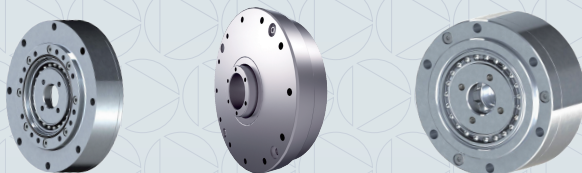


D Series



HARMONIC REDUCERS

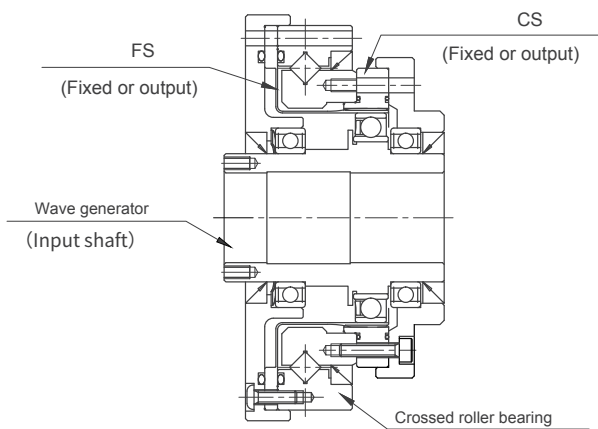
D Series Compact Flexspline

- ◻ **Very compact size with large transmittable torque.**
- ◻ **High transmission accuracy with zero backlash.**
- ◻ **Ideal when compactness is priority.**

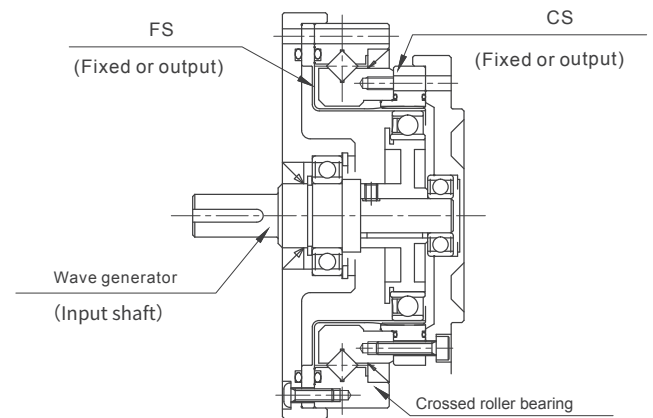
DHD-R Series (rigid joint)	p.3 - 7
DHD-H Series (hollow shaft)	p. 8 - 10
DCD-R Series (rigid joint)	p. 11 - 13

HARMONIC REDUCERS

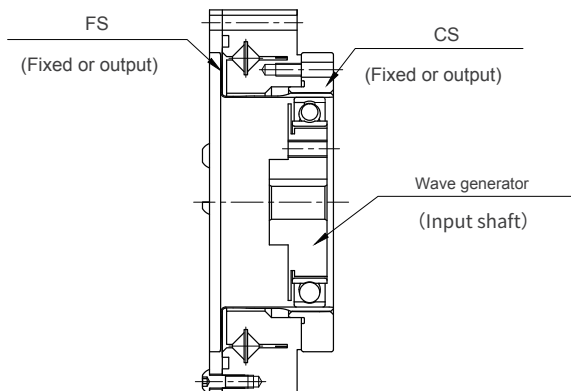
DESIGN OF INPUT CONNECTION



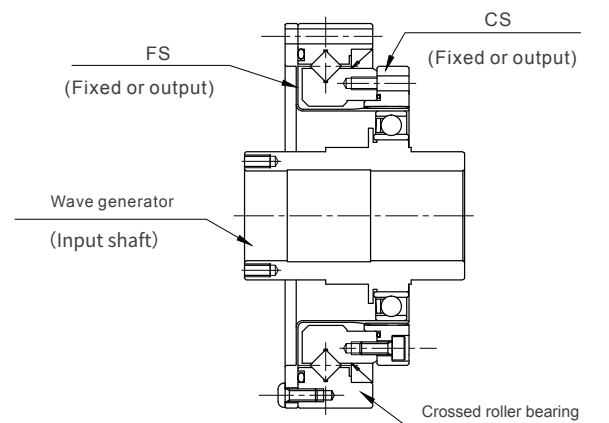
Hollow Shaft (H)



Solid Shaft (S)



Rigid Joint (R)



Simplified Hollow Shaft

NAMING RULE:

DHSG-14-50-U-H21

SHAPE OF GEARBOX
H: Hat shape | C: Cup shape

LENGTH OF FLEXSPLINE
S: Standard | D: Compact

TORQUE
G: high torque | Omitted: Standard torque

MODEL SIZE

HOLE OR SHAFT SIZE (mm)

DESIGN OF INPUT JOINT
H: Hollow shaft | S: Solid shaft | R: Rigid joint

STRUCTURE CODE
U: Module | C: Component

REDUCTION RATIO

RATING TABLE

Size	Ratio	Rated torque at 2000rpm(Nm)	limit for repeated peak torque(Nm)	Limit for average torque(Nm)	Limit for momentary peak torque(Nm)	Maximum input speed(r/min)	Limit for average input speed(r/min)
14	50	3.7	12	4.8	23	8500	3500
	80	5.4	16	7.7	35		
	100	5.4	19	7.7	35		
17	50	11	23	18	48	7300	3500
	80	15	29	19	61		
	100	16	37	27	71		
	120	16	37	27	71		
20	50	17	39	24	69	6500	3500
	80	24	51	33	89		
	100	28	57	34	95		
	120	28	60	34	95		
	160	28	64	34	95		
25	50	27	69	38	127	5600	3500
	80	44	96	60	179		
	100	47	110	75	184		
	120	47	117	75	204		
	160	47	123	75	204		
32	50	53	151	75	268	4800	3500
	80	83	213	117	398		
	100	96	233	151	420		
	120	96	247	151	445		
	160	96	261	151	445		

POSITIONAL ACCURACY

Ratio \ Size	Unit	14	17	20	25	32
Reduction ratio	arc s ec	90	90	60	60	60

HYSTERESIS LOSS

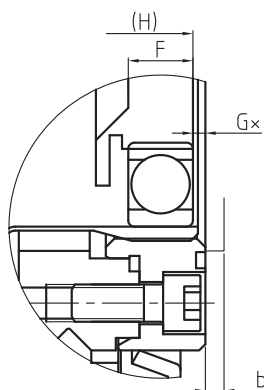
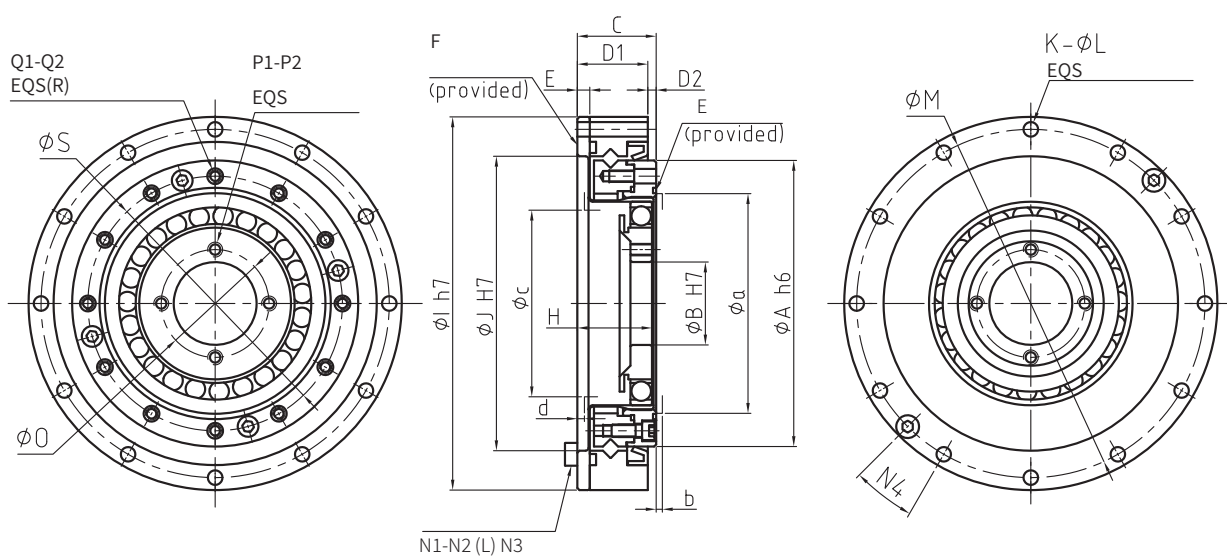
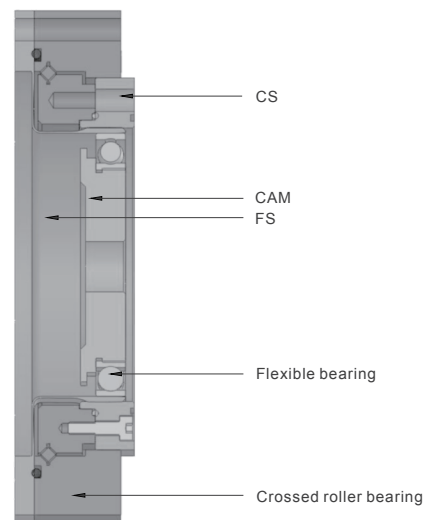
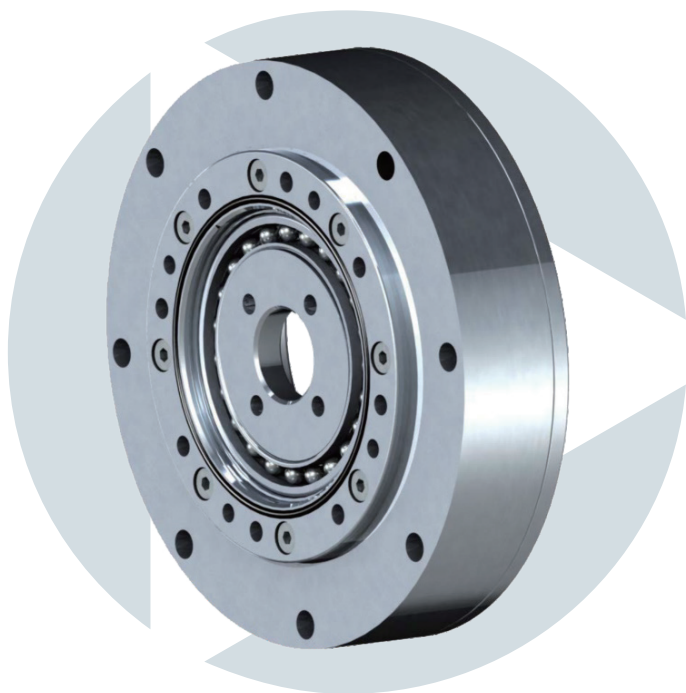
Ratio \ Size	Unit	14	17	20	25	32
50	arc min	2.5	2.0	2.0	2.0	2.0
80 or more	arc min	2.0	1.0	1.0	1.0	1.0

TORSIONAL STIFFNESS

Ratio \ Size			14	17	20	25	32
T ₁		Nm	2.0	3.9	7.0	14	29
T ₂		Nm	6.9	12	25	48	108
Reduction ratio 50	K ₁	Nm/arc min	0.9	2.1	3.4	6.4	15.0
	K ₂	Nm/arc min	1.15	2.8	4.3	8.6	19.4
	K ₃	Nm/arc min	1.5	3.6	6.4	11.8	26.9
Reduction ratio 80 or more	K ₁	Nm/arc min	1.25	2.7	4.3	8.6	19.4
	K ₂	Nm/arc min	1.4	3.0	5.3	11.8	24.7
	K ₃	Nm/arc min	1.9	4.2	8.0	15.0	35.5

DHD SERIES HARMONIC REDUCERS

DHD-R SERIES



DIMENSIONS

Unit:mm

Symbol \ Size	14	17	20	25	32
φ A h6	49	59	69	84	110
φ B H7	11	15	20	24	32
C	17.5	18.5	19	22	27.9
D 1	15.5	16.5	17	20	23.6
D 2	2	2	2	2	4.3
E	2.4	3	3	3.3	3.6
F	4	5	5.2	6.3	9.6
G *	1.9 ± 0.1	1.7 ± 0.1	1 ± 0.1	0.5 ± 0.1	0.6 ± 0.1
H *	15.6	16.8	18	21.5	27.2
φ I h7	70	80	90	110	142
φ J H7	50	61	71	88	114
K	8	12	12	12	12
φ L	3.5	3.5	3.5	4.5	5.5
φ M	64	74	84	102	132
N 1	2	2	2	4	4
N 2	M 3	M 3	M 3	M 3	M 4
N 3	6	6	6	8	10
N 4	22.5°	15°	15°	15°	15°
φ O	17	21	26	30	40
P 1	4	4	4	4	4
P 2	M 3	M 3	M 3	M 3	M 4
Q 1	8	12	12	12	12
Q 2	M 3x5	M 3x6	M 3x6	M 4x6	M 5x8
R	-	φ 3.5x5.5	φ 3.5x5.5	φ 4.5x6	φ 5.5x10.8
φ S	43	52	61.4	76	99
φ a	36.5	45	53	66	86
b	1	1	1.5	1.5	2
φ c	31	38	45	56	73
d	1.4	1.8	1.7	1.8	1.8
e	O-Ring 37*0.6	O-Ring 45*0.5	O-Ring 52*0.7	O-Ring 66.5*1.3	O-Ring 85*2
f	O-Ring 53*1	O-Ring 63.5*1	O-Ring 74*1	O-Ring 91*1	O-Ring 118*1
weight(kg)	0.33	0.42	0.52	0.91	1.87

Notes: 1. As size G shall affect the performance and strength, so please strictly observe it.

2. Since the FS will be deformed elastically, in order to prevent it from coming into contact with the housing, please pay attention to the four sizes φa, b, φc, and d.

DHD SERIES HARMONIC REDUCERS

DHD-R SERIES

MOMENT OF INERTIA

Size Parameter	14	17	20	25	32
Moment of inertia ($\times 10^{-4} \text{kgm}^2$)	0.021	0.054	0.090	0.282	1.090

STARTING TORQUE

Unit:cNm

Size Ratio	14	17	20	25	32
50	6.2	10	13	26	51
80	5	8.8	10.8	20	42
100	4.8	7.4	9.4	17.6	40
120	-	6.8	8.4	16	34
160	-	-	7.2	13.8	30

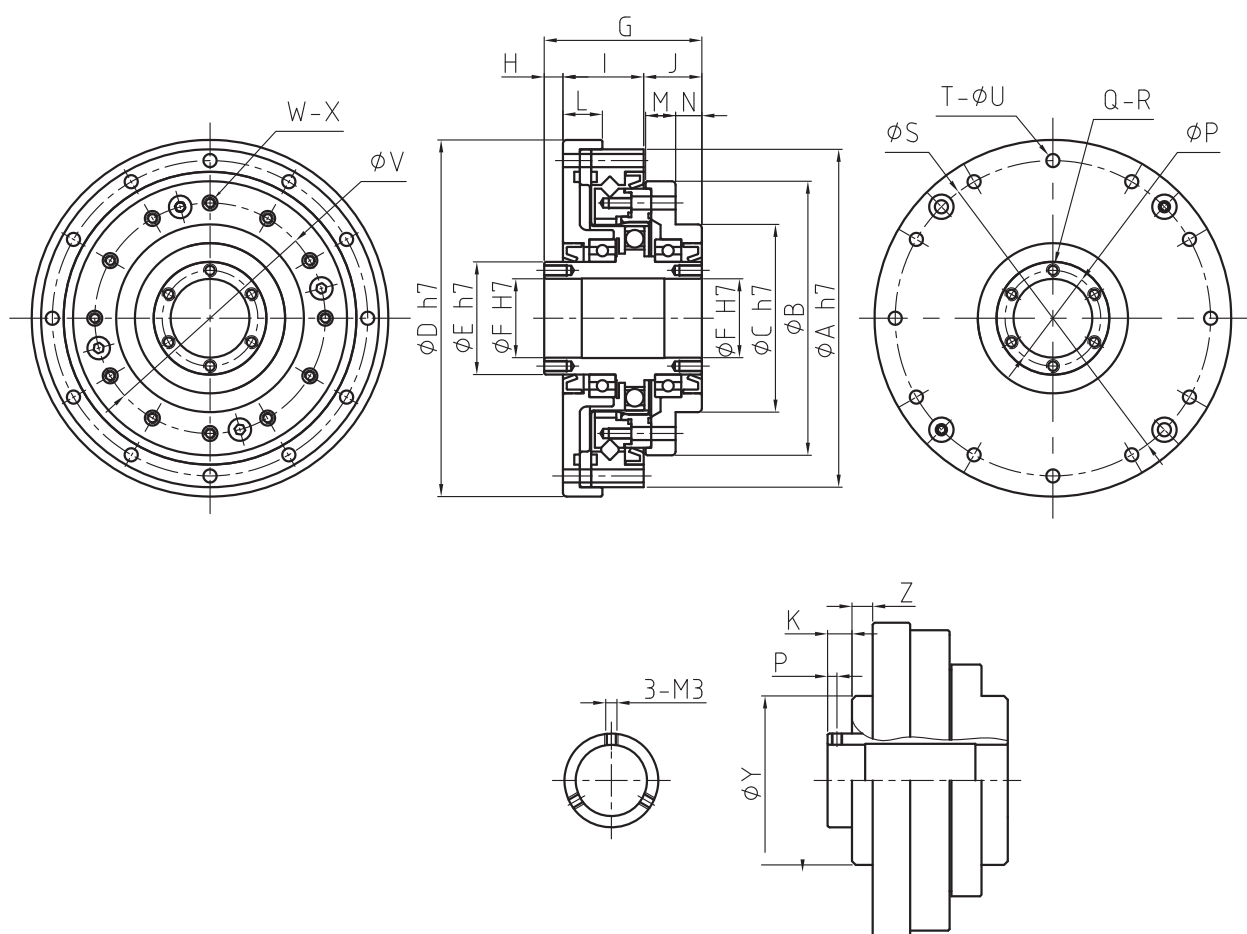
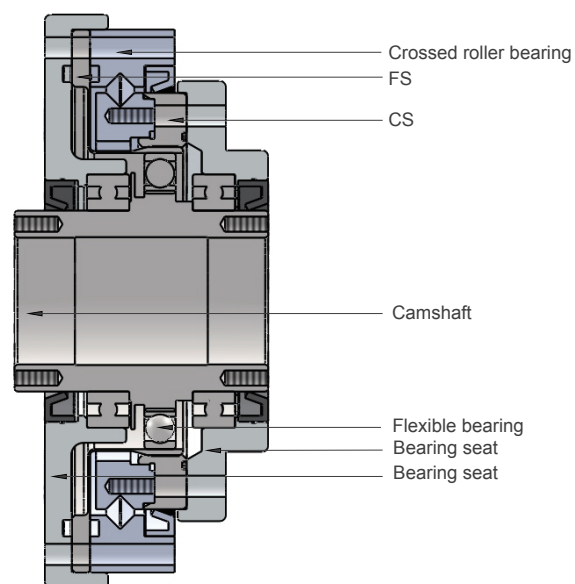
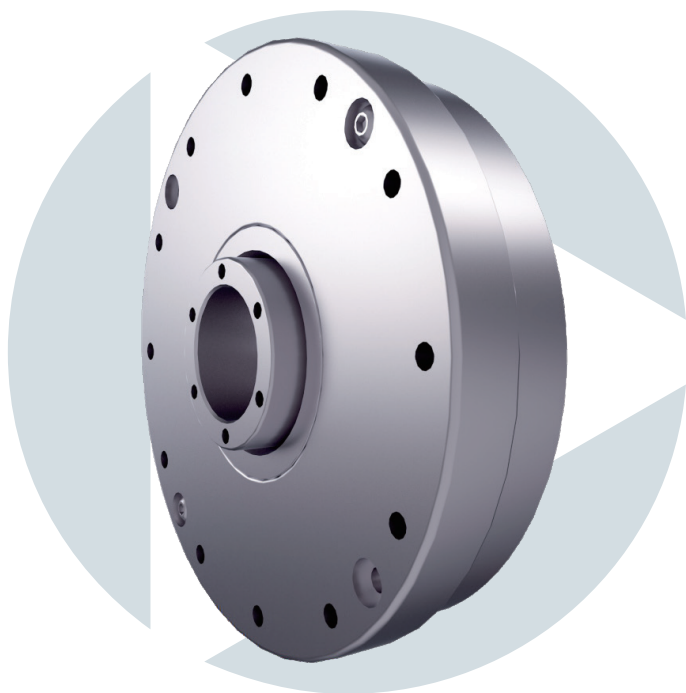
BACKDRIVING TORQUE

Unit:Nm

Size Ratio	14	17	20	25	32
50	3.7	11	15	24	36
80	4.3	15	21	32	46
100	5.8	21	27	41	60
120	-	28	33	51	68
160	-	-	42	64	91

DHD SERIES HARMONIC REDUCERS

DHD-H SERIES



Shape of input part of size 14,17

DIMENSIONS

Unit:mm

Size Symbol	14	17	20	25	32
ϕ A h7	70	80	90	110	142
ϕ B	52	62	73	87	114
ϕ C h7	36	45	50	60	75
ϕ D h7	74	84	95	115	147
ϕ E h7	20	25	30	38	54
ϕ F H7	14	19	21	29	41
G	45.5	48	42	46.5	55
H	-	-	5	6	7
I	19.5	20.5	21.5	24	28.6
J	14	15.5	15.5	16.5	19.4
K	6.5	6.5	-	-	-
L	9	10	10.5	10.5	12
M	7	8	8	10	11
N	6.5	7	7	6	7.5
ϕ P (P)	(2.5)	(2.5)	25.5	33.5	48
Q	3	3	6	6	6
R	M 3	M 3	M 3 \times 6	M 3 \times 6	M 3 \times 6
ϕ S	64	74	84	102	132
T	8	12	12	12	12
ϕ U	3.5	3.5	3.5	4.5	5.5
ϕ V	43	52	61.4	76	99
W	8	12	12	12	12
X	M 3 \times 5	M 3 \times 5	M 3 \times 6	M 4 \times 6	M 5 \times 8
	ϕ 3.5 \times 5.5	ϕ 3.5 \times 12.5	ϕ 3.5 \times 11.8	ϕ 4.5 \times 14.5	ϕ 5.5 \times 19.7
ϕ Y	36	45	-	-	-
Z	5.5	5.5	-	-	-
weight(kg)	0.49	0.66	0.84	1.4	2.7

MOMENT OF INERTIA

Size Parameter	14	17	20	25	32
Moment of inertia ($\times 10^{-4} \text{kgm}^2$)	0.064	0.141	0.271	0.793	2.900

STARTING TORQUE

Unit:cNm

Size Ratio	14	17	20	25	32
50	10.2	20	27	46	78
80	9	18.8	25	40	69
100	8.8	17.4	24	38	67
120	-	16.8	23	36	61
160	-	-	21	34	57

BACKDRIVING TORQUE

Unit:Nm

Size Ratio	14	17	20	25	32
50	6	21	29	44	63
80	7.1	28	41	60	84
100	9.7	41	54	80	111
120	-	51	65	99	126
160	-	-	84	126	171

RATING TABLE

Size	Ratio	Rated torque at 2000rpm(Nm)	limit for repeated peak torque(Nm)	Limit for average torque(Nm)	Limit for momentary peak torque(Nm)	Maximum input speed(r/min)	Limit for average input speed(r/min)
14	50	3.7	12	4.8	24	8500	3500
	80	5.4	16	7.7	35		
	100	5.4	19	7.7	35		
17	50	11	23	18	48	7300	3500
	80	15	29	19	61		
	100	16	37	27	71		
	120	16	37	27	71		
20	50	17	39	24	69	6500	3500
	80	24	51	33	89		
	100	28	57	34	95		
	120	28	60	34	95		
	160	28	64	34	95		
25	50	27	69	38	127	5600	3500
	80	44	96	60	179		
	100	47	110	75	184		
	120	47	117	75	204		
	160	47	123	75	204		
32	50	53	151	75	268	4800	3500
	80	83	213	117	398		
	100	96	233	151	420		
	120	96	247	151	445		
	160	96	261	151	445		

POSITIONAL ACCURACY

Ratio \ Size	Unit	14	17	20	25	32
Reduction ratio	rc s ec	90	90	60	60	60

HYSTERESIS LOSS

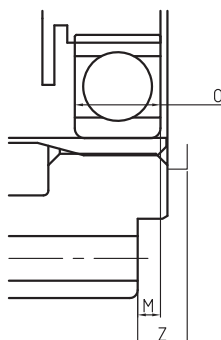
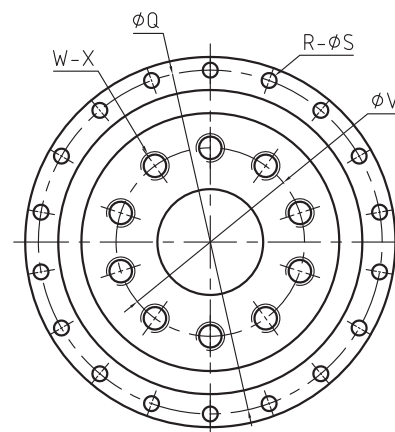
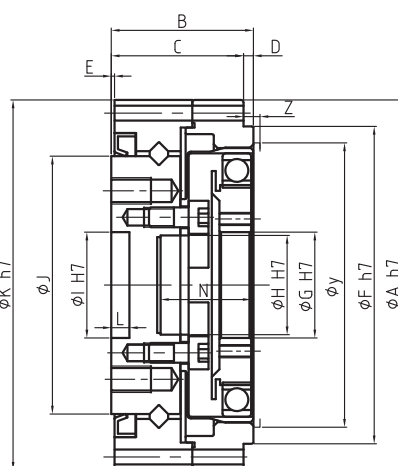
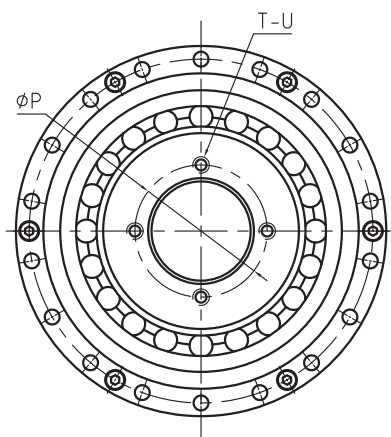
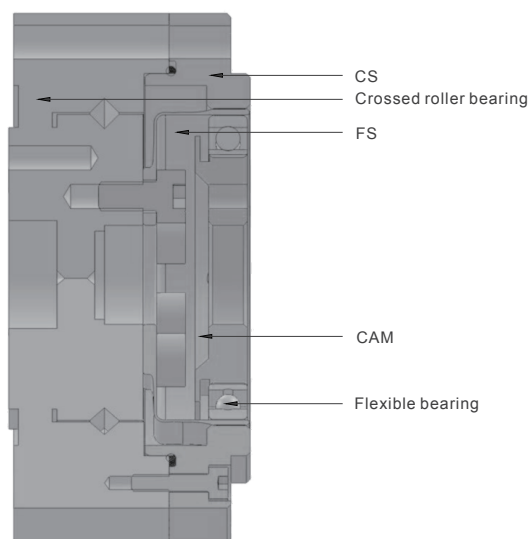
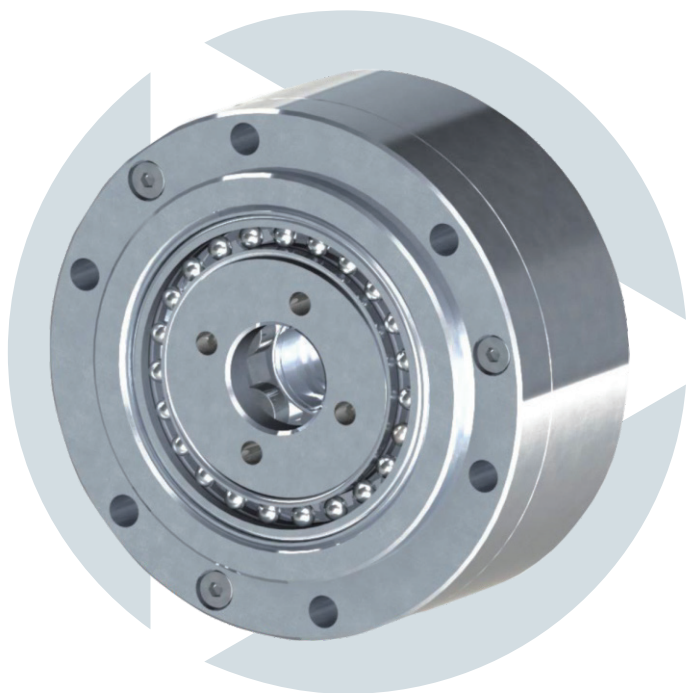
Ratio \ Size	Unit	14	17	20	25	32
50	arc min	2.5	1.5	1.5	1.5	1.5
80 or more	arc min	2.0	1.0	1.0	1.0	1.0

TORSIONAL STIFFNESS

Size \ Ratio			14	17	20	25	32
T ₁		Nm	2.0	3.9	7.0	14	29
T ₂		Nm	6.9	12	25	48	108
Reduction ratio 50	K ₁	Nm/arc min	0.9	2.1	3.4	6.4	15.0
	K ₂	Nm/arc min	1.15	2.8	4.3	8.6	19.4
	K ₃	Nm/arc min	1.5	3.6	6.4	11.8	26.9
Reduction ratio 80 or more	K ₁	Nm/arc min	1.25	2.7	4.3	8.6	19.4
	K ₂	Nm/arc min	1.4	3.0	5.3	11.8	28.7
	K ₃	Nm/arc min	1.9	4.2	8.0	15.0	35.5

DCD SERIES HARMONIC REDUCERS

DCD-R SERIES



DIMENSIONS

Unit:mm

Symbol \ Size	14	17	20	25	32
ϕ A h7	55	62	70	85	112
B	25	26.5	29.7	37.1	43
C	23	24.5	27.5	34.1	40
D	2	2	2	3	3
E	0.5	0.5	0.5	0.5	1
ϕ F h7	42.5	49.5	58	73	96
ϕ G H7	11	15	20	24	32
ϕ H H7	11	11	16	20	30
ϕ I H7	12	14	18	24	32
ϕ J	31	37.3	44	58	78
ϕ K h7	55	62	70	85	112
L	5	5	5	5.5	5.5
M	1.5 ± 0.1	1.5 ± 0.1	1.5 ± 0.1	2.5 ± 0.1	2.3 ± 0.1
N	14.6	16.1	18.6	23.7	27.4
O	4	5	5.2	6.3	9.6
ϕ P	17	21	26	30	40
ϕ Q	49	56	64	79	104
R	6	10	12	18	18
ϕ S	3.5	3.5	3.5	3.4	4.5
T	4	4	4	4	4
U	M3	M3	M3	M3	M4
ϕ V	25	27	34	42	57
W	10	8	8	8	10
X	M3X7	M5X8	M6X9	M8X12	M8X12
ϕ y	38	45	53	66	86
Z	3	3	3.5	4.5	5
weight(kg)	0.35	0.46	0.65	1.2	2.4

Notes: 1. As size M shall affect the performance and strength, so please strictly observe it.

2. Since the FS will be deformed elastically, in order to prevent it from coming into contact with the housing, please pay attention to the two sizes Z, ϕ Y.

MOMENT OF INERTIA

Size Parameter	14	17	20	25	32
Moment of inertia ($\times 10^{-4} \text{kgm}^2$)	0.021	0.054	0.090	0.282	1.090

STARTING TORQUE

Unit:cNm

Size Ratio	14	17	20	25	32
50	4.4	6.7	8.9	16	32
80	3.2	4.4	5.7	10	22
100	2.8	3.8	5.1	9.1	20
120	-	3.6	4.5	8.2	17
160	-	-	3.9	7.2	15

BACKDRIVING TORQUE

Unit:Nm

Size Ratio	14	17	20	25	32
50	2.9	4.3	5.2	9.5	19
80	2.9	4.1	5.7	10	21
100	3.5	4.6	6	11	23
120	-	5.1	6.4	12	24
160	-	-	7.4	13	30