

Nabtesco

Nabtesco Corporation

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RV®

Precision Reduction Gears Product Guide

Nabtesco
more accurate, more powerful

Always There, Supporting Your Life

with our unique motion control technology

Nabtesco's products and technologies are used in everyday goods as well as a range of transport equipment, industrial robots, construction machinery, new energy devices, and other types of equipment that both support our society and drive it forward.

We deliver these products and technologies based on our "moving it, stopping it." technology, which helps to move and stop objects in a precise and flexible manner. You might not see us, but we are always somewhere there in the background, supporting your life in a myriad of ways with this technology.

Nabtesco makes a significant contribution to society with its world-class, leading-edge technologies and high-quality products.



History

As an Honorable Company (*Shinise*)
Established in the 21st Century

Established in 1944



Established in 1925

Established in 2003



2004

Teijin Seiki and NABCO formed business alliance in the Hydraulic Equipment Business and concluded a basic agreement on business integration.

Nabtesco Corporation was established. Listed on the first section of the Tokyo Stock Exchange.

Nabtesco consolidated Teijin Seiki and NABCO and became an operating holding company.

Nabtesco Corporation was established by two companies with a long history, Teijin Seiki Co., Ltd. and NABCO, Ltd., which together founded a holding company in 2003 to give birth to Nabtesco.

The two companies decided to merge to become one firm based on the belief that the integration of their products, core technologies, corporate strategies, and corporate cultures would help them increase their corporate value and achieve long-term growth.

Over the course of the 10-plus years since the integration, Nabtesco has been steadily expanding its business into a broader range of fields based on its motion control technology. Meanwhile, the manufacturing DNA of the two founding firms has been passed down from generation to generation to be incorporated into the highly reliable Nabtesco brand.

Nabtesco Network

(Precision Reduction Gear Business)

Germany
Düsseldorf

India
Bangalore

China
Shanghai

Japan
Tokyo
Nagoya
Osaka

USA
Michigan

Precision Reduction Gear RV™

Supporting Several Global Frontier Industries

Nabtesco Precision reduction gears have long been used in the joints of industrial robots to support their accurate and powerful motion. Nabtesco's stellar track record in this field covers more than 30 years. Nowadays, Nabtesco's precision reduction gear is used in many fields in addition to industrial robots, including machine tools, FPD production machines, semi-conductor production machines, etc., due to its high accuracy, high rigidity and compactness.

What is Precision Reduction Gear RV™?

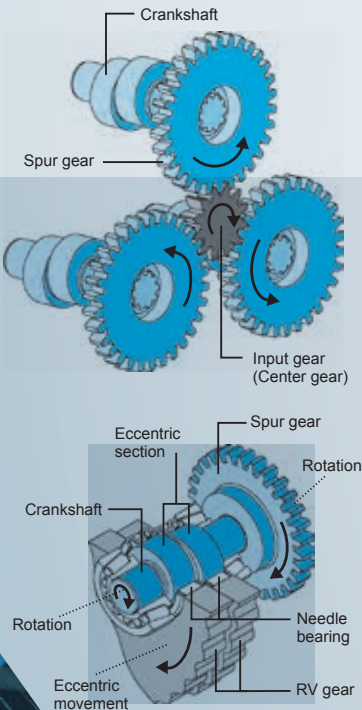
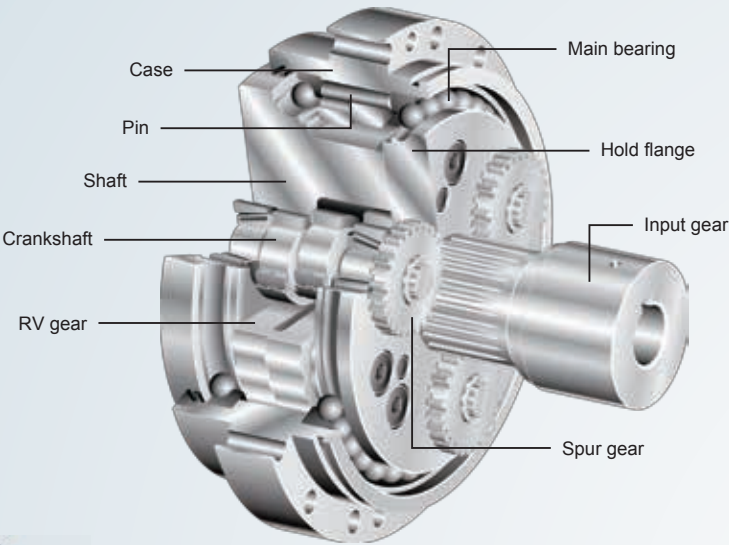
Precision reduction gear RV™ is a reduction gear for precise motion control which uses a planocentric reduction gear mechanism. This reduction gear design has advantages in rigidity and resistance against overload with a compact body due to a large number of simultaneously engaged gear teeth. Furthermore, minimal backlash, rotational vibration and low inertia lead to rapid acceleration, smooth motion and accurate positioning.

- High accuracy (backlash & lost motion : Less than 1 arc.min.)
- High rigidity
- High shock load resistance
- High torque density (High torque & Compact body)
- Wide range of reduction ratios
- Minimal vibration

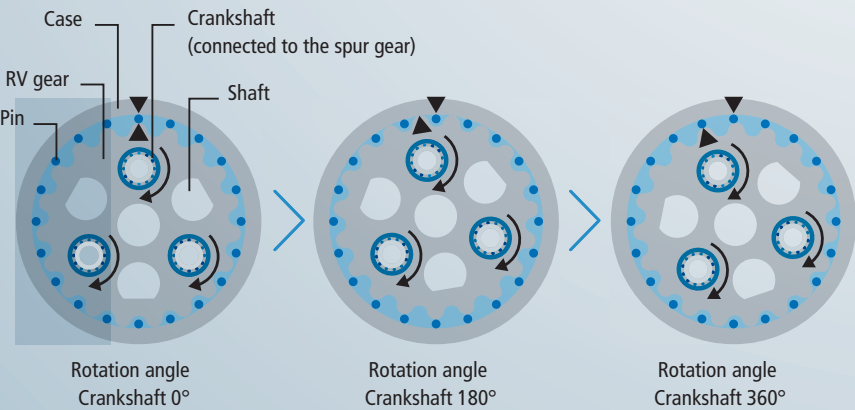


Precision Reduction Gear RV™

Operating Principle



1. Rotation of the servomotor is transmitted through the input gear to the spur gears, and the speed is reduced according to the gear ratio between the input gear and the spur gears.
2. The crankshafts rotate at the same speed, as they are directly connected to the spur gears.
3. Two RV gears are mounted on crankshafts with needle bearings.
4. When the crankshafts rotate, the RV gears rotate eccentrically.
5. The pins are arrayed in grooves inside the case. The number of pins is one more than the number of teeth on the RV gear.
6. When the crankshafts make one complete rotation, the RV gear teeth rotate one step in the opposite direction.
7. The rotation is transmitted to the output shaft via the crankshafts. The rotation speed of the crankshafts is reduced according to the number of pins.
8. The total speed ratio is a product of the speed ratio of the 1st and 2nd stage reduction.

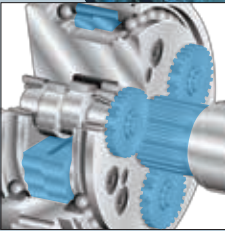


Structure and Features

2-Stage Reduction Structure

Speed reduction by 1st stage (spur gears) & 2nd stage (pin & gear)

FEATURES & ADVANTAGES	BENEFITS
Changeable speed ratio Wide range of speed ratios with the same outer diameter (low speed ratio—high speed ratio)	▶ More compact machine High speed ratio enables smaller servomotor
Low speed rotation of the inner components (the RV gear) Minimal vibration	▶ Enhanced machine accuracy, Reduced heat build-up
Small input part (input gear) Low inertia	▶ Smaller servomotor needed



Pin & Gear Structure

The arrayed pins on the inner side of the case & the RV gears

FEATURES & ADVANTAGES	BENEFITS
The large number of simultaneous engagement of pins & teeth of the RV gears Minimal backlash & lost motion (≤ 1 arc.min.) High shock load resistance (withstands 5 x rated torque)	▶ Enhanced machine accuracy Enhanced machine durability

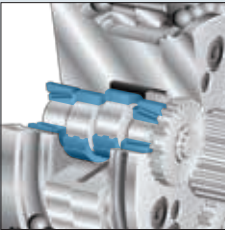
*Excluding some models



Rolling Contact Structure

Roller bearings

FEATURES & ADVANTAGES	BENEFITS
Low friction Excellent start efficiency Minimal backlash & lost motion (≤ 1 arc.min.)	▶ Energy saving (smaller servomotor) Enhanced machine accuracy
Low wear Low material degradation	▶ Easy maintenance (no backlash adjustment)



Integrated Outer Load Support Bearings Structure

Original angular ball bearings

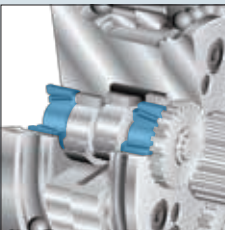
FEATURES & ADVANTAGES	BENEFITS
Large load capacity (no need for additional support structures) e.g. RS-900A Allowable thrust load : 88,200 N Allowable moment : 44,100 Nm	▶ Reduced assembly man-hours



Two-sided Support Structure

Crankshafts supported by the shaft & the hold flange

FEATURES & ADVANTAGES	BENEFITS
High resistance against force High torsional rigidity Minimal vibration High shock load resistance (withstands 5 x rated torque)	▶ Enhanced machine accuracy Enhanced machine durability





Product Lineup of Precision Reduction Gear RV™

Precision Reduction Gear RV™ technology is used in all our products. Nabtesco has released several series according to the needs of our customers.



Gear



Adapter



Lubricant



Motor

COMPONENT SETS



Gear



RV-N/E

■ 58–14,700 Nm
■ 31–203.52

- Solid shaft
- Backlash 1 arc.min.



RF-P

■ 190–320 Nm
■ 31–56

- Solid shaft
- Backlash 2 arc.min.
- High speed



RV-C/CA

■ 98–11,760 Nm

- Hollow shaft
- Backlash 1 arc.min.



RV Original

■ 137–5,390 Nm
■ 57–192.4

- Solid shaft
- Backlash 1 arc.min.
- No support bearing

GEARHEADS



Gear



Adapter



Lubricant



RD2 RD_-E

■ 58–3,136 Nm
■ 31–185

- Solid shaft
- Backlash 1–2 arc.min.
- 3 input options (straight, right angle, pulley)



RS

■ 2,548–8,820 Nm
■ 120–240

- Hollow shaft
- Backlash 1 arc.min.
- Right angle input
- Table type



GH

■ 69–980 Nm
■ 10.74–31.43

- Solid shaft
- Backlash 6 arc.min.
- High speed



NT

■ 1,470–2,156 Nm
■ 60

- Hollow shaft
- Backlash 1 arc.min.
- Facial runout ≤ 8μm
- For machine tools



RD2 RD_-C

■ 98–3,136 Nm
■ 81–258

- Hollow shaft
- Backlash 1–1.5 arc.min.
- 3 input options (straight, right angle, pulley)



RH

■ 1,470–3,136 Nm
■ 78.3–152

- Hollow shaft
- Backlash 1 arc.min.
- With base flange



RA

■ 167–1,568 Nm
■ 80–171

- Solid shaft
- Backlash 1 arc.min.
- For machine tools

SERVO ACTUATORS



Gear



Adapter



Lubricant



Motor



AF-N

■ 82–3,856 Nm
■ 81–252.33

- Solid shaft
- Backlash 1 arc.min.
- With servomotor



AF-C

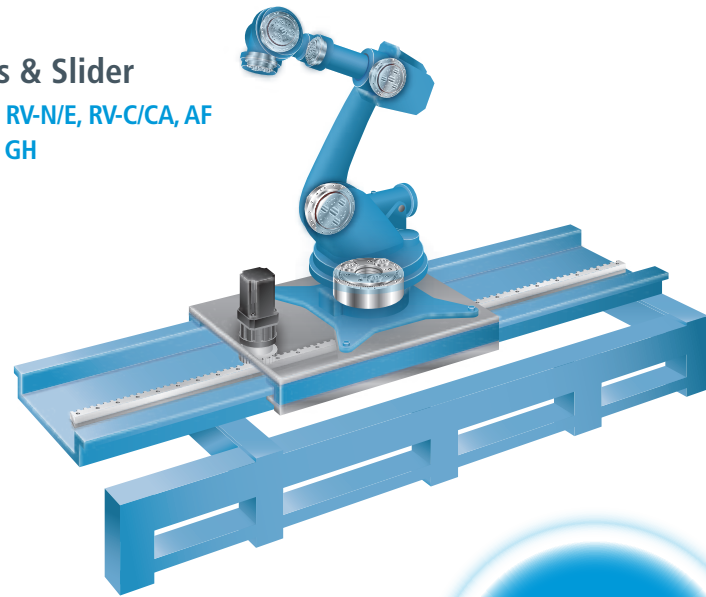
■ 460–3,002 Nm
■ 120.47–157

- Hollow shaft
- Backlash 1 arc.min.
- With servomotor

■ Rated torque ■ speed ratio

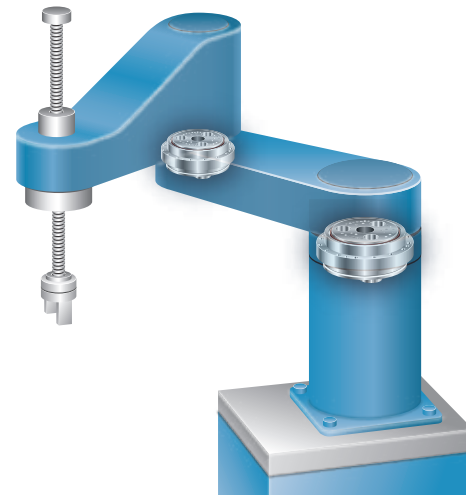
6-axis & Slider

6-axis : RV-N/E, RV-C/CA, AF
Slider : GH



SCARA

RV-N/E, RV-C, AF



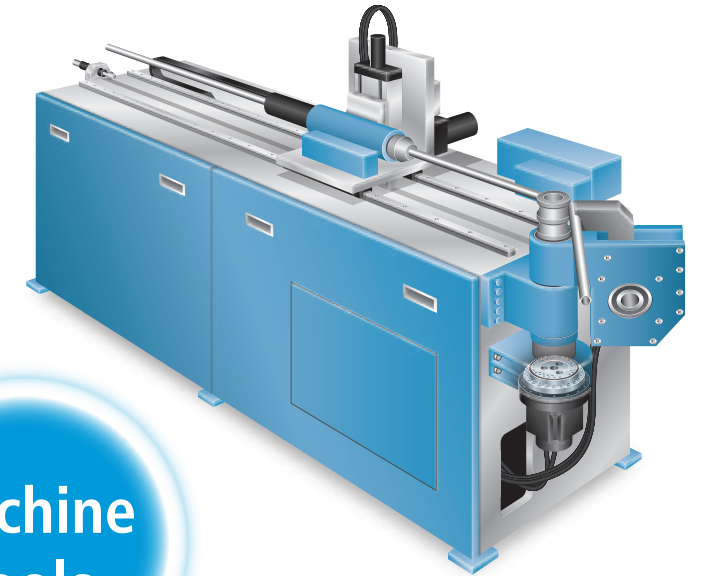
5-axis MC

NT



Pipe Bending

RD2, AF



Machine Tools

Auto Tool Changer

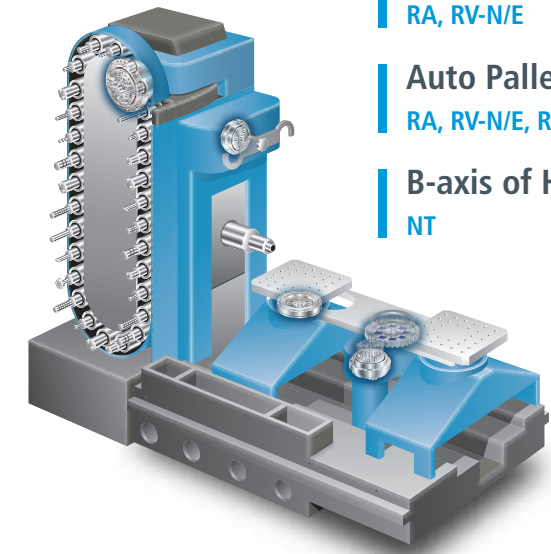
RA, RV-N/E

Auto Pallet Changer

RA, RV-N/E, RV-C

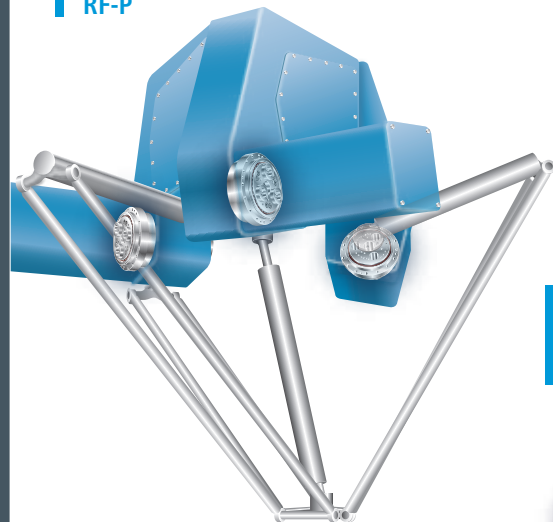
B-axis of HMC

NT



Delta

RF-P



Robot

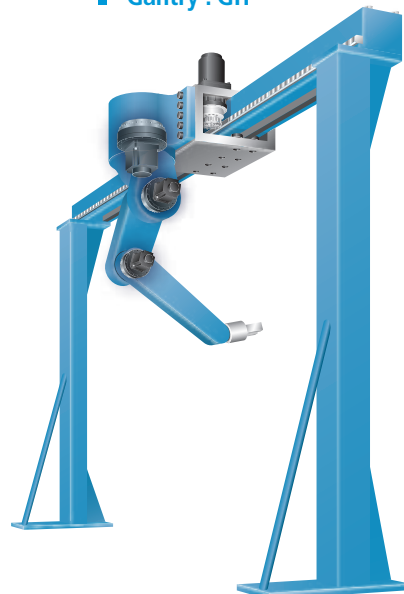
Pick & Place

RD2, AF



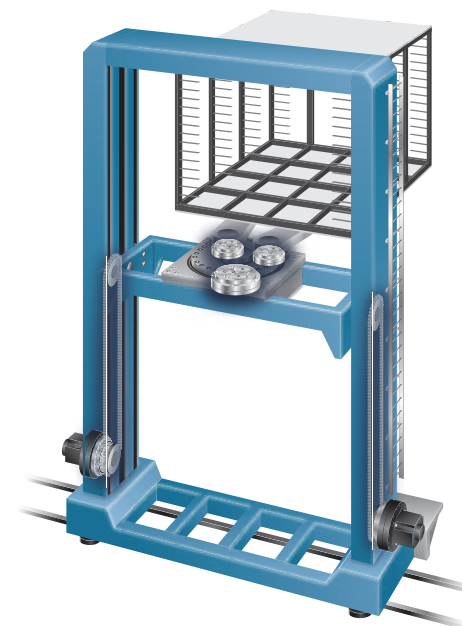
6-axis & Gantry

6-axis : RV-N/E, RV-C, AF
Gantry : GH



Stacker

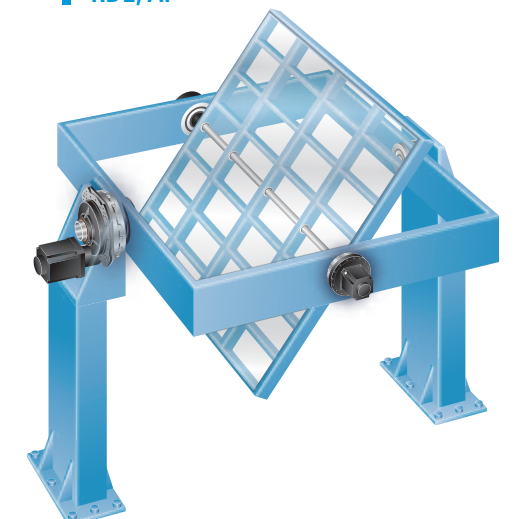
RV original, RD2, AF



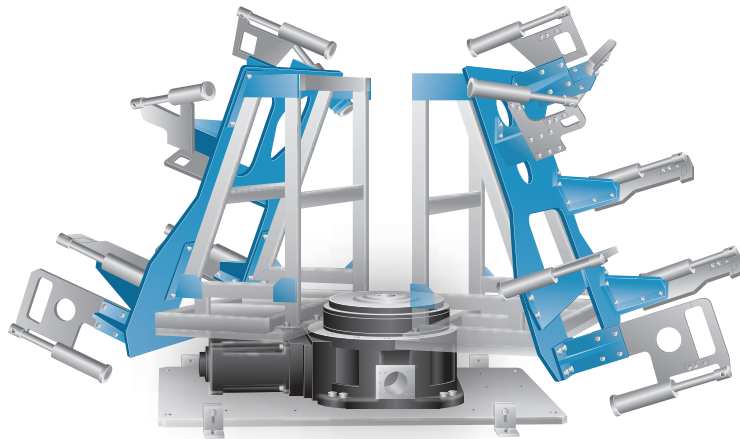
FPD

Inspection Equipment

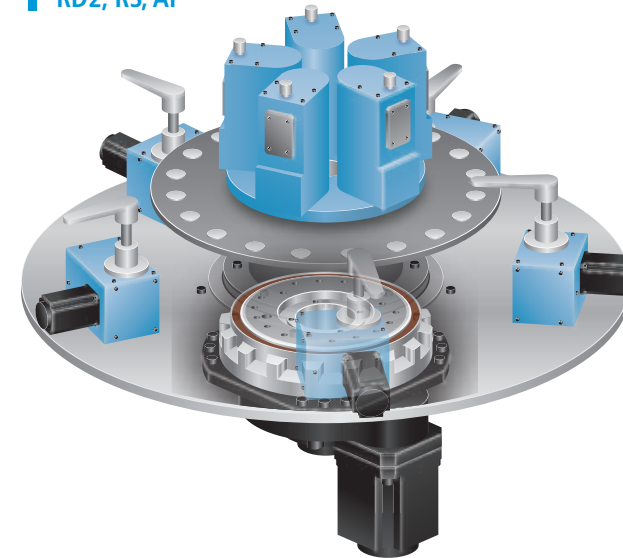
RD2, AF



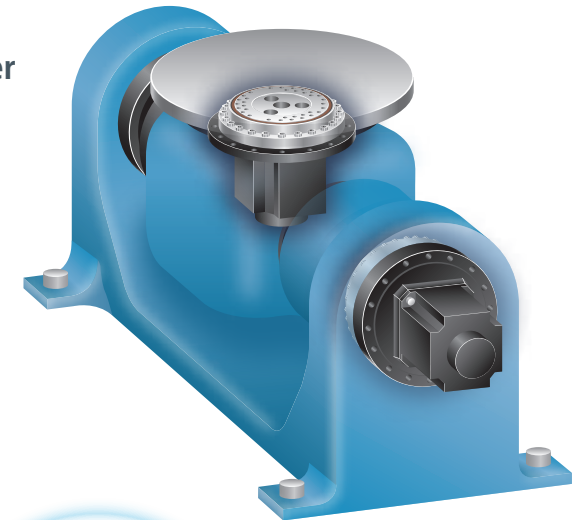
Turn Table
RD2, RS, AF



Indexer
RD2, RS, AF

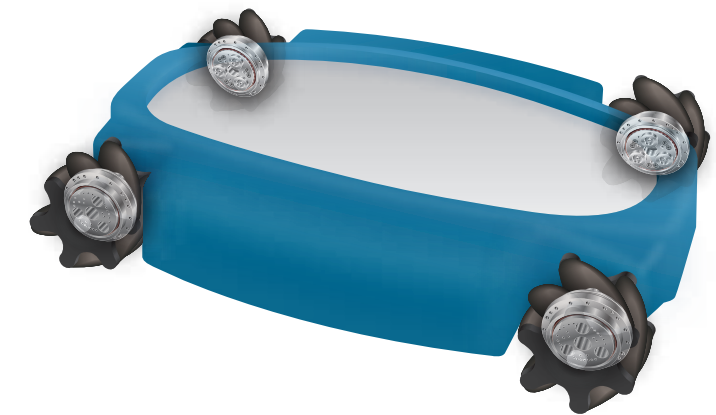


2-axis Positioner
RD2, AF

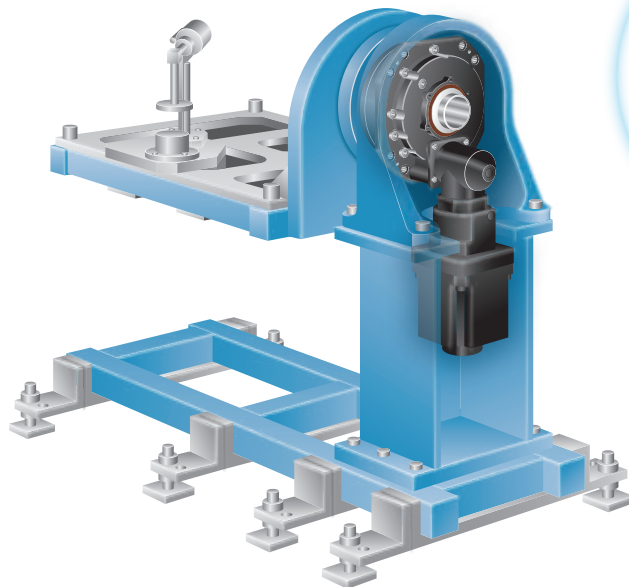


FA

AGV
RF-P

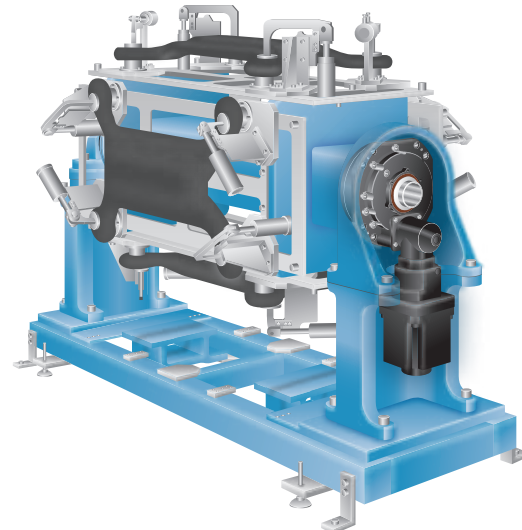


Positioner
RD2, AF



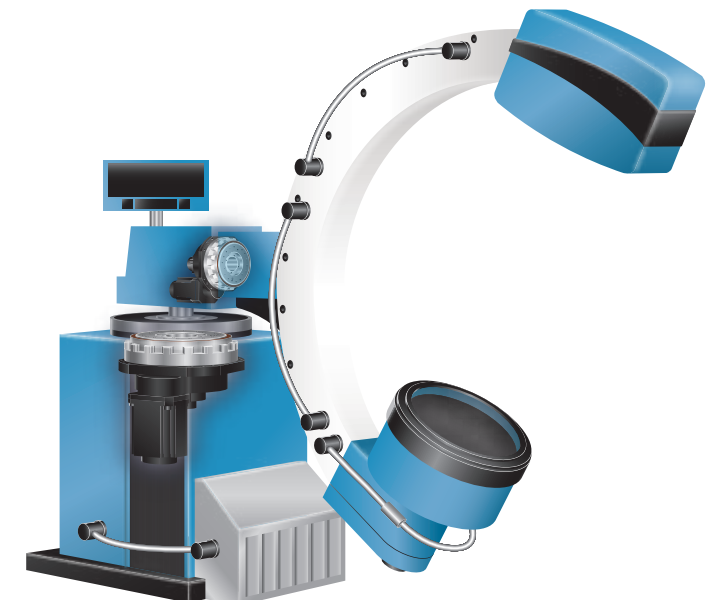
Welding

Positioner
RD2, AF



Medical

CT Scanner
RD2, AF



COMPONENT SETS



Gear

RV-N/E
series



RV-C/CA
series



RF-P
series



RV Original
series



RV-N/E

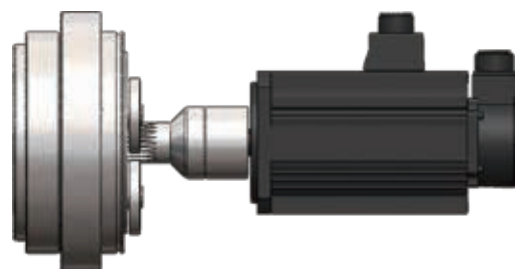
Basic Solid Shaft Model

FEATURES

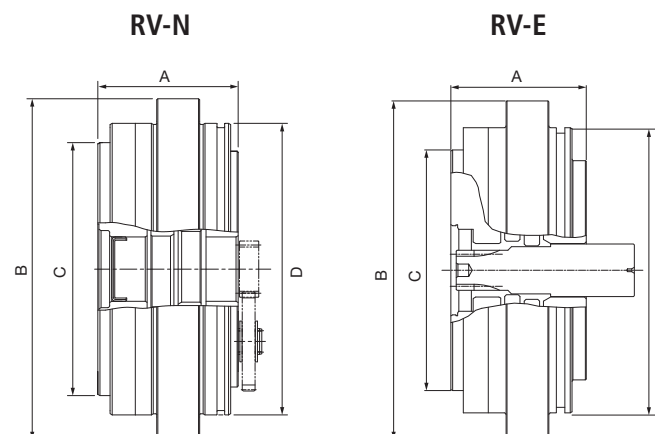
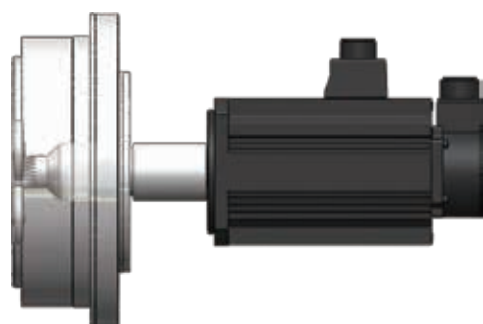
- Compact & slim
- Lightweight
- High accuracy (backlash $\leq 1\text{arc.min.}$)
- High shock load resistance (withstands 5 x rated torque)
- Good accel. performance (up to 2.5 x rated torque)

ADVANTAGES

RV-N: Compact
Easily sealed



RV-E: Slim



RV-N

RV-E

RV-N SPECIFICATION

Model RV-	25N	42N	60N	80N	100N	125N	160N	380N	500N	700N	900N	2800N*2
Standard ratio	41	41	41	41	41	41	41	75	81	105	105	ASK
	81	81	81	81	81	81	81	93	105	118	118	
	107.66*1	105	102.17*1	101	102.17*1	102.17*1	102.81*1	117	123	142.44	142.44	
	126	126	121	129	121	121	125.21*1	139	144	159	159	
	137	141	145.61*1	141	141	145.61*1	156	162	159	183	183	
	164.07*1	164.07*1	161	171	161	161	201	185	192.75	203.52*1	203.52*1	
Rated torque (Nm)	245	412	600	784	1,000	1,225	1,600	3,724	4,900	7,000	9,000	28,000
Allowable starting/stopping torque (Nm)	612	1,029	1,500	1,960	2,500	3,062	4,000	9,310	12,250	17,500	22,500	70,000
Momentary max. allowable torque (Nm)	1,225	2,058	3,000	3,920	5,000	6,125	8,000	18,620	24,500	35,000	45,000	140,000
Rated output speed (rpm)	15	15	15	15	15	15	15	15	15	15	15	15
Allowable output speed: Duty ratio 40% (reference value) (rpm)	110	100	94	88	83	79	48	27	25	19	ASK	ASK
Rated service life (h)	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Backlash/Lostmotion (arc.min.)	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	2/2
Torsional rigidity (central value) (Nm/arc.min.)	61	113	200	212	312	334	490	948	1,620	2,600	3,685	15,600
Allowable moment (Nm)	784	1,660	2,000	2,150	2,700	3,430	4,000	7,050	11,000	15,000	12,740	62,000
Allowable thrust load (N)	2,610	5,220	5,880	6,530	9,000	13,000	14,700	25,000	32,000	44,000	39,200	70,400

*1: These speed ratios are indivisible figures. *2: RV-2800N is designed for oil lubrication.

RV-N DIMENSIONS

Model RV-	25N	42N	60N	80N	100N	125N	160N	380N	500N	700N	900N	2800N
A (mm)	62	65.5	69.5	74	80	80	104	131	137.5	170	195.5	270
B (Ømm)	133	159	183	189	208	221	238	295	325	395	440	720
C (Ømm)	94h7	118h7	140h7	140h7	160h7	160h7	179h7	222h7	253h7	315h7	335h7	560h7
D (Ømm)	113h7	136h7	160h7	160h7	179h7	186h7	202h7	252h7	284h7	350h7	364h7	633h8

RV-E SPECIFICATION

Model RV-	6E	20E	40E	80E	110E	140E	160E	200E	320E	320E3	450E	450E3	1500E
Standard ratio	31	57	57	57	81	ASK	81	ASK	81	ASK	81	ASK	ASK
	43	81	81	81	111		101		101		101		
	53.5	105	105	101	161		129		118.5		118.5		
	59	121	121	121	175.28*1		145		129		129		
	79	141	153	153*2			171		141		154.84*1		
	103	161							171		171		
									185		192.42*1		
Rated torque (Nm)	58	167	412	784	1,078	1,372	1,568	1,960	3,136	3,136	4,410	4,410	14,700
Allowable starting/stopping torque(Nm)	117	412	1,029	1,960	2,695	3,430	3,920	4,900	7,840	7,840	11,025	11,025	36,750
Momentary max. allowable torque (Nm)	294	833	2,058	3,920*3	5,390	6,860	7,840*3	9,800	15,680*3	15,680*3	22,050*3	22,050	73,500
Rated output speed (rpm)	30	15	15	15	15	15	15	15	15	15	15	15	15
Allowable output speed: Duty ratio 100% (reference value) (rpm)	100	75	70	70	50	35	45	28	35	25	25	14	10
Rated service life (h)	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	10,000	6,000	10,000	9,000
Backlash/Lostmotion (arc.min.)	1.5/1.5	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Torsional rigidity (central value) (Nm/arc.min.)	20	49	108	196	294	343	392	583	980	1,078	1,176	1,176	6,320
Allowable moment (Nm)	196	882	1,666	2,156*3	2,940	3,430	3,920	4,508	7056*3	7,840	8,820	8,820	44,100
Allowable thrust load (N)	1,470	3,920	5,194	7,840	10,780	12,500	14,700	16,660	19,600	21,070	24,500	24,500	51,000

*1 These speed ratios are indivisible figures. *2 Speed ratio of 153 is used only for bolt clamping output shaft type. *3 This value is of bolt clamping output shaft type.

RV-E DIMENSIONS

Model RV-	6E	20E	40E	80E	110E	140E	160E	200E	320E	320E3	450E	450E3	1500E
A (mm)	53	65	76	84	92.5	92.5	104	104	125	125	140	140	220
B (Ømm)	122	145	190	222	244h7	244h7	280h7	280h7	325h7	325h7	370h7	370h7	570
C (Ømm)	86h7	105h6	135h7	160h7	182h7	182h7	204h7	204h7	245h7	245h7	275h7	275h7	390h7
D (Ømm)	103h7	123h7	160h7	190h7	244h7	244h7	280h7	280h7	325h7	325h7	370h7	370h7	494h7

RV-C/CA

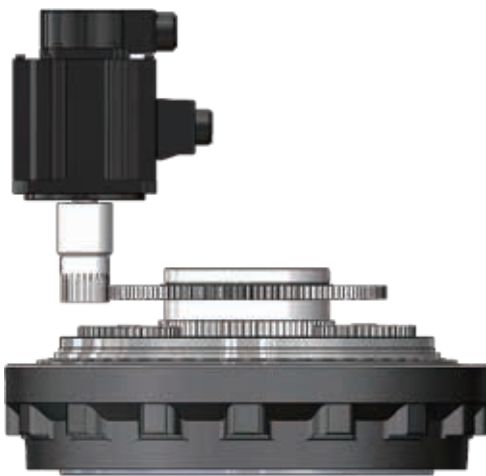
Basic Hollow Shaft Model

FEATURES

- Hollow shaft
- High accuracy (backlash ≤ 1arc.min.)
- High shock load resistance (withstands 5 x rated torque)
- Good accel. performance (up to 2.5 x rated torque)

ADVANTAGES

RV-C: Wide model lineup



RV-CA: Slim



RV-C



RV-CA

RV-C SPECIFICATION

Model RV-	10C	27C	50C	100C	120C	155C	200C	320C	400CS	500C	700CS	900C	1200C
Standard ratio *1	27	36.57 ^{*2}	32.54 ^{*2}	36.75	36.75	ASK	34.86 ^{*2}	35.61 ^{*2}	ASK	37.34 ^{*2}	ASK	ASK	ASK
Rated torque (Nm)	98	265	490	980	1,176	1,470	1,960	3,136	3,920	4,900	6,860	8,820	11,760
Allowable starting/stopping torque (Nm)	245	662	1,225	2,450	2,940	3,675	4,900	7,840	9,800	12,250	17,150	22,050	29,400
Momentary max. allowable torque (Nm)	490	1,323	2,450 ^{*3}	4,900 ^{*3}	5,880	7,350	9,800 ^{*3}	15,680	19,600	24,500	34,300	44,100	58,800
Rated output speed (rpm)	15	15	15	15	15	15	15	15	15	15	15	15	15
Allowable output speed: Duty ratio 100% (reference value) (rpm)	80	60	50	40	38.5	30	30	25	ASK	20	14.5	ASK	9
Rated service life (h)	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Backlash/Lostmotion (arc.min.)	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Torsional rigidity (central value) (Nm/arc.min.)	47	147	255	510	588	735	980	1,960	2,940	3,430	4,375	4,900	5,880
Allowable moment (Nm)	686	980	1,764	2,450	3,920	7,056	8,820	20,580	24,500	34,300	29,400	44,100	44,100
Allowable thrust load (N)	5,880	8,820	11,760	13,720	15,680	17,640	19,600	29,400	34,330	39,200	37,000	51,000	51,000

*1 This speed ratio does not include speed ratio with an input gear (option). *2 These speed ratios are indivisible figures. *3 This value is of bolt clamping output shaft type.

RV-C DIMENSIONS

Model RV-	10C	27C	50C	100C	120C	155C	200C	320C	400CS	500C	700CS	900C	1200C
A (Ømm)	147	182	222.5	250.5	250.5	293	347	440h7	485	520	485	543	570
B (Ømm)	110h7	140h7	176h7	199h7	199h7	234h7	260h7	340h7	347	390h7	386	390h7	390h7
C (Ømm)	31	43	57	71	71	ASK	90	138	ASK	138	ASK	ASK	ASK
D (mm)	49.5	57.5	68	72.6	72.6	89	102	101	124.4	130.5	124.4	144	136
E (mm)	26.35±0.6	31.35±0.65	34.35±0.65	39.35±0.65	39.35±0.65	ASK	56.2±0.85	71.75±0.9	ASK	81.7MAX	ASK	ASK	ASK

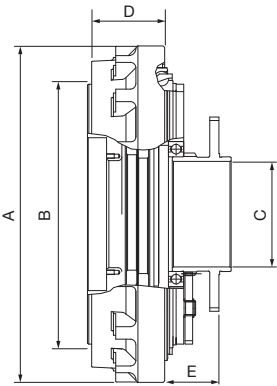
RV-CA SPECIFICATION

Model RV-	260CA	320CA	500CA
Standard ratio	ASK	ASK	ASK
Rated torque (Nm)	2,548	3,136	5,000
Allowable starting/stopping torque (Nm)	6,370	7,840	12,500
Momentary max. allowable torque (Nm)	12,740	15,680	25,000
Rated output speed (rpm)	15	15	15
Allowable output speed: Duty ratio 100% (reference value) (rpm)	21	25	10
Rated service life (h)	6,000	6,000	6,000
Backlash/Lostmotion (arc.min.)	1/1	1/1	1/1
Torsional rigidity (central value) (Nm/arc.min.)	1,540	1,960	3,380
Allowable moment (Nm)	12,740	20,580	30,000
Allowable thrust load (N)	24,500	29,400	37,750

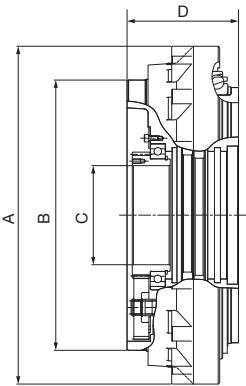
RV-CA DIMENSIONS

Model RV-	260CA	320CA	500CA
A (Ømm)	390h7	450	486
B (Ømm)	315h7	360h7	386h7
C (Ømm)	130MIN	132MIN	140MIN
D (mm)	148.5	148.5	179

RV-C



RV-CA



RF-P



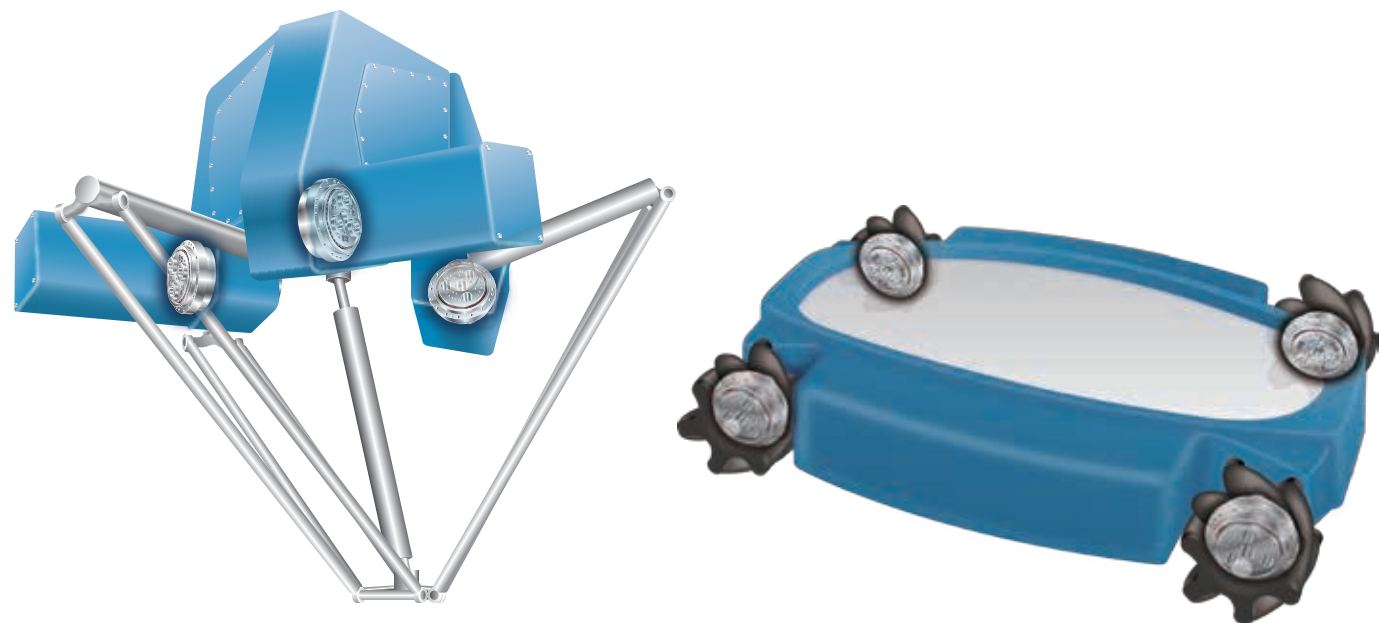
Faster Speeds, Accurately

FEATURES

- High output speed (up to 250rpm)
- High accuracy (backlash ≤ 2 arc.min.)
- Good accel. performance (up to 3 x rated torque)
- Adapted for use with food-grade oil
- Long service life (20,000h)



For accurate, faster positioning

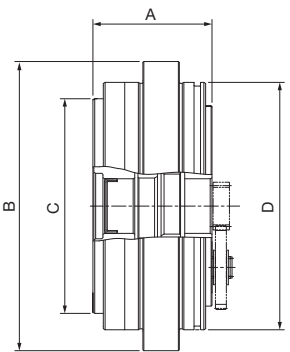


SPECIFICATION

Model RF-	10P	19P	32P
Standard ratio	ASK	ASK	ASK
Rated torque (Nm)	100	190	320
Allowable starting/stopping torque (Nm)	300	570	960
Momentary max. allowable torque (Nm)	500	570	960
Rated output speed (rpm)	50	50	31
Allowable output speed: Duty ratio 50% (reference value) (rpm)	250	200	92
Rated service life (h)	20,000	20,000	20,000
Backlash/Lostmotion (arc.min.)	2/2	2/2	2/2
Torsional rigidity (central value) (Nm/arc.min.)	42	66	149
Allowable moment (Nm)	460	960	1,960
Allowable thrust load (N)	2,200	3,000	5,880

DIMENSIONS

Model RF-	10P	19P	32P
A (mm)	64.5	71	78
B (Ømm)	127	148	183
C (Ømm)	94h7	110h7	140h7
D (Ømm)	ASK	127h7	160h7



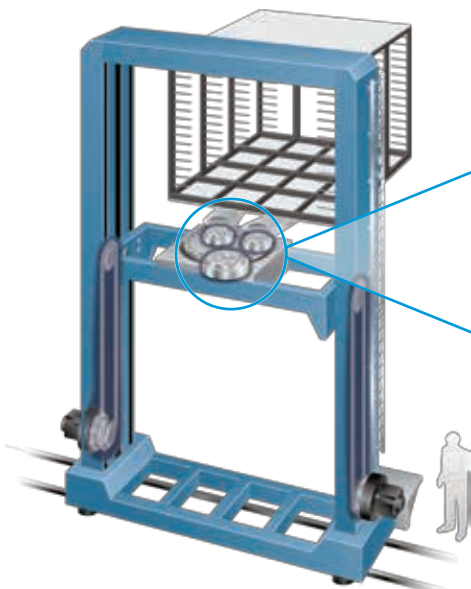
Bearingless Model

FEATURES

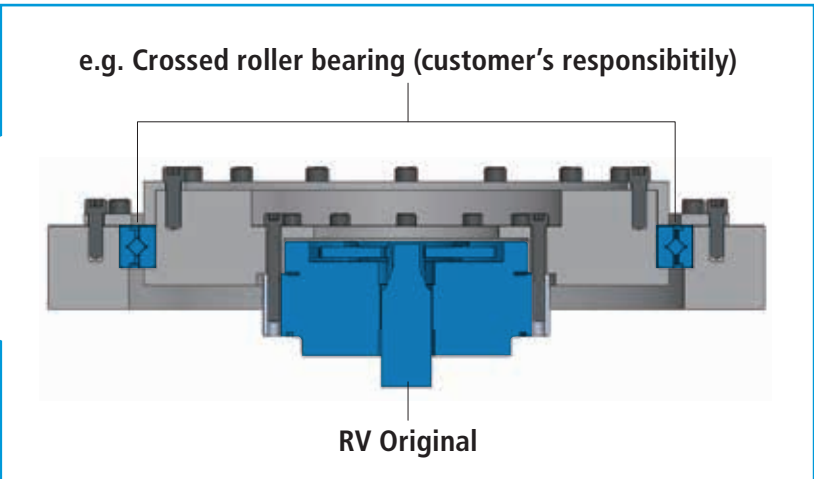
- No support bearing
- High accuracy (backlash ≤ 1arc.min.)
- High shock load resistance (withstands 5 x rated torque)
- Good accel. performance (up to 2.5 x rated torque)



For machines that require a larger moment load capacity than that of a reduction gear



e.g. Stacker



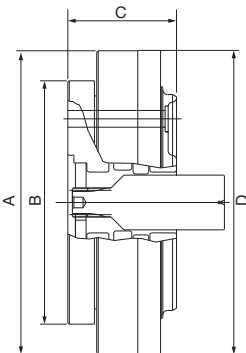
SPECIFICATION

Model RV-	15	30	60	160	320	450	550	900
Standard ratio	57	57	57	81	81	81	123	ASK
	81	81	81	101	101	101	141	
	105	105	101	129	118.5	118.5	163.5	
	121	121	121	145	129	129	192.42*	
	141	153	153	171	141	154.84*		
Rated torque (Nm)								
Allowable starting/stopping torque (Nm)	274	833	1,592	3,920	7,840	11,025	13,475	22,050
Momentary max. allowable torque (Nm)	686	1,666	3,185	6,615	12,250	18,620	26,950	44,100
Rated output speed (rpm)	15	15	15	15	15	15	15	15
Allowable output speed: Duty ratio 100% (reference value) (rpm)	60	50	40	45	35	25	20	7.5
Rated service life (h)	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Backlash/Lostmotion (arc.min.)	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Torsional rigidity (central value) (Nm/arc.min.)	39.2	98	196	392	980	1,176	1,666	5,923

*These speed ratios are indivisible figures.

DIMENSIONS

Model RV-	15	30	60	160	320	450	550	900
A (Ømm)	129.9 ⁰ _{-0.05}	159.5±0.2	199.5	239.5	289.5	324.5	369.5	550
B (Ømm)	105h6	135h6	160h6	204h6	245	275	316h7	440h7
C (mm)	65	71.5	71.5	96	117.6	128.5	147	185
D (Ømm)	130h7	160h7	200h7	239.9 ⁰ _{-0.05}	290h7	325h7	370h7	550h7



GEARHEADS



Gear



Adapter



Lubricant

RD2
RD_-E
series



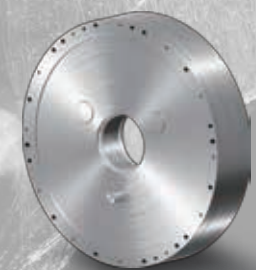
RS
series



GH
series



NT
series



RD2
RD_-C
series



RH
series



RA
series



RD2

More Flexibility for Design

FEATURES

- 3 input options : straight (RDS), right angle (RDR), pulley (RDP)
- Solid shaft & hollow shaft
- Pre-lubricated
- High accuracy (backlash ≤ 1arc.min.)
- High shock load resistance (withstands 5 x rated torque)
- Good accel. performance (up to 2.5 x rated torque)

BENEFITS

- Usable in a wide range of applications
- Total 131 models

Solid shaft



Hollow shaft



RD-E SPECIFICATION

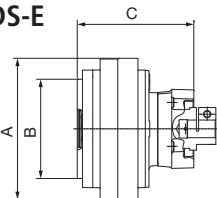
Model RDS- / RDR-	6E	20E	40E	80E	160E	320E
Standard ratio	31 43 53.5 79 103	41 57 81 105 121 161	41 57 81 105 121 153	41 57 81 101 121 153	66 81 101 121 145 171	66 81 101 121 141 185
Rated torque (Nm)	RDS-E	58	167	412	784	1,568
	RDR-E	58	108 ^{i:41} 151 ^{i:57} 167 ^{i:81,105,121,161}	400 ^{i:41} 412 ^{i:57,81,105,121,153}	400 ^{i:41} 556 ^{i:57} 784 ^{i:81,101,121,153}	1,800 ^{i:66} 2,209 ^{i:81} 2,755 ^{i:101} 3,136 ^{i:121,141,185}
Allowable starting/ stopping torque (Nm)	RDS-E	117	412	1,029	1,960	3,920
	RDR-E	117	271 ^{i:41} 378 ^{i:57} 412 ^{i:81,105,121,161}	1,000 ^{i:41} 1,029 ^{i:57,81,105,121,153}	1,000 ^{i:41} 1,390 ^{i:556} 1,960 ^{i:81,101,121,153}	4,503 ^{i:66} 5,527 ^{i:81} 6,892 ^{i:101} 7,840 ^{i:121,141,185}
Momentary max. allowable torque (Nm)	RDS-E	294	833	2,058	3,920	7,840
	RDR-E	294	543 ^{i:41} 755 ^{i:57} 833 ^{i:81,105,121,161}	2,000 ^{i:41} 2,058 ^{i:57,81,105,121,153}	2,000 ^{i:41} 2,781 ^{i:556} 3,920 ^{i:81,101,121,153}	9,002 ^{i:66} 11,048 ^{i:81} 13,776 ^{i:101} 15,680 ^{i:121,141,185}
Rated output speed (rpm)		30	15	15	15	15
Allowable input speed (rpm)		3,500	3,500	3,000	3,000	2,000
Rated service life (h)		6,000	6,000	6,000	6,000	6,000
Backlash/Lostmotion (arc.min.)	RDS-E	1.5/1.5	1/1	1/1	1/1	1/1
	RDR-E	2/2	1.5/1.5	1.5/1.5	1.5/1.5	1.5/1.5
Torsional rigidity (central value) (Nm/arc.min.)		20	49	108	196	392
Allowable moment (Nm)		196	882	1,666	2,156	3,920
Allowable thrust load (N)		1,470	3,920	5,194	7,840	14,700

Model RDP-	6E	20E	40E	80E	160E	320E
Standard ratio	-	81	57	81	66	81
Rated torque (Nm)	-	167	412	784	1,568	3,136
Allowable starting/stopping torque (Nm)	-	412	1,029	1,960	3,920	7,840
Momentary max. allowable torque (Nm)	-	833	2,058	3,920	7,840	15,680
Rated output speed (rpm)	-	15	15	15	15	15
Allowable input speed (rpm)	-	3,500	3,000	3,000	2,000	2,000
Rated service life (h)	-	6,000	6,000	6,000	6,000	6,000
Backlash/Lostmotion (arc.min.)	-	1/1	1/1	1/1	1/1	1/1
Torsional rigidity (Nm/arc.min.)	-	49	108	196	392	980
Allowable moment (Nm)	-	882	1,666	2,156	3,920	7,056
Allowable thrust load (N)	-	3,920	5,194	7,840	14,700	19,600

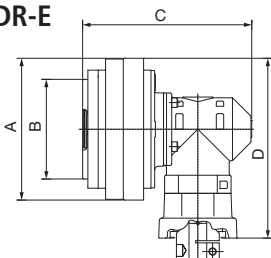
RD-E DIMENSIONS

Model RD_-	6E	20E	40E	80E	160E	320E
A (Ømm)	125.5	150	192	222	280	325
B (Ømm)	86h7	105h6	135h7	160h7	204h7	245h7
C (mm)	RDS-E	170.55/182.55	182.8/194.8	243.5/267.5	362.5/353.5	385/376
	RDR-E	178.4	184	229.1	352.5	377
	RDP-E	-	152	194.6	257	281.5
D (mm)	RDR-E	170.55/182.55	182.8/194.8	243.5/267.5	362.5/353.5	385/376

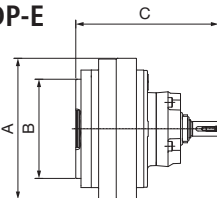
RDS-E



RDR-E



RDP-E



RD_-C SPECIFICATION

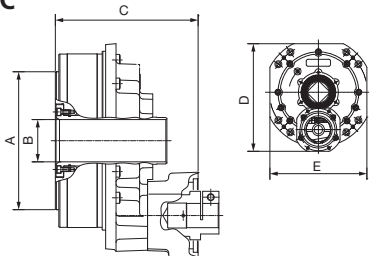
Model RDS- / RDR-	10C	27C	50C	100C	200C	320C
Standard ratio	81	99.82	109	100.5	105.83	115
	108	141.68	152.6	150	155.96	157
	153	184	196.2	210	206.09	207
	189	233.45	239.8	258	245.08	253
	243					
Rated torque (Nm)	98	265	490	980	1,960	3,136
Allowable starting/stopping torque (Nm)	245	662	1,225	2,450	4,900	7,840
Momentary max. allowable torque (Nm)	490	1,323	2,450	4,900	9,800	15,680
Rated output speed (rpm)	15	15	15	15	15	15
Allowable input speed (rpm)	3,500	3,500	3,000	3,000	2,000	2,000
Rated service life (h)	6,000	6,000	6,000	6,000	6,000	6,000
Backlash/Lostmotion (arc.min.)	RDS-C	1/1	1/1	1/1	1/1	1/1
	RDR-C	1.5/1.5	1.5/1.5	1.5/1.5	1.5/1.5	1.5/1.5
Torsional rigidity (central value) (Nm/arc.min.)	47	147	255	510	980	1,960
Allowable moment (Nm)	686	980	1,764	2,450	8,820	20,580
Allowable thrust load (N)	5,880	8,820	11,760	13,720	19,600	29,400

Model RDP-	10C	27C	50C	100C	200C	320C
Standard ratio	108	99.82	109	100.5	105.83	157
Rated torque (Nm)	98	265	490	980	1,960	3,136
Allowable starting/stopping torque (Nm)	245	662	1,225	2,450	4,900	7,840
Momentary max. allowable torque (Nm)	490	1,323	2,450	4,900	9,800	15,680
Rated output speed (rpm)	15	15	15	15	15	15
Allowable input speed (rpm)	3,500	3,500	3,000	3,000	2,000	2,000
Rated service life (h)	6,000	6,000	6,000	6,000	6,000	6,000
Backlash/Lostmotion (arc.min.)	1/1	1/1	1/1	1/1	1/1	1/1
Torsional rigidity (Nm/arc.min.)	47	147	255	510	980	1,960
Allowable moment (Nm)	686	980	1,764	2,450	8,820	20,580
Allowable thrust load (N)	5,880	8,820	11,760	13,720	19,600	29,400

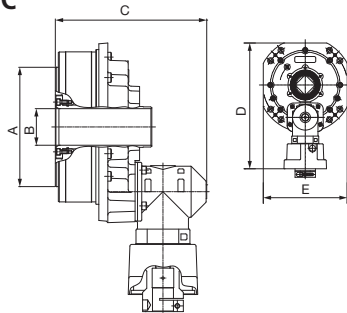
RD_-C DIMENSIONS

Model RD_-	10C	27C	50C	100C	200C	320C
A (Ømm)	110h7	140h7	176h7	199h7	260h7	340h7
B (Ømm)	25	36	48	61	75	120
C (mm)	RDS-C	132/143	141/152	177.5/201.5	182.1/206.1	246/243
	RDR-C	191.5	200.5	248	252.6	382
	RDP-C	159.5	168.5	213.5	218.1	286.5
D (mm)	RDS-C	187.2/197.7	227.2/237.7	270/278.5	302/310.5	403/413
	RDR-C	254.5/266.5	294.5/306.5	363.5/387.5	395.5/419.5	550.5/541.5
	RDP-C	187.2	227.2	268	300	402.7
E (mm)	172.4	207.4	252	280	368	447

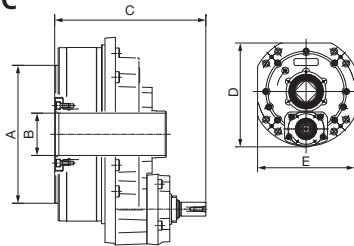
RDS-C



RDR-C



RDP-C

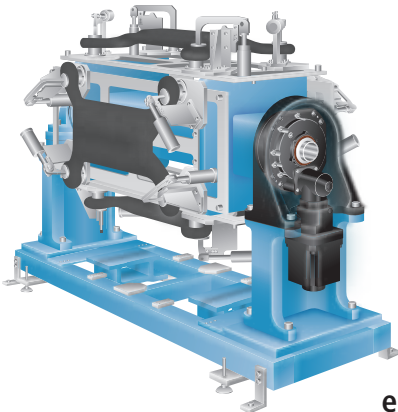


OPTION
BASE FLANGE

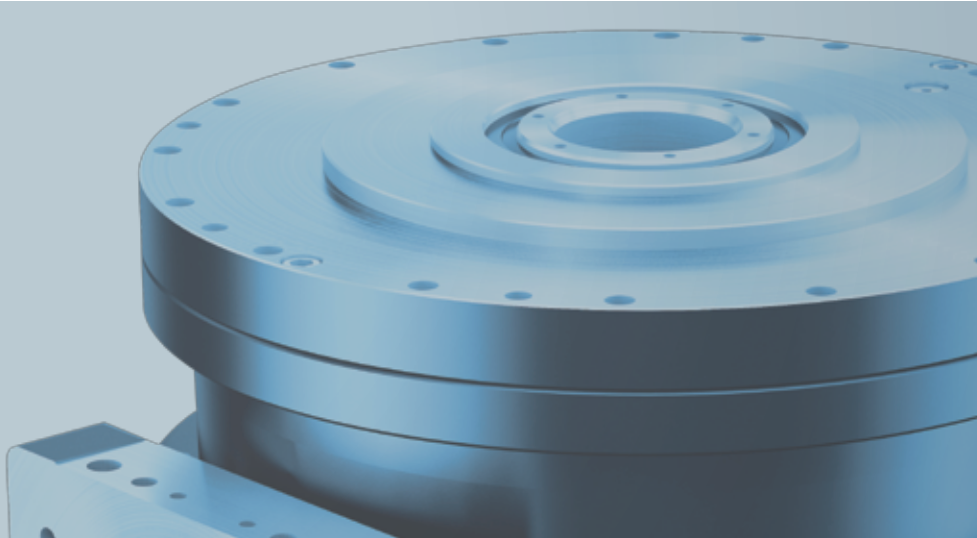
Optional Base Flange for RD_-160E & RD_-100C



Application



e.g. Welding positioner



Index Table Unit with Large Capacity, Low Profile

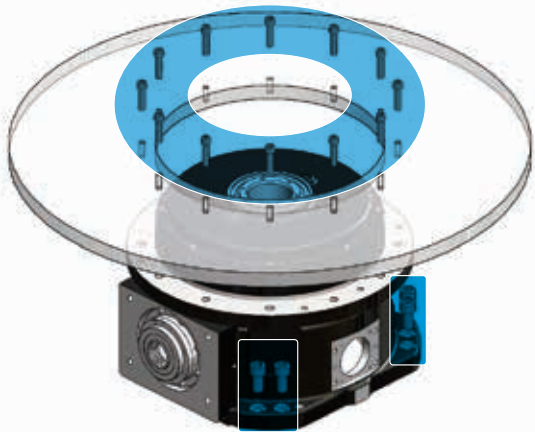
FEATURES

- Capacity for 2,500 – 9,000 kg
- Hollow shaft (for placement of cables)
- Low profile
- Pre-lubricated
- Right angle input
- Table type
- High accuracy (backlash ≤ 1arc.min.)
- High shock load resistance (withstands 5 x rated torque)
- Good accel. performance (up to 2.5 x rated torque)

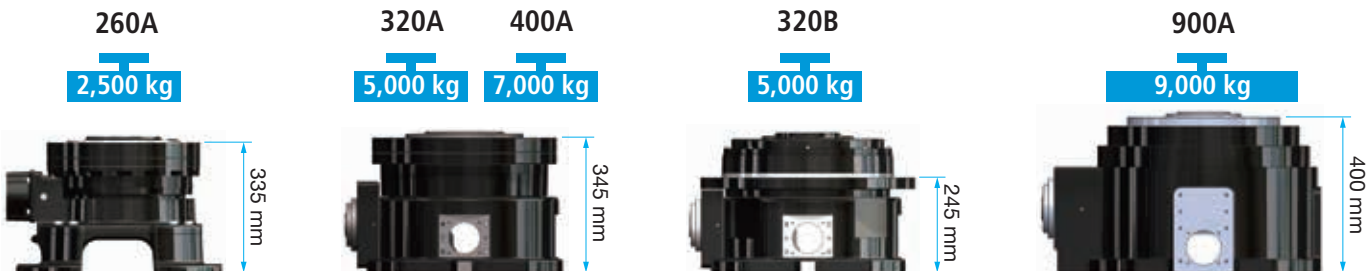


BENEFITS

- Easy to install (bolt tightening & locating pins only)



Lower table height (low-profile body)

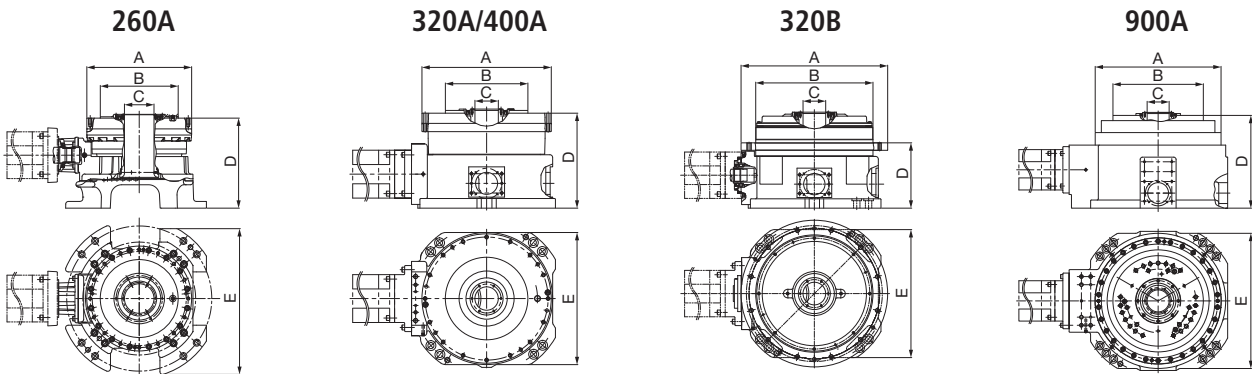


SPECIFICATION

Model RS-	260A	320A	320B	400A	900A
Standard ratio	120	170	170	170	193.6 240
Rated torque (Nm)	2,548	3,136	3,136	3,920	8,820
Allowable starting/stopping torque (Nm)	6,370	7,840	7,840	9,800	17,640
Momentary max. allowable torque (Nm)	12,740	15,680	15,680	19,600	35,280
Rated output speed (rpm)	15	15	15	15	15
Allowable output speed: Duty ratio 100% (reference value) (rpm)	21.5	20	20	20	10
Rated service life (h)	6,000	6,000	6,000	6,000	6,000
Backlash/Lostmotion (arc.min.)	1/1	1/1	1/1	1/1	1/1
Torsional rigidity (central value) (Nm/arc.min.)	1,540	1,570	1,570	2,450	4,900
Allowable moment (Nm)	12,740	20,580	20,580	24,500	44,100
Allowable thrust load (N)	24,500	49,000	49,000	72,000	88,200

DIMENSIONS

Model RS-	260A	320A	320B	400A	900A
A (Ømm)	390	470	550	470	543
B (Ømm)	290h7	300h7	440h7	300h7	390h7
C (Ømm)	110	85	85	85	95
D (mm)	335	345	245	345	400
E (mm)	543	480	480	480	583



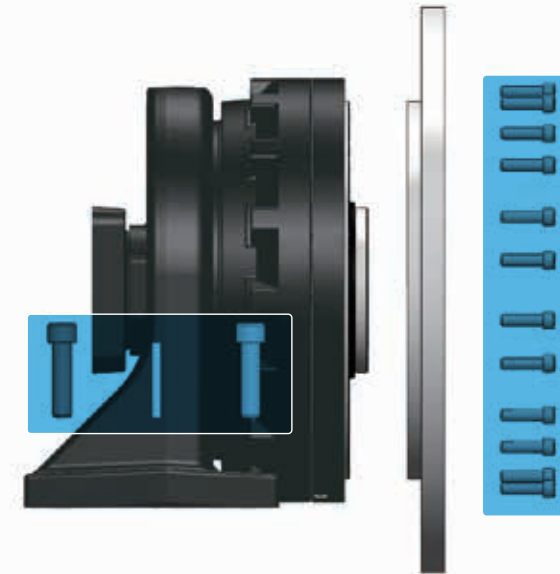
Gearhead for positioners

FEATURES

- Slim
- Base flange (attached)
- Large center hole dia. (Ø120 mm: 320CA, Ø70 mm: 155C)
- Pre-lubricated
- High accuracy (backlash ≤ 1 arc.min.)
- High shock load resistance (withstands 5 x rated torque)
- Good accel. performance (up to 2.5 x rated torque)
- Can be used with external shaft motors of robots

BENEFITS

- Easy to install (bolt tightening & location pins only)
- Smaller footprint (slim body)



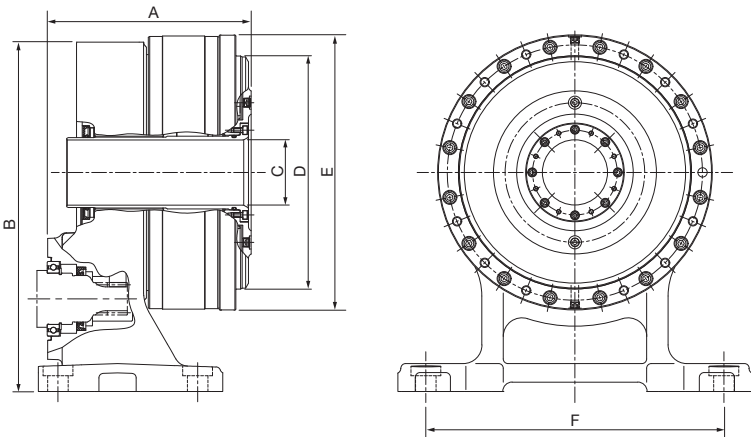
SPECIFICATION

Model RH-	155C	320CA
Standard ratio	78.3	152
	104.4	
	120.46	
Rated torque (Nm)	1,470	3,136
Allowable starting/stopping torque (Nm)	3,675	7,840
Momentary max. allowable torque (Nm)	7,350	15,680
Rated output speed (rpm)	15	15
Allowable output speed: Duty ratio 100% (reference value) (rpm)	30	25
Rated service life (h)	6,000	6,000
Backlash/Lostmotion (arc.min.)	1/1	1/1
Torsional rigidity (central value) (Nm/arc.min.)	735	1,960
Allowable moment (Nm)	4,000	20,580
Allowable thrust load (N)	16,000	29,400

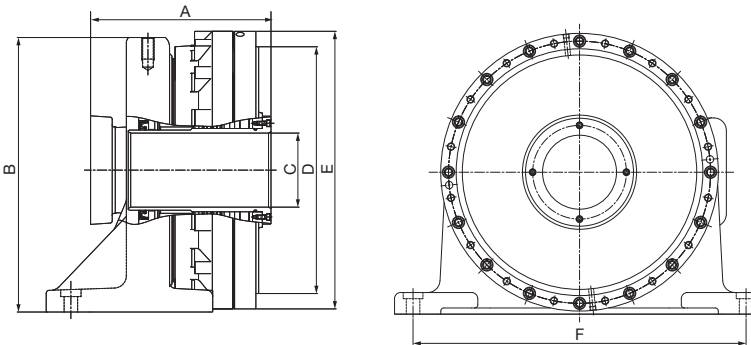
DIMENSIONS

Model RH-	155C	320CA
A (mm)	218.5	292.5
B (mm)	375	445
C (Ømm)	70	120
D (Ømm)	250h7	400h7
E (Ømm)	295	450
F (mm)	320	540

RH-155C



RH-320CA



Faster Speeds, Powerfully

FEATURES

High output speed (up to 270rpm)

Solid shaft

Flange output type & shaft output type

Pre-lubricated

High shock load resistance (withstands 7 x rated torque)

Good accel. performance (up to 3 x rated torque)



GH-P
Flange output type

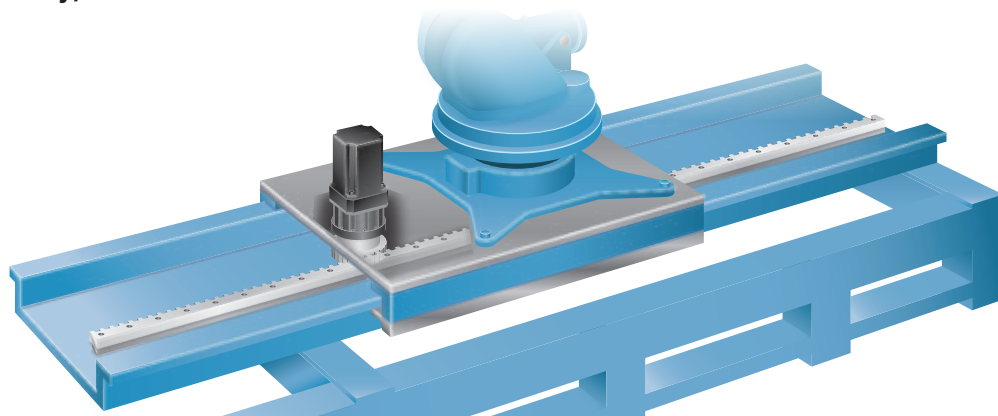


GH-S
Shaft output type

BENEFITS

Enhanced shock load resistance

Reduced cycle time (heavy-duty)



SPECIFICATION

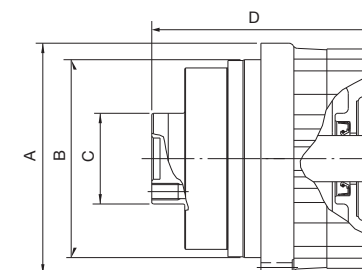
Model GH	7	14	24	40	100
Standard ratio	11*	11	11	11*	20.375
	21	21	21	21	31.4
	31*	31	31	31*	
Rated torque (Nm)	69	167	235	392	980
Allowable starting/stopping torque (Nm)	206	500	706	1,176	2,942
Momentary max. allowable torque (Nm)	480	1,166	1,646	2,744	6,865
Rated output speed (rpm)	50	50	50	50	50
Allowable output speed: Duty ratio 30% (reference value) (rpm)	270	270	250	250	135
Rated service life (h)	6,000	6,000	6,000	6,000	6,000
Backlash/Lostmotion (arc.min.)	6/6	6/6	6/6	6/6	10/10
Torsional rigidity (central value) (Nm/arc.min.)	20	45	65	108	382
Allowable moment (Nm)	460	804	843	1,823	4,900
Allowable thrust load (N)	1,372	1,960	2,940	2,940	5,586

*These speed ratios are indivisible figures.

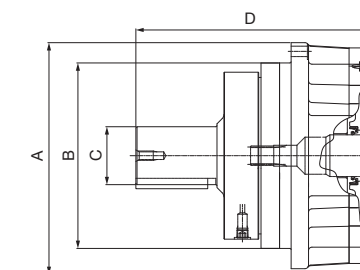
DIMENSIONS

Model GH		7	17	24	40	100
A (Ømm)		140	180	195	240	382
B (Ømm)		120h7	151h7	160h7	200h7	310h7
C (Ømm)	GH-P	55h7	72h7	42js6	108h7	144h7
	GH-S	28h6	38h6	50h6	60h6	-
D (mm)	GH-P	136.2	157	146	202.2	237
	GH-S	158.2	200.2	205	281.2	-

GH-P
Flange output type



GH-S
Shaft output type



Drive Unit for Auto Tool Changer

FEATURES

Case rotation type & shaft rotation type

Pre-lubricated

Solid shaft

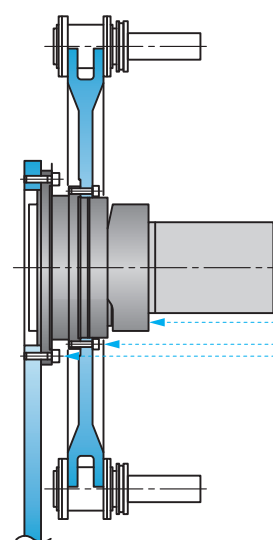
High accuracy (backlash < 1arc.min.)

High shock load resistance (withstands 5 x rated torque)

Good accel. performance (up to 2.5 x rated torque)

BENEFITS

Suitable for Auto Tool Changer



Bolt tightening
from one direction

Space saving in axial direction
e.g. RA-EA



RA-EA
Case rotation type



RA-EC
Shaft rotation type

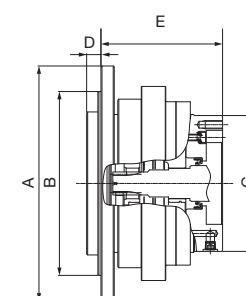
SPECIFICATION

Model RA-		20EA/20EC	40EA/40EC	80EA/80EC	160EA/160EC
Standard ratio	EA	80, 104, 120, 140, 160	80, 104, 120, 152	80, 100, 120, 152	80, 100, 128, 144, 170
	EC	81, 105, 121, 141, 161	81, 105, 121, 153	81, 101, 121, 153	81, 101, 129, 145, 171
Rated torque (Nm)		167	412	784	1,568
Allowable starting/stopping torque (Nm)		412	1,029	1,960	3,920
Momentary max. allowable torque (Nm)		833	2,058	3,920	7,840
Rated output speed (rpm)		15	15	15	15
Allowable output speed: Duty ratio 40% (reference value) (rpm)		75	70	70	45
Rated service life (h)		6,000	6,000	6,000	6,000
Backlash/Lostmotion (arc.min.)		1/1	1/1	1/1	1/1
Torsional rigidity (central value) (Nm/arc.min.)		49	108	196	392
Allowable moment (Nm)		882	1,666	2,156	3,920
Allowable thrust load (N)		3,920	5,194	7,840	14,700

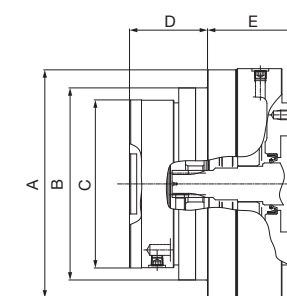
DIMENSIONS

Model RA-	20EA/20EC	40EA/40EC	80EA/80EC	160EA/160EC
A (Ømm)	175/150	230/192	260/226	325/290
B (Ømm)	140h7/124h7	180h7/160h7	210h7/190h7	270h7/240h7
C (Ømm)	124h7/110h7	160h7/140h7	190h7/170h7	240h7/210h7
D (mm)	17/59.1	14/65	16/77	15/108
E (mm)	93.6/59	119.1/78	127/72	168/85.5

RA-EA
Case rotation type



RA-EC
Shaft rotation type



Lower Facial Runout Model

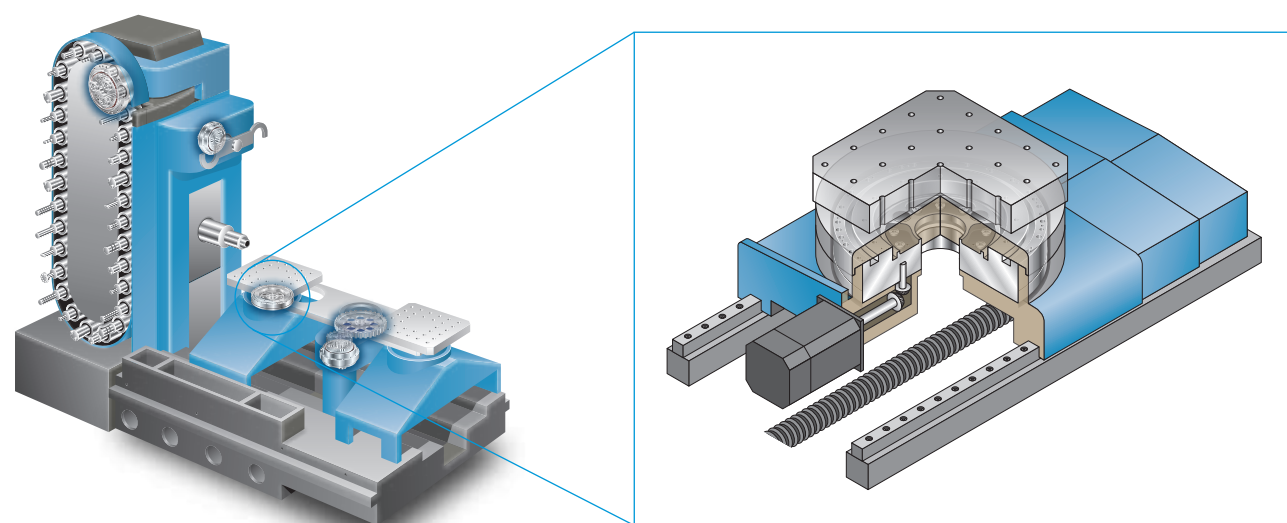
FEATURES

- Facial runout $\leq 8\mu\text{m}$
- High output speed (up to 70 rpm)
- Slim
- Hollow shaft
- Pre-lubricated
- High shock load resistance (withstands 5 x rated torque)
- Good accel. performance (up to 2.5 x rated torque)



BENEFITS

- No need to adjust facial runout or backlash
- No need to adjust pre-load bearings



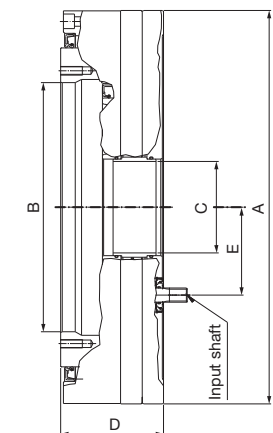
e.g. Horizontal MC

SPECIFICATION

Model NT-	550	650
Standard ratio	60	60
Runout of output shaft (μm)	8	8
Rated torque (Nm)	1,470	2,156
Allowable starting/stopping torque (Nm)	2,940	4,312
Momentary max. allowable torque (Nm)	5,880	8,624
Rated output speed (rpm)	15	15
Allowable output speed: Duty ratio 100% (reference value) (rpm)	70	70
Rated service life (h)	6,000	6,000
Backlash/Lostmotion (arc.min.)	1/1	1/1
Torsional rigidity (central value) (Nm/arc.min.)	882	1,470
Allowable moment (Nm)	5,390	9,800
Allowable thrust load (N)	32,340	32,340

DIMENSIONS

Model NT-	550	650
A (Ømm)	550	670h7
B (Ømm)	348H7	420H7
C (Ømm)	125	151
D (mm)	144	146
E (mm)	123±0.03	141±0.03



SERVO ACTUATORS



Gear



Adapter



Lubricant



Motor

AF-N
series



AF-C
series



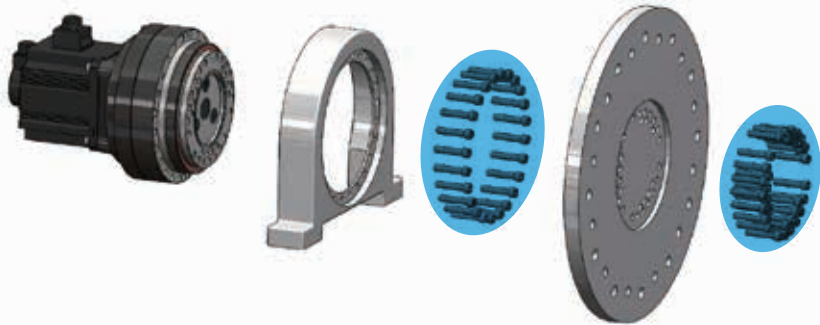
AF-N/C

All-in-One Model

- FEATURES
- Servomotor from Panasonic Corporation (attached)
- Pre-lubricated
- Solid shaft & hollow shaft
- High accuracy (backlash ≤ 1arc.min.)
- Compact body



- BENEFITS
- Easy to install (bolt tightening only)
- No need to select a servo motor



AF-N SPECIFICATION

Model AF	017N	017N	042N	042N	080N	042N	125N	380N	500N
Motor	A6					A5			
Series									
Representative model	MHMF042L2	MDMF102L3	MDMF102L2	MDMF152L2	MDMF202L2	MDME102SC	MHME302SC	MDME402SC	MDME402SC
Rated capacity (kW)	0.4	1.0	1.0	1.5	2.0	1.0	3.0	4.0	4.0
Brake	without/with	with	with	with	with	with	with	with	with
Encoder spec.	Single rotation: 23-bit Absolute Multi-rotation: 16-bit (battery backup)					Single rotation: 17-bit Absolute Multi-rotation: 16-bit (battery backup)			
Power voltage	AC200-230V +10%, -15%					50/60Hz			
Standard ratio	81	126	126	126	129	93	1737/17	1525/7	757/3
Rated torque (Nm)	82	415	481	722	986	355	1,169	3,329	3,856
Momentary max. torque (Nm)	289	415	1,029	1,029	1,960	1,029	3,062	9,310	11,567
Rated output speed (rpm)	37	15.9	15.9	15.9	15.5	21.5	19.6	9.2	7.9
Momentary max. speed (rpm)	80.2	31.7	31.7	31.7	31	32.3	29.4	13.8	11.9
Brake holding torque (Nm)	-/130	1,726	1,726	1,726	1,767	456	2,503	5,338	6,182
Allowable load inertia moment (kgm ²)	11	117	117	164	221	51	371	2,026	2,713
Backlash/Lostmotion (arc.min.)	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Torsional rigidity (central value) (Nm/arc.min.)	36	36	113	113	212	113	334	948	1,620
Allowable moment (Nm)	784	784	1,660	1,660	2,150	1,660	3,430	7,050	11,000
Allowable thrust (N)	2,610	2,610	5,220	5,220	6,530	5,220	13,000	25,000	32,000

AF-N DIMENSIONS

Model AF	017N (0.4kW)	017N (1.0kW)	042N (1.0kW)	042N (1.5kW)	080N	042N	125N	380N	500N
A (mm)	189 / 218.3 without/with brake	249.2	255	269	293.4	272	319.9	401.15	407
B (□mm)	60	130	130	130	130	130	176	176	176
C (Ømm)	133	133	159	159	189	159	221	295	325
D (Ømm)	94h7	94h7	118h7	118h7	140h7	118h7	160h7	222h7	253h7

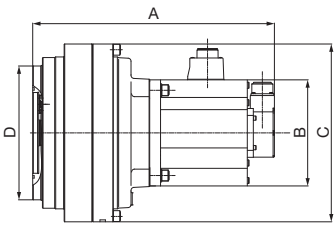
AF-C SPECIFICATION

Model AF	050C	120C	200C	320C
Motor	A6		A5	
Series				
Representative model	MDMF102L2	MDMF202L2	MDME302SC	MDME502SC
Rated capacity (kW)	1.0	2.0	3.0	5.0
brake	without	without	with	with
Encoder spec.	Single rotation: 23-bit Absolute Multi-rotation: 16-bit (battery backup)		Single rotation: 17-bit Absolute Multi-rotation: 16-bit (battery backup)	
Power voltage	AC200-230V +10%, -15%		50/60Hz	
Standard ratio	2289/19	120	155.96	157
Rated torque (Nm)	460	917	1,784	3,002
Momentary max. torque (Nm)	1,225	2,746	4,900	7,840
Rated output speed (rpm)	16.6	16.7	12.8	12.7
Momentary max. speed (rpm)	33.2	33.3	19.2	19.1
Brake holding torque (Nm)	-	-	2,527	3,847
Allowable load inertia moment (kgm ²)	84	158	303	1,216
Backlash/Lostmotion (arc.min.)	1/1	1/1	1/1	1/1
Torsional rigidity (central value) (Nm/arc.min.)	255	588	980	1,960
Allowable moment (Nm)	1,764	3,920	8,820	20,580
Allowable thrust (N)	11,760	15,680	19,600	29,400

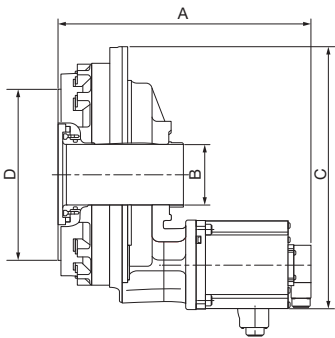
AF-C DIMENSIONS

Model AF	050C	120C	200C	320C
A (mm)	303	354.1	491.7	499
B (Ømm)	48	61	75	120
C (mm)	284	317.5	418	491.5
D (Ømm)	176h7	199h7	260h7	340h7

AF-N

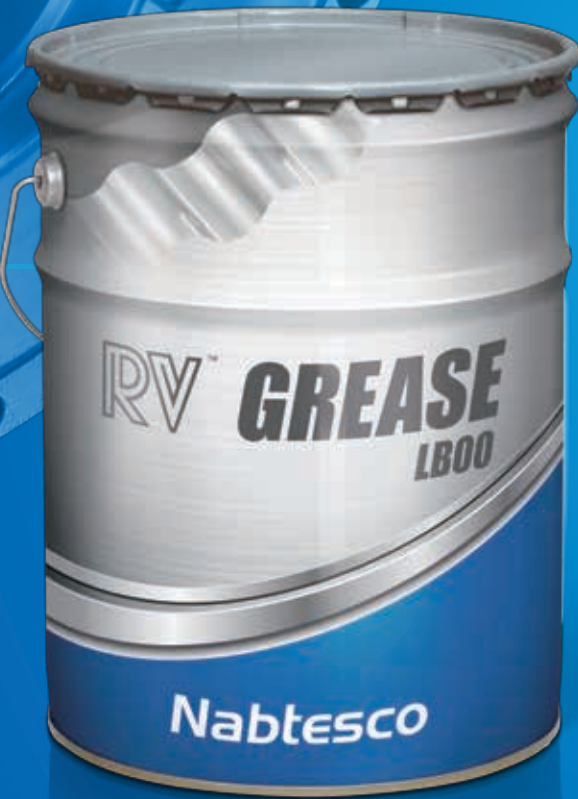


AF-C



Precision reduction gears RV™
dedicated lubricating grease

“RV GREASE LB00” unlocks
the true potential of the precision
reduction gear RV.



RV GREASE LB00 has high-lubricating performance over a wide operating condition range including temperature, speed and load. This has been achieved by applying special additives and high-grade base oil.

Compared to the existing grease, RV GREASE LB00 has excellent low temperature performance, reducing input torque.

Test items		Test method	RV GREASE LB00
Thickener		—	Lithium soap
Base oil		—	Synthetic hydrocarbon oil, Mineral oil
Base oil kinematic viscosity (40°C), mm²/s		JIS K 2220 23. ASTM D 445	71.8
Appearance		—	Yellowish brown,buttery
Worked penetration		JIS K 2220 7. ASTM D 217	410
Dropping point, °C		JIS K 2220 8. ASTM D 566	188
Oxidation stability (99°C, 100 h), kPa		JIS K 2220 12. ASTM D 942	10
Working stability		JIS K 2220 15. FTMS 791C-313	427
Low-temperature torque (-30°C), mN, m	Starting torque	JIS K 2220 18. ASTM D 1478-63	140
	Running torque		30
Four-ball EP, N	L.N.S.L. W.P. L.W.I	ASTM D 2596	1569 3089 647

These values are typical properties and we cannot guarantee the applicability of this information in service.

Precision reduction gears RV™
dedicated lubricating oil

“RV OIL SB150” provides both
high lubricating performance
and oil exchangeability.



Although the two requirements are usually conflicting, RV OIL SB150 has achieved well-balanced high lubrication properties and oil exchangeability by utilizing optimized additives together with high grade base oil. You can rest assured it can be used with any precision reduction gear RV without any disadvantages.

Test items		Test method	RV OIL SB150
Base oil		—	Synthetic hydrocarbon oil, Mineral oil
Base oil kinematic viscosity (40°C, 100°C), mm²/s		JIS K 2220 23. ASTM D 445	158 (40°C) 19.4 (100°C)
Viscosity Index		JIS K 2283	140
Appearance		—	Green
Flash point, °C		JIS K 2265-4	260
Rust-preventing characteristic (60°C, 24h)		ISO 7120 JIS K 2510	pass
Corrosiveness to copper (100°C, 3h)		ISO 2160 JIS K 2513	1a
Foaming characteristics (seq-I, 24°C), mL/mL		ISO 6247 JIS K 2518	0/0
Four-ball EP, N	L.N.S.L. W.P. L.W.I	ASTM D 2783	981 1961 410

These values are typical properties and we cannot guarantee the applicability of this information in service.

Considering the use of our product

Our product mentioned in this product guide features high precision and high rigidity, however, it is necessary to strictly comply with various restrictions and make considerations to maximize the product's features. Please read this technical document thoroughly and select and adopt an appropriate model based on the actual operating environment, method, and conditions at your facility.

Export

When this product is exported from Japan, it may be subject to the export regulations provided in the "Foreign Exchange Order and Export Trade Control Order". Be sure to take sufficient precautions and perform the required export procedures in advance if the final operating party is related to the military or the product is to be used in the manufacture of weapons, etc.

Application

If failure or malfunction of the product may directly endanger human life or if it is used in units which may injure the human body (atomic facilities, space equipment, medical equipment, safety units, etc.), examination of individual situations is required. Contact our agent or nearest business office in such a case.

Safety measures

Although this product has been manufactured under strict quality control, a mistake in operation or misuse can result in breakdown or damage, or an accident resulting in injury or death. Be sure to take all appropriate safety measures, such as the installation of independent safeguards.

Product specifications indicated in this catalog

The specifications indicated in this catalog are based on Nabtesco evaluation methods. This product should only be used after confirming that it is appropriate for the operating conditions of your system.

Operating environment

Use this product under the following environment:

- Location where the ambient temperature is between -10°C and 40°C. (for AF series, between 0°C and + 40°C)
- Location where the humidity is less than 85% and no condensation occurs. (for AF series, between 20% and 85% RH)
- Location where the altitude is less than 1000 m.
- Well-ventilated location

Do not install this product at the following locations.

- Locations where a lot of dust is collected.
- Outdoor areas that are directly affected by wind and rain
- Locations near to areas that contain combustible, explosive, or corrosive gases and flammable materials.
- Locations where the performance of the motor can be affected by magnetic fields or vibration.
- Locations where significant vibration or shock is applied.

Note 1: If the required installation environment cannot be established, contact our customer representative in advance.

Note 2: When using the reduction gear under special conditions (clean room, equipment for food, concentrated alkali, high-pressure steam, etc.), contact our customer representative in advance.

Maintenance

The standard replacement time for lubricant is 20,000 hours. However, when operation involves a reduction gear surface temperature above 40°C, the state of degradation of the lubricant should be checked in advance of that and the grease replaced earlier as necessary.

Operation temperature

Please operate under conditions where the surface temperature of the reduction gear does not exceed 60°C. If the temperature exceeds 60°C, there is a risk of damaging the product. The AF series also has addition limitations regarding the surface temperature of the motor. For details, please refer to the product catalogs and operation manuals.

Output rotation angle

When the range of the rotation angle is small (10 degrees or less), the service life of the reduction gear may be reduced due to poor lubrication or the internal parts being subject to a concentrated load.

Note: Contact us in case the rotation angle is 10 degrees or less.

Documents

Product details, safety information and detailed instructions can be found in the product catalogs and operation manuals.

These documents are downloadable from the following website.

URL : <https://precision.nabtesco.com/en/>

Glossary

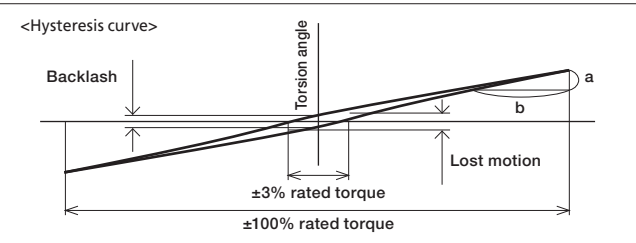
COMMON

Torsional rigidity, lost motion, backlash

When torque is applied to the output shaft while the input shaft is fixed, torsion occurs in the reduction gear. The change in torsion is described in the hysteresis curve, and Torsional rigidity, lost motion and backlash can be calculated from this data.

Allowable Moment and Maximum Thrust Load

The external load moment may be applied to the reduction gear during normal operation. The allowable values of the external moment and the external axial load at this time are each referred to as "allowable moment" and "maximum thrust load".



For COMPONENT SETS, GEARHEADS

Rated service life

The lifetime resulting from the operation with the rated torque and the rated output speed is referred to as the "rated service life".

Allowable starting/stopping torque

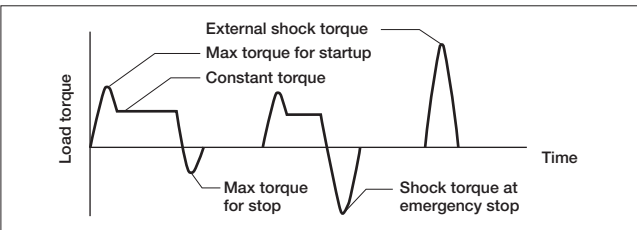
When the machine starts or stops, the load torque to be applied to the reduction gear is larger than the constant-speed load torque due to the effect of the inertia torque of the rotating part. In such a situation, the allowable torque during starting/stopping is referred to as "allowable starting/stopping torque".

Note: Be careful that the load torque, which is applied at startup and stop, does not exceed the allowable starting/stopping torque.

Momentary maximum allowable torque

A large torque may be applied to the reduction gear due to execution of emergency stop or by an external shock. In such a situation, the allowable value of the momentary applied torque is referred to as "momentary maximum allowable torque".

Note: Be careful that the momentary excessive torque does not exceed the momentary maximum allowable torque.



Allowable output speed

The allowable value for the reduction gear's output speed during operation without a load is referred to as the "allowable output speed".

Note: Depending on the conditions of use (duty ratio, load, ambient temperature), the reduction gear temperature may exceed 60°C even when the speed is under the allowable output speed. In such a case, either take cooling measures or use the reduction gear at a speed that keeps the surface temperature at 60°C or lower.

For SERVO ACTUATORS

Rated torque

Calculated value with consideration of the motor rated torque, reduction speed ratio, and reduction gear efficiency.

Momentary maximum torque

Calculated value with consideration of the motor torque, reduction speed ratio, and reduction gear efficiency when the motor torque limit is set.

Rated output speed

Calculated value with consideration of the motor rated speed and reduction speed ratio.

Momentary maximum output speed

Calculated value with consideration of the motor maximum speed and reduction speed ratio.

Note: Be aware of cooling conditions so that the surface temperature of the reduction gear does not exceed 60°C during use.

Brake holding torque

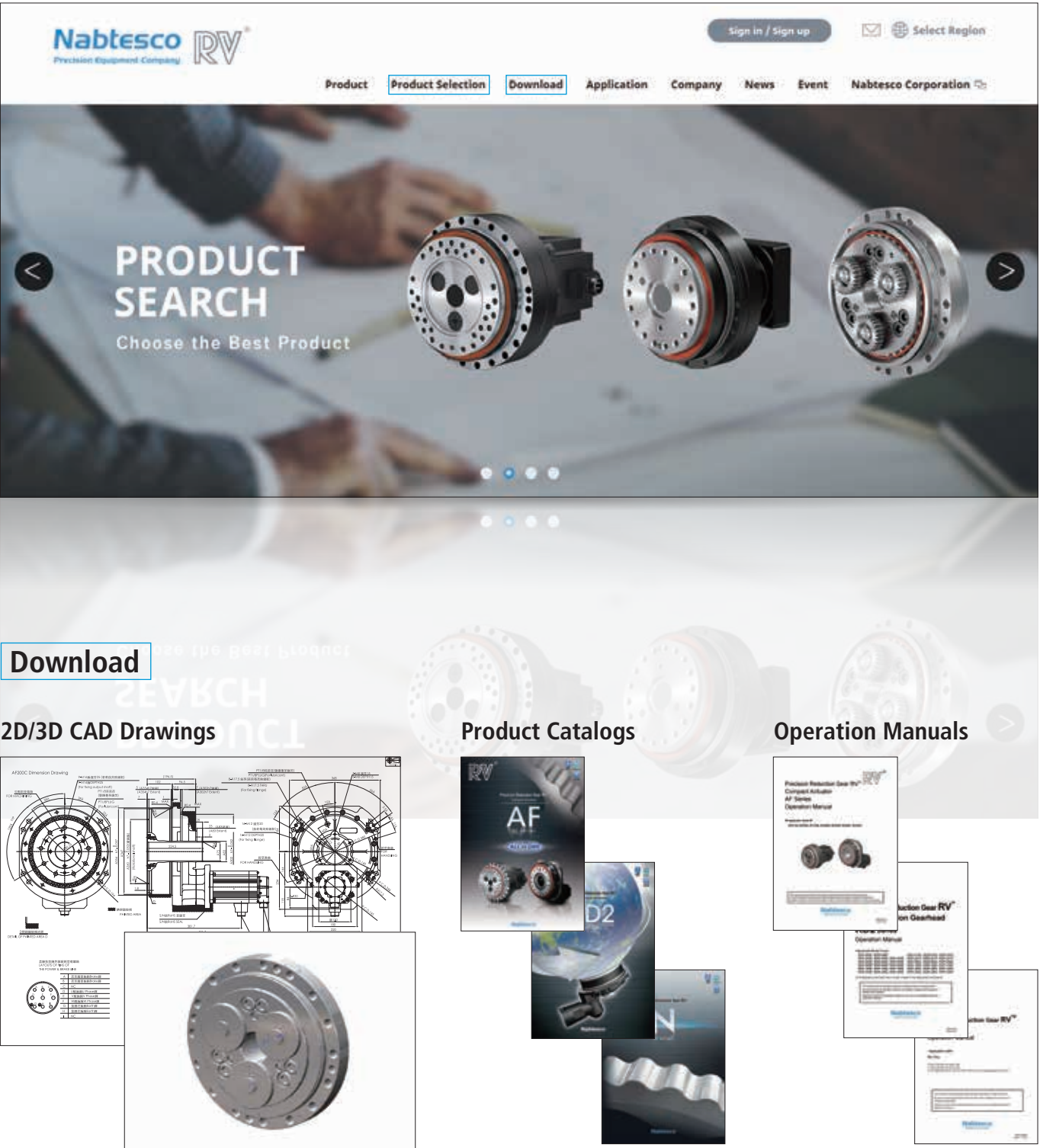
Calculated value with consideration of the motor brake torque, reduction speed ratio, and reduction gear efficiency.

Note: The motor built-in brake is for holding the stop state. Do not use the brake to stop a moving load.

Introduction of Our Website

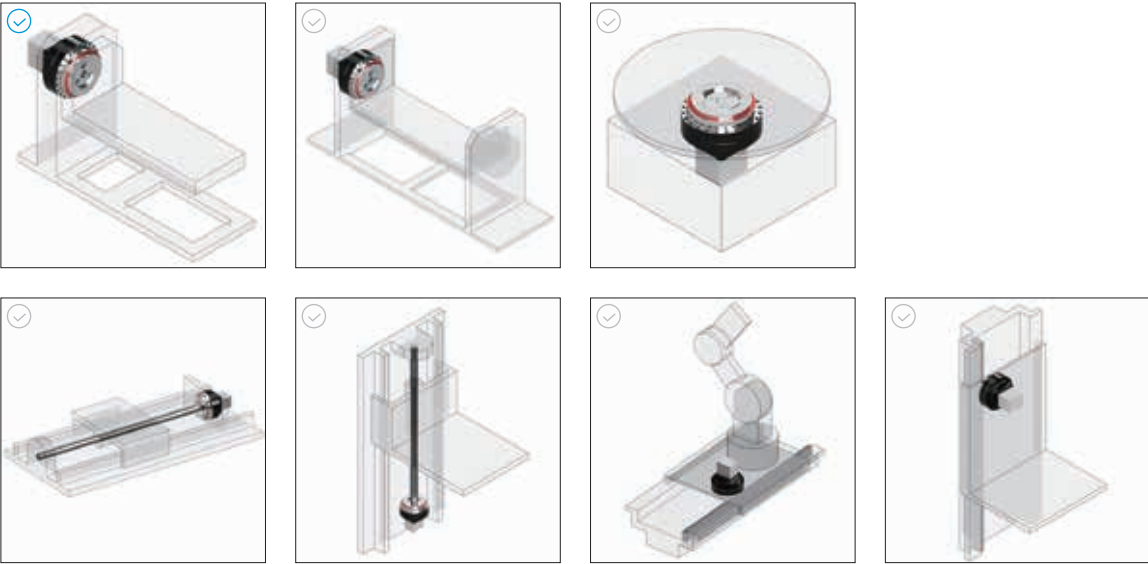
Includes a product selection tool, along with downloadable 2D/3D CAD drawings, product catalogs and operation manuals. (registration required)

URL : <https://precision.nabtesco.com/en/>

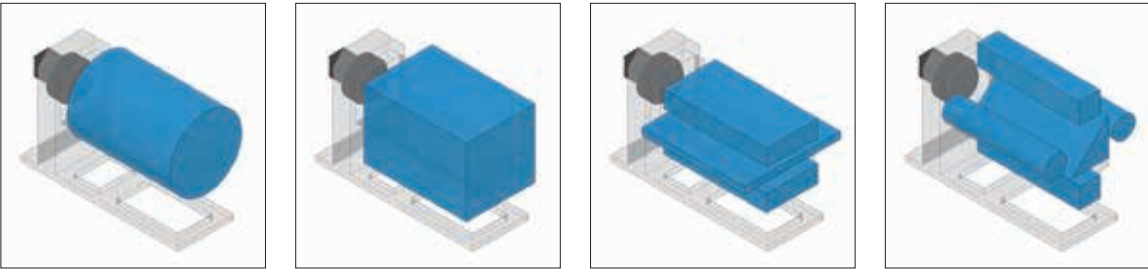


Product Selection (Detailed Product Selection)

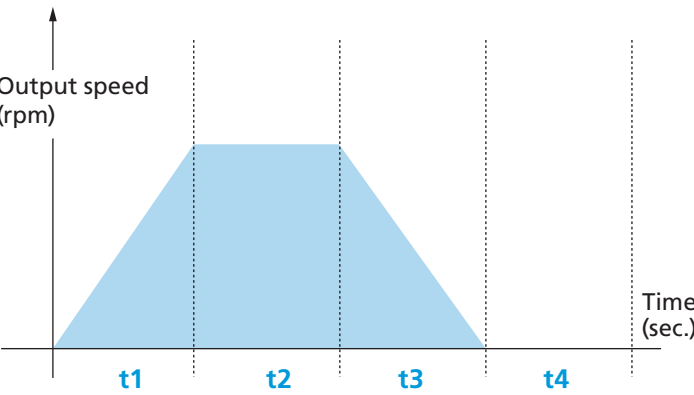
Select your application



Input load conditions (size, weight, center of gravity, etc.)



Input cycle conditions
(Indexing angle, Indexing time, etc.)



Reference Report

A suitable model & its life time for your application

Warranty