Nidec

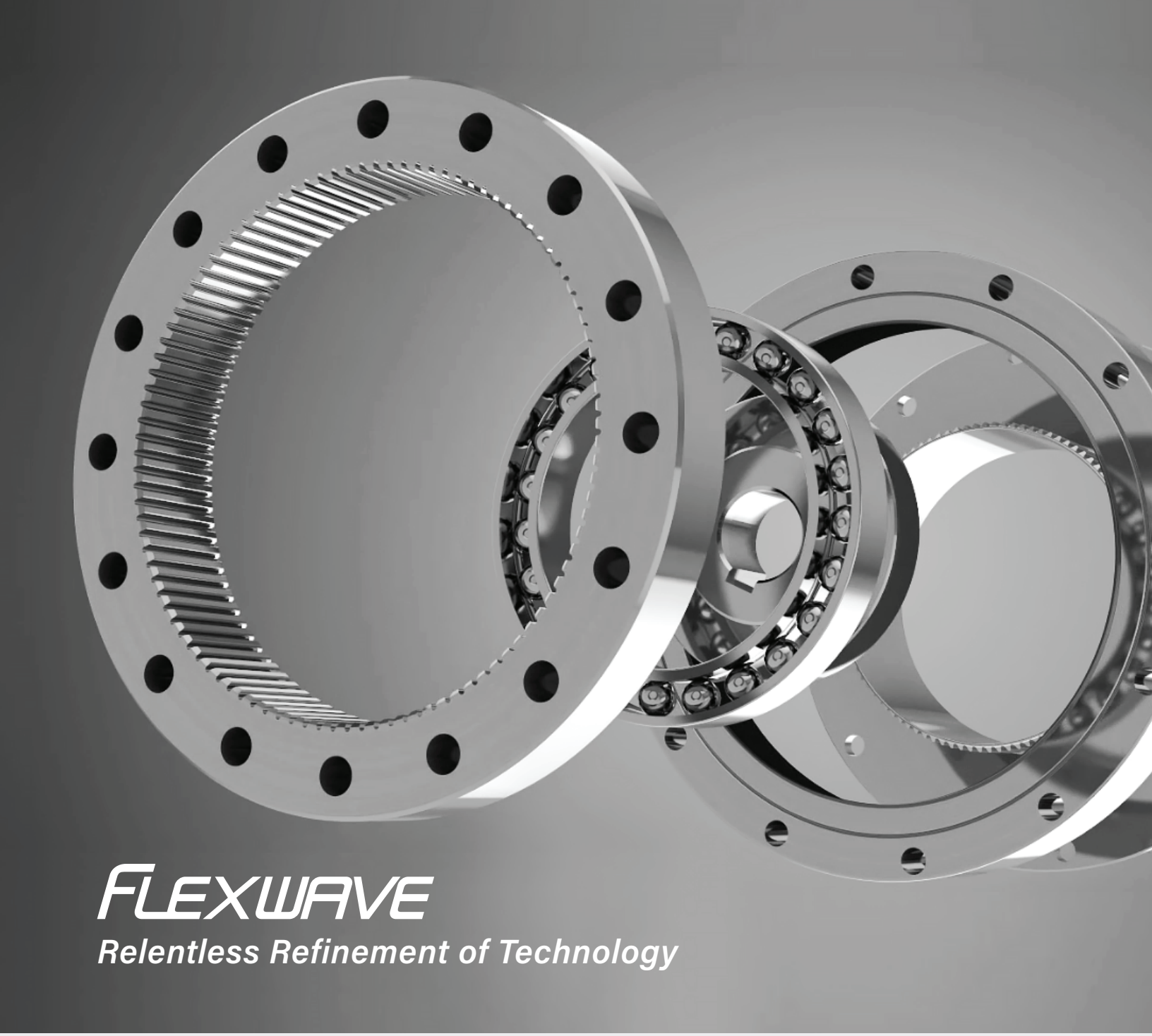
FLEXWAVE

The Next Generation

WP Series

The Highest Precision

NIDEC DRIVE TECHNOLOGY CORPORATION



FLEXWAVE

Relentless Refinement of Technology

The *Next Generation* Nidec FLEXWAVE high precision gear reducers offer machine designers virtually unlimited flexibility and adaptability when designing highly innovative drive mechanisms. Standard configurations include; component sets, self-contained assemblies, and complete gear units ready to mount to standard servomotors with pre-assembled innovative standard motor mounting kits.

The *Next Generation* Nidec FLEXWAVE optimized tooth profiles combined with the Nidec Corporation core competencies of manufacturing high precision components at scale offer the most robust solutions with the highest reliability rates available to meet the most demanding application requirements where performance is guaranteed.

The *Next Generation* Nidec FLEXWAVE Cup style and Top Hat style Flex gears combined with solid or hollow input shafts extend the possibilities for integrating into unique designs with Ultra Flat versions available for when space is tight and High Torque versions for the more demanding applications requiring high torque density.

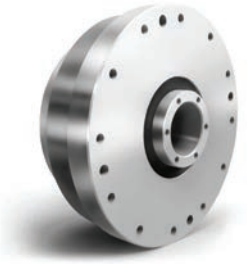
Index

All *Next Generation* Nidec FLEXWAVE high precision gear reducers are fully interchangeable with industry standards allowing designers to upgrade performance to existing designs by simply changing part numbers on the bills of materials.

- Exceptional Repeatability and Positional Accuracy
- Zero Backlash
- High Torque Density
- High Efficiency Ratings
- Lightweight and Compact
- High Torsional Stiffness

The *Next Generation* Nidec FLEXWAVE - proving to be the superior choice for the next generation drive mechanisms in Robotics, Machine Tool, Medical Equipment, Semiconductor Manufacturing, Satellite Communications and Assembly Automation applications.

Open type



Hollow unit

WPU-☐-☐-SNH
WPU-☐-☐-SDH
WPU-☐-☐-SRH

Input shaft unit

WPU-☐-☐-SNJ
WPU-☐-☐-SRJ

Simple unit

WPS-☐-☐-SN
WPS-☐-☐-SD
WPS-☐-☐-SR

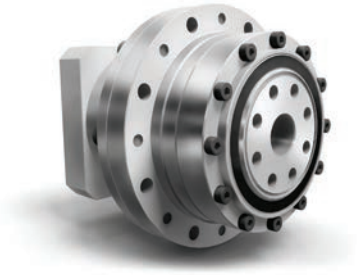
Closed type

Component

WPC-☐-☐-CF
WPC-☐-☐-CN
WPC-☐-☐-CR
WPC-☐-☐-CD

Unit

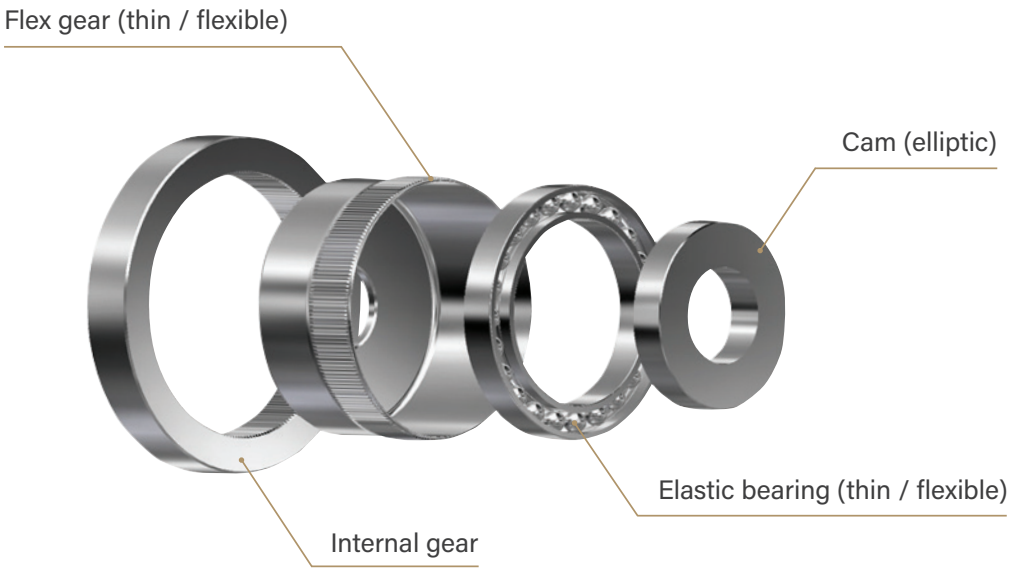
WPU-☐-☐-CF
WPU-☐-☐-CN
WPU-☐-☐-CR
WPU-☐-☐-CD
WPU-☐-☐-CDH



Gearhead

WPG-☐-☐-CR

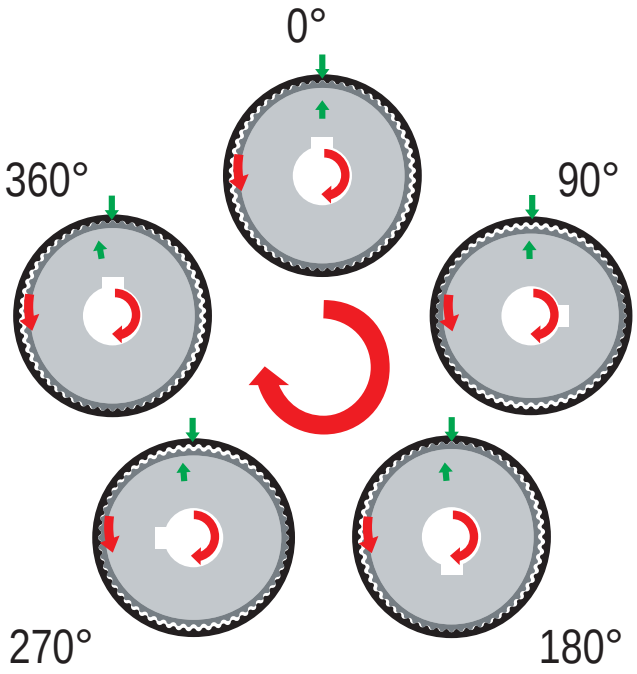
Parts configuration



Strain Wave Technology

Reduction mechanism

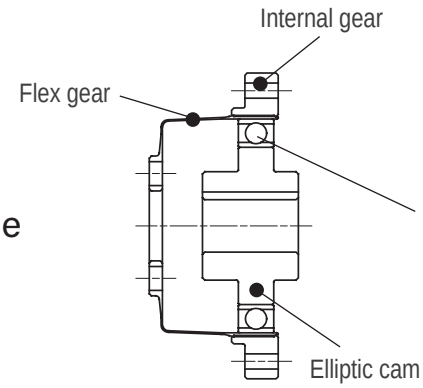
- Flex gear and elastic bearing take elliptic shape with cam inserted.
- Elliptical cam input is inserted into Flex gear and then mounted into internal gear; the flex gear egages the internal gear in 2 locations 180˚apart. This allows for high torque in a compact stable manner.
- With internal gear fixed and cam (input) rotated clockwise, the flex gear (output) rotates counter clockwise. Direction and speed of rotation is determined by tooth count of gears and mounting geometry.

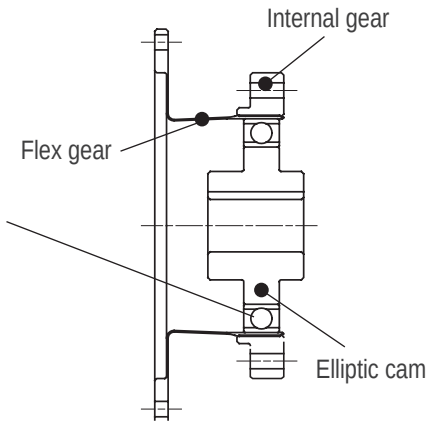


Closed type

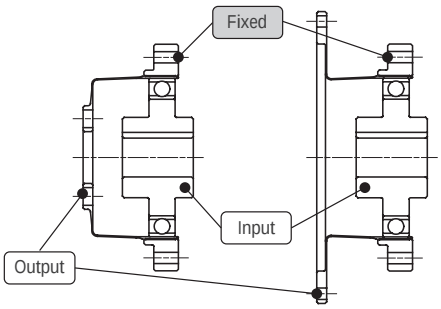
Open type

Parts name

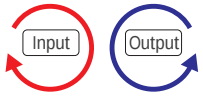




Reduction ratio

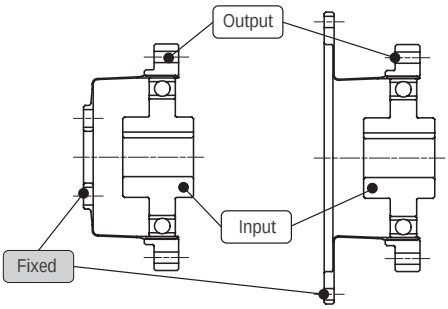


Reduction ratio = $\frac{-1}{R}$

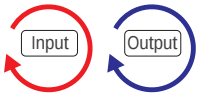


* The input and output rotation directions are opposite.

* "R" represents the "Ratio" figure in the specifications table on the next page.



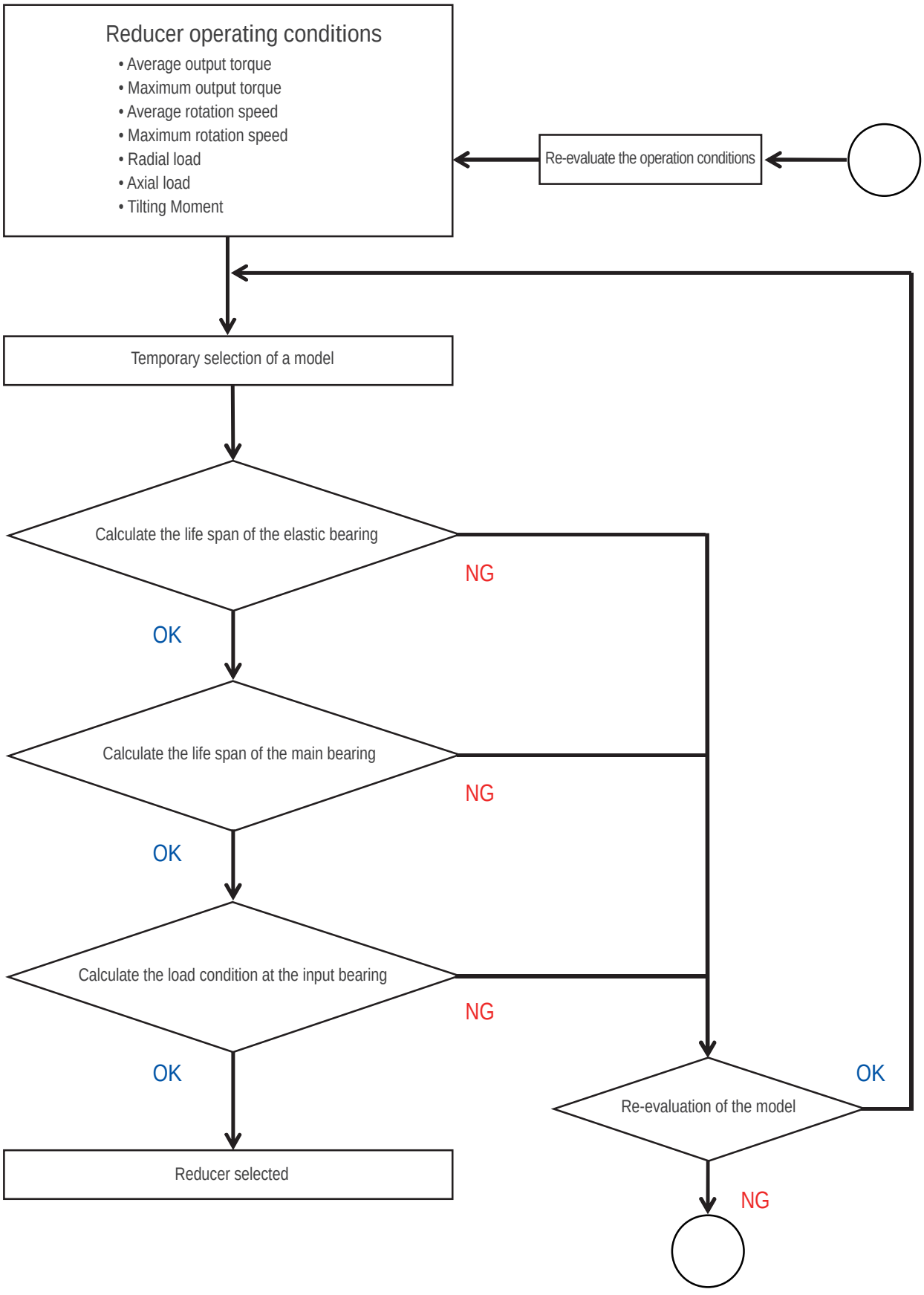
Reduction ratio = $\frac{1}{R+1}$



* The input and output rotation directions are same.

Model Selection

Model selection flow



Reducer Model Nomenclature

WP	U	—	35	—	50	—	CD
Series Name	Type		Size		Ratio		Code *
WP WP series	**C:** Component type **S:** Simple unit type **U:** Unit type Hollow unit		35 42 50 63 80		50 80 100 120		CD CDH SD SDH

* For code details, check Dimensions Table

Ratio Matrix Availability

Frame Size	Reduction Ratio			
	50	80	100	120
35				
42				
50				
63				
80				

Reducer Specifications

Size	Ratio R*1	Nominal Output Torque *2	Maximum Output Torque *3	Emergency Stop Torque *4	Nominal Input Speed *5	Maximum Input Speed *6	Life *7
		[Nm]	[Nm]	[Nm]	[r/min]	[r/min]	[hours]
35	50	3.7	12	24	3000	8500	7000
	80	5.4	16	29			
	100	5.4	19	31			
42	50	11	23	48	3000	7300	
	80	15	29	52			
	100	16	37	55			
	120	16	37	55			
50	50	17	39	69	3000	6500	
	80	24	51	75			
	100	28	57	76			
	120	28	57	76			
63	50	27	69	127	3000	5600	
	80	44	96	147			
	100	47	110	152			
	120	47	110	152			
80	50	53	151	268	3000	4800	
	80	82	212	334			
	100	96	233	359			
	120	96	233	359			

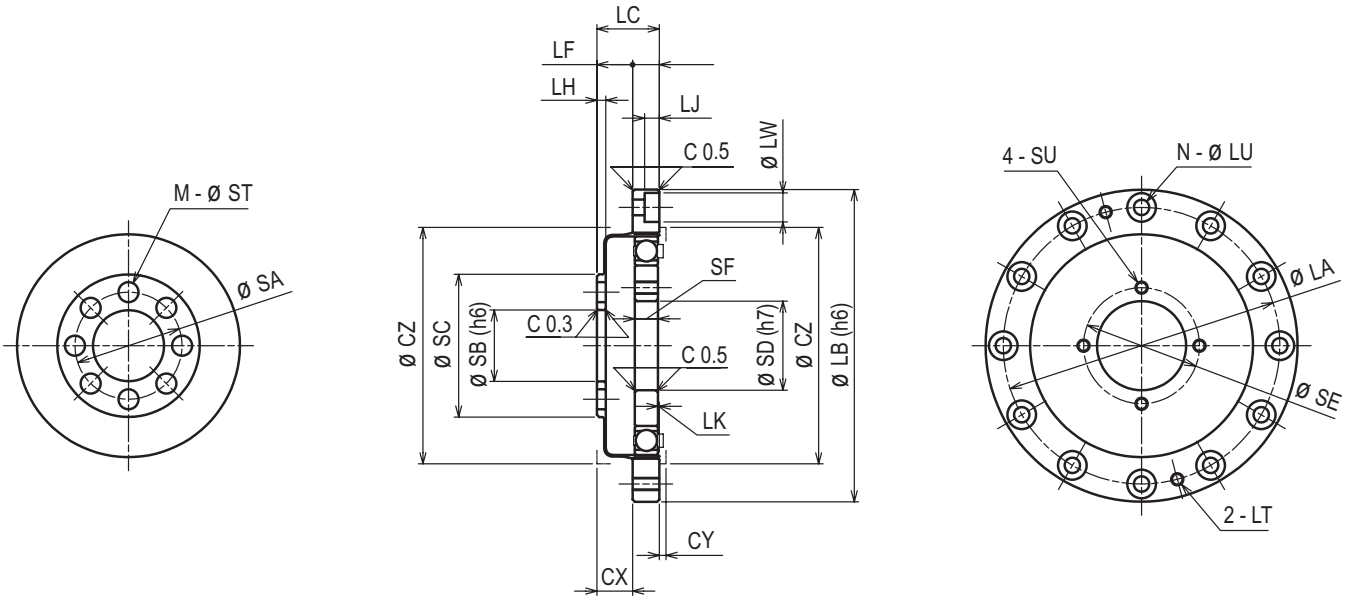
*1 Reduction ratio is to be calculated by the formula in the previous page, using R value in this table.
*2 The maximum allowable value at the input rotation speed of 2000r/min
*3 The maximum torque when starting and stopping.
*4 The maximum torque when it receives shock.
*5 The maximum average input speed.
*6 The maximum input speed.
*7 The life time at the input rotation speed of 2000 r/min and nominal output torque.

Dimensions

Closed type: Component

WPC-□-□-CD

Size	Weight	Moment of Inertia
	kg	x10^{-4}kgm^2
35	0.062	0.0226
42	0.10	0.0565
50	0.16	0.113
63	0.26	0.342
80	0.57	1.18



[mm]

Size	LA	LB	LE	LF	LG	LH	LJ	LK	N	LU	LW	LT
35	44	50	11	6.5	4.5	1.4	-	0.3	6	3.5	-	M3
42	54	60	12.5	7.5	5	1.7	-	0.3	8	3.5	-	M3
50	62	70	14	8	6	2	3.3	0.3	12	3.5	6.5	M3
63	75	85	17	10	7	2	3.3	0.4	12	3.5	6.5	M3
80	100	110	22	13	9	2.5	4.4	0.5	12	4.5	8	M4

Size	SA	SB	SC	SD	SE	SF	CX	CY	CZ	M	ST	SU
35	17	11	23.5	11	17	4	6.5	1	38	8	3.5	M3
42	19.5	11	27	15	21	5	7.5	1	45	8	4.5	M3
50	24	16	32	20	26	5.2	8	1.5	53	8	4.5	M3
63	30	20	40	24	30	6.3	10	1.5	66	8	5.5	M3
80	41	30	52	32	40	8.6	13	2	86	10	6.5	M4

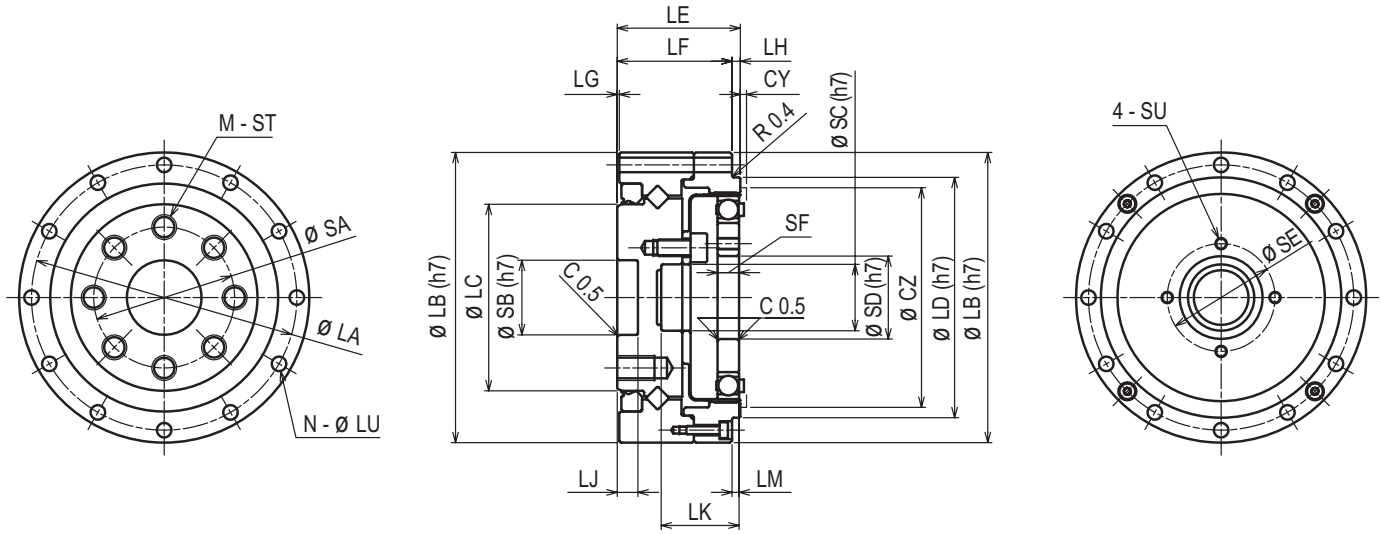
* Inner dimensions of CX, CY, CZ are recommended dimensions.

Dimensions

Closed type: Unit

WPU-□-□-CD

Size	Weight	Moment of Inertia
	kg	x10^{-4}kgm^2
35	0.33	0.0227
42	0.43	0.0565
50	0.61	0.113
63	1.1	0.343
80	2.2	1.18



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Size	LA	LB	LC	LD	LE	LF	LG	LH	LJ	LK	LM	N	LU
35	49	55	31	42.5	25	23	0.5	2	5	14.8	1.7	6	3.5
42	56	62	38	49.5	26.5	24.5	0.5	2	5	16.3	1.7	10	3.5
50	64	70	45	58	29.7	27.7	0.5	2	5	18.8	1.7	12	3.5
63	79	85	58	73	37.1	34.1	0.5	3	5.5	23.6	2.6	18	3.5
80	104	112	78	96	43	40	1	3	5.5	30.6	2.5	18	4.5

Size	SA	SB	SC	SD	SE	SF	CY	CZ	M	ST	SU
35	25	12	11	11	17	4	1	38	10	M3 × 6	M3
42	27	14	11	15	21	5	1	45	8	M5 × 8	M3
50	34	18	16	20	26	5.2	1.5	53	8	M6 × 9	M3
63	42	24	20	24	30	6.3	1.5	66	8	M8 × 12	M3
80	57	32	30	32	40	8.6	2	86	10	M8 × 12	M4

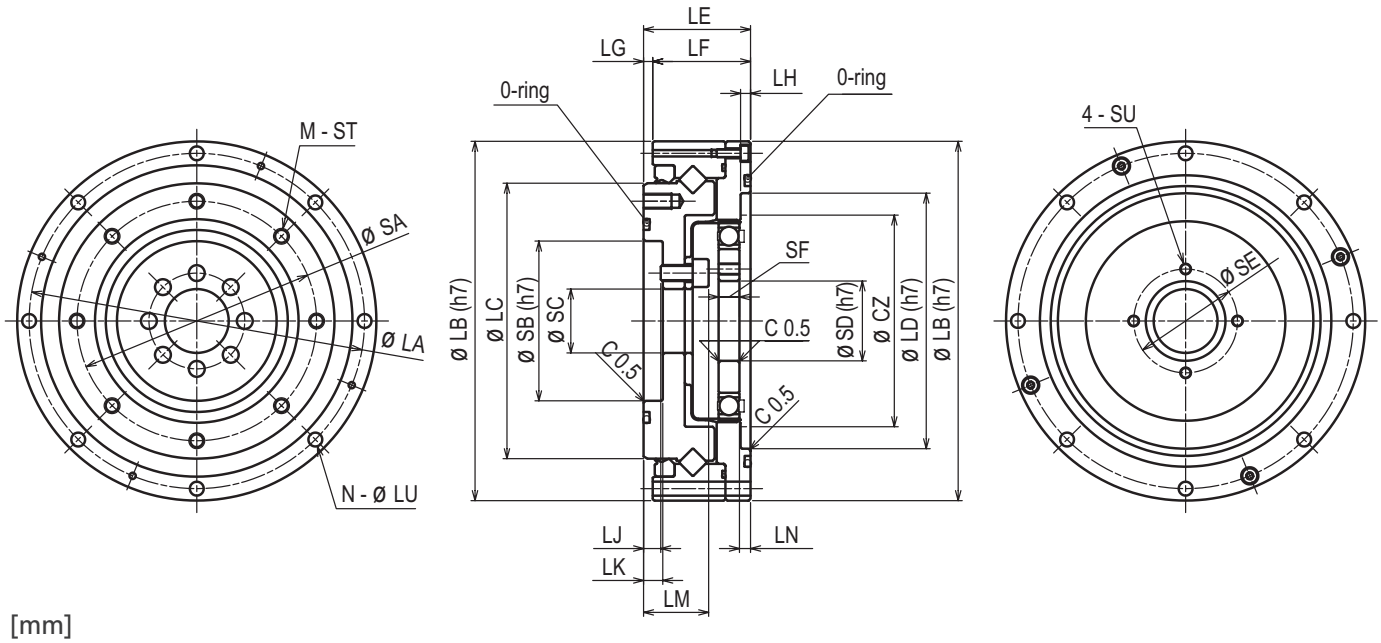
* Inner dimensions of CY, CZ are recommended dimensions.

Dimensions

Open type: Unit

WPU-□-□-CDH

Size	Weight	Moment of Inertia
	kg	x10^{-4}kgm^2
35	0.46	0.0228
42	0.63	0.0571
50	0.91	0.113
63	1.6	0.344
80	3.0	1.18



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Size	LA	LB	LC	LD	LE	LF	LG	LH	LJ	LK	LM	LN	N	LU
35	64	70	49	48	22	21.5	0.5	2.5	3.9	4.9	12.9	2.8	6	3.5
42	74	80	59	56	22.7	22.2	0.5	2.5	1.4	3.7	13.4	2.8	8	3.5
50	84	90	69	64	26.8	24.5	2.3	2.5	4.3	4.8	16.3	2.8	8	3.5
63	102	110	84	80	31.5	29.4	2.1	3	3.5	5.5	18.5	3.4	10	4.5
80	132	142	110	106	37	34.2	2.8	3	2.5	6	20.5	3.5	10	5.5

Size	SA	SB	SC	SD	SE	SF	CZ	M	ST	SU
35	42	30	11	11	17	4	38	8	M3 × 5	M3
42	50	34	11	15	21	5	45	10	M3 × 6	M3
50	60	40	16	20	26	5.2	53	8	M4 × 7	M3
63	73	52	20	24	30	6.3	66	8	M5 × 8	M3
80	96	70	30	32	40	8.6	86	8	M6 × 10	M4

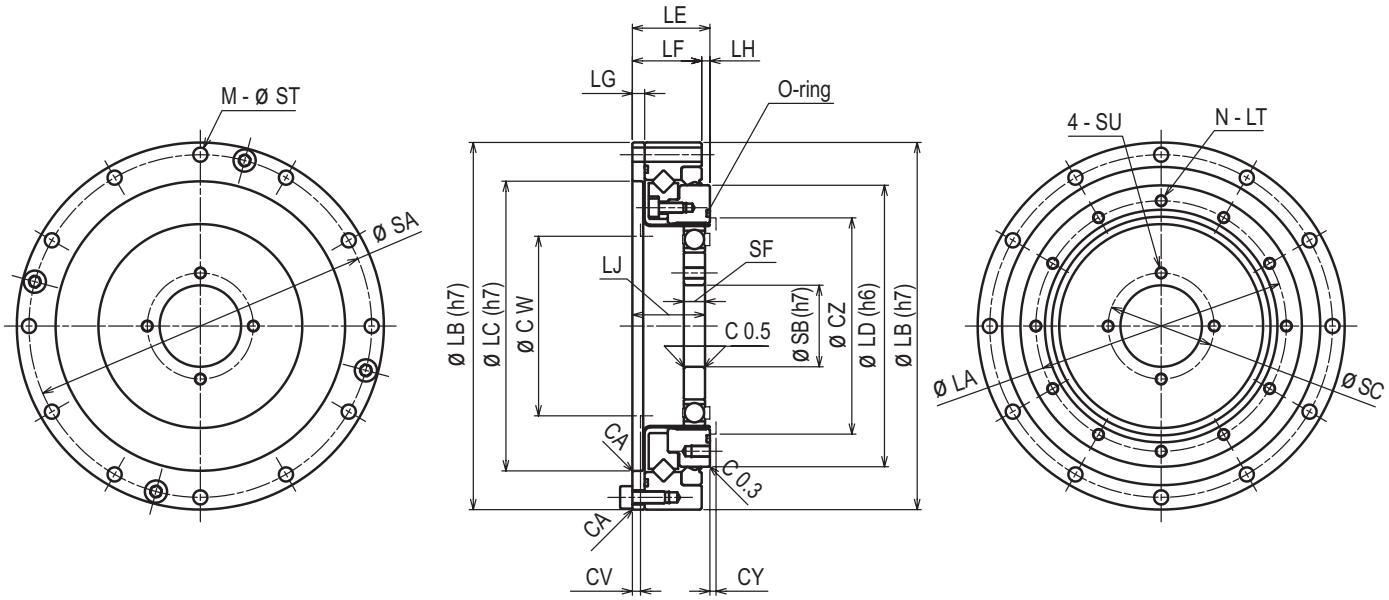
* Inner dimensions of CY, CZ are recommended dimensions.

Dimensions

Open type, Simple unit

WPS-□-□-SD

Size	Weight	Moment of Inertia
	kg	x10^{-4}kgm^2
35	0.31	0.0233
42	0.43	0.0578
50	0.54	0.114
63	93	0.347
80	2.0	1.20



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Size	LA	LB	LC	LD	LE	LF	LG	LH	LJ	N	LT
35	43	70	50	49	17.5	15.5	2.4	2	15.7	8	M3 × 4.5
42	52	80	61	59	18.5	16.5	3	2	16.9	12	M3 × 4.5
50	61.4	90	71	69	19	17	3	2	17.8	12	M3 × 4.5
63	76	110	88	84	22	20	3.3	2	21.6	12	M4 × 6
80	99	142	114	110	27.9	23.6	3.6	4.3	27.3	12	M5 × 8

Size	O-ring
35	38.0 × 0.8
42	45.0 × 0.8
50	55.0 × 1.2
63	68.0 × 1.2
80	86.0 × 1.2

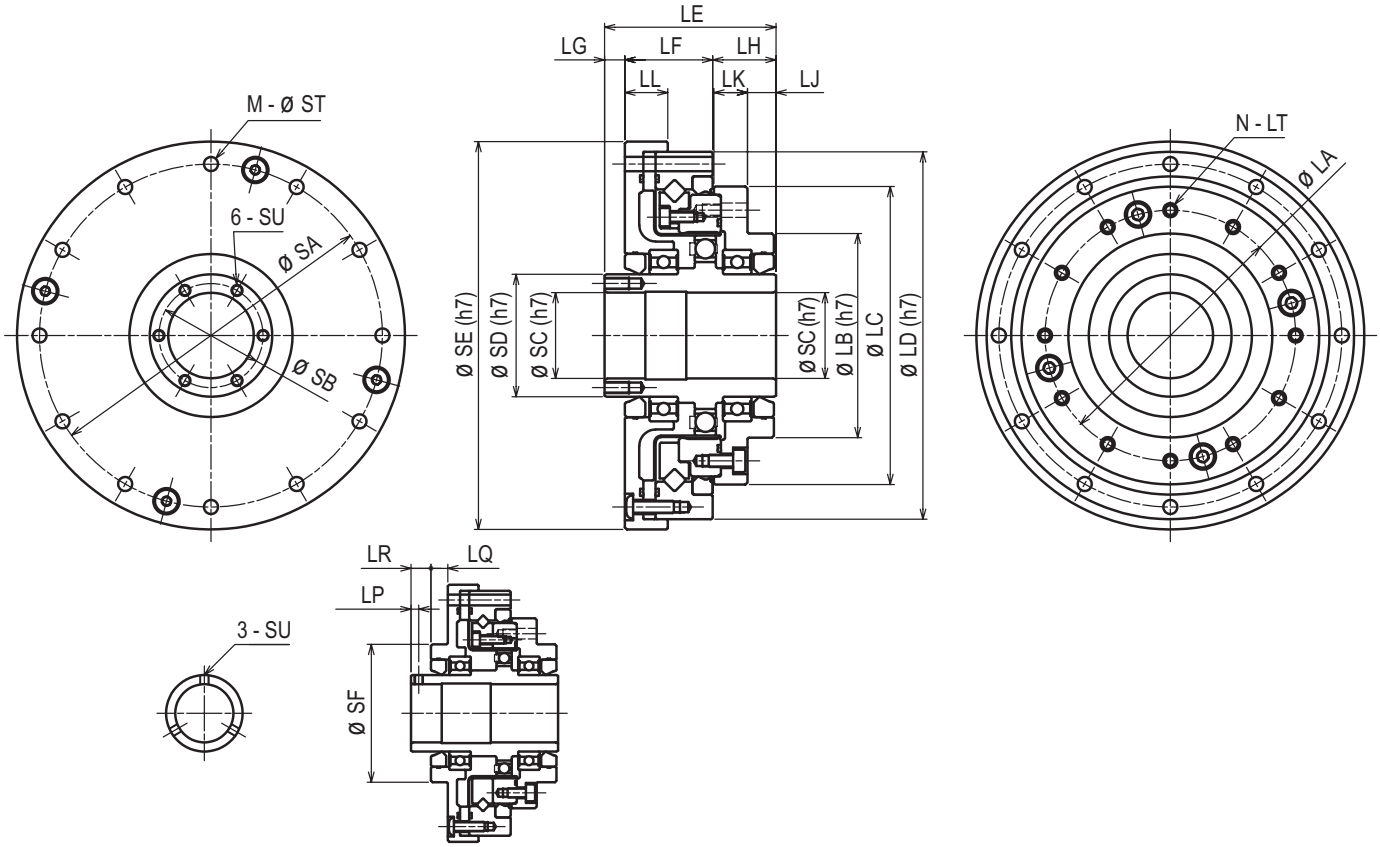
Size	SA	SB	SC	SF	CA	CY	CZ	CV	CW	M	ST	SU
35	64	11	17	4	0.3	1	36.5	1.6	31	8	3.5	M3
42	74	15	21	5	0.3	1	43.5	2	37	12	3.5	M3
50	84	20	26	5.2	0.3	1.5	53	2	44	12	3.5	M3
63	102	24	30	6.3	0.3	1.5	66	2	56	12	4.5	M3
80	132	32	40	8.6	0.5	2	84	2	72	12	5.5	M4

Dimensions

Open type, Unit (Hollow shaft)

WPU-□-□-SDH

Size	Weight	Moment of Inertia
	kg	x10^{-4}kgm^2
35	0.49	0.0839
42	0.66	0.180
50	0.84	0.352
63	1.4	0.940
80	2.8	3.47



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INPUT SHAFT FOR 35 & 42

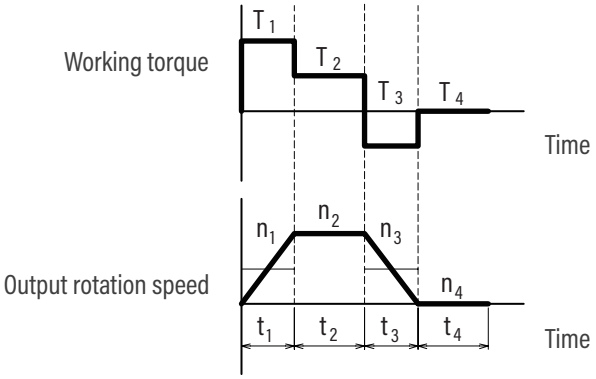
Size	LA	LB	LC	LD	LE	LF	LG	LH	LJ	LK	LL	LP	LQ	LR
35	43	36	52	70	45.5	19.5	12	14	6.5	7.5	9	2.5	5.5	6.5
42	52	45	62	80	48	20.5	12	15.5	7	8.5	10	2.5	5.5	6.5
50	61.4	50	73	90	42	21.5	5	15.5	7	8.5	10.5	-	-	-
63	76	60	87	110	46.5	24	6	16.5	6	10.5	10.5	-	-	-
80	99	75	114	142	55	28.6	7	19.4	7.5	11.9	12	-	-	-

Size	SA	SB	SC	SD	SE	SF	M	ST	SU	N	LT
35	64	-	14	20	74	36	8	3.5	M3	8	M3 × 4.5, Ø 3.5 × 5.5
42	74	-	19	25	84	45	12	3.5	M3	12	M3 × 4.5, Ø 3.5 × 6.5
50	84	25.5	21	30	95	-	12	3.5	M3 × 6	12	M3 × 4.5, Ø 3.5 × 6.5
63	102	33.5	29	38	115	-	12	4.5	M3 × 6	12	M4 × 6, Ø 4.5 × 8.5
80	132	48	41	54	147	-	12	5.5	M3 × 6	12	M5 × 8, Ø 5.5 × 7.6

Life Estimation (Elastic Bearing)

Life span for the elastic bearing

Operation Cycle Example



Calculation formula for output torque

Average output torque	**Tao**	**Nm**	$Tao = \sqrt[3]{\frac{n_1 \cdot t_1 \cdot \lvert T_1 \rvert^3 + n_2 \cdot t_2 \cdot \lvert T_2 \rvert^3 + \cdots + n_n \cdot t_n \cdot \lvert T_n \rvert^3}{n_1 \cdot t_1 + n_2 \cdot t_2 \cdots n_n \cdot t_n}}$
Peak output torque value	**Tmo**	**Nm**	Tmo = maximum value of $T_1, T_2, \cdots T_n$

Please make sure the peak output torque is below the maximum output torque in the specification table.

Calculation formula for input speed

Average output rotation speed	**nao**	**r/min**	$nao = \frac{n_1 \cdot t_1 + n_2 \cdot t_2 \cdots n_n \cdot t_n}{t_1 + t_2 + \cdots + t_n}$
Peak output rotation speed	**nmo**	**r/min**	nmo = maximum value of $n_1, n_2, \cdots n_n$
Average input speed	**nai**	**r/min**	$nai = nao \times R$ (R = ratio)
Peak input speed value	**nmi**	**r/min**	$nmi = nmo \times R$ (R = ratio)

Please make sure the peak input speed value is below the maximum input speed in the specification table.

Calculation formula for life span

Part life span for the elastic bearing	**Lhe**	**h**	$Lhe = 7000 \times \left(\frac{Tar}{Tao}\right)^3 \times \left(\frac{nar}{nai}\right)$
Rating torque	**Tar**	**Nm**	*Nominal output torque in the specification table*
Rating input rotation speed	**nar**	**r/min**	*2000 r/min*

Life Estimation (Main Bearing)

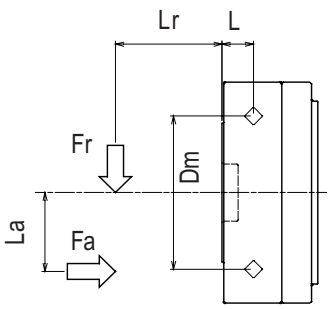
Model selection / Life estimation

Main bearing specification (Cross roller bearing)

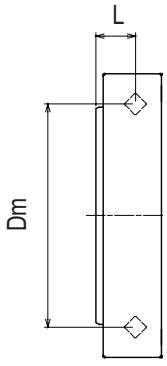
Series	Size	Pitch Circle Diameter of the Bearing Rollers	Offset	Basic Dynamic Load Rating	Basic Static Load Rating	Allowable Moment	Moment Rigidity
		Dm	L	C	Co	Mal	Km
		m	m	N	N	Nm	× 10^4 Nm/rad
WPU-□-□-CD	35	0.034	0.009	5620	6540	36.5	7.35
	42	0.041	0.010	6340	8170	55.8	8.02
	50	0.049	0.011	10400	13300	91.0	13.5
	63	0.062	0.013	15800	21100	156	27.7
	80	0.082	0.013	24400	35600	313	66.0
WPU-□-□-CDH	35	0.051	0.006	7110	10200	74.0	14.4
	42	0.060	0.007	10900	15200	124	19.7
	50	0.071	0.008	17200	24700	187	40.1
	63	0.086	0.009	25100	37400	258	71.5
	80	0.114	0.011	43300	67600	580	188
WPS-□-□-SD	35	0.051	0.011	8010	11400	37.0	8.86
	42	0.061	0.011	7370	10900	62	20.8
	50	0.072	0.011	8030	12800	93	22.5
	63	0.087	0.013	14300	24500	129	33.3
	80	0.113	0.018	23700	42500	290	84.5
WPU-□-□-SDH	35	0.051	0.017	8010	11400	37.0	8.86
	42	0.061	0.018	7370	10900	62	20.8
	50	0.072	0.018	8030	12800	93	22.5
	63	0.087	0.021	14300	24500	129	33.3
	80	0.113	0.026	23700	42500	290	84.5

External load

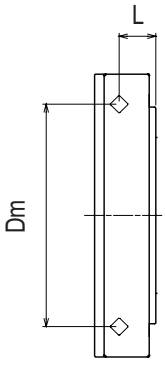
WPU-□-□-CD



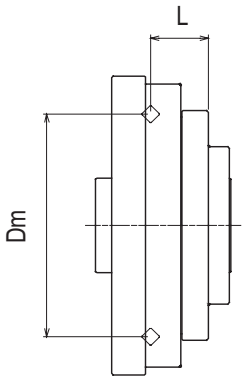
WPU-□-□-CDH



WPS-□-□-SD



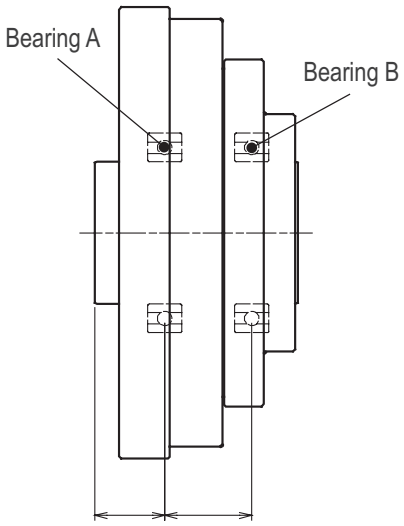
WPU-□-□-SDH



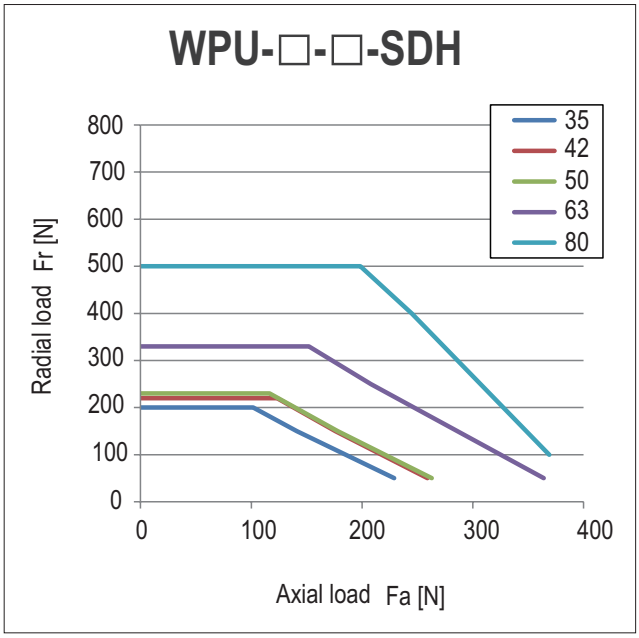
Maximum Load at Input Shaft

Bearing specification (Open type, Unit)

Series	Size	A Bearing A		B Bearing B		a	b
		Basic Dynamic Load Rating	Basic Static Load Rating	Basic Dynamic Load Rating	Basic Static Load Rating		
		C	Co	C	Co		
		N	N	N	N	mm	mm
WPU-□-□-SDH	35	4000	2470	4000	2470	16.0	20.0
	42	4300	2950	4300	2950	16.0	22.5
	50	4500	3450	4500	3450	14.5	18.0
	63	4900	4350	4900	4350	15.5	21.8
	80	8800	8500	6400	6200	17.0	28.5



Maximum load (Average input rotation speed : 2000r/min, Life span : 7000h)



Lubricant Information

Grease

Sumiplex MP No.2 (SUMICO LUBRICANT CO., LTD.)
Operating temperature range: 0~40˚C (ambient temperature)

Grease application

- The quantity of grease applied to C should be adjusted depending on the mounting direction. C of the unit type product is already filled with the same quantity of grease as horizontal mounting.
- For vertical up/down, 50% of the space between input assy and casing inner wall should be filled with grease.
- If the amount of grease is not sufficient due to case design, please contact us.

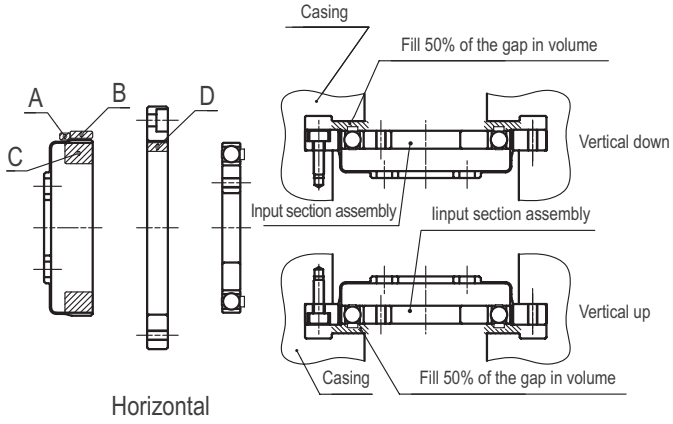
Please apply grease according to the table below.

[grams]

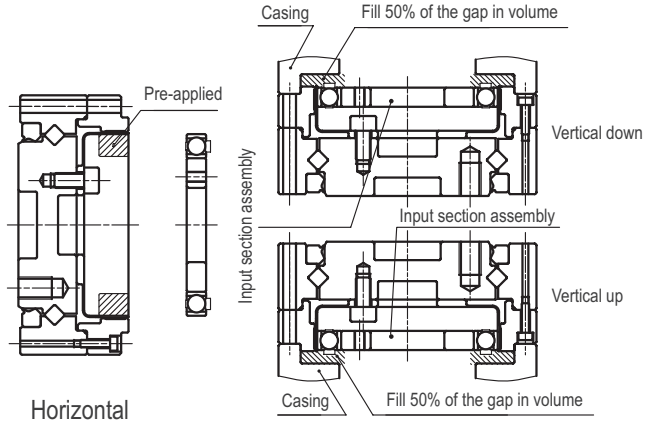
Size	Applied part					
	A	B	C Horizontal	C Vertical Up	C Vertical Down	D
35	0.2	0.2	3	4	5	0.2
42	0.3	0.3	5	6	7	0.3
50	0.4	0.4	8	9	11	0.4
63	1.8	0.8	16	19	21	0.8
80	1.5	1.5	36	42	48	1.5

Grease application location

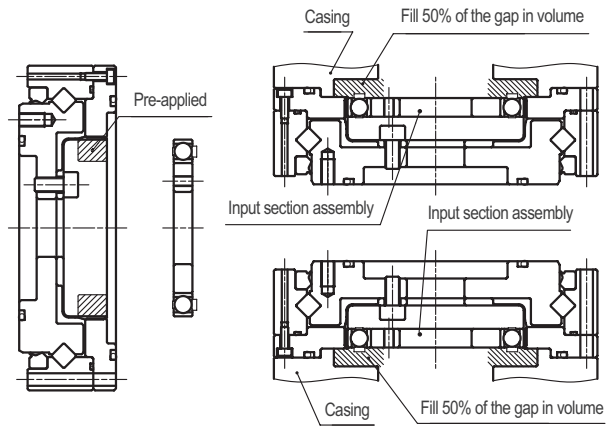
WPC-□-□-CD



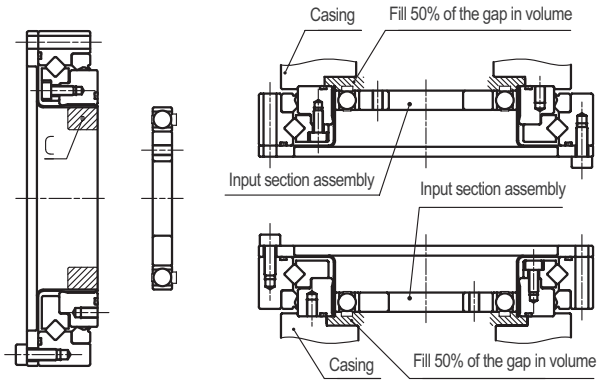
WPU-□-□-CD



WPU-□-□-CDH



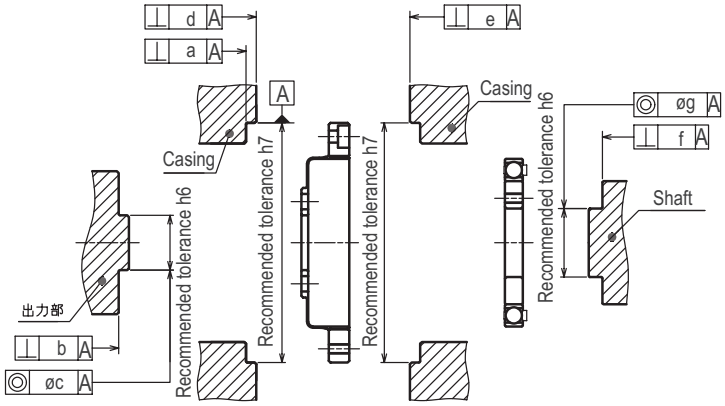
WPS-□-□-SD



Attachment Fixture Requirement

Attachment fixture requirement

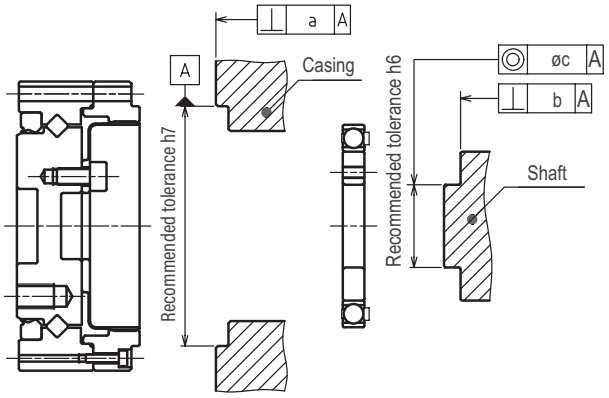
WPC-□-□-CD



Installation accuracy [mm]

Size	35	42	50	63	80
a	0.020	0.020	0.020	0.025	0.025
b	0.012	0.012	0.014	0.016	0.016
c	0.016	0.020	0.024	0.024	0.024

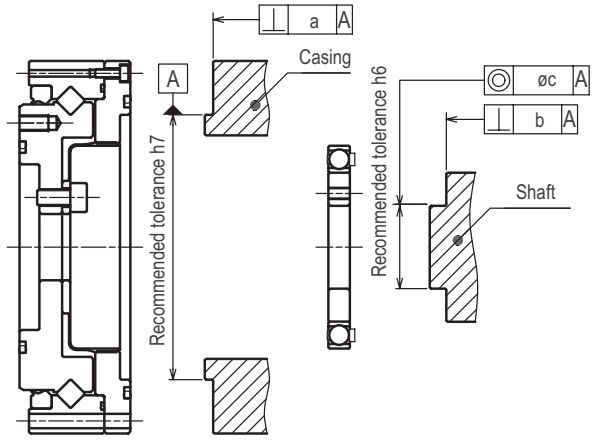
WPU-□-□-CD



Installation accuracy [mm]

Size	35	42	50	63	80
a	0.020	0.020	0.020	0.025	0.025
b	0.020	0.020	0.020	0.025	0.025
c	0.020	0.020	0.020	0.025	0.025
d	0.012	0.012	0.014	0.016	0.016
e	0.016	0.020	0.024	0.024	0.024

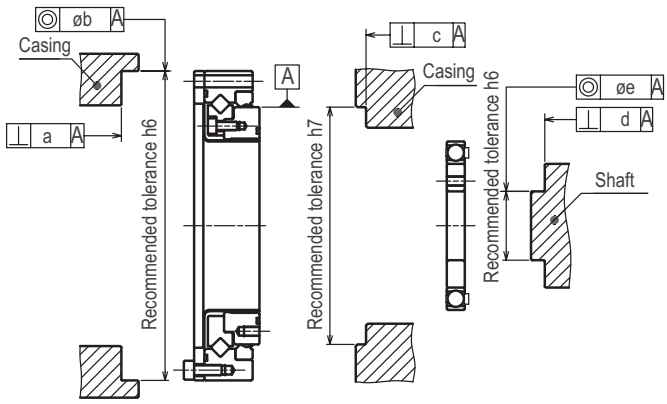
WPU-□-□-CDH



Installation accuracy [mm]

Size	35	42	50	63	80
a	0.020	0.020	0.020	0.025	0.025
b	0.012	0.012	0.014	0.016	0.016
c	0.016	0.020	0.024	0.024	0.024

WPS-□-□-SD



Installation accuracy [mm]

Size	35	42	50	63	80
a	0.020	0.020	0.020	0.025	0.025
b	0.020	0.020	0.020	0.025	0.025
c	0.020	0.020	0.020	0.025	0.025
d	0.012	0.012	0.014	0.016	0.016
e	0.016	0.020	0.024	0.024	0.024

Transmitting Torque

Bolting

Please refer to the table below for the bolt tightening torque.

Tightening torque for bolts

Bolt size	M3	M4	M5	M6	M8	M10
Tightening torque [Nm]	1.9	4.3	8.7	15	36	71

Recommended bolt: Strength rating above 12.9

Bolt specifications and transmitting torque (Closed Type, Unit)

WPU-☐-☐-CD: Output flange attachment

Size	35	42	50	63	80
Bolt size	M3	M5	M6	M8	M8
Bolt count	10	8	8	8	10
Bolt PCD [mm]	25	27	34	42	57
Tightening torque [Nm]	1.9	8.7	15	36	36
Transmitting torque [Nm]	58	141	252	566	960

WPU-☐-☐-CD: Internal gear attachment

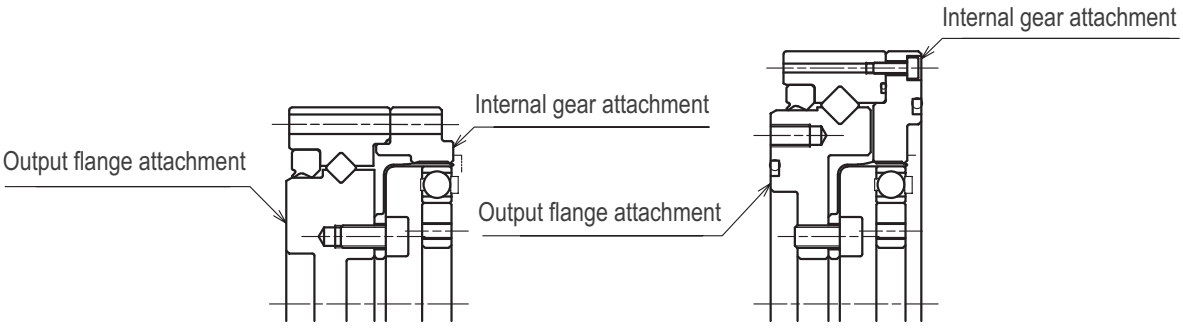
Size	35	42	50	63	80
Bolt size	M3	M3	M3	M3	M4
Bolt count	6	10	12	18	18
Bolt PCD [mm]	49	56	64	79	104
Tightening torque [Nm]	1.9	1.9	1.9	1.9	4.3
Transmitting torque [Nm]	68	130	178	330	757

WPU-☐-☐-CDH: Output fange attachment

Size	35	42	50	63	80
Bolt size	M3	M3	M3	M4	M5
Bolt count	6	8	8	10	10
Bolt PCD [mm]	64	74	84	102	132
Tightening torque [Nm]	1.9	1.9	1.9	4.3	8.7
Transmitting torque [Nm]	89	137	156	412	864

WPU-☐-☐-CDH: Internal gear attachment

Size	35	42	50	63	80
Bolt size	M3	M3	M3	M4	M5
Bolt count	6	8	8	10	10
Bolt PCD [mm]	64	74	84	102	132
Tightening torque [Nm]	1.9	1.9	1.9	4.3	8.7
Transmitting torque [Nm]	89	137	156	412	864



Transmitting Torque

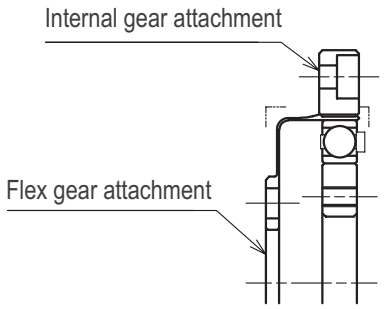
Bolt specifications and transmitting torque (Closed type, Component)

Flex gear attachment

Size	35	42	50	63	80
Bolt size	M3	M4	M4	M5	M6
Bolt count	8	8	8	8	10
Bolt PCD [mm]	17	19.5	24	30	41
Tightening torque [Nm]	1.9	4.3	4.3	8.7	15
Transmitting torque [Nm]	32	63	78	157	380

Internal gear attachment

Size	35	42	50	63	80
Bolt size	M3	M3	M3	M3	M4
Bolt count	6	8	12	12	12
Bolt PCD [mm]	44	54	62	75	100
Tightening torque [Nm]	1.9	1.9	1.9	1.9	4.3
Transmitting torque [Nm]	61	100	172	209	485



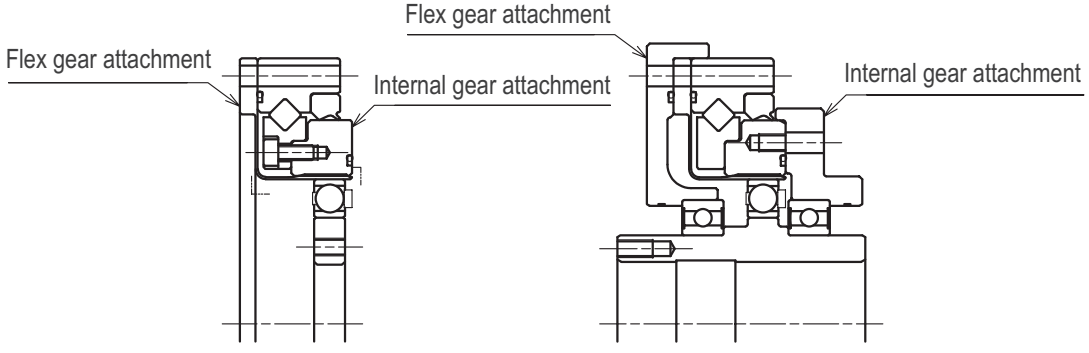
Bolt specifications and transmitting torque (Open type)

Flex gear attachment

Size	35	42	50	63	80
Bolt size	M3	M3	M3	M4	M5
Bolt count	8	12	12	12	12
Bolt PCD [mm]	64	74	84	102	132
Tightening torque [Nm]	1.9	1.9	1.9	4.3	8.7
Transmitting torque [Nm]	119	206	234	495	1037

Internal gear attachment

Size	35	42	50	63	80
Bolt size	M3	M3	M3	M4	M5
Bolt count	8	12	12	12	12
Bolt PCD [mm]	43	52	61.4	76	99
Tightening torque [Nm]	1.9	1.9	1.9	4.3	8.7
Transmitting torque [Nm]	80	145	171	369	778



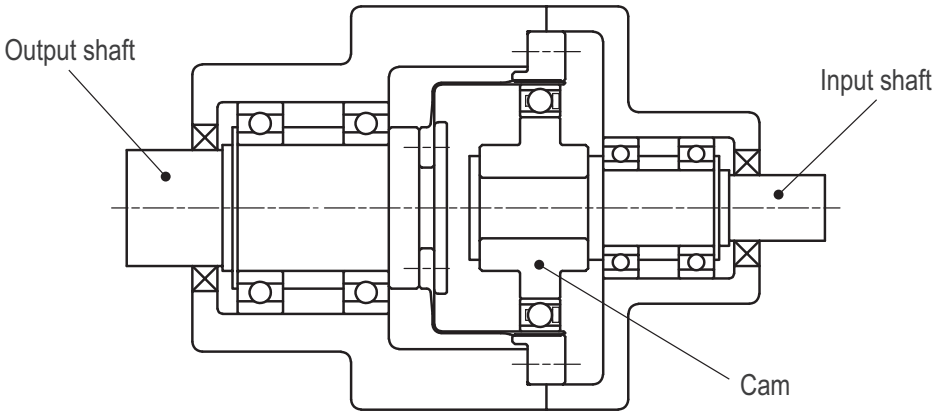
Installation and Assembly Instructions

WPC-□-□-C □

Shaft installation instruction

Please design the support structure for input shaft and output shaft so that both radial and axial loads are supported. (Diagram below shows an example)

Inside thrust load has an effect on the cam. Secure cam from possible axial movement.



Warm-up run

After assembly, "Warm-up run" is necessary before run with load / torque. The purpose is to coat the Flex gear and Internal gear surface evenly with enough grease in order to meet the load / torque performance.

Condition example

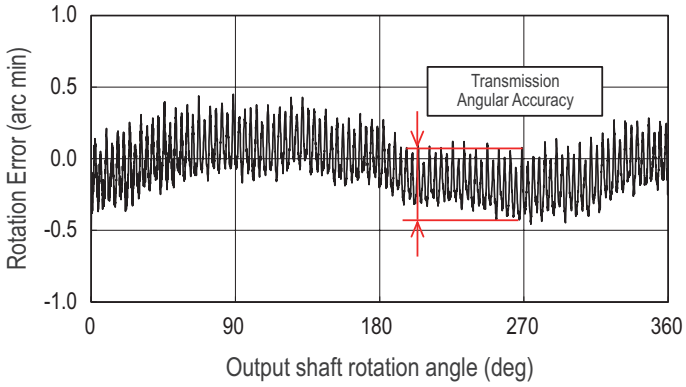
- Load - No load
- Input rotation speed - Start slowly from 1,000r/min or less, then accelerate up to 3,000r/min
- Test time - About 1 hour
- Output rotation angle - As large as possible

Characteristics Data

Transmission angular accuracy

What is Transmission Angular Accuracy?

It is the difference between the measured output rotation angle and the theoretical angle, while input shaft is rotated with no load.



[arc min]

Ratio	Size				
	35	42	50	63	80
50	2.0	2.0	1.5	1.0	1.0
80	1.5	1.5	1.0	1.0	1.0
100	1.5	1.5	1.0	1.0	1.0
120	-	1.5	1.0	1.0	1.0

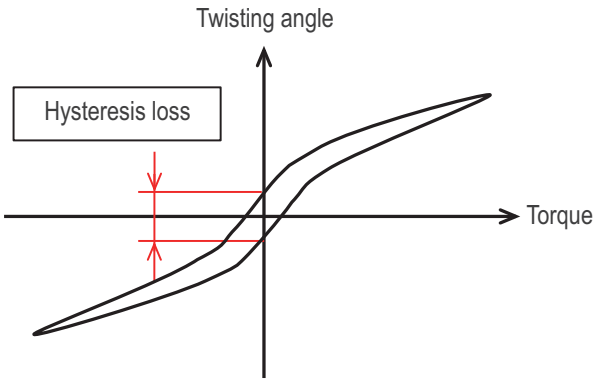
Table values are reference values.

Hysteresis loss

What is Hysteresis Loss?

When torque load is applied at the output shaft in alternate direction repeatedly with input shaft fixed, there is residual twisting angle when torque is back to zero.

In this context, hysteresis loss is the difference in the forward and backward twisting angle



[arc min]

Ratio	Size				
	35	42	50	63	80
50	2.0	2.0	2.0	2.0	2.0
80	1.5	1.5	1.0	1.0	1.0
100	1.5	1.5	1.0	1.0	1.0
120	-	1.5	1.0	1.0	1.0

Table values are reference values.

Characteristics Data

Maximum backlash

What is Maximum Backlash?

In this context, maximum backlash is the output backlash for spline type input shaft. (Backlash is zero for rigid type input, because gear engagement backlash is zero.)

[arc min]

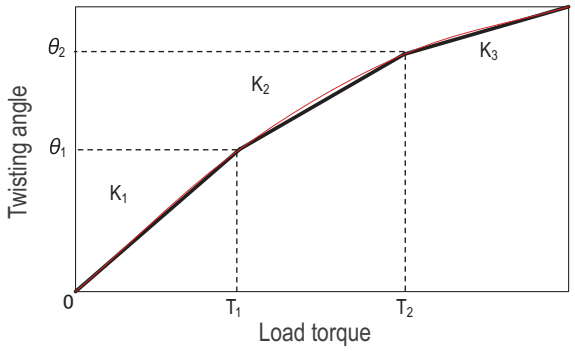
Ratio	Size				
	35	42	50	63	80
50	27	27	18	16	16
80	17	17	11	10	10
100	13	13	9	8	8
120	-	11	7	7	7

Stiffness (Closed type, Unit)

What is Stiffness?

In this context, stiffness is the output shaft twisting angle and the spring coefficient, while torque load is applied to the output shaft with input side fixed.

K1... Spring coefficient at 0 ~ T_1 torque
K2... Spring coefficient at T_1 ~ T_2 torque
K3... Spring coefficient at T_2 ~ torque



Ratio	Item	Unit	Size				
			35	42	50	63	80
-	T_1	Nm	2	3.9	7	14	29
-	T_2	Nm	6.9	12	25	48	108
50	K_1	× 10^4Nm/rad	0.39	0.66	1.1	2.2	4.6
	K_2	× 10^4Nm/rad	0.47	0.75	1.4	2.6	5.1
	K_3	× 10^4Nm/rad	0.52	0.82	1.4	2.7	5.6
	θ_1	arcmin	1.7	2.0	2.2	2.2	2.2
	θ_2	arcmin	5.0	5.5	6.3	6.4	7.2
80 100 120	K_1	× 10^4Nm/rad	0.44	0.86	1.6	2.9	6.2
	K_2	× 10^4Nm/rad	0.60	1.0	1.9	3.2	6.5
	K_3	× 10^4Nm/rad	0.72	1.0	1.9	3.1	6.5
	θ_1	arcmin	1.6	1.6	1.5	1.7	1.6
	θ_2	arcmin	4.0	4.1	4.6	5.2	5.7

Average value shown in the table.

Characteristics Data

Starting torque (Closed type, Unit)

What is Starting Torque?

Input torque needed for input side to start rotating (no load, ambient temperature: 25˚C).

[cNm]

Ratio	Size				
	35	42	50	63	80
50	7.0	11	14	17	26
80	6.8	9.5	13	24	26
100	6.4	9.4	11	14	20
120	-	8.1	9.3	14	20

*1 For reference only. Torque value may vary depending on the condition.

*2 Charts does not show effects due to rotation resistance of bearings and oil seals on the input side.

Output starting torque (Closed type, Unit)

What is Output Starting Torque?

Output torque needed for output side to start rotating (no load, ambient temperature: 25°C)

[Nm]

Ratio	Size				
	35	42	50	63	80
50	1.2	3.6	4.4	5.8	13
80	1.6	3.9	7.2	13	26
100	1.7	5.7	8.6	9.4	23
120	-	4.2	8.1	10	30

*1 For reference only. Torque value may vary depending on the condition.

*2 Charts does not show effects due to rotation resistance of bearings and oil seals on the input side.

No-load running torque (Closed type, Unit)

What is No-load Running Torque?

Input torque needed to keep it running with no load (average value, ambient temperature: 25˚C)

[cNm]

Ratio	Input Rotation Speed	Size				
		35	42	50	63	80
50	500r/min	3.4	7.5	9.2	17	35
	1000r/min	4.3	8.2	11	18	37
	2000r/min	5.0	8.5	13	18	39
	3500r/min	5.4	11	14	22	38
80	500r/min	3.2	7.6	10	20	35
	1000r/min	4.0	8.7	12	21	38
	2000r/min	4.8	8.9	14	22	39
	3500r/min	5.2	11	14	24	38
100	500r/min	3.2	7.1	11	21	36
	1000r/min	4.0	8.2	13	23	39
	2000r/min	4.7	8.4	14	24	39
	3500r/min	5.1	9.7	14	25	38
120	500r/min	-	6.7	9.8	23	40
	1000r/min	-	8.1	12	24	41
	2000r/min	-	8.4	13	26	41
	3500r/min	-	8.4	13	26	39

*1 For reference only. Torque value may vary depending on the condition.

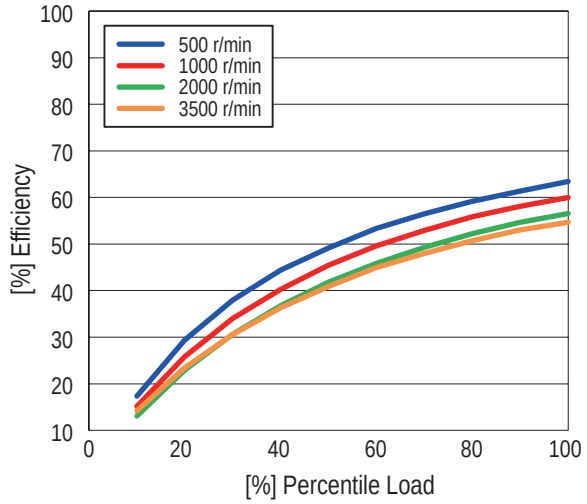
*2 Charts does not show effects due to rotation resistance of bearings and oil seals on the input side.

Characteristics Data

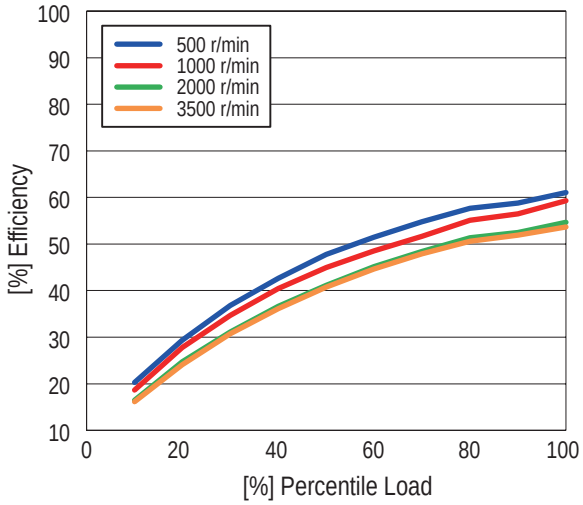
Efficiency (Closed type, Unit)

- Percentile load (%) is equal to load torque divided by allowable average torque.
- Ambient temperature: 25°C

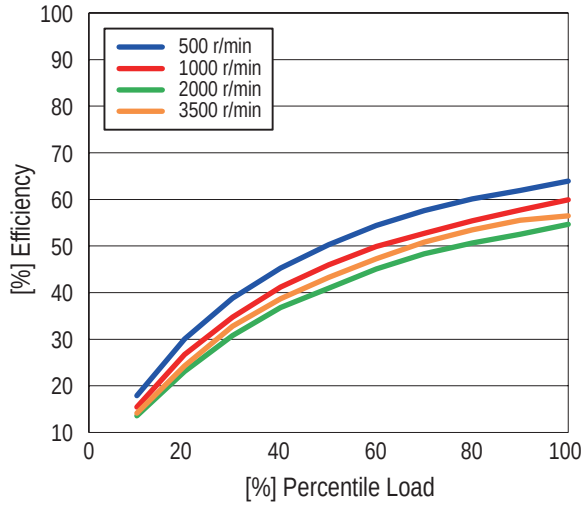
WPU-35-50



WPU-35-80



WPU-35-100



*1 These diagrams represent the average value of the actual measurement.

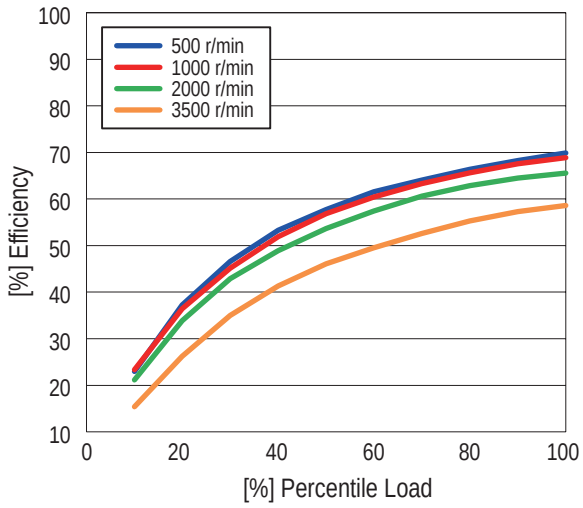
*2 Charts does not show effects due to rotation resistance of bearings and oil seals on the input side.

Characteristics Data

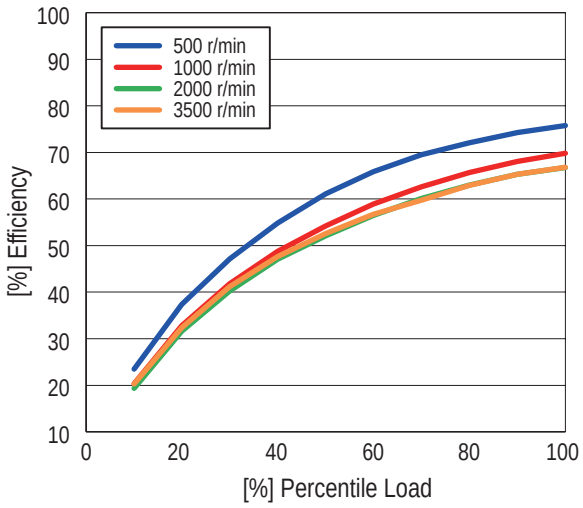
Efficiency (Closed type, Unit)

- Percentile load (%) is equal to load torque divided by allowable average torque.
- Ambient temperature: 25°C

WPU-42-50



WPU-42-80



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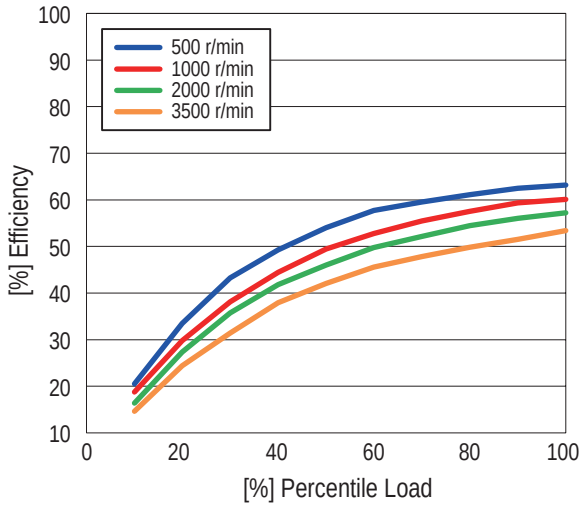
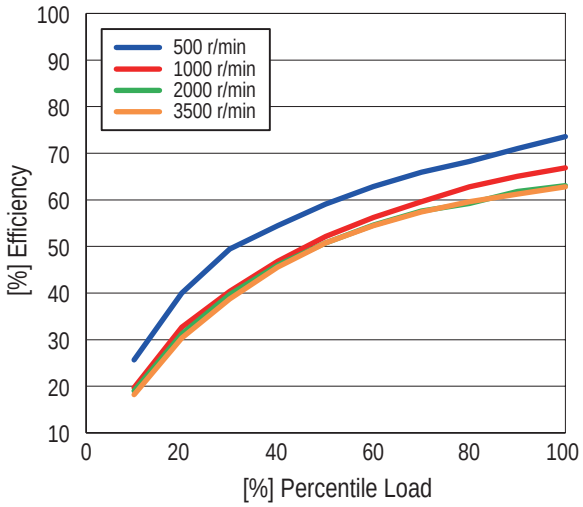


WPU-42-120



*1 These diagrams represent the average value of the actual measurement.

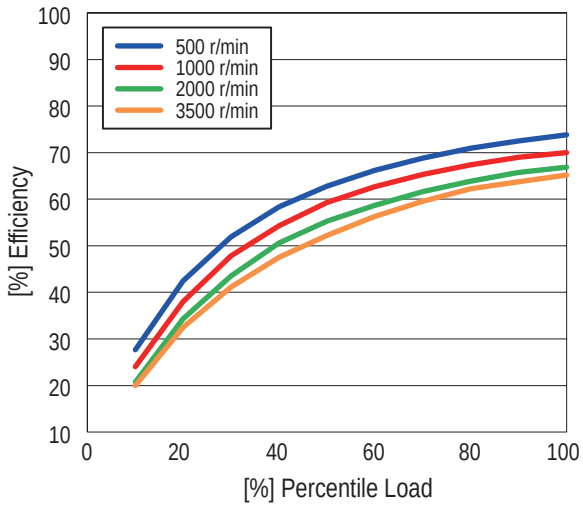
*2 Charts does not show effects due to rotation resistance of bearings and oil seals on the input side.

Characteristics Data

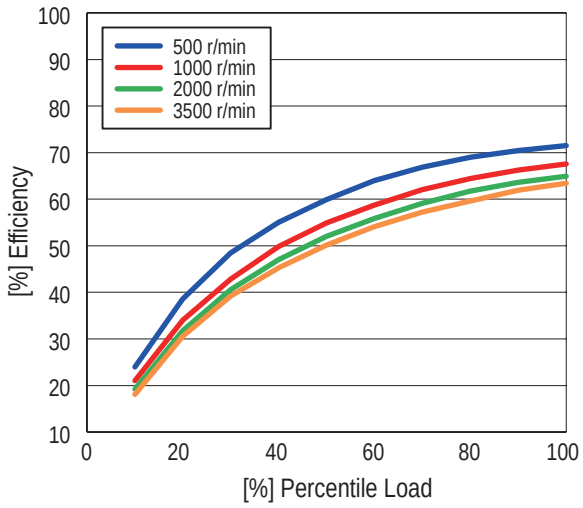
Efficiency (Closed type, Unit)

- Percentile load (%) is equal to load torque divided by allowable average torque.
- Ambient temperature: 25°C

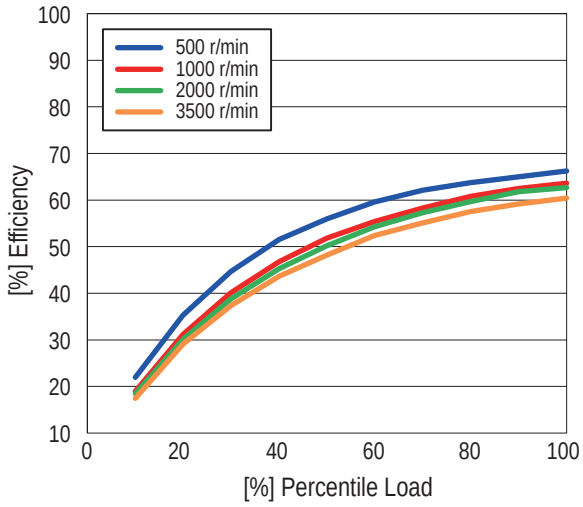
WPU-50-50



WPU-50-80



WPU-50-100



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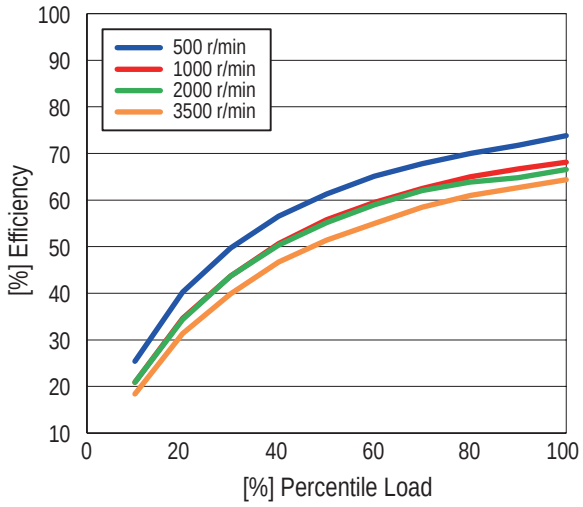


*1 These diagrams represent the average value of the actual measurement.

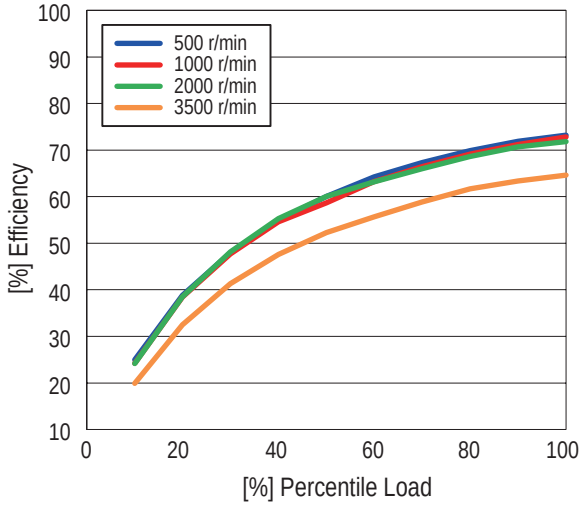
*2 Charts does not show effects due to rotation resistance of bearings and oil seals on the input side.

Characteristics Data

Efficiency (Closed type, Unit)

- Percentile load (%) is equal to load torque divided by allowable average torque.
- Ambient temperature: 25°C

WPU-63-50



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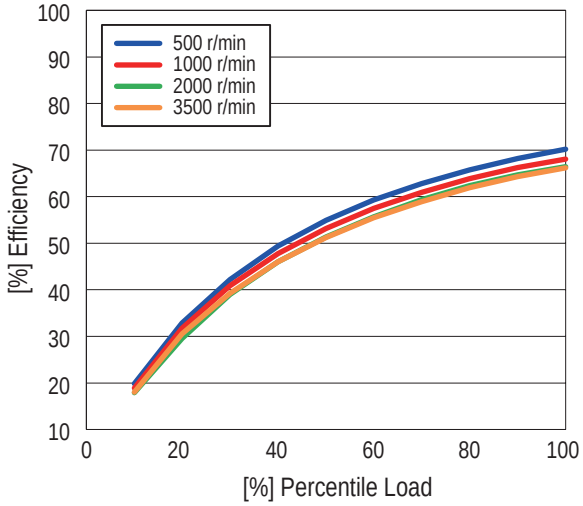

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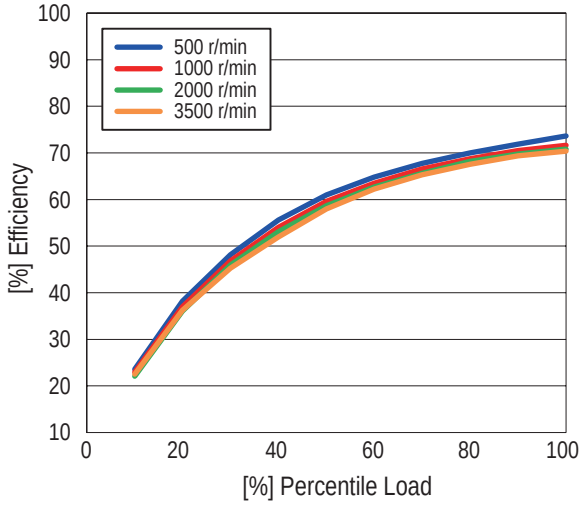

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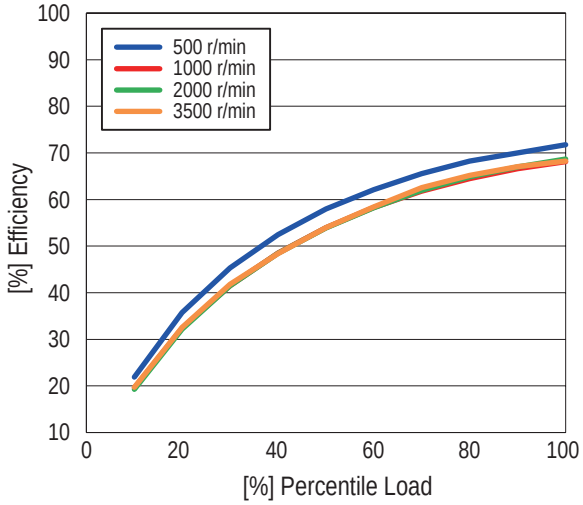


*1 These diagrams represent the average value of the actual measurement.

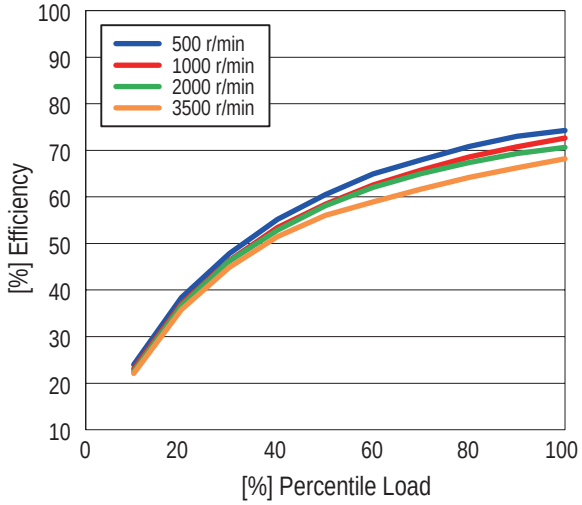
*2 Charts does not show effects due to rotation resistance of bearings and oil seals on the input side.

Characteristics Data

Efficiency (Closed type, Unit)

- Percentile load (%) is equal to load torque divided by allowable average torque.
- Ambient temperature: 25°C

WPU-80-50



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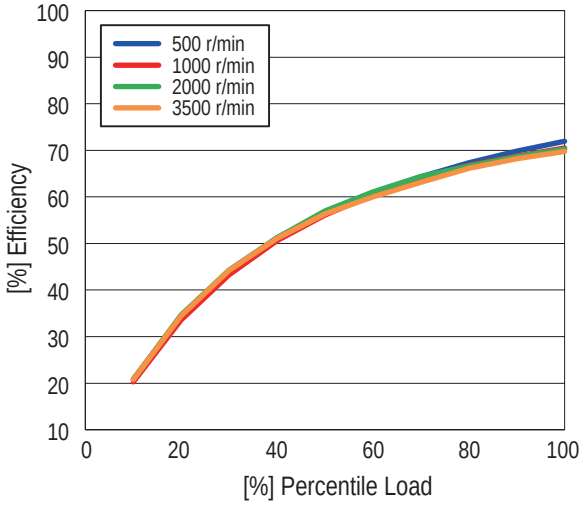

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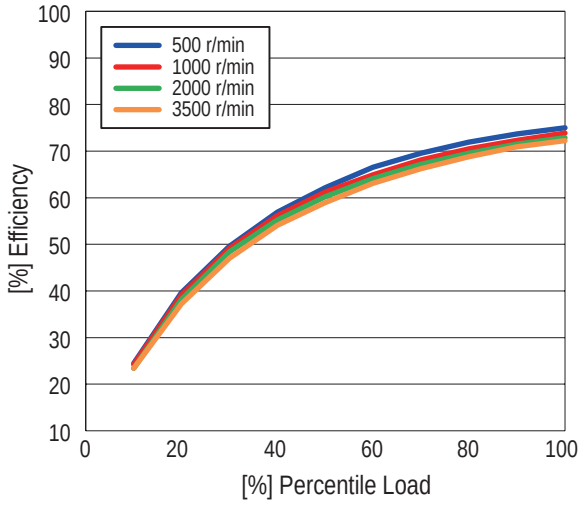

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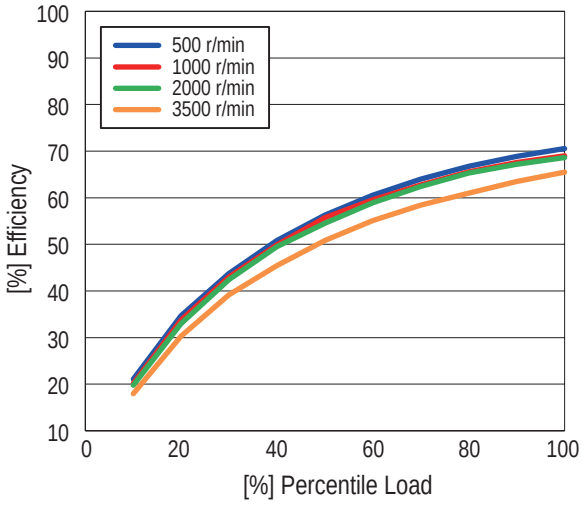


*1 These diagrams represent the average value of the actual measurement.

*2 Charts does not show effects due to rotation resistance of bearings and oil seals on the input side.

Customer Service and Support

Distinction in Service and Support

Nidec Drive Technology Corporation has invested heavily in building a global customer service and application support network that will meet the evolving needs of our customers. By leveraging our global infrastructure, our OEM customers maintain their competitiveness and profitability at home while able to expand into emerging markets abroad without any drop-off of service and support.

Nidec DTC pledges that we will continue to expand our service and support network footprint globally, and continuously strive for perfection as a dependable partner to our customers. In this section you will learn about our service and support capabilities that we will leverage in order to provide you peace of mind.

Online and Phone Support

Resolve your technical issues quickly and accurately, without disrupting your business. When you do business with Nidec Drive Technology, your company and your customers have immediate access to our global network of support centers and resources. Whether you need help designing, installing, and maintaining equipment or diagnosing an operating issue, Nidec DTC will deliver the tools and information that you need in order to insure that your equipment is running to perfection.

Contact your local sales office for immediate support either over the phone or in the field. All customer accounts in North America have a dedicated Technical Support Engineer, knowledgeable about your business, on-standby ready to support you and your customers. If you do not know who to contact, please call our 1-800 number in order to get properly directed to the right person for help.

For online support, please visit our website in order to download any drawings, instruction manuals, or technical performance specifications that you require. All catalogs and brochures are easily downloadable on the website. If you prefer to inquire about an issue or for more information, please do not hesitate to submit your request online or email us at the address listed below.

Training Services

Investing our time in you, so together we build better, more competitive product for your customer. As the industrial world becomes increasingly competitive, new technologies are introduced every year requiring manufacturers to constantly rationalize and update existing designs. As a result, successful manufacturers realize the absolute need for product training.

Nidec DTC has a network of engineers that are factory trained and authorized to provide your workforce solid training on our products and basic power transmission concepts. The main objective of our standard program and materials is to better empower your workforce to size and select gearboxes for any motion control applications. We provide this service at no cost to our customers, because we see the value in building a more knowledgeable customer and helping them more quickly react to equipment design revisions when needed.

Other manufacturers are not as forthcoming with sharing information with their customers, an attempt to hide their higher manufacturing costs or to use unreleased performance data as a "product differentiator". Nidec DTC views their customers as long term partners and trains and shares information freely based on that vision.

Training classes can be conducted online, at any of our sales branches or offices, or at key distributor branches when requested. Nidec DTC can also bring the training session to your facility in order to make better use of your time and costs. A thorough hands-on training seminar can be provided at our North American headquarters in Glendale Heights, where customers can get the opportunity to completely assemble and test our products.

The Nidec DTC training program options provide support for any budget. Our training programs improve your employees' skill and knowledge competencies in the areas of power transmission and motion control while addressing any location, time, travel and productivity constraints. Contact your local sales office today in order to get a product refresher on your calendar.

Nidec Drive Technology Hotline:

Toll-free: (800) 842-1479
Email: info@nidec-dtc.com

Selection Tool Configurator

Nidec Drive Technology's Online Product Configurator makes it easier than ever for engineers to incorporate our products into their drive system design. Our configurator allows our customers to select from wide range of servo motor manufacturer models to ensure flawless fitment with our products. With over 75 motor manufacturers included, there is a good possibility we have a solution ready to go.

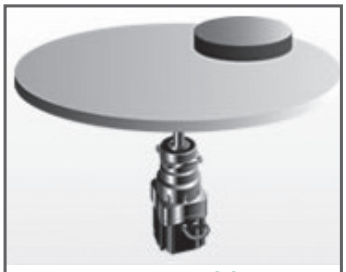
In addition to motor sizing, our configurator also allows our customers to select gearheads based on application. These applications include rotary tables, belt conveyors, rack and pinion drives, lifting and lowering devices, ball screws, drive gears, drive carriages and robot joints. After selecting the application template, customers can then input the application load parameters and motion profile. The proper frame size and reduction ratio are then determined, with motor selection as the final last step.

Once sizing is complete, our configurator will then display the full part number, along with gearbox and motor technical specifications. This part number includes the motor mounting adapter, which can be sent directly to our sales support team for pricing & delivery.

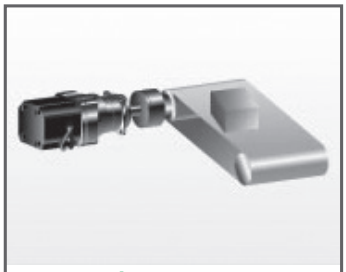
Drawings and models are also available in PDF, DXF, IGS and STEP formats, making it simple for machine designers to quickly drop them into machine schematics to check for proper fitment. We have seasoned application engineers standing by to assist with any sizing or selection questions.

https://www.nidec-drivetechnology.co.jp/selection/all/

Application Selection



Rotary Table

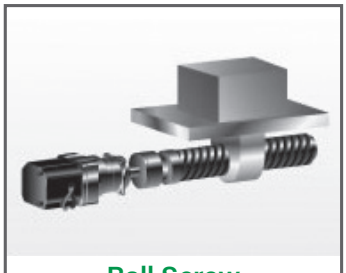


Belt Conveyor

Rack and Pinion

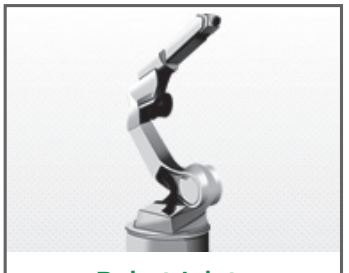
Lifting & Lowering Device

Drive Carriage



Ball Screw

Drive Gears



Robot Joints

www.nidec-dtc.com

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