Features and Benefits | RD-C Series

High shock load capability
High rigidity
High precision
High reduction ratio

The double-end support design and unique pin gear mechanism provide the following advantages

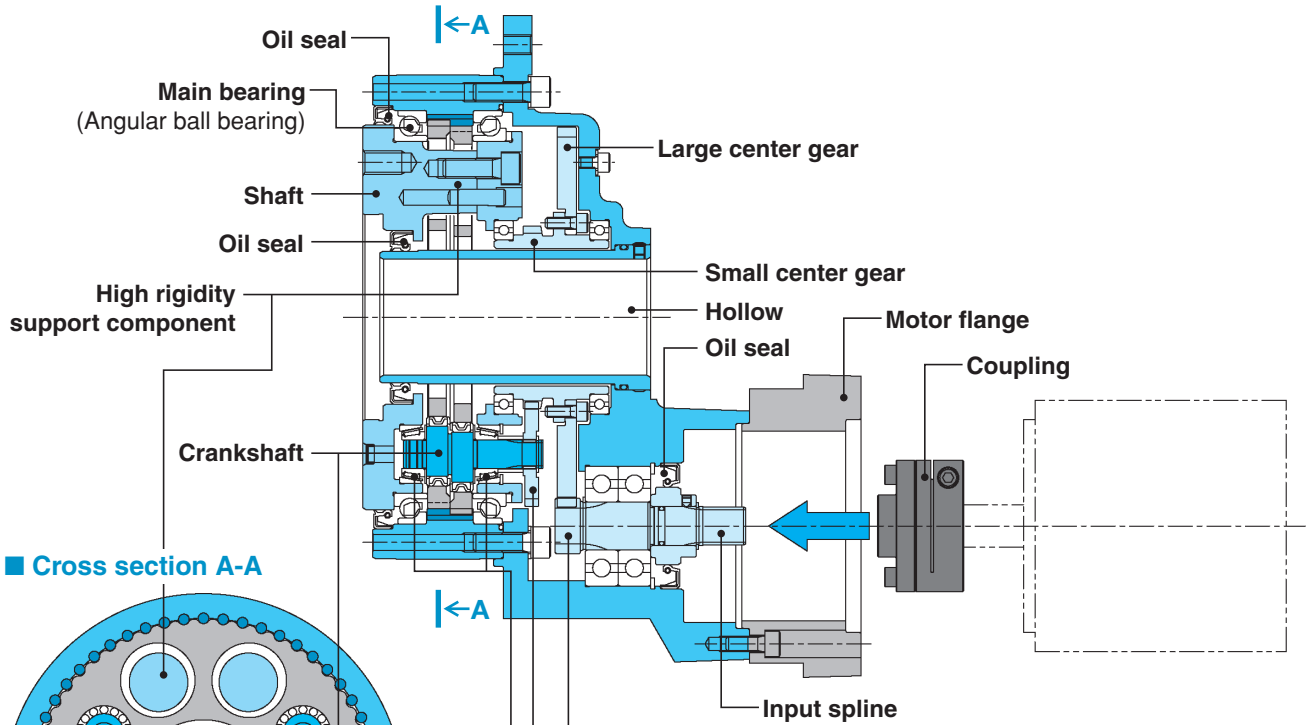
(1) Capable of 5 times the rated torque
(2) High torsional rigidity
(3) Low backlash [1 arc.min]
(4) High torque density (capable of high torque with downsized gear)
(5) Capable of high reduction ratio (MAX I = 258:1)

Heavy load support

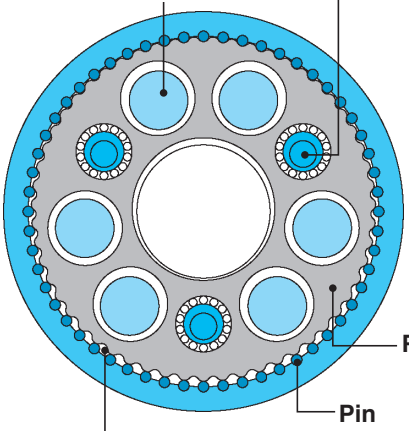
A set of internal main bearings (large angular ball bearings) enables complete support of heavy external loads.

Maximum ease of use

(1) The hollow shaft structure that allows routing of cables through the reduction gear
(2) Pre-greased
(3) Coupling and motor flange provide easy motor mounting



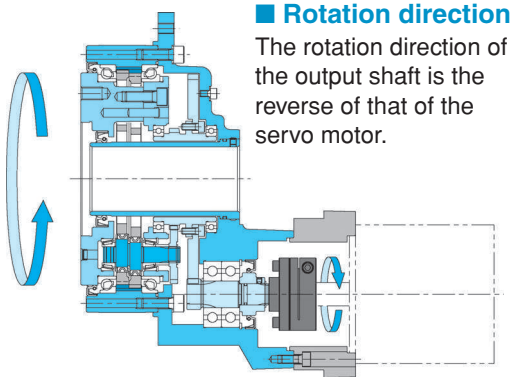
■ Cross section A-A



Rolling contact machanism
The RV gear teeth are in constant, simultaneous contact with all of the pins.

■ Rotation direction

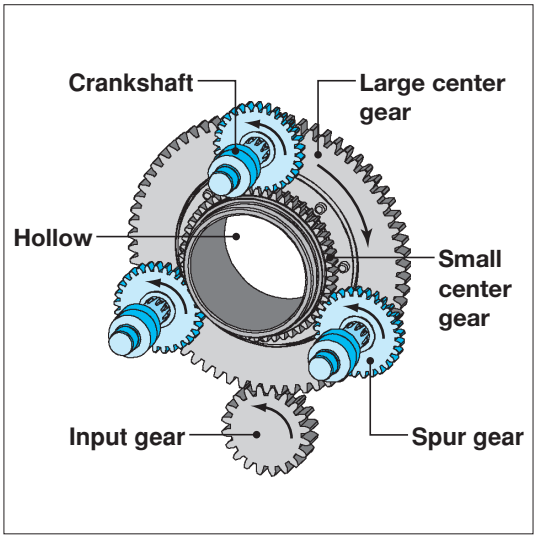
The rotation direction of the output shaft is the reverse of that of the servo motor.



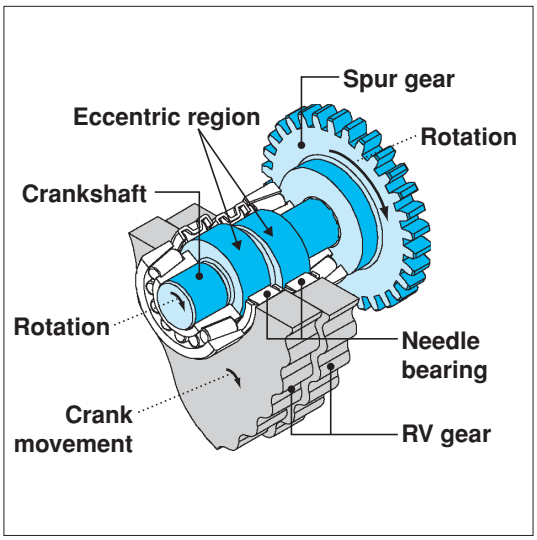
Principle of Operation | RD-C Series

1. Rotation of the servo motor is transmitted through the input gear to the large center gear, and is then transmitted through the small center gear to the spur gear. At this point, the speed is reduced accordingly to the gear ratio between the small center gear and the spur gear. This operation is carried out in the First reduction section <Fig. 1>.
2. Since they are directly connected, the crankshafts have the same rotational speed as the spur gears <Fig. 1>.
3. Two RV gears are mounted around the needle bearings on the eccentric region of the crankshaft. (In order to balance the equal amount of force, two RV gears are mounted) <Fig. 2>.
4. When the crankshafts rotate, the two RV gears mounted on the eccentric sections also revolve eccentrically around the input axis (crank movement) <Fig. 2>.
5. Pins are arrayed in a constant pitch in the grooves inside the case. The number of pins is just one larger than the number of RV teeth <Fig. 3>.
6. As the crankshafts revolve one complete rotation, the RV gears revolve eccentrically one pitch of a pin (crank movement), with all the RV teeth in contact with all of the pins <Fig. 3>.
7. The rotation is then output to the shaft (output shaft) via the crankshaft so that the crankshaft rotation speed can be reduced in proportion to the number of pins <Fig. 3>.
8. The total reduction ratio is the product of the first reduction ratio multiplied by the second reduction ratio.

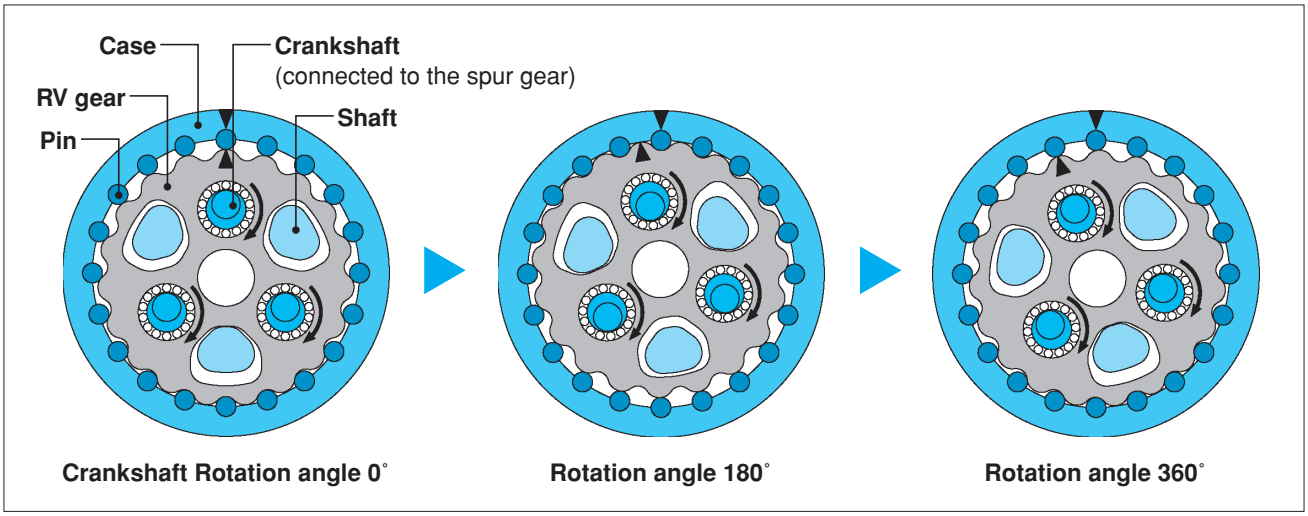
■ Fig. 1 First reduction section



■ Fig. 2 Crankshaft section



■ Fig. 3 Second reduction section



Rating Table

Model Code	Ratio Code (Speed Ratio)					T_0 Rated Torque N-m (lb-in)	N_0 Rated Output Speed rpm	K Rated Life [Continuous] Hr	T_{S1} Allowable Acceleration/ Deceleration Torque N-m (lb-in)
RD-E Series									
RD-006E	031 (31)	043 (43)	054 (53,5)	079 (79)	103 (103)	58 (521)	30	6000	117 (1042)
RD-020E	041 (41)	057 (57)	081 (81)	105 (105)	161 (161)	167 (1476)	15	6000	412 (3645)
RD-040E	041 (41)	057 (57)	081 (81)	105 (105)	153 (153)	412 (3645)	15	6000	1029 (9114)
RD-080E	041 (41)	057 (57)	081 (81)	101 (101)	153 (153)	784 (6944)	15	6000	1960 (17359)
RD-160E	066 (66)	081 (81)	101 (101)	145 (145)	171 (171)	1568 (13887)	15	6000	3920 (34719)
RD-320E	066 (66)	081 (81)	101 (101)	141 (141)	185 (185)	3136 (27775)	15	6000	7840 (69437)
RD-C Series									
RD-010C	081 (81)	108 (108)	153 (153)	189 (189)	243 (243)	98 (868)	15	6000	245 (2170)
RD-027C	100 (99,82)	142 (141,68)	184 (184)	233 (233,45)		265 (2344)	15	6000	662 (5859)
RD-050C	109 (109)	153 (152,6)	196 (196,2)	240 (239,8)		490 (4340)	15	6000	1225 (10850)
RD-100C	101 (100,5)	150 (150)	210 (210)	258 (258)		980 (8680)	15	6000	2450 (21699)
RD-200C	106 (105,83)	156 (155,96)	206 (206,09)	245 (245,08)		1960 (17359)	15	6000	4900 (43398)
RD-320C	115 (115)	157 (157)	207 (207)	253 (253)		3136 (27775)	15	6000	7840 (69437)

Note: 1. The rating table shows the specification values of each reduction gear.

2. The allowable output speed may be limited by heat depending on the operation rate.

3. For the moment of inertia of the reduction gear, refer to the external dimension drawings of the reduction gear and the coupling.

4. For dimension α, refer to “Allowable Moment And Maximum Axial Load” in the Glossary on page 8.

T_{S2} Momentary Maximum Allowable Torque N-m (lb-in)	N_{S1} Allowable Output Speed [Continuous] (Note 2) rpm	N_{S2} Allowable Output Speed [Intermittent] (Note 2) rpm	Backlash arc.min	Lost Motion arc.min	Torsional R:G:dity Spring Constant N-m/ arc.min (lb-in/arc.min)	Capacity of Main Bearing			
						M_0 Allowable Moment N-m (lb-in)	M_{S1} Momentary Maximum Allowable Moment N-m (lb-in)	F_0 Maximum Thrust Load N (lb)	α Dimension α (Note 4) mm
294 (2604)	60	100	1.5	1.5	20 (177)	196 (1736)	392 (3472)	1470 (331)	77.8
833 (7378)	45	75	1.0	1.0	49 (434)	882 (7812)	1764 (15623)	3920 (882)	93.2
2058 (18227)	42	70	1.0	1.0	108 (955)	1666 (14755)	3332 (29511)	5194 (1168)	114.6
3920 (34719)	42	70	1.0	1.0	196 (1736)	2156 (19095)	4312 (38190)	7840 (1764)	136.1
7840 (69437)	27	45	1.0	1.0	392 (3472)	3920 (34719)	7840 (69437)	14700 (3307)	167.3
15680 (138874)	21	35	1.0	1.0	980 (8680)	7056 (62493)	14112 (124987)	19600 (4409)	203
490 (4340)	48	80	1.0	1.0	47 (417)	686 (6076)	1372 (12152)	5880 (1323)	91.2
1323 (11718)	36	60	1.0	1.0	147 (1302)	980 (8680)	1960 (17359)	8820 (1984)	112
2450 (21699)	30	50	1.0	1.0	255 (2257)	1764 (15623)	3528 (31247)	11760 (2646)	136.8
4900 (43398)	24	40	1.0	1.0	510 (4513)	2450 (21699)	4900 (43398)	13720 (3087)	148.9
9800 (86796)	18	30	1.0	1.0	980 (8680)	8820 (78117)	17640 (156233)	19600 (4409)	204.4
15680 (138874)	15	25	1.0	1.0	1960 (17359)	20580 (182272)	39200 (347185)	29400 (6614)	245.9