

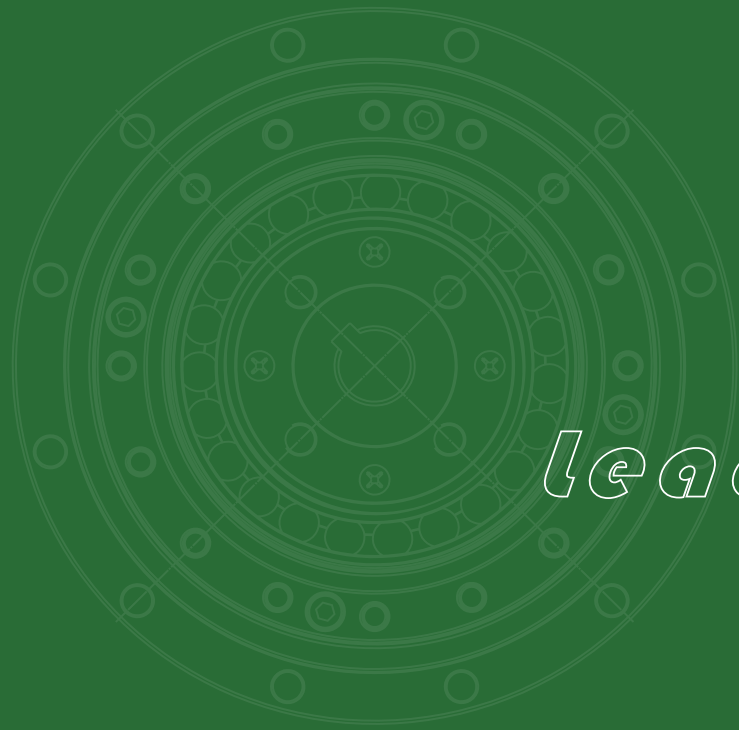


# CATALOG STRAIN WAVE REDUCER

*leaderdrive*®

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E-Mail: [verkauf@assag.ch](mailto:verkauf@assag.ch)

One of the participating companies for making new national industry standards



*leaderdrive*®

With five major technical breakthroughs, the company stands at the forefront of the strain wave reducer world

01

High torque

02

Smaller size and lighter weight

03

High efficiency and near-zero backlash

04

Long life

05

Unmatched stability at low speed

# Company Information

The Leader Harmonious Drive Systems Co., Ltd. was established in 2011 by Dr. Zuo as a company specializing in the research, design, and production of precision strain wave reducers. Located only 30 miles from Shanghai, Suzhou is a dynamic and modern city that promises economic growth in the coming years.

The corporate campus is composed of ten-thousand square meters of standard factory buildings that operate alongside an independent R&D center. Since its founding, the company has attracted top talents in the fields of engineering and strain wave technology. Their hard work and dedication has been validated through 16 national invention patents, 23 new national practical patents, and numerous awards. Collaborating with Jiangsu Reducer Quality Supervision and Inspection Center and Beijing Technology and Business University, Leader Harmonious Drive Co. Ltd proudly accepts the task of setting the national standards for the "Strain Wave Gear Drive Reducers for Robots."

With advanced engineering and manufacturing, the strain wave

reducers produced at Leader Company are cutting edge. The products are ideal for the most demanding of applications such as aerospace, industrial robotics, numerical control machines, semiconductor manufacturing, and precision mechanical control. Products are especially well suited for high precision, low speed, and high torque applications.

The vision of the founders is simple: to make the Leader Harmonious Drive Systems Co., Ltd. the global leader in the field of precision transmission.

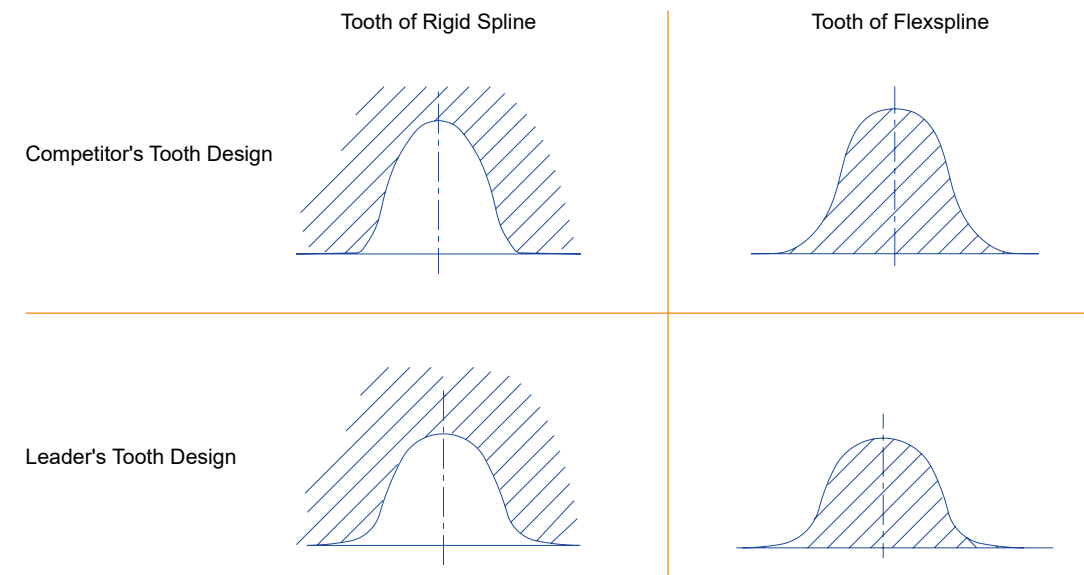
Leader Precision Drive Co., Ltd. is the international sale company of Leader Harmonious Drive Systems Co., Ltd. to provide a full range of services from product selection assistance to startup. Honesty, devotion, and diligence are our principles of customer services. Leader Precision Drive Co. Ltd has grown steadily over the years and is a respected and well-known distributor in the area of precision transmission.



## A Unique Perspective on Harmonic Gearing

Traditionally, the design of a rigid gear sold on the market is based on the the Conjugate Meshing Theory (Willis's Theorem). However, researchers at Leaderdrive have discovered that strain wave gearing meshing is more complex than that. Instead, strain wave gearing meshing can be more accurately described by the Geometric Mapping Theory of Curves. By incorporating this theory into the design, this patented technology has greatly improved the meshing of strain wave gearing, differentiating the product from competitors. The design can also be further extended to high ratio rigid reducers for better precision and control.

## The P-type Tooth Profile



## The unique P-type profile has distinctive advantages over a typical profile:

1. Lower profile reduces bending stress at the base to improve torque capacity.
2. Wide tooth base and streamlined profile transition reduces core stress concentration.
3. Lower profile reduces displacement and strain in the flexspine, leading to longer flexspline life.
4. 20 -30% of tooth surface is in meshing contact to reduce surface contact pressure.



# Model Number Rules

## Abbreviation for company

## Length Code of Flexspline

Code	Length
S	Standard
D	Dwarf

## Reduction Ratio

Note  
 1.30 50 80 100 120 160 are general reduction ratio  
 2.Reduction ratio can be designed according to customer's demand

## Structure Code

Code	Structure
C	Complete type
P	Component type
CL	Light weight of complete type

**L C S G — 14 ——— 50 — C — II**

## Shape Code of Flexspline

Code	Shape
C	Cup
H	Hollow

## Torque Code of Model

Code	Torque
G	High
null	Normal

## P.D.D of Flexible Gear

Code	PDD (mm)
14	35.6
17	43.2
20	50.8
25	63.5
32	81.3
40	102
50	127
58	147

## Connection Type

Between input end and cam of wave generator

Code	Type
I	Standard type
II	Cross slipper type coupling
III	Hollow shaft type
IV	Shaft input type



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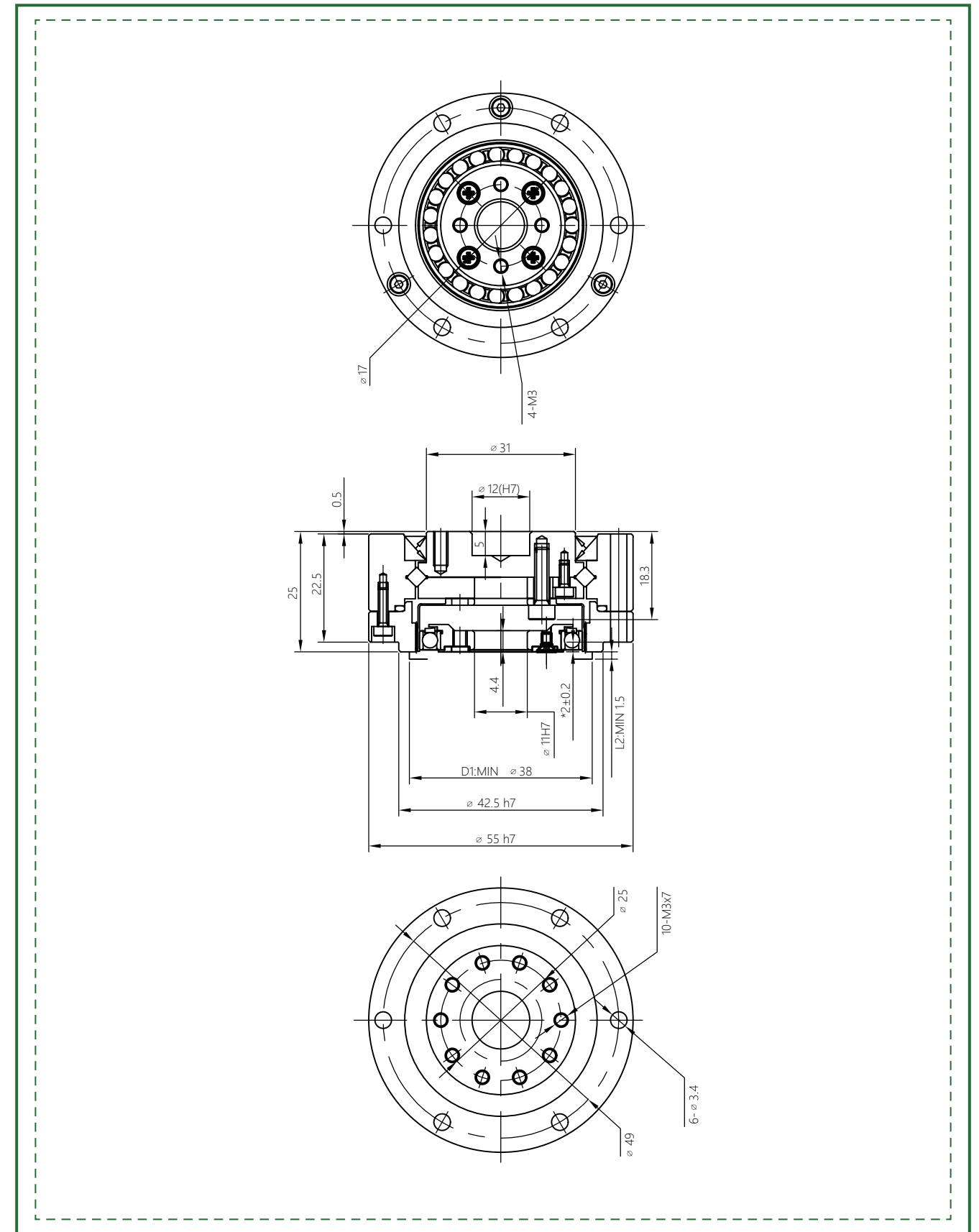
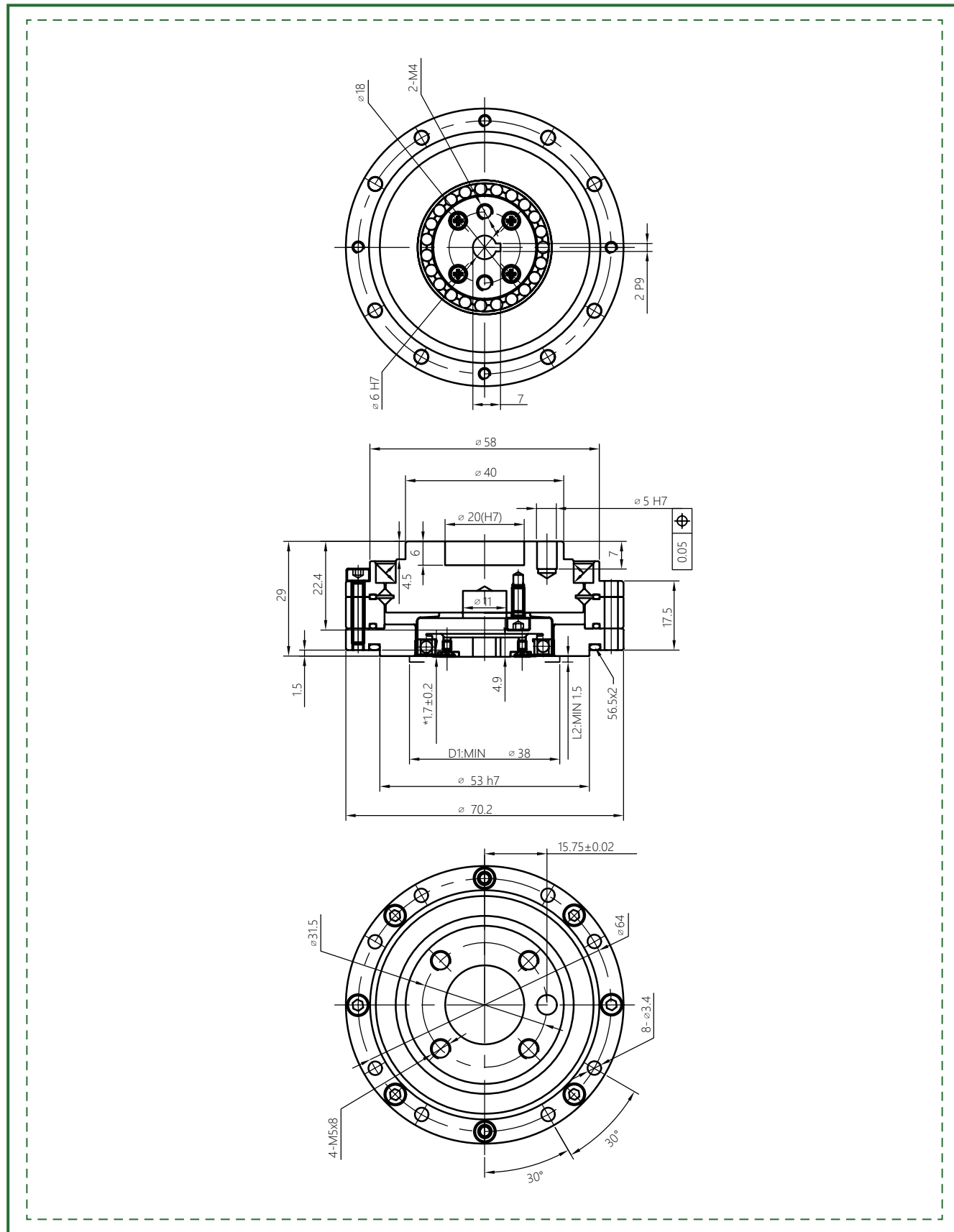
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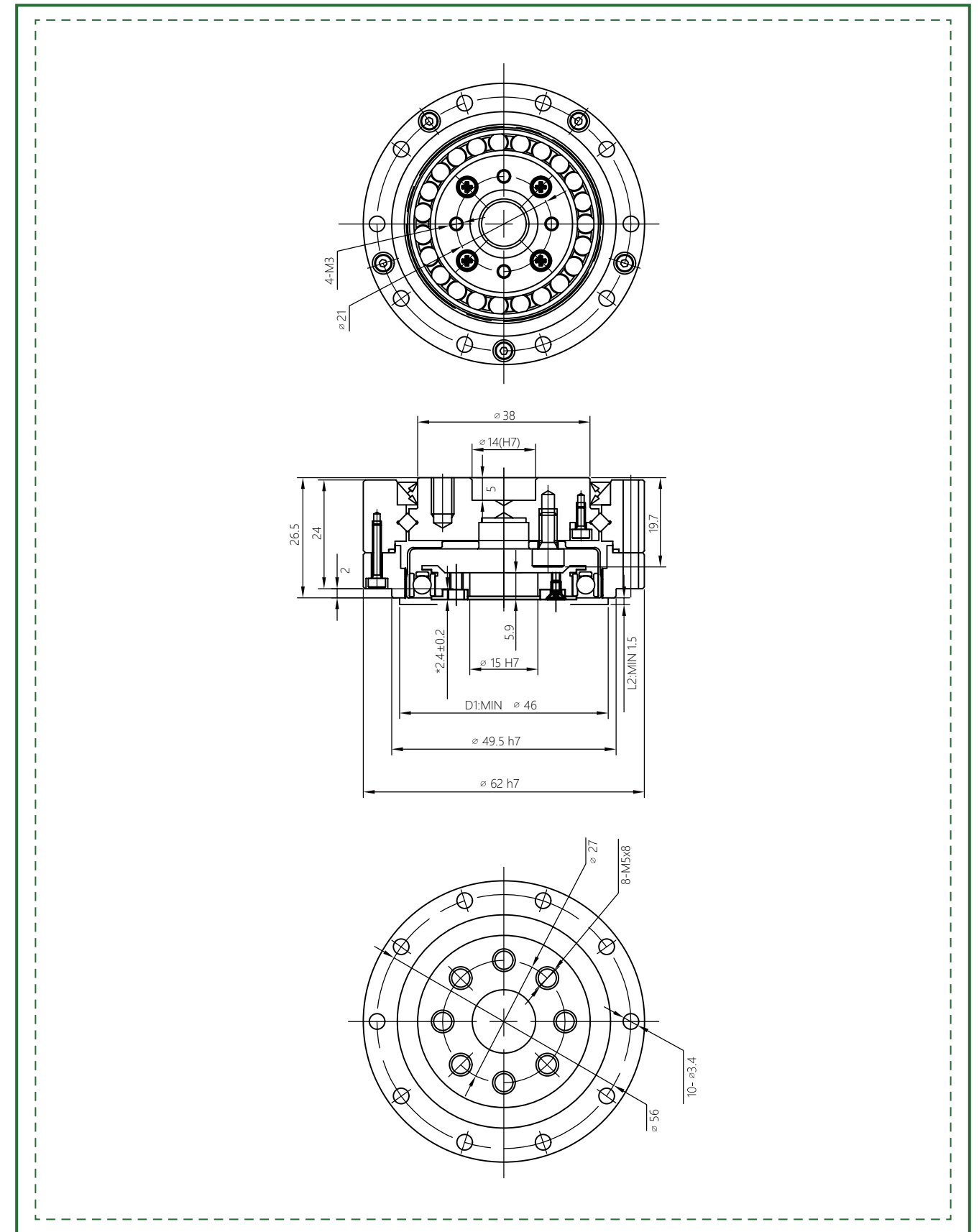
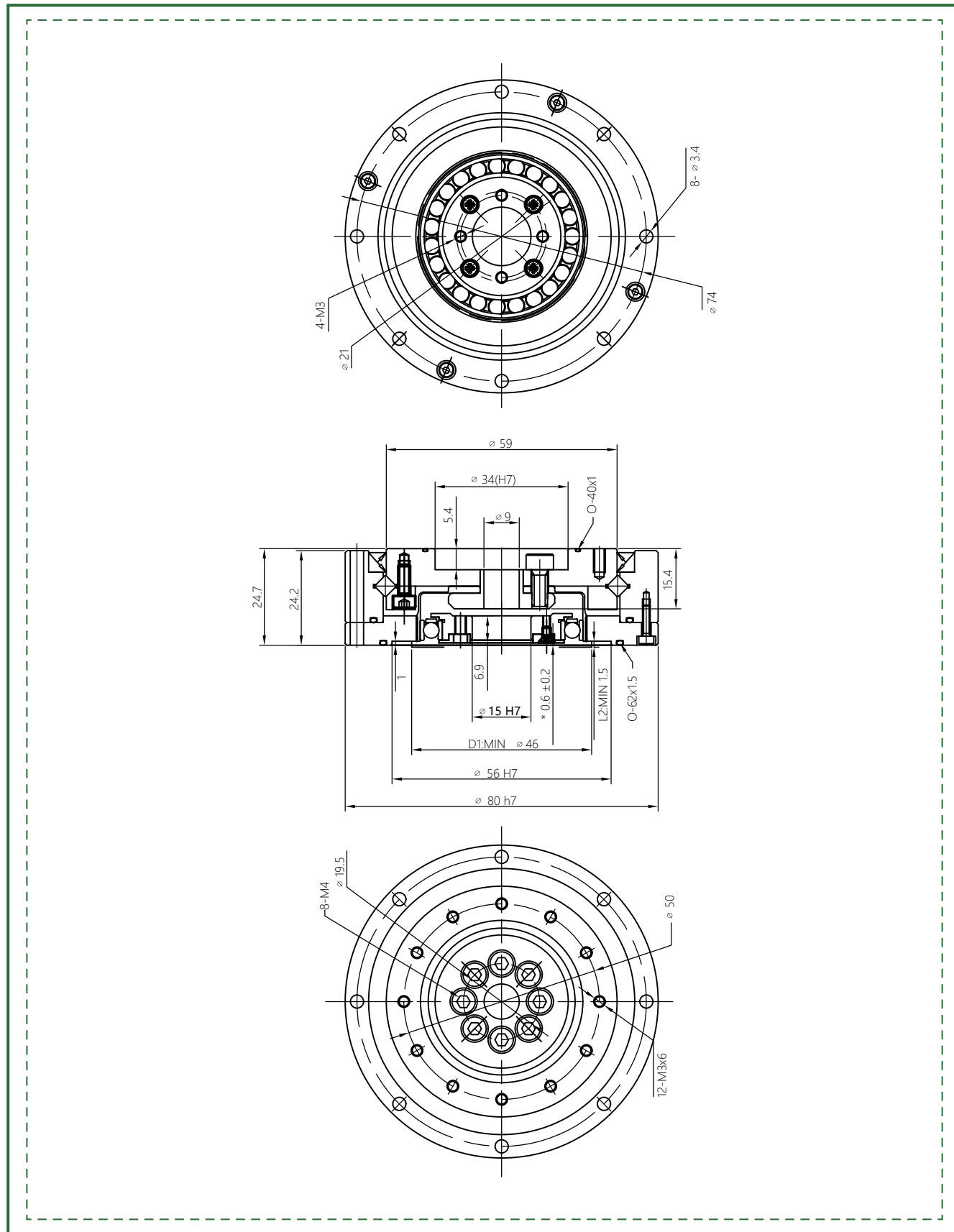
## Parameter Table

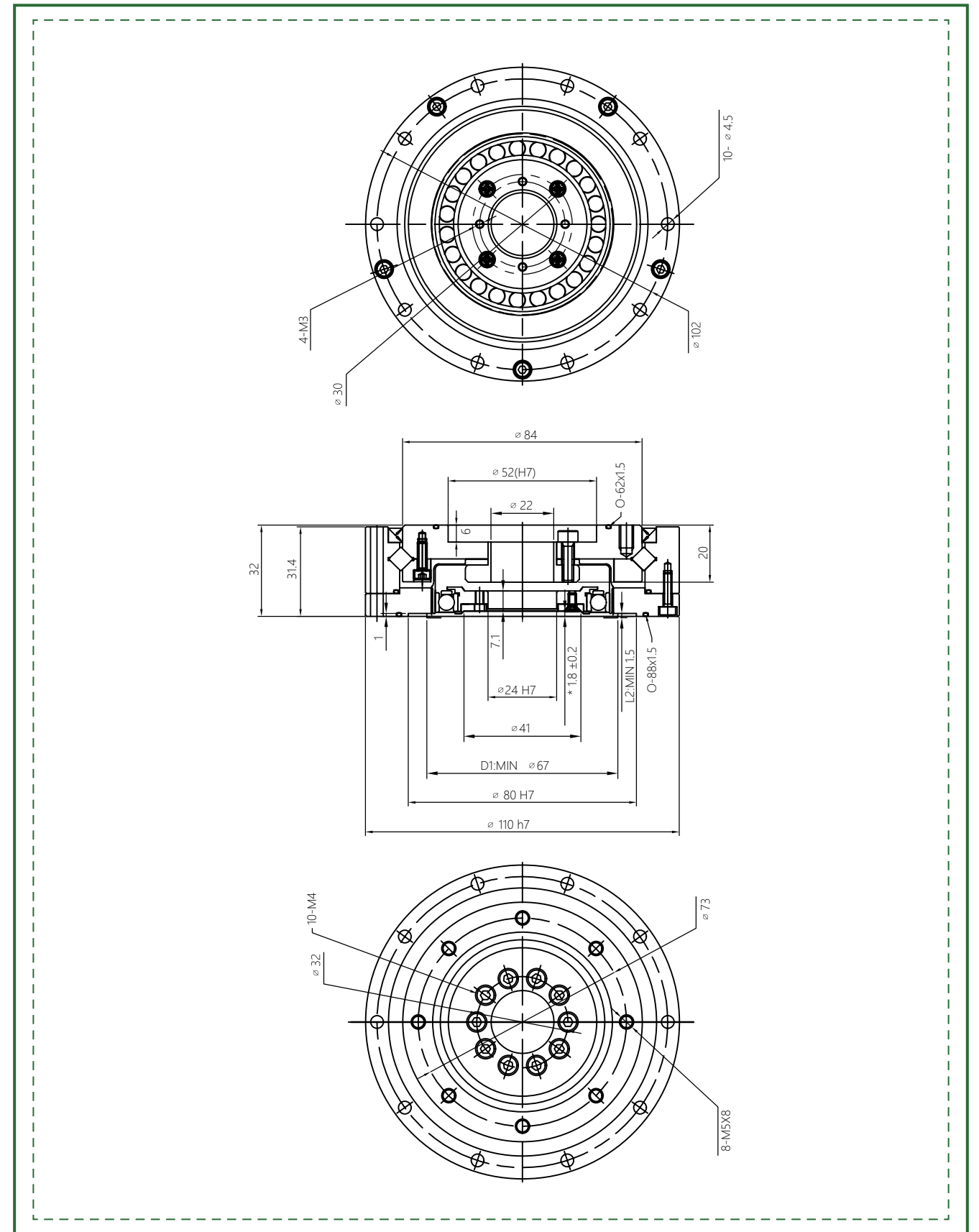
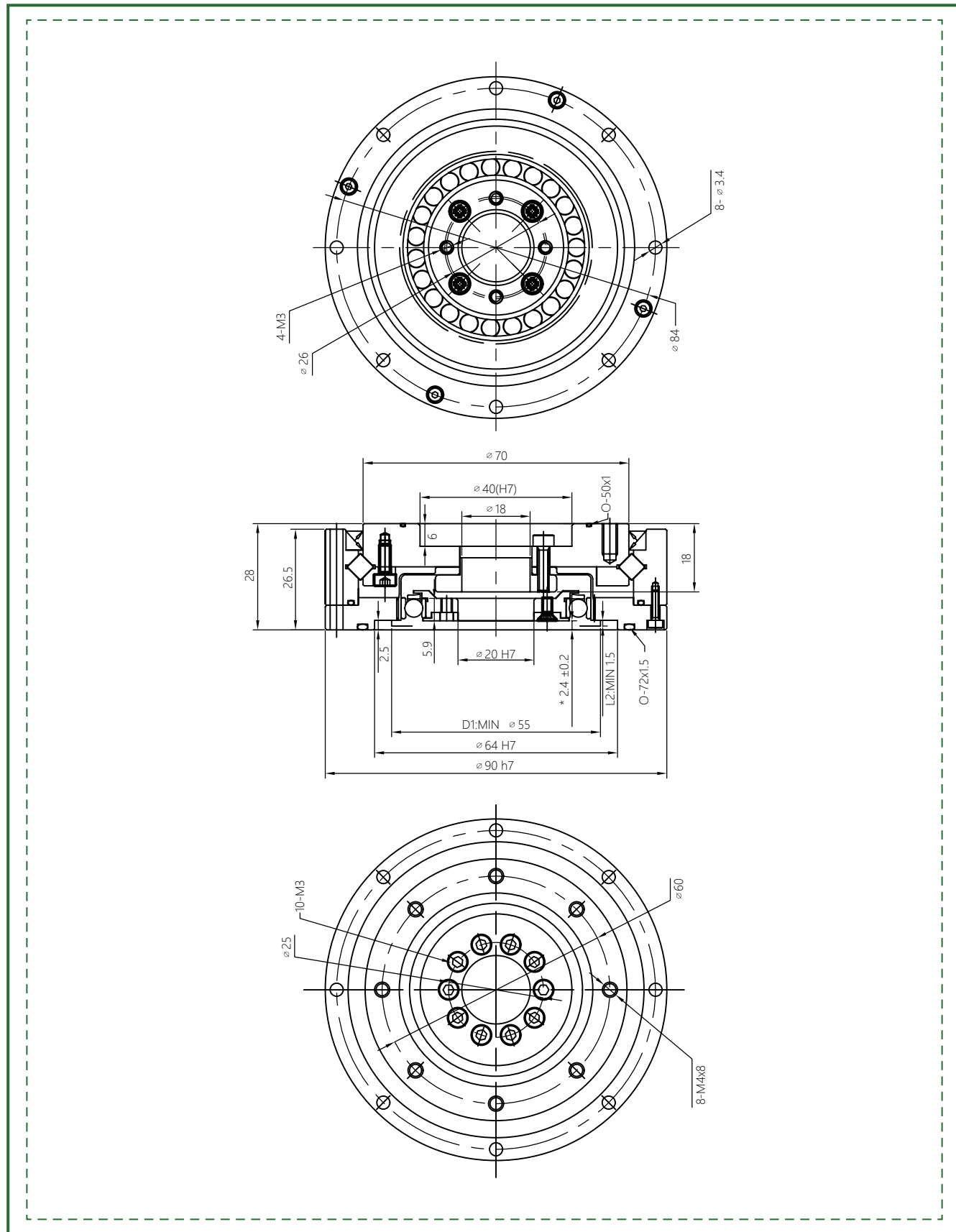
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		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	Kg	Hour
14	50	3.5	11.4	4.6	23	8000	3500	≤20	0.56	9000
	80	5.1	15	6.2	29			≤20		10000
	100	5.1	18	7.3	33			≤20		10000
17	50	10.4	22	17	46	7000	3500	≤20	0.48	9000
	80	14	29	21	54			≤20		10000
	100	15	35	26	67			≤20		10000
20	50	16	37	23	66	6000	3500	≤20	0.68	9000
	80	23	49	28	78			≤20		10000
	100	27	54	32	90			≤20		10000
25	50	26	66	36	121	5500	3500	≤20	1.3	9000
	80	42	91	62	157			≤20		10000
	100	45	104	71	175			≤20		10000
	120	45	111	71	187			≤20		10000
32	50	50	143	71	255	4500	3500	≤20	2.5	9000
	80	79	202	126	350			≤20		10000
	100	91	221	144	399			≤20		10000
	120	91	235	144	423			≤20		10000
40*	50	91	267	130	456	4000	3000	≤20	3.8	9000
	100	176	378	247	665			≤20		10000
	160	196	430	300	727			≤20		10000

\* Consult factory

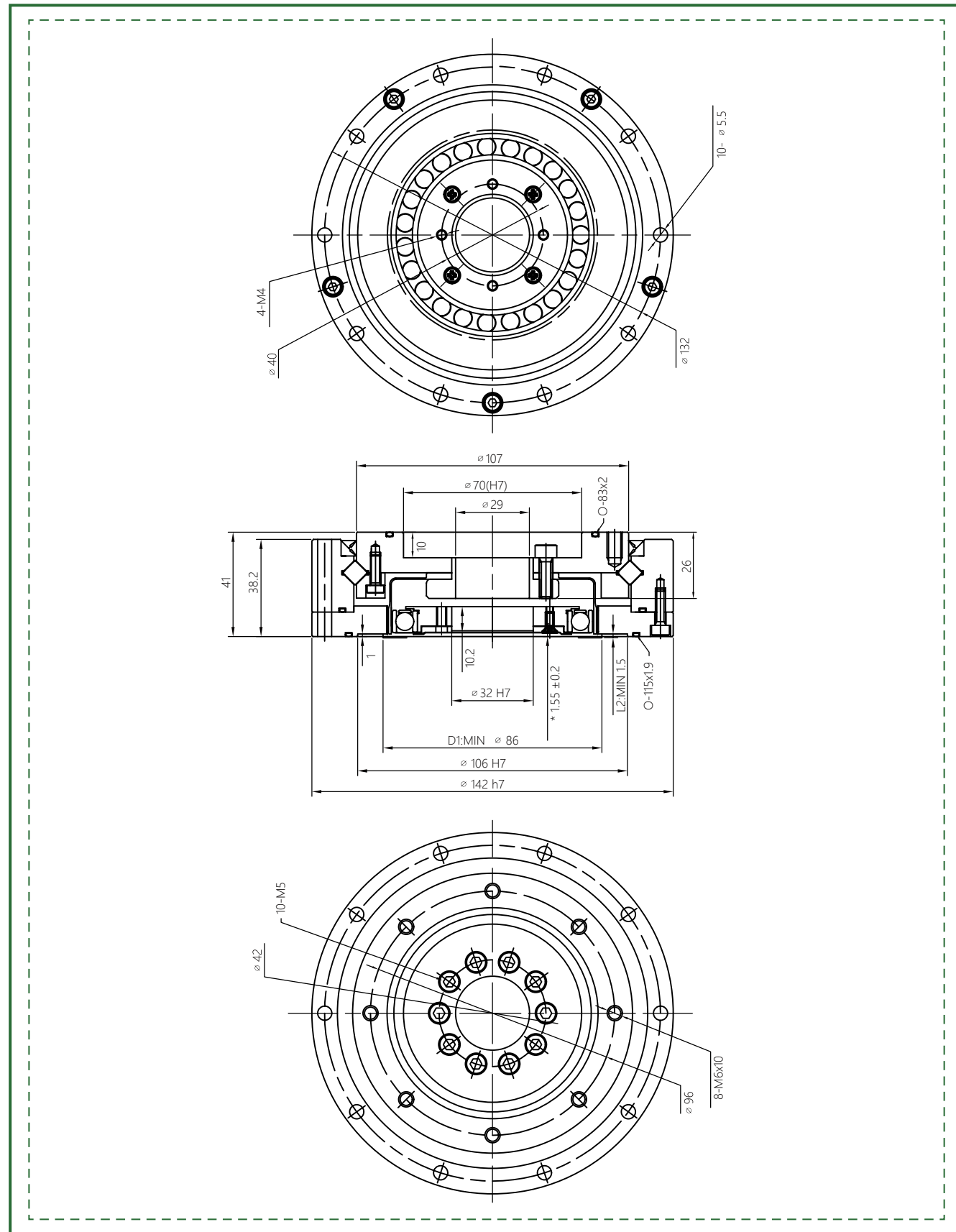
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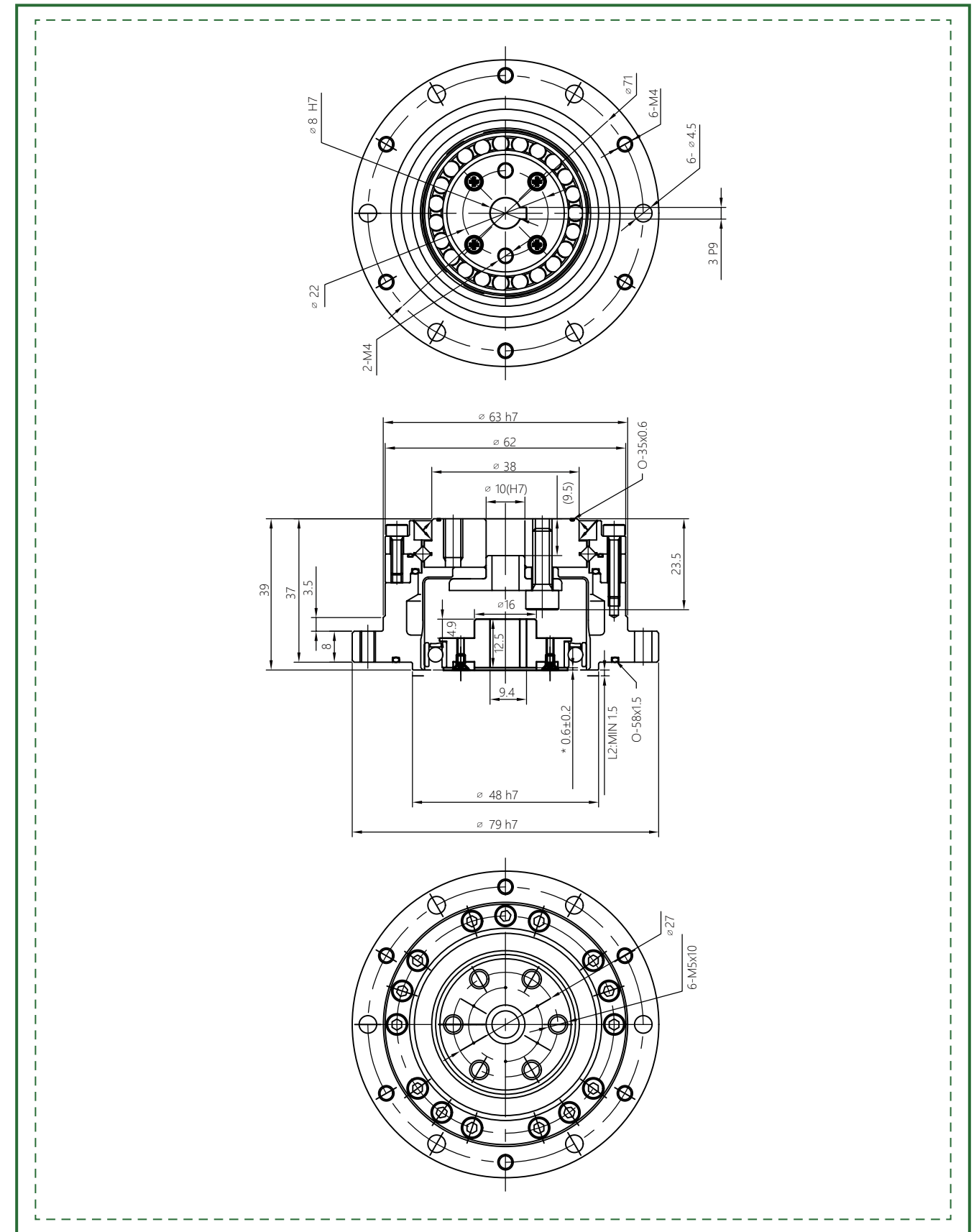
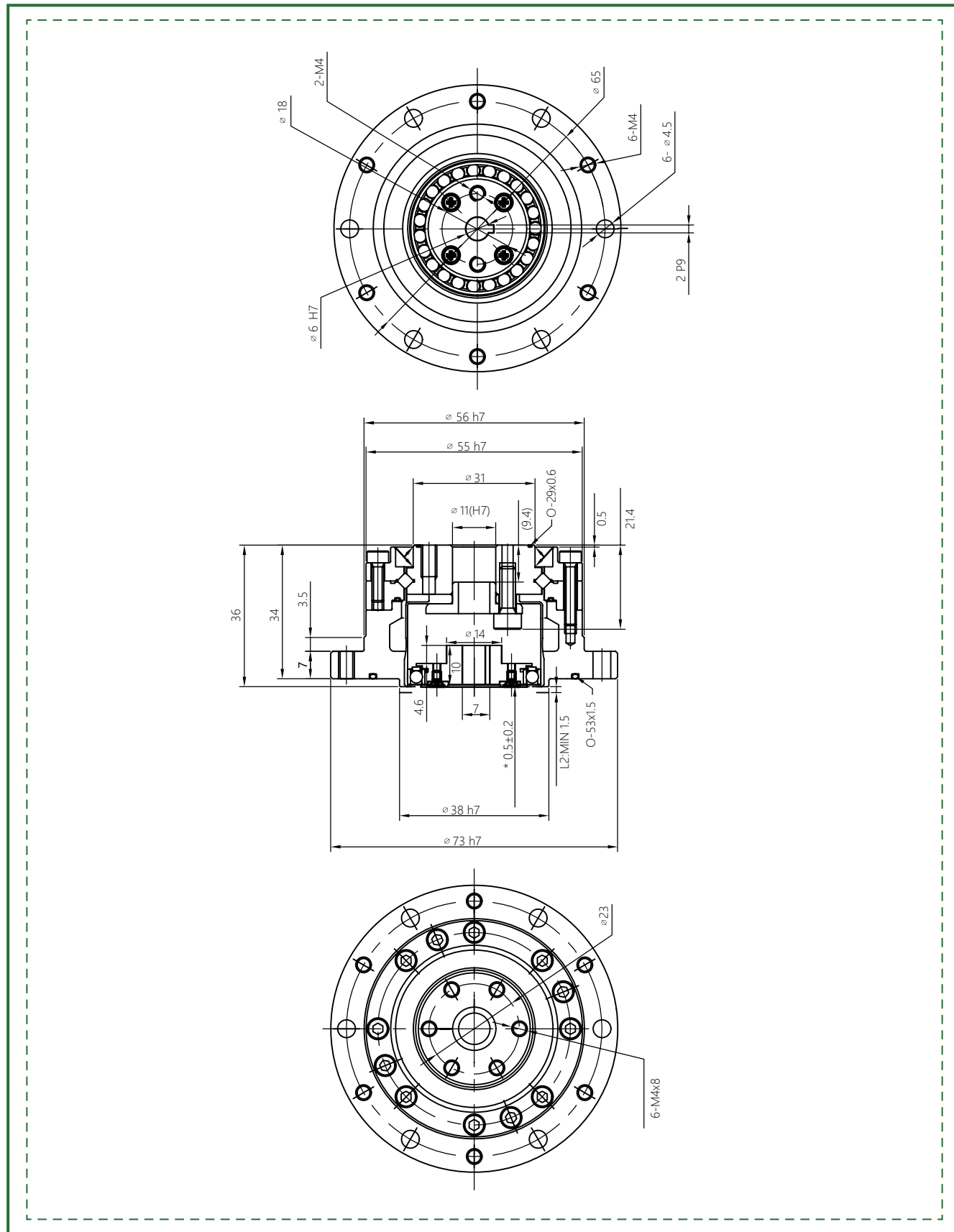


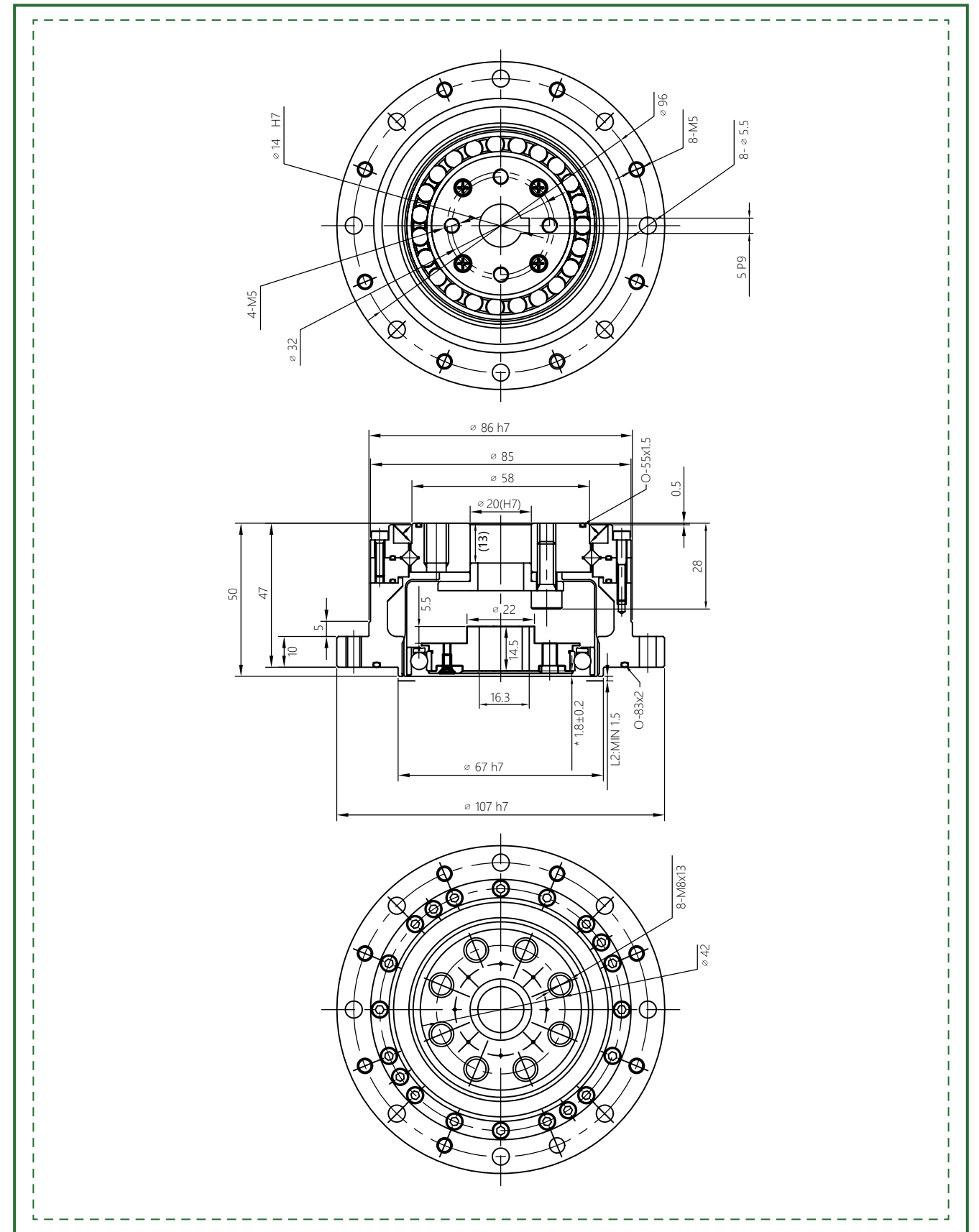
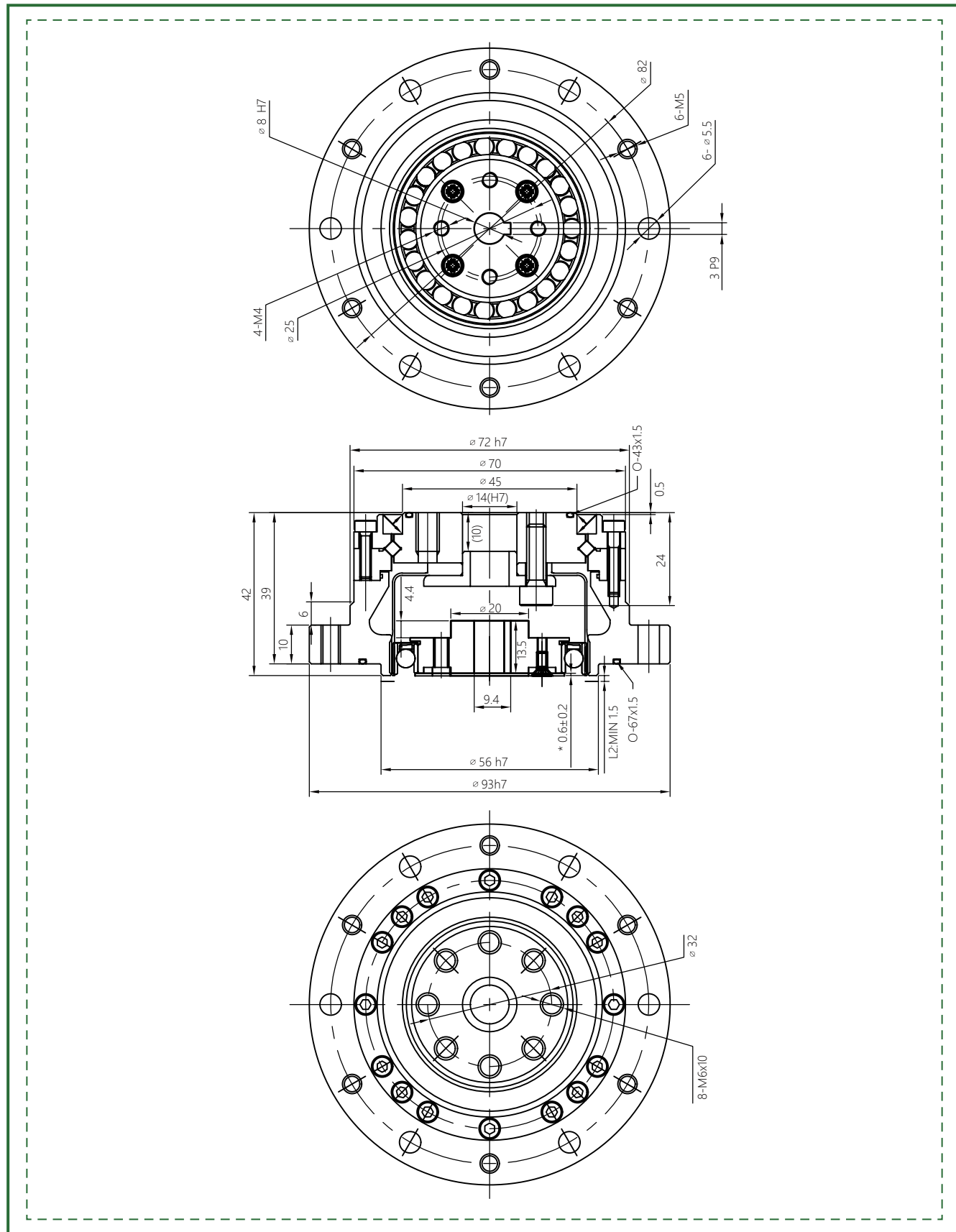


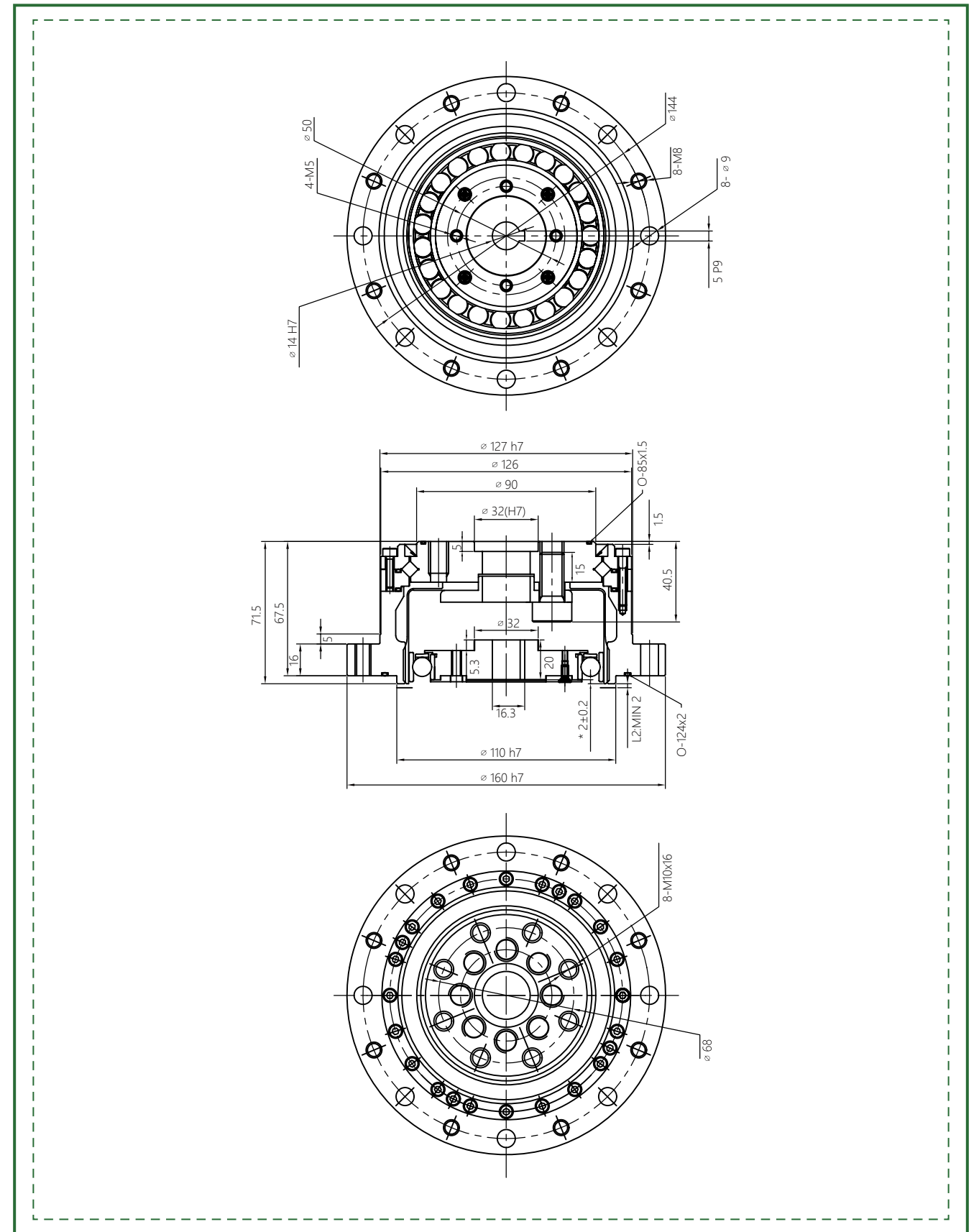
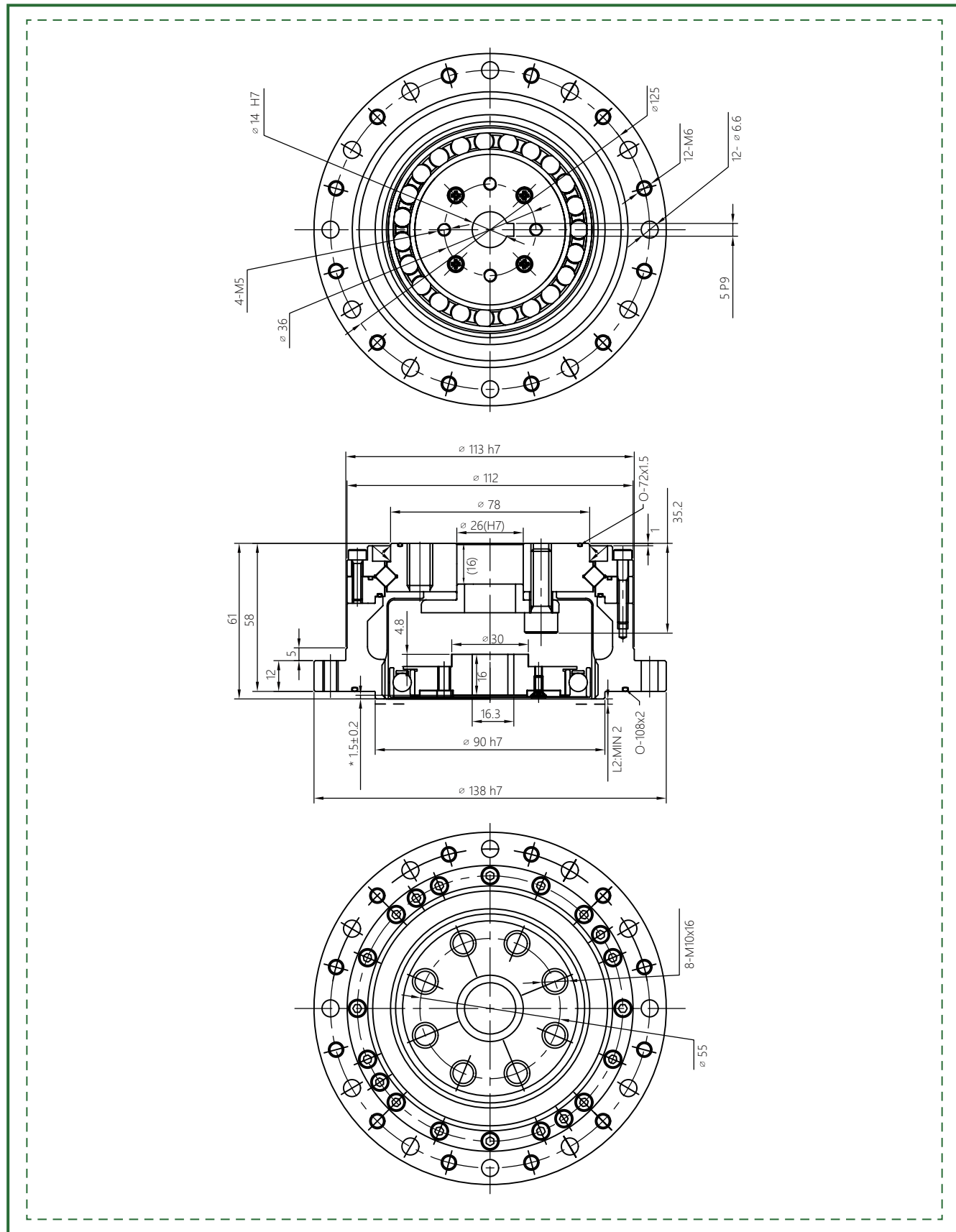
### Parameter Table

Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	Kg	Hour
14	30	3.8	8.5	6.5	16	8000	3500	≤20	0.51	10000
	50	5.1	17.1	6.6	33			≤20		10000
	80	7.4	22	10.5	44			≤10		15000
	100	7.4	26	10.5	51			≤10		15000
17	30	8.4	15	11.5	28	7000	3500	≤20	0.68	10000
	50	15.2	32	25	66			≤20		10000
	80	21	41	26	83			≤10		15000
	100	23	51	37	103			≤10		15000
	120	23	51	37	82			≤10		15000
20	30	14	26	19	48	6000	3500	≤20	0.98	10000
	50	24	53	32	93			≤20		10000
	80	32	70	45	121			≤10		15000
	100	38	78	47	140			≤10		15000
	120	38	83	47	140			≤10		15000
	160	38	87	47	140			≤10		15000
25	30	26	48	36	90	5500	3500	≤20	1.47	10000
	50	37	93	52	177			≤20		10000
	80	60	130	83	242			≤10		15000
	100	64	149	103	270			≤10		15000
	120	64	159	103	289			≤10		15000
	160	64	167	103	298			≤10		15000
32	30	51	95	71	190	4500	3500	≤20	3.19	10000
	50	72	205	103	363			≤20		10000
	80	112	289	159	540			≤10		15000
	100	130	316	205	615			≤10		15000
	120	130	335	205	652			≤10		15000
	160	130	353	205	652			≤10		15000
40	50	130	382	186	652	4000	3000	≤20	5.0	10000
	80	196	493	270	931			≤10		15000
	100	252	540	353	1026			≤10		15000
	120	279	586	429	1121			≤10		15000
	160	279	615	429	1121			≤10		15000
50*	50	233	679	333	1358	3000	2500	≤20	9.6	10000
	80	353	894	493	1767			≤10		15000
	100	446	931	633	1957			≤10		15000
	120	503	1026	772	1957			≤10		15000
	160	503	1121	801	2327			≤10		15000
58*	80	522	1406	732	2328	3000	2200	≤10	14.8	15000
	100	661	1511	1007	3021			≤10		15000
	120	708	1634	1131	3164			≤10		15000
	160	708	1748	1150	3259			≤10		15000

\* Consult factory

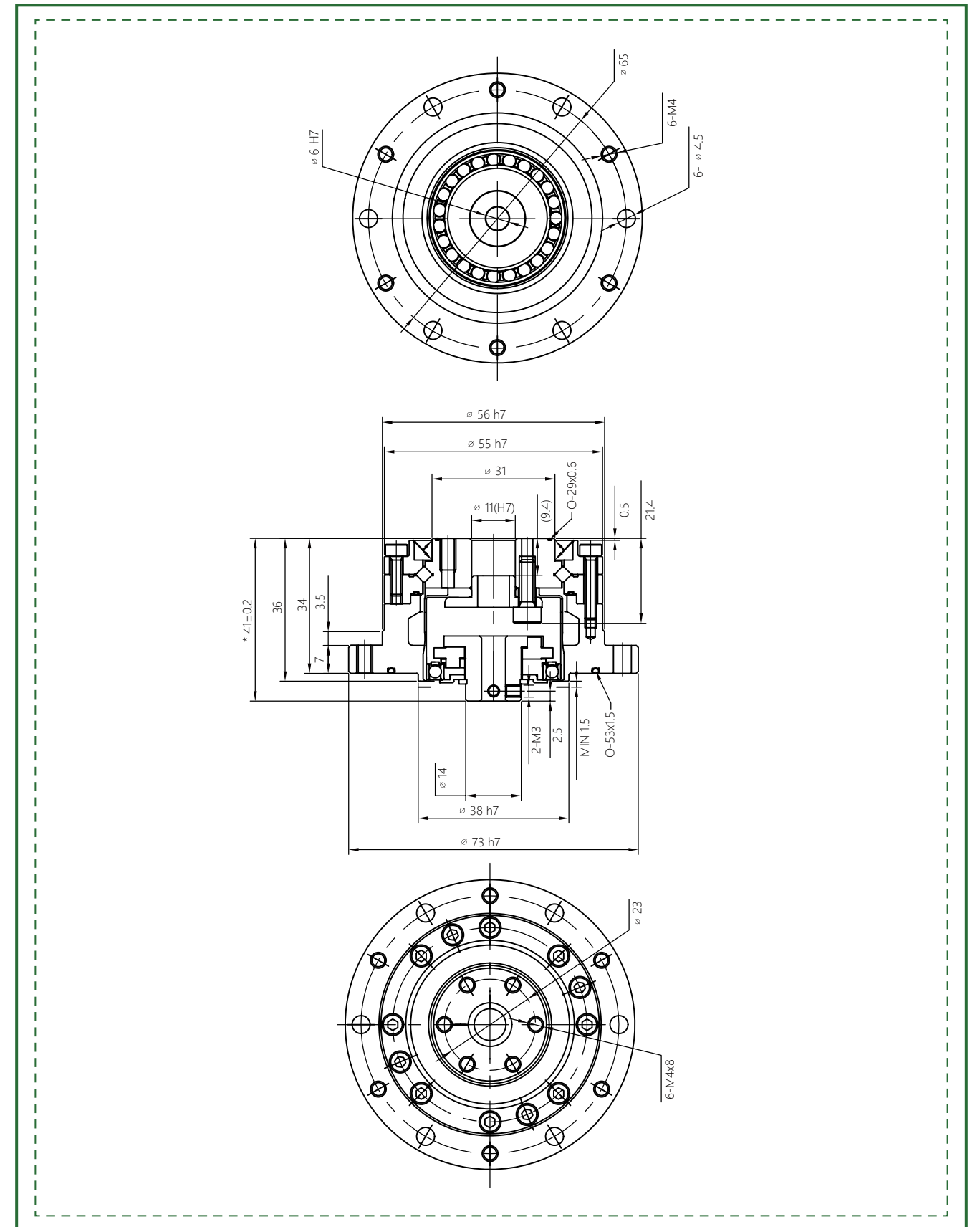






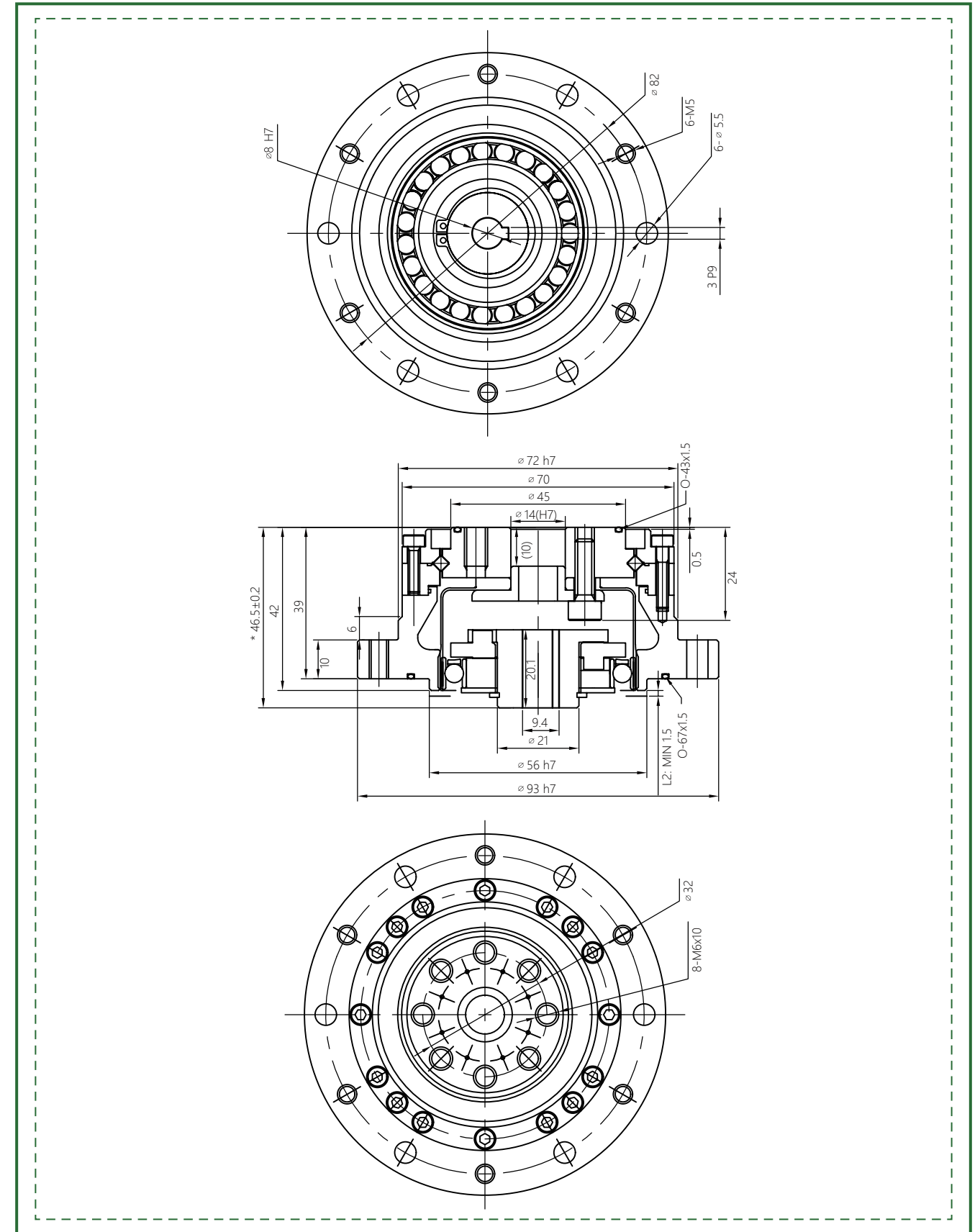
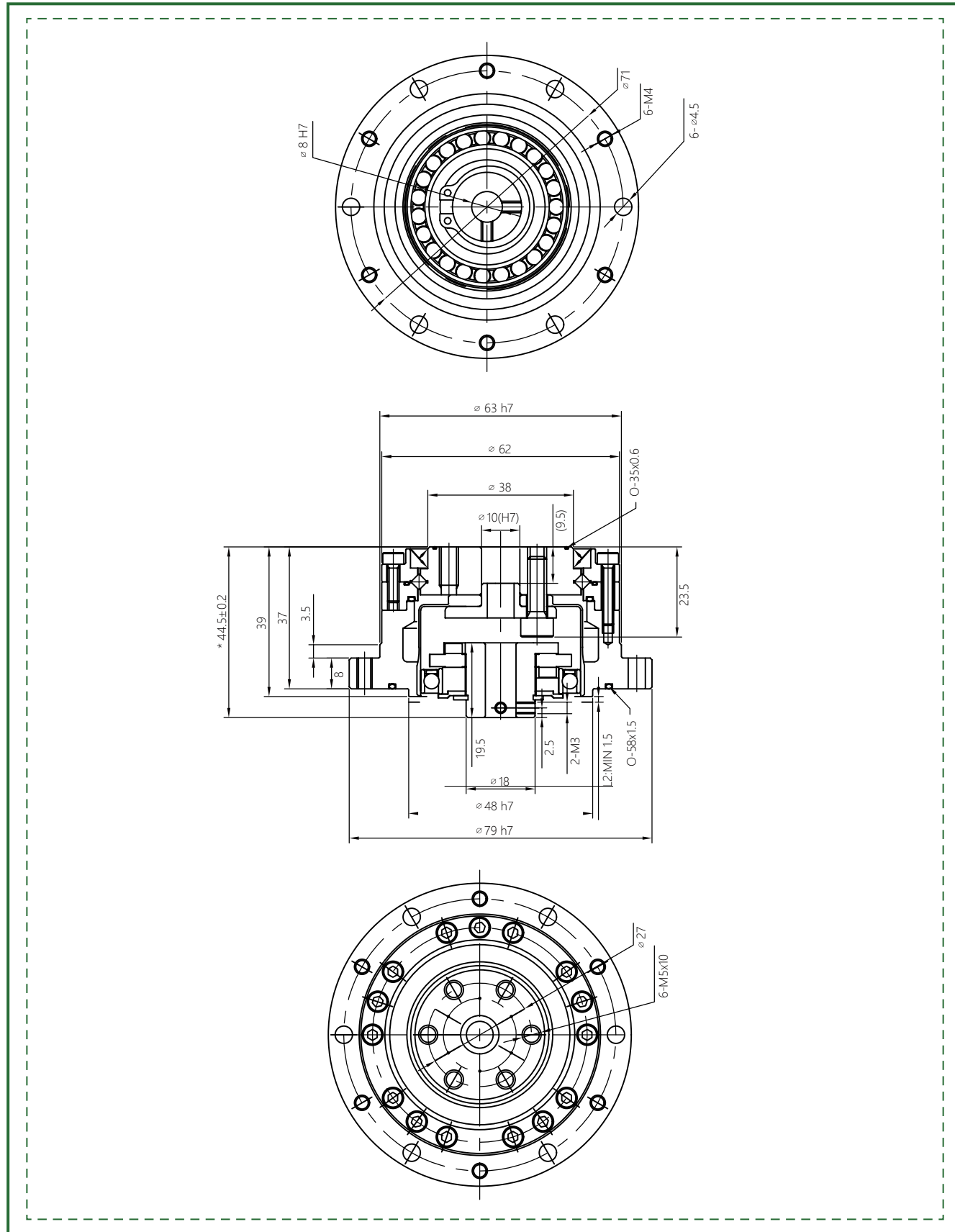
### Parameter Table

Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	Kg	Hour
14	30	3.8	8.5	6.5	16	8000	3500	≤20	0.52	10000
	50	5.1	17.1	6.6	33			≤20		10000
	80	7.4	22	10.5	44			≤20		15000
	100	7.4	26	10.5	51			≤20		15000
17	30	8.4	15	11.5	28	7000	3500	≤20	0.69	10000
	50	15.2	32	25	66			≤20		10000
	80	21	41	26	83			≤20		15000
	100	23	51	37	103			≤20		15000
	120	23	51	37	82			≤20		15000
20	30	14	26	19	48	6000	3500	≤20	0.99	10000
	50	24	53	32	93			≤20		10000
	80	32	70	45	121			≤20		15000
	100	38	78	47	140			≤20		15000
	120	38	83	47	140			≤20		15000
	160	38	87	47	140			≤20		15000
25	30	26	48	36	90	5500	3500	≤20	1.48	10000
	50	37	93	52	177			≤20		10000
	80	60	130	83	242			≤20		15000
	100	64	149	103	270			≤20		15000
	120	64	159	103	289			≤20		15000
	160	64	167	103	298			≤20		15000
32	30	51	95	71	190	4500	3500	≤20	3.2	10000
	50	72	205	103	363			≤20		10000
	80	112	289	159	540			≤20		15000
	100	130	316	205	615			≤20		15000
	120	130	335	205	652			≤20		15000
	160	130	353	205	652			≤20		15000
40	50	130	382	186	652	4000	3000	≤20	5.0	10000
	80	196	493	270	931			≤20		15000
	100	252	540	353	1026			≤20		15000
	120	279	586	429	1121			≤20		15000
	160	279	615	429	1121			≤20		15000
50*	50	233	679	333	1358	3000	2500	≤20	9.0	10000
	80	353	894	493	1767			≤20		15000
	100	446	931	633	1957			≤20		15000
	120	503	1026	772	1957			≤20		15000
	160	503	1121	801	2327			≤20		15000
58*	80	522	1406	732	2328	3000	2200	≤10	14.8	15000
	100	661	1511	1007	3021			≤10		15000
	120	708	1634	1131	3164			≤10		15000
	160	708	1748	1150	3259			≤10		15000

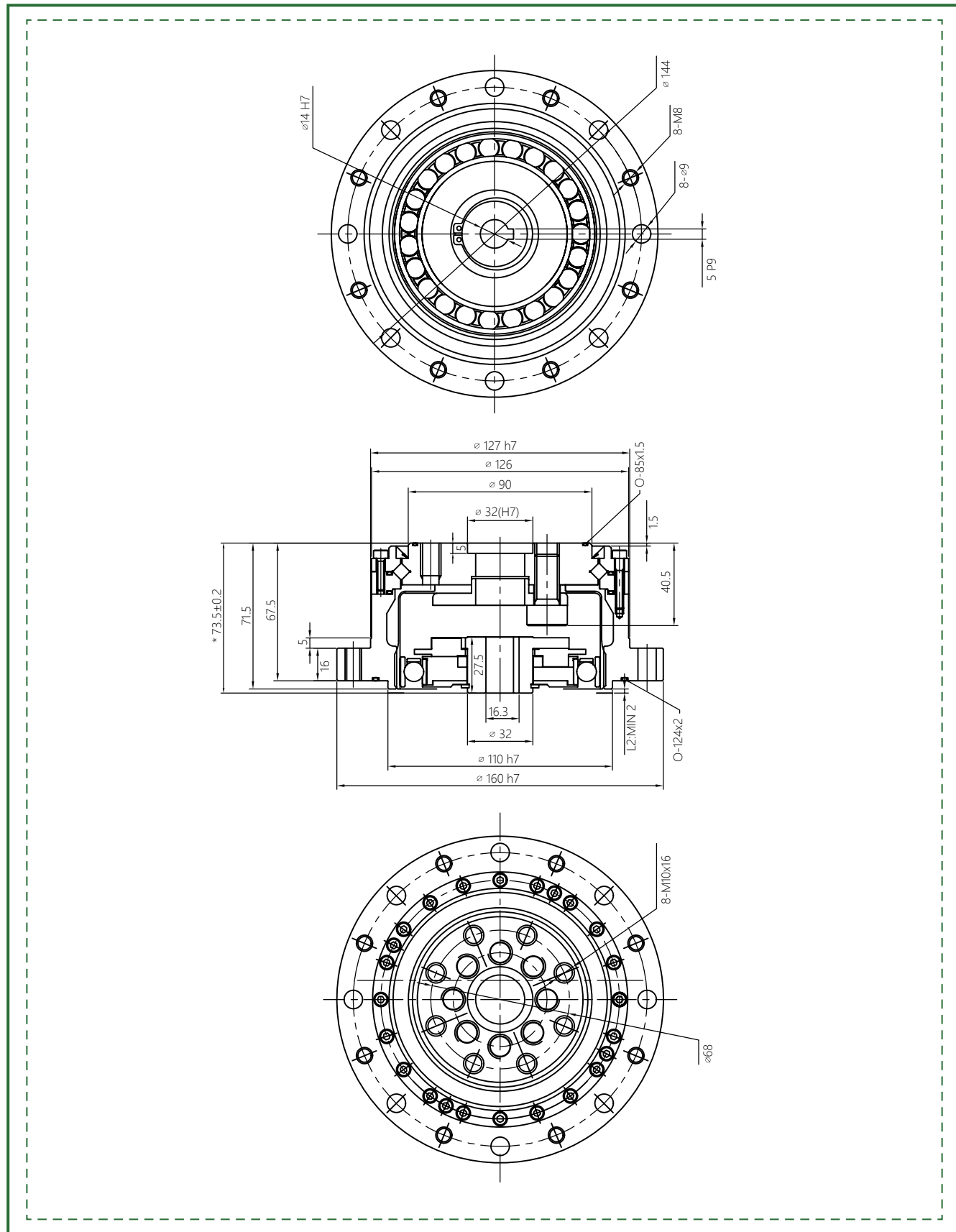


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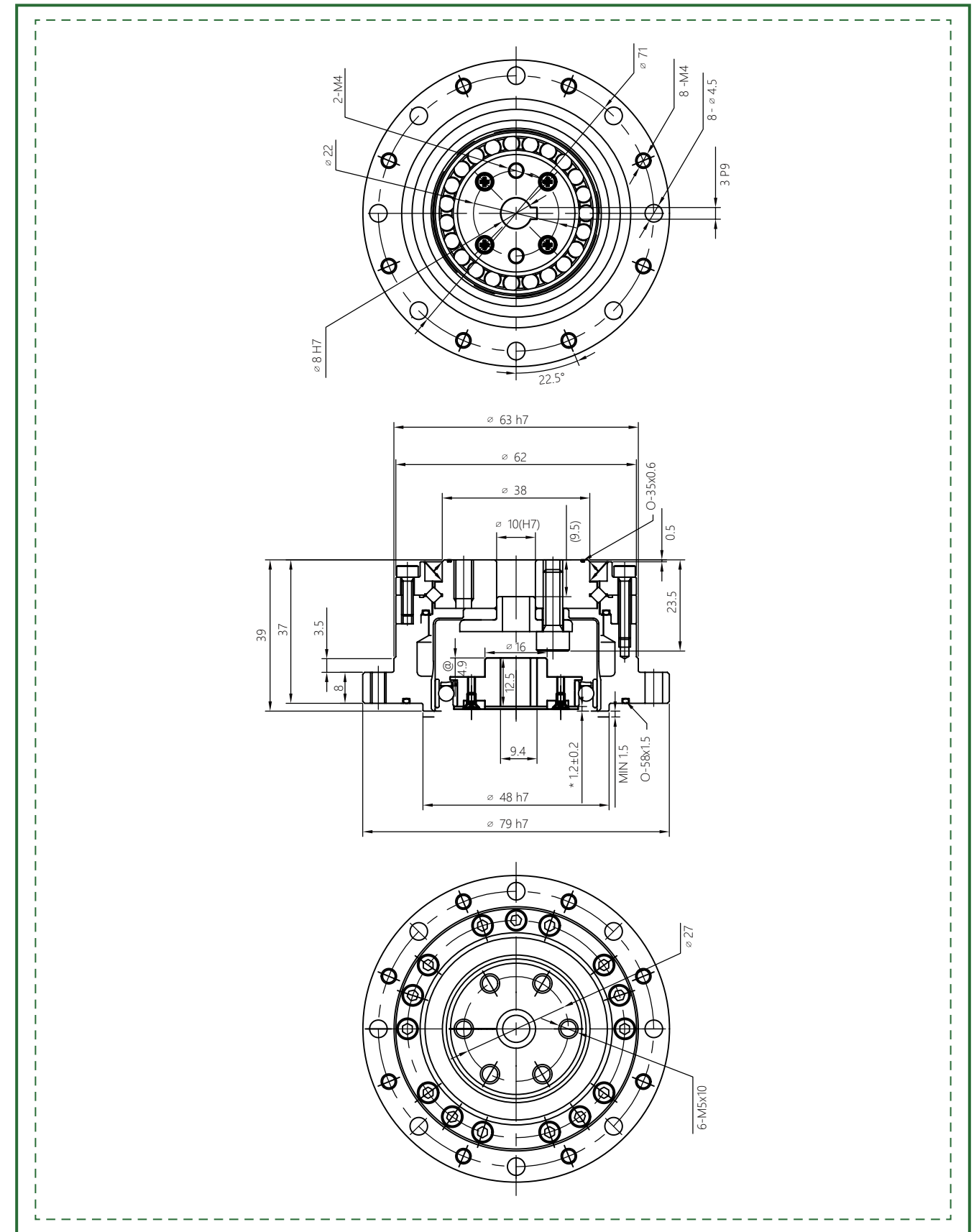
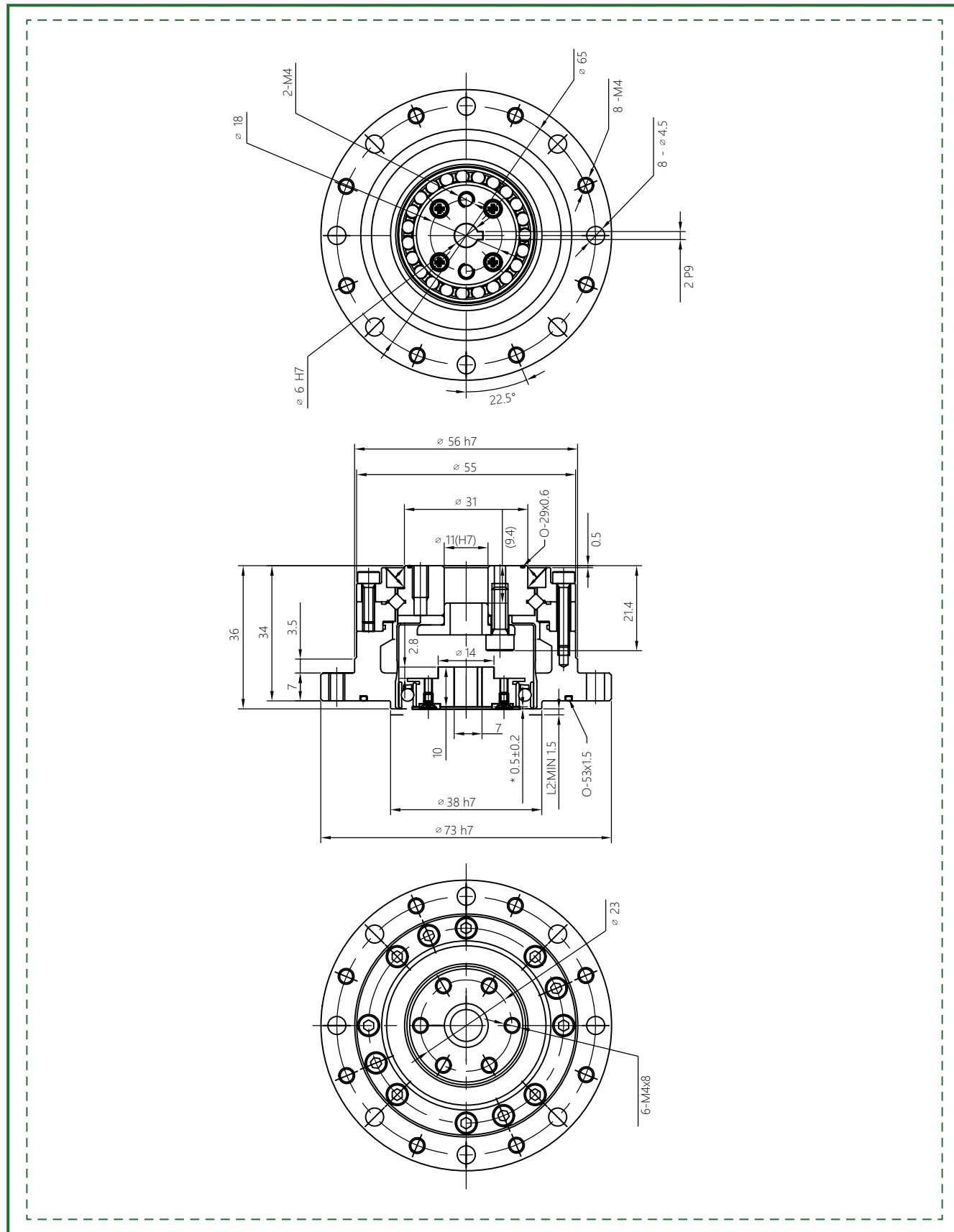


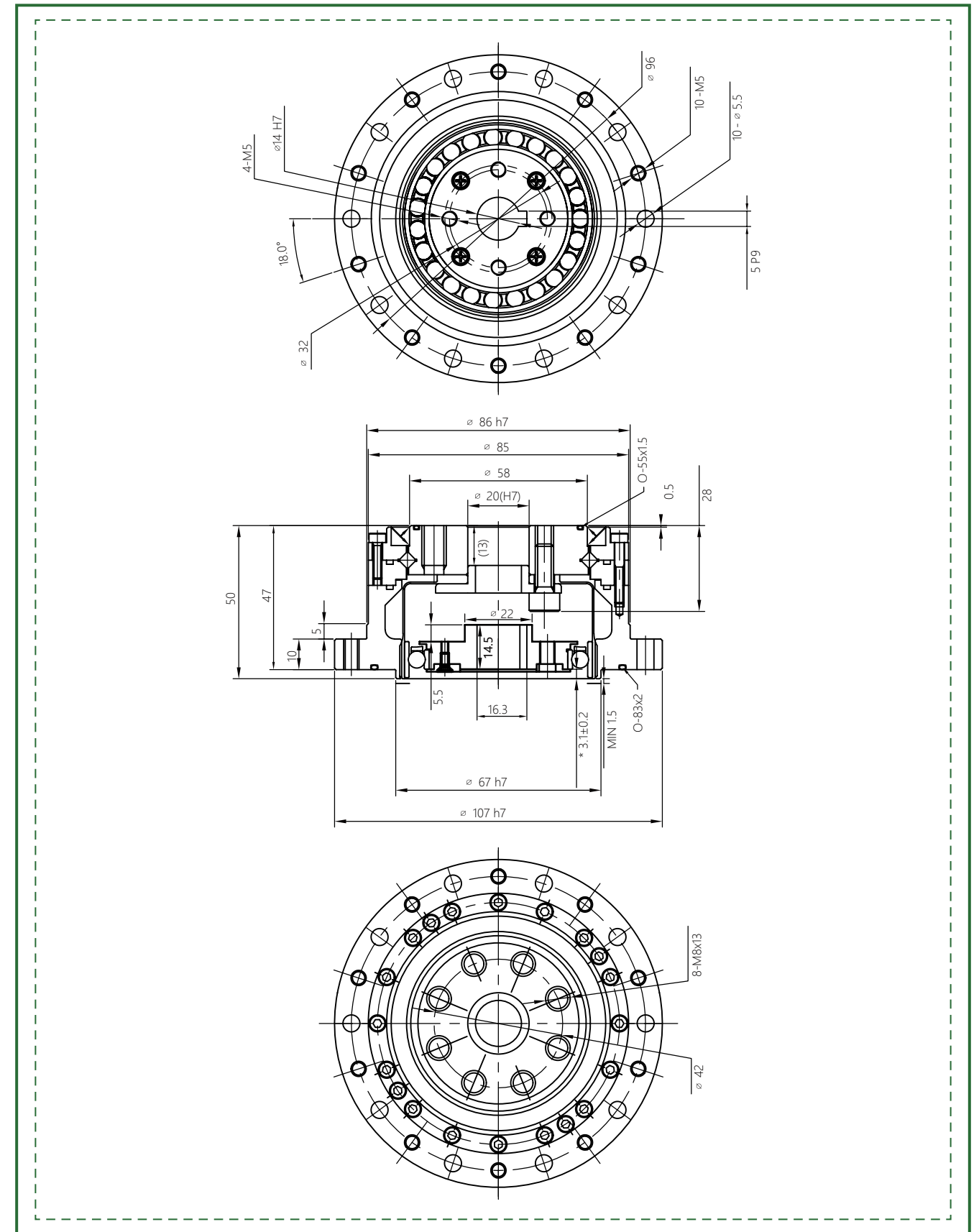
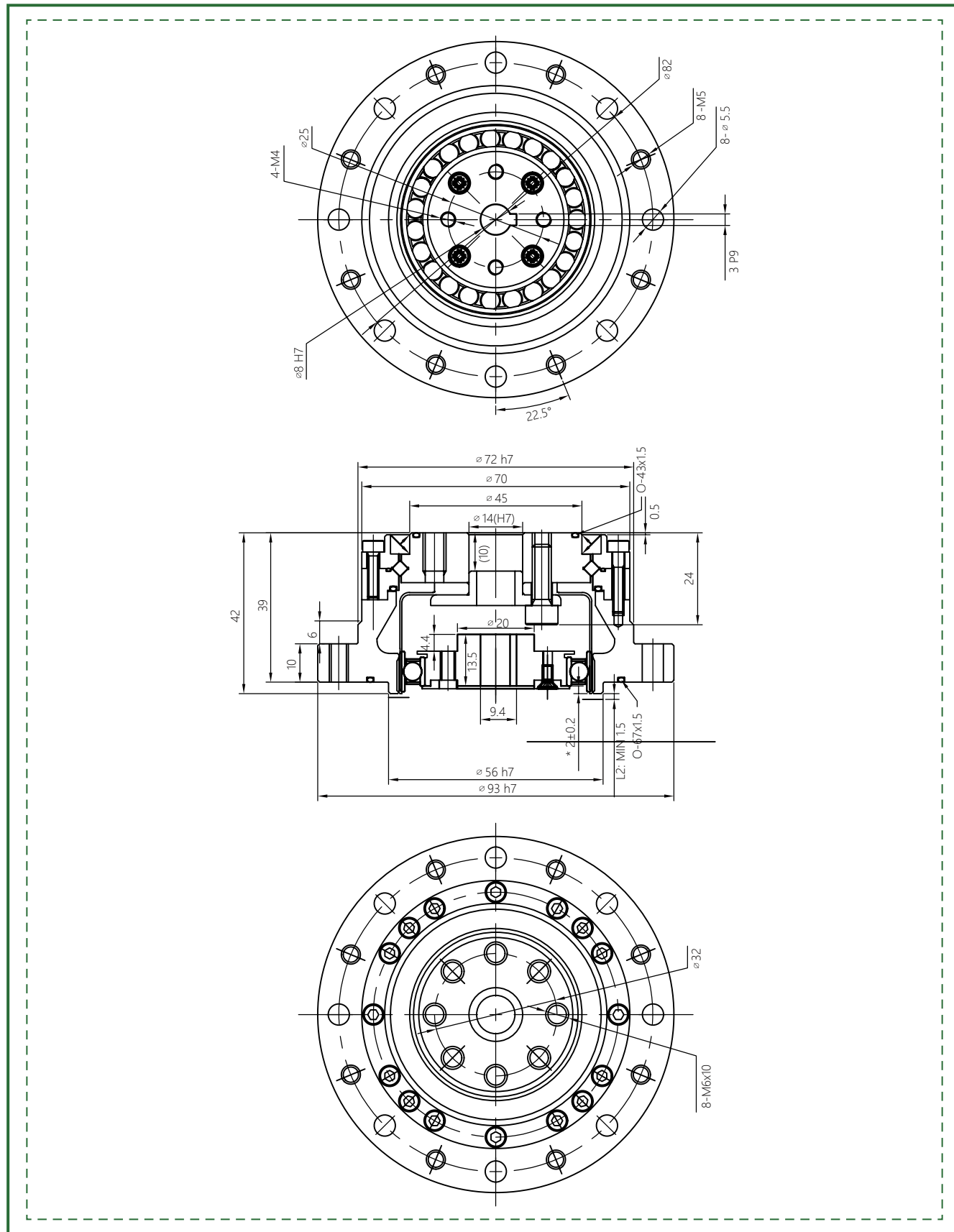


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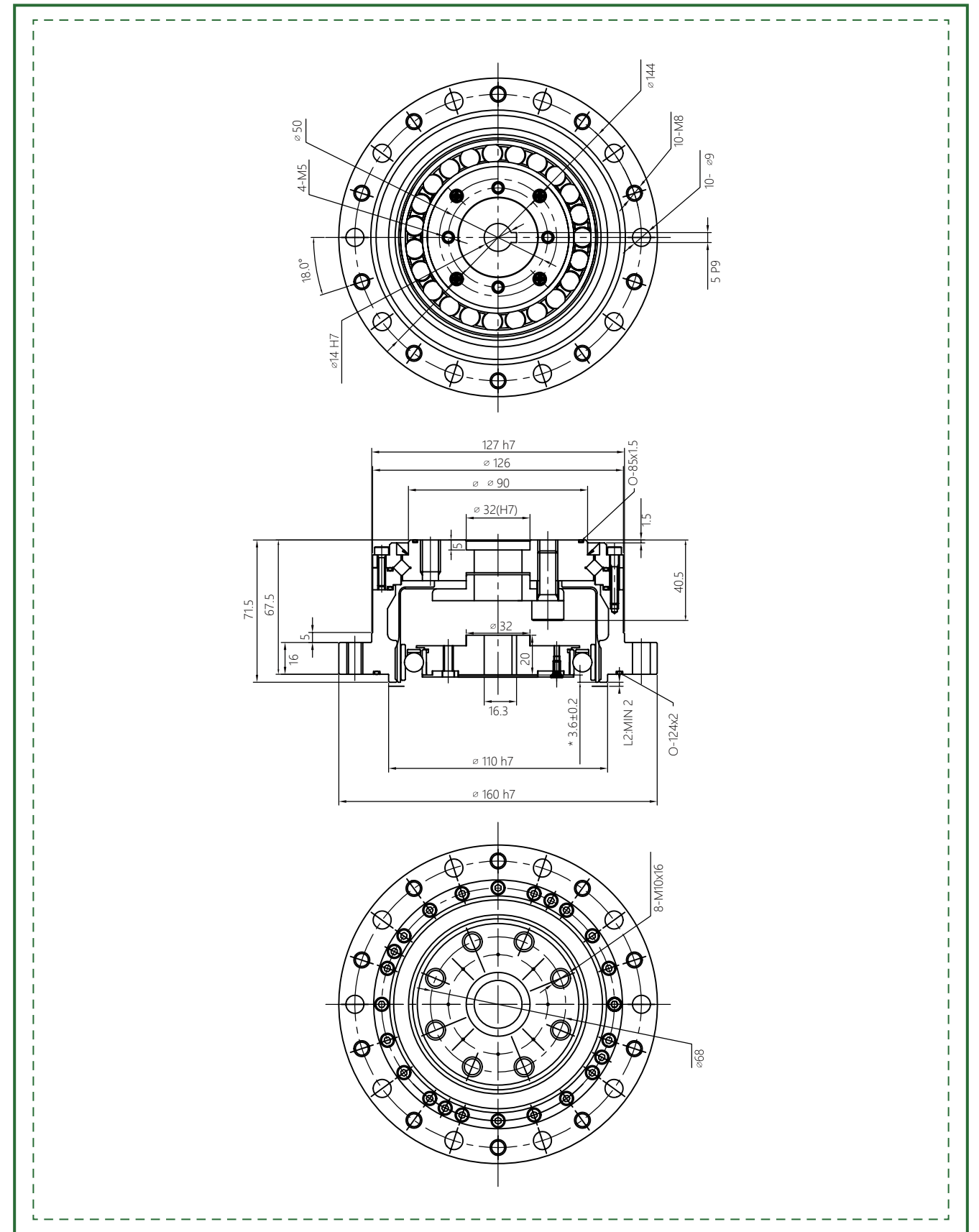
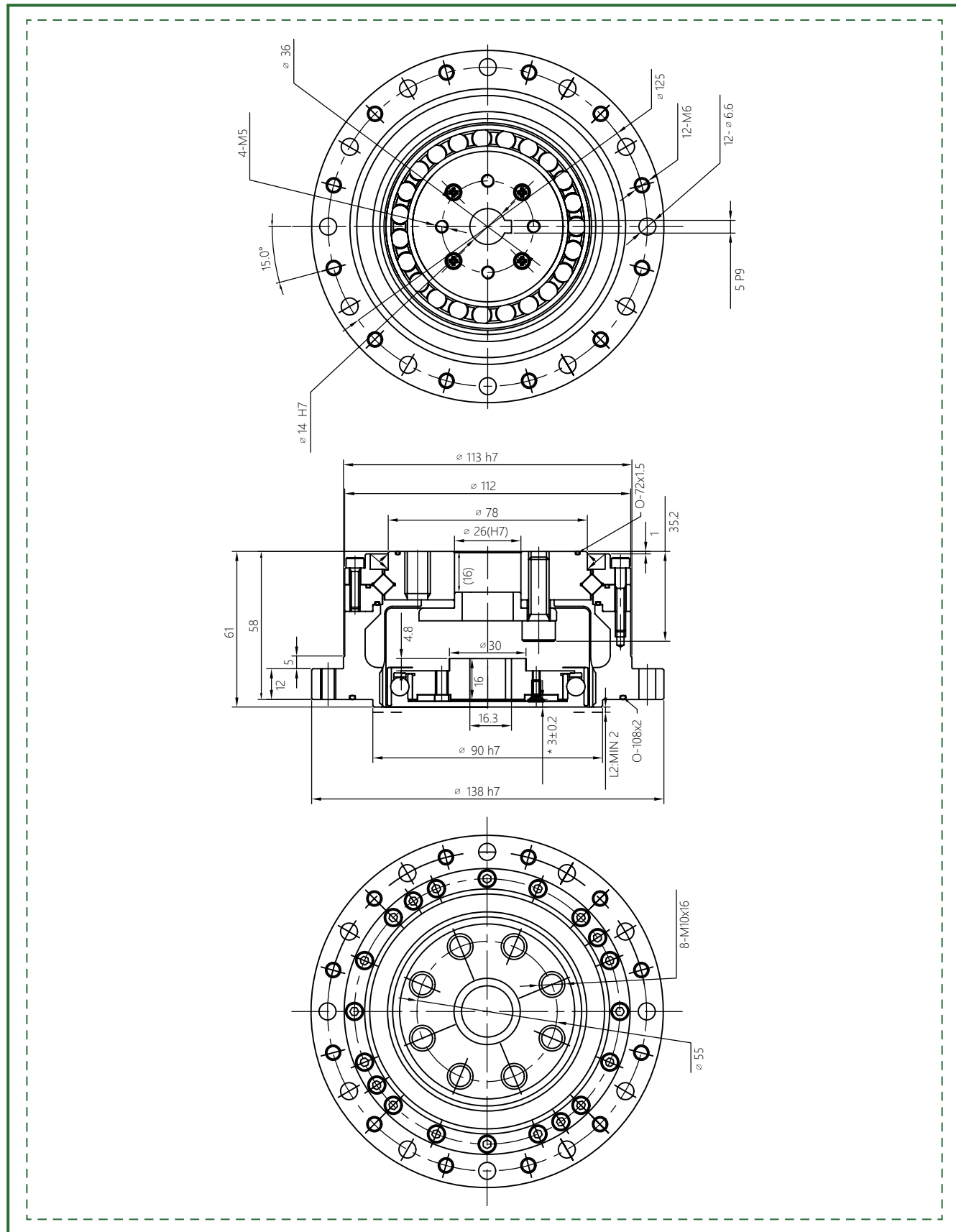
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		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	Kg	Hour
14	50	6.6	23	8.6	43	8000	3500	≤10	0.51	10000
	80	9.6	29	13.5	57			≤10		15000
	100	9.6	34	13.5	66			≤10		15000
17	50	19.8	42	32.5	86	7000	3500	≤10	0.68	10000
	80	27.5	53	33.5	108			≤10		15000
	100	30	66	48.5	134			≤10		15000
	120	30	66	48.5	107			≤10		15000
20	50	32	69	42	121	6000	3500	≤10	0.98	10000
	80	42	91	58	158			≤10		15000
	100	50	102	61	182			≤10		15000
	120	50	108	61	182			≤10		15000
	160	50	113	61	182			≤10		15000
25	50	48	121	68.5	230	5500	3500	≤10	1.47	10000
	80	78	169	107.5	315			≤10		15000
	100	84	194	133	351			≤10		15000
	120	84	207	133	376			≤10		15000
	160	84	217	133	388			≤10		15000
32	50	94	267	133	472	4500	3500	≤10	3.19	10000
	80	146	376	206	702			≤10		15000
	100	169	411	267	800			≤10		15000
	120	169	436	267	848			≤10		15000
	160	169	459	267	848			≤10		15000
40	50	169	497	242	847	4000	3000	≤10	5.0	10000
	80	255	641	351	1210			≤10		15000
	100	328	702	460	1334			≤10		15000
	120	363	762	557	1458			≤10		15000
	160	363	800	557	1458			≤10		15000
50*	80	459	1163	642	2297	3000	2500	≤10	9.0	15000
	100	580	1211	823	2545			≤10		15000
	120	654	1334	1005	2545			≤10		15000
	160	654	1458	1042	3025			≤10		15000
58*	80	678	1828	951	3026	3000	2200	≤10	14.8	15000
	100	860	1964	1309	3927			≤10		15000
	120	921	2124	1470	4113			≤10		15000
	160	921	2272	1494	4236			≤10		15000

\* Consult factory





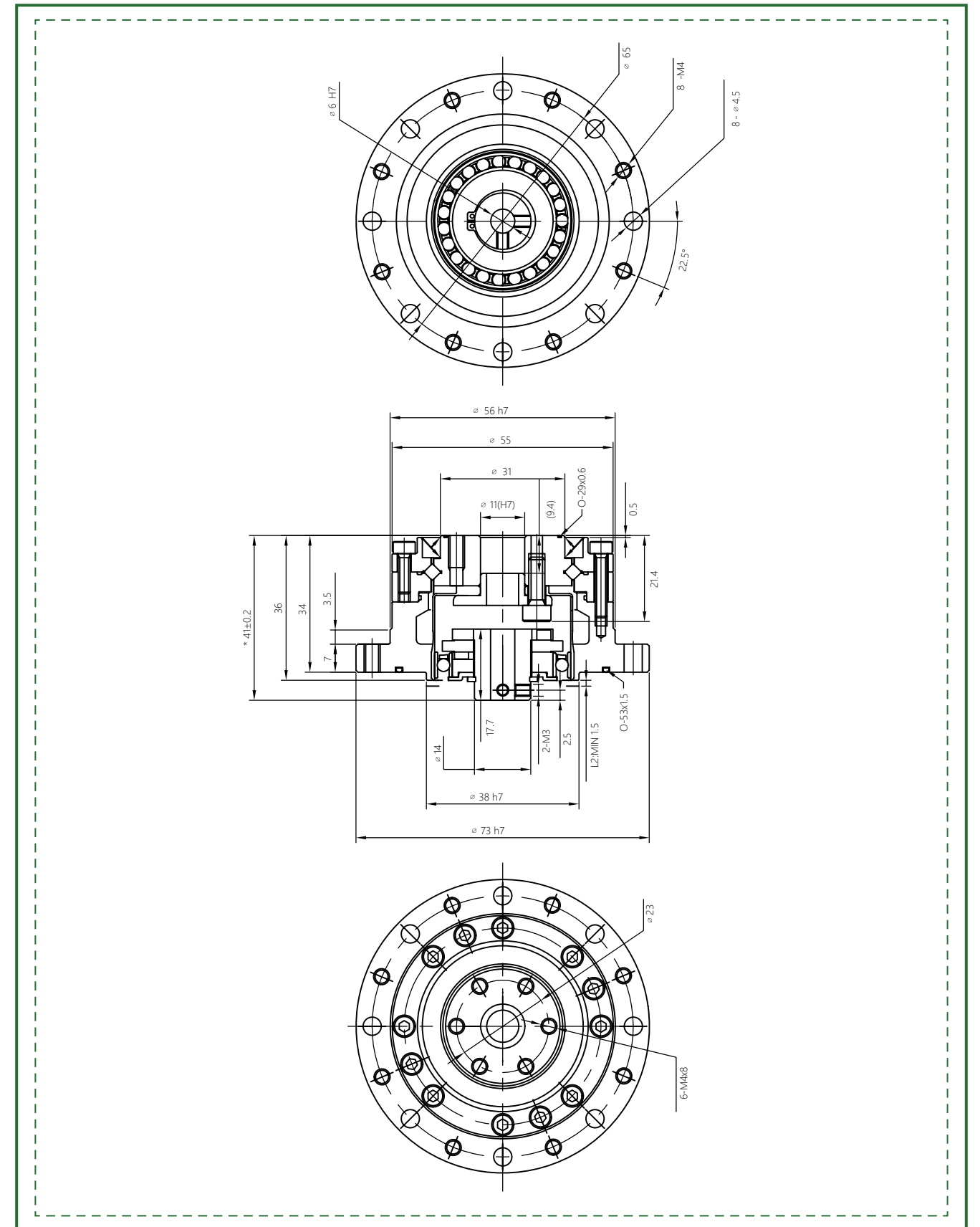


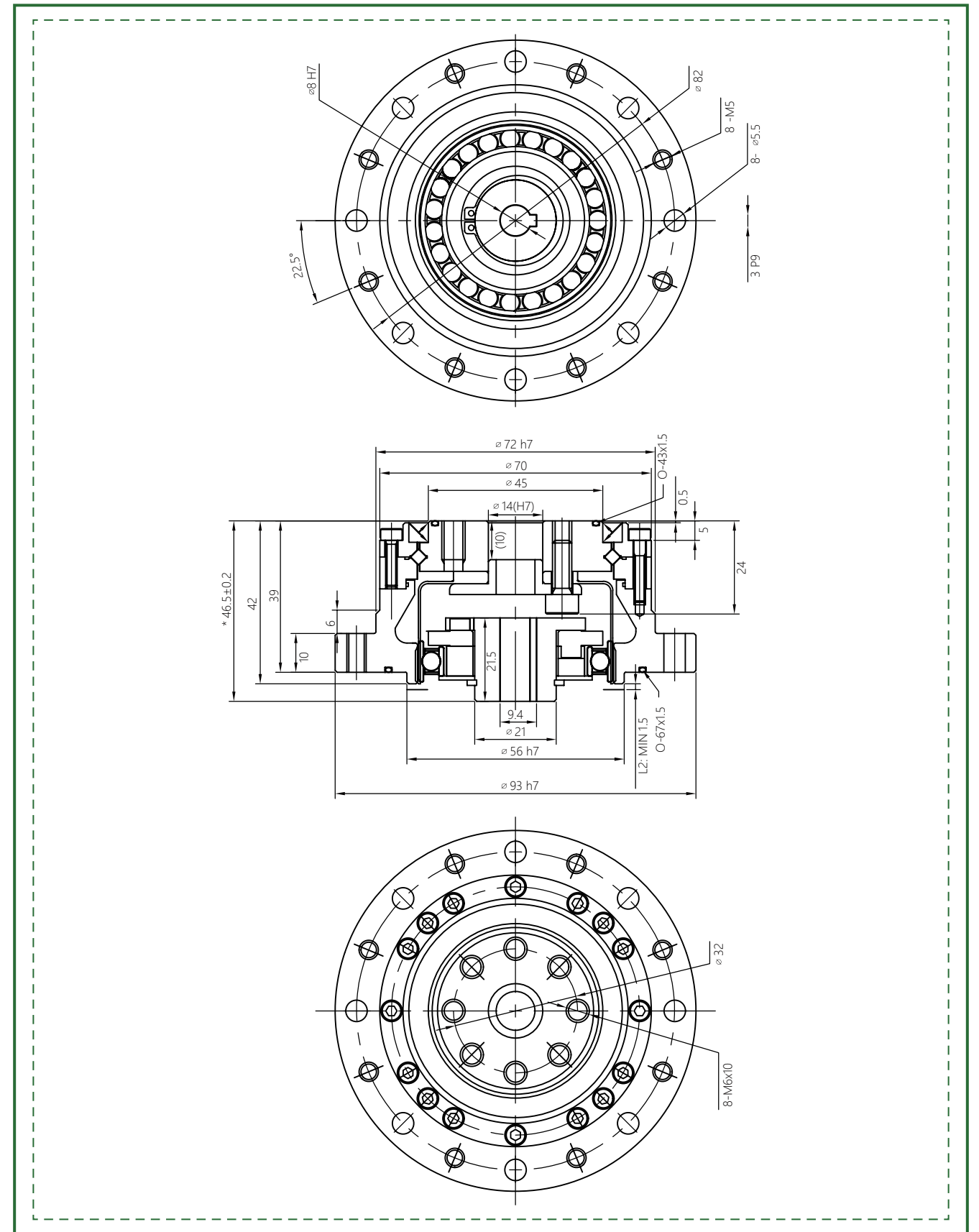
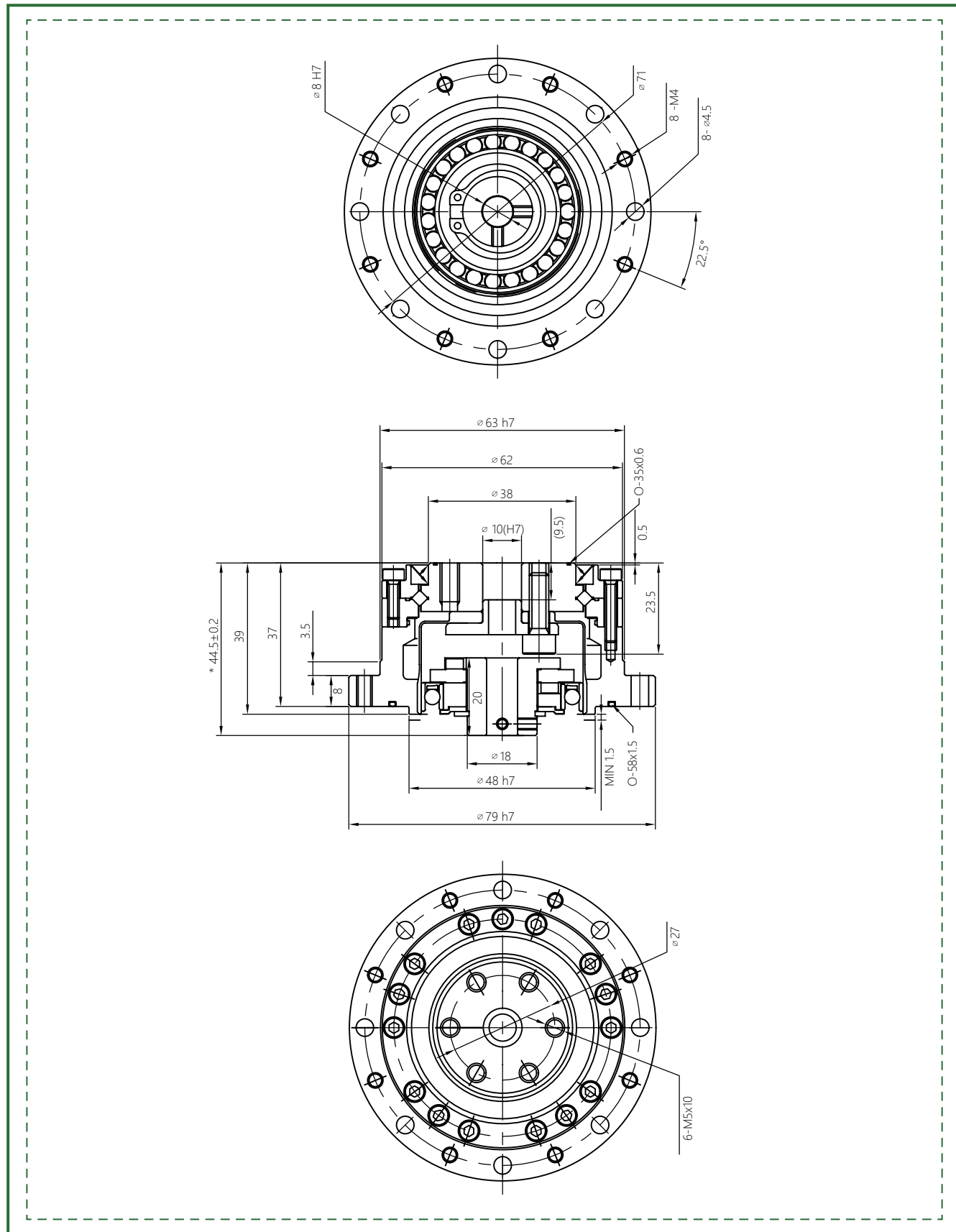


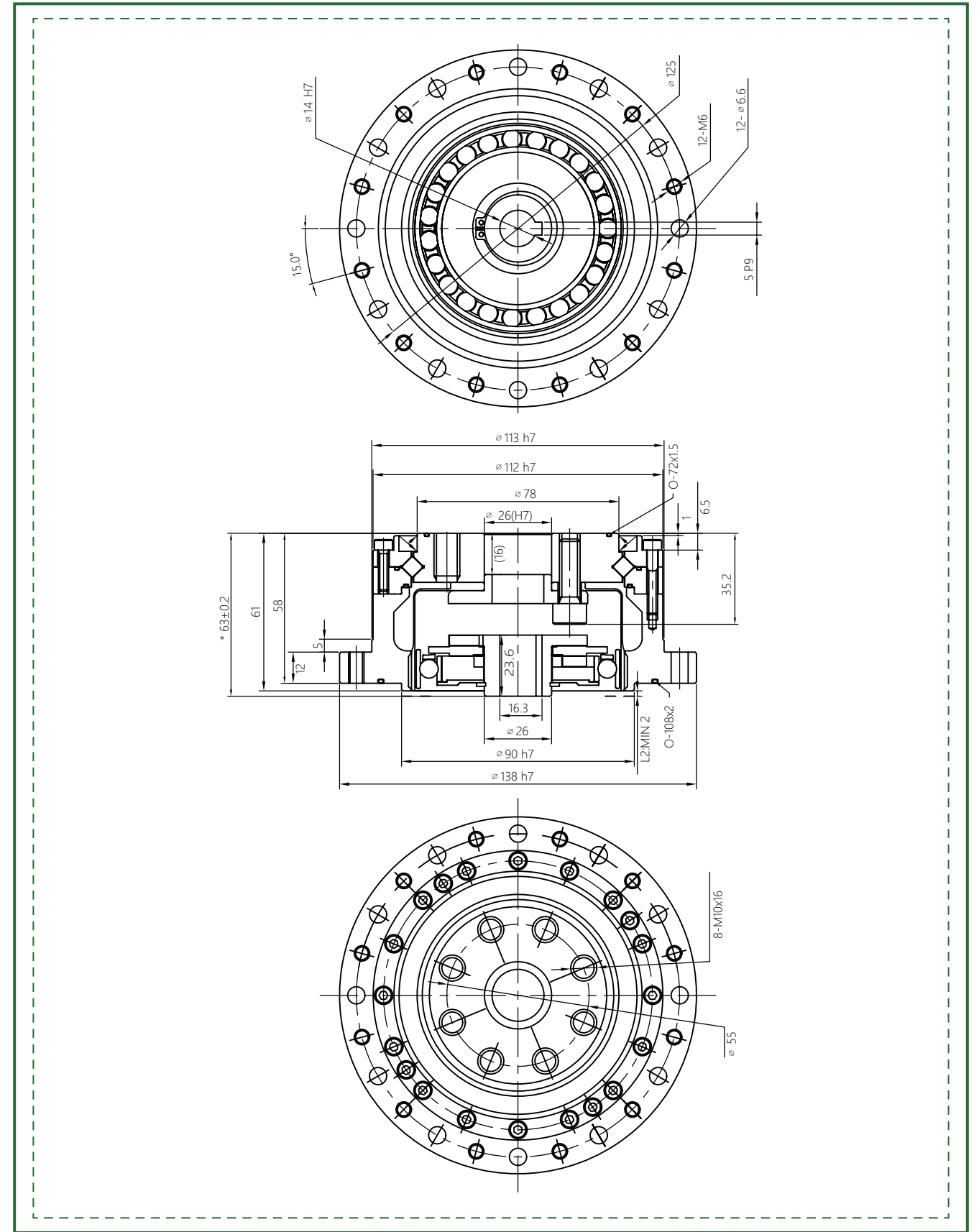
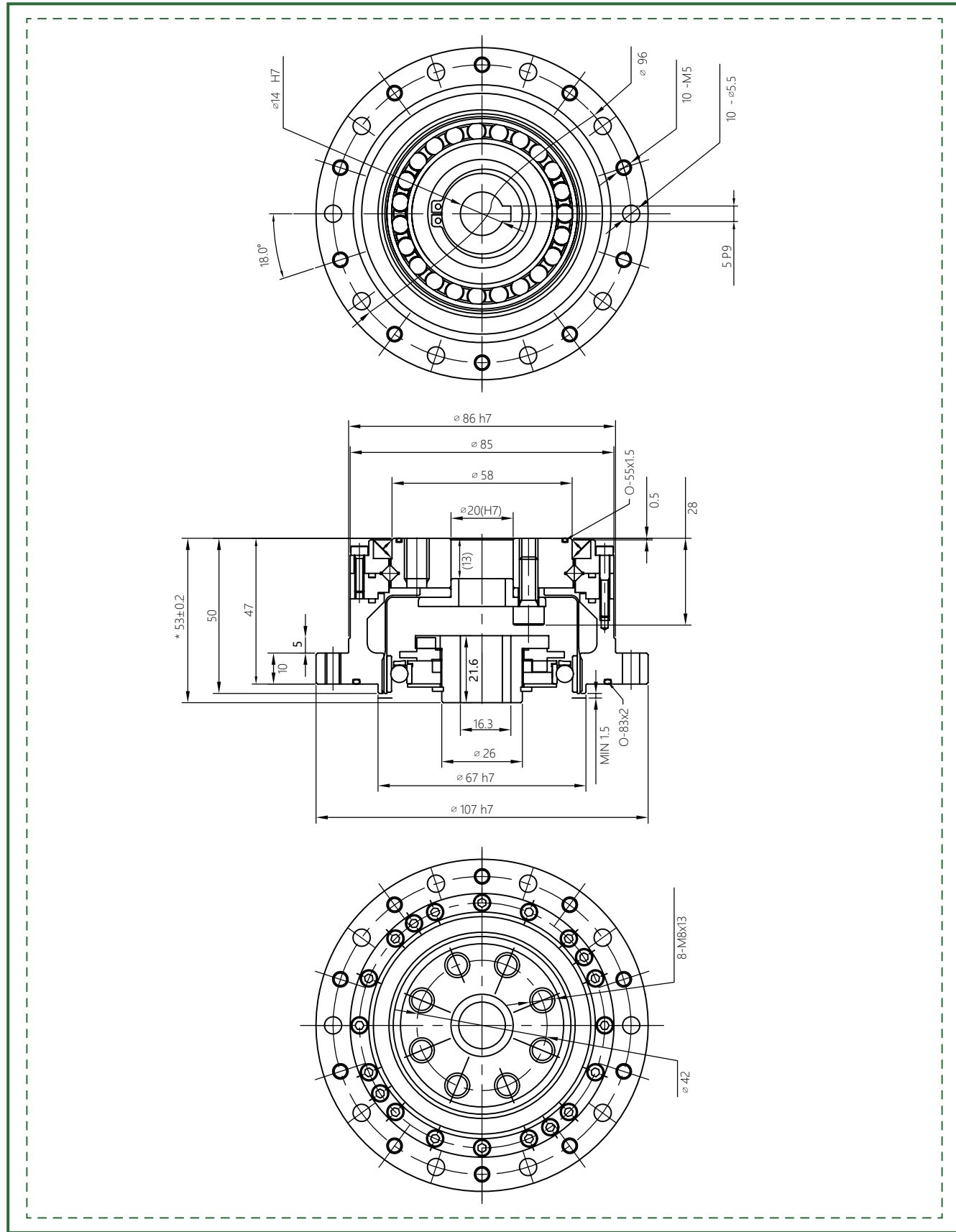
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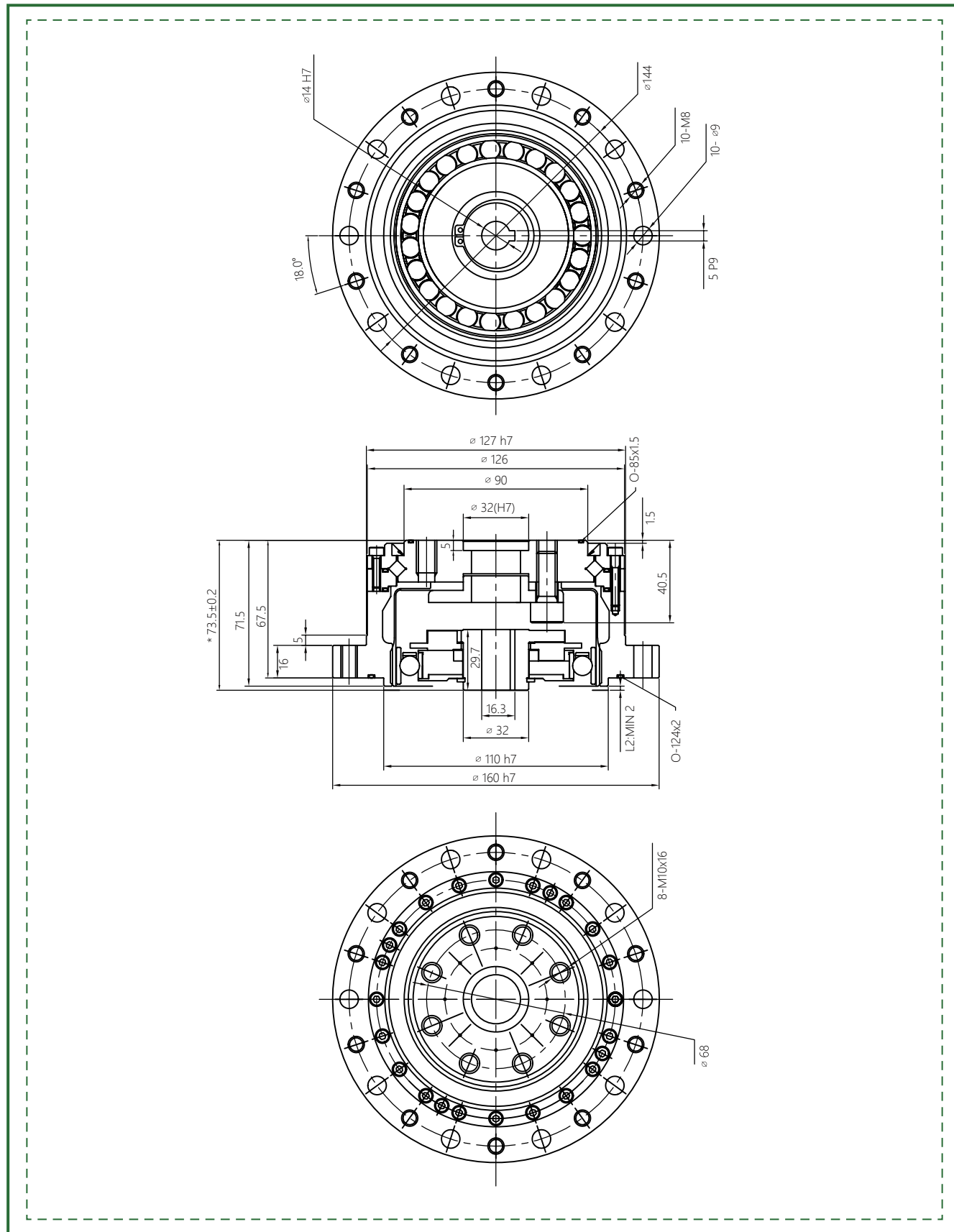
Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	Kg	Hour
14	50	6.6	23	8.6	43	8000	3500	≤20	0.52	10000
	80	9.6	29	13.5	57			≤20		15000
	100	9.6	34	13.5	66			≤20		15000
17	50	19.8	42	32.5	86	7000	3500	≤20	0.69	10000
	80	27.5	53	33.5	108			≤20		15000
	100	30	66	48.5	134			≤20		15000
	120	30	66	48.5	107			≤20		15000
20	50	32	69	42	121	6000	3500	≤20	0.99	10000
	80	42	91	58	158			≤20		15000
	100	50	102	61	182			≤20		15000
	120	50	108	61	182			≤20		15000
	160	50	113	61	182			≤20		15000
25	50	48	121	68.5	230	5500	3500	≤20	1.48	10000
	80	78	169	107.5	315			≤20		15000
	100	84	194	133	351			≤20		15000
	120	84	207	133	376			≤20		15000
	160	84	217	133	388			≤20		15000
32	50	94	267	133	472	4500	3500	≤20	3.2	10000
	80	146	376	206	702			≤20		15000
	100	169	411	267	800			≤20		15000
	120	169	436	267	848			≤20		15000
	160	169	459	267	848			≤20		15000
40	50	169	497	242	847	4000	3000	≤20	5.0	10000
	80	255	641	351	1210			≤20		15000
	100	328	702	460	1334			≤20		15000
	120	363	762	557	1458			≤20		15000
	160	363	800	557	1458			≤20		15000
50*	80	459	1163	642	2297	3000	2500	≤20	9.0	15000
	100	580	1211	823	2545			≤20		15000
	120	654	1334	1005	2545			≤20		15000
	160	654	1458	1042	3025			≤20		15000
58*	80	678	1828	951	3026	3000	2200	≤10	14.8	15000
	100	860	1964	1309	3927			≤10		15000
	120	921	2124	1470	4113			≤10		15000
	160	921	2272	1494	4236			≤10		15000

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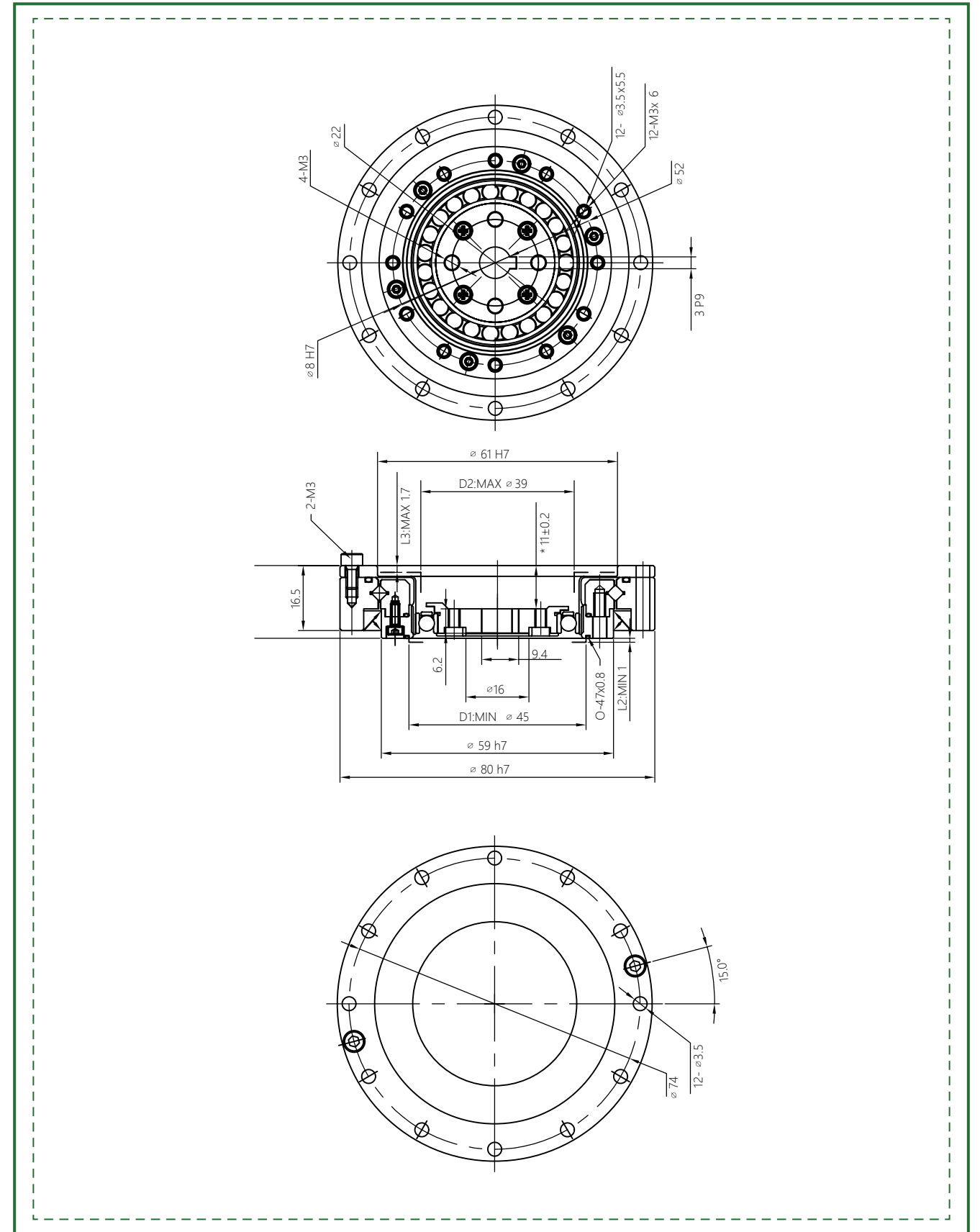
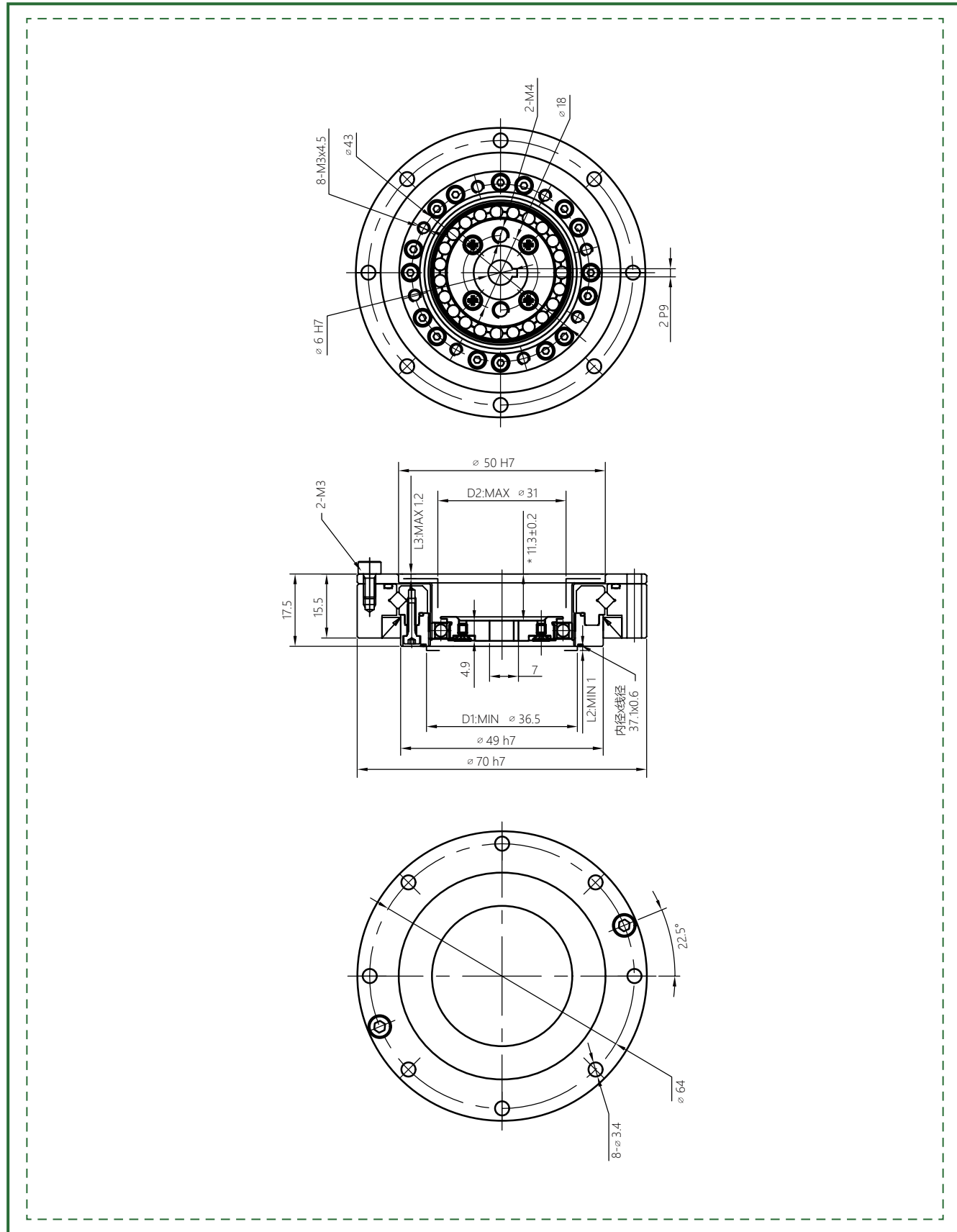


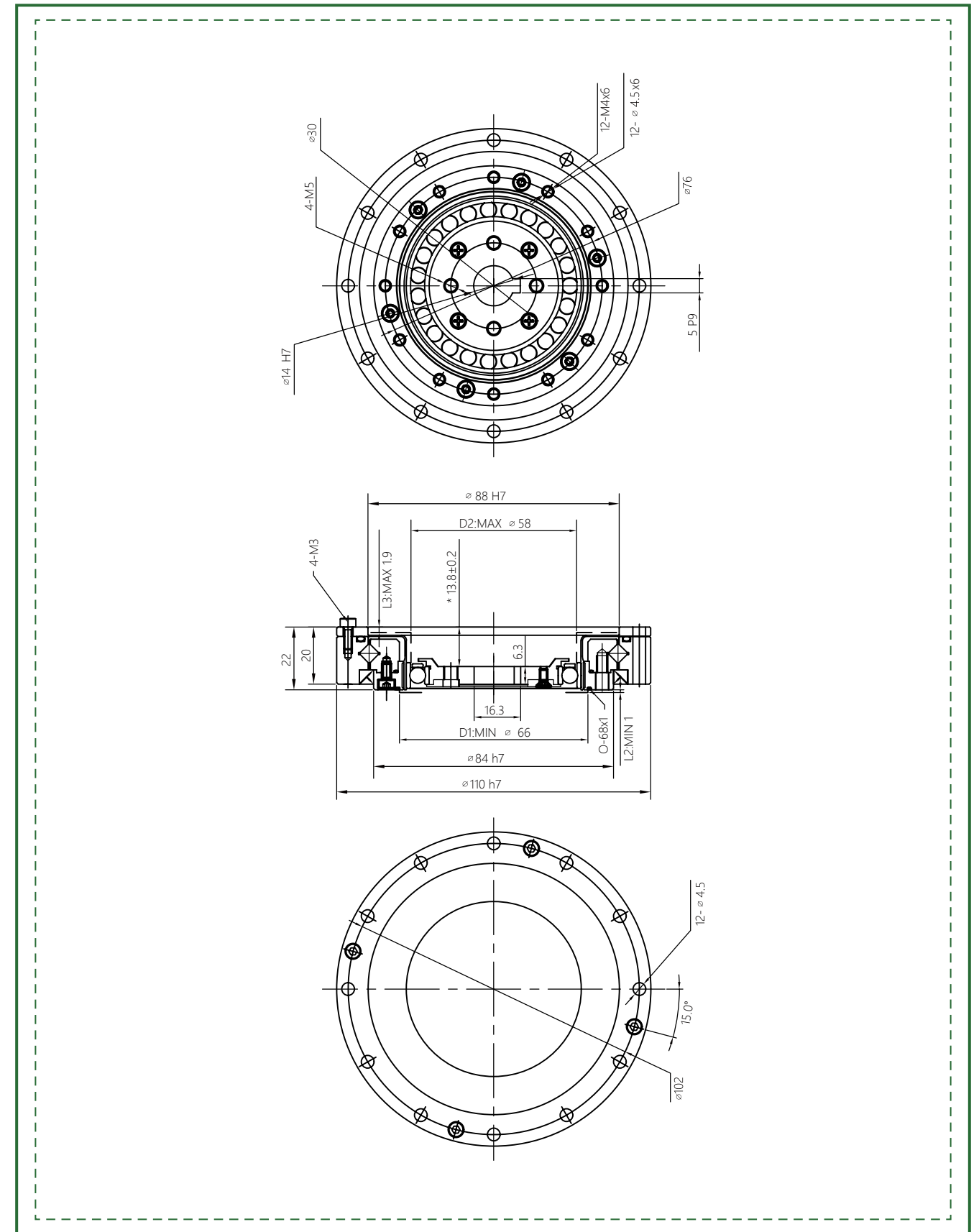
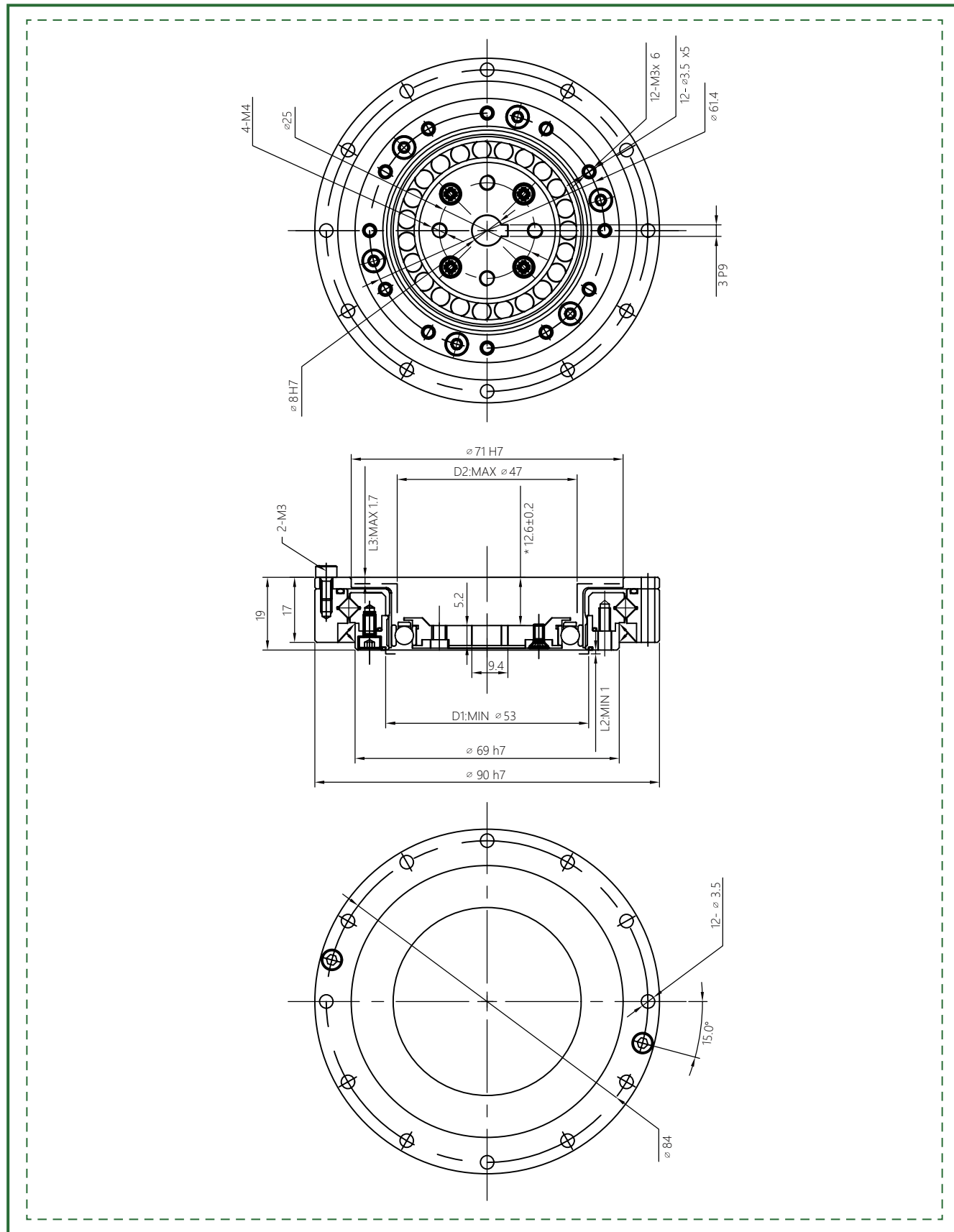


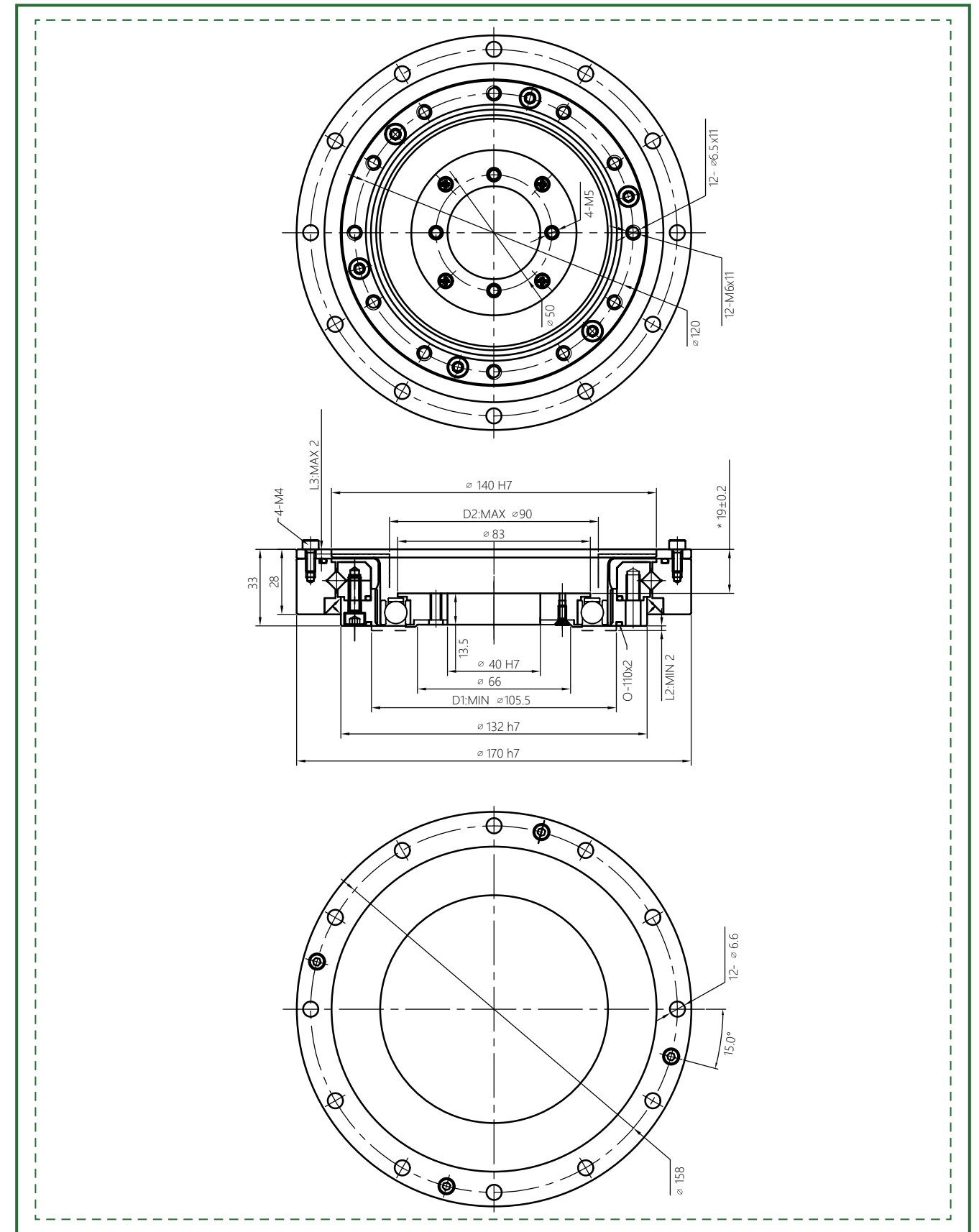
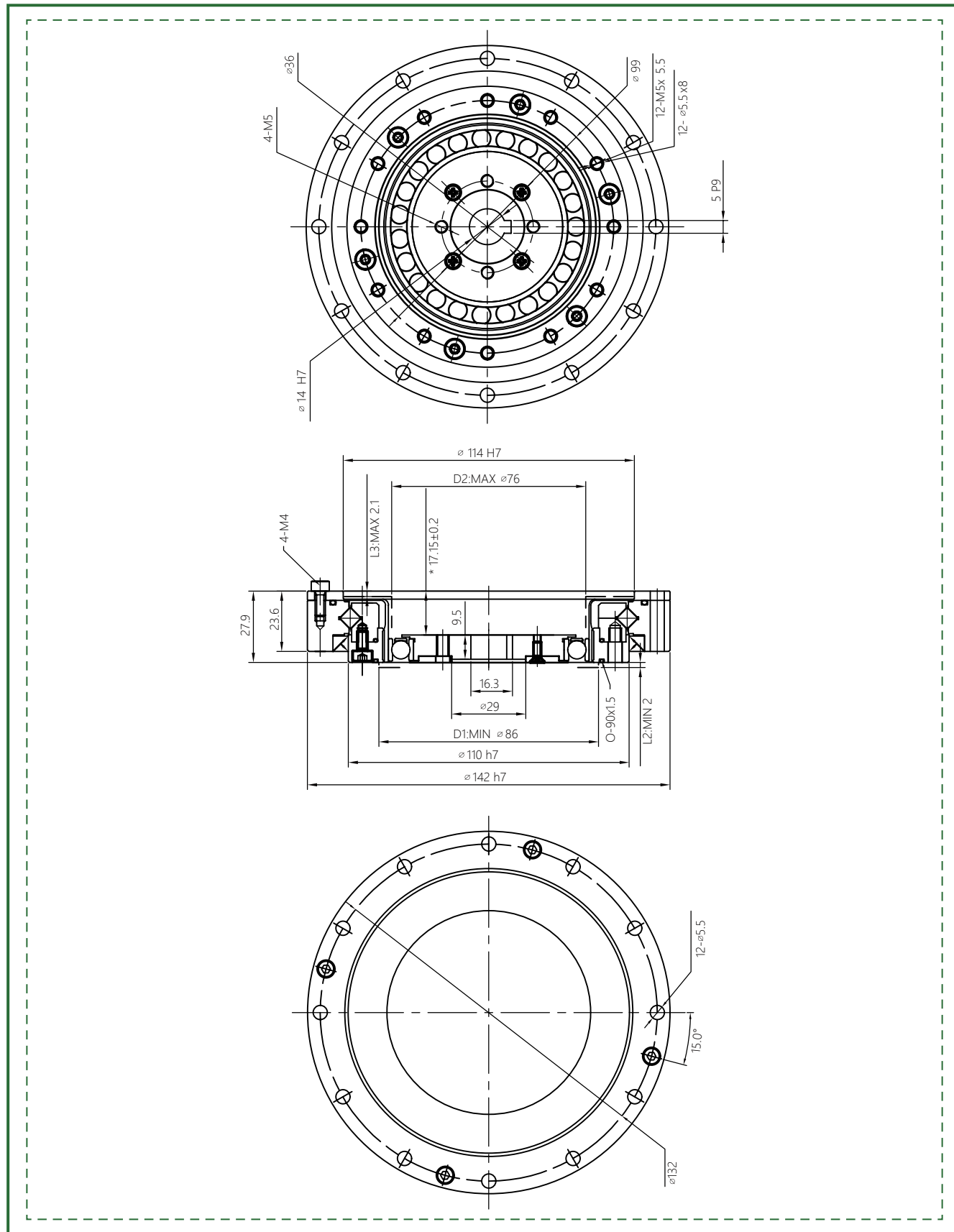
Parameter Table

Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	Weight	Design Life
Model No		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	Kg	Hour
14	50	3.5	11.4	4.6	23	8000	3500	$\leq 20$	0.35	9000
	80	5.1	15	6.2	29			$\leq 20$		10000
	100	5.1	18	7.3	33			$\leq 20$		10000
17	50	10.4	22	17	46	7000	3500	$\leq 20$	0.45	9000
	80	14	29	21	54			$\leq 20$		10000
	100	15.2	35	26	67			$\leq 20$		10000
20	50	16.1	37	23	66	6000	3500	$\leq 20$	0.55	9000
	80	23	49	28	78			$\leq 20$		10000
	100	27	54	32	90			$\leq 20$		10000
25	50	26	66	36	121	5500	3500	$\leq 20$	0.95	9000
	80	42	91	62	157			$\leq 20$		10000
	100	45	105	71	175			$\leq 20$		10000
	120	45	111	71	187			$\leq 20$		10000
32	50	50	143	71	255	4500	3500	$\leq 20$	1.92	9000
	80	79	202	126	350			$\leq 20$		10000
	100	91	221	144	399			$\leq 20$		10000
	120	91	235	144	423			$\leq 20$		10000
40	50	91	267	130	456	4000	3000	$\leq 20$	3.15	9000
	100	176	378	247	665			$\leq 20$		10000
	160	196	430	300	727			$\leq 20$		10000





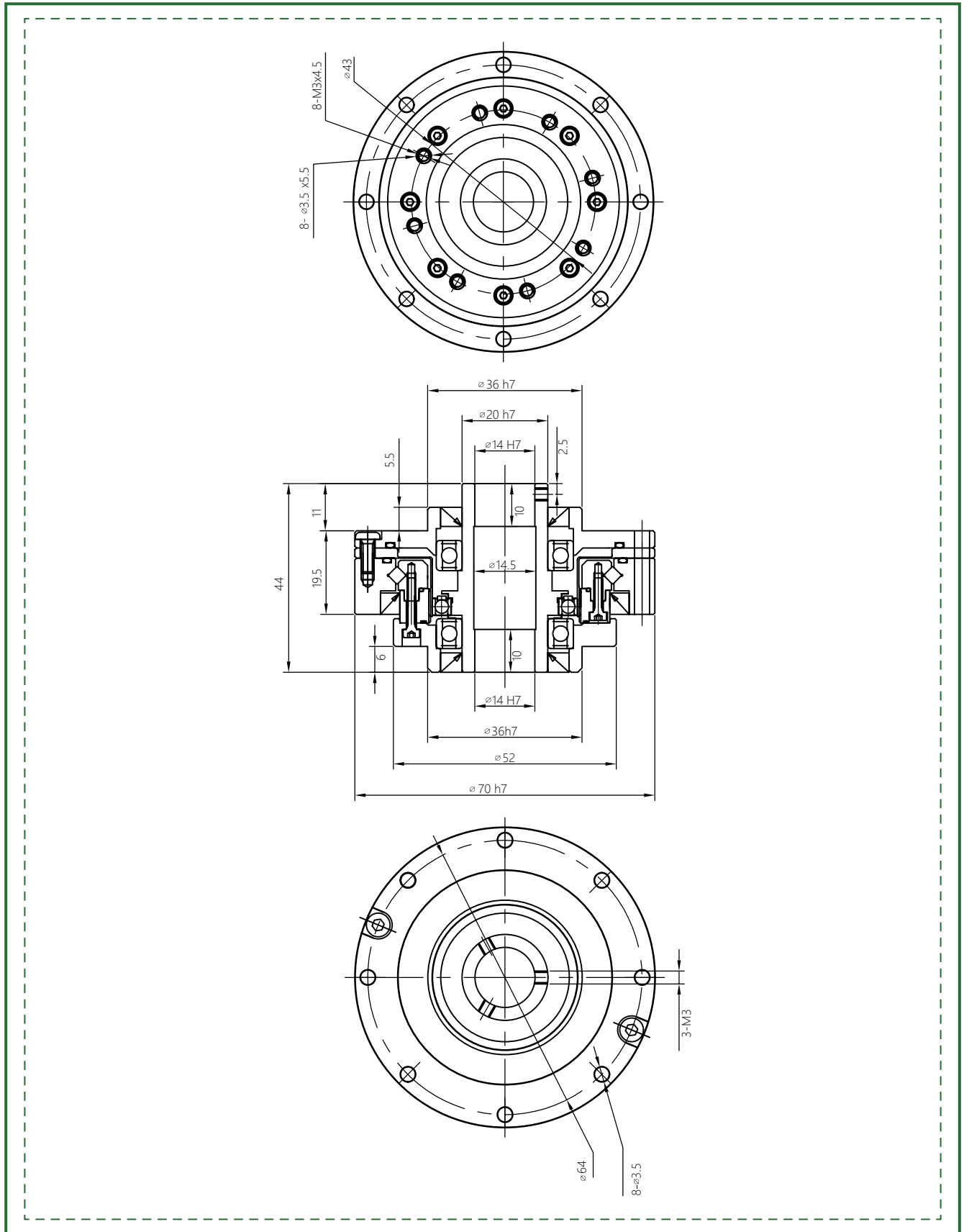


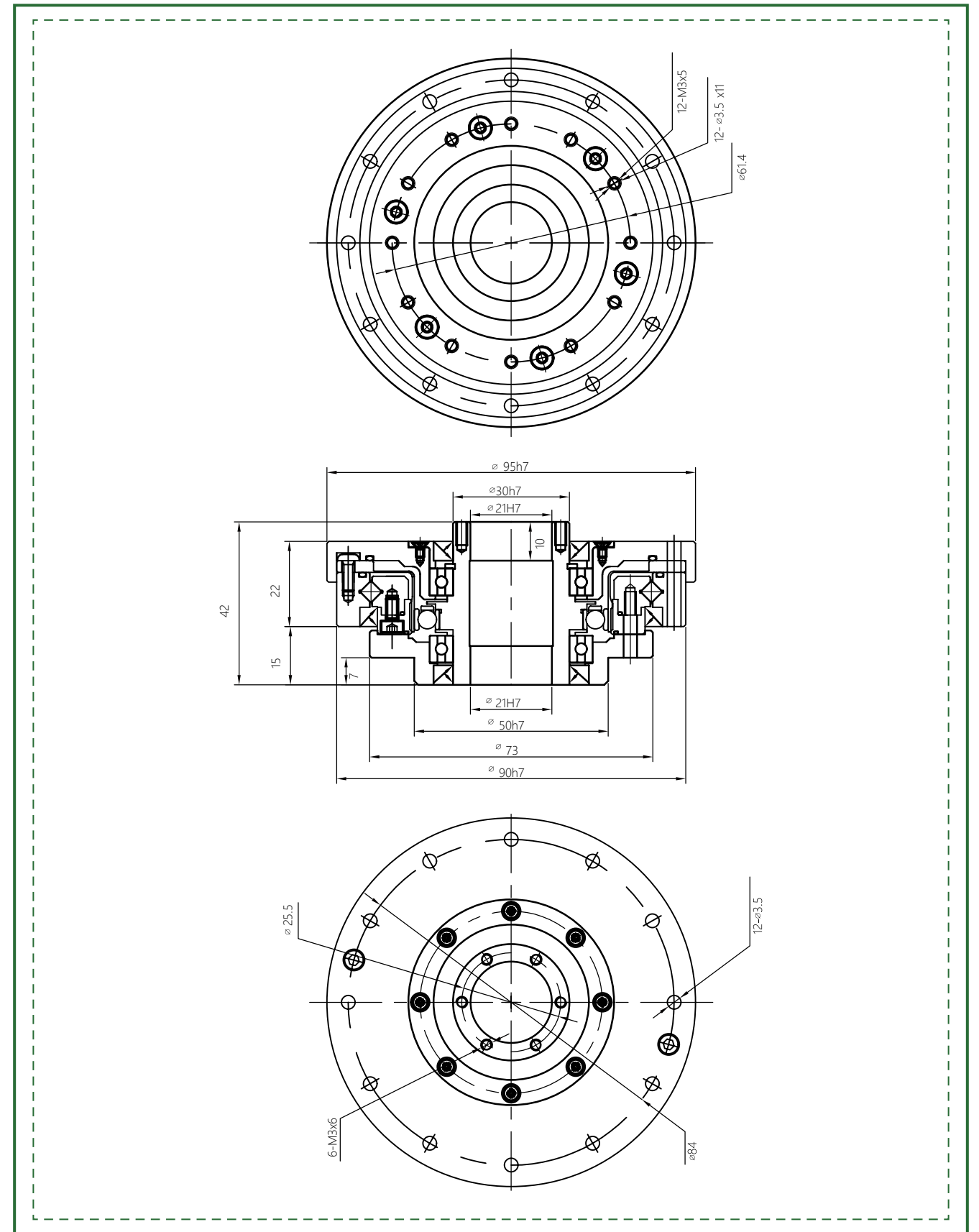
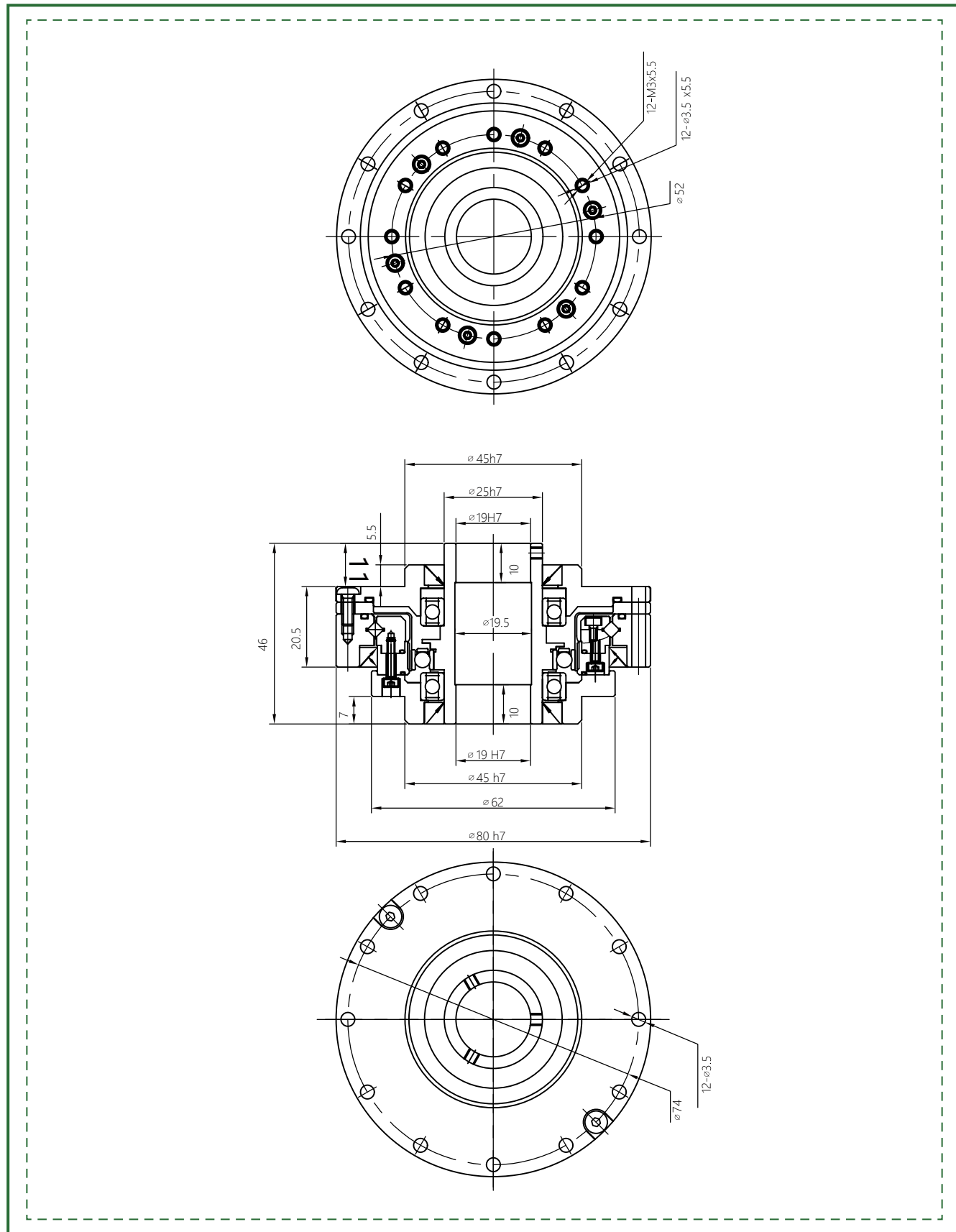


### Parameter Table

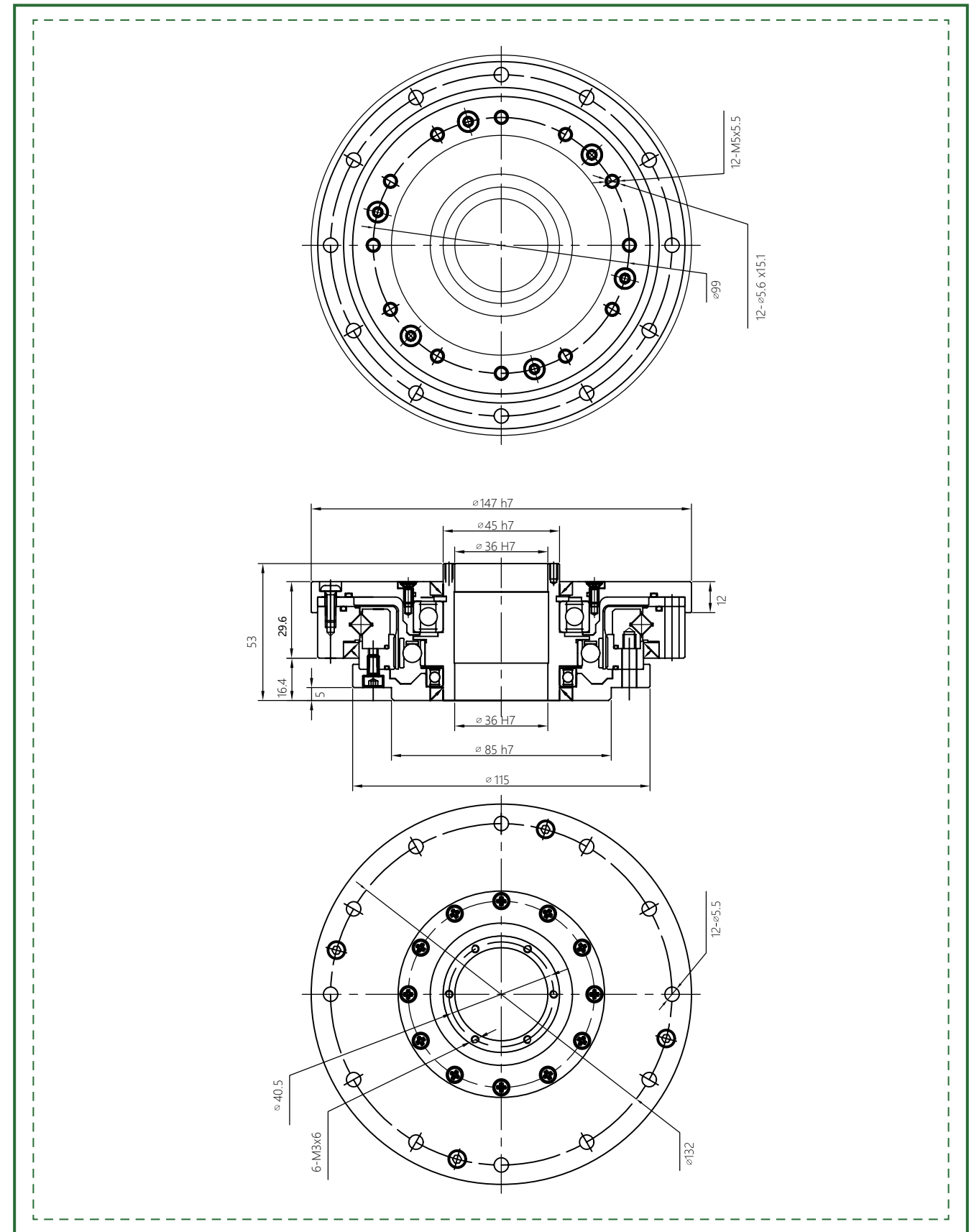
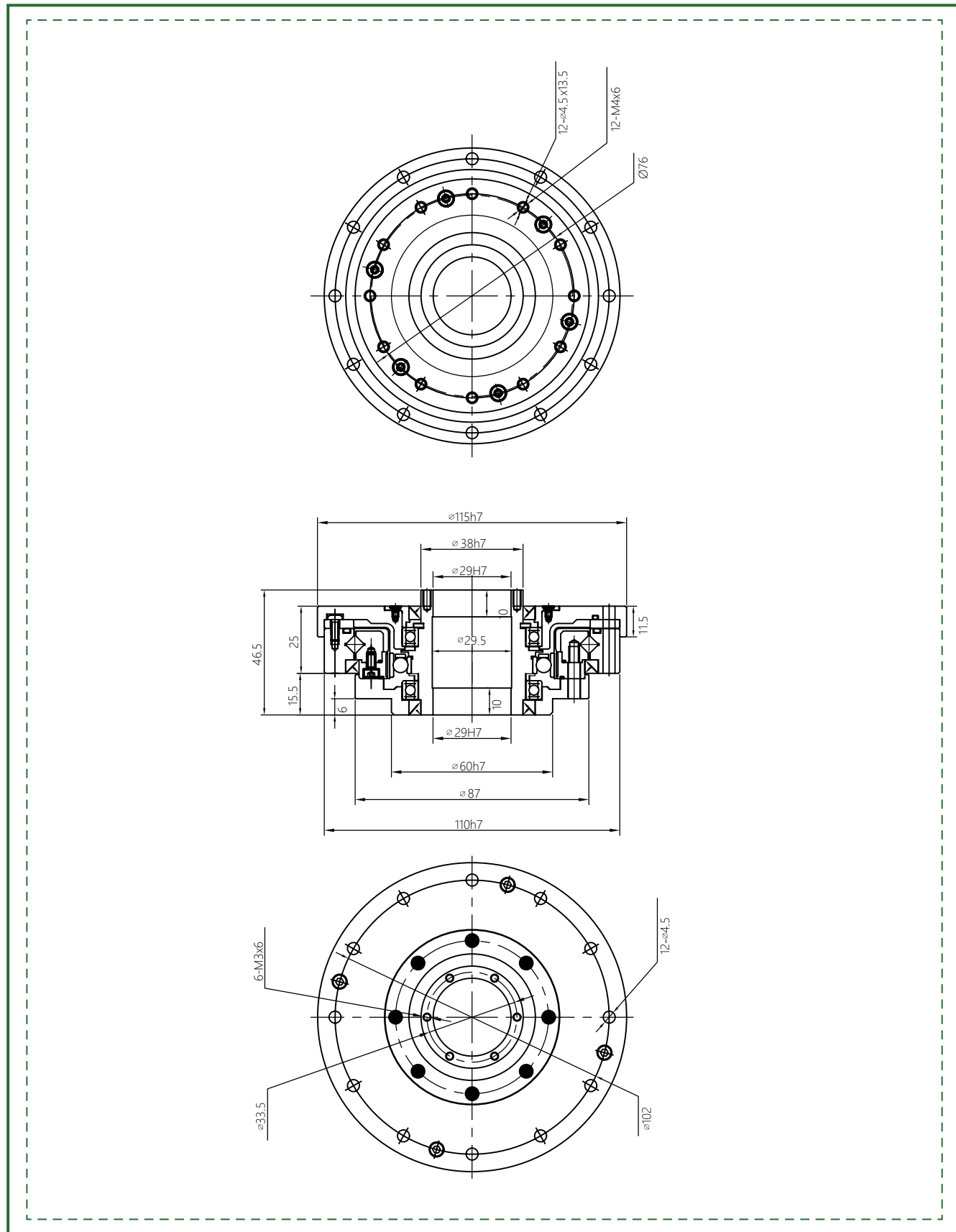
Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	Kg	Hour
14	50	3.5	11.4	4.6	23	8000	3500	≤20	0.35	9000
	80	5.1	15	6.2	29			≤20		10000
	100	5.1	18	7.3	33			≤20		10000
17	50	10.4	22	17	46	7000	3500	≤20	0.45	9000
	80	14	29	21	54			≤20		10000
	100	15.2	35	26	67			≤20		10000
20	50	16.1	37	23	66	6000	3500	≤20	0.55	9000
	80	23	49	28	78			≤20		10000
	100	27	54	32	90			≤20		10000
25	50	26	66	36	121	5500	3500	≤20	0.95	9000
	80	42	91	62	157			≤20		10000
	100	45	105	71	175			≤20		10000
	120	45	111	71	187			≤20		10000
32	50	50	143	71	255	4500	3500	≤20	1.92	9000
	80	79	202	126	350			≤20		10000
	100	91	221	144	399			≤20		10000
	120	91	235	144	423			≤20		10000
40*	50	91	267	130	456	4000	3000	≤20	3.15	9000
	100	176	378	247	665			≤20		10000
	160	196	430	300	727			≤20		10000

\* Consult factory



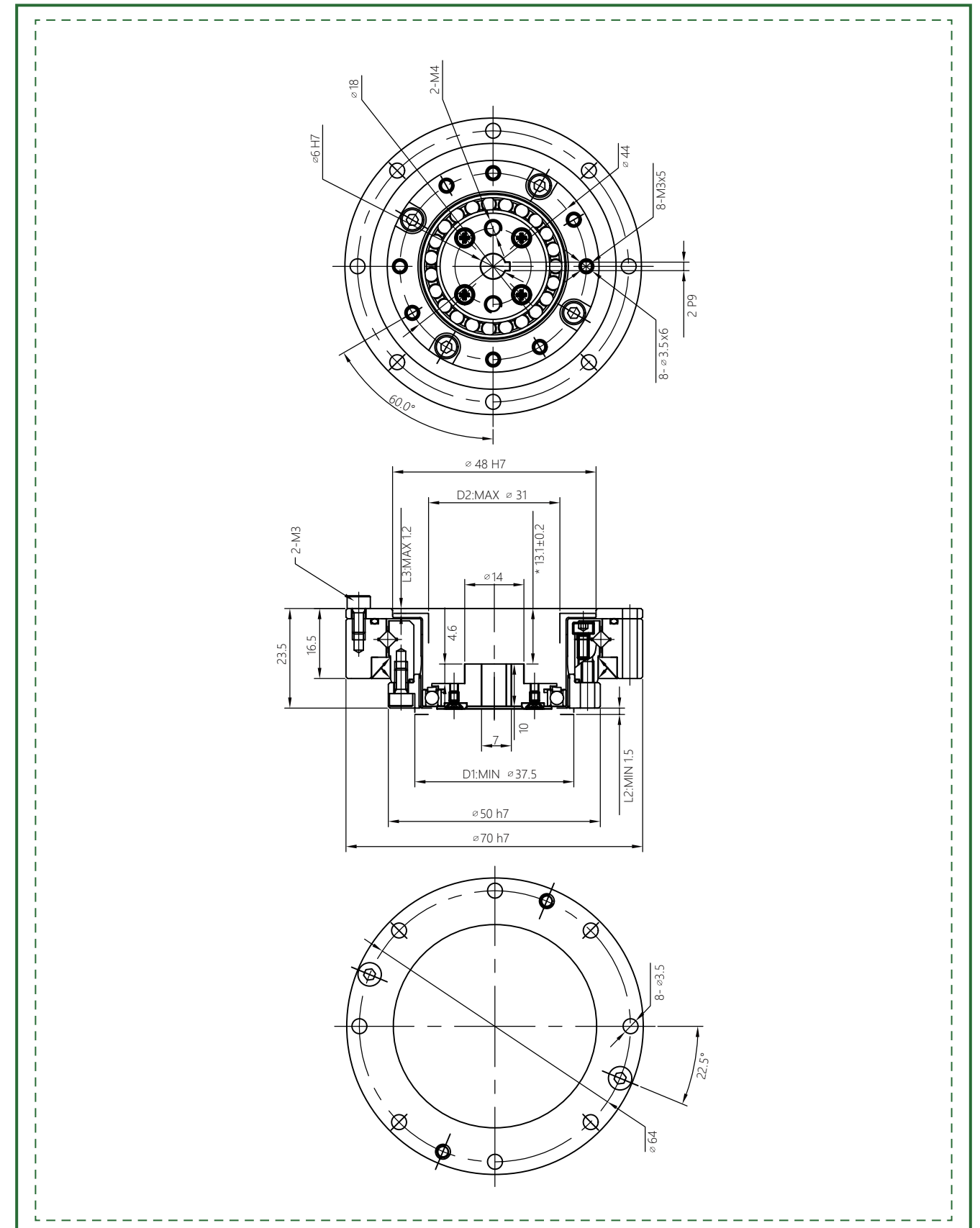




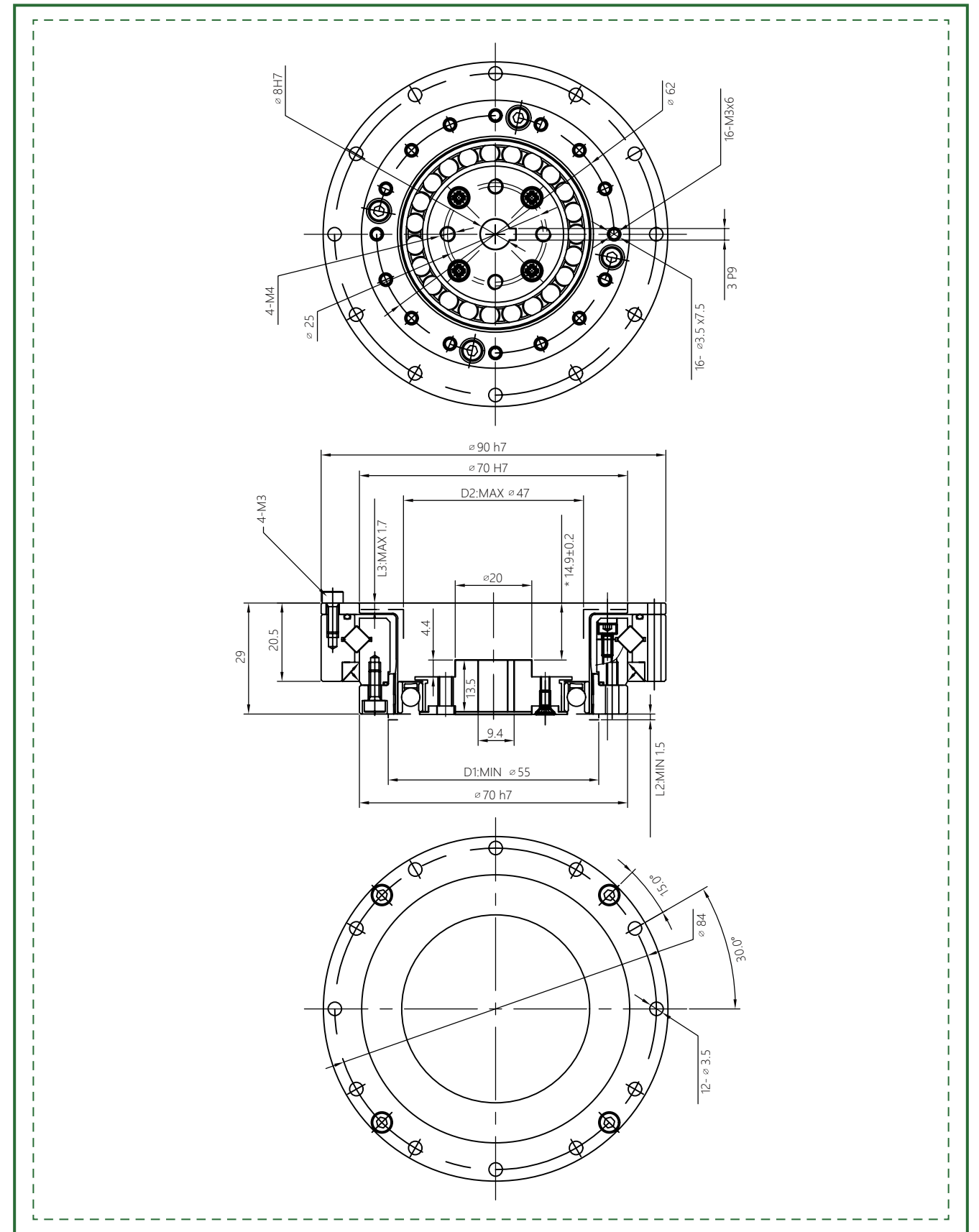
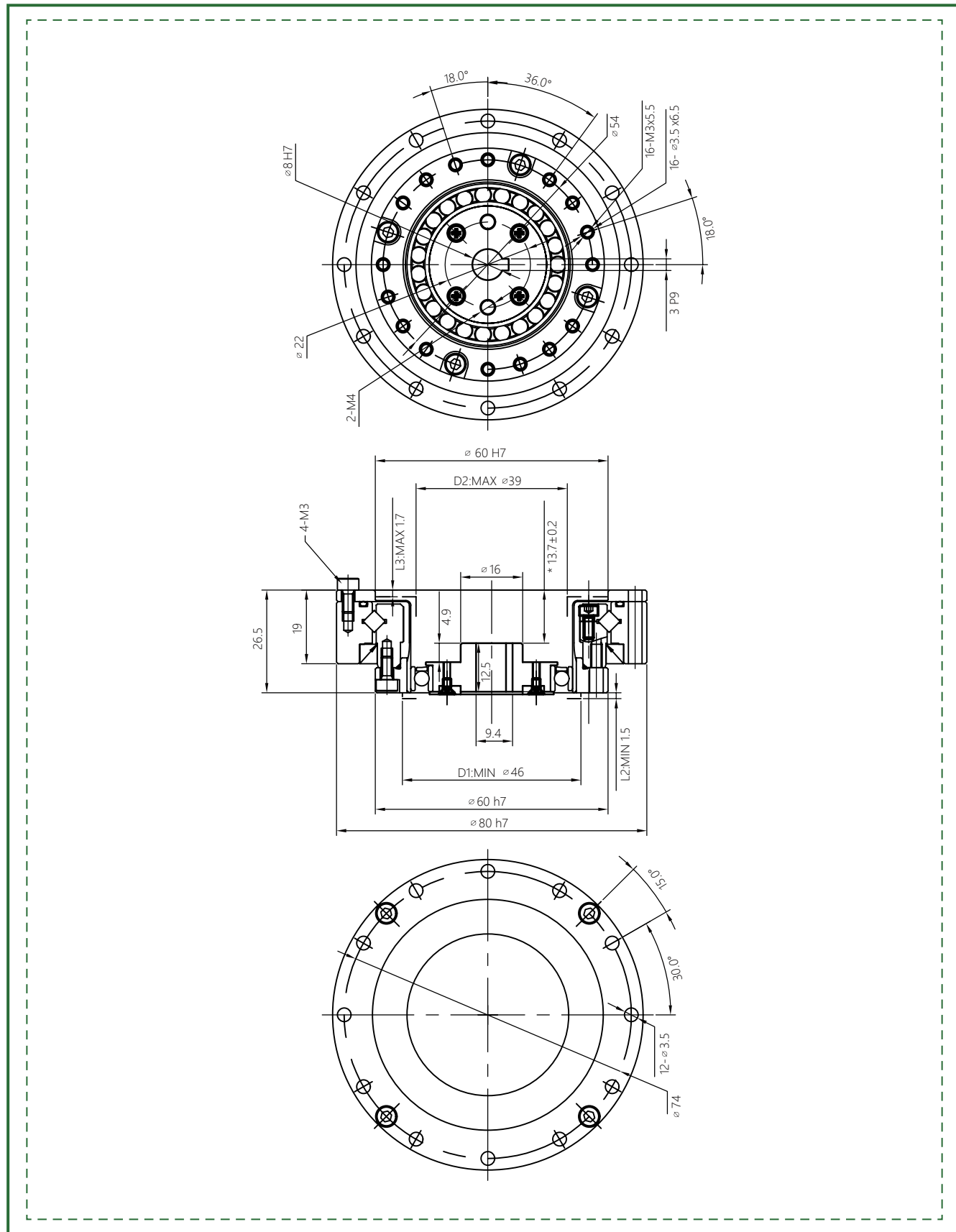


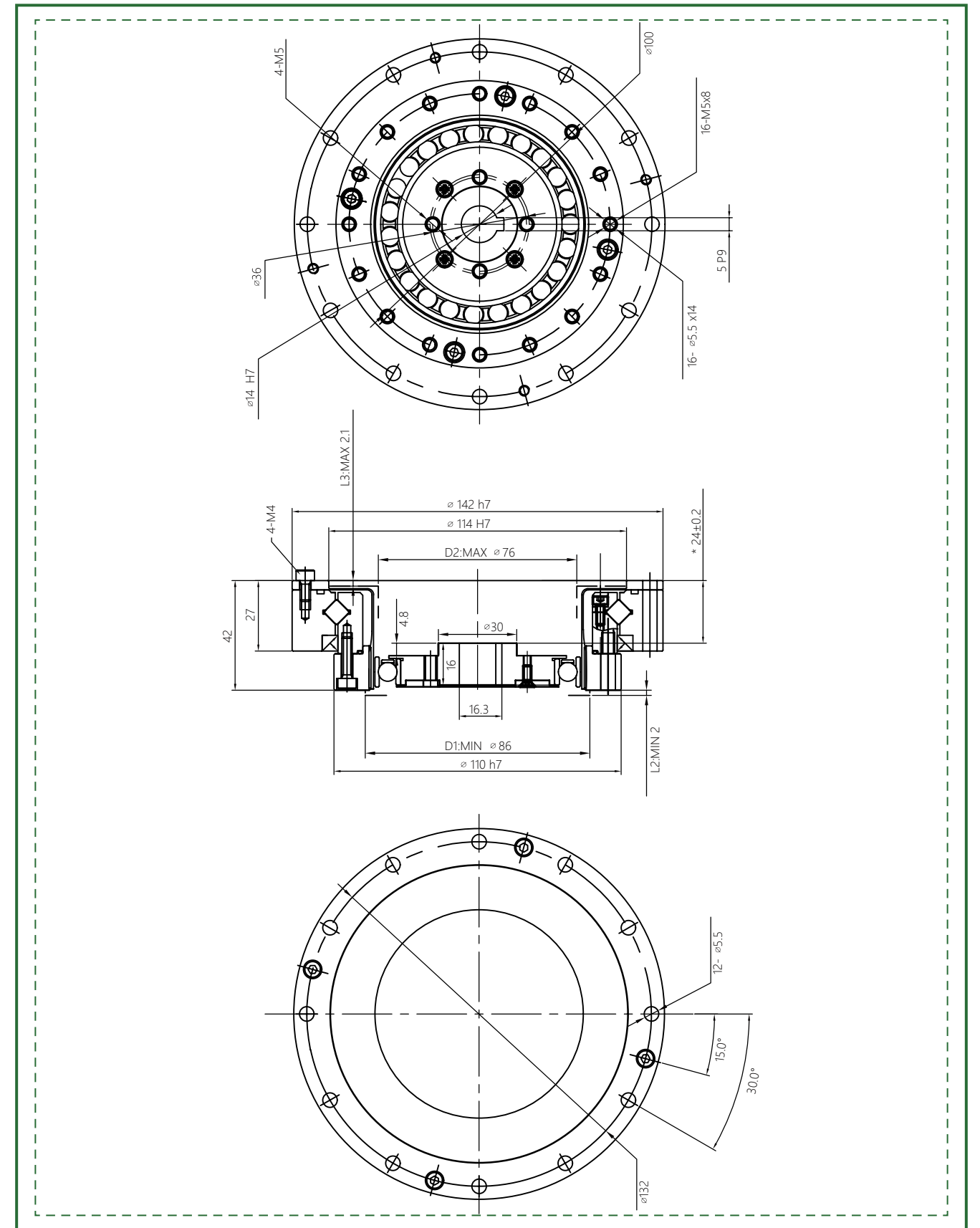
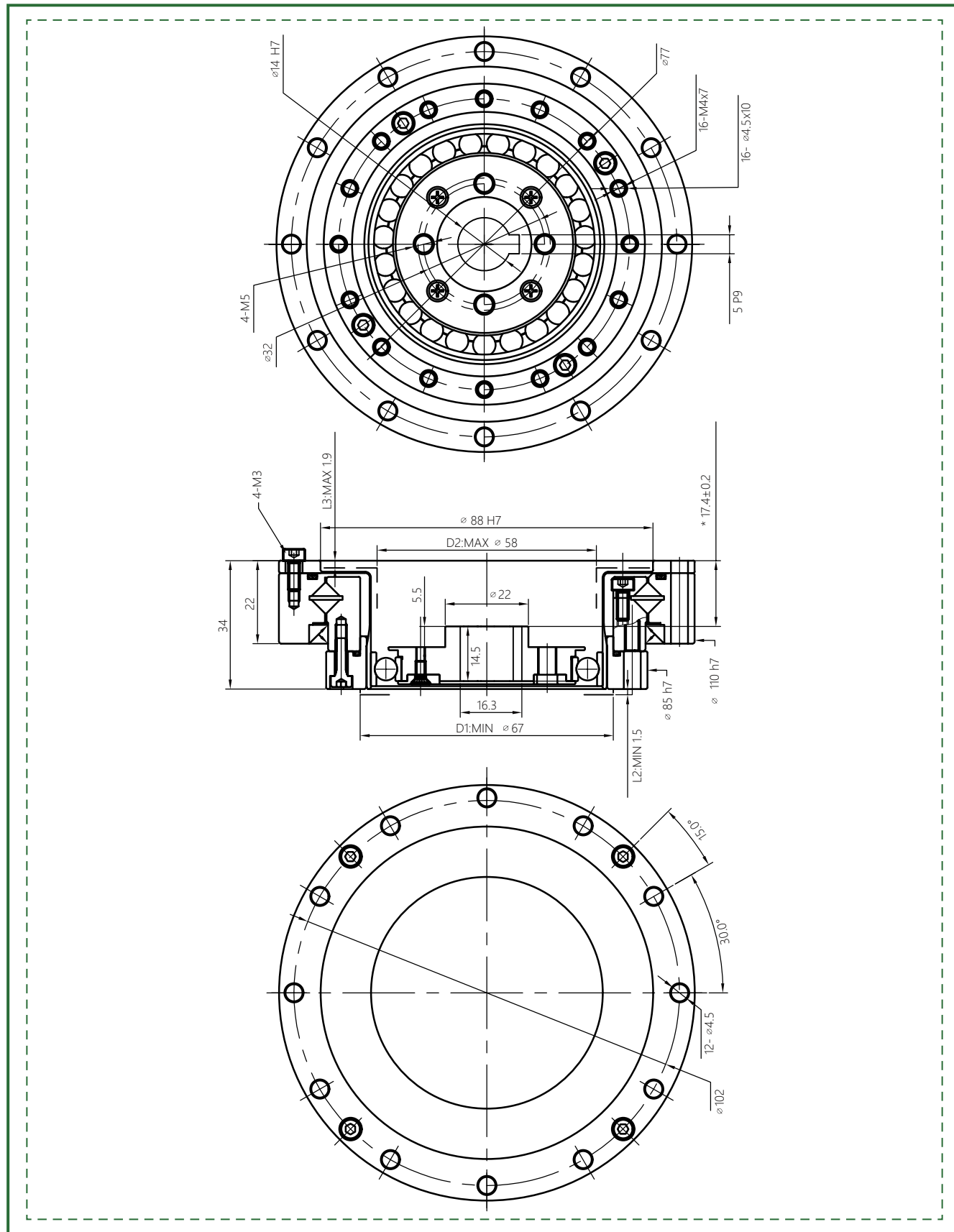
### Parameter Table

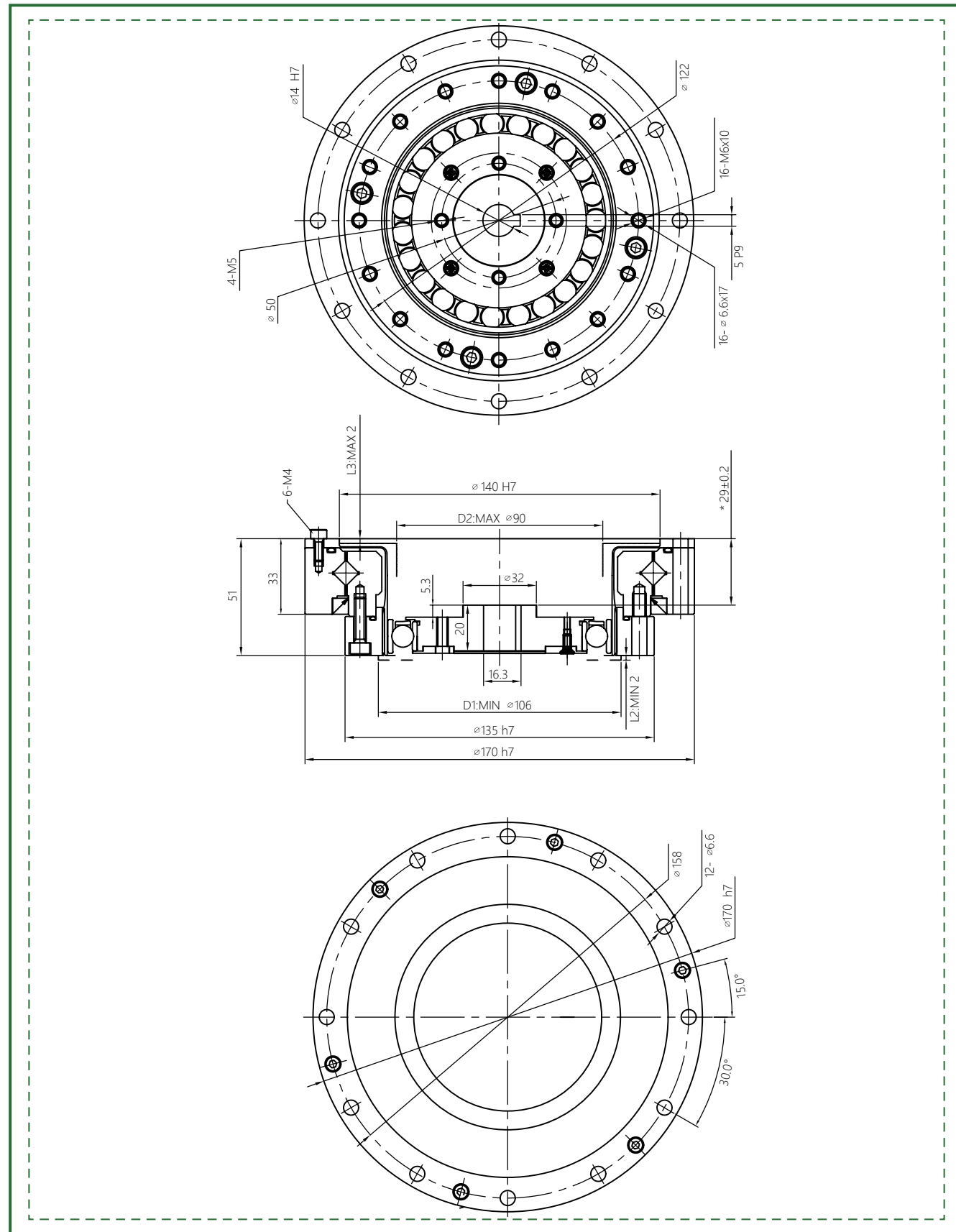
Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	Kg	Hour
14	30	3.8	8.6	7.8	16	8000	3500	≤20	0.38	10000
	50	5.1	17	6.6	33			≤20		10000
	80	7.4	22	10.5	45			≤10		15000
	100	7.4	27	10.5	51			≤10		15000
17	30	8.4	15.2	11.5	29	7000	3500	≤20	0.56	10000
	50	15.2	32	25	66			≤20		10000
	80	21	41	26	83			≤10		15000
	100	23	51	37	104			≤10		15000
20	30	14	26	19	48	6000	3500	≤20	0.76	10000
	50	24	53	32	93			≤20		10000
	80	32	70	45	121			≤10		15000
	100	38	78	47	140			≤10		15000
25	30	26	48	36	90	5500	3500	≤20	1.24	10000
	50	37	93	52	177			≤20		10000
	80	60	130	83	242			≤10		15000
	100	64	149	103	270			≤10		15000
32	30	51	95	71	190	4500	3500	≤20	2.6	10000
	50	72	205	103	363			≤20		10000
	80	112	289	159	540			≤10		15000
	100	130	316	205	615			≤10		15000
40	30	130	335	205	652	4000	3000	≤10	5.0	15000
	50	130	353	205	652			≤10		15000
	80	196	493	270	931			≤10		15000
	100	252	540	353	1026			≤10		15000
50*	30	279	586	428	1121	3000	2500	≤10	9.5	15000
	50	279	615	428	1121			≤10		15000
	80	233	679	333	1358			≤20		10000
	100	353	894	493	1767			≤10		15000
58*	30	446	931	633	1957	3000	2200	≤10	13.6	15000
	50	502	1026	772	1957			≤10		15000
	80	502	1121	801	2328			≤10		15000
	100	522	1406	732	2328			≤10		15000
58*	120	661	1511	1007	3021	3000	2200	≤10	13.6	15000
	160	708	1634	1131	3164			≤10		15000
	160	708	1748	1150	3259			≤10		15000



\* Consult factory





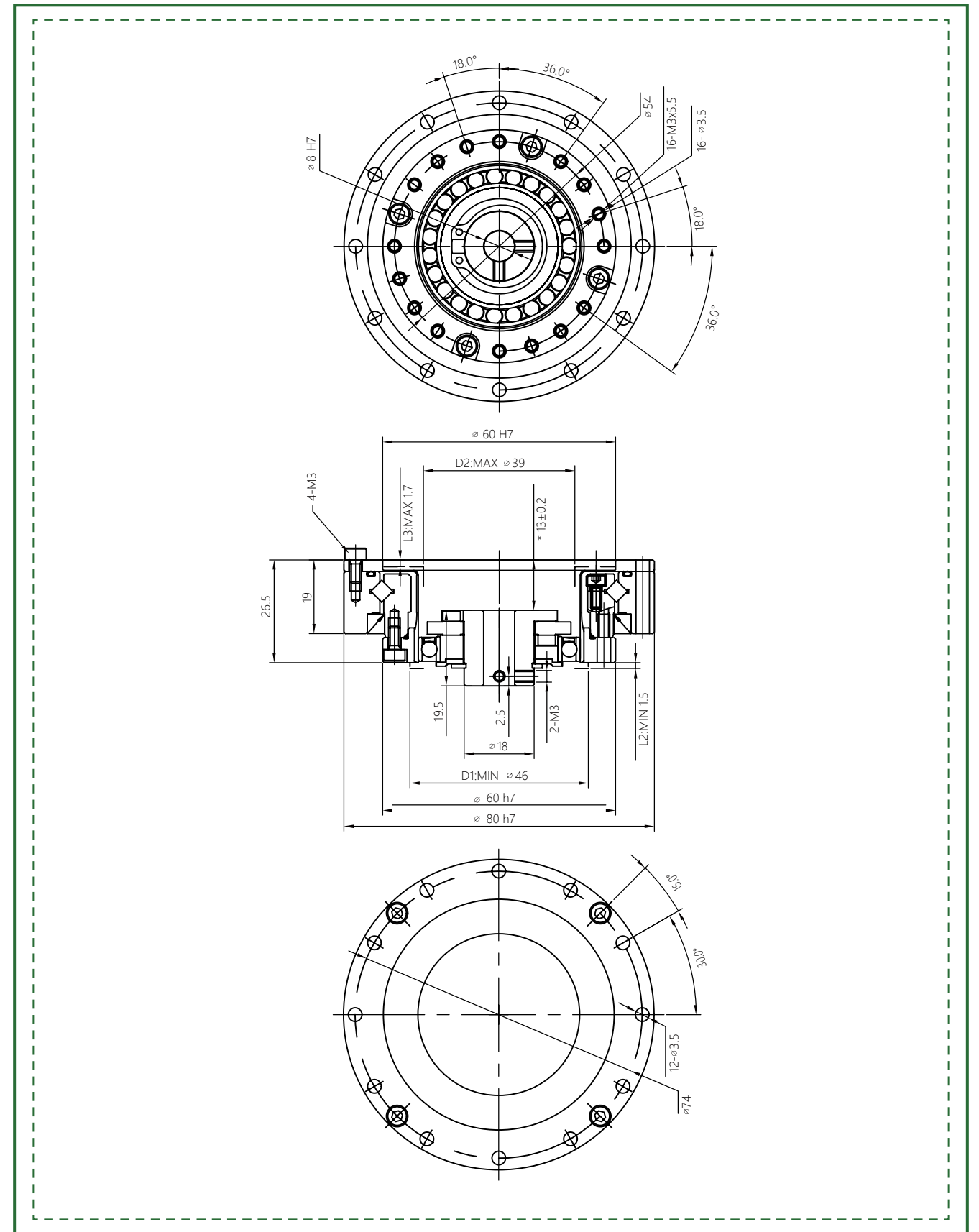
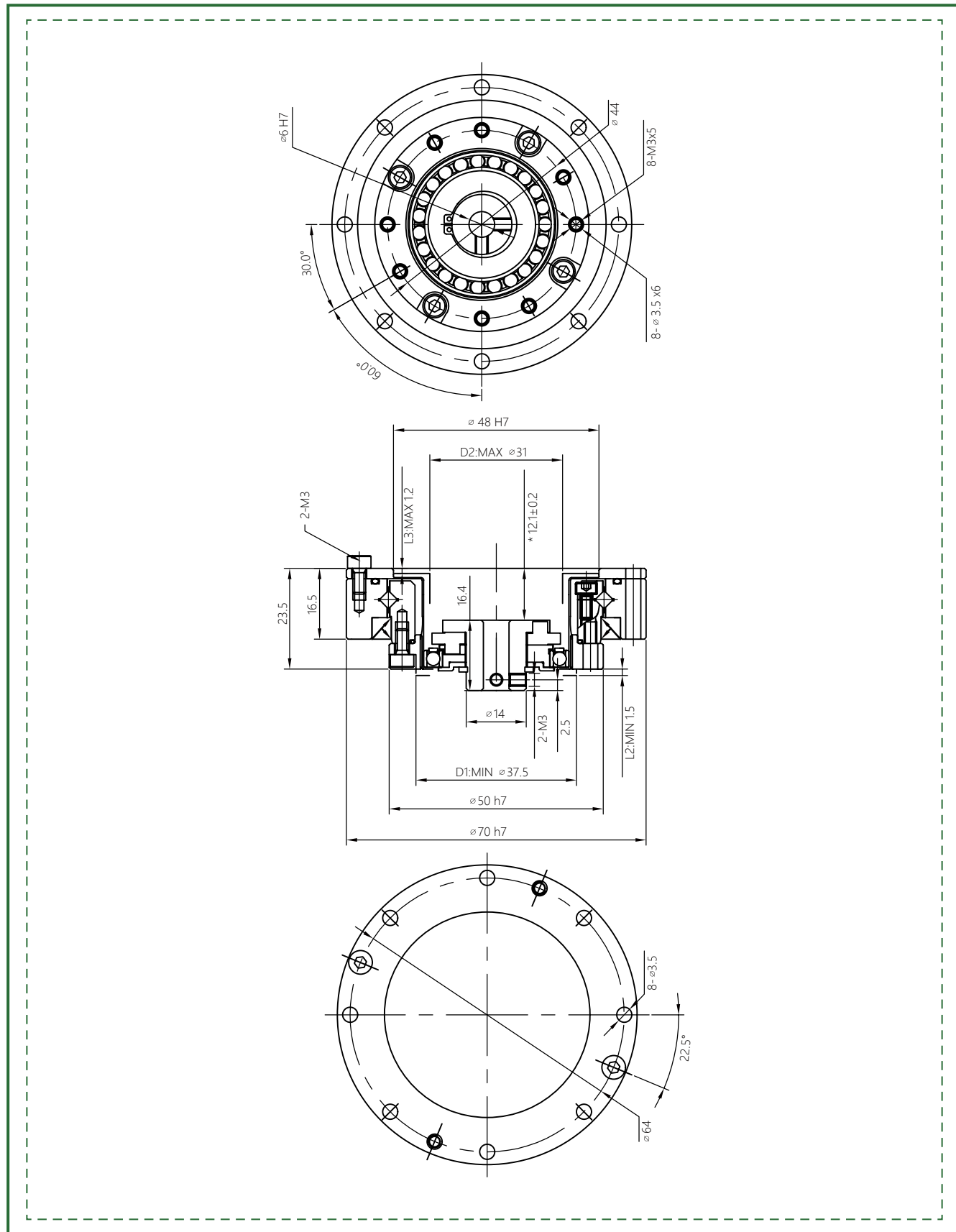


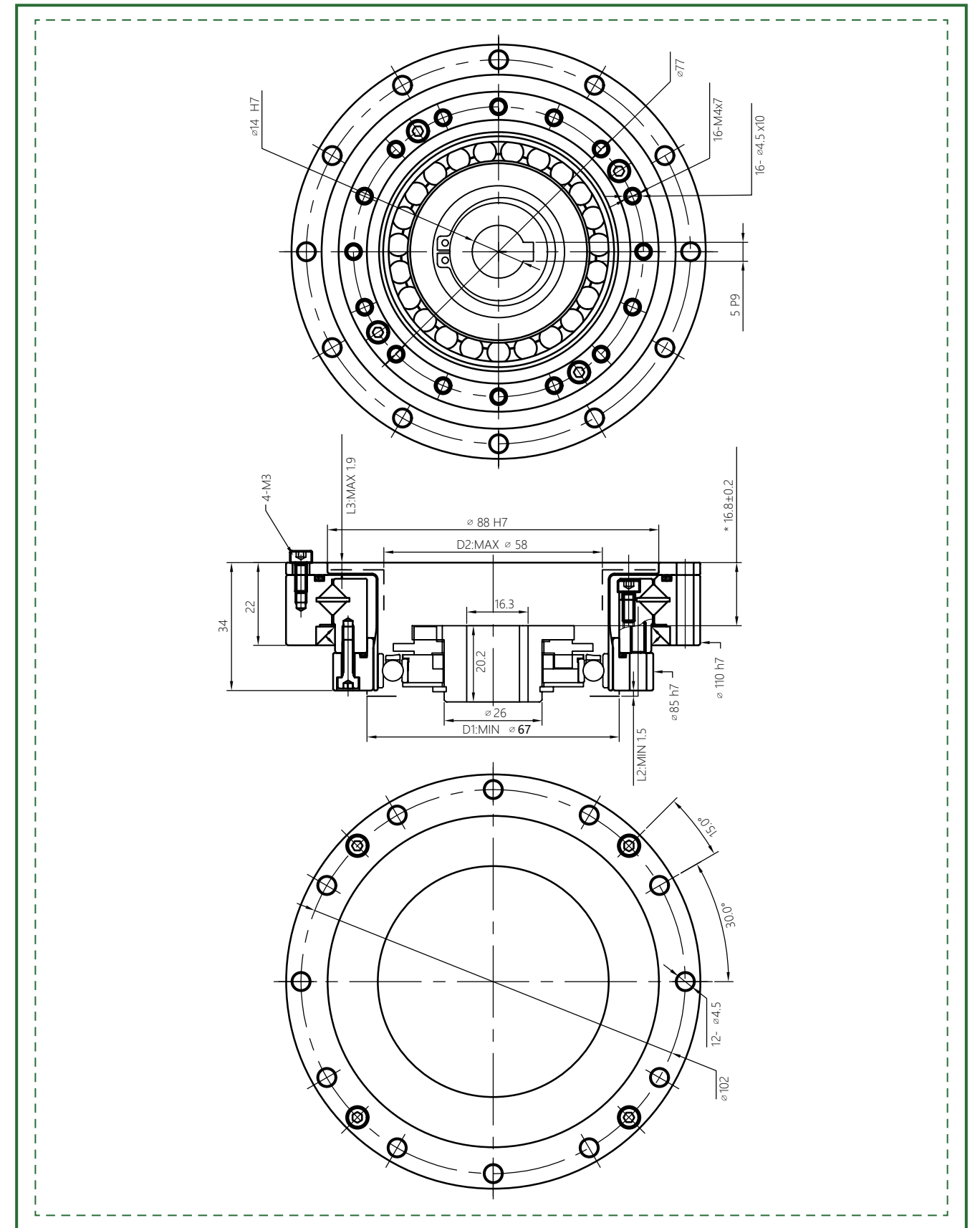
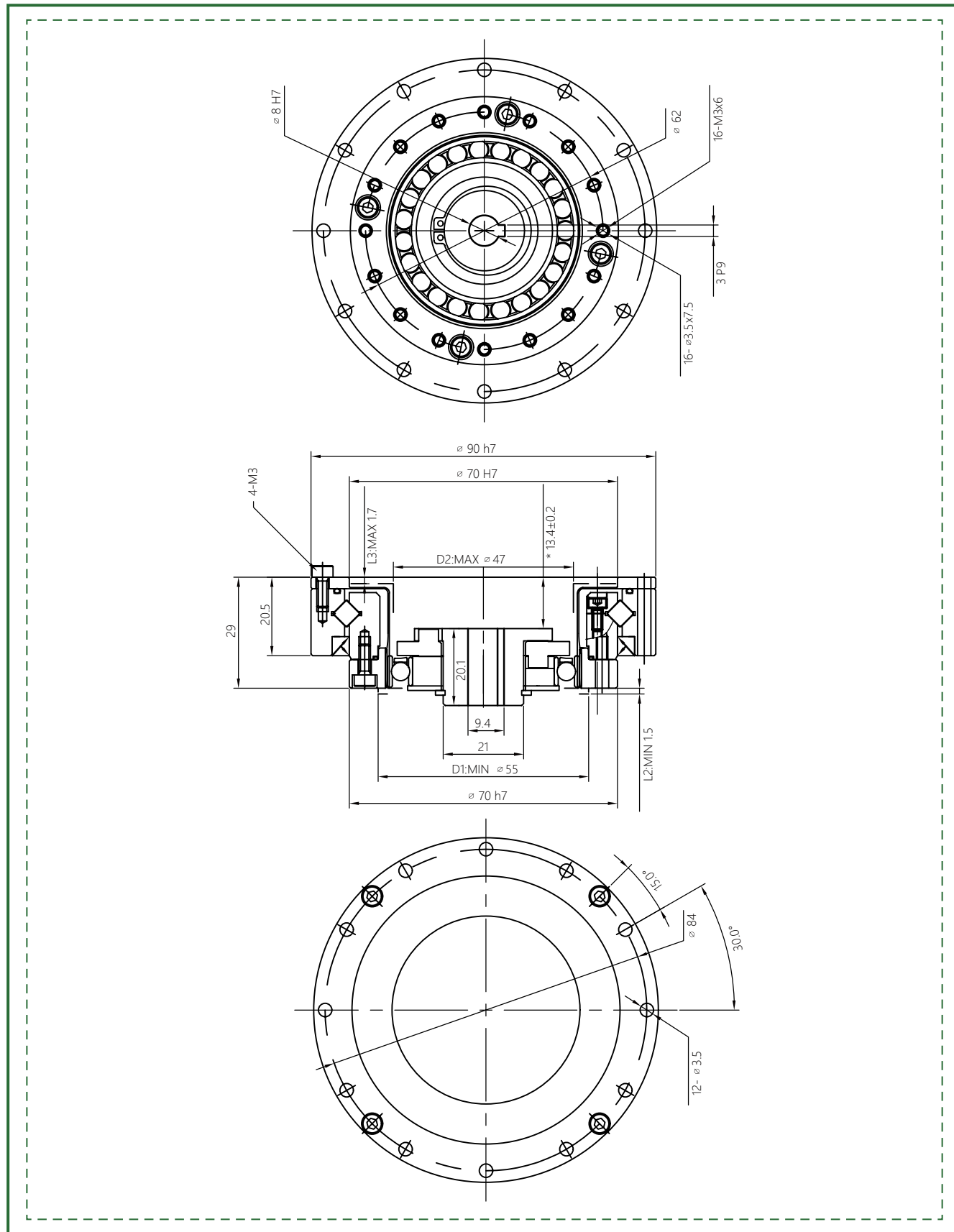
## Parameter Table

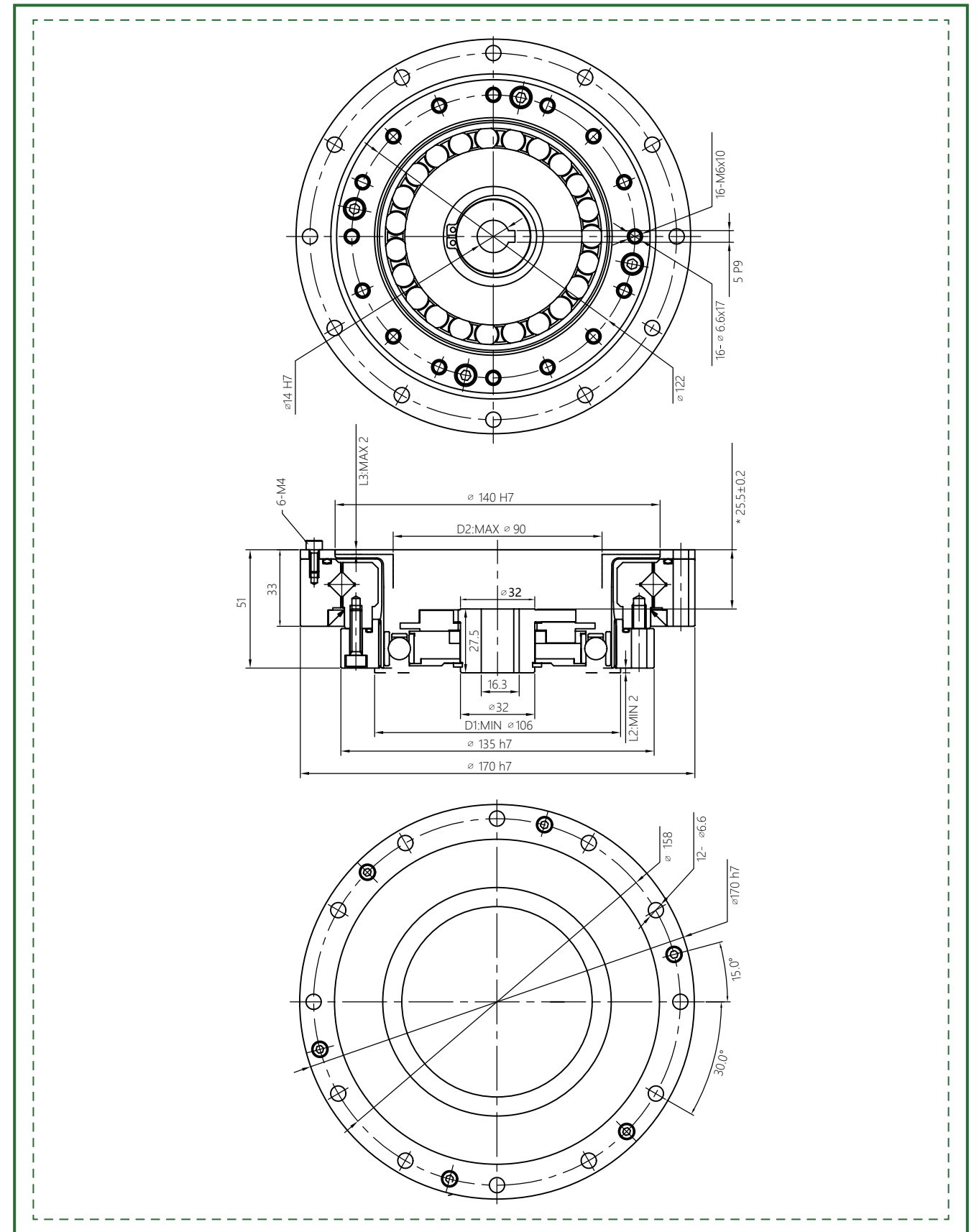
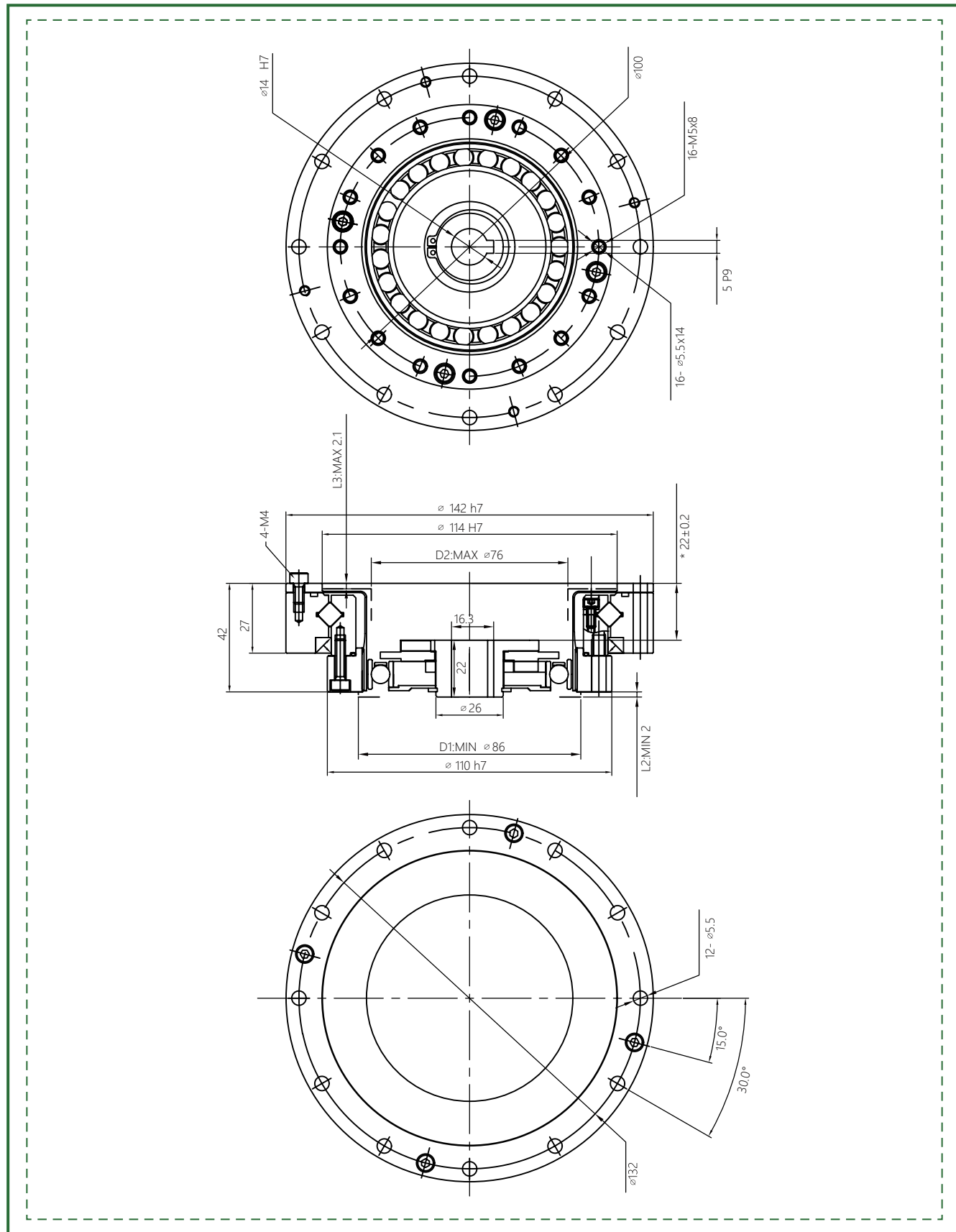
Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	Weight	Design Life
Model No		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	Kg	Hour
14	30	3.8	8.6	7.8	16	8000	3500	$\leq 20$	0.38	10000
	50	5.1	17	6.6	33			$\leq 20$		10000
	80	7.4	22	10.5	45			$\leq 20$		15000
	100	7.4	27	10.5	51			$\leq 20$		15000
17	30	8.4	15.2	11.5	29	7000	3500	$\leq 20$	0.56	10000
	50	15.2	32	25	66			$\leq 20$		10000
	80	21	41	26	83			$\leq 20$		15000
	100	23	51	37	104			$\leq 20$		15000
	120	23	51	37	82			$\leq 20$		15000
20	30	14	26	19	48	6000	3500	$\leq 20$	0.76	10000
	50	24	53	32	93			$\leq 20$		10000
	80	32	70	45	121			$\leq 20$		15000
	100	38	78	47	140			$\leq 20$		15000
	160	38	87	47	140			$\leq 20$		15000
25	30	26	48	36	90	5500	3500	$\leq 20$	1.24	10000
	50	37	93	52	177			$\leq 20$		10000
	80	60	130	83	242			$\leq 20$		15000
	100	64	149	103	270			$\leq 20$		15000
	120	64	159	103	289			$\leq 20$		15000
	160	64	167	103	298			$\leq 20$		15000
32	30	51	95	71	190	4500	3500	$\leq 20$	2.6	10000
	50	72	205	103	363			$\leq 20$		10000
	80	112	289	159	540			$\leq 20$		15000
	100	130	316	205	615			$\leq 20$		15000
	120	130	335	205	652			$\leq 20$		15000
40	50	130	382	186	652	4000	3000	$\leq 20$	5.0	10000
	80	196	493	270	931			$\leq 20$		15000
	100	252	540	353	1026			$\leq 20$		15000
	120	279	586	428	1121			$\leq 20$		15000
	160	279	615	428	1121			$\leq 20$		15000
50*	50	233	679	333	1358	3000	2500	$\leq 20$	9.5	10000
	80	353	894	493	1767			$\leq 20$		15000
	100	446	931	633	1957			$\leq 20$		15000
	120	502	1026	772	1957			$\leq 20$		15000
	160	502	1121	801	2328			$\leq 20$		15000
58*	80	522	1406	732	2328	3000	2200	$\leq 10$	13.6	15000
	100	661	1511	1007	3021			$\leq 10$		15000
	120	708	1634	1131	3164			$\leq 10$		15000
	160	708	1748	1150	3259			$\leq 10$		15000

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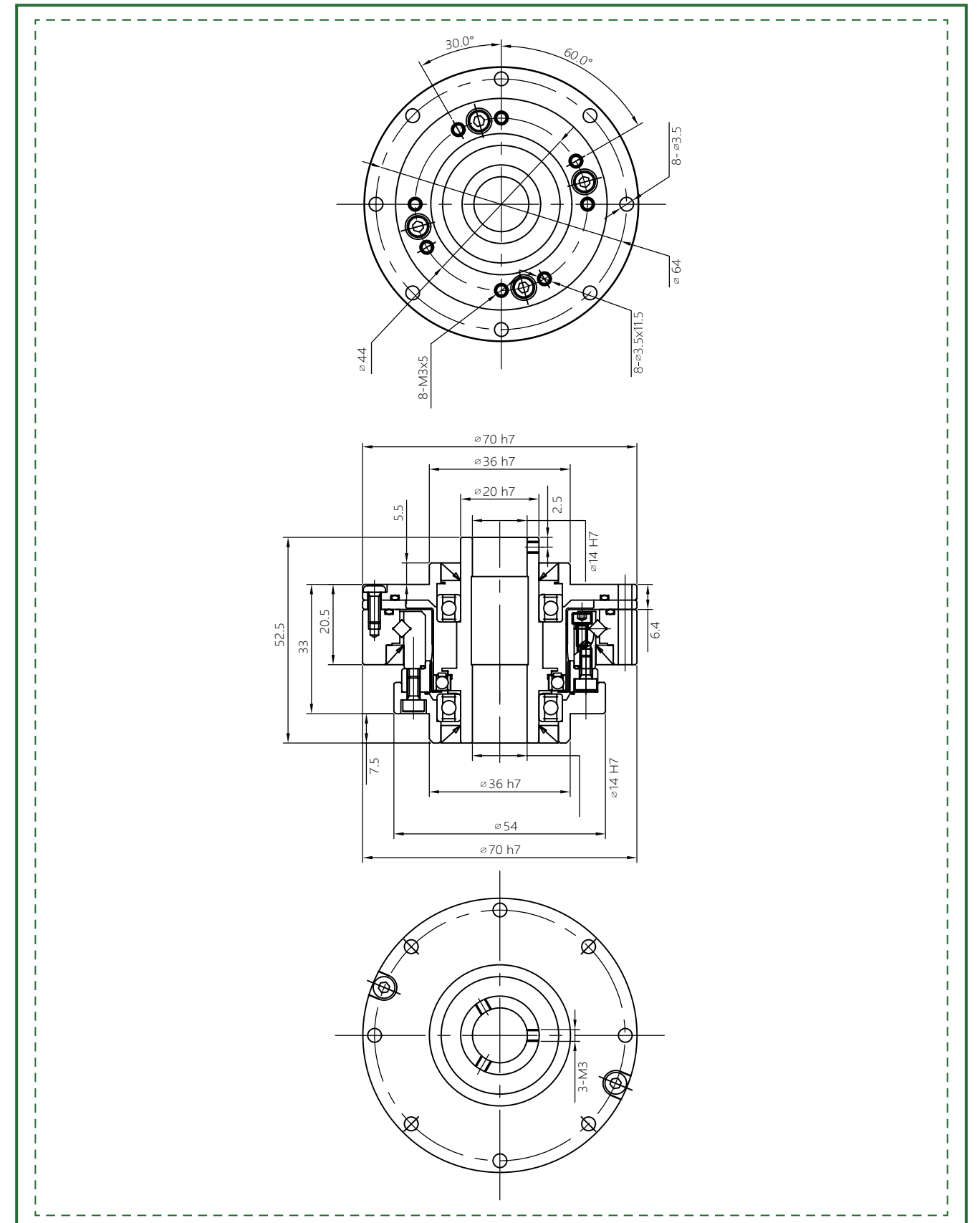




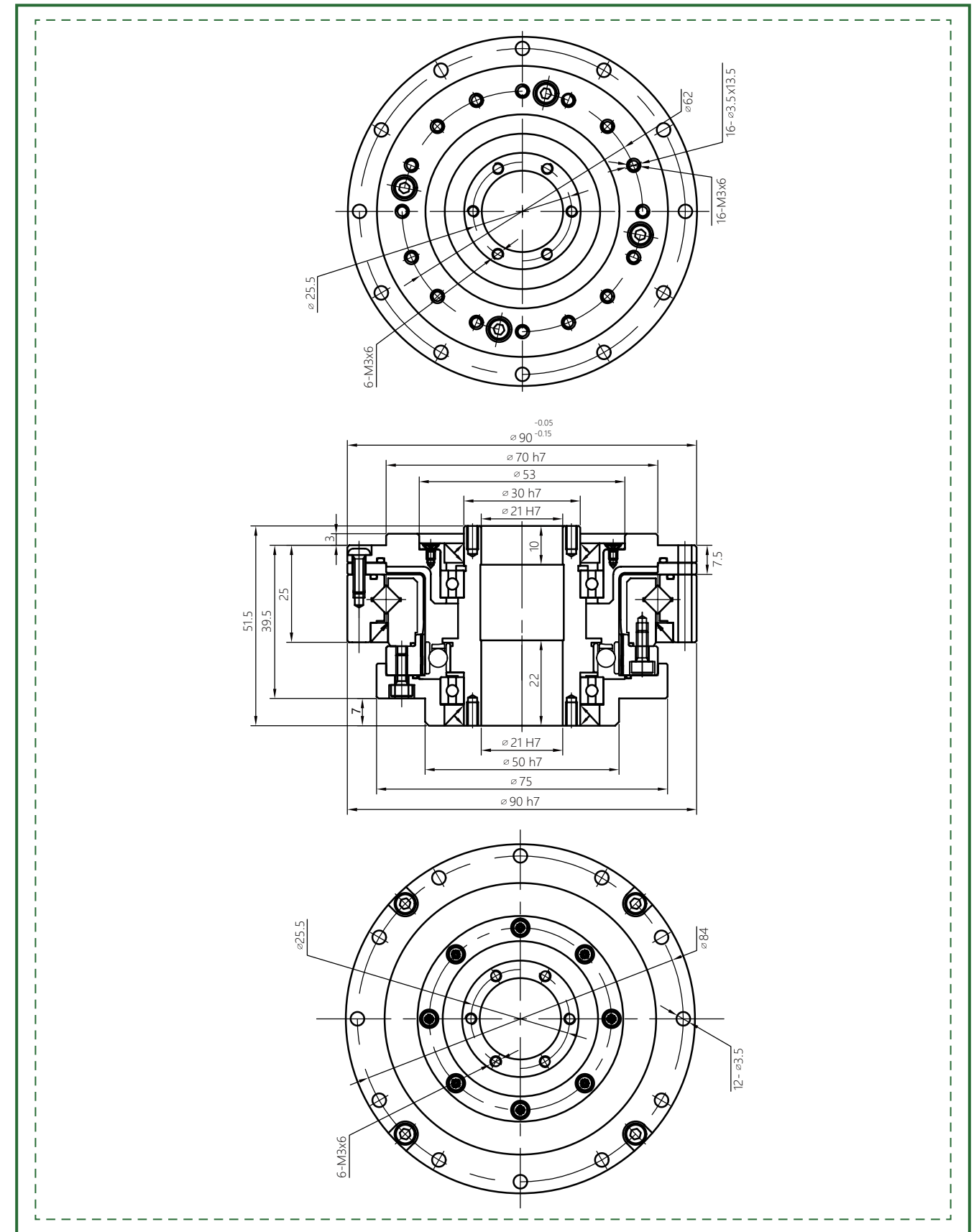
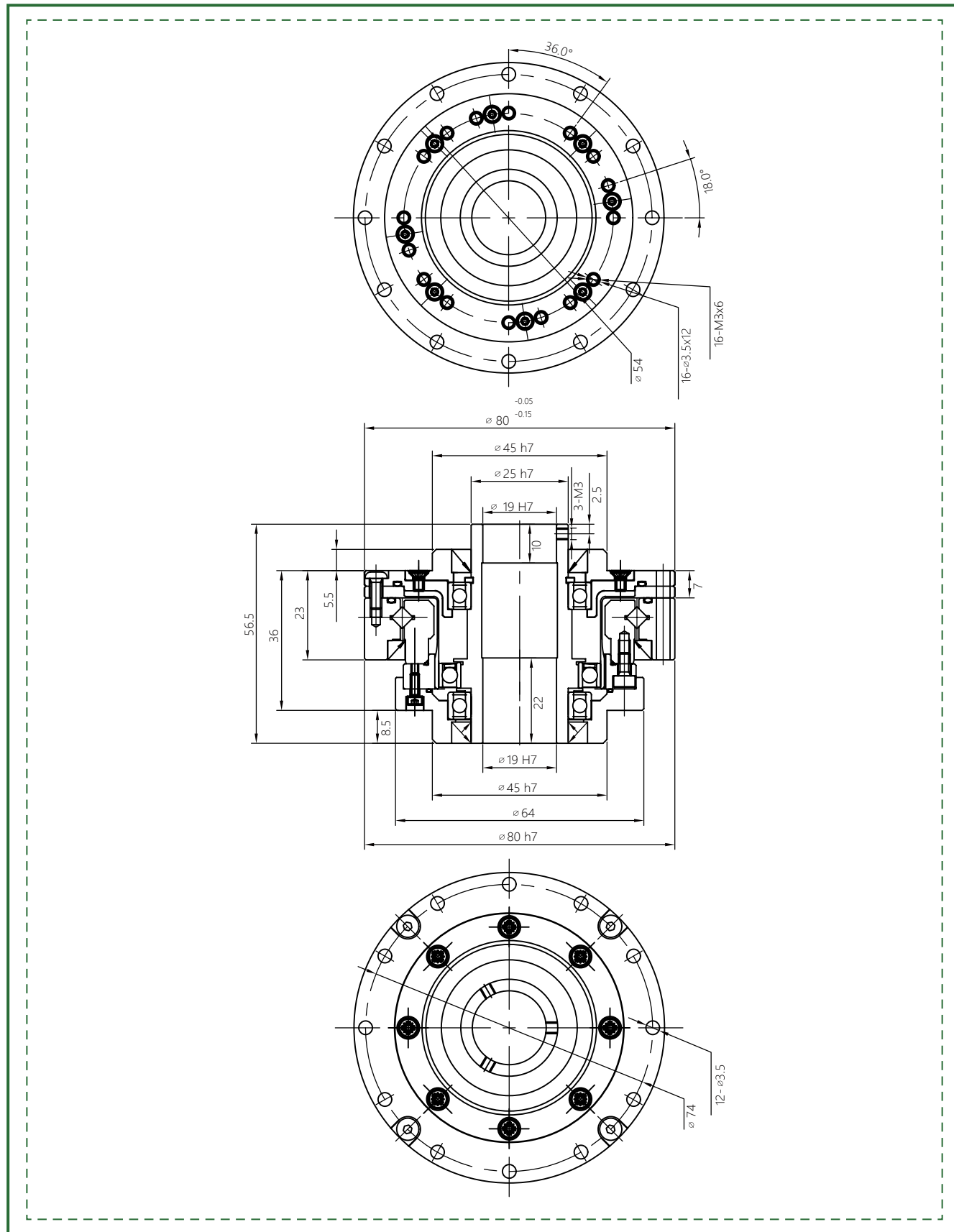


### Parameter Table

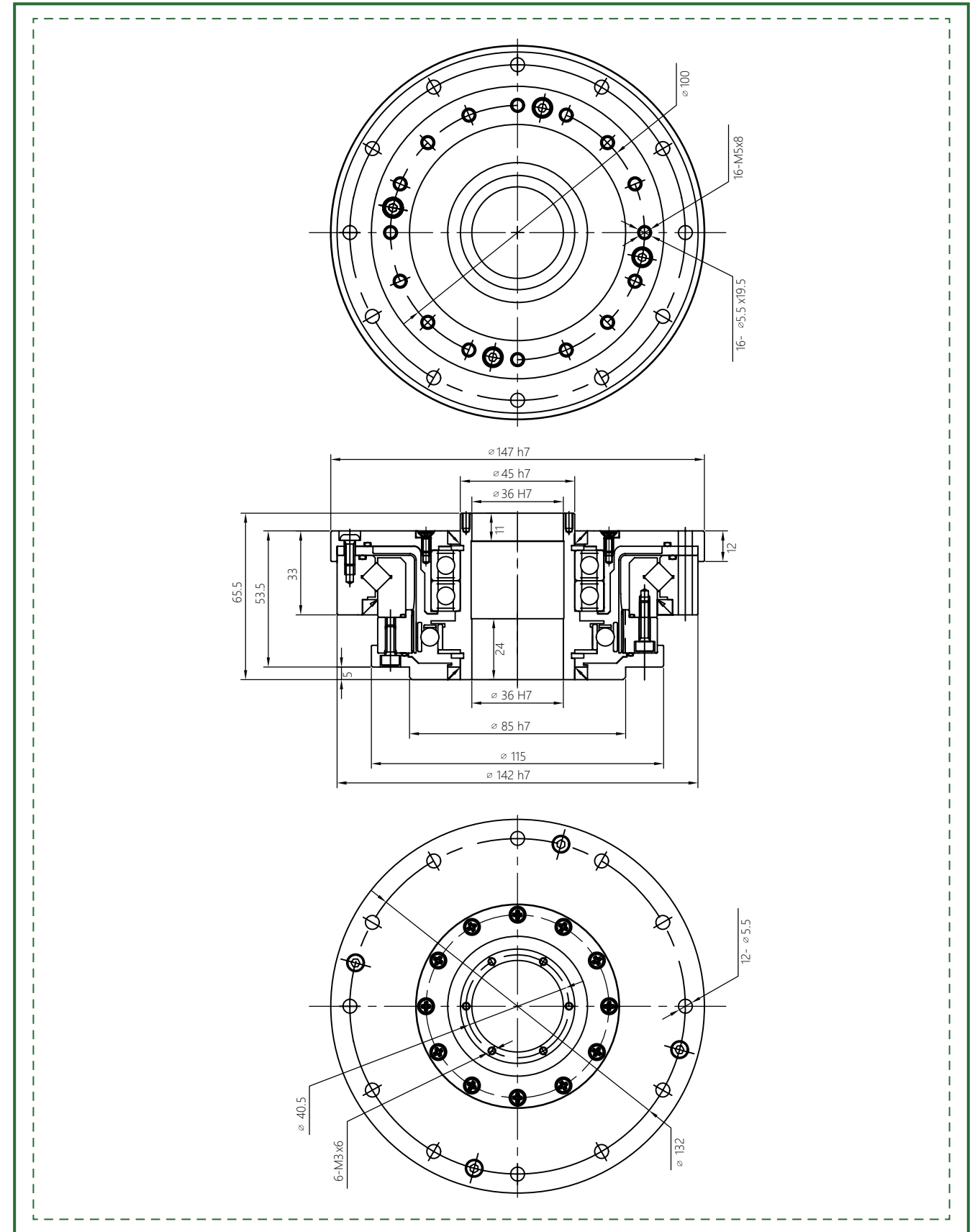
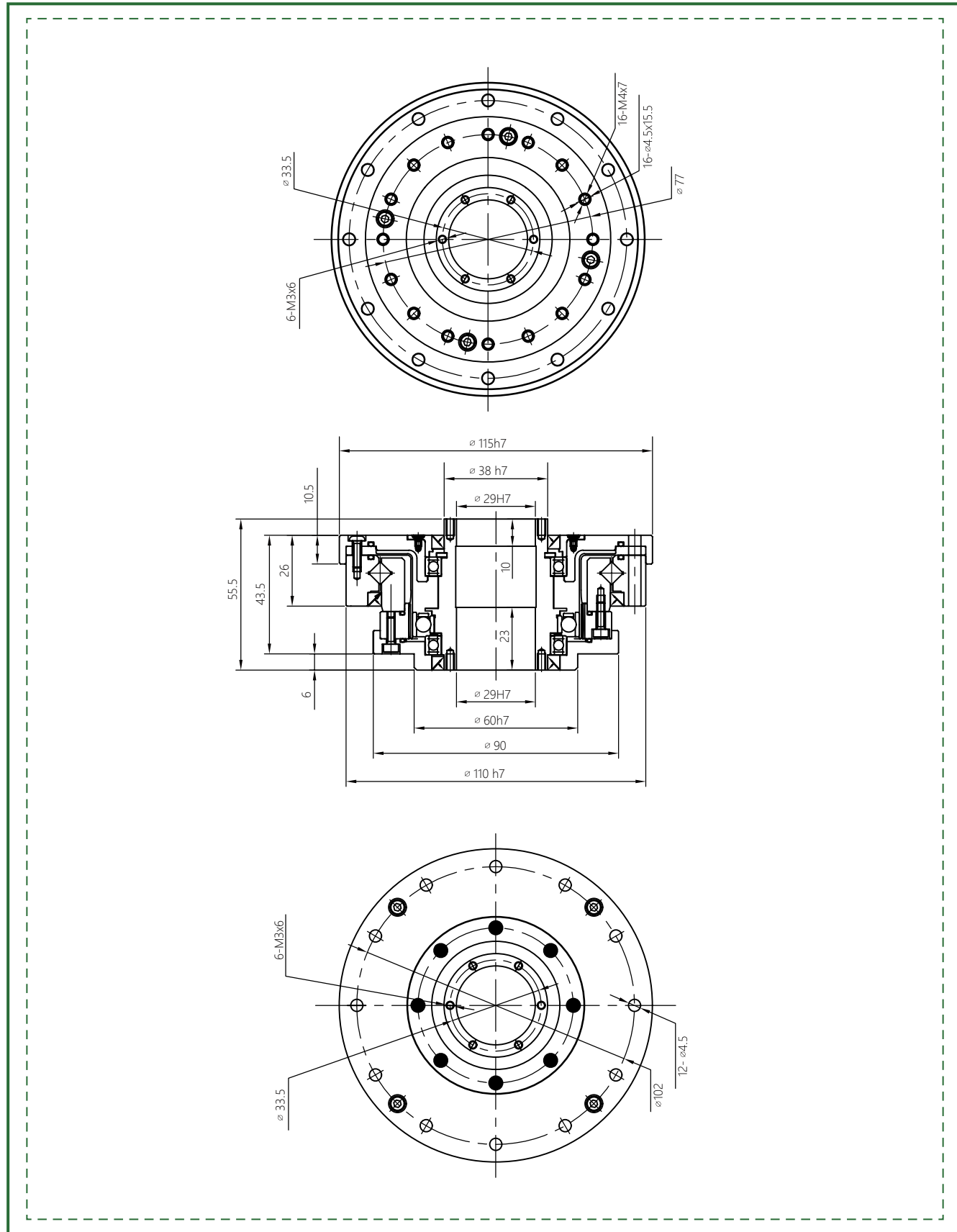
Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	With Maximum Tension	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	N	Kg	Hour
14	30	3.8	8.6	7.8	16	8000	3500	≤20	≤77	0.72	10000
	50	5.1	17	6.6	33			≤20			10000
	80	7.4	22	10.5	45			≤10			15000
	100	7.4	27	10.5	51			≤10			15000
17	30	8.4	15.2	11.5	29	7000	3500	≤20	≤92	1.0	10000
	50	15.2	32	25	66			≤20			10000
	80	21	41	26	83			≤10			15000
	100	23	51	37	104			≤10			15000
20	30	14	26	19	48	6000	3500	≤20	≤136	1.38	10000
	50	24	53	32	93			≤20			10000
	80	32	70	45	121			≤10			15000
	100	38	78	47	140			≤10			15000
25	30	26	48	36	90	5500	3500	≤20	≤147	2.15	10000
	50	37	93	52	177			≤20			10000
	80	60	130	83	242			≤10			15000
	100	64	149	103	270			≤10			15000
32	30	51	95	71	190	4500	3500	≤20	≤154	4.3	10000
	50	72	205	103	363			≤20			10000
	80	112	289	159	540			≤10			15000
	100	130	316	205	615			≤10			15000
40	30	130	382	186	652	4000	3000	≤20	≤294	7.8	10000
	50	196	493	270	931			≤10			15000
	80	252	540	353	1026			≤10			15000
	100	279	586	428	1121			≤10			15000
50*	30	233	679	333	1358	3000	2500	≤20	≤373	14.5	10000
	50	353	894	493	1767			≤10			15000
	80	446	931	633	1957			≤10			15000
	100	502	1026	772	1957			≤10			15000
58*	30	502	1121	801	2328	3000	2200	≤20	≤1300	20.0	10000
	50	678	1828	951	3026			≤10			15000
	80	860	1964	1309	3927			≤10			15000
	100	921	2124	1470	4113			≤10			15000
58*	120	921	2272	1494	4236	3000	2200	≤10	≤1300	20.0	15000
	160	921	2272	1494	4236			≤10			15000

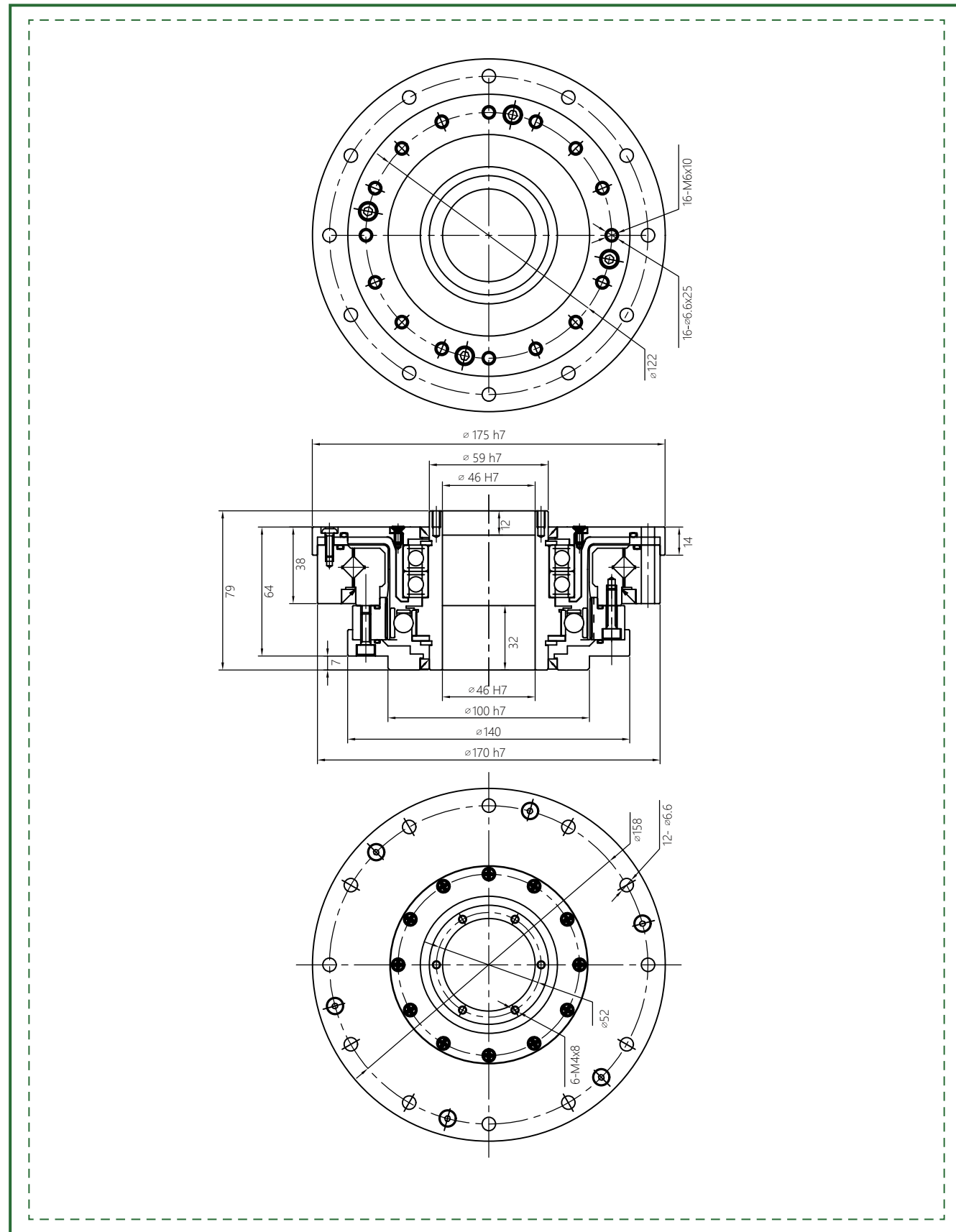


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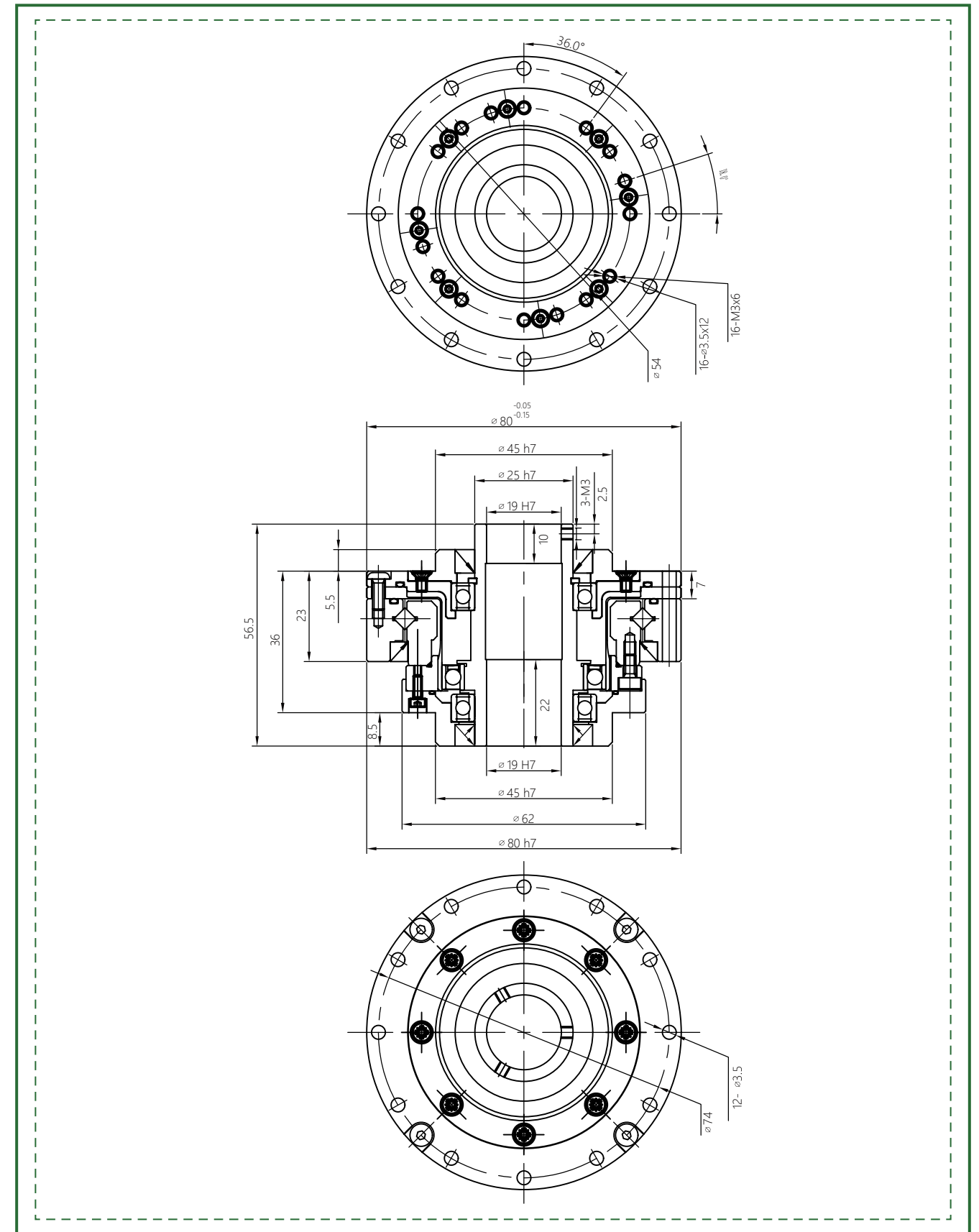
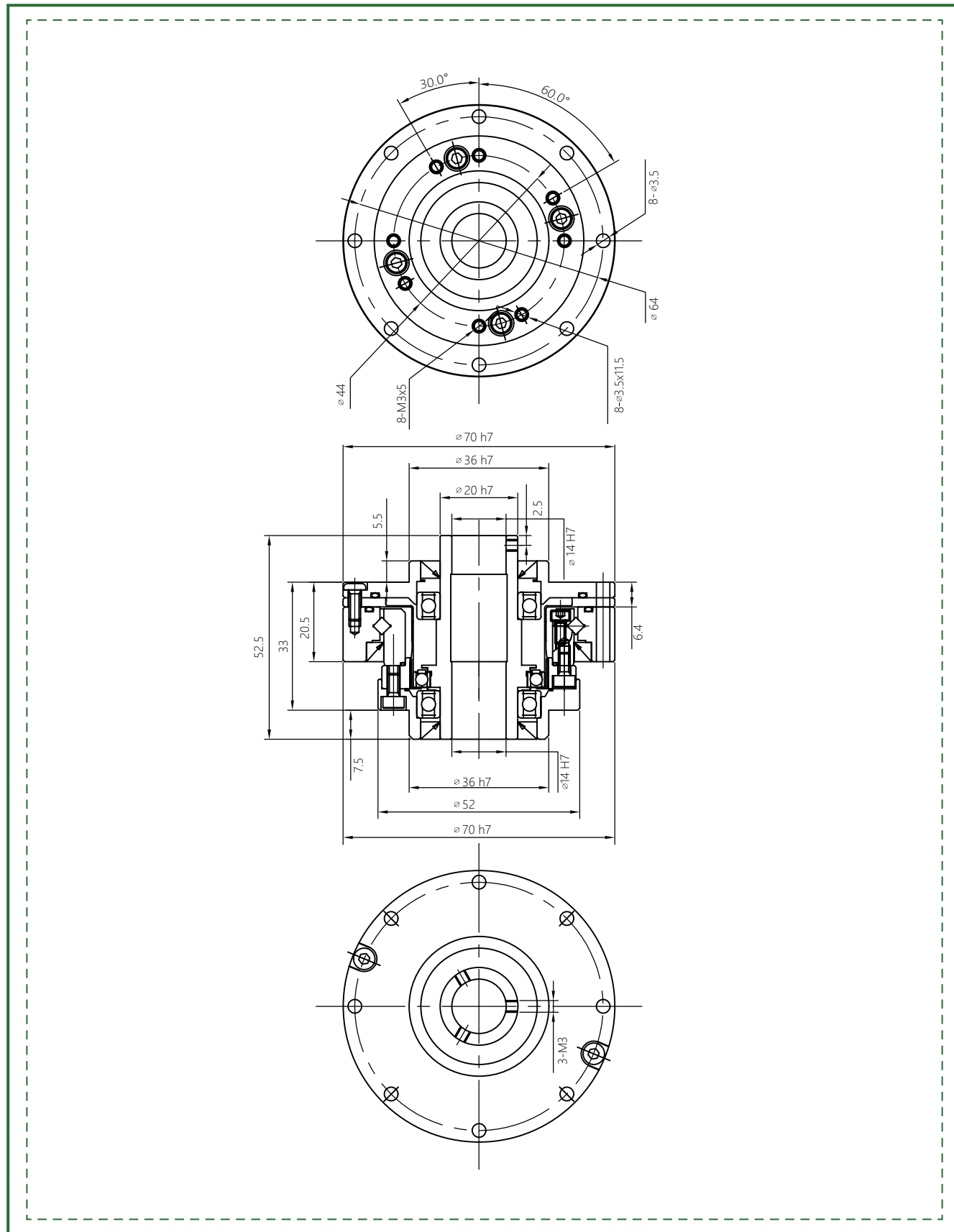


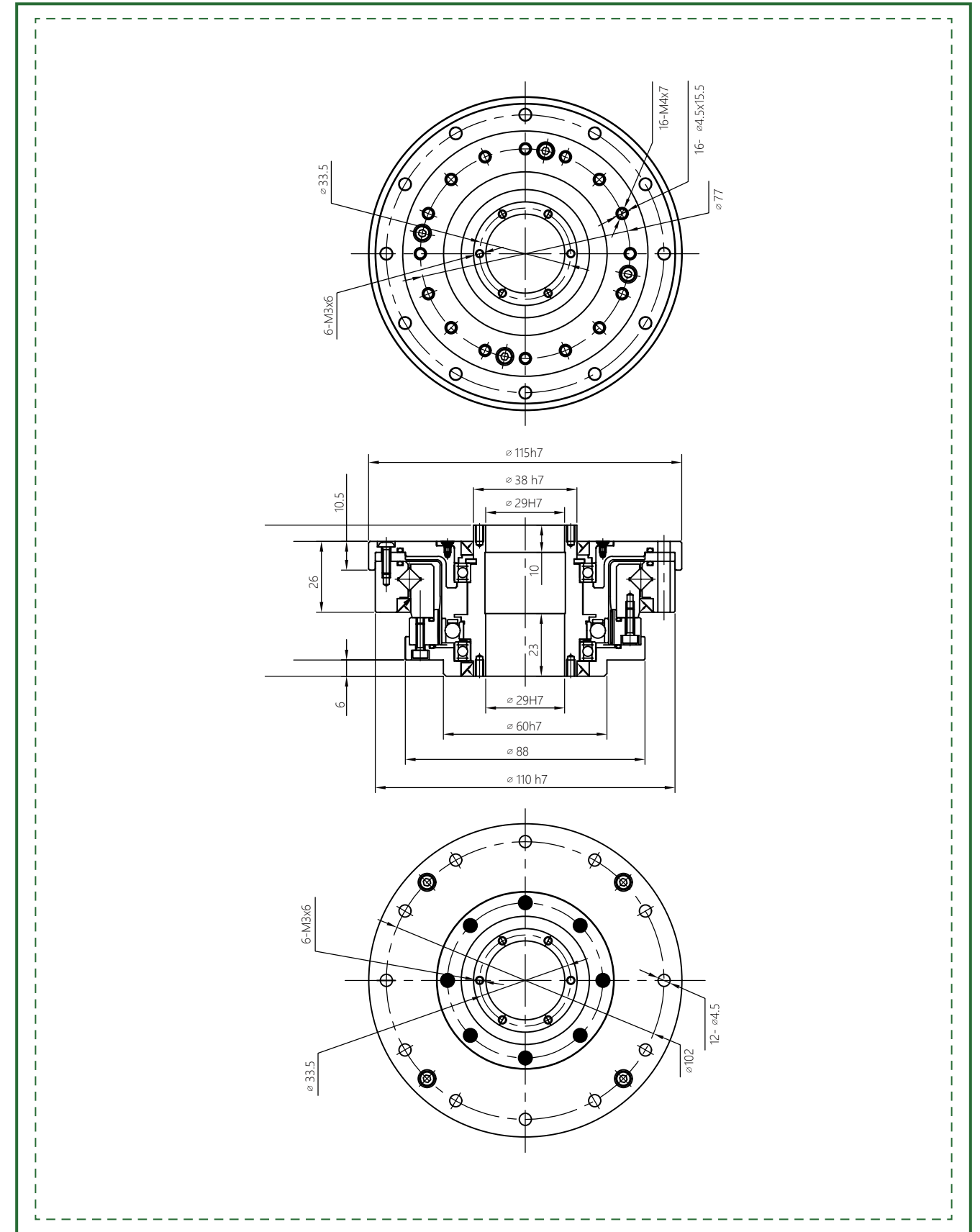
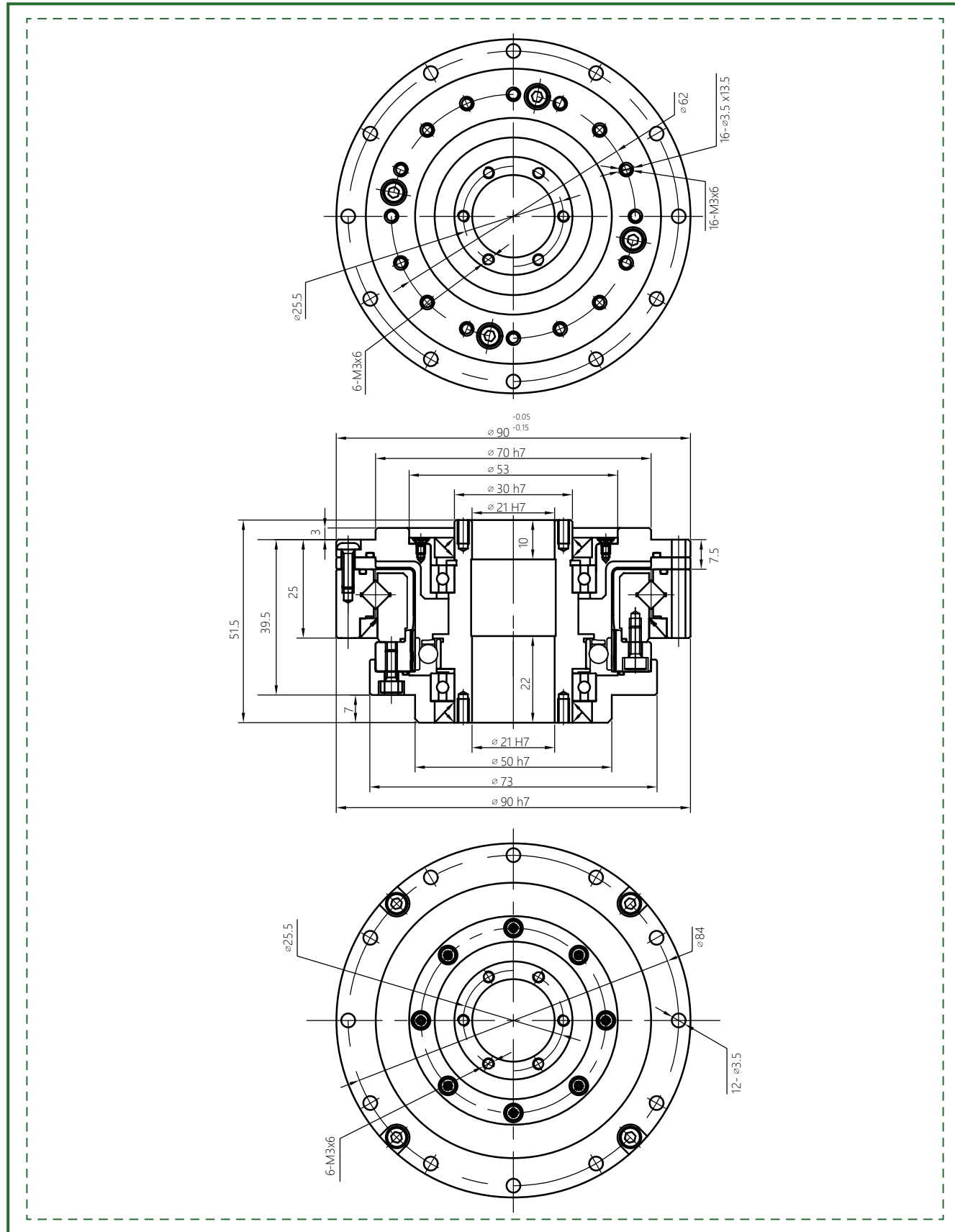


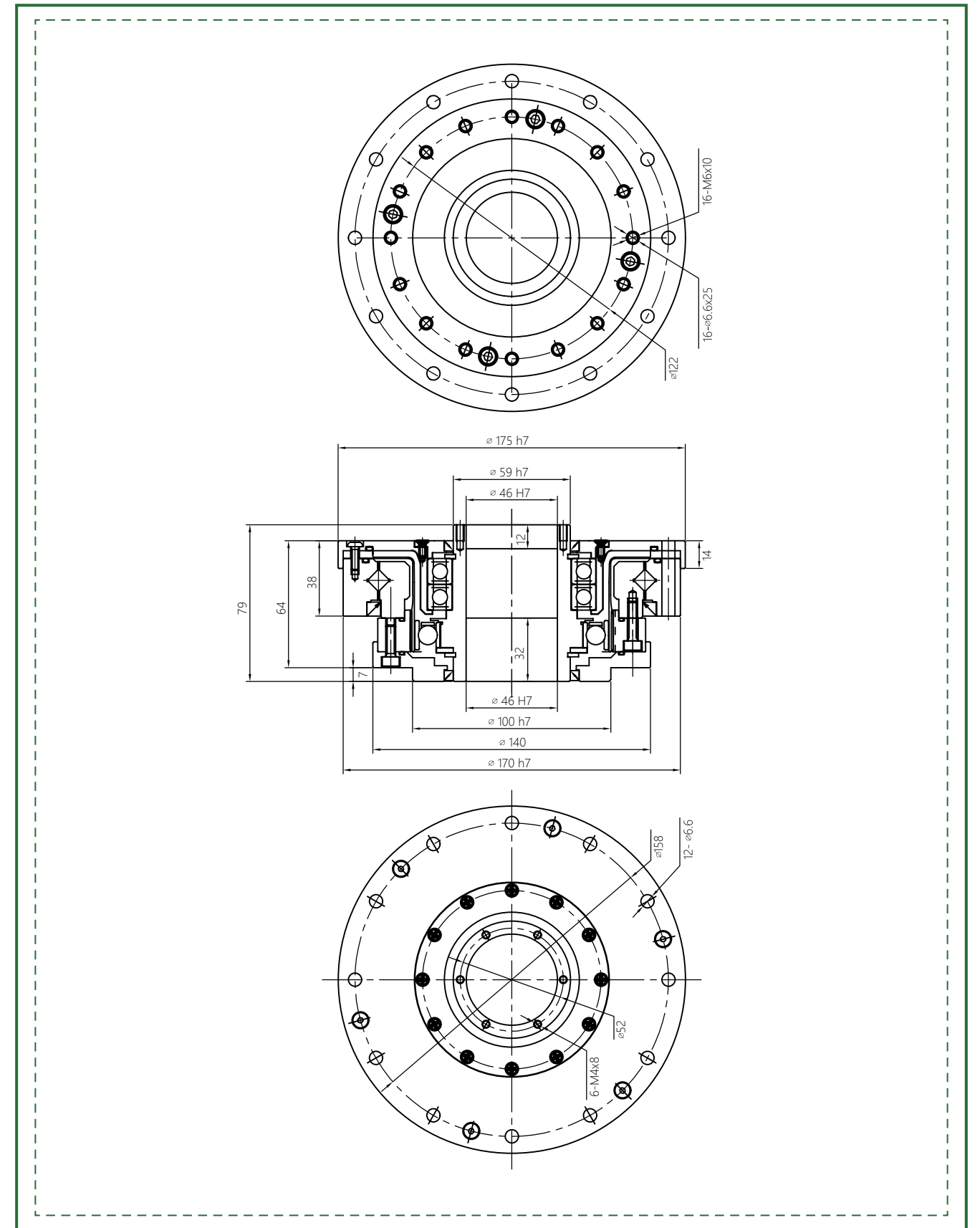
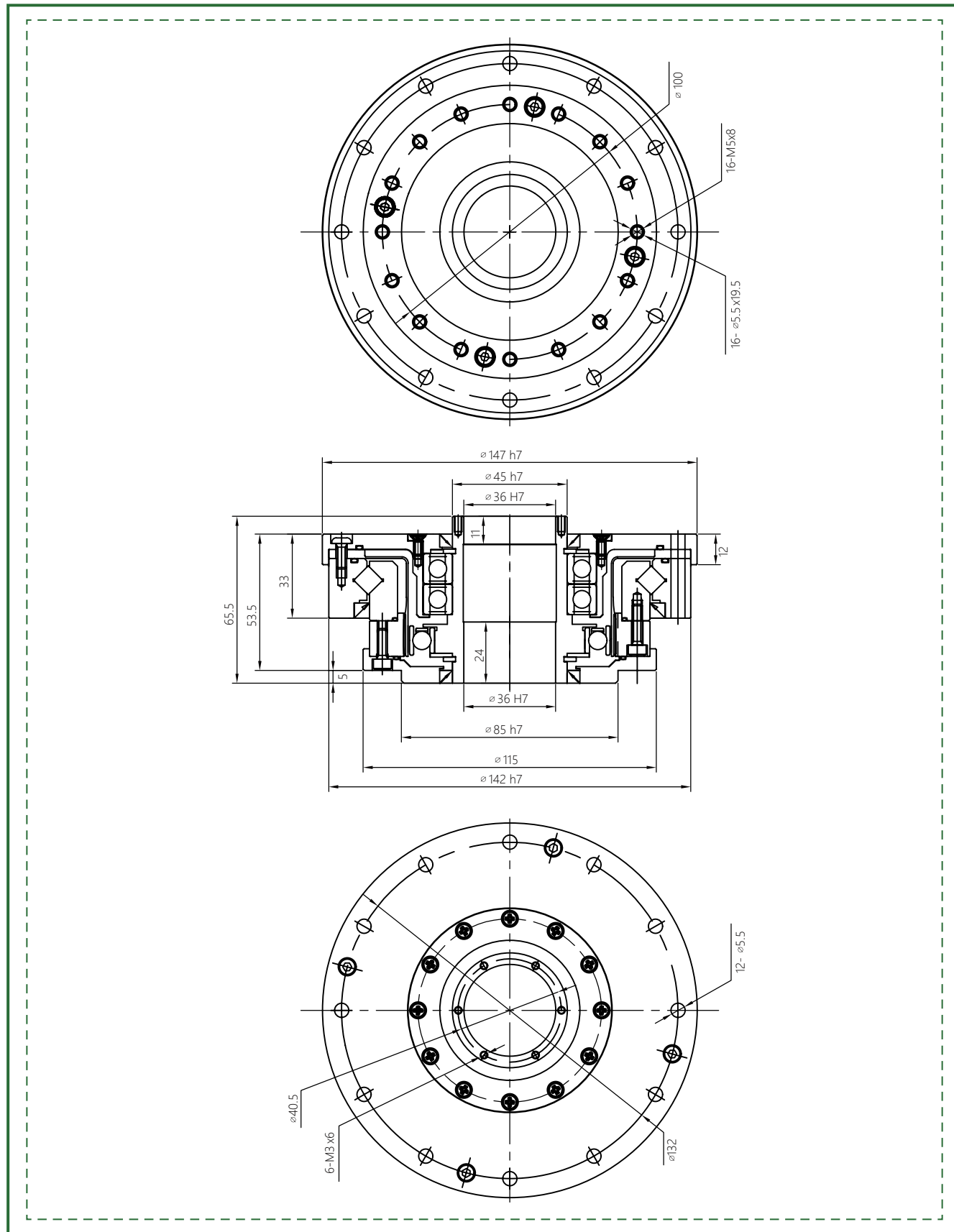
### Parameter Table

Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	With Maximum Tension	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	N	Kg	Hour
14	30	3.8	8.6	7.8	16	8000	3500	≤20	≤77	0.56	10000
	50	5.1	17	6.6	33			≤20			10000
	80	7.4	22	10.5	45			≤10			15000
	100	7.4	27	10.5	51			≤10			15000
17	30	8.4	15.2	11.5	29	7000	3500	≤20	≤92	0.80	10000
	50	15.2	32	25	66			≤20			10000
	80	21	41	26	83			≤10			15000
	100	23	51	37	104			≤10			15000
	120	23	51	37	82			≤10			15000
20	30	14	26	19	48	6000	3500	≤20	≤136	1.09	10000
	50	24	53	32	93			≤20			10000
	80	32	70	45	121			≤10			15000
	100	38	78	47	140			≤10			15000
	120	38	83	47	140			≤10			15000
	160	38	87	47	140			≤10			15000
25	30	26	48	36	90	5500	3500	≤20	≤147	1.70	10000
	50	37	93	52	177			≤20			10000
	80	60	130	83	242			≤10			15000
	100	64	149	103	270			≤10			15000
	120	64	159	103	289			≤10			15000
	160	64	167	103	298			≤10			15000
32	30	51	95	71	190	4500	3500	≤20	≤154	3.50	10000
	50	72	205	103	363			≤20			10000
	80	112	289	159	540			≤10			15000
	100	130	316	205	615			≤10			15000
	120	130	335	205	652			≤10			15000
	160	130	353	205	652			≤10			15000
40	50	130	382	186	652	4000	3000	≤20	≤294	6.35	10000
	80	196	493	270	931			≤10			15000
	100	252	540	353	1026			≤10			15000
	120	279	586	428	1121			≤10			15000
	160	279	615	428	1121			≤10			15000
50*	50	233	679	333	1358	3000	2500	≤20	≤373	12.0	10000
	80	353	894	493	1767			≤10			15000
	100	446	931	633	1957			≤10			15000
	120	502	1026	772	1957			≤10			15000
58*	80	678	1828	951	3026	3000	2200	≤10	≤1300	16.5	15000
	100	860	1964	1309	3927			≤10			15000
	120	921	2124	1470	4113			≤10			15000
	160	921	2272	1494	4236			≤10			15000

\* Consult factory



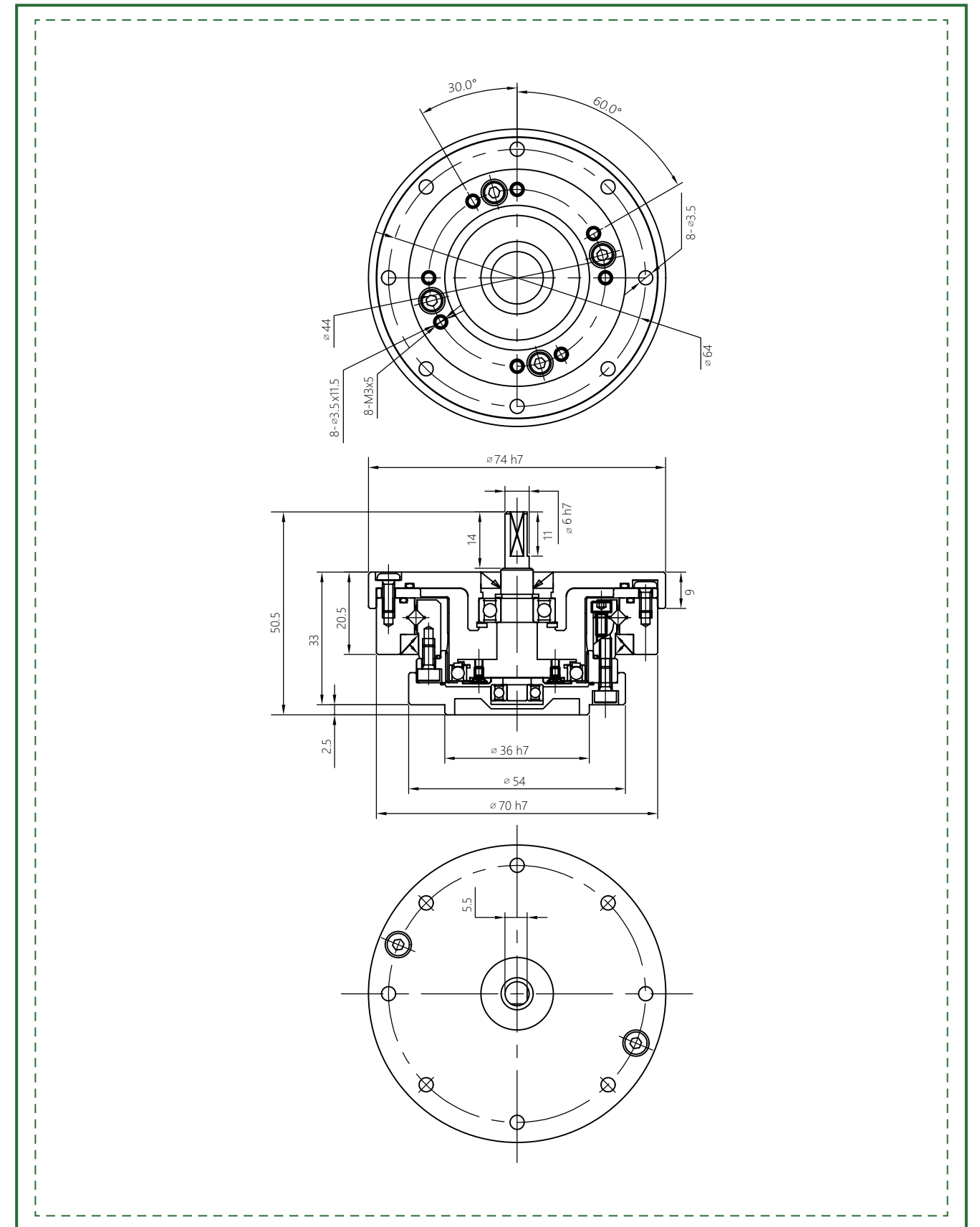


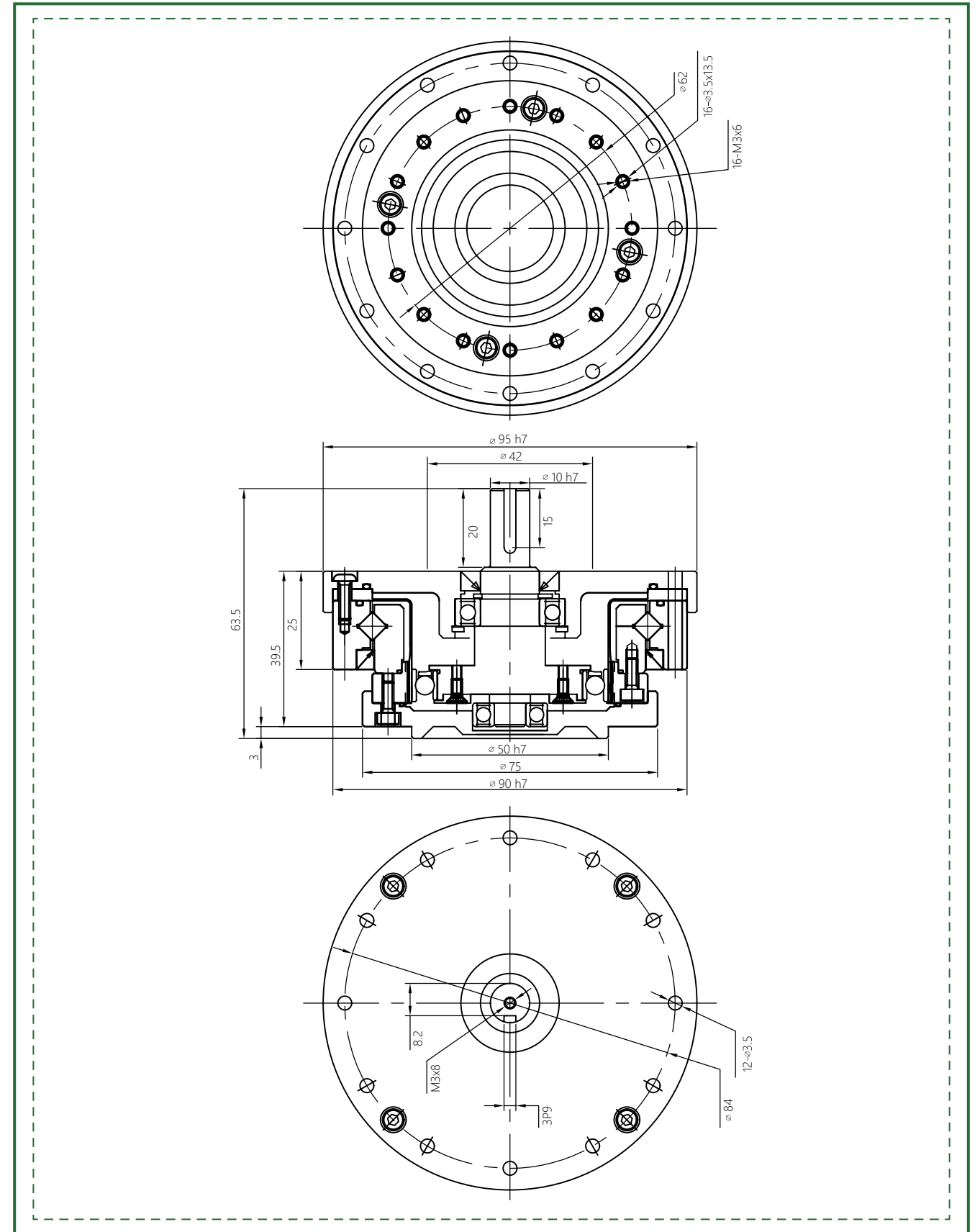
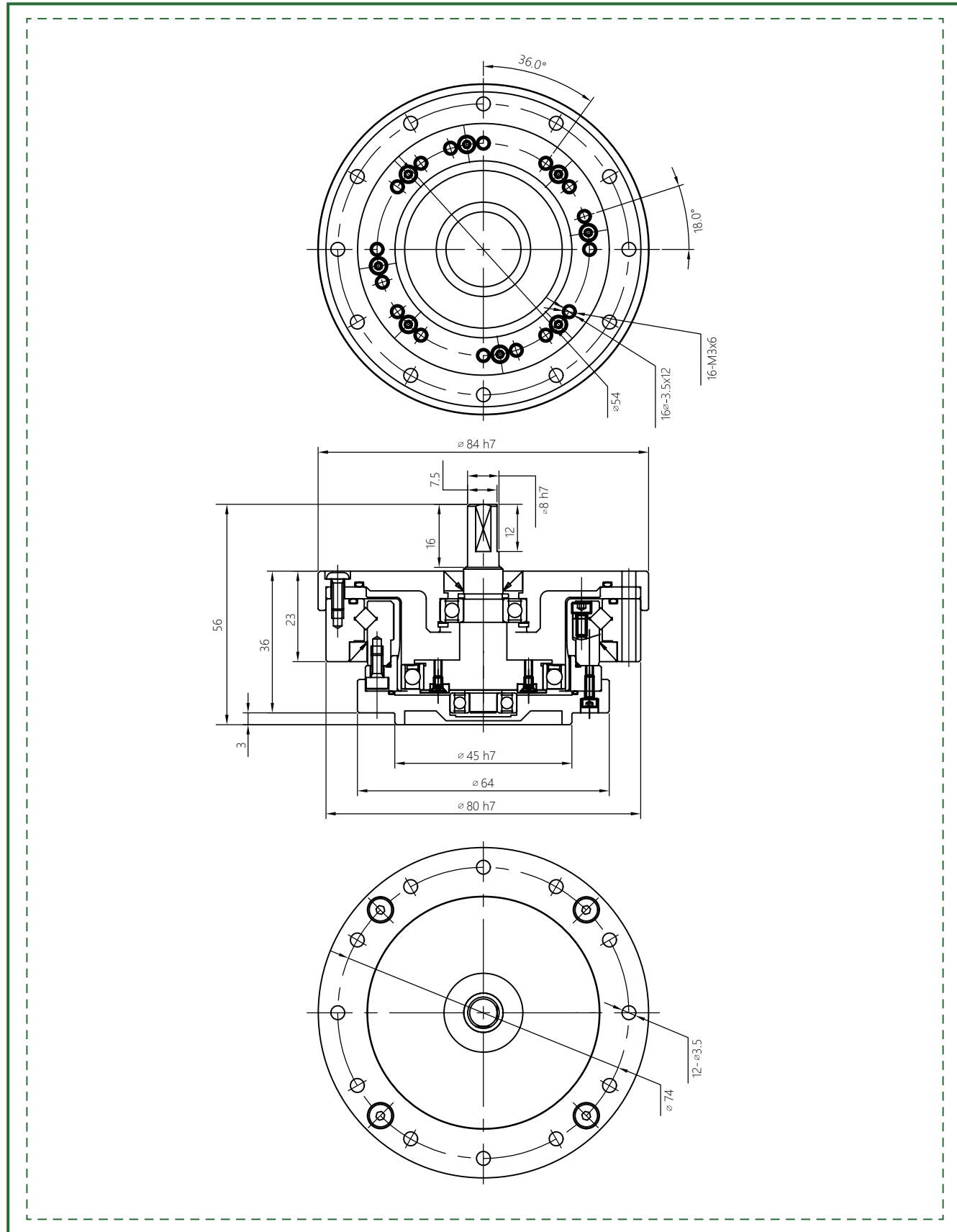


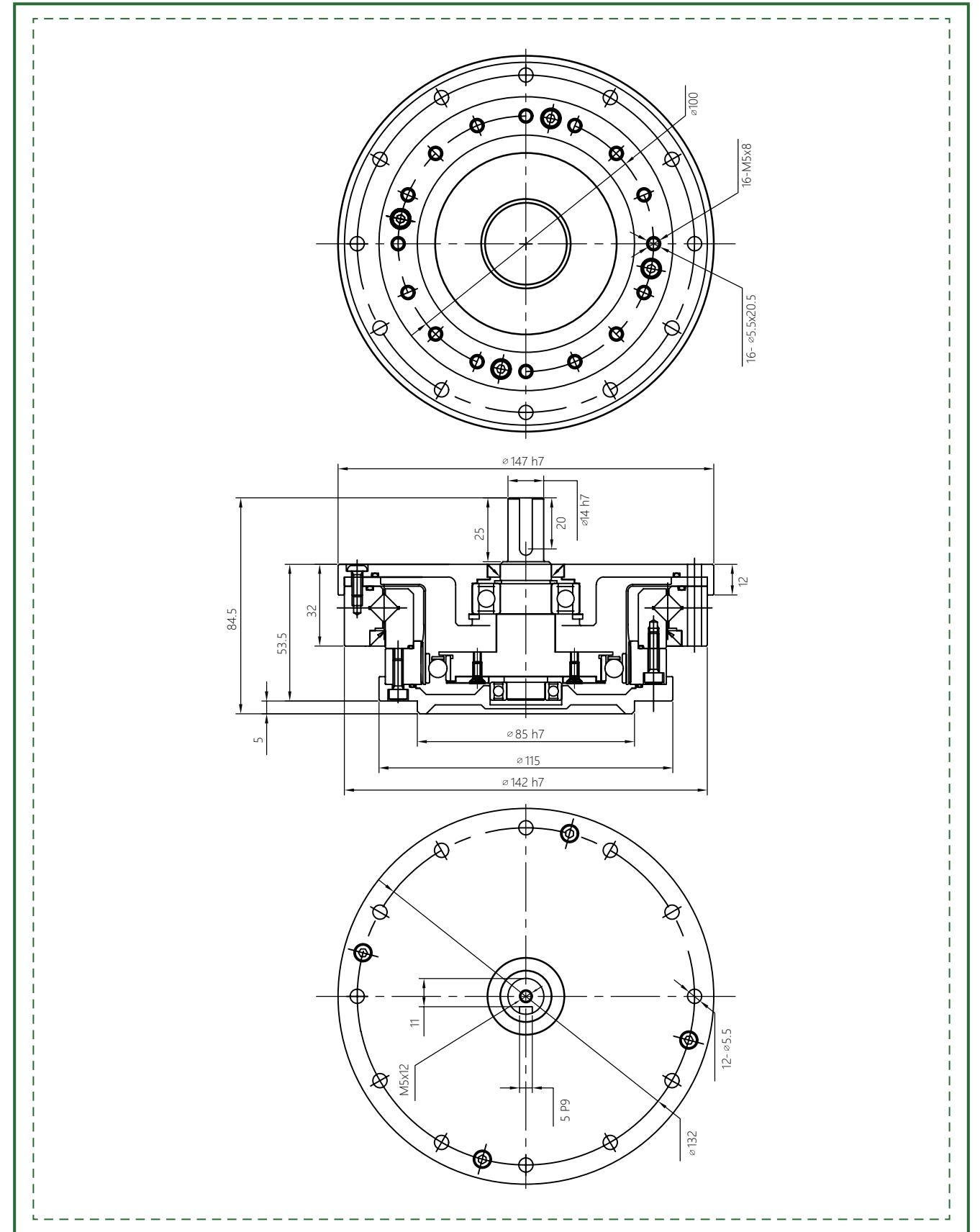
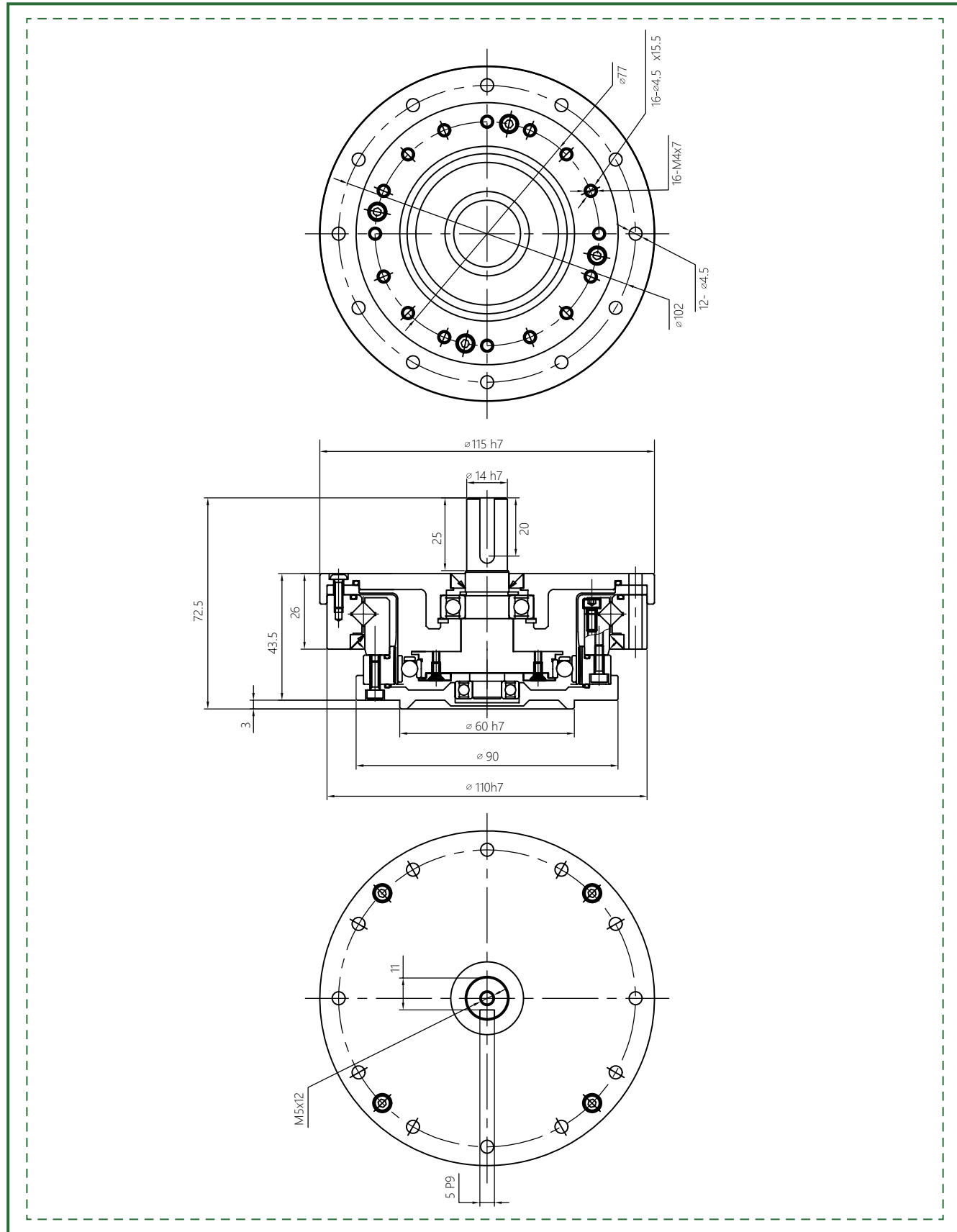


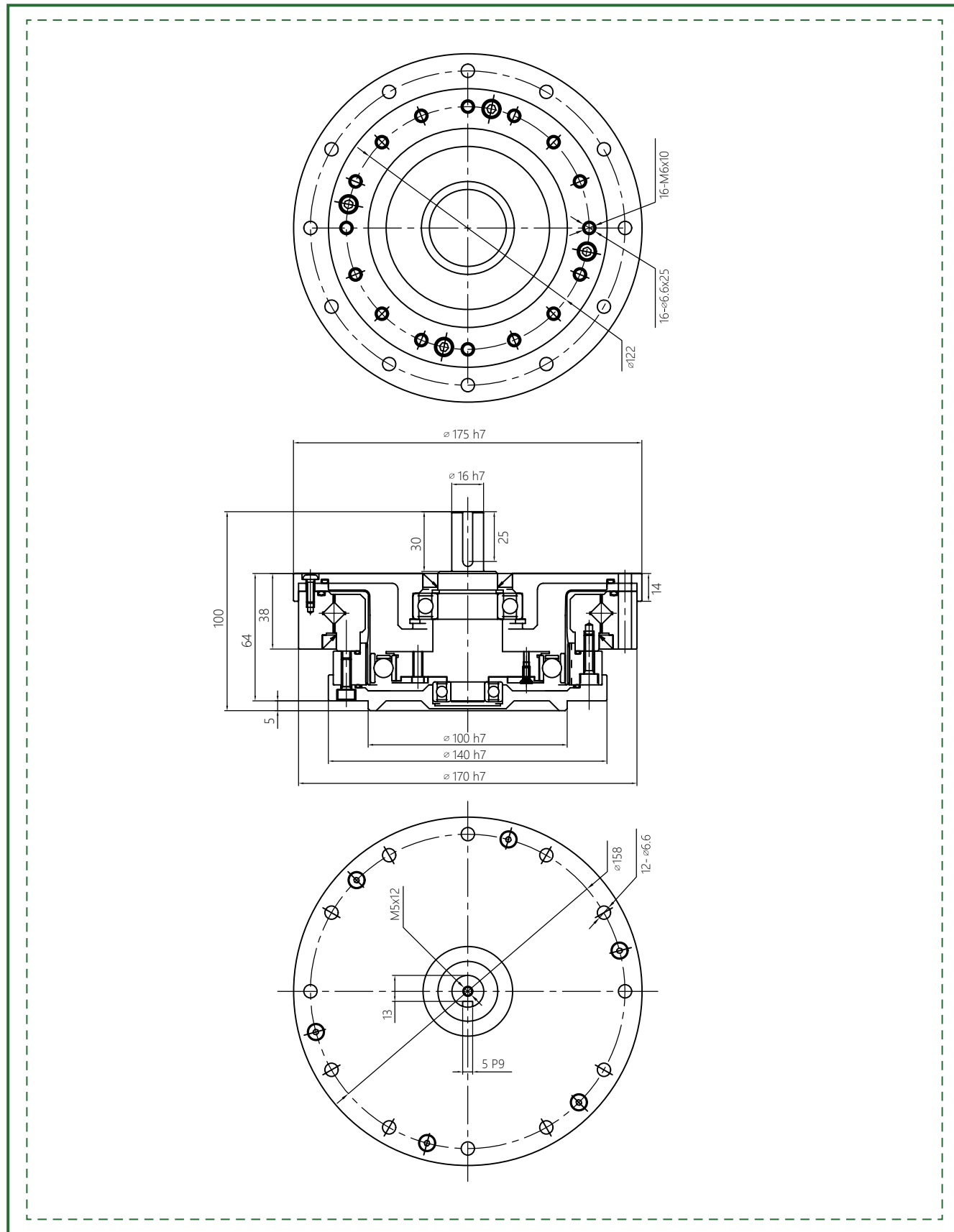
### Parameter Table

Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	With Maximum Tension	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	N	Kg	Hour
14	30	3.8	8.6	7.8	16	8000	3500	≤20	≤26	0.65	10000
	50	5.1	17	6.6	33			≤20			10000
	80	7.4	22	10.5	45			≤10			15000
	100	7.4	27	10.5	51			≤10			15000
17	30	8.4	15.2	11.5	29	7000	3500	≤20	≤32	0.92	10000
	50	15.2	32	25	66			≤20			10000
	80	21	41	26	83			≤10			15000
	100	23	51	37	104			≤10			15000
	120	23	51	37	82			≤10			15000
20	30	14	26	19	48	6000	3500	≤20	≤58	1.36	10000
	50	24	53	32	93			≤20			10000
	80	32	70	45	121			≤10			15000
	100	38	78	47	140			≤10			15000
	120	38	83	47	140			≤10			15000
	160	38	87	47	140			≤10			15000
25	30	26	48	36	90	5500	3500	≤20	≤71	2.05	10000
	50	37	93	52	177			≤20			10000
	80	60	130	83	242			≤10			15000
	100	64	149	103	270			≤10			15000
	120	64	159	103	289			≤10			15000
	160	64	167	103	298			≤10			15000
32	30	51	95	71	190	4500	3500	≤20	≤114	4.35	10000
	50	72	205	103	363			≤20			10000
	80	112	289	159	540			≤10			15000
	100	130	316	205	615			≤10			15000
	120	130	335	205	652			≤10			15000
	160	130	353	205	652			≤10			15000
40	50	130	382	186	652	4000	3000	≤20	≤294	6.45	10000
	80	196	493	270	931			≤10			15000
	100	252	540	353	1026			≤10			15000
	120	279	586	428	1121			≤10			15000
	160	279	615	428	1121			≤10			15000





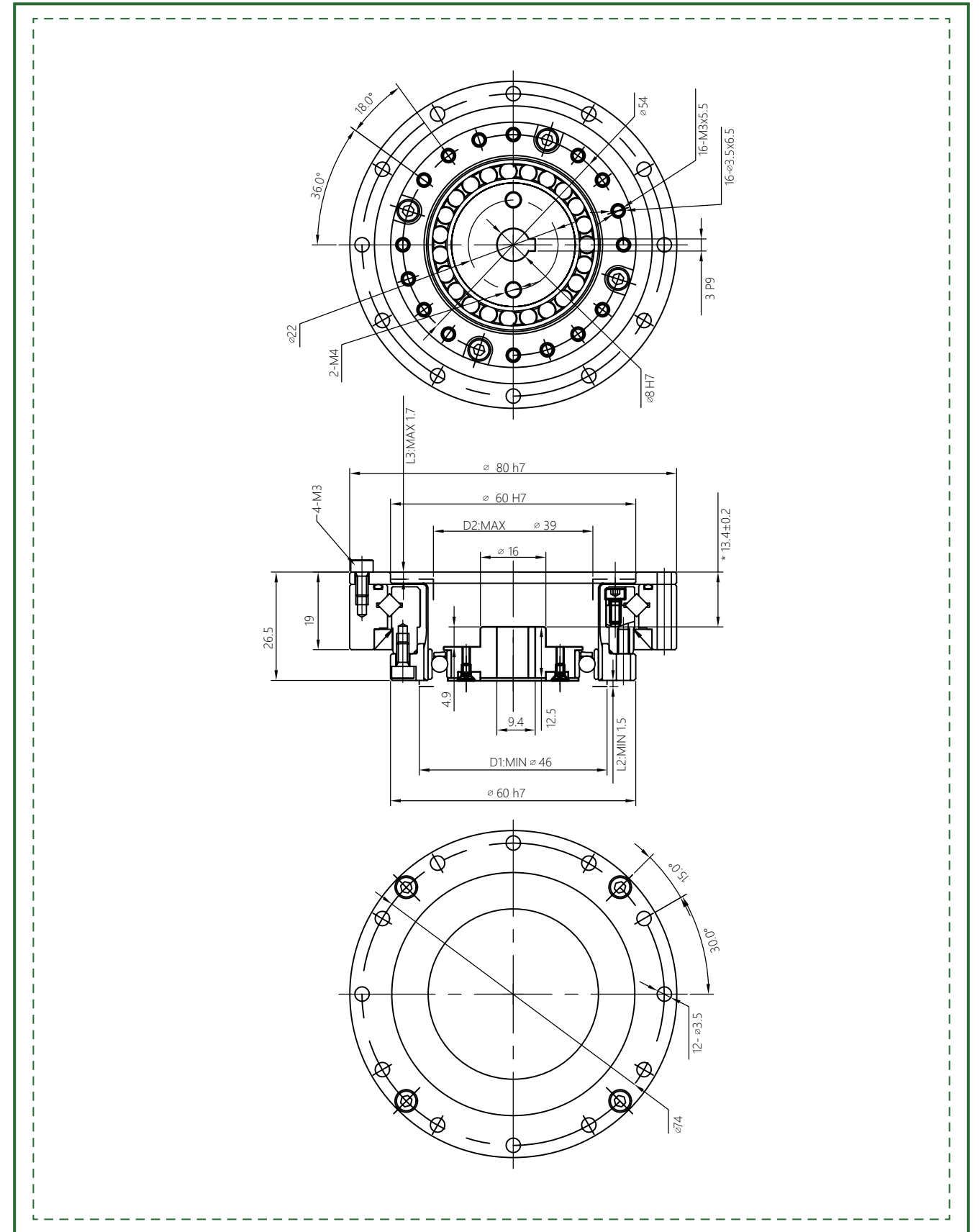
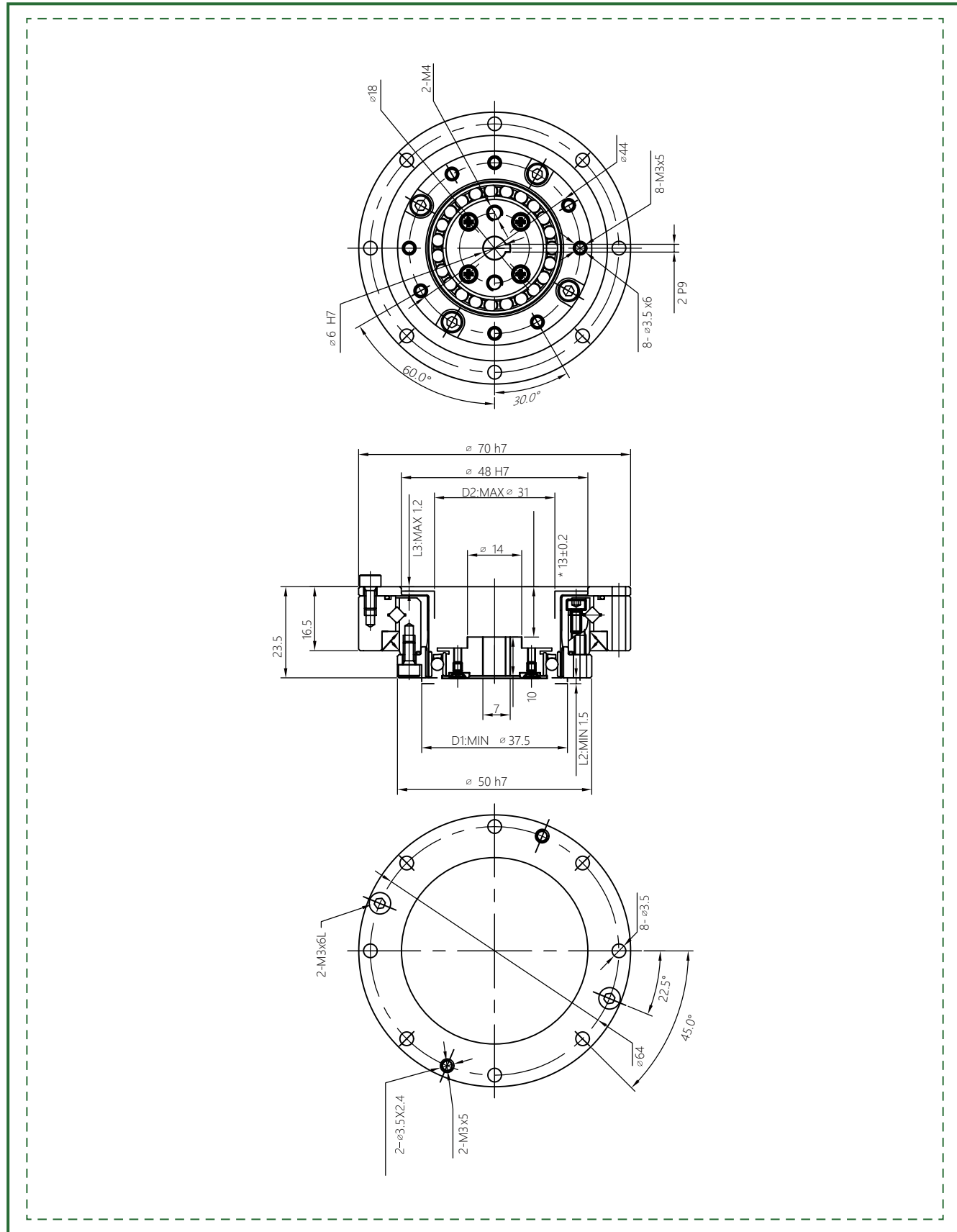




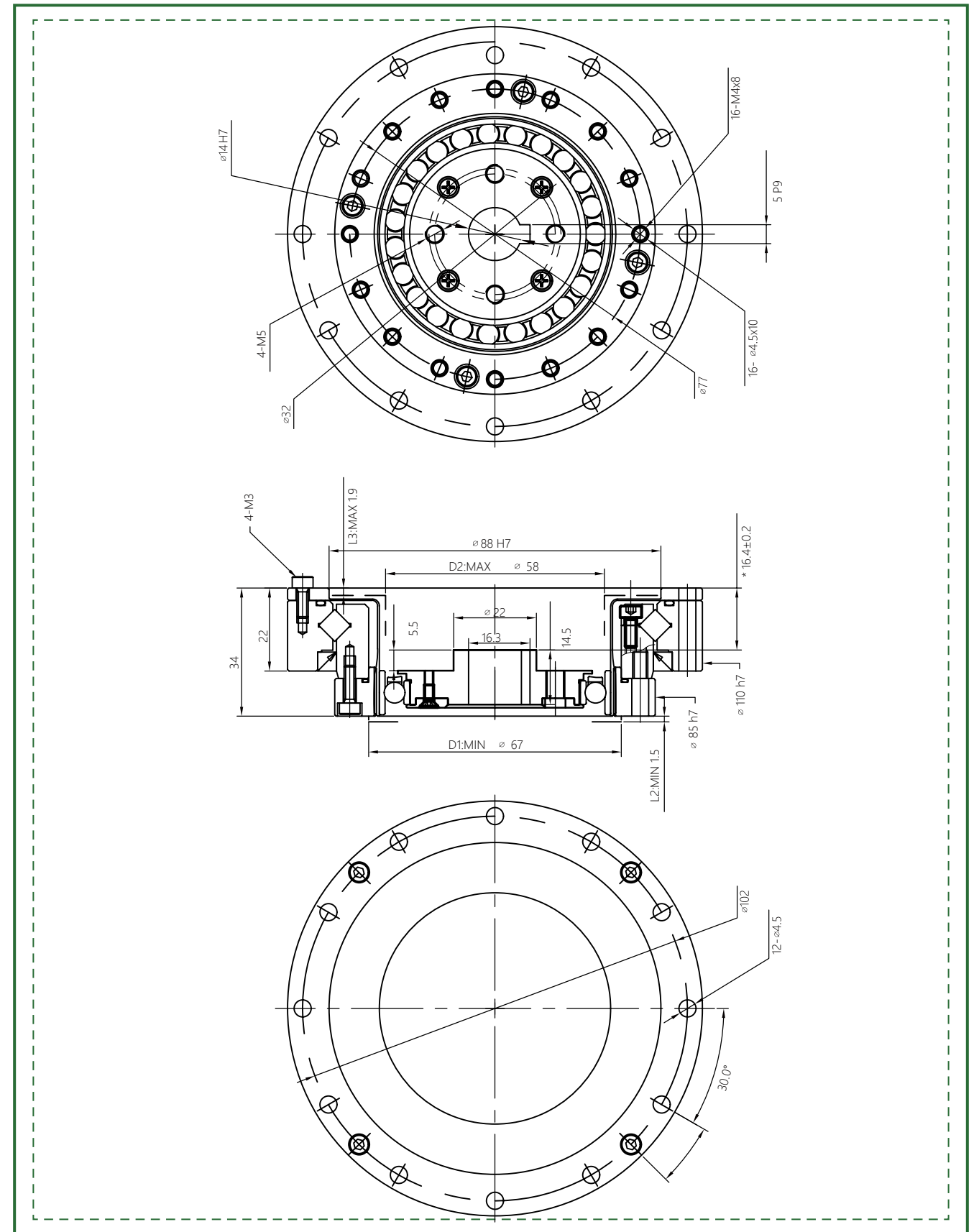
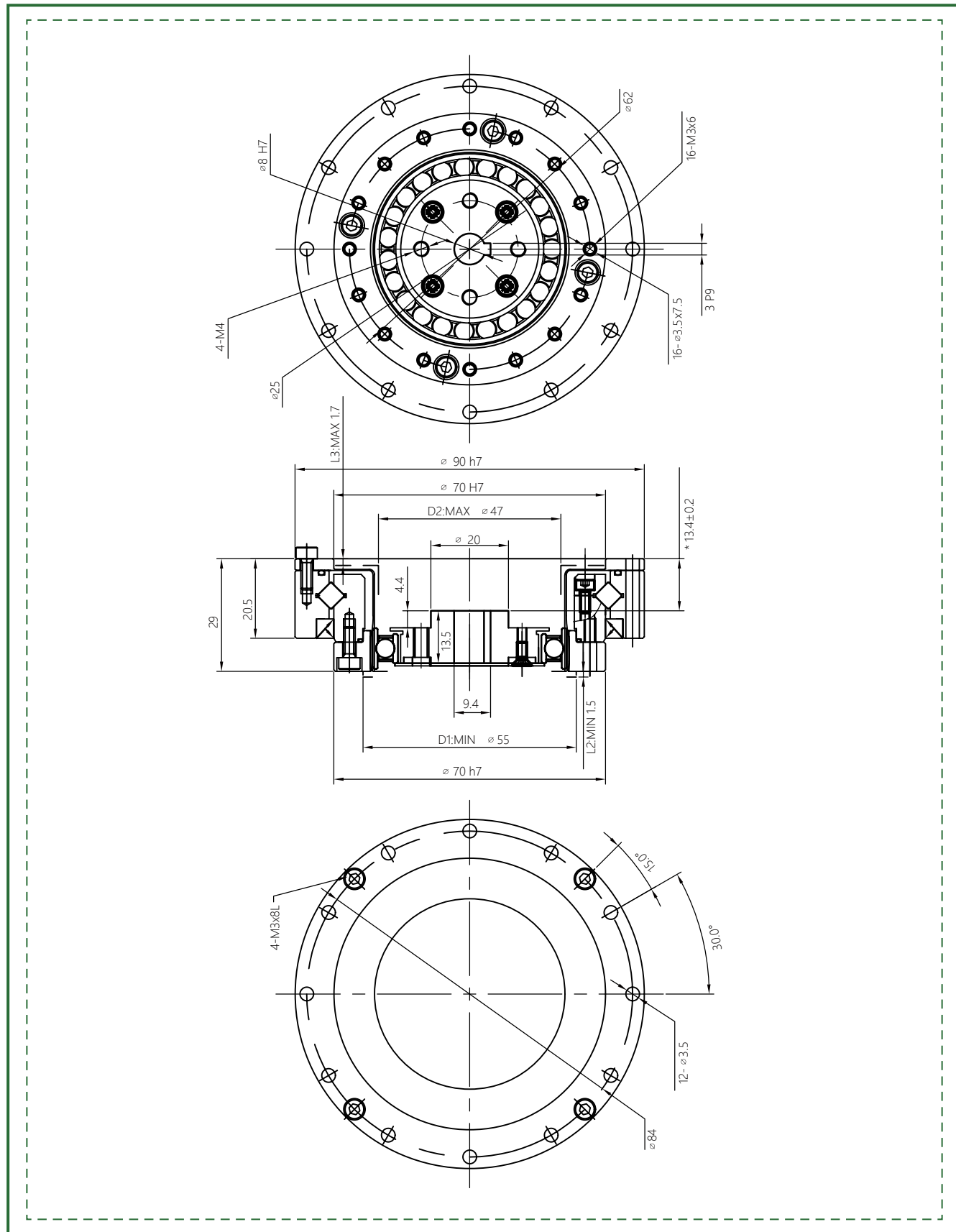
### Parameter Table

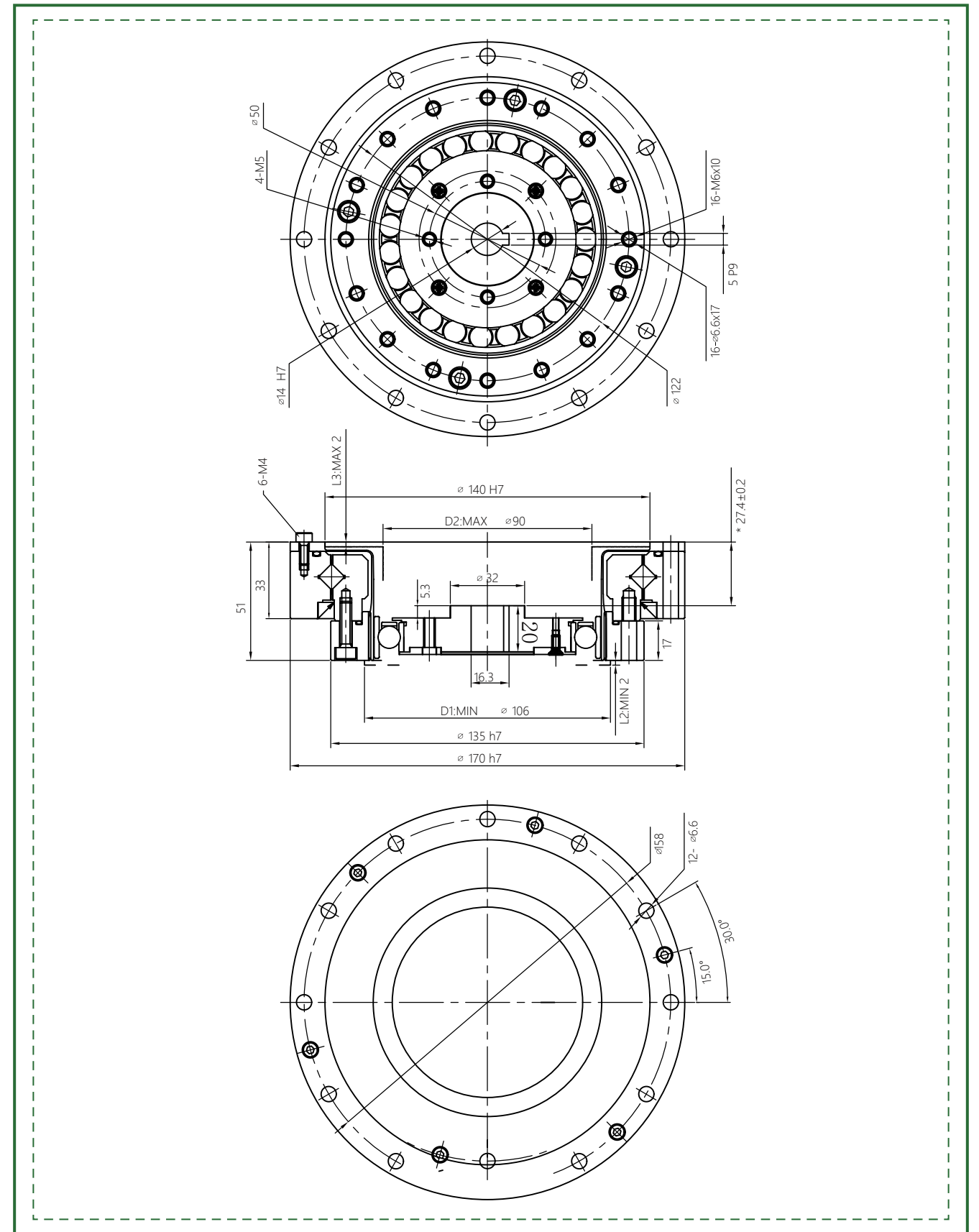
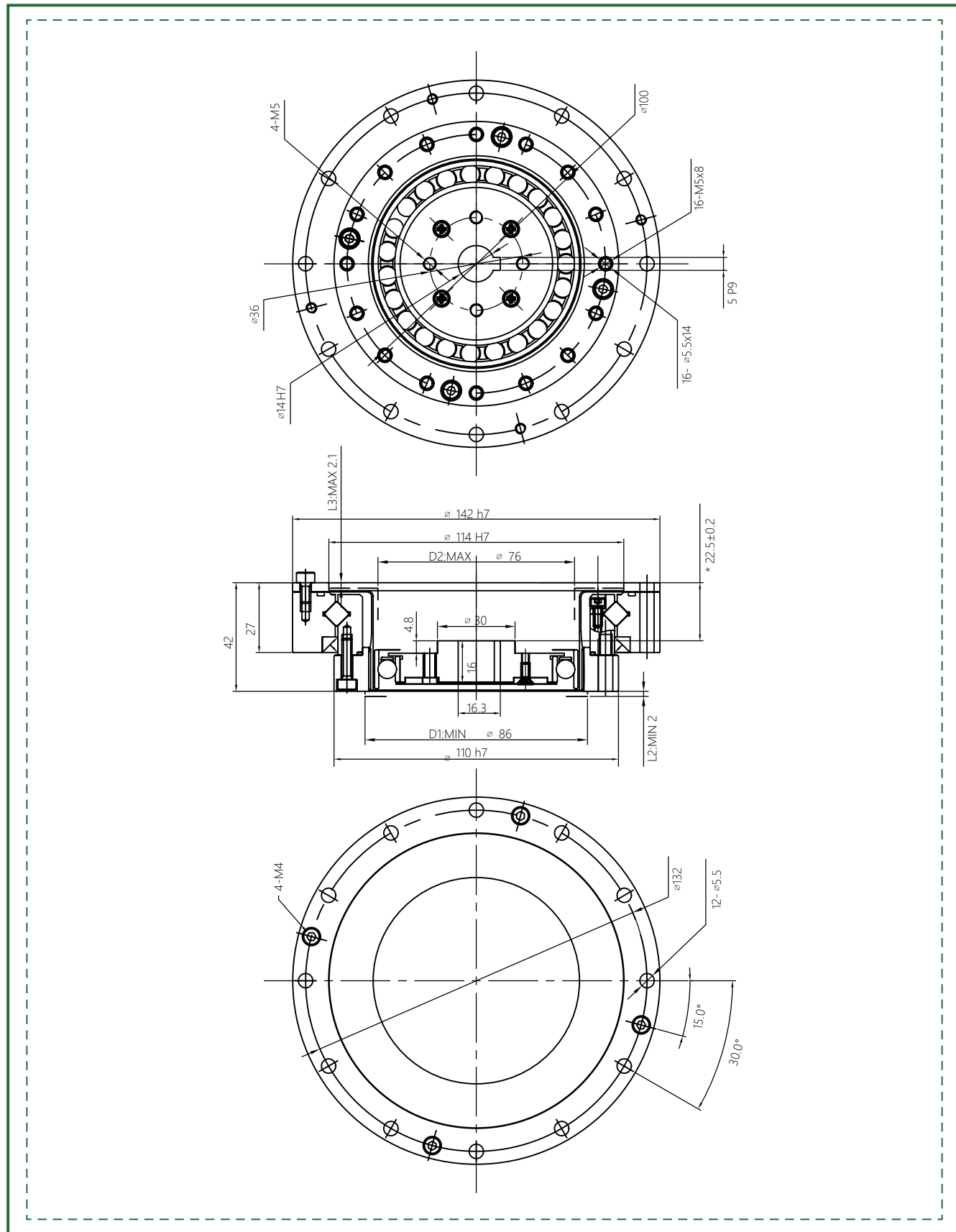
Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	Kg	Hour
14	50	6.6	23	8.6	43	8000	3500	≤10	0.38	10000
	80	9.6	29	13.5	57			≤10		15000
	100	9.6	34	13.5	66			≤10		15000
17	50	19.8	42	32	86	7000	3500	≤10	0.56	10000
	80	27.5	53	33	108			≤10		15000
	100	30	66	49	134			≤10		15000
	120	30	66	49	107			≤10		15000
20	50	32	69	42	121	6000	3500	≤10	0.76	10000
	80	42	91	58	158			≤10		15000
	100	50	102	61	182			≤10		15000
	120	50	108	61	182			≤10		15000
	160	50	113	61	182			≤10		15000
25	50	48	121	68.5	230	5500	3500	≤10	1.24	10000
	80	78	169	107	315			≤10		15000
	100	84	194	133	351			≤10		15000
	120	84	207	133	376			≤10		15000
	160	84	217	133	388			≤10		15000
32	50	94	267	133	472	4500	3500	≤10	2.6	10000
	80	146	376	206	702			≤10		15000
	100	169	411	267	800			≤10		15000
	120	169	436	267	848			≤10		15000
	160	169	459	267	848			≤10		15000
40	50	169	497	242	847	4000	3000	≤10	5.0	10000
	80	255	641	351	1210			≤10		15000
	100	328	702	460	1334			≤10		15000
	120	363	762	557	1458			≤10		15000
	160	363	800	557	1458			≤10		15000
50*	80	459	1163	642	2297	3000	2500	≤10	9.5	15000
	100	580	1211	823	2545			≤10		15000
	120	654	1334	1005	2545			≤10		15000
	160	654	1458	1042	3025			≤10		15000
58*	80	678	1828	951	3026	3000	2200	≤10	13.6	15000
	100	860	1964	1309	3927			≤10		15000
	120	921	2124	1470	4113			≤10		15000
	160	921	2722	1494	4236			≤10		15000

\* Consult factory





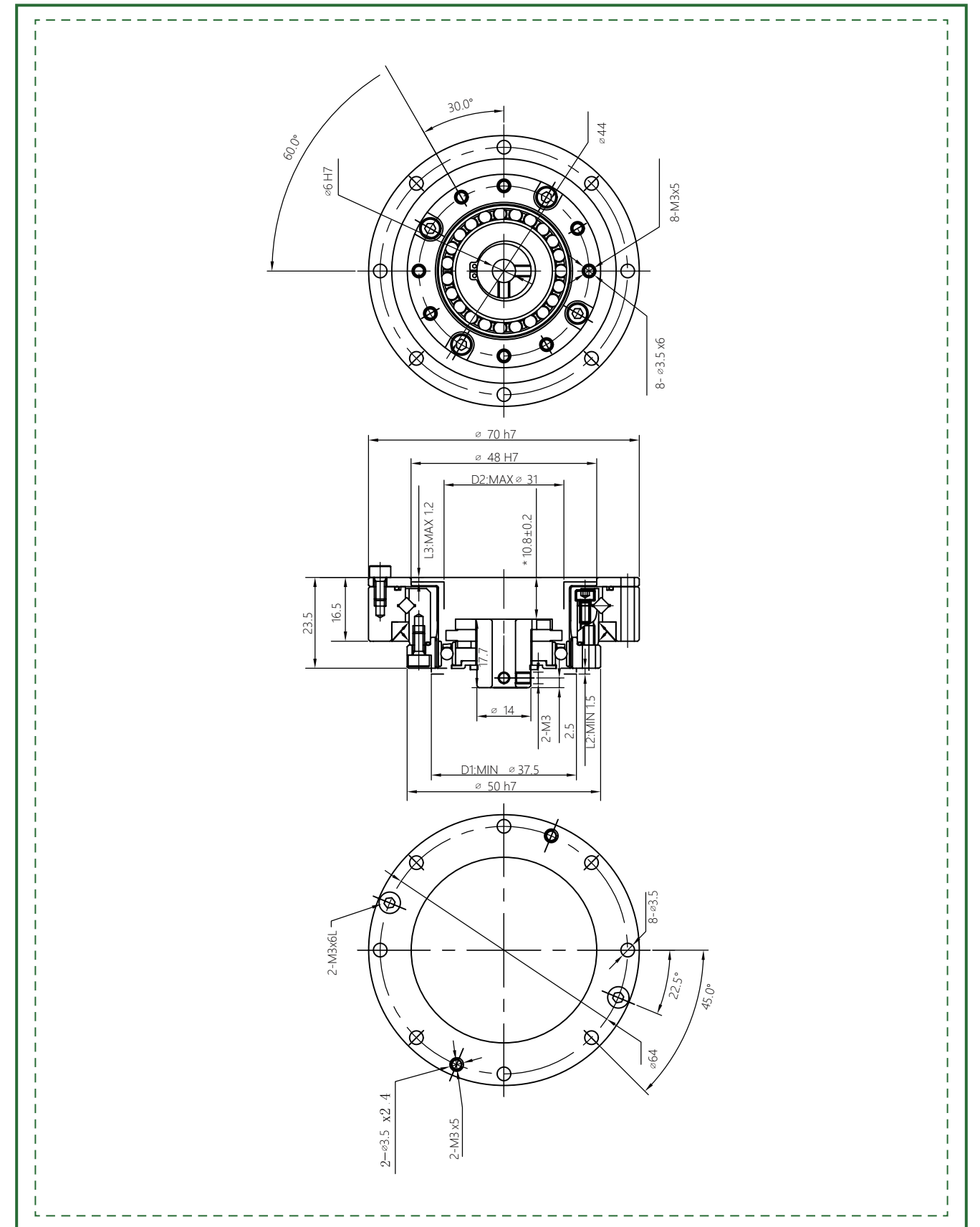


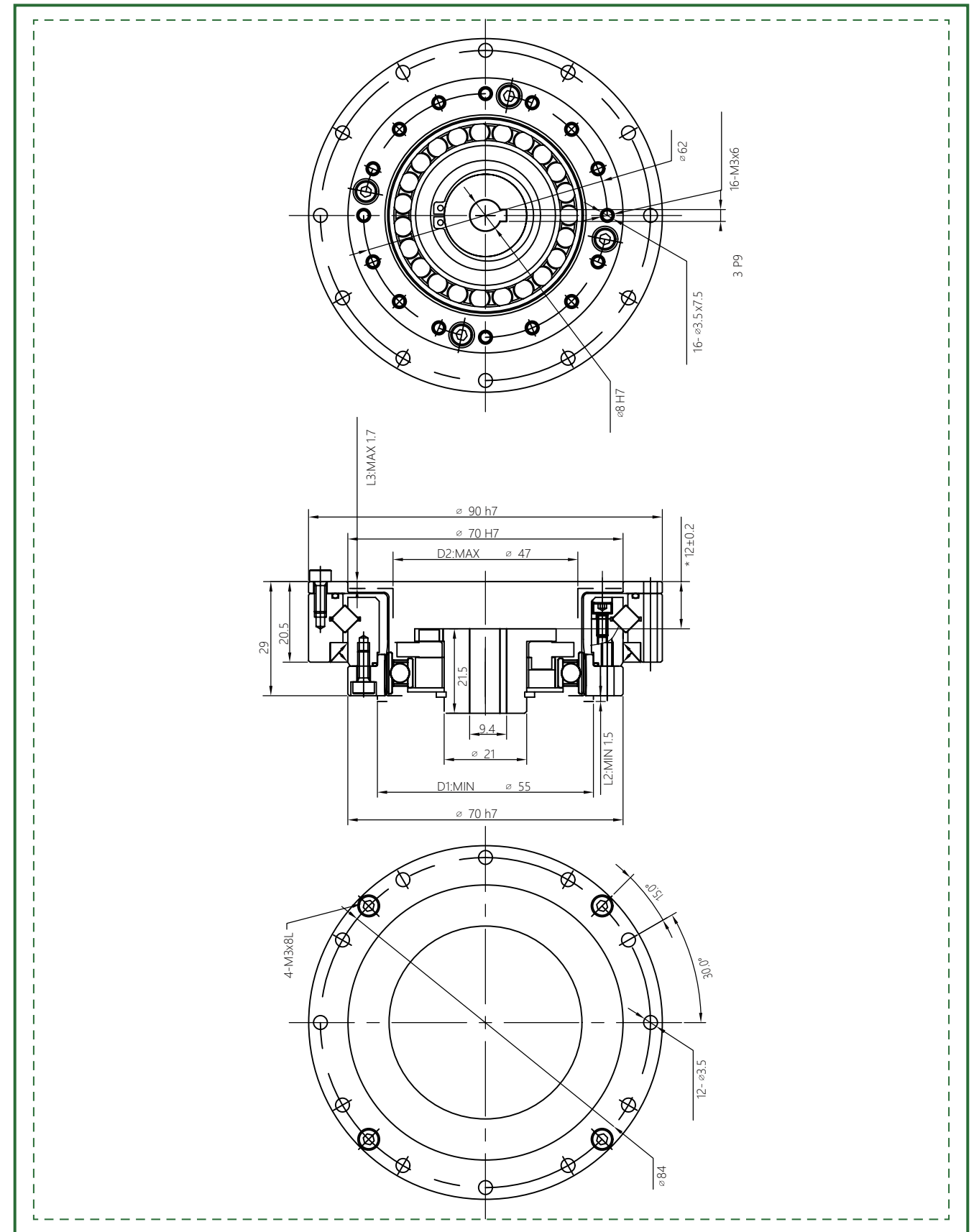
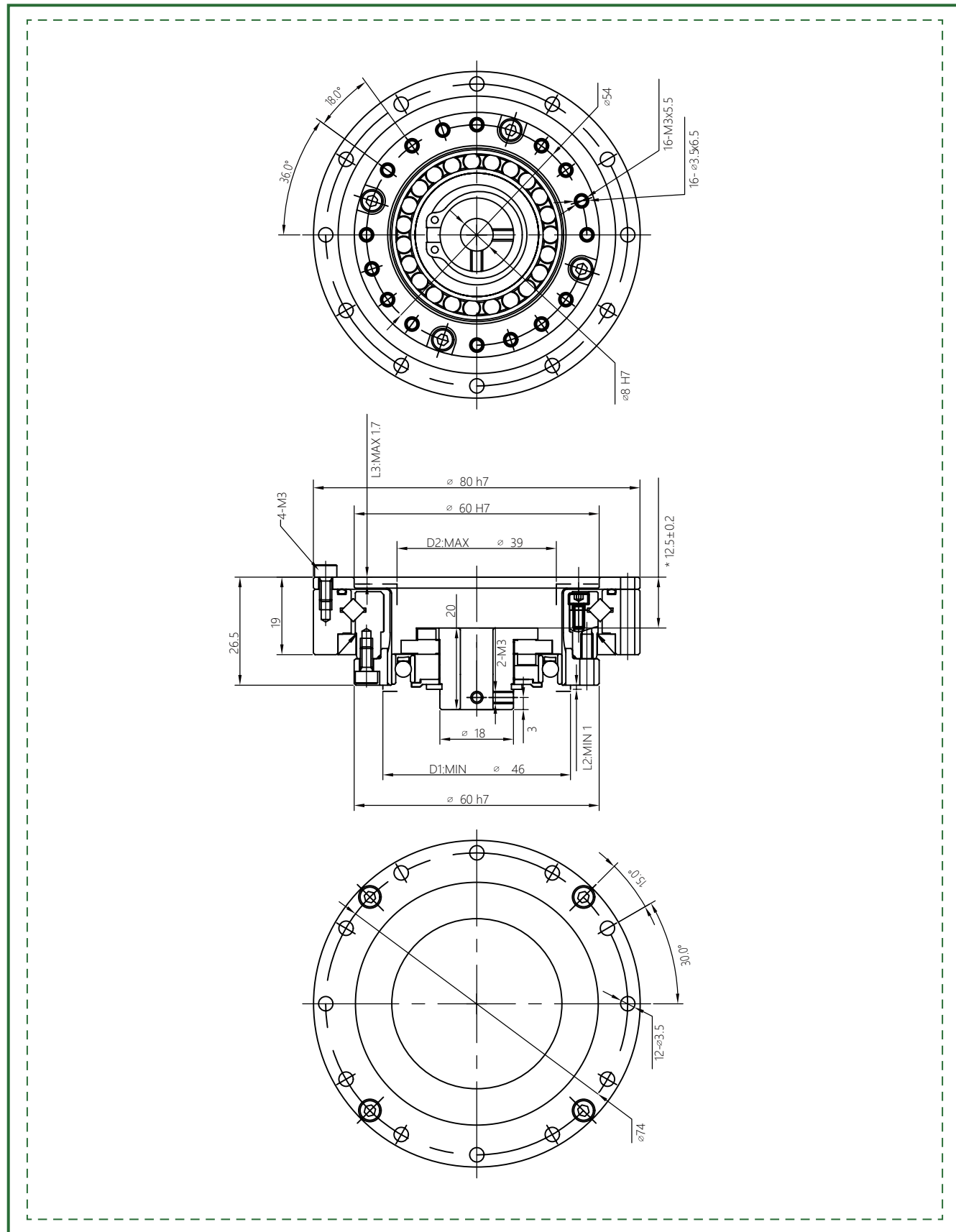


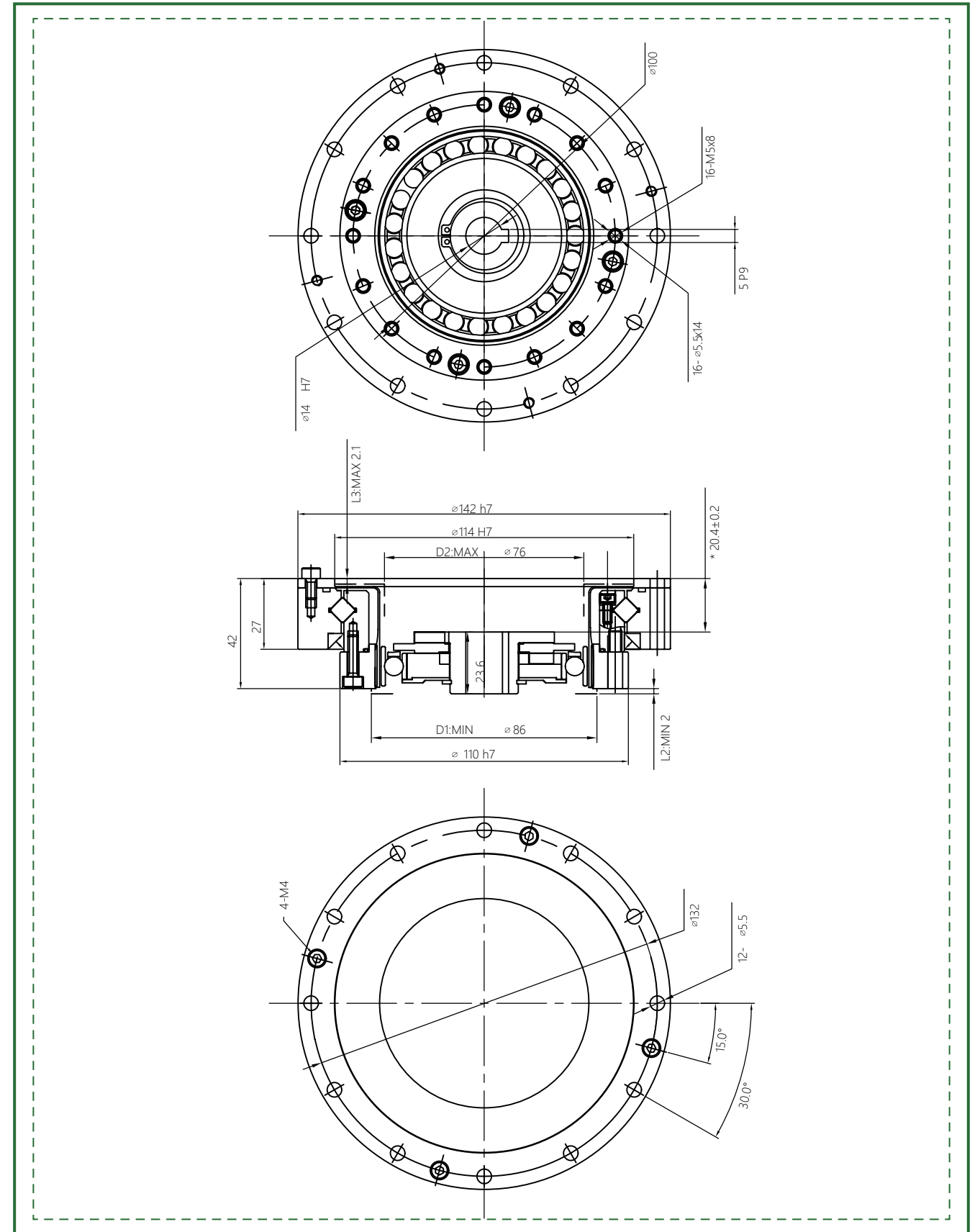
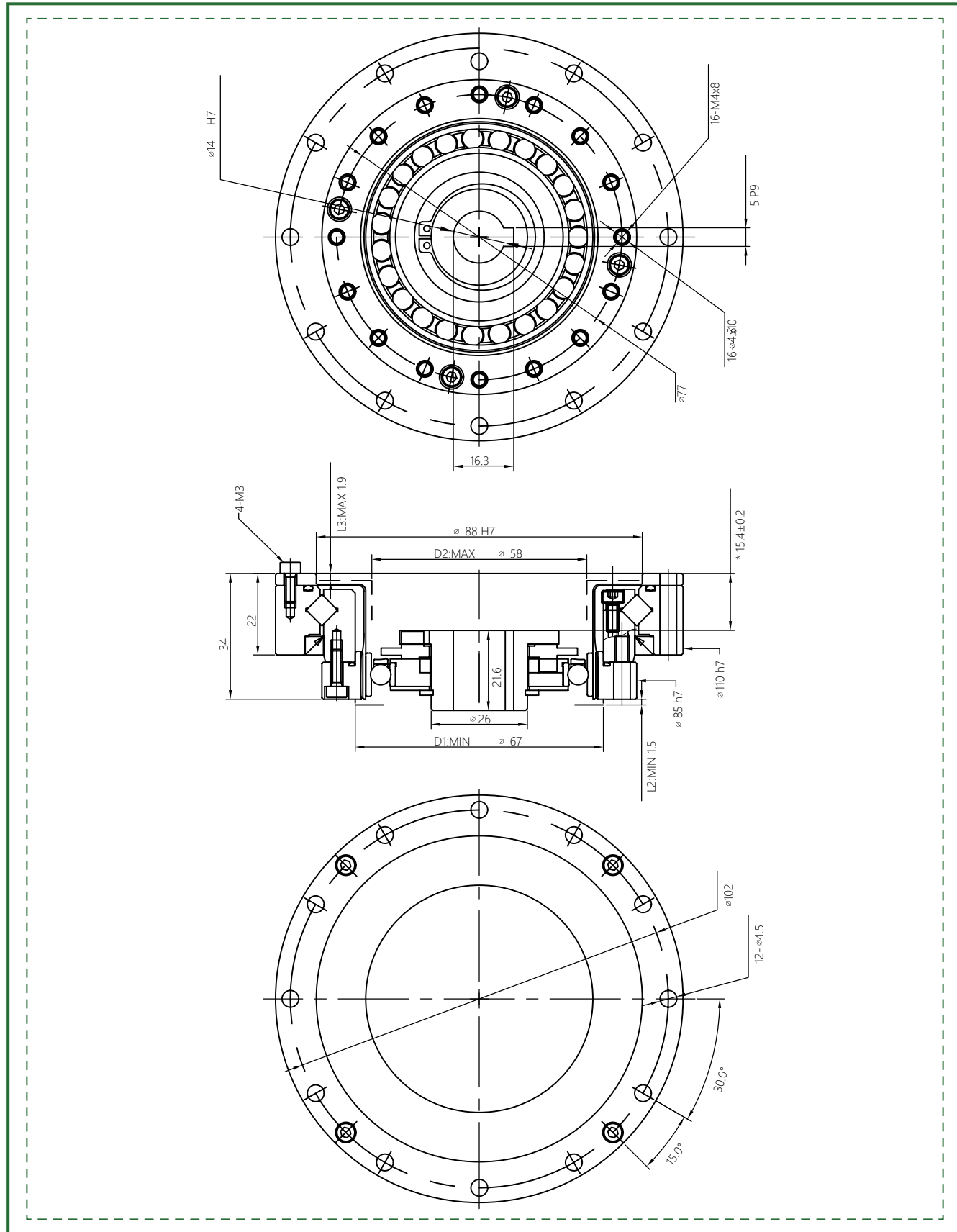
### Parameter Table

Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	Kg	Hour
14	50	6.6	23	8.6	43	8000	3500	≤20	0.38	10000
	80	9.6	29	13.5	57			≤20		15000
	100	9.6	34	13.5	66			≤20		15000
17	50	19.8	42	32	86	7000	3500	≤20	0.56	10000
	80	27.5	53	33	108			≤20		15000
	100	30	66	49	134			≤20		15000
	120	30	66	49	107			≤20		15000
20	50	32	69	42	121	6000	3500	≤20	0.76	10000
	80	42	91	58	158			≤20		15000
	100	50	102	61	182			≤20		15000
	120	50	108	61	182			≤20		15000
	160	50	113	61	182			≤20		15000
25	50	48	121	68.5	230	5500	3500	≤20	1.24	10000
	80	78	169	107	315			≤20		15000
	100	84	194	133	351			≤20		15000
	120	84	207	133	376			≤20		15000
	160	84	217	133	388			≤20		15000
32	50	94	267	133	472	4500	3500	≤20	2.6	10000
	80	146	376	206	702			≤20		15000
	100	169	411	267	800			≤20		15000
	120	169	436	267	848			≤20		15000
	160	169	459	267	848			≤20		15000
40	50	169	497	242	847	4000	3000	≤20	5.0	10000
	80	255	641	351	1210			≤20		15000
	100	328	702	460	1334			≤20		15000
	120	363	762	557	1458			≤20		15000
	160	363	800	557	1458			≤20		15000
50*	80	459	1163	642	2297	3000	2500	≤10	9.5	15000
	100	580	1211	823	2545			≤10		15000
	120	654	1334	1005	2545			≤10		15000
	160	654	1458	1042	3025			≤10		15000
58*	80	678	1828	951	3026	3000	2200	≤10	13.6	15000
	100	860	1964	1309	3927			≤10		15000
	120	921	2124	1470	4113			≤10		15000
	160	921	2722	1494	4236			≤10		15000

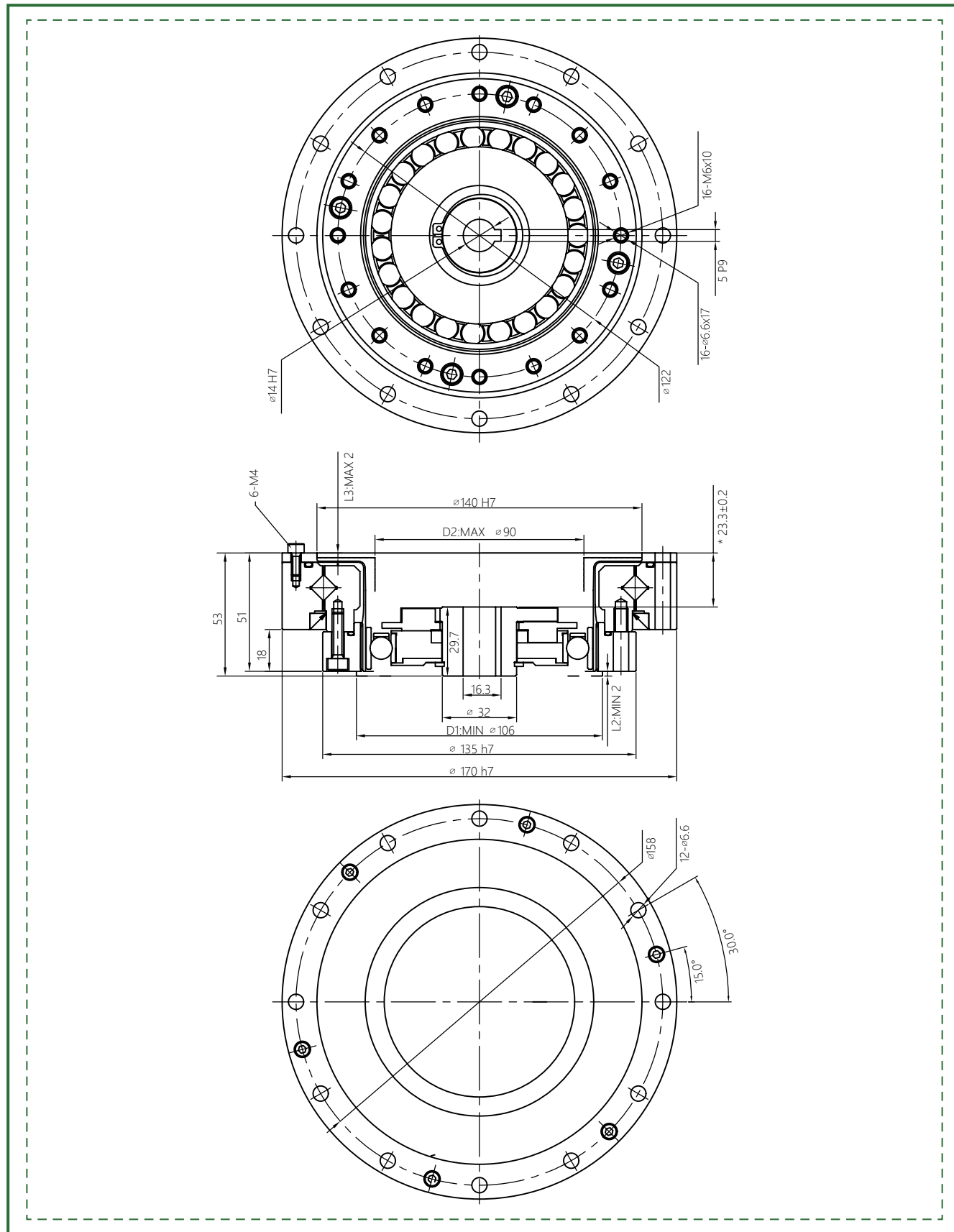
\* Consult factory







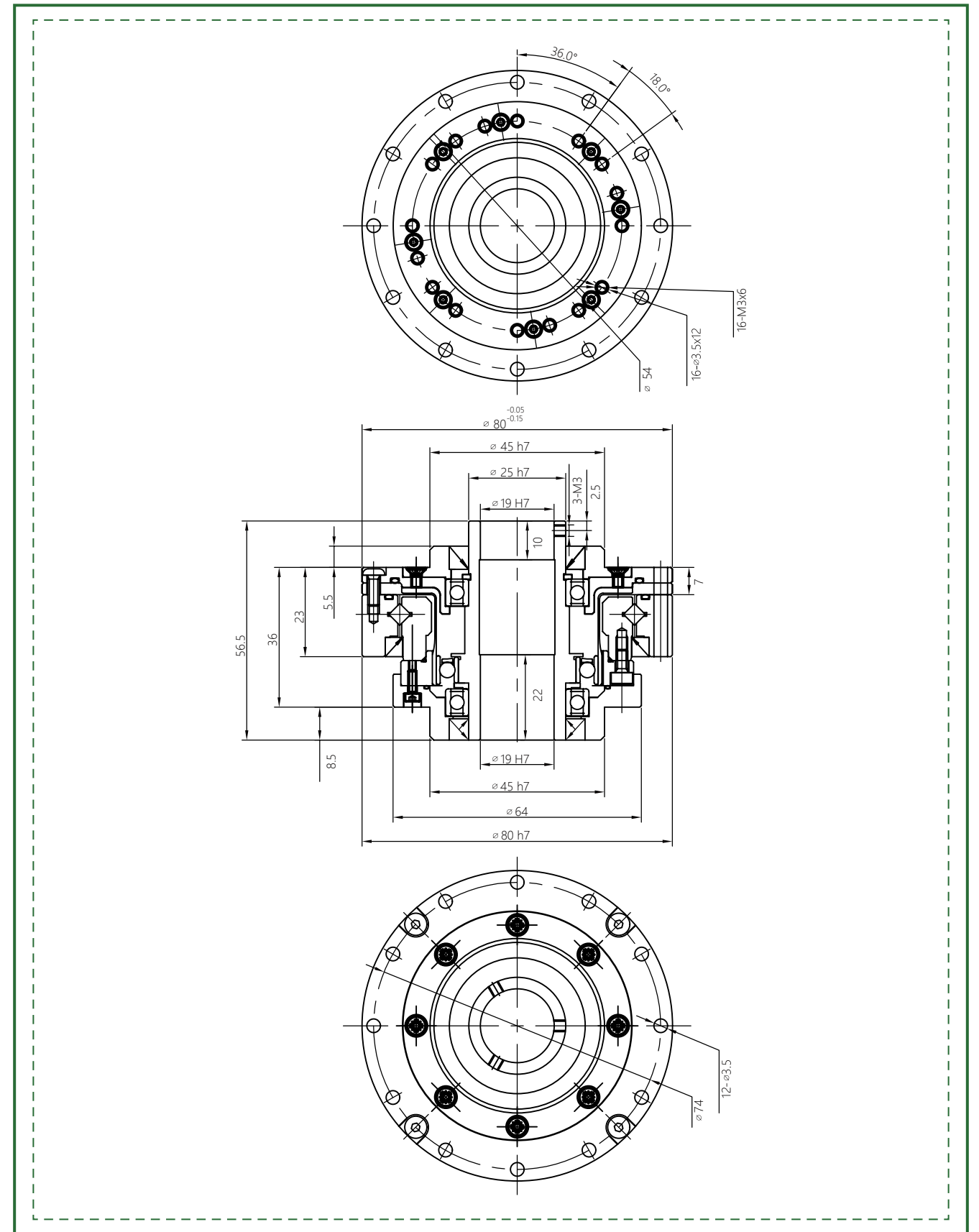
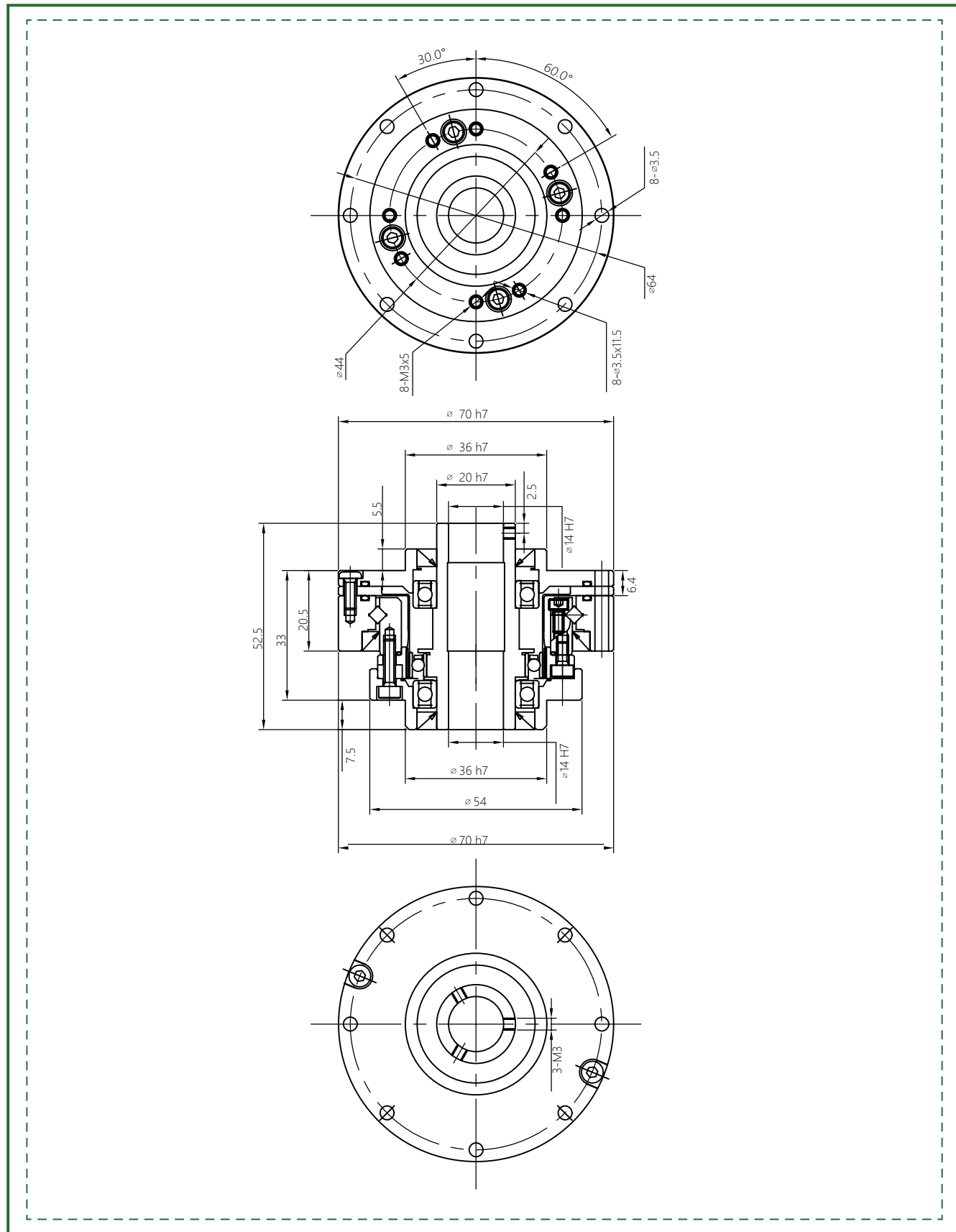


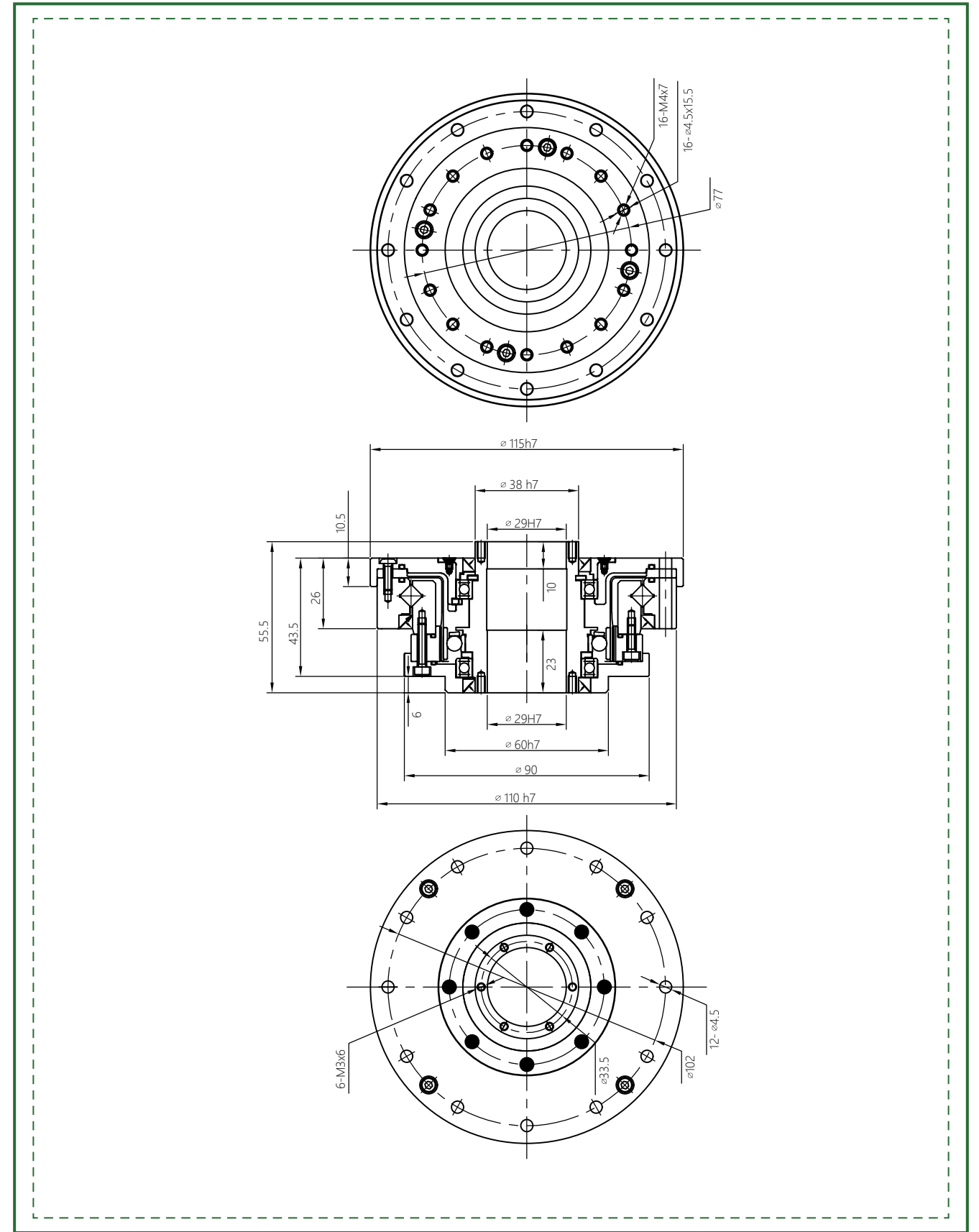
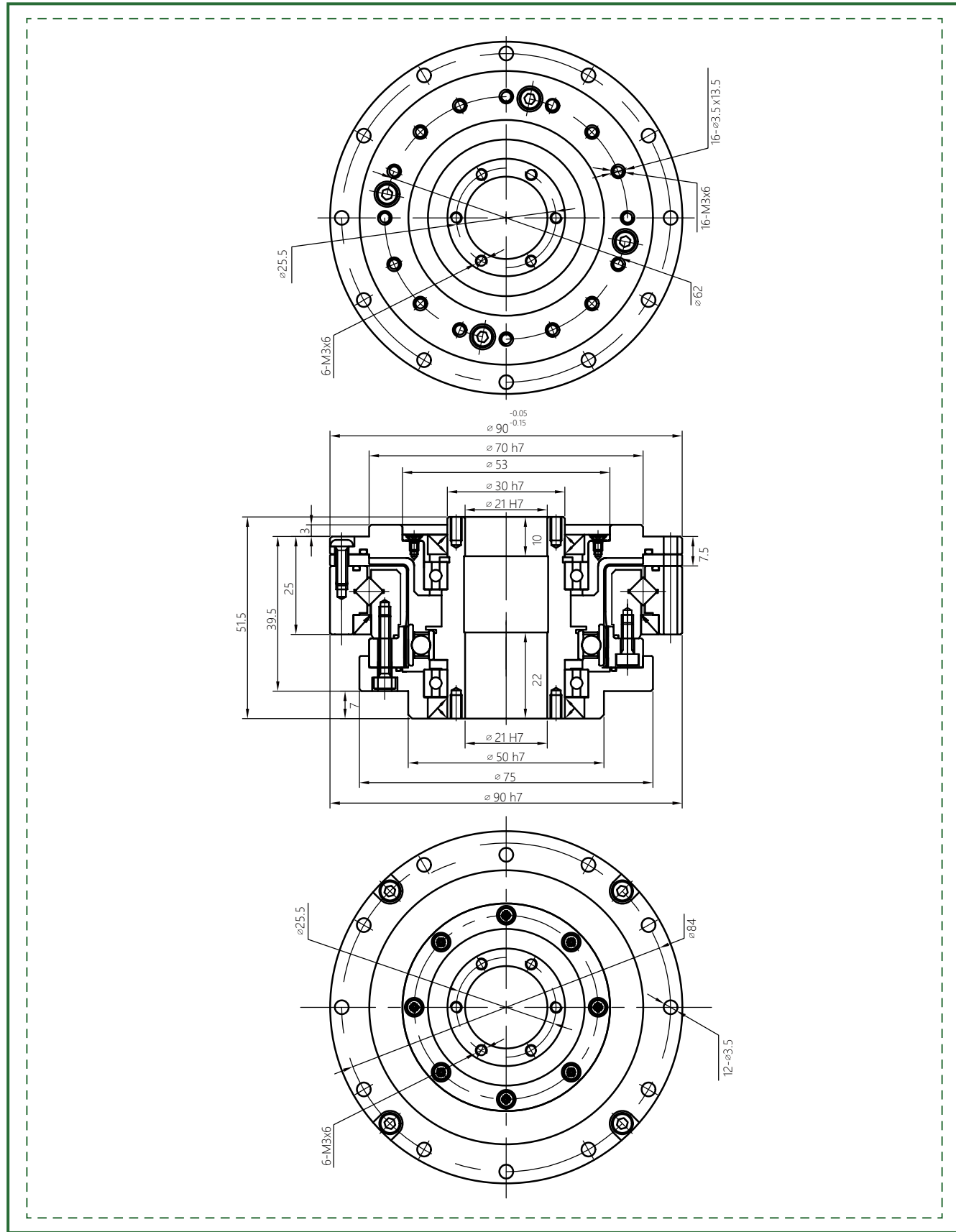


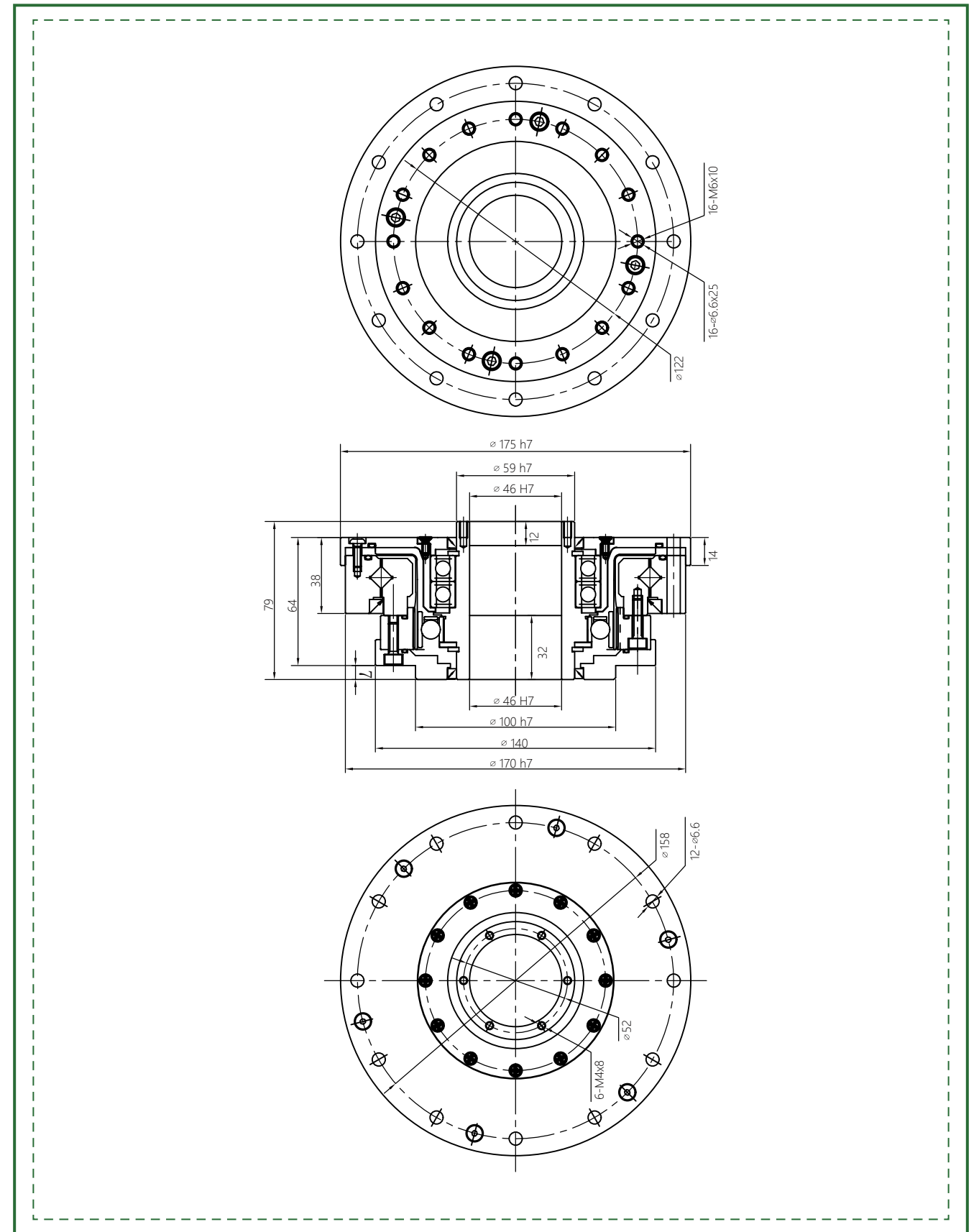
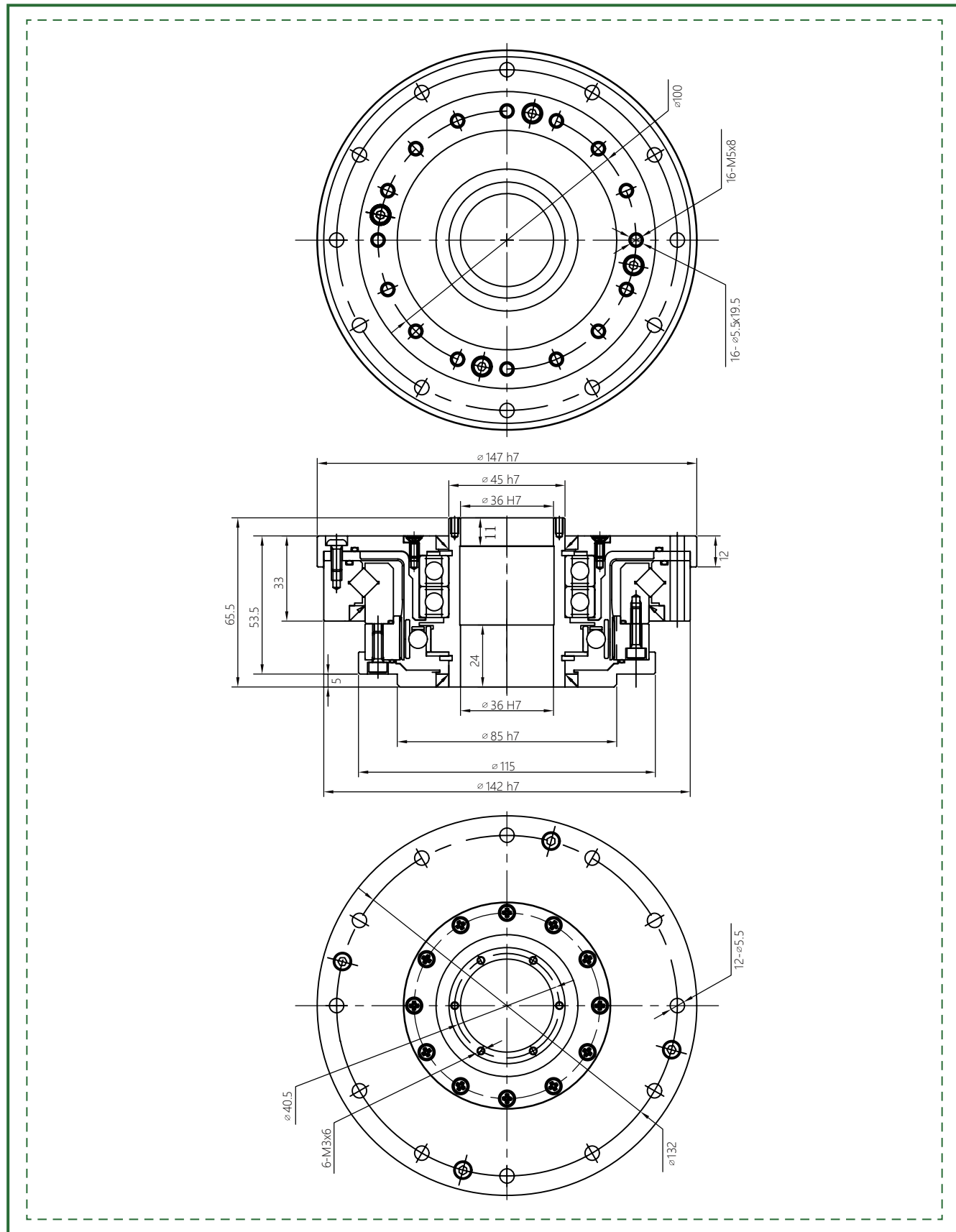
### Parameter Table

Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	With Maximum Tension	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	N	Kg	Hour
14	50	6.6	23	8.6	43	8000	3500	$\leq 20$	$\leq 77$	0.72	10000
	80	9.6	29	13.5	57			$\leq 10$			15000
	100	9.6	34	13.5	66			$\leq 10$			15000
17	50	19.8	42	32	86	7000	3500	$\leq 20$	$\leq 92$	1.0	10000
	80	27.5	53	33	108			$\leq 10$			15000
	100	30	66	49	134			$\leq 10$			15000
	120	30	66	49	107			$\leq 10$			15000
20	50	32	69	42	121	6000	3500	$\leq 20$	$\leq 136$	1.38	10000
	80	42	91	58	158			$\leq 10$			15000
	100	50	102	61	182			$\leq 10$			15000
	120	50	108	61	182			$\leq 10$			15000
	160	50	113	61	182			$\leq 10$			15000
25	50	48	121	68.5	230	5500	3500	$\leq 20$	$\leq 147$	2.15	10000
	80	78	169	107	315			$\leq 10$			15000
	100	84	194	133	351			$\leq 10$			15000
	120	84	207	133	376			$\leq 10$			15000
	160	84	217	133	388			$\leq 10$			15000
32	50	94	267	133	472	4500	3500	$\leq 20$	$\leq 154$	4.3	10000
	80	146	376	206	702			$\leq 10$			15000
	100	169	411	267	800			$\leq 10$			15000
	120	169	436	267	848			$\leq 10$			15000
	160	169	459	267	848			$\leq 10$			15000
40	50	169	497	242	847	4000	3000	$\leq 10$	$\leq 294$	7.8	10000
	80	255	641	351	1210			$\leq 10$			15000
	100	328	702	460	1334			$\leq 10$			15000
	120	363	762	557	1458			$\leq 10$			15000
	160	363	800	557	1458			$\leq 10$			15000
50*	80	459	1163	641	2297	3000	2500	$\leq 10$	$\leq 373$	14.5	15000
	100	580	1211	823	2545			$\leq 10$			15000
	120	654	1334	1004	2545			$\leq 10$			15000
	160	654	1458	1041	3025			$\leq 10$			15000
58*	80	678	1828	951	3026	3000	2200	$\leq 10$	$\leq 1300$	20.0	15000
	100	860	1964	1309	3927			$\leq 10$			15000
	120	921	2124	1470	4113			$\leq 10$			15000
	160	921	2272	1494	4236			$\leq 10$			15000

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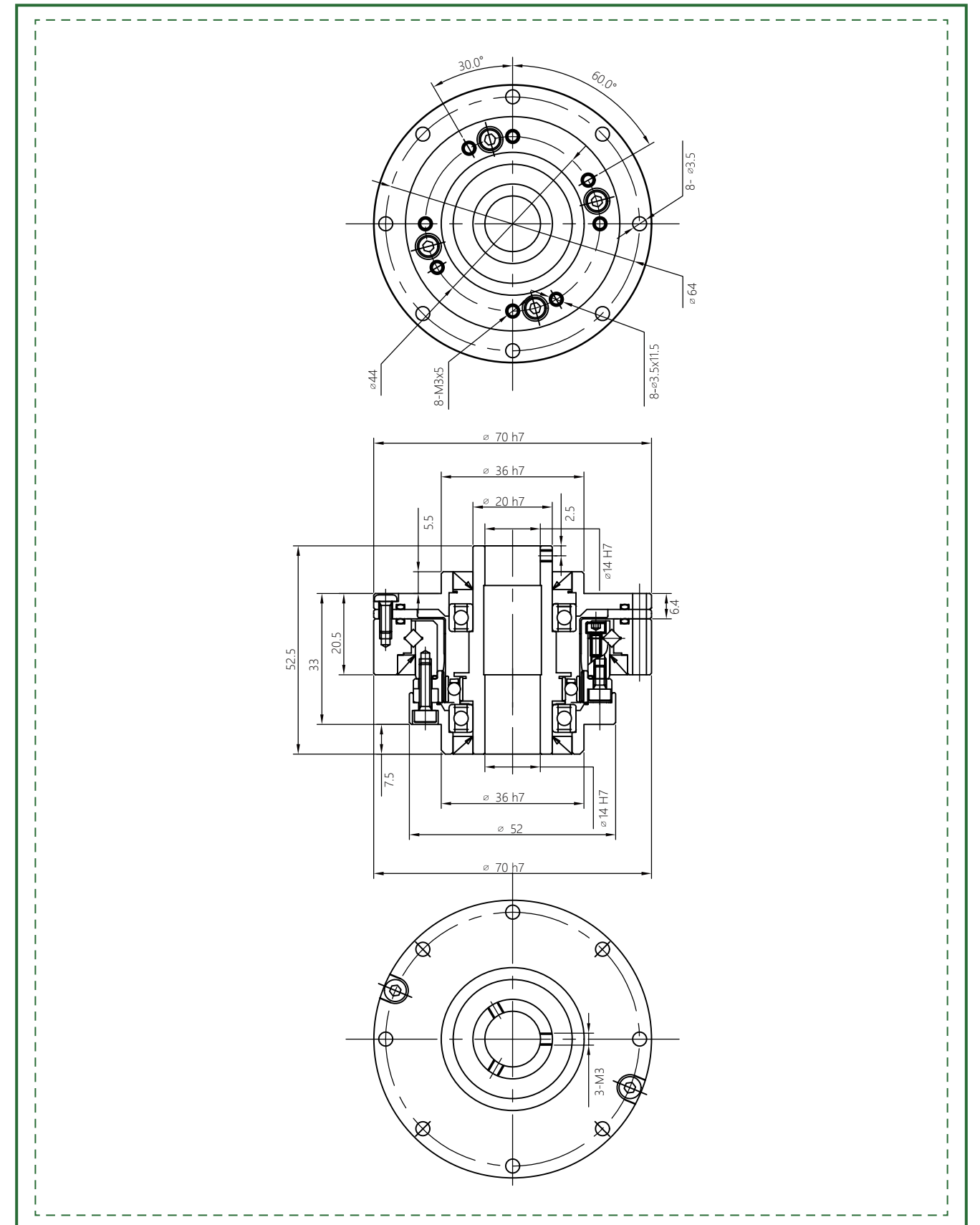




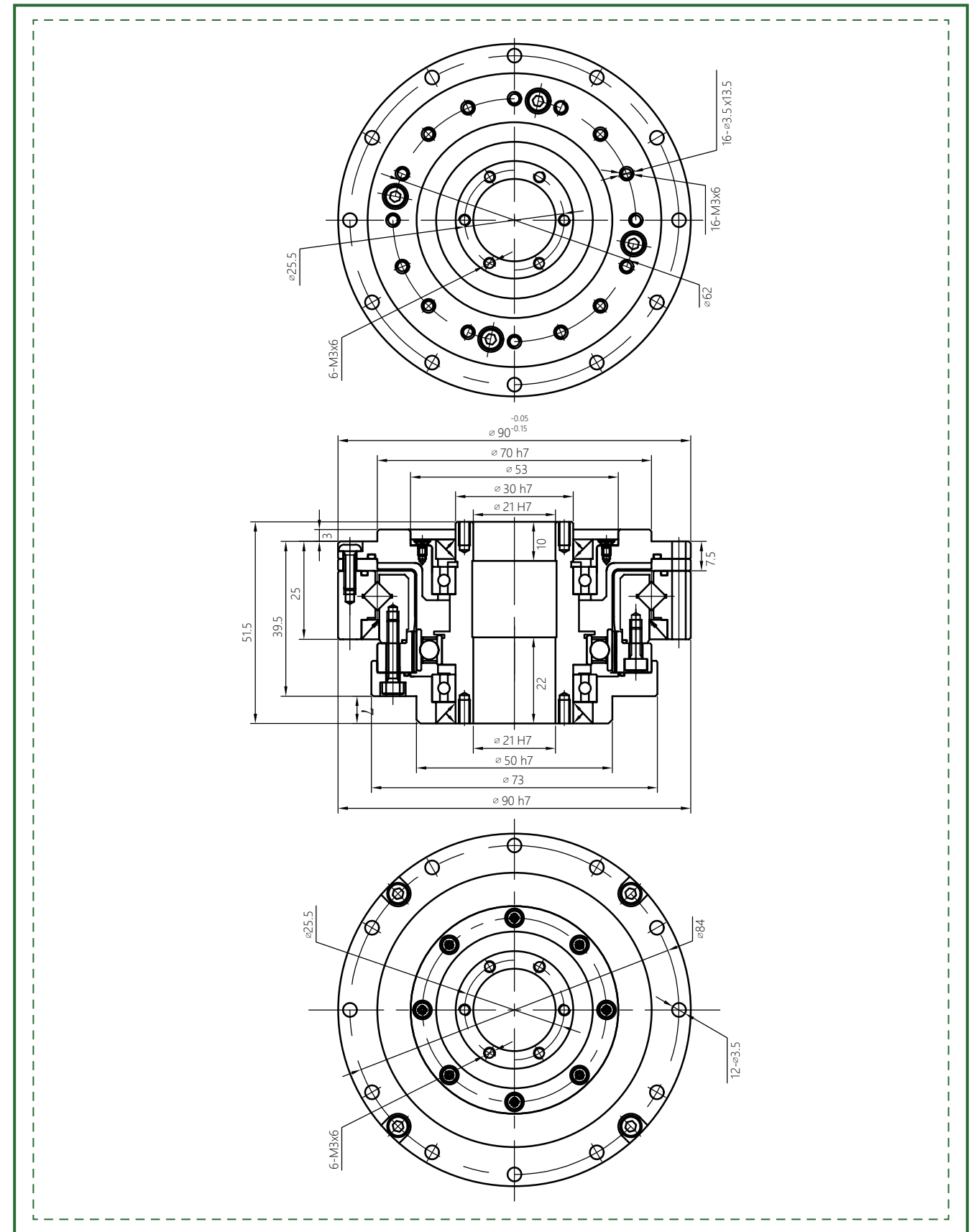
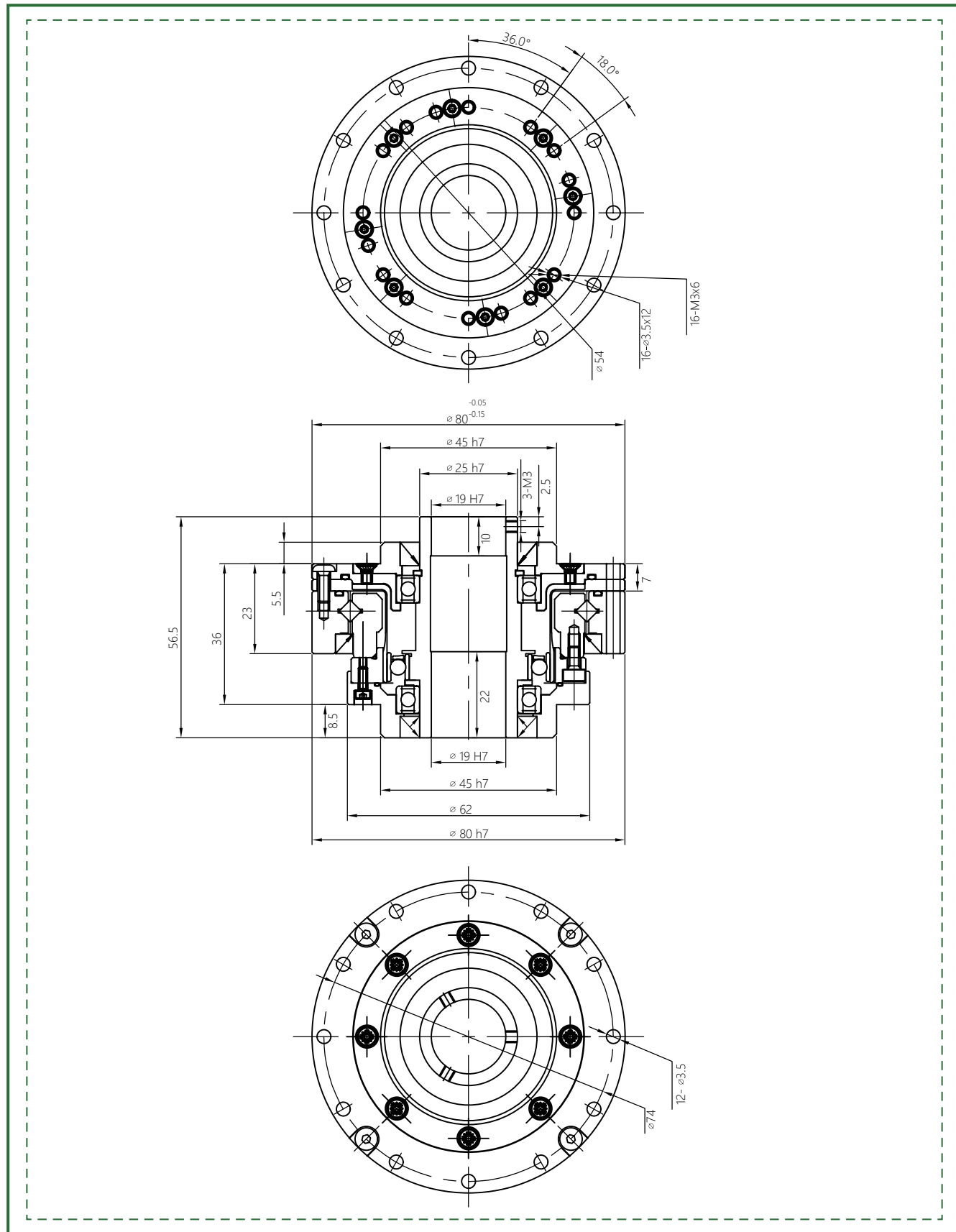
### Parameter Table

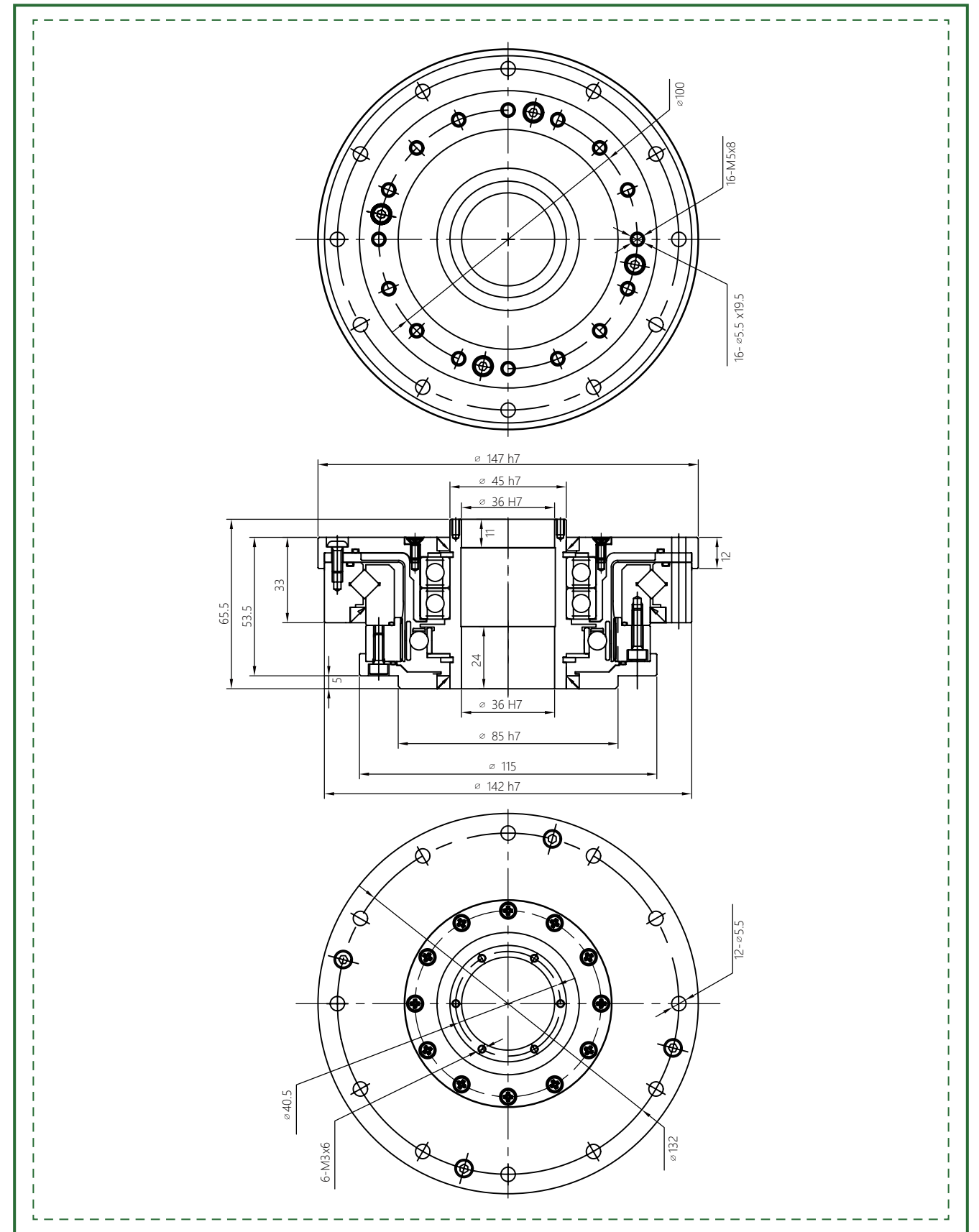
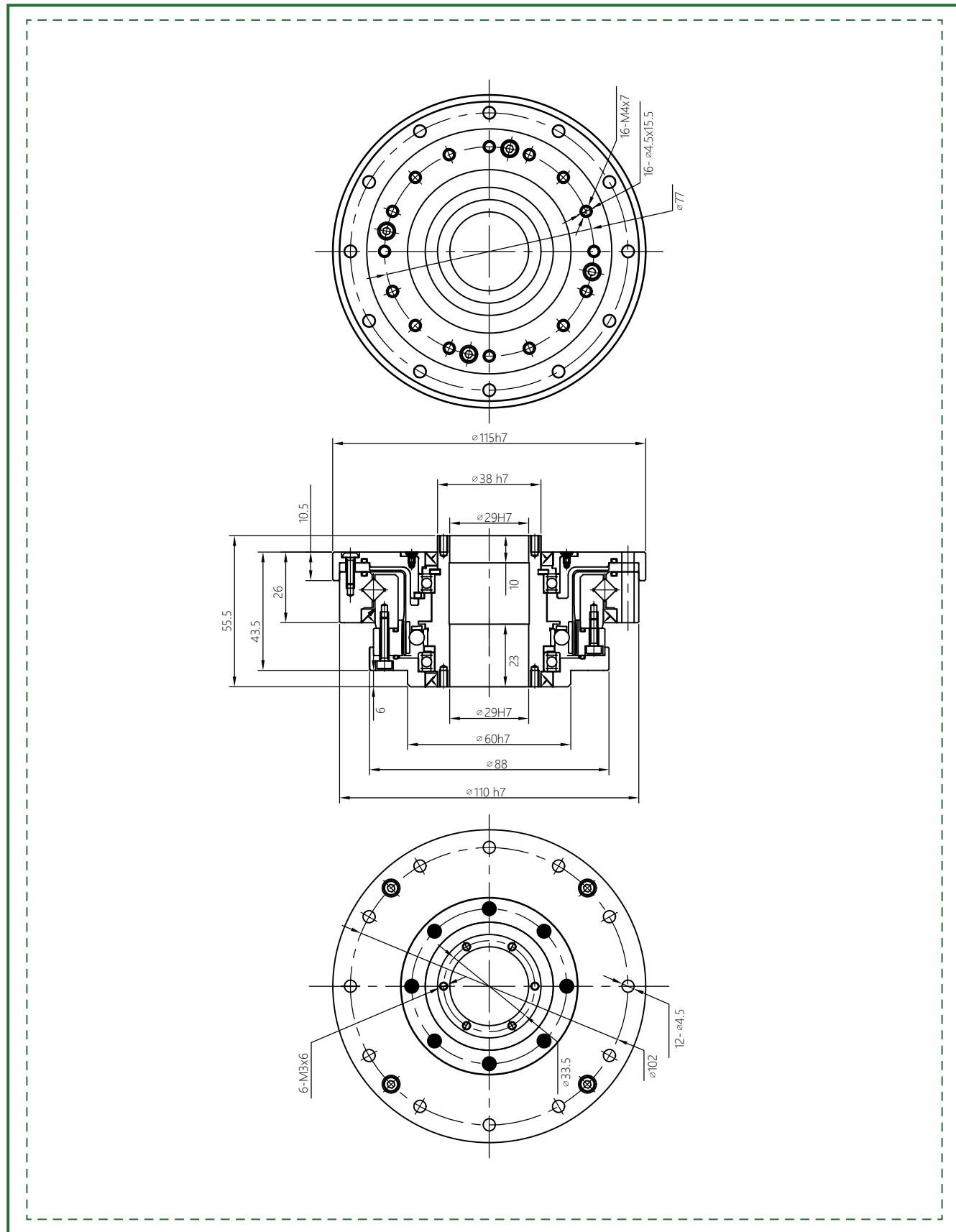
Item Model No	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	With Maximum Tension	Weight	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	N	Kg	Hour
14	50	6.6	23	8.6	43	8000	3500	≤10	≤77	0.56	10000
	80	9.6	29	13.5	57			≤10			15000
	100	9.6	34	13.5	66			≤10			15000
17	50	19.8	42	32	86	7000	3500	≤10	≤92	0.80	10000
	80	27.5	53	33	108			≤10			15000
	100	30	66	49	134			≤10			15000
	120	30	66	49	107			≤10			15000
20	50	32	69	42	121	6000	3500	≤10	≤136	1.09	10000
	80	42	91	58	158			≤10			15000
	100	50	102	61	182			≤10			15000
	120	50	108	61	182			≤10			15000
	160	50	113	61	182			≤10			15000
25	50	48	121	68.5	230	5500	3500	≤10	≤147	1.70	10000
	80	78	169	107	315			≤10			15000
	100	84	194	133	351			≤10			15000
	120	84	207	133	376			≤10			15000
	160	84	217	133	388			≤10			15000
32	50	94	267	133	472	4500	3500	≤10	≤154	3.50	10000
	80	146	376	206	702			≤10			15000
	100	169	411	267	800			≤10			15000
	120	169	436	267	848			≤10			15000
	160	169	459	267	848			≤10			15000
40	50	169	497	242	847	4000	3000	≤10	≤294	6.35	10000
	80	255	641	351	1210			≤10			15000
	100	328	702	460	1334			≤10			15000
	120	363	762	557	1458			≤10			15000
	160	363	800	557	1458			≤10			15000
50*	80	459	1163	641	2297	3000	2500	≤10	≤373	12.0	15000
	100	580	1211	823	2545			≤10			15000
	120	654	1334	1004	2545			≤10			15000
	160	654	1458	1041	3025			≤10			15000
58*	80	678	1828	951	3026	3000	2200	≤10	≤1300	16.5	15000
	100	860	1964	1309	3927			≤10			15000
	120	921	2124	1470	4113			≤10			15000
	160	921	2272	1494	4236			≤10			15000

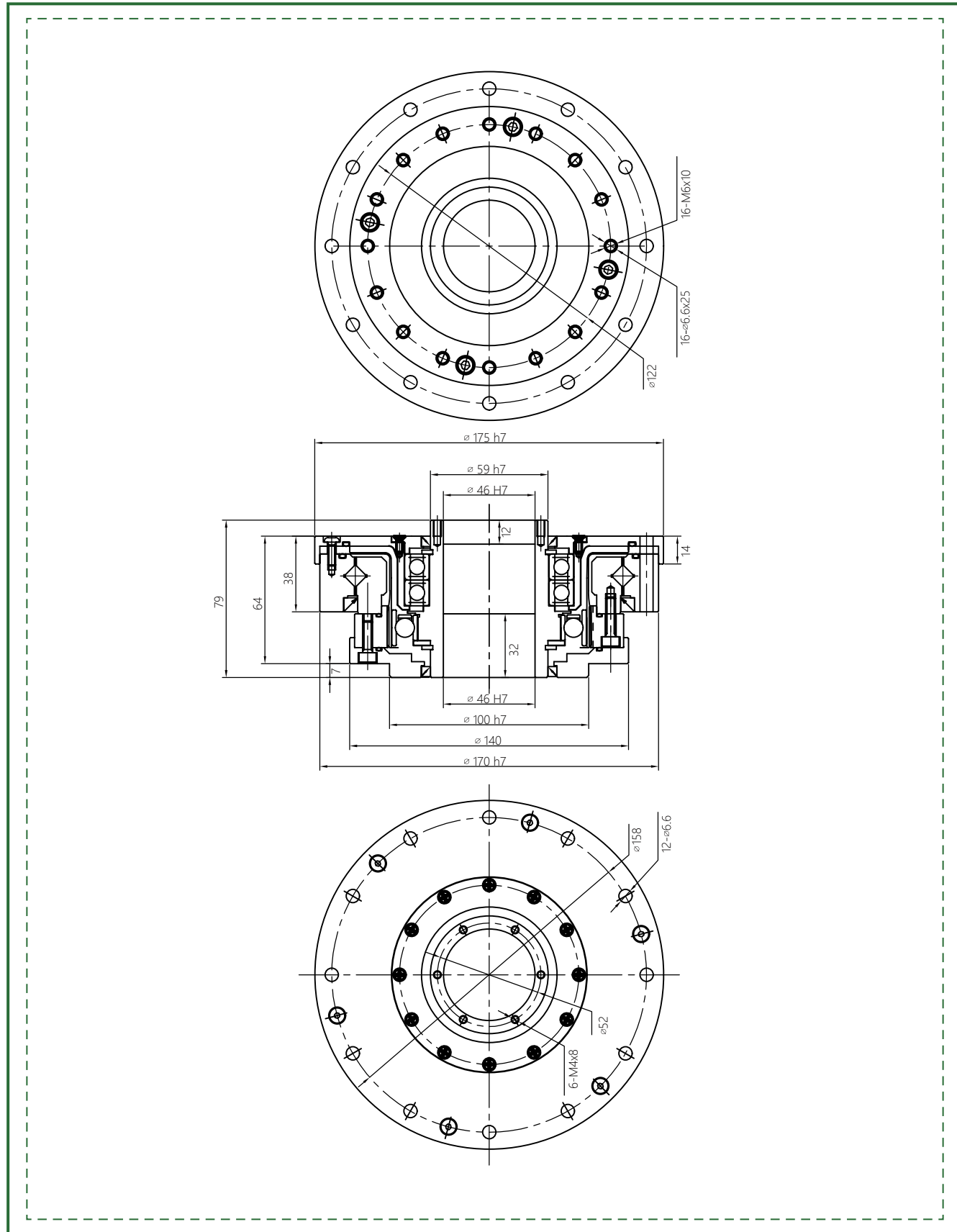
\* Consult factory





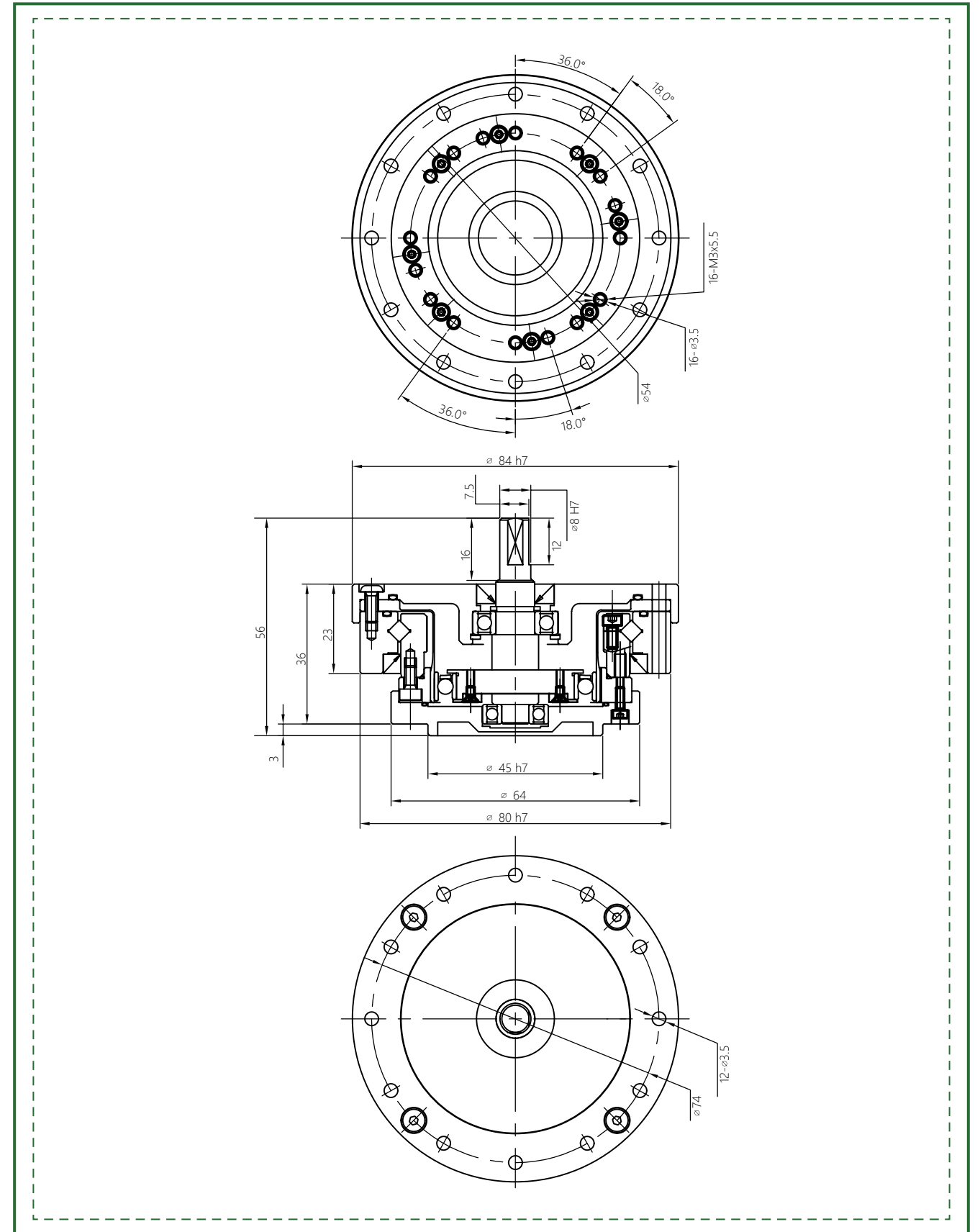
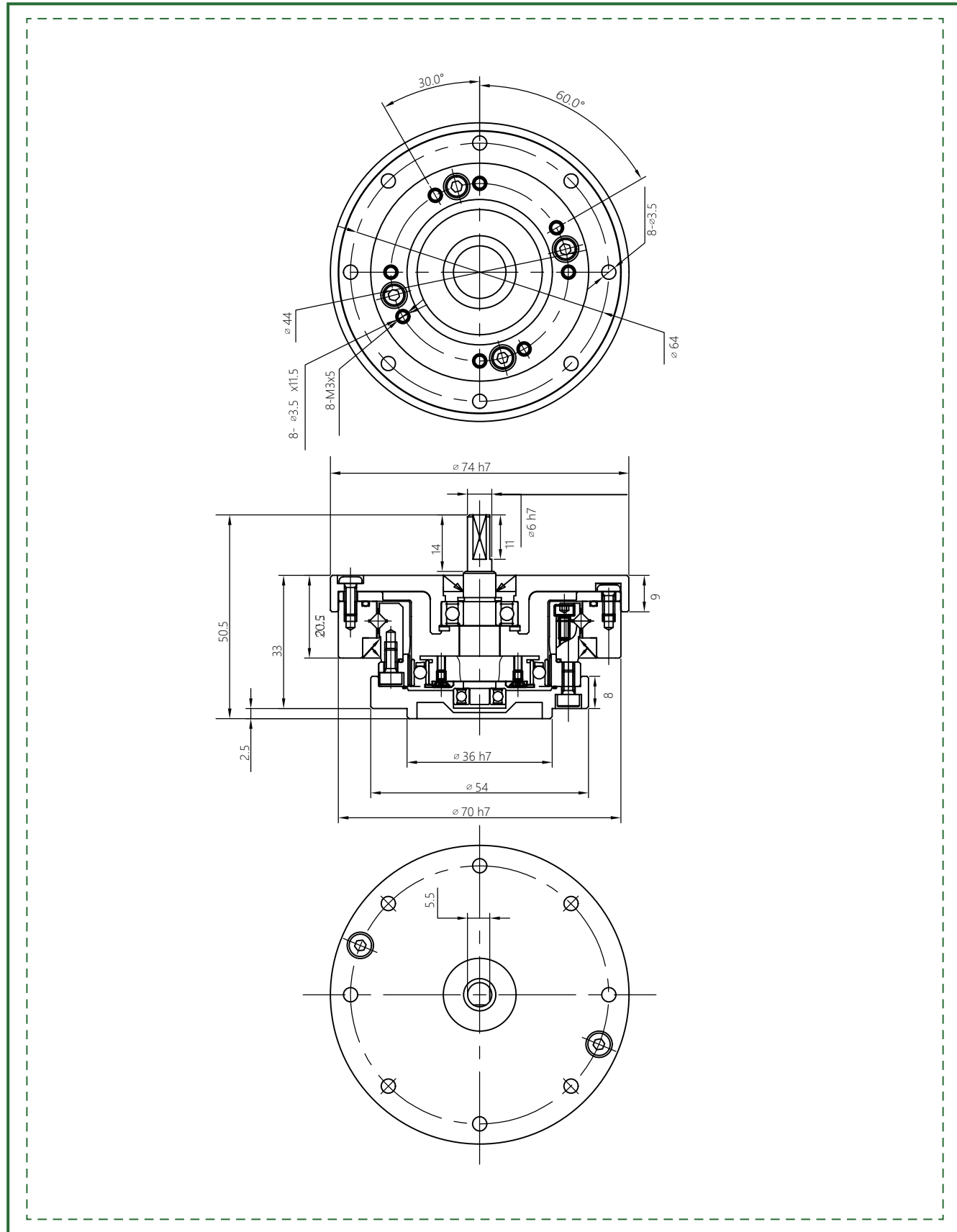


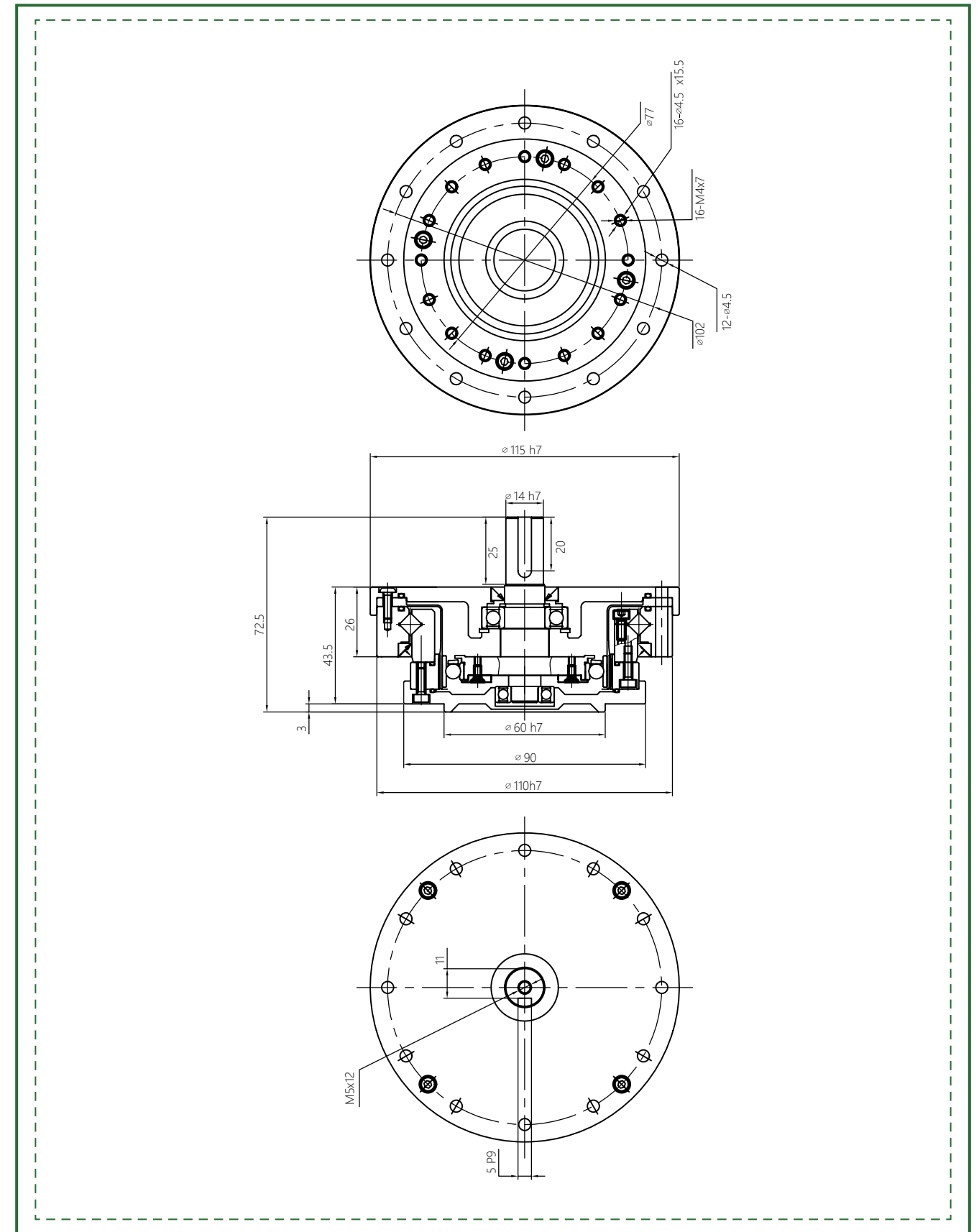
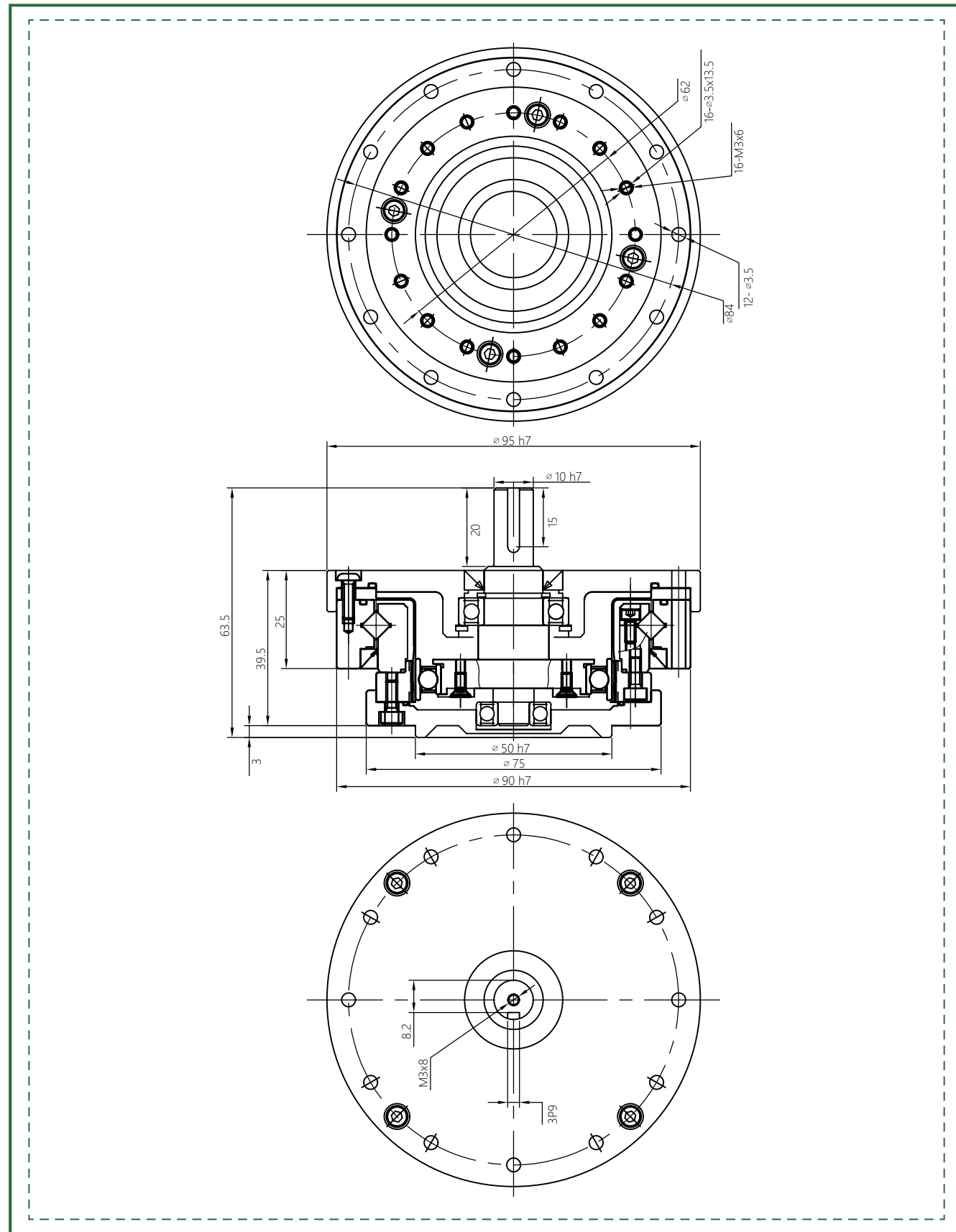


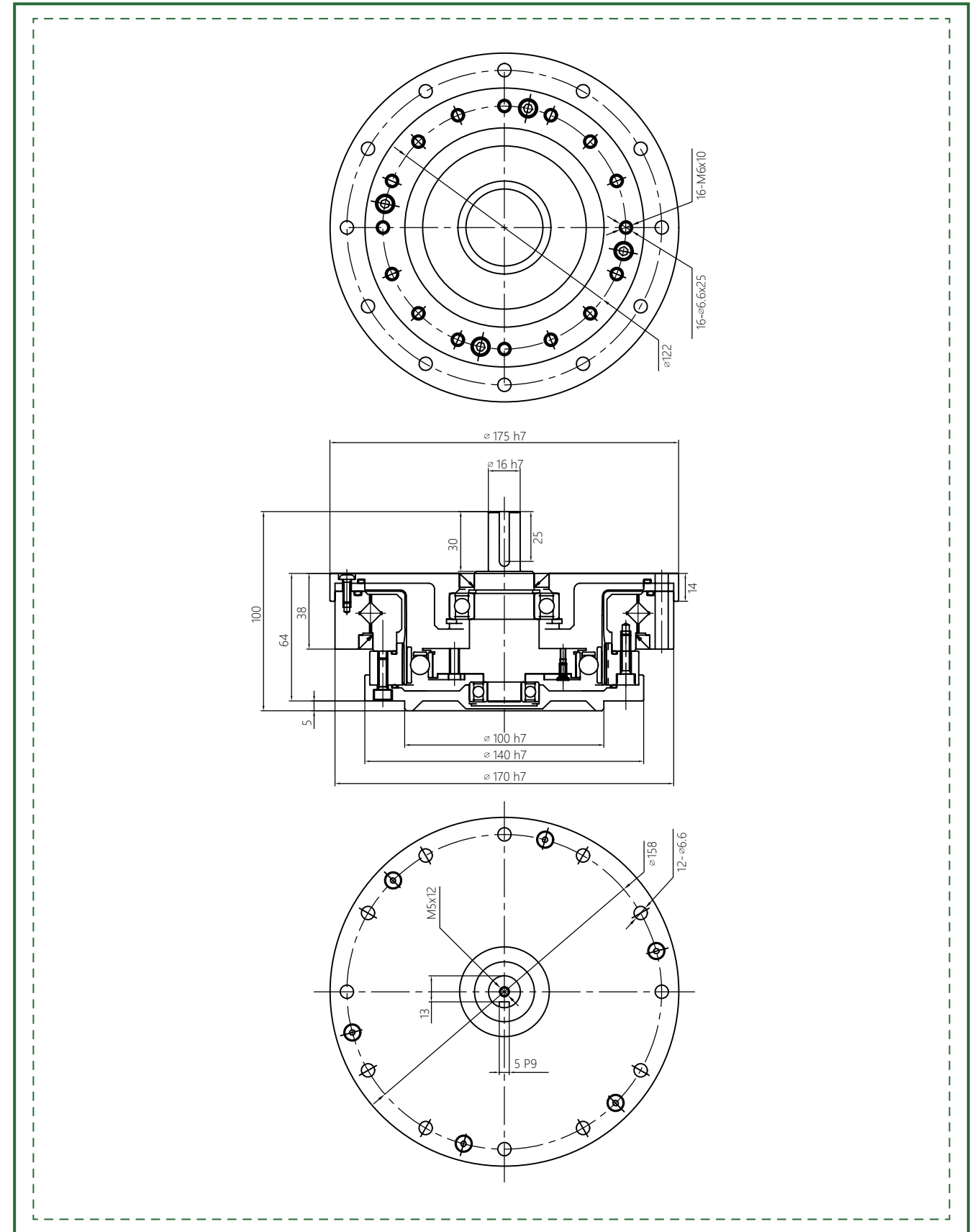
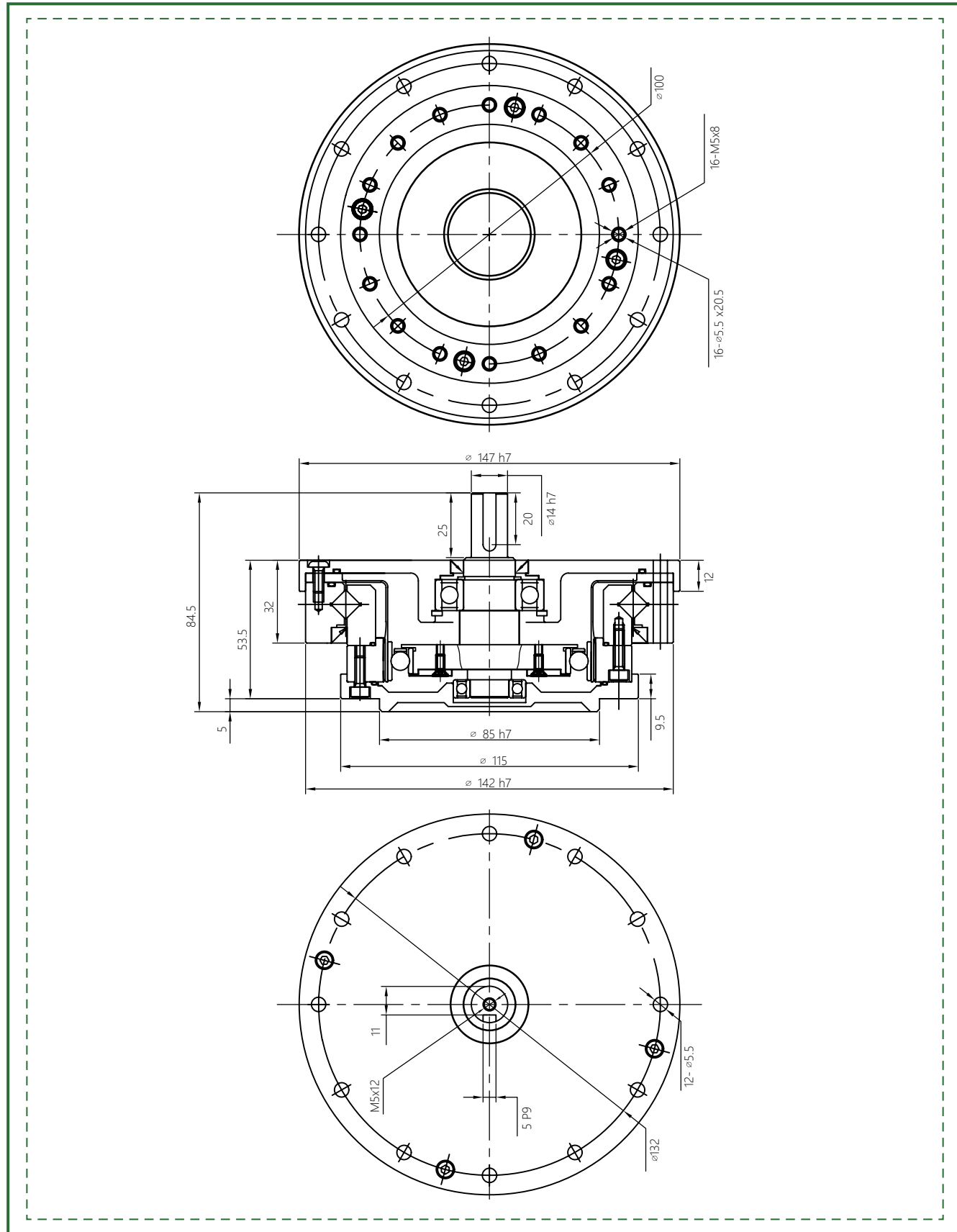


### Parameter Table

Item	Reduction Ratio	Rated Torque at 2000r/min	Allowable Peak Torque at Start and Stop	Allowable Average Torque	Allowable Maximum Momentary Torque	Maximum Input Speed	Allowable Average Input Speed	Back lash	With Maximum Tension	Weight	Design Life
Model No		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	N	Kg	Hour
14	50	6.6	23	8.6	43	8000	3500	≤10	≤26	0.65	10000
	80	9.6	29	13.5	57			≤10			15000
	100	9.6	34	13.5	66			≤10			15000
17	50	19.8	42	32	86	7000	3500	≤10	≤32	0.92	10000
	80	27.5	53	33	108			≤10			15000
	100	30	66	49	134			≤10			15000
	120	30	66	49	107			≤10			15000
20	50	32	69	42	121	6000	3500	≤10	≤58	1.36	10000
	80	42	91	58	158			≤10			15000
	100	50	102	61	182			≤10			15000
	120	50	108	61	182			≤10			15000
	160	50	113	61	182			≤10			15000
25	50	48	121	68.5	230	5500	3500	≤10	≤71	2.05	10000
	80	78	169	107	315			≤10			15000
	100	84	194	133	351			≤10			15000
	120	84	207	133	376			≤10			15000
	160	84	217	133	388			≤10			15000
32	50	94	267	133	472	4500	3500	≤10	≤114	4.35	10000
	80	146	376	206	702			≤10			15000
	100	169	411	267	800			≤10			15000
	120	169	436	267	848			≤10			15000
	160	169	459	267	848			≤10			15000
40	50	169	497	242	847	4000	3000	≤10	≤294	7.9	10000
	80	255	641	351	1210			≤10			15000
	100	328	702	460	1334			≤10			15000
	120	363	762	557	1458			≤10			15000
	160	363	800	557	1458			≤10			15000



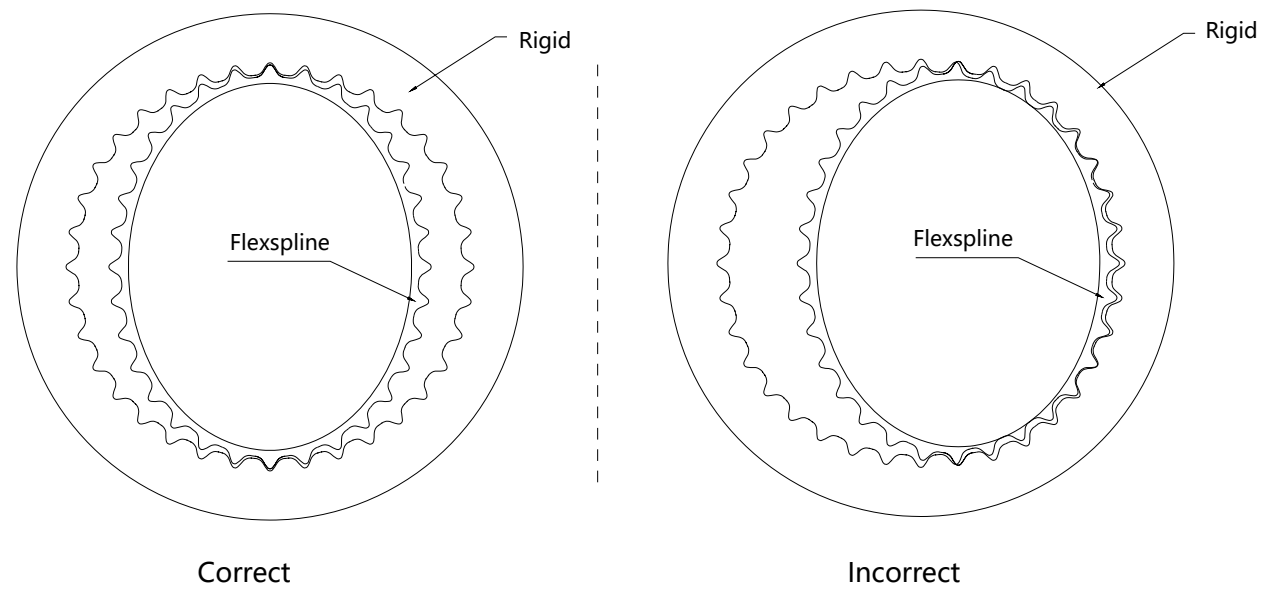






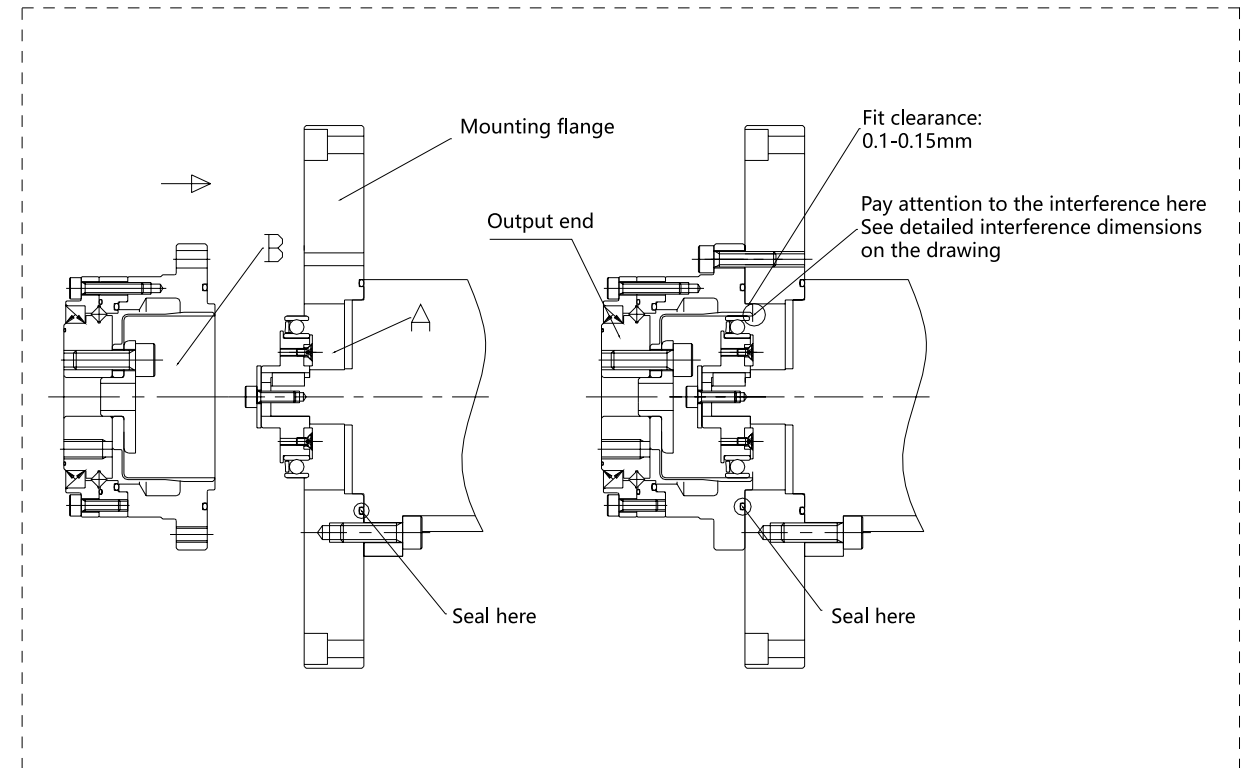
# General Installation Cautions

1. The assembly of a strain wave reducer must be carried out in a clean environment to avoid the introduction of any foreign objects which may cause premature failure.
2. Be sure to have adequate lubrication on the tooth surface and flexible bearing. Avoid application design to have the tooth face in constant upward position which could cause lubrication deficiency. If a constant upward gear face position can not be avoided, fill grease cavity to fully submerge the meshing splines.
3. When installing the cam, make sure the meshing is exactly at 6 o'clock and 12 o'clock as shown in picture 1. Should it be off from the line of symmetry as shown in picture 2, the assembly will vibrate and fail.
4. After assembly, trial run at a low speed of 100 rpm. Should any unusual vibration or noise is observed, stop and double check the assembly. Contact a manufacturer representative immediately for assistance.
5. Only use the factory specified grease, do not use a substitute without factory approval.
6. Only use grade 12.9 fasteners, and use thread loctite to prevent fasteners from loosening during operation.
7. The mounting surface must be flat within 0.01 mm and perpendicular to the axis within 0.01mm. The mounting threaded holes or through holes must be within 0.1 mm of the theoretical location.



## Model Specific Assembly Instructions

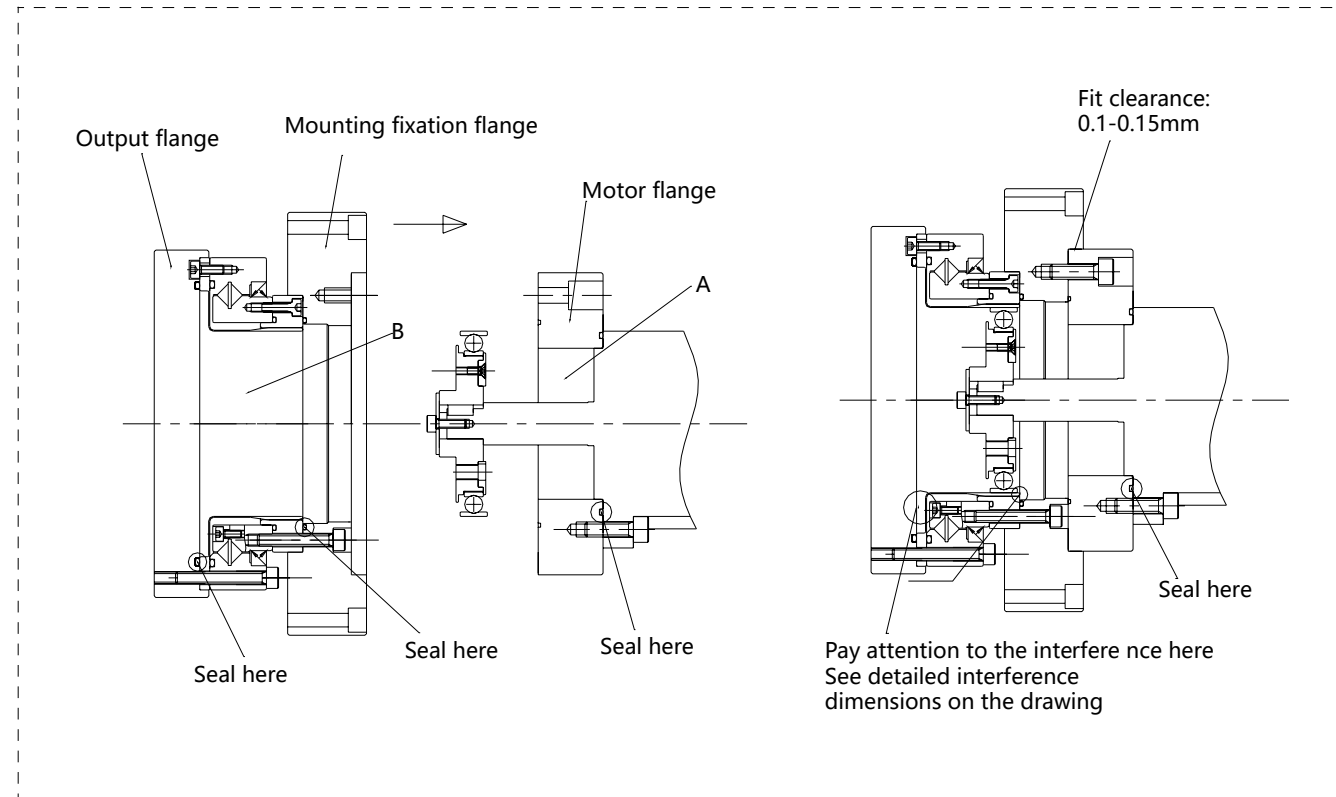
LCD/LCS Series--Rigid spline stationary, flex spline output, and standard ratio installation



1. Apply a generous amount of grease on the flexible bearing. Fill the "A" cavity with grease to 80% full. Install the wave generator on the input shaft and secure with a bolt and washer.
2. Evenly apply grease to the inner wall of the flex spline, and then fill the "B" cavity with grease to 80% full.
3. Engage the meshing by following the arrow in the illustration. The long axis of the wave generator must coincide with the long axis of the flex spline. Install fasteners to a gentle snug.
4. Set the input shaft speed at 100 rpm and start. Tighten the bolts gradually in a crisscross pattern until the desired torque is reached.

## Model Specific Assembly Instructions

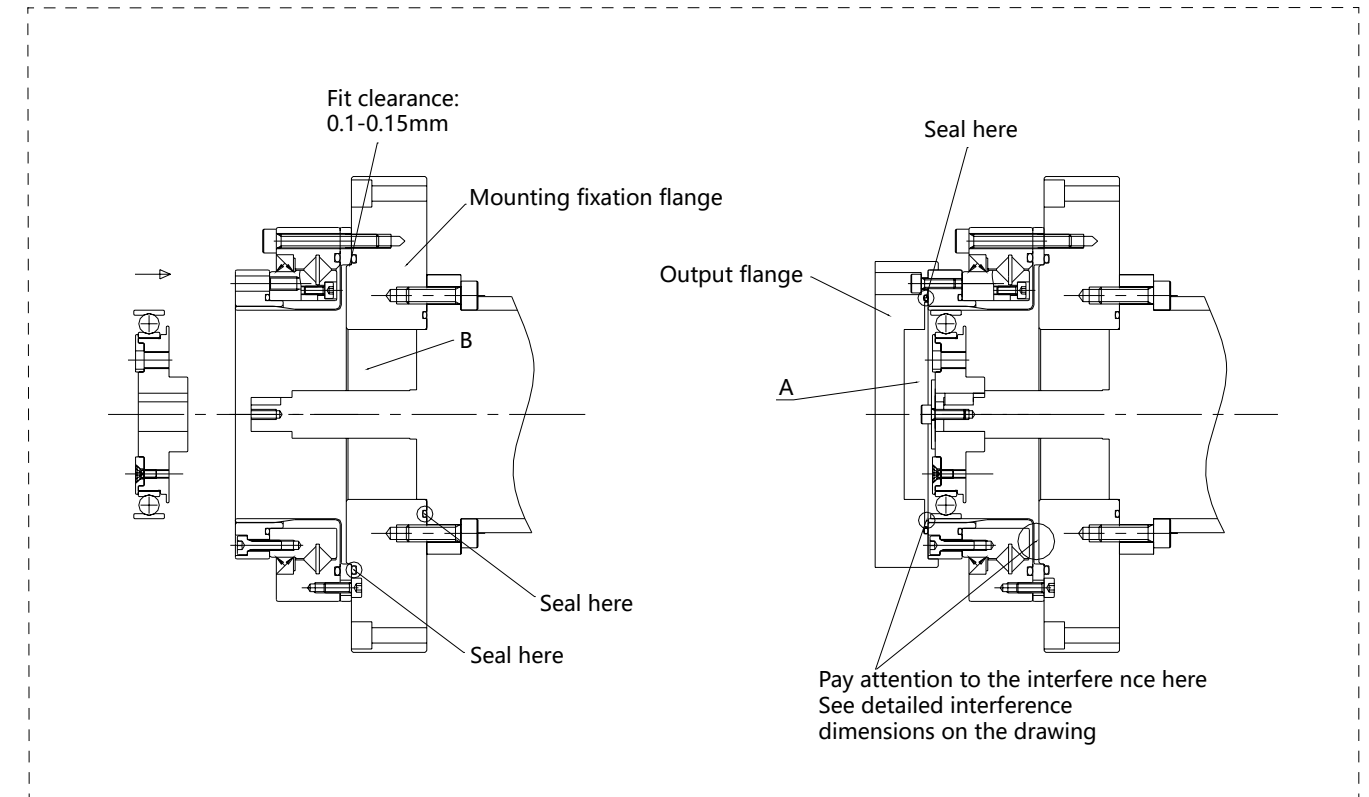
LHD/LHS Series Option 1-- Rigid spline stationary, flex spline output, and standard ratio installation



1. Mount the strain wave reducer on the output flange, and then mount the rigid spline to the stationary flange.
2. Apply a generous amount of grease on the flexible bearing. Fill the "A" cavity with grease to 80% full. Install the wave generator on the input shaft and secure with a bolt and washer.
3. Evenly apply grease to the inner wall of the flex spline, and then fill the "B" cavity with grease to 80% full.
4. Engage the meshing by following the arrow in the illustration. The long axis of the wave generator must coincide with the long axis of the flex spline. Install fasteners to a gentle snug.
5. Set the input shaft speed at 100 rpm and start. Tighten the bolts gradually in a crisscross pattern until the desired torque is reached.

## Model Specific Assembly Instructions

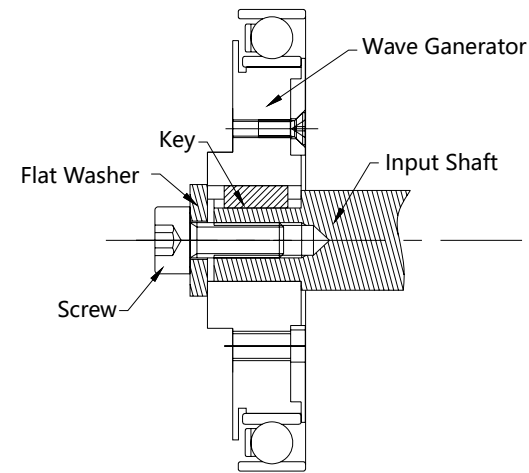
LHD/LHS Series Option 2-- Flexspline stationary, rigid spline output, and standard ratio+1 installation



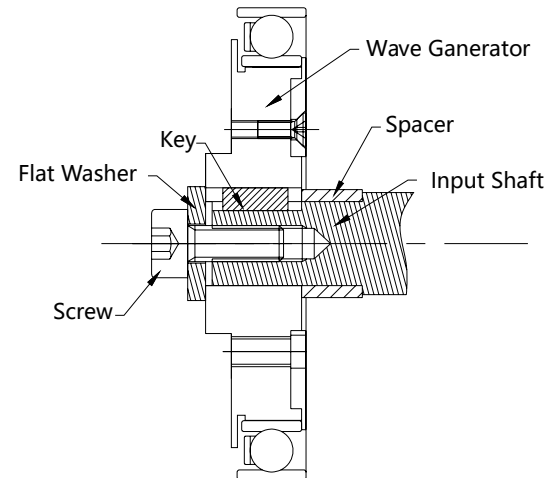
1. Mount the strain wave reducer main assembly on the mounting flange; gently snug the fasteners.
2. Apply a generous amount of grease on the flex spline. Fill the "B" cavity with grease to 80% full.
3. Install the wave generator on the input shaft. Engage the meshing by following the arrow in the illustration. The long axis of the wave generator must coincide with the long axis of the flex spline. Turn the wave generator to align the key way on the cam and the input shaft. Apply Loctite 638 on the key and install. Secure the wave generator with a bolt and washer on to the input shaft.
4. Apply grease to the flexible bearing, and then fill the "A" cavity with grease to 80% full.
5. Set the input shaft speed at 100 rpm and start. Tighten the bolts gradually in a crisscross pattern until the desired torque is reached. Bolt the output flange to the drive in a similar fashion.

**Table 1. Wave Generator and Input Shaft Connection Options**

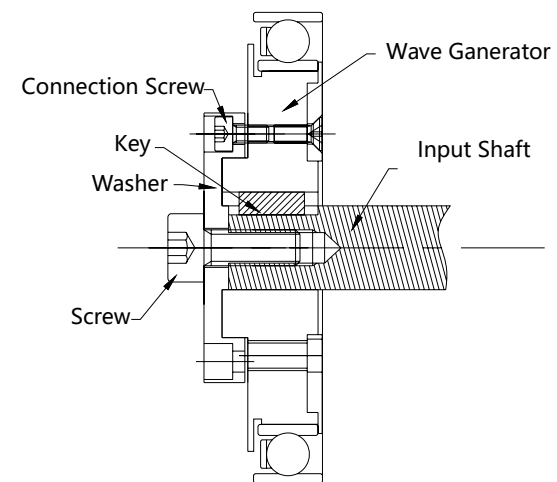
**1**  
Direct connection for input shaft with appropriate shoulder location



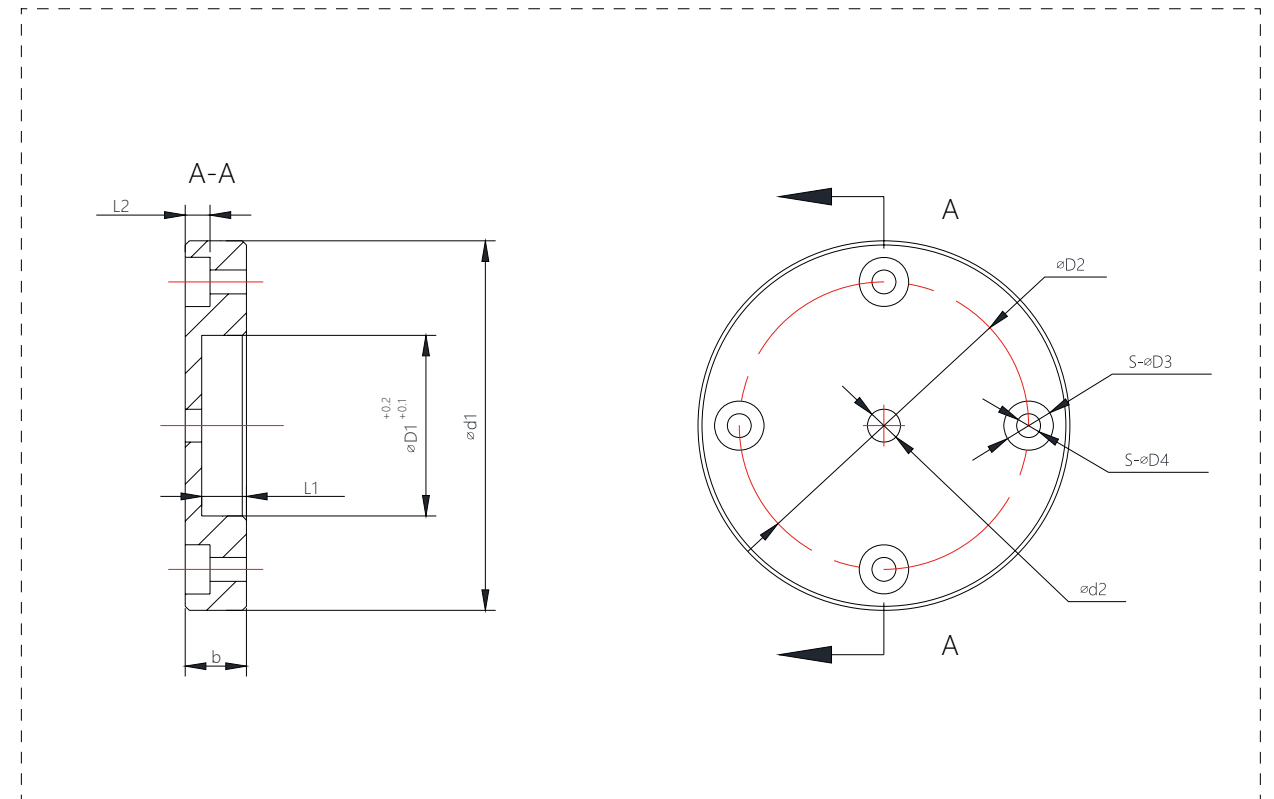
**2**  
Spacer connection for input shaft extending too long after the shoulder



**3**  
Special shaft end connection cap for input shaft without a shoulder



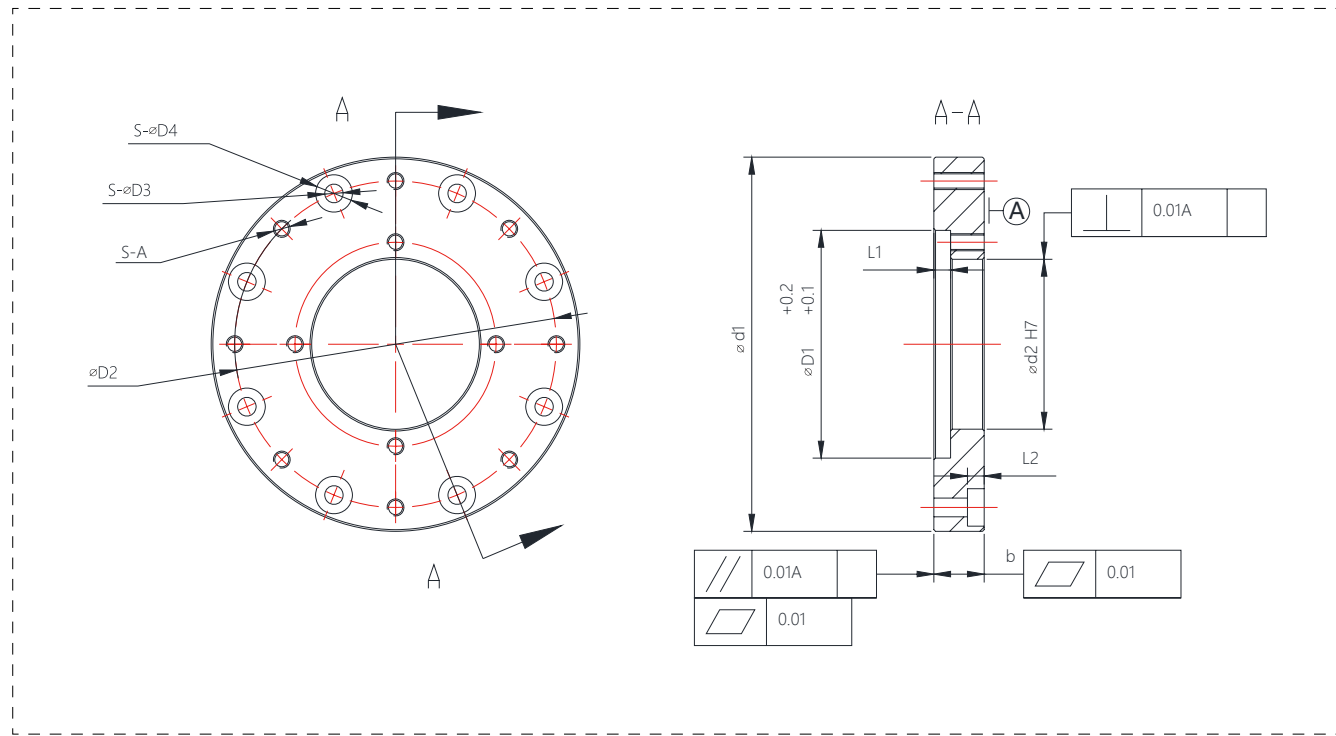
**Table 2: Reference Dimensions of Shaft End Connection Cap for Cam Type 1.(For reference only)**



Model No	$\Phi D1$	$\Phi D2$	$\Phi D3$	$\Phi D4$	S	b	L1	L2	$\Phi d1$	$\Phi d2$	Connecting screw
14	$\Phi 14$	$\Phi 19$	$\Phi 5$	$\Phi 2.4$	4	5.8	2.6	3	$\Phi 26$	Varies with application	M2x6
17	$\Phi 16$	$\Phi 23$	$\Phi 5$	$\Phi 2.4$	4	5.8	4.7	3	$\Phi 30$		M2x6
20	$\Phi 20$	$\Phi 27$	$\Phi 5$	$\Phi 3$	4	5.8	4.2	3	$\Phi 37$		M2. 5x6
25	$\Phi 22$	$\Phi 35$	$\Phi 5$	$\Phi 3$	4	7.6	5.3	4.5	$\Phi 45$		M2. 5x6
32	$\Phi 30$	$\Phi 38$	$\Phi 6$	$\Phi 3.5$	4	7.6	4.6	5	$\Phi 50$		M3x6
40	$\Phi 32$	$\Phi 50$	$\Phi 9$	$\Phi 5.5$	4	10	5	6	$\Phi 68$		M5x10

**Table 3: Reference Dimensions of Motor Mounting Flange on LCS (LCSG)**

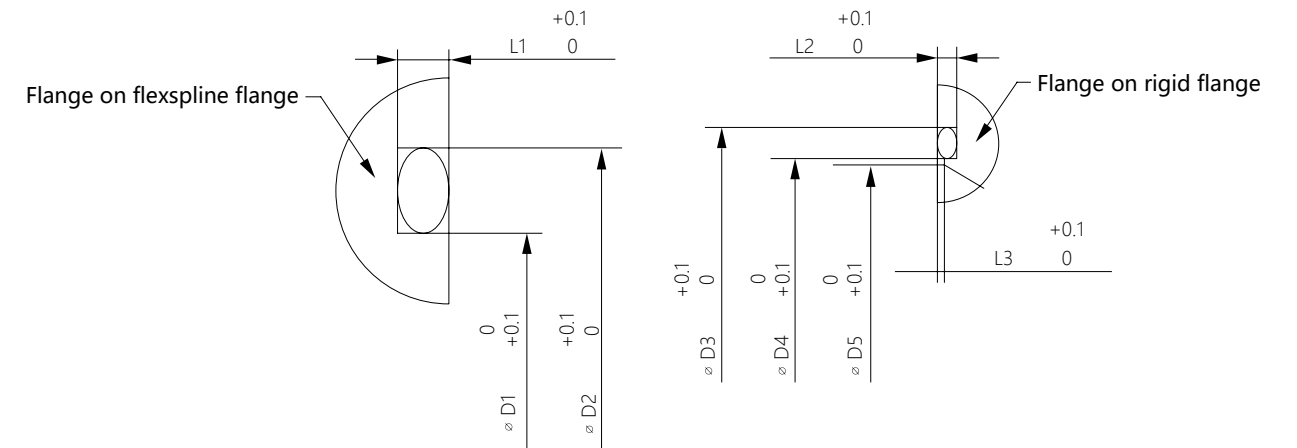
**Series Reducer(For reference only)**



Model No	$\phi D1$	$\phi D2$	$\phi D3$	$\phi D4$	A	S	L1	$\phi d1$	$\phi d2$	b	L2
LCS-14	$\phi 38$	$\phi 65$	$\phi 4.5$	$\phi 8$	M4	6	4	Varies with application			
LCSG-14	$\phi 38$	$\phi 65$	$\phi 4.5$	$\phi 8$	M4	8	4				
LCS-17	$\phi 48$	$\phi 71$	$\phi 4.5$	$\phi 8$	M4	6	4				
LCSG-17	$\phi 48$	$\phi 71$	$\phi 4.5$	$\phi 8$	M4	8	4				
LCS-20	$\phi 56$	$\phi 82$	$\phi 5.5$	$\phi 9$	M5	6	5				
LCSG-20	$\phi 56$	$\phi 82$	$\phi 5.5$	$\phi 9$	M5	8	5				
LCS-25	$\phi 67$	$\phi 96$	$\phi 5.5$	$\phi 9$	M5	8	5				
LCSG-25	$\phi 67$	$\phi 96$	$\phi 5.5$	$\phi 9$	M5	10	5				
LCS-32	$\phi 90$	$\phi 125$	$\phi 6.6$	$\phi 11$	M6	12	5				
LCSG-32	$\phi 90$	$\phi 125$	$\phi 6.6$	$\phi 11$	M6	12	5				
LCS-40	$\phi 110$	$\phi 144$	$\phi 9$	$\phi 13$	M8	8	6				
LCSG-40	$\phi 110$	$\phi 144$	$\phi 9$	$\phi 13$	M8	10	6				

**Table 4: Dimensions of O-ring and Groove**

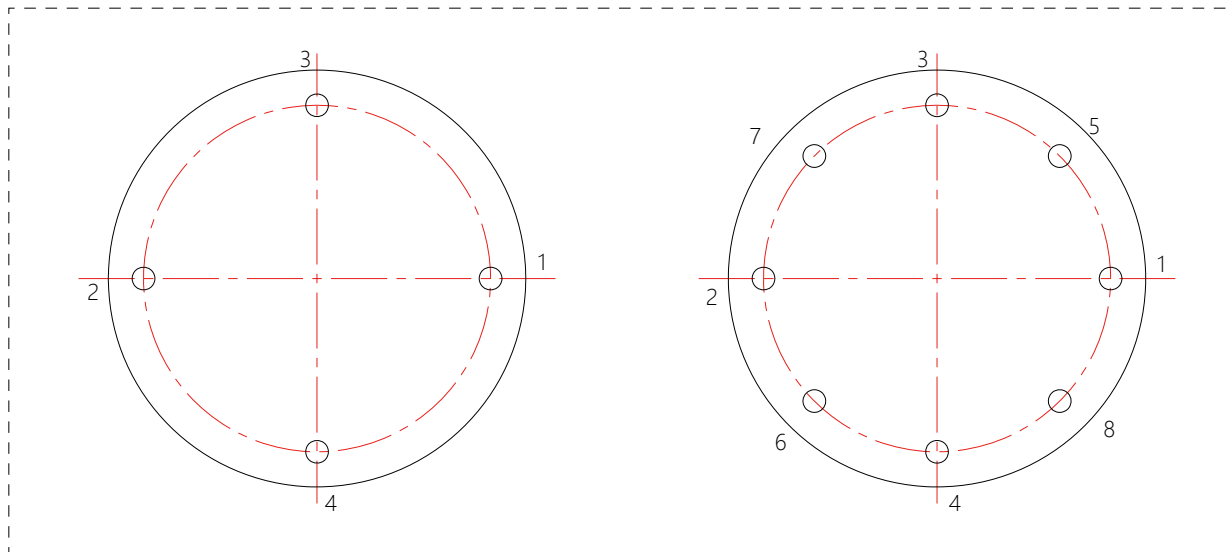
Model	Elange on flexspline				Flange on rigid					
	O-ring	O-ring groove			O-ring	O-ring groove				
		$\phi D1$	$\phi D2$	L1		$\phi D3$	$\phi D4$	$\phi D5$	L2	L3
LHS (LHSG)-14	55x1.5	51.5	55.5	1.2	37.8x0.6	38	36.5	36.2	0.45	0.15
LHS (LHSG)-17	64x1.5	60.5	64.5	1.2	47x1	48	45.5	45	0.75	0.2
LHS (LHSG)-20	72x1.5	70	74	1.2	56x1	56.2	53.8	53	0.75	0.2
LHS (LHSG)-25	90x1.8(Inside diameter*Wire diameter)	89.8	94.6	1.4	70x1.5	70.5	66.8	66	1.2	0.3
LHS (LHSG)-32	120x1.9	115.5	120.5	1.5	90x1.5	91	87	86	1.2	0.3
LHS (LHSG)-40	145x2.4	140	147	1.9	110x2	112.9	107.5	106.5	1.5	0.4
LHD-14	55x1.5	51.5	55.5	1.2	37.1x0.6(Inside diameter*Wire diameter)					
LHD-17	64x1.5	60.5	64.5	1.2	47x0.8					
LHD-20	72x1.5	70	74	1.2	55x0.8					
LHD-25	95x2	90.4	95.8	1.5	68x1					
LHD-32	120x1.9	115.5	120.5	1.5	90x1.5					
LHD-40	145x2.4	140	147	1.9	110x2					



**Table 5: Grease Amount for Wave Generator I/II**

Model	Grease amount (ml)	Model	Grease amount (ml)	Model	Grease amount (ml)	Model	Grease amount (ml)
LCS(G)-14	10	LHS(G)-14	13.5	LCD-14	4	LHD-14	10
LCS(G)-17	16	LHS(G)-17	22.5	LCD-17	6.5	LHD-17	15
LCS(G)-20	24	LHS(G)-20	32	LCD-20	11.5	LHD-20	24
LCS(G)-25	45.5	LHS(G)-25	60	LCD-25	21.5	LHD-25	40
LCS(G)-32	100	LHS(G)-32	125	LCD-32	44	LHD-32	80
LCS(G)-40	180	LHS(G)-40	225	LCD-40	95	LHD-40	135

**Table 6: Fastener Tightening Sequence**



**Table 7: Fastening Torque**

Function grade of screws	Grade 12.9							
Thread nominal diameter	mm	3	4	5	6	8	10	12
Tightening torque	N.m	2	4	9	15	35	70	125

# Grease Lubrication

Hollow shaft III series and solid shaft IV series are grease filled in the factory. There is no need to add grease at installation. The other series internal chambers are grease filled. Need to add grease when installing wave generators.

## Types of Grease

LD No. 1 is specially formulated for strain wave reducer application. It provides excellent lubrication at the harmonic meshing, protects components from wear and extends component life.

LD Super No. 1 is a more advanced formula for extreme applications. It further extends life and temperature range—suitable for high torque, severe temperature applications.

**Note: LD No. 1 and LD Super No. 1 can not be mixed.**

## Grease Application Notes:

1. The seals at the input and output have to be carefully design. Dynamic seal should be a lip seal with structural support and the stationary seal can be O-ring type or RTV. The sealing surface must have high surface finish and not defective.
2. Must use the factory recommended grease and not to mix with any other grease.
3. The grease application must be in accordance with the factory instructions.
4. If the strain wave reducer unit is operating in constant upright position, lubrication deficiency may occur, need to use extra grease.
5. The grease properties will vary with temperature. It degrades faster at high temperature. For optimum lubrication conditions, the harmonic drive should operate below 70 degree C. The temperature rise should be less than 40 degree C.
6. The grease quality will have direct effect on the wear of the internal components. The recommended grease change interval is every 3000 operating hours.

# Authentication Certificate

## ISO 9001:2008



## Products Exhibition

