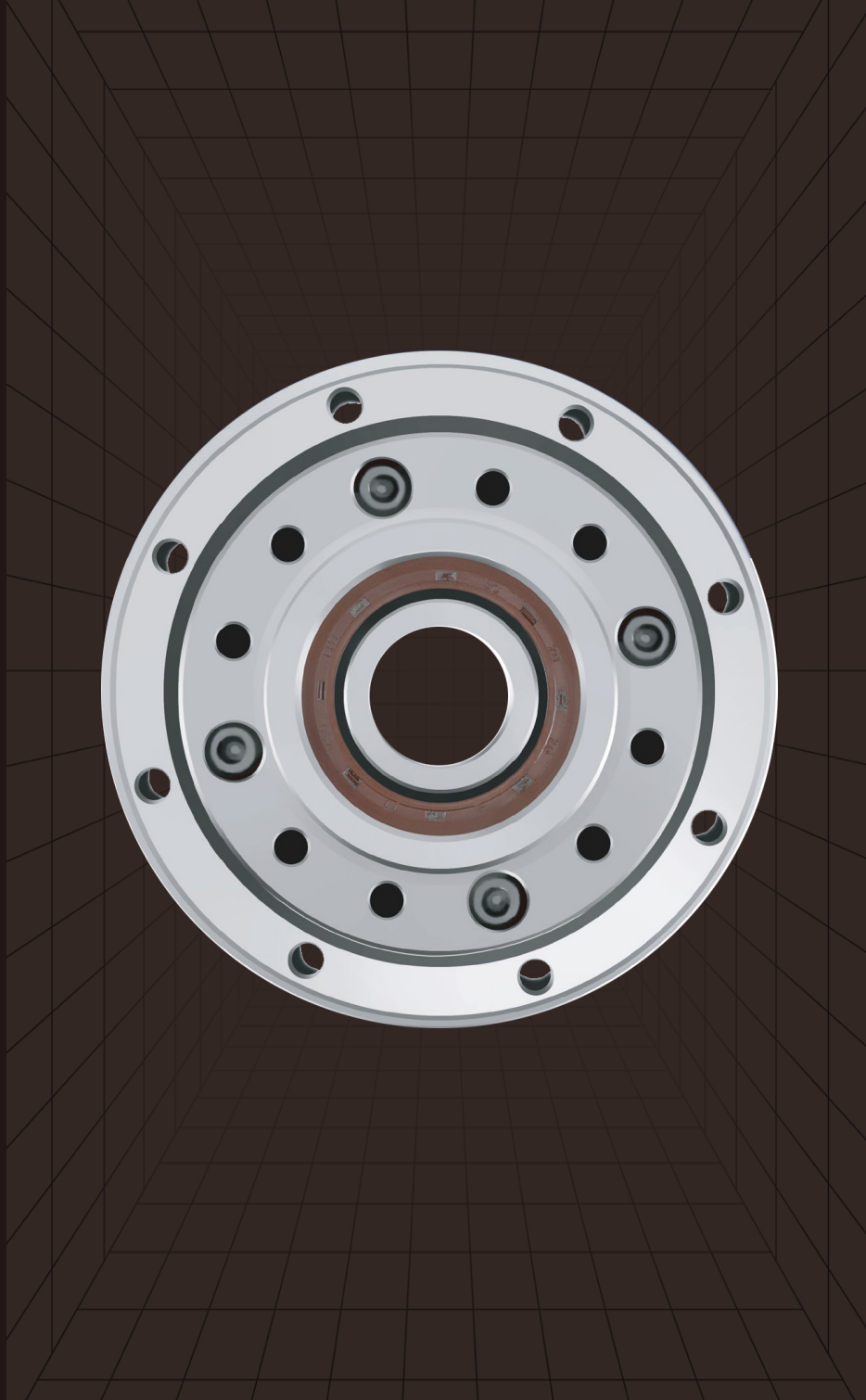




FH SERIES

INTRODUCTION OF FHD



FHD-I



FHD-III

FHD

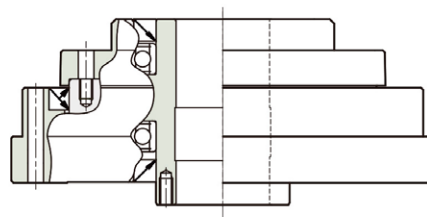
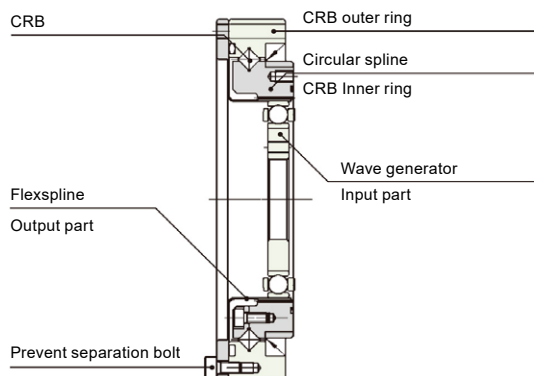
■ Introduction

FHD flexspline with flanging ultra short tube structure. Which can be used when circular spline fixed, and the flexspline as end output. It can also used to fix the flexspline, and the circular spline as end output. The axial length of FHD-I is shortened by 50%, FHD-III is shortened by 15% without changing product performance.

■ Application

- Humanoid robot
- Semiconductor manufacturing equipment
- FPD manufacturing equipment
- Industrial robot
- Space equipment

■ Unit type structure of FHD



TECHNICAL DATA OF FHD

Rating table of FHD

Model	Reduction ratio	Rated torque at input 2000r/min	Permissible peak torque at start/stop	Permissible max. value of ave.load torque	Instantaneous permissible max. torque	Permissible max. input rotational speed Grease lubricant	Permissible ave. input rotational speed Grease lubricant	Backlash	Weight	Design life
		N·m	N·m	N·m	N·m	r/min	r/min			
8	50	1.25	2.3	1.6	4.6	8500	3500	≤40	0.06	8000
	100	1.65	3.3	2.3	6.3					8000
11	50	2.4	5.8	3.5	11.5	8000	3500	≤30	0.13	8000
	100	3.5	7.7	6.2	17.5					8000
14	50	3.7	12	4.8	23	8500	3500	≤20	FHD-I:0.34 FHD-III:0.64	9000
	80	5.4	16	7.7	35					10000
	100	5.4	19	7.7	35					10000
17	50	11	23	18	48	7300	3500	≤20	FHD-I:0.42 FHD-III:0.87	9000
	80	15	29	19	61					10000
	100	16	37	27	71					10000
20	50	17	39	24	69	6500	3500	≤20	FHD-I:0.54 FHD-III:1.14	9000
	80	24	51	33	89					10000
	100	28	57	34	95					10000
25	50	27	69	38	127	5600	3500	≤20	FHD-I:0.95 FHD-III:1.75	9000
	80	44	96	60	179					10000
	100	47	110	75	184					10000
32	50	53	151	75	268	4800	3500	≤20	FHD-I:1.90 FHD-III:3.56	9000
	80	83	213	117	398					10000
	100	96	233	151	420					10000

Transmission accuracy

unit: arc min

Type Reduction ratio	8	11	14	17	20	25	32
50	2	2	1.5	1.5	1	1	1
above 50	2	2	1.5	1.5	1	1	1

Hysteresis loss

unit: arc min

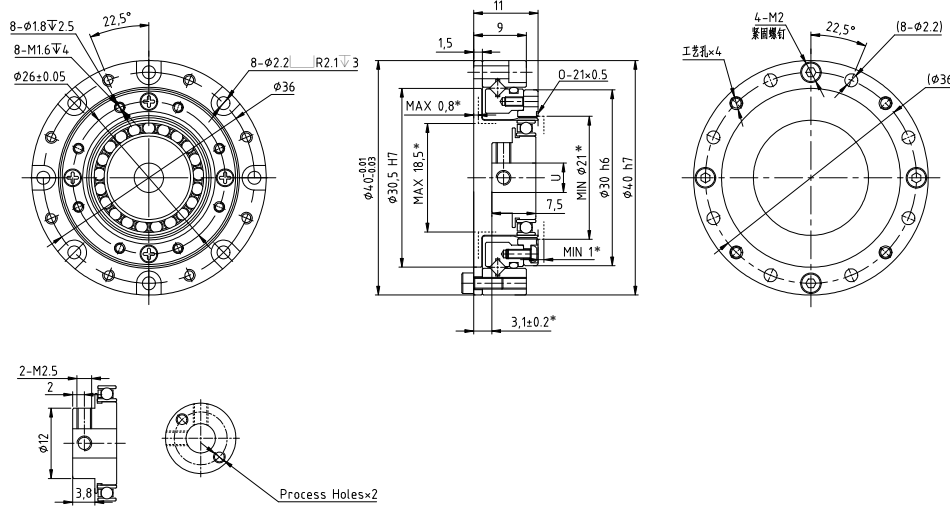
Type Reduction ratio	8	11	14	17	20	25	32
50	3.5	3	2.5	2	2	2	2
above 50	3	2.5	2	1	1	1	1

Torsional stiffness

Project		Type Unit	11	14	17	20	25	32	40
T1		Nm	0.29	0.8	2	3.9	7	14	29
T2		Nm	0.75	2	6.9	12	25	48	108
Reduction ratio 50	K1	× 10 ⁴ Nm/rad	0.037	0.19	0.29	0.67	1.1	2	4.7
	K2	× 10 ⁴ Nm/rad	0.051	0.23	0.37	0.88	1.3	2.7	6.1
	K3	× 10 ⁴ Nm/rad	0.071	0.27	0.47	1.2	2	3.7	8.4
Reduction ratio above 50	K1	× 10 ⁴ Nm/rad	0.073	0.23	0.4	0.84	1.3	2.7	6.1
	K2	× 10 ⁴ Nm/rad	0.077	0.26	0.44	0.94	1.7	3.7	7.8
	K3	× 10 ⁴ Nm/rad	0.1	0.37	0.61	1.3	2.5	4.7	11

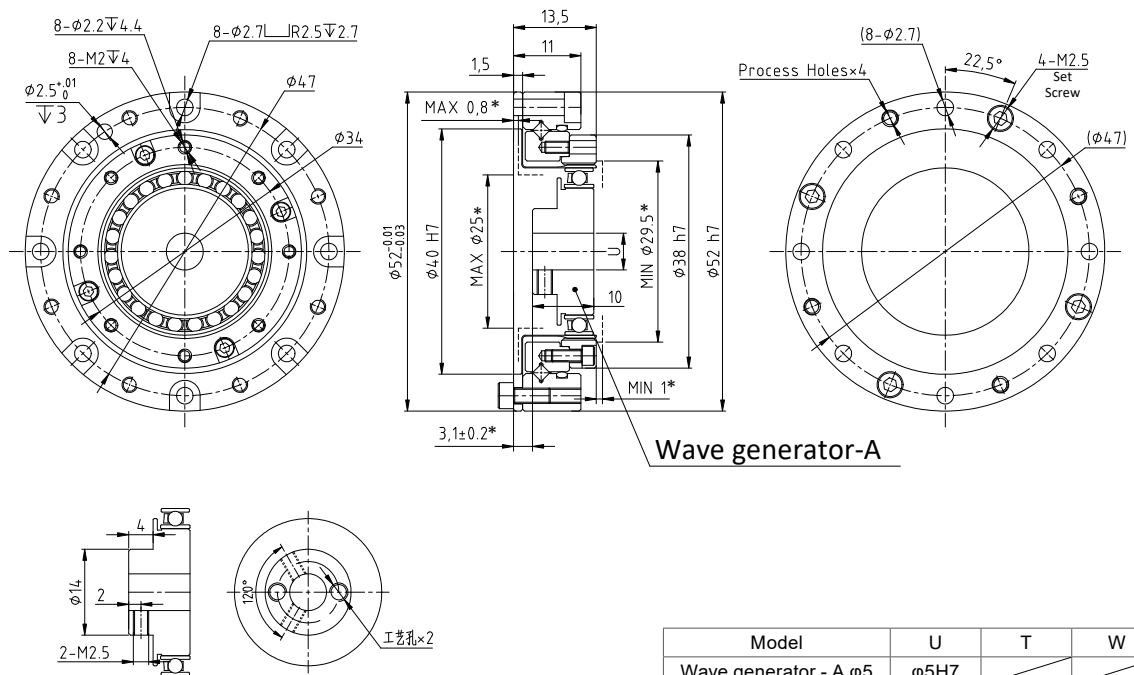
OUTLINE DRAWING

FHD-8-XX-U-I



Model	U	T	W
Wave generator - A φ5	φ5H7		

FHD-11-XX-U-I



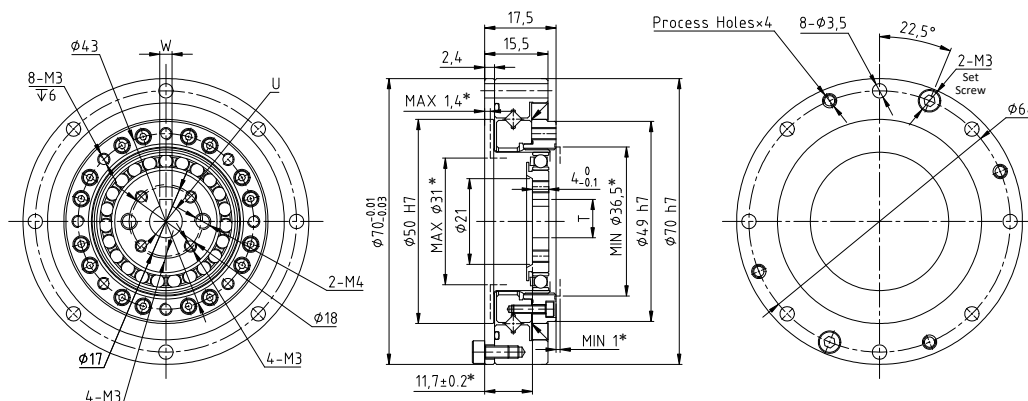
Wave generator-A

Model	U	T	W
Wave generator - A φ5	φ5H7		
Wave generator - A φ6	φ6H7		

Model	Reduction ratio	Rated torque at input 2000r/min		Permissible peak torque at start/stop		Permissible max. value of ave. load torque		Instantaneous permissible max. torque		Permissible max. input rotational speed	Permissible ave. input rotational speed	Backlash	Weight	Design life
		N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m	r/min	r/min	Arc Sec	kg	Hour
8	50	1.25	0.13	2.3	0.23	1.6	0.16	4.6	0.47	8000	3500	≤40	0.06	8000
	100	1.65	0.17	3.3	0.34	2.3	0.23	6.3	0.64					8000
11	50	2.4	0.24	5.8	0.59	3.5	0.36	11.5	1.17	8000	3500	≤30	0.13	8000
	100	3.5	0.36	7.7	0.79	6.2	0.63	17.5	1.79					8000

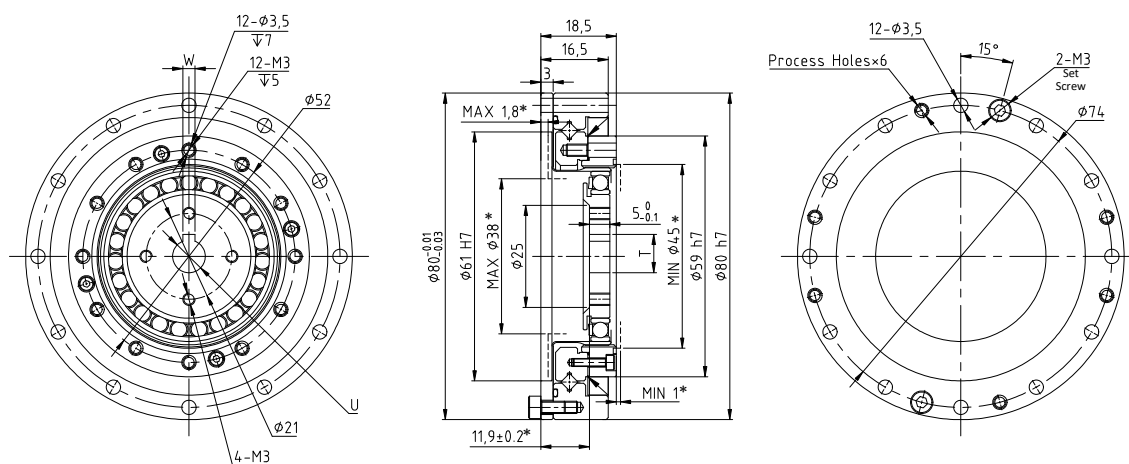
OUTLINE DRAWING

FHD-14-XX-U-I



Model	U	T	W
Wave generator - A $\phi 6$	$\phi 6H7$	$7^{+0.1}_0$	2JS9/P9
Wave generator - A $\phi 8$	$\phi 6H7$	$9.4^{+0.1}_0$	3JS9/P9
Wave generator - A $\phi 11$	$\phi 8H7$		

FHD-17-XX-U-I

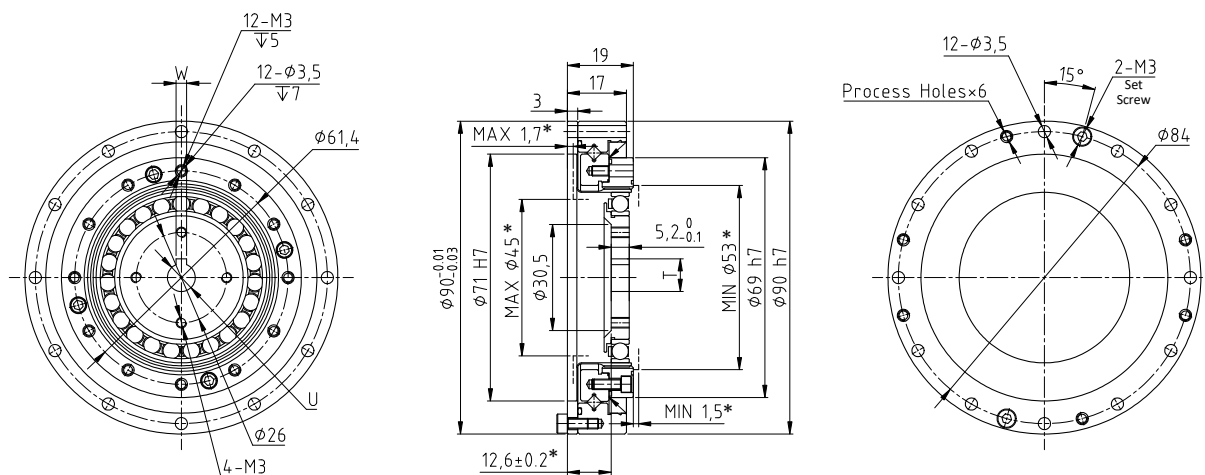


Model	U	T	W
Wave generator - A $\phi 6$	$\phi 6H7$	$7^{+0.1}_0$	2JS9/P9
Wave generator - A $\phi 8$	$\phi 8H7$	$9.4^{+0.1}_0$	3JS9/P9
Wave generator - A $\phi 11$	$\phi 11H7$		
Wave generator - A $\phi 15$	$\phi 15H7$		

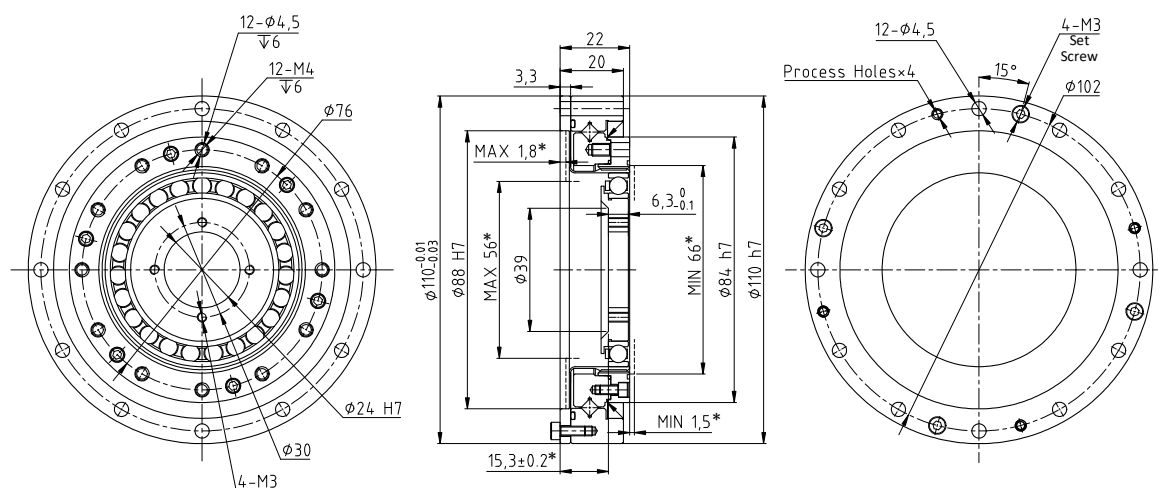
Model	Reduction ratio	Rated torque at input 2000r/min		Permissible peak torque at start/stop		Permissible max. value of ave. load torque		Instantaneous permissible max. torque		Permissible max. input rotational speed	Permissible ave. input rotational speed	Backlash	Weight	Design life
		N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m					
14	50	3.7	0.38	12	1.2	4.8	0.49	24	2.4	8500	3500	≤ 20	0.34	9000
	80	5.4	0.55	16	1.6	7.7	0.79	35	3.6					10000
	100	5.4	0.55	19	1.9	7.7	0.79	35	3.6					10000
17	50	11	1.1	23	2.3	18	1.8	48	4.9	7300	3500	≤ 20	0.42	9000
	80	15	1.5	29	3	19	1.9	61	6.2					10000
	100	16	1.6	37	3.8	27	2.8	71	7.2					10000

OUTLINE DRAWING

FHD-20-XX-U-I



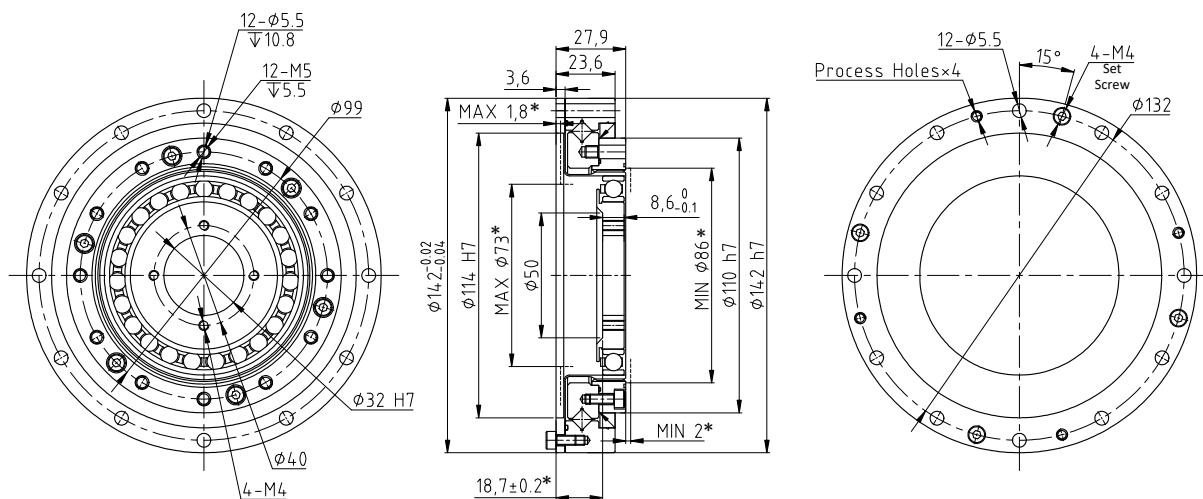
FHD-25-XX-U-I



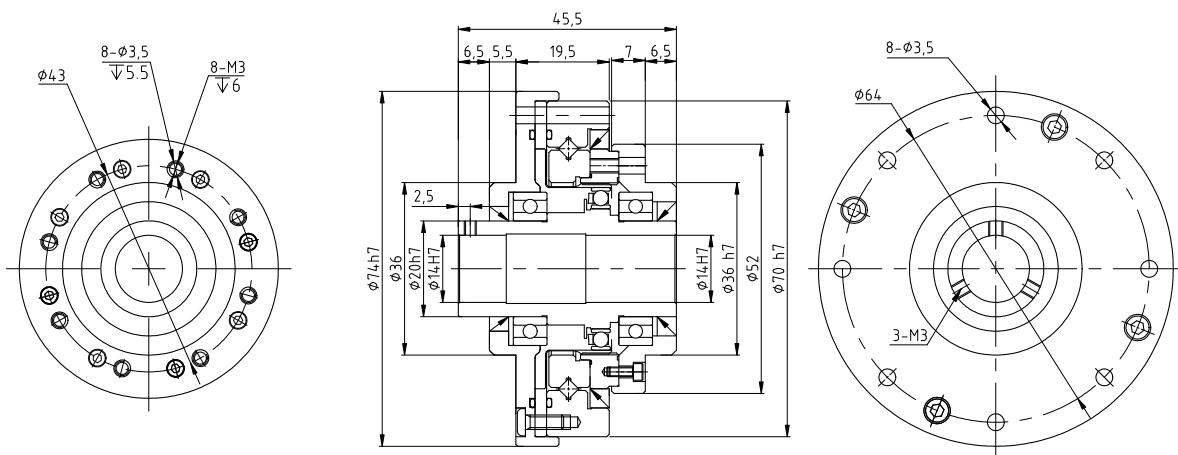
Model	Reduction ratio	Rated torque at input 2000r/min		Permissible peak torque at start/stop		Permissible max. value of ave. load torque		Instantaneous permissible max. torque		Permissible max. input rotational speed	Permissible ave. input rotational speed	Backlash	Weight	Design life
		N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m	r/min	r/min	Arc Sec	kg	Hour
20	50	17	1.7	39	4	24	2.4	69	7	6500	3500	≤ 20	0.54	9000
	80	24	2.4	51	5.2	33	3.4	89	9.1					10000
	100	28	2.9	57	5.8	34	3.5	95	9.7					10000
25	50	27	2.8	69	7	38	3.9	127	13	5600	3500	≤ 20	0.95	9000
	80	44	4.5	96	9.8	60	6.1	179	18					10000
	100	47	4.8	110	11	75	7.6	184	19					10000

OUTLINE DRAWING

FHD-32-XX-U-I



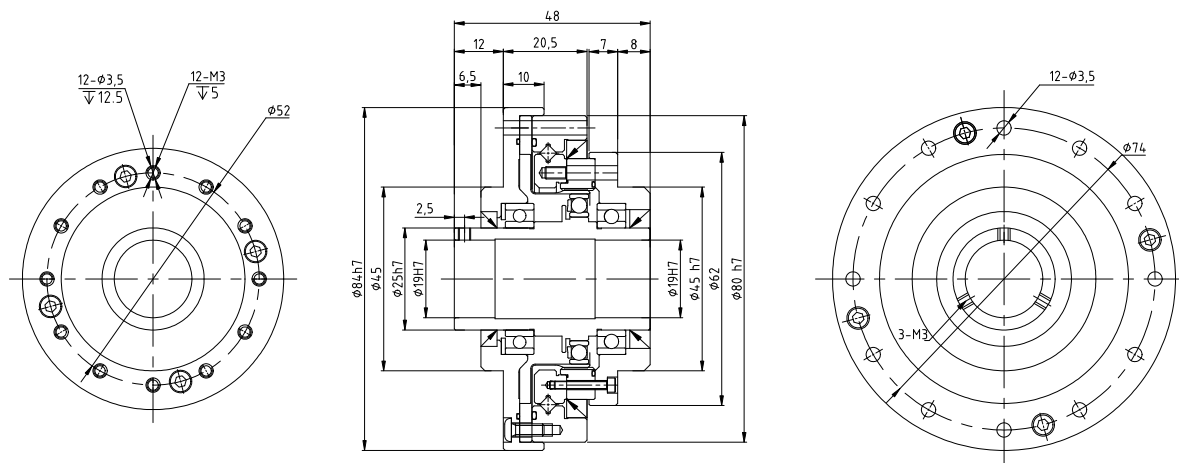
FHD-14-XX-U-III



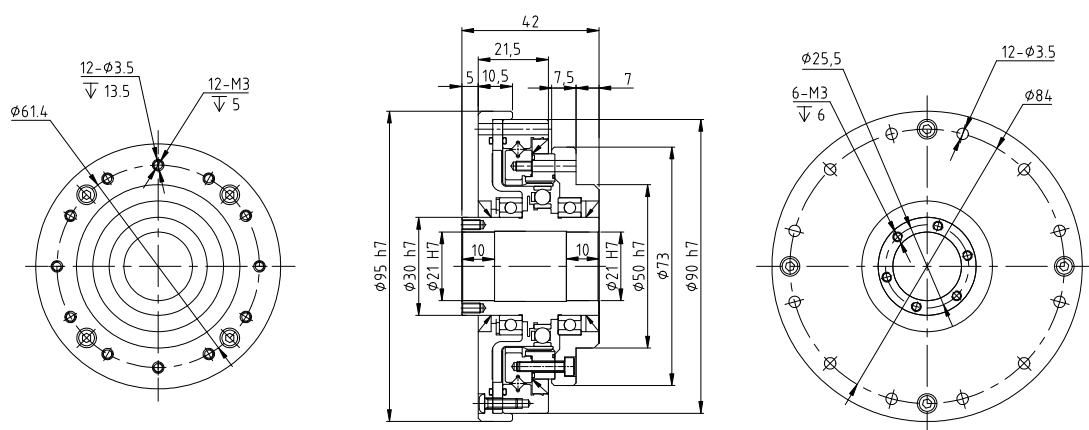
Model	Reduction ratio	Rated torque at input 2000r/min		Permissible peak torque at start/stop		Permissible max. value of ave. load torque		Instantaneous permissible max. torque		Permissible max. input rotational speed	Permissible ave. input rotational speed	Backlash	Weight	Design life
		N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m	r/min	r/min	Arc Sec	kg	Hour
32	50	53	5.4	151	15	75	7.6	268	27	4800	3500	≤ 20	1.9	9000
	80	83	8.5	213	22	117	12	398	41					10000
	100	96	9.8	233	24	151	15	420	43					10000
14	50	3.7	0.38	12	1.2	4.8	0.49	24	2.4	8500	3500	≤ 20	0.64	9000
	80	5.4	0.55	16	1.6	7.7	0.79	35	3.6					10000
	100	5.4	0.55	19	1.9	7.7	0.79	35	3.6					10000

OUTLINE DRAWING

FHD-17-XX-U-III



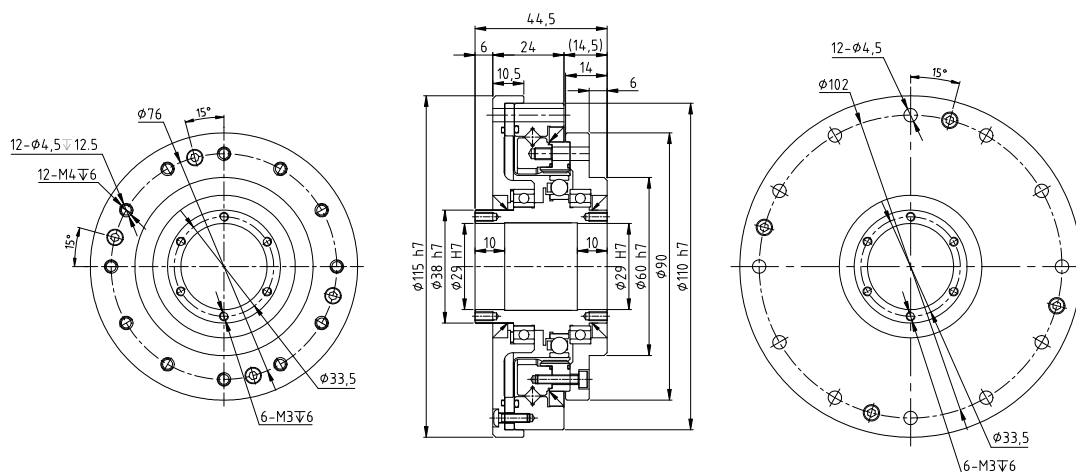
FHD-20-XX-U-III



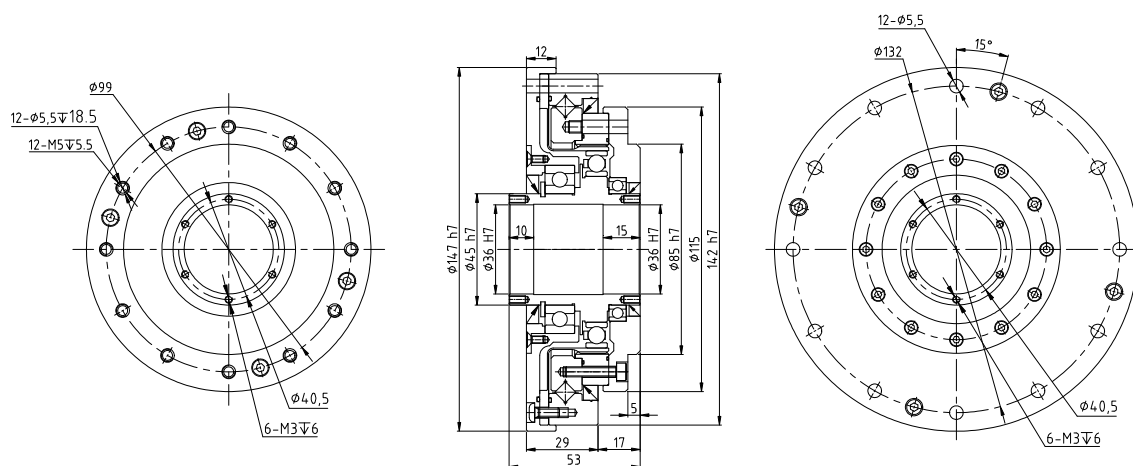
Model	Reduction ratio	Rated torque at input 2000r/min		Permissible peak torque at start/stop		Permissible max. value of ave. load torque		Instantaneous permissible max. torque		Permissible max. input rotational speed	Permissible ave. input rotational speed	Backlash	Weight	Design life
		N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m	r/min	r/min	Arc Sec	kg	Hour
17	50	11	1.1	23	2.3	18	1.8	48	4.9	7300	3500	≤ 20	0.87	9000
	80	15	1.5	29	3	19	1.9	61	6.2					10000
	100	16	1.6	37	3.8	27	2.8	71	7.2					10000
20	50	17	1.7	39	4	24	2.4	69	7	6500	3500	≤ 20	1.14	9000
	80	24	2.4	51	5.2	33	3.4	89	9.1					10000
	100	28	2.9	57	5.8	34	3.5	95	9.7					10000

OUTLINE DRAWING

FHD-25-XX-U-III



FHD-32-XX-U-III



Model	Reduction ratio	Rated torque at input 2000r/min		Permissible peak torque at start/stop		Permissible max. value of ave.load torque		Instantaneous permissible max. torque		Permissible max. input rotational speed	Permissible ave. input rotational speed	Backlash	Weight	Design life
		N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m	N·m	Kgf·m	r/min	r/min	Arc Sec	kg	Hour
25	50	27	2.8	69	7	38	3.9	127	13	5600	3500	≤20	1.75	9000
	80	44	4.5	96	9.8	60	6.1	179	18					10000
	100	47	4.8	110	11	75	7.6	184	19					10000
32	50	53	5.4	151	15	75	7.6	268	27	4800	3500	≤20	3.56	9000
	80	83	8.5	213	22	117	12	398	41					10000
	100	96	9.8	233	24	151	15	420	43					10000