/15	050	1/50
004	1/4	020	1/20	063	1/63
005	1/5	025	1/25	070	1/70
007	1/7	030	1/30	081	1/81
009	1/9	035	1/35	090	1/90
010	1/10	040	1/40	100	1/100
–	–	045	1/45	–	–

Special order No.

Input Adapter Flange Servo Motors / Model

A	HIGEN, MITSUBISHI order
B	Panasonic order

Shaft Option

S	Smooth Output Shaft
K	Output Shaft with Key

(1) Precision grade is special specification.
(2) For some models of the servo motor, the shape may differ from the Company's planetary reducer, therefore please check it again when placing an order.

■ Dimensions
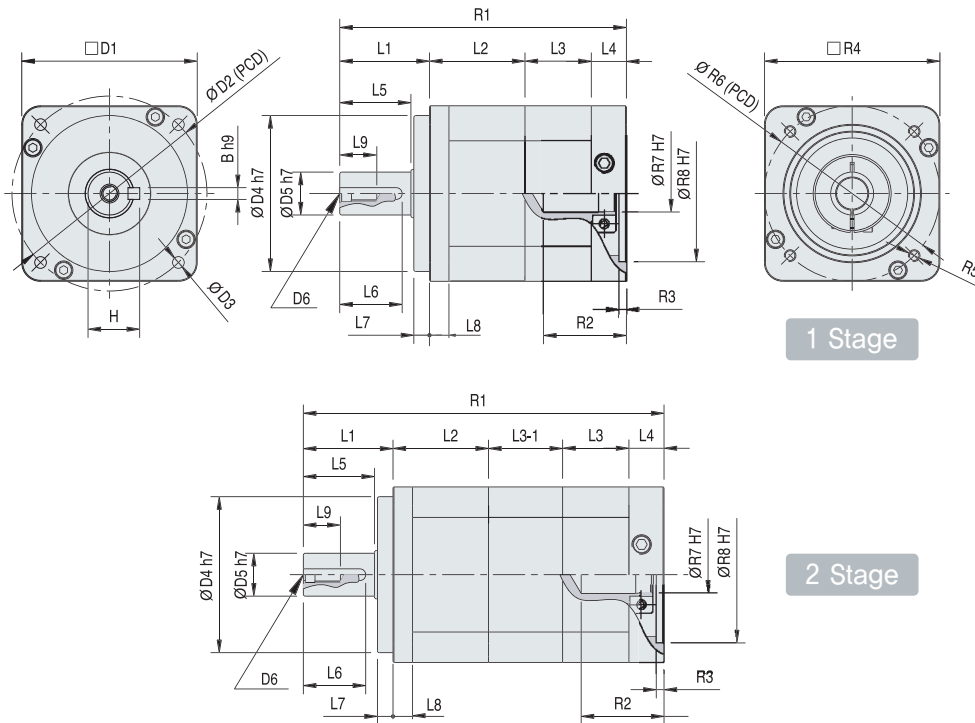
1 Stage

2 Stage

(Unit : mm)

MODEL No.		SPI 042	SPI 060	SPI 090	SPI 115
L1		24.5	37	46	65
L2		28.5	36	49	59
L3	1 Stage	25.5	30	34	40
L3-1	2 Stage	25	26	38	50
L4		13.5	18	18	42
L5		19.5	29	36.5	51
L6		16	25	32	45
L7		4	7	8	12
L8		7	8	10	14
L9		13	13	19	28
D1		42	60	90	115
D2		50	70	100	130
D3		3.4	5.5	6.5	9
D4	h7	35	50	80	110
D5	h7	13	16	22	32
D6		M4XP 0.7	M5XP 0.8	M8XP 1.25	M12XP 1.75
R1	1 Stage	92	121	147	206
R1-1	2 Stage	117	147	188	256
R2		27	32.5	42.5	63
R3		3.5	4	4	7
R4	h7	42	60	90	130
R5		M4XP 0.7	M5XP 0.8	M6XP 1.0	M8XP 1.25
R6		46	70	90	145
R7	H7	8	14	19	24
R8	H7	30	50	70	110
B	h9	5	5	6	10
H		15	18	24.5	35

Note) 1. For product improvement, appearance, dimensions etc. may be changed without notice.
　　　 2. R1~R8 may vary according to the selected servo motor specification. (for a special order product)
　　　 3. Consult Bohez for the adaptations to your motorcombination and accordingly the 3D plan

A list of applicable servo motors by reducer specification

■ A list of applicable servo motors by specification – 1

Frame Size of Gearheads / Servo Motor Model No.	Nanotec	Crouzet	METRONIX	SAMSUNG	SANYO
SPI 042 / SPL 042	ST41 SC41 ST42 SCA56 SCB56 ST59	SQ57	APM–SAR3A APM–SAR5A APM–SAR01A	CSMT–A3 CSMT–A5 CSMT–01 CSMZ–A3 CSMZ–A5 CSMZ–01	P30B04005 P30B04010 P50B05005 P50B05010
SPI 060 / SPL 060	SC60 ST60	SQ57 SQ75	APM–SB01A APM–SB02A APM–SB04A	CSMT–02, 04 CSMR–01 CSMZ–02, 04 CSMQ–01	P30B06020 P30B06040 P50B05020 P50B07020 P50B07030 P50B07040
SPI 090 / SPL 090	ST89	SQ75	APM–SC04A, 06A APM–SC03D, 05D APM–SC08A, 10A APM–SC06D, 07D	CSMT–02, 04 CSMT–06, 08 CSMT–10 CSMQ–02, 04 CSMZ–08	P30B08075 P50B08050 P50B08075
SPI 115 / SPL 115	CN09, CN15 CN22, CN30 KN06A, KN11 KN16, KN22 TN05, TN09 TN13, TN17 TF05, TF09, TF13 LN03, LN06 LN09, LN12 LF03, LF06, LF09	SQ75	APM–SE09A, 15A APM–SE06D, 11D APM–SE05G, 09G APM–SE03M, 06M	CSMD–08, 10 CSMD–15, 20 CSMH–05, 10, 15 CSMS–10, 15, 20, 25 CSMF–04, 08, 15 CSMK–03, 06, 09	P50B08100

Note) 1. See also「How to select a reducer 1」 (10 Page) by servo motor capacity.
    2. Check again specifications and dimensions of the servo motor of the maker after selecting the servo motor.
    3. The model names of the above servo motors are arranged by reference to catalogues of each manufacturer, and for more details, contact Bohez
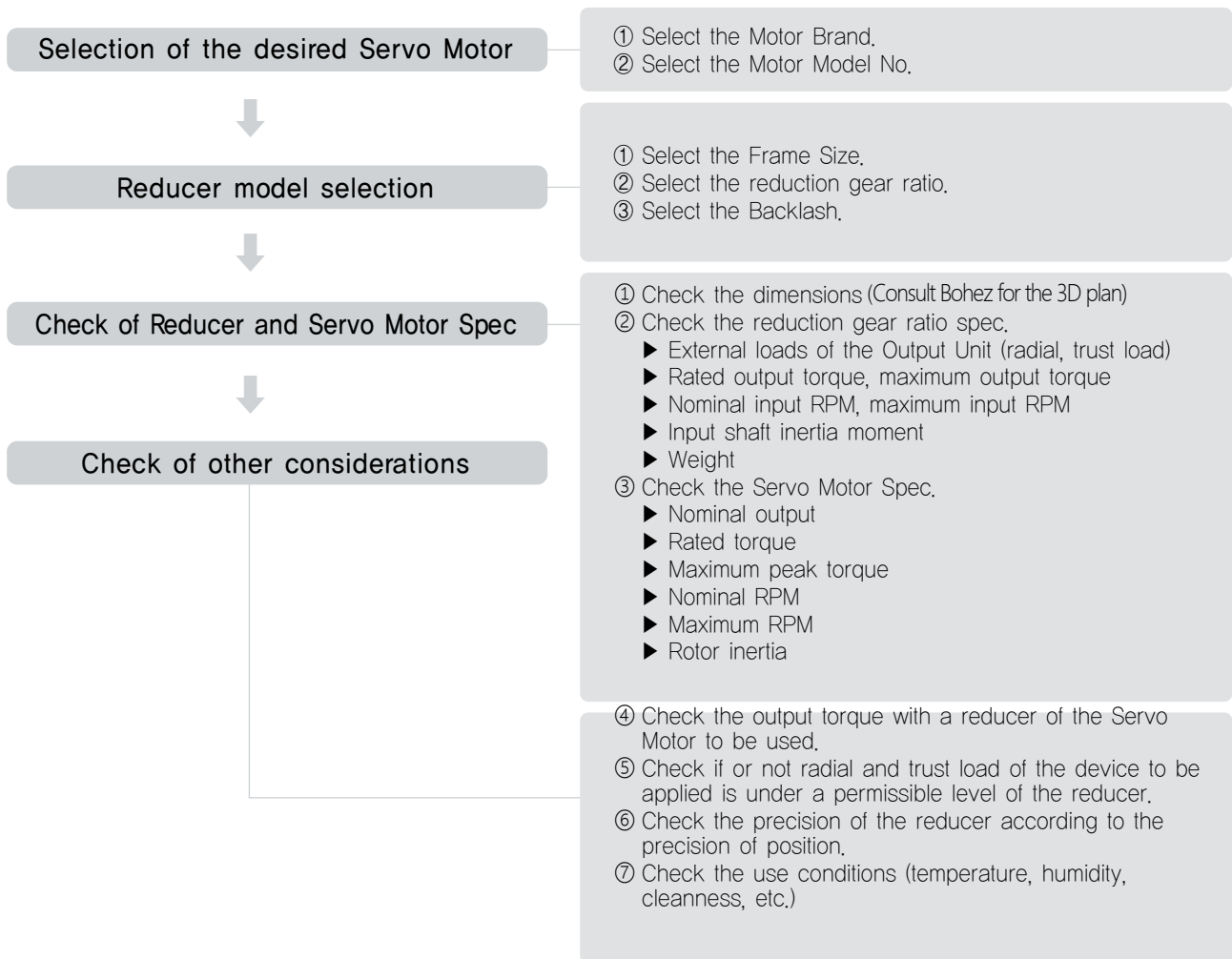
■ A list of applicable servo motors by specification – 2

Frame Size of Gearheads / Servo Motor Model No.	MITSUBISHI	PANASONIC	YASKAWA	FUJI
SPI 042 / SPL 042	HC–PQ HC–KFS(MFS) 053 HC–KFS(MFS) 13 HA–FF053(B)	MSMA–3A, 5A, 01A MQMA–01 MSMA–022A	SGMAH–A3, A5 SGMAH–01 SGM–A5, 01 SGMP–01	GYS 500DC1 GYS 101DC1 GYS 101DC2 GYC 101DC1
SPI 060 / SPL 060	HC–PQ HC–KFS(MFS) 23 HC–KFS(MFS) 43 HC–UFS 13 HA–FF23, 33, 43	MQMA, MSMA–02, 04 MSMA–022A MSMA–042A	SGMAH–02, 04 SGMPH–01, 02, 04 SGM–02, 04 SGMP–02, 04	GYC 101DC1 GYS 201DC1 GYS 401DC1 GYS 401DC2 GYC 201DC1 GYC 401DC1
SPI 090 / SPL 090	HC–KFS(MFS) 73 UC–UFS 23 UC–UFS 43 HA–FF 63	MSMA–08	SGMAH–07, 08 SGMPH–02, 04, 08 SGM–08 SGMP–08	GYC 201DC1 GYC 401DC1 GYC 751DC1 GYS 751DC1 GYS 751DC2
SPI 115 / SPL 115	HC–SFS 81 HC–SFS 52~152 HC–SFS 53~153 HC–LFS 52, 102, 152 HC–RFS 103, 153 UC–UFS 73	MSMA–10, 15, 20, 25 MSMA–302A1 MSMA–352A1 MDMA–08A1/D1 MDMA–10, 15, 20A1/D1 MGMA–03, 06, 09A1/D1 MFMA–04A1/D1 MHMA–05, 10, 15A1/D1	SGMPH–08, 15 SGMGH–03, 05, 06, 09 (1,500rpm) SGMGH–09 (1,000rpm) SGMGH–13 SGMSH–10, 15, 20 SGMUH–10, 15 SGMUH–30, 40 SGMP–08, 15	GYC 102DC1 GYA 501DC1 GYC 152DC1 GYC 202DC1 GYS 102DC1 GYS 152DC1 GYS 202DC1 GYG 501, 751CC2 GYG 102CC2 GYG 501BC2 GYG 851BC2

Reducer Selection

■ Check points for reducer selection

Selection of the desired Servo Motor

① Select the Motor Brand.
② Select the Motor Model No.

↓

Reducer model selection

① Select the Frame Size.
② Select the reduction gear ratio.
③ Select the Backlash.

↓

Check of Reducer and Servo Motor Spec

① Check the dimensions (Consult Bohez for the 3D plan)
② Check the reduction gear ratio spec.
  ▶ External loads of the Output Unit (radial, trust load)
  ▶ Rated output torque, maximum output torque
  ▶ Nominal input RPM, maximum input RPM
  ▶ Input shaft inertia moment
  ▶ Weight
③ Check the Servo Motor Spec.
  ▶ Nominal output
  ▶ Rated torque
  ▶ Maximum peak torque
  ▶ Nominal RPM
  ▶ Maximum RPM
  ▶ Rotor inertia

↓

Check of other considerations

④ Check the output torque with a reducer of the Servo Motor to be used.
⑤ Check if or not radial and trust load of the device to be applied is under a permissible level of the reducer.
⑥ Check the precision of the reducer according to the precision of position.
⑦ Check the use conditions (temperature, humidity, cleanness, etc.)

■ How to select a reducer 〈1〉 For simple selection with servo motor capacity and reduction gear ratio (based on Motor Input Speed 3,000rpm)

Ratio / Motor Capa.	1 Stage			2 Stage				Motor Mounting PCD (mm)	Motor Shaft Dia. (mm)
	3	5	9	15	25	45	81		
50W								45, 46, 60	6, 8, 11
100W	SPI 042 / SPL 042							45, 46, 60, 70	8, 11
200W								60, 70, 90	9, 11, 14
400W	SPI 060 / SPL 060							70, 90, 100, 115	10, 14, 16
750W								90, 100, 115, 145	16, 19
1,000W								100, 115, 145	16, 19, 24
1,500W	SPI 090 / SPL 090							115, 145	19, 22, 24
2,000W								115, 145	19, 22, 24
3,000W	SPI 115 / SPL 115							115, 145	19, 22, 24

Note) 1. 「How to select a reducer 〈1〉」is a reference for simple reducer selection, and if more exact reducer selection is required, see 「How to select a reducer 〈2〉」.
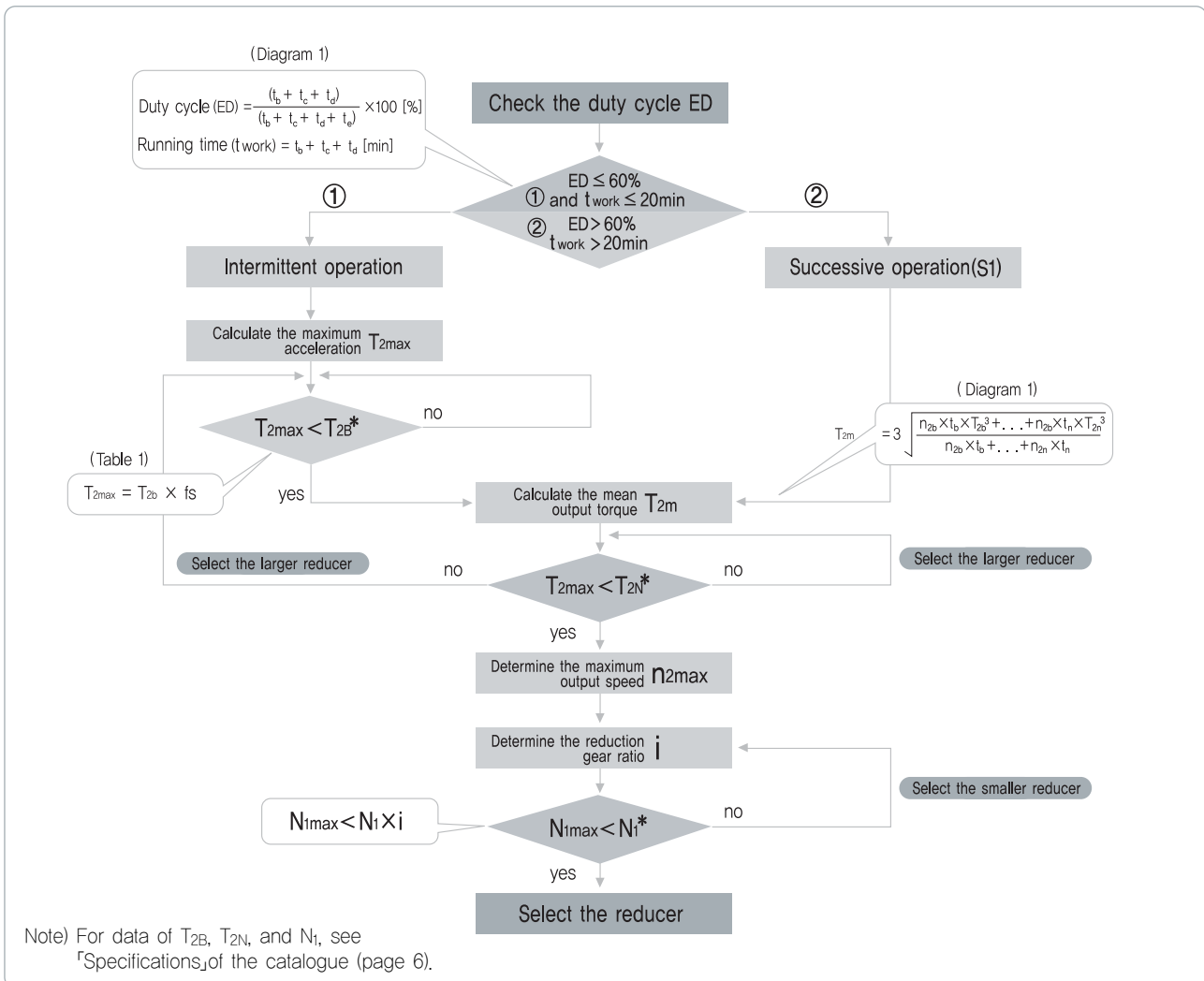2. Whenever selecting a reducer, select a reducer within the range
   (rated torque x reduction gear ratio of the Servo Motor< rated torque of the reducer), if possible.
3. The above Reducer Selection Table is based on up to 1/50 of reduction gear ratio. (For safe use of the servo motor, if a reducer having more than 1/50 of reduction gear ratio, contact the Company, and if possible, raise frame size of the reducer one step ahead.)

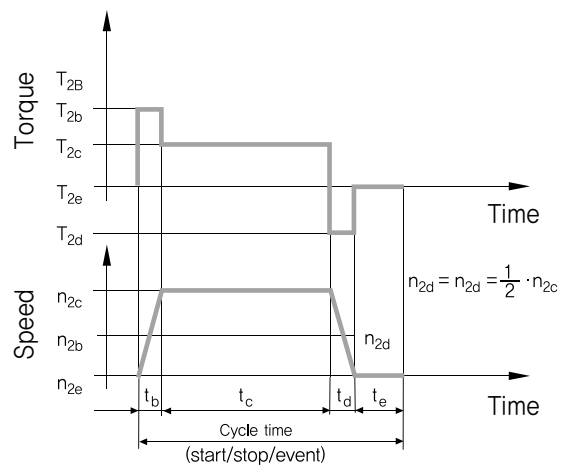## ■ How to select a reducer ⟨2⟩ For selection considering operation conditions

(Diagram 1)

$$\text{Duty cycle (ED)} = \frac{(t_b + t_c + t_d)}{(t_b + t_c + t_d + t_e)} \times 100 \ [\%]$$

$$\text{Running time } (t\,\text{work}) = t_b + t_c + t_d \ [\text{min}]$$

Check the duty cycle ED

① ED ≤ 60% and $t\,\text{work}$ ≤ 20min
② ED > 60% $t\,\text{work}$ > 20min

① Intermittent operation

② Successive operation(S1)

Calculate the maximum acceleration T_{2max}

$T_{2max} < T_{2B}{}^{*}$ → no

(Table 1)
$T_{2max} = T_{2b} \times fs$

yes

(Diagram 1)

$$T_{2m} = \sqrt[3]{\frac{n_{2b} \times t_b \times T_{2b}{}^3 + \ldots + n_{2b} \times t_n \times T_{2n}{}^3}{n_{2b} \times t_b + \ldots + n_{2n} \times t_n}}$$

Calculate the mean output torque T_{2m}

Select the larger reducer   no

$T_{2max} < T_{2N}{}^{*}$ no   Select the larger reducer

yes

Determine the maximum output speed n_{2max}

Determine the reduction gear ratio i

Select the smaller reducer

$N_{1max} < N_1 \times i$

$N_{1max} < N_1{}^{*}$ no

yes

Select the reducer

Note) For data of T_{2B}, T_{2N}, and N_1, see 「Specifications」of the catalogue (page 6).

■ Table 1 fs Table of factors

Number of Cycles / hr	fs*
0~1,000	1
1,000~1,500	1.1
1,500~2,000	1.25
2,000~3,000	1.55
3,000~5,000	1.83

Note) fs (shock factor) : Shock factor

■ Diagram 1 Torque & Speed Diagram

Torque: T_{2B}, T_{2b}, T_{2c}, T_{2e}, T_{2d}

Time

$$n_{2d} = n_{2d} = \frac{1}{2} \cdot n_{2c}$$

Speed: n_{2c}, n_{2b}, n_{2d}, n_{2e}

t_b t_c t_d t_e

Time

Cycle time
(start/stop/event)

How to measure reducer backlash

■ Hysteresis curve Torque – torsion angle diagram
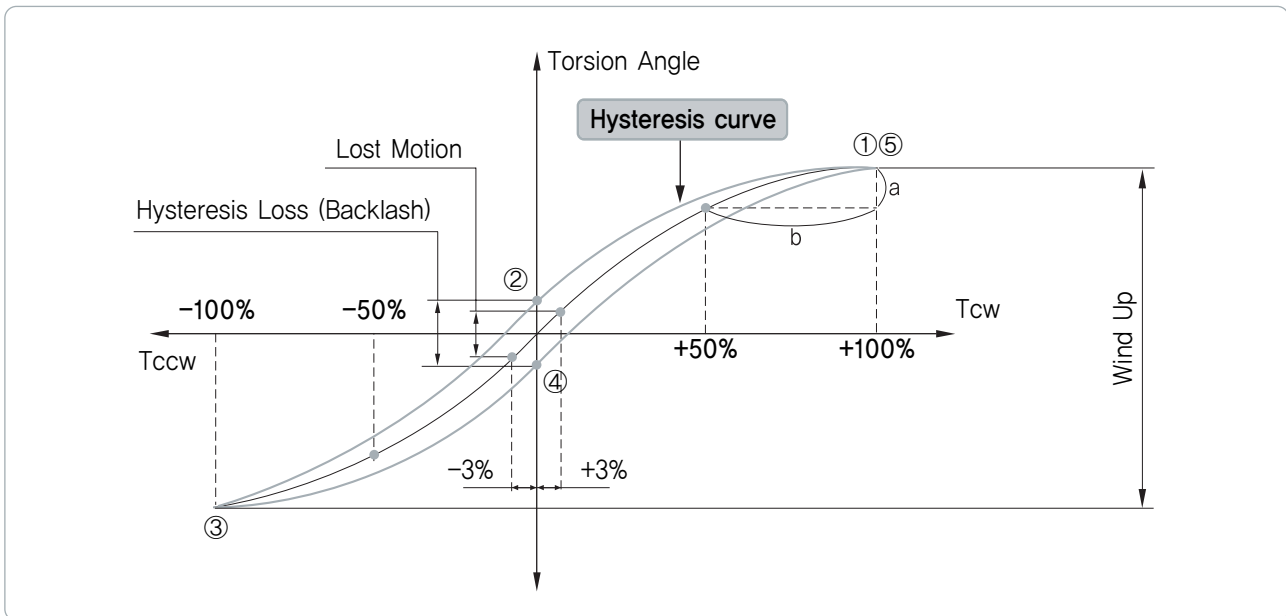
■ Backlash Hysteresis Loss

In general, whenever measuring backlash, which indicates the level of a reducer, the value measured by giving 3% of rated output torque of the reducer toward both directions(±3%) should be read. That is, if the input shaft of the reducer is fixed and torque is given to the output part, torsion responding to torque is incurred in the output part.

① Normal rotation(rated output torque Tcw) ▶ ② Zero ▶ ③ Inverse rotation(rated output torque Tccw) ▶ ④ Zero ▶ ⑤ If torque values are gradually changed in the same sequence as normal rotation(rated output torque Tcw), the curve is drawn as shown in the figure [Hysteresis Curve].

As shown in the figure, ②④ value for the zero torque part of the hysteresis curve is called Hysteresis Loss, and for the Bohez's planetary reducer(SPI/SPL series), the amount of Hysteresis Loss is measured, and it is set as product backlash specification.

■ Lost Motion Rotational accuracy

Lost Motion indicates angle of torsion in the middle of hysteresis up/down curve width within ±3% of rated output torque for backlash measurement. In general cases, Lost Motion including elastic deformation of power transmission system except Hysteresis Loss is indicated in a higher value.

■ Torsional Rigidity

Difference in angle of torsion, which is measured while the input shaft is fixed and each 50% and 100% of load torque are given to the output shaft, is expressed in a proportional slope, and torsional rigidity in Fig. [Hysteresis Curve] can be indicated in the following equation.
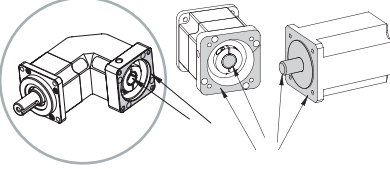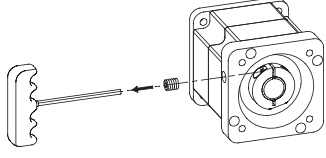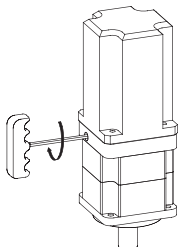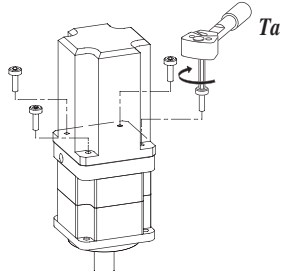
$$T_r = \frac{b}{a}$$
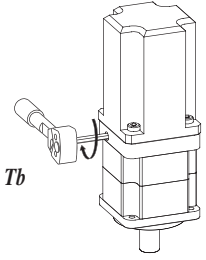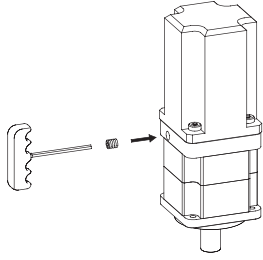
T_r : Torsional rigidity
a : 50% of rated output torque
b : Difference in angle of torsion when each 50% and 100% of rated output torque are given to the output shaft

■ Servo motor mounting For mounting with the servo motor, keep the following sequence

1 Clean the part to be mounted after checking the motor and reducer sizes.

2 Loosen the screw plug from the adapter flange and adjust the position so that the clamp bolt can be seen. (For proper servo motor shaft fixation method, see「Appendix 1」.)

3 When mounting onto the motor, closely adhere the adapter flange of the reducer and the motor mounting side and slightly tighten the clamping bolt so that the clamp ring not idle.

Ta

4 Tighten diagonally to the specified tightening torque with a torque wrench. (For tightening torque, see「Appendix 2」.)

Tb

5 Tighten the clamp bolt to the specified tightening torque with a torque wrench. (For tightening torque, see「Appendix 2」.)

6 Tighten again the screw plug

■ Appendix 1 Proper servo motor shaft fixation method

If the servo motor shaft has not a circular but key way, remove the key and make sure that the key way of the servo motor shaft and the clamp bolt of the reducer input shaft can be perpendicular as shown in「Fig. B」at mounting. Also, arrange each slot position of the Clamp Ring, the Gear Shaft, and the Bushing in a line to get higher tightening power.

Clamp Bolt

Bushing

Input Gear Shaft

Servo motor shaft

Clamp Ring

(Figure A) Annular shaft

(Figure B) Key way
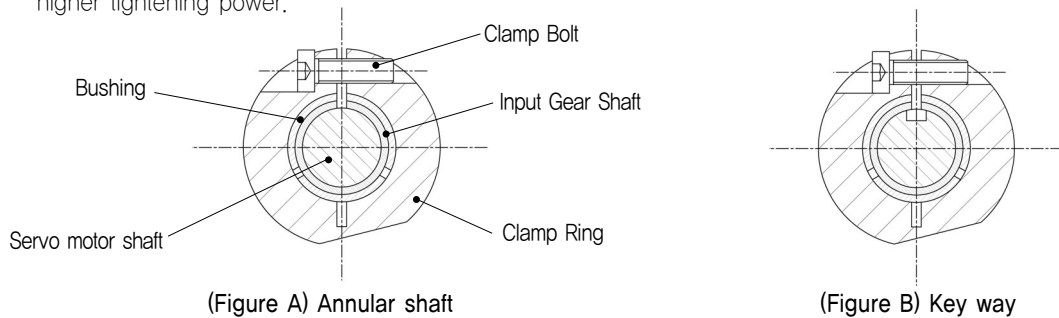
■ Appendix 2 Bolt tightening torque

Series Name	For Mounting on the Motor		For the Clamp Ring	
	Bolt Size	Fastening Torque Ta	Bolt Size	Fastening Torque Tb
SPI 042 / SPL 042	M4	3.0 Nm	M3	2.1 Nm
SPI 060 / SPL 060	M5	5.8 Nm	M5	9.8 Nm
SPI 090 / SPL 090	M6	9.8 Nm	M5	9.8 Nm
SPI 115 / SPL 115	M8	19.6 Nm	M8	41.0 Nm

Cautions at use and warranty

■ Caution

Be careful of product handling.
· Be careful not to give an impact to the product with a hammer and not to cause damage from a drop at handling.

In case of directly connecting the product to the load side, pay attention to assembling.
· Be careful of direct connection such as concentricity, parallel level, tension, etc. whenever connecting the product to the load side such as a belt, a chain, etc.
· Be careful of handling the edge of the product and the key way of the output shaft. It may cause an injury.
· Do not put a hand or other foreign substance in a rotating shaft while the product drives. It may cause an injury.

Do not give an impact to the product.
· Be careful not to give an excessive impact whenever assembling a pulley, a coupling, a key, etc. to the product.

Do not exceed permissible torque at use.
· Do not give more than the instantaneous permissible maximum torque. It may cause troubles by bolts loosened on the tightening part, shaking, damage, etc.

Do not disassemble the product.
· Do neither disassemble nor reassemble the product. Otherwise the original performance may not be guaranteed.

If any abnormal condition is sensed, stop the system.
· If abnormal sound, vibration, abnormal heat, etc. occur, immediately stop the system. Otherwise it may adversely influence the system.

■ Warranty

A WARRANTY PERIOD AND A WARRANTY LIMIT OF THE PRODUCT IS AS FOLLOWS.

1 Warranty Period

Either 18 months after the delivery or 12 months of an operation period for the product, which reaches earlier, should be applied on condition of use with operation, assembling, and lubrication specified by the Company.

2 Warranty Limit

For a fault by a defect in Company's manufacturing during the above warranty period, repair or exchange of the product should be conducted under Company's responsibilities. However, the following cases are excluded from the Warranty Limit.

① Unsuitable handling or use by customers

② Remodeling or repair not by the company without permission

③ A fault resulting from other reasons except the product

④ Such fault as attributable to natural disaster etc.,
which is not the Company's responsibility

Warranty herein means warranty for the product.
Other losses (chance loss by loss of the machine & assembly man-hour, assembly & disassembly, and mounting costs) arising out of a failure of the product are beyond the range of Company's burdens.

■ To submit SPI/SPL product questions, simply fill out the following form

Customer	Company :	Zip/Postal Codes :	Name :	Job Title :
	TEL :	FAX :	E-mail :	
Address			Country :	

Operating Conditions	
Machine Name	
Application	

Spec. of the Gearheads	**SPI / SPL −**	Reduction Ratio i =	Backlash : arcmin

1. The Conditions of Load
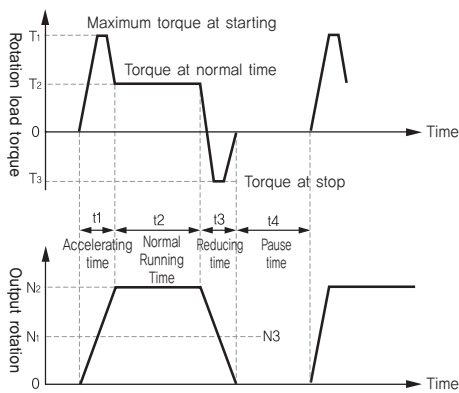
	starting (Max.)	Normal	Stop(Max.)	Pause time
N·m	T1	T2	T3	–
rpm	N1	N2	N3	–
sec	t1	t2	t3	t4

Running Time	Cycle/day	Day/year	year

2. The Load Conditions of Output Shaft

a Datum plan of the mounting

W1 : kg	L : mm
W1 : kg	r : mm
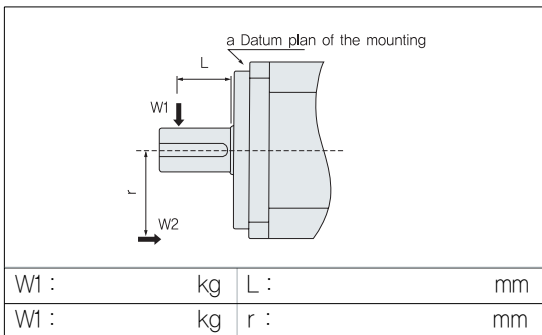
3. The Mounting Direction

☐ Horizontality   ☐ ☐   Verticality ☐ ☐ ☐ ☐

The Outline figure of Mounting

4. The Specifications of Input Side

☐ Servo motor   ☐ other (   )

Capacity	W
Nominal Torque	N·m
Input Speed	rpm
Output Shaft Dimensions	Ø = , ℓ mm

5. Others

_____

_____

_____

_____

MEMO

MEMO

MEMO

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