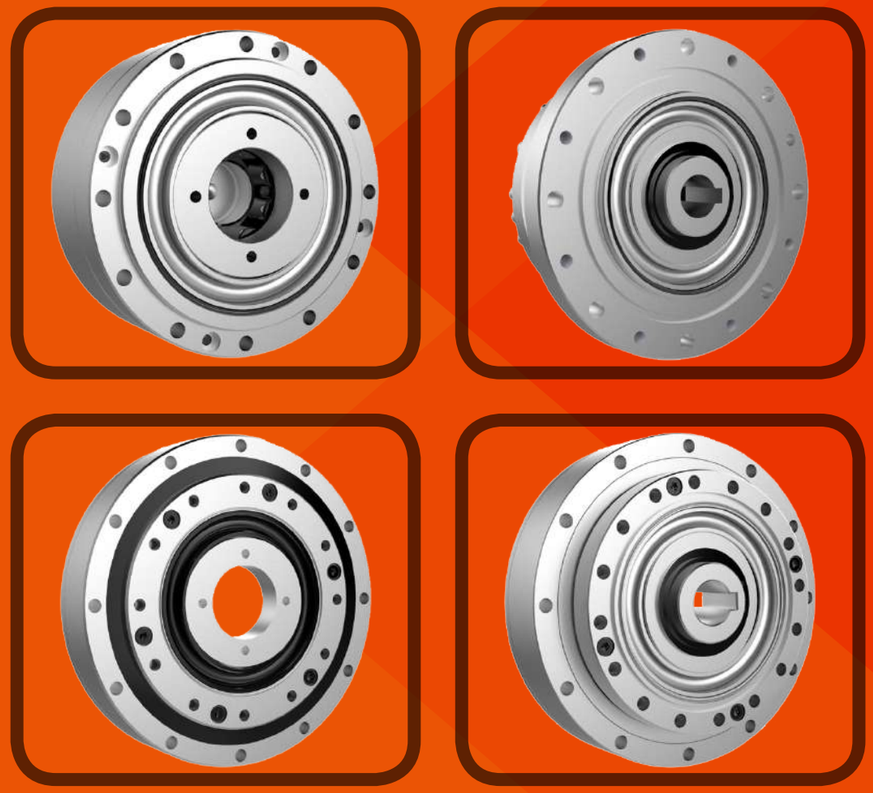
Version: 202505

Product Catalogue

Harmonic Drives

Help you realize the desire of precision product conception



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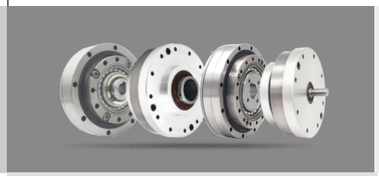
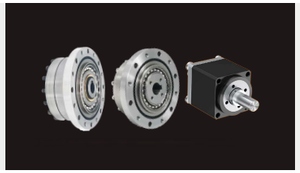
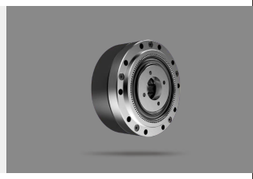






Harmonic Drives Types & Models

HSA HARMONIC

SHD Series

- SHD-03
- SHD-05
- SHD-08
- SHD-11
- SHD-14
- SHD-17
- SHD-20
- SHD-25

03 (Special for Joint)	Ratio **30**, Ratio **50**
05 (Special for Joint)	Ratio **30**, Ratio **50**, Ratio **80**
08、11 (Special for Joint)	Ratio **30**, Ratio **50**, Ratio **100**
14/17	Ratio **30**, Ratio **50**, Ratio **80**, Ratio **100**
20/25	Ratio **30** (SHD-20), Ratio **50**, Ratio **80**, Ratio **100**, Ratio **120**

SHD-Reducer

SHF-I Spindle Adjustable

SHF Series

- SHF-I Spindle Adjustable
- SHF-II Hollow Type
- SHF-III Integrated Type
- SHF-IV Shaft Input Type

14/17	Ratio **30**, Ratio **50**, Ratio **80**, Ratio **100**
20/25	Ratio **30**, Ratio **50**, Ratio **80**, Ratio **100**, Ratio **120**

SHF-II Hollow Type

SHF-III Integrated Type

SHF-IV Shaft Input Type

CSF Series

- CSF-I Spindle Adjustable
- CSF-II Integrated Type
- CSF-03-mini
- CSF-05-mini
- CSF-08-mini
- CSF-11-mini

32	Ratio **50**, Ratio **80**, Ratio **100**, Ratio **120**
03	Ratio **30**, Ratio **50**
05	Ratio **30**, Ratio **50**, Ratio **80**
08/11	Ratio **30**, Ratio **50**, Ratio **80**, Ratio **100**

CSF-I Spindle Adjustable

CSF-II Integrated Type

CSD Series

- CSD-14
- CSD-17
- CSD-20

14/17	Ratio **30**, Ratio **50**, Ratio **80**, Ratio **100**
20	Ratio **30**, Ratio **50**, Ratio **80**, Ratio **100**, Ratio **120**

CSD-Reducer

Harmonic Transmission Principle

Principle of Harmonic Gear Transmission

Harmonic gear transmission was invented by American inventor **C.W. Musser** in 1955. It is a new transmission mode using the forward movement or power transmission of elastic deformation of flexible working components. It breaks through the mode of mechanical transmission using rigid component mechanism and uses a flexible component to realize mechanical transmission, Thus, a series of special functions that are difficult to achieve by other drives are obtained. Because the deformation process of the intermediate flexible member is basically a symmetrical harmonic, it is named.

Composition of Harmonic Gear

Circular Spline: a rigid internal gear with 2 more teeth than a flexible gear, which is usually fixed on the casing;

Flexspline: a thin cup-shaped metal elastic part with gear on the outer ring of the opening part. It deforms with the rotation of the wave generator and is usually connected with the output shaft;

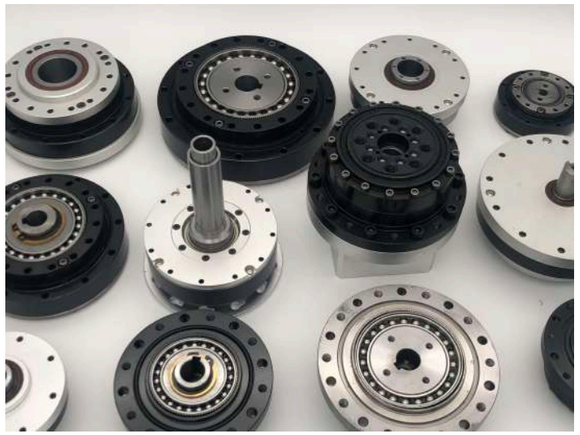
Wave Generator: it is composed of an elliptical cam and a flexible bearing, which is usually connected with the input shaft. The inner ring of the flexible bearing is fixed on the cam, and the outer ring can be elastically formed into an ellipse through the ball.

Reduction Principle of Harmonic Gear

The principle of harmonic gear reduction is to realize motion and power transmission by using the relative motion of Flexspline, Circular Spline and Wave Generator, mainly the controllable elastic deformation of flexspline. The elliptical cam in the wave generator rotates in the flexspline to deform the flexspline. When the flexspline teeth and circular spline teeth at both ends of the elliptical cam shaft of the wave generator enter into meshing, the flexspline teeth at both ends of the short shaft are separated from the circular spline teeth. For the teeth between the long axis and the short axis of the wave generator, they are in a semi meshing state of gradually entering meshing along the different sections of the two circumference of the flexspline and the circular spline, which is called meshing. It is called meshing out when it is gradually out of meshing and half meshing. When the wave generator rotates continuously, the flexspline constantly deforms, so that the teeth of the two wheels continuously change their original working state in the four movements of meshing, meshing, meshing and disengagement, resulting in staggered tooth movement, which realizes the motion transmission from the active wave generator to the flexspline.

Technical Characteristics Of Sango Harmonic Drives

Based on theoretical calculation and finite element analysis, Sango intelligent harmonic reducer team combined with cutting-edge inspection system to obtain a large amount of measured data, successfully broke through the non-standard design difficulties of double circular arc tooth profile by means of multi-objective regression optimization, and developed breakthrough harmonic reducer products.



Precision

Our Harmonic Drive adopts S-shaped optimized involute tooth structure, which makes the meshing more smooth and stable. The tooth shape processing of rigid and flexible spline breaks through the traditional slow wire walking and gear hobbing technology. The special technology of hobbing gear shaping semi finishing + polishing to improve the accuracy of profile tooth surface; It breaks the current situation of relying on imported machine tools and imported tools, and quickly forms a mass production scale with independent core technology, low cost and high output.

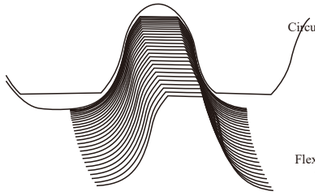


Illustration of the deepest engagement state

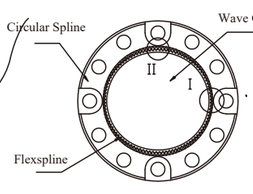


Fig. 1 Assembly Drawing of Flexspline and Circular Spline

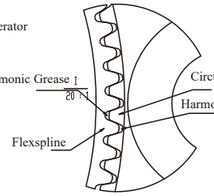


Fig. 2 Meshing Area of Flexspline and Circular Spline

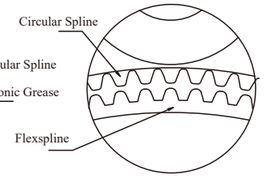


Fig. 3 Non-meshing Area of Flexspline and Circular Spline

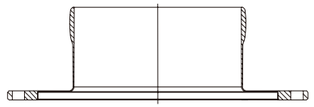
Long

Flexspline material of Sango Harmonic Drive adopts customized electroslag remelting purified military steel. The thin-walled deformed part has been subjected to repeated spinning process and heat treatment to achieve a perfect balance between wear resistance and plasticity.

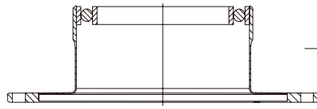
The nodular cast iron with high spheroidizing rate is used as the circular spline material to replace the traditional 40Cr material. The unique self-lubricating thermal conductivity of nodular iron is 1 times higher than that of steel. It can quickly absorb vibration, has excellent wear reduction performance, and has a service life twice that of the traditional 40Cr steel rigid wheel.

Durable

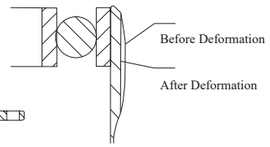
Sango Harmonic Drive innovated and invented a unique method of finishing after deformation in the processing technology of flexible gear tooth. It not only solves the problem of accuracy, but also solves the problem of uneven contact spots of assembly deformed steel flexspline after traditional processing, so that the tooth surface is fully engaged, the force is more uniform, the friction is less, and the product is more durable.



Before Deformation



After Deformation



Comparison Diagram

Use

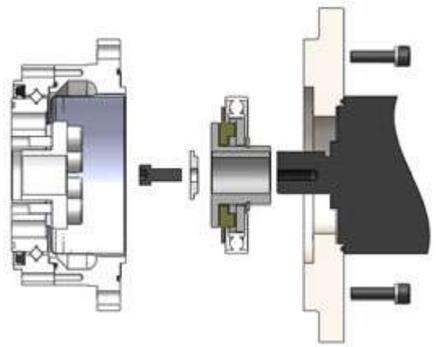
Our Harmonic Drive meets the market demand and is equipped with cam flange specifications of various structures. Various series of formed products are launched for industries with different needs to facilitate customer selection and use.

Product Selection

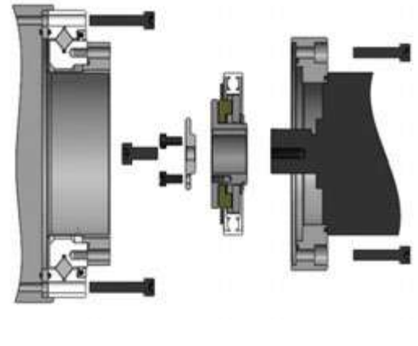
XXX 25 50 XX

- XX — Type Code (I.II.III.IV)
- 50 — Gear Ratio (30.50.80.100.120.160)
- 25 — Sizes (14.17.20.25.32)
- XXX — Models (E.g：SHD.SHF.CSF.CSD)

Installation And Precautions Of Harmonic

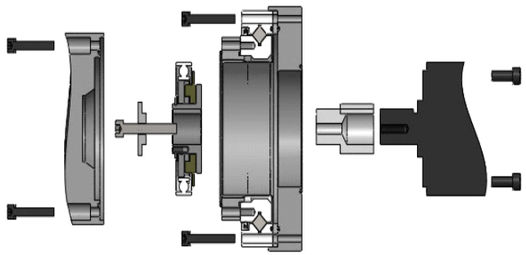


CSF Series



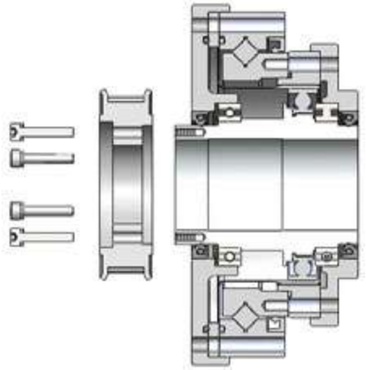
SHF Series

(Circular Spline Fixed, Flexspline Output)



SHF Series

(Flexspline Fixed, Circular Spline Output)



SHF Hollow Type)

(1) Inject lubricating grease into the inner wall space of the flexspline, install the reducer into the output end, and connect the pre-tightening with screws and spring gaskets. The pre-ightening sequence is cross,the preload is 0.5Nm.

(2) Apply lubricating grease evenly on the flexible bearing, and then install the wave generator into the flexspline and the bearing at the output end. When installing the wave generator, please pay special attention to control the influence of center offset and skew as small as possible to reduce the influence of non concentricity. Avoid applying excessive force to the bearing of the wave generator, and install the wave generator into the flexspline by rotating it smoothly. After installation, please rotate the wave generator gently by hand. If it can be rotated with average force, it is considered normal. If there is a very uneven situation, it is in an asymmetric meshing state. At this time, the wave generator needs to be removed and reinstalled.

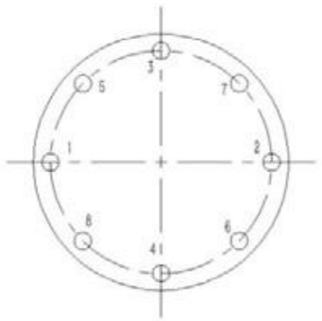
(3) Apply loctite 638 glue on the key of the shaft at the input end, then insert the shaft into the of the wave generator, and pre tighten the input end with the reducer with screws and spring gaskets. The pre tightening sequence is cross, and the pre tightening force is 0.5N. M. Then set the motor speed at about 100 rpm, start the motor, lock the screws in a cross way, and increase the corresponding locking force of the screws equally four to five times. All connecting and fixing screws shall be grade 12.9 and coated with screw locking glue to prevent screw failure or loosening during operation.

(4) Keep the motor rotating, lock the screw at the output end in a cross way, and increase it to the corresponding locking force of the screw four to five times. All connecting and fixing screws shall be grade 12.9 and coated with screw locking glue to prevent screw failure or loosening during operation. Loctite is the recommended screw locking glue.

Precaution

- When the reducer is used, if the output end is always horizontal and downward, the grease injected into the inner wall space of the flexspline shall exceed the meshing tooth surface.
- Static sealing shall be adopted between the installation plane of circular spline and its connector and the installation plane of flexspline and its connector, so as to ensure that the grease will not leak during the use of the reducer and avoid the damage of the reducer when working with little or no oil.
- During installation, please do not knock the parts of the reducer with hard objects or press them vigorously to avoid damage to the parts.
- If you have any problems during installation, please contact Sango Automation.

ScrewsTightening Sequence: Cross



Screw Tightening Torque Table

Screw Performance Grade	**12.9** Grade
Nominal Diameter of Thread **mm**	N.m
3	**2**
4	**4**
5	**9**
6	**15**
8	**35**
10	**70**
12	**125**

Requirements for Use of Lubricating Grease

Items / Size	Working Temperature	
	0～+**55**℃	**-40**～+**55**℃
14	**XBZH-Yo** Semi fluid grease for harmonic drive **O#** Or **Harmonic Drive Grease SK-1A，SK-2**	
17		
20		
25		
32		

Please use the specified grease, otherwise the service life of the reducer may be reduced or damaged.

Precautions For Safe Use

Scope of Application

Harmonic gear reducers are increasingly widely used in aviation, aerospace, energy, navigation, shipbuilding, bionic machinery, common ordnance, machine tools, instruments, electronic equipment, mining metallurgy, transportation, hoisting machinery, petrochemical machinery, textile machinery, agricultural machinery and medical equipment, especially in servo systems with high dynamic performance, The use of harmonic gear transmission shows its advantages. It transmits power from tens of watts to tens of kilowatts, but high-power harmonic gear transmission is mostly used in short-term workplaces.

Precautions for Use

- Please use it in the specified environment

  Observe the following conditions when using:

  Ambient temperature: 0 ~ 40; Do not splash water, oil, etc; No corrosive and explosive gas; No dust such as metal powder.

- Please use the specified method for installation

  The installation method shall be implemented correctly according to the product manual. If it is not installed correctly, it may lead to vibration, reduction of accuracy, shortening of service life, damage and other faults.

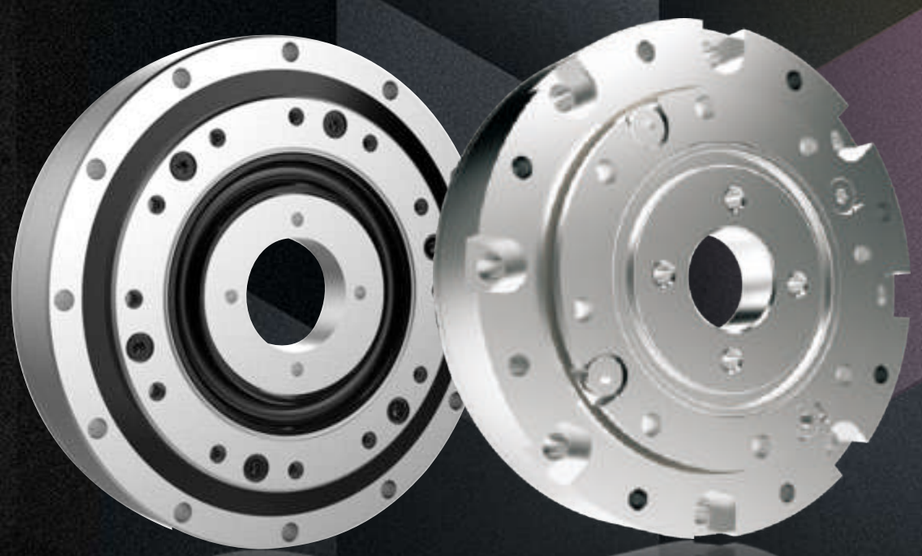
- Use the specified lubricant

  Failure to use the specified lubricant may result in reduced product life.

- Please do not disassemble or reassemble the product, otherwise its original performance will not be restored.
- Do not exceed the allowable torque when using; otherwise it may cause product failure.

SHD

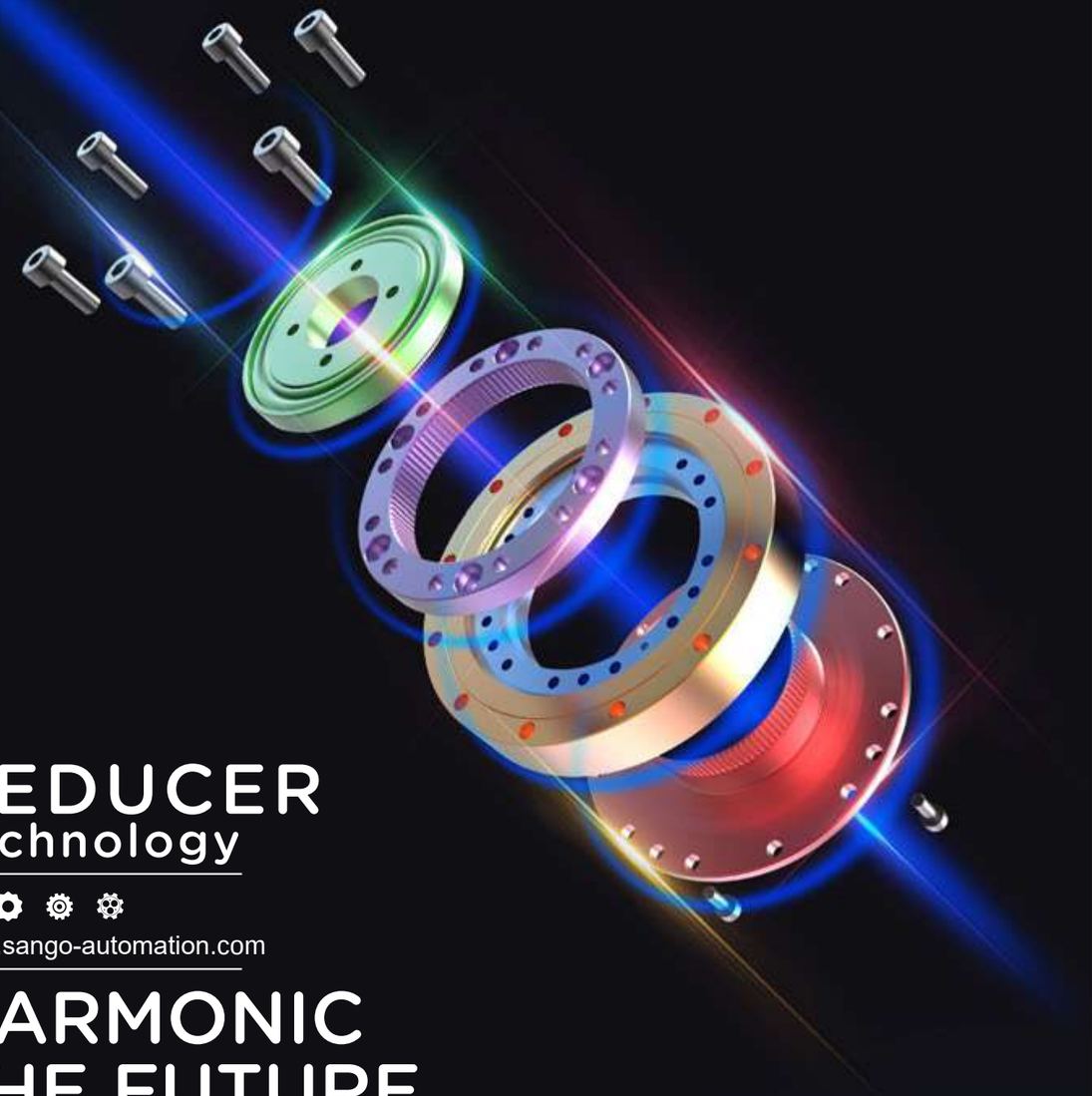
Harmonic Drive Series



SHD
Joint Special Use Series

SHD Series

INNOVATIVE
STRUCTURAL DESIGN



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HARMONIC
THE FUTURE

SHD

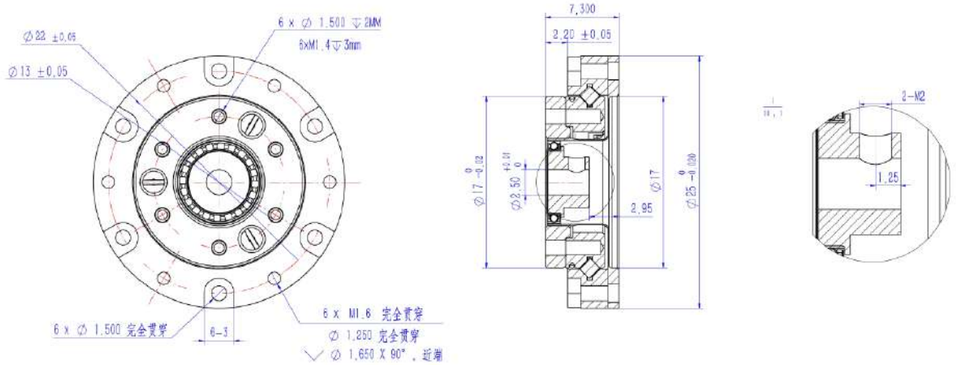
SHD

Special for Joint

I Product Features

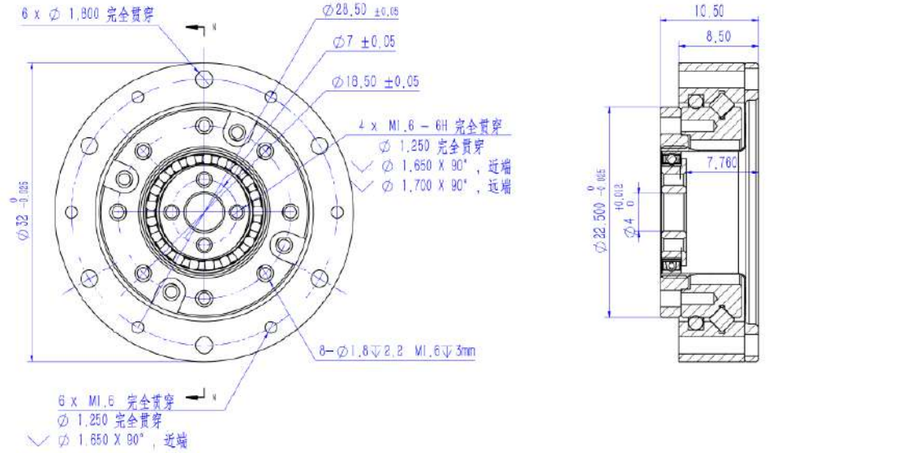
Ultrathin Hollow Structure	Compact Structure	High Torque Capacity	High Rigidity	Excellent positioning accuracy and rotation accuracy	Wrist Joints Special for Robot

SHD-03-xxx Series Harmonic Drives



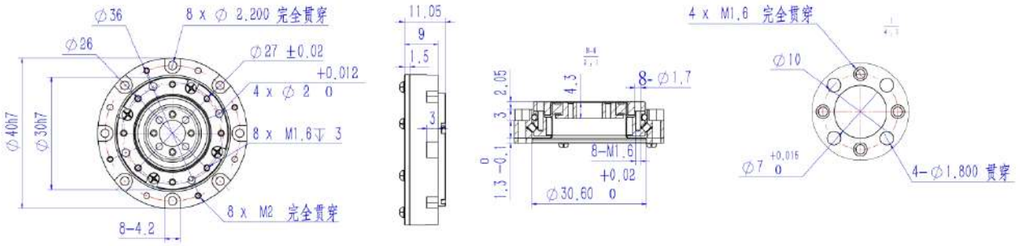
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
3	30	0.08	0.15	0.12	0.25	10000	6500	7.0×10^{-4}	≤20
	50	0.13	0.24	0.16	0.50				≤20

SHD-05-xxx Series Harmonic Drives



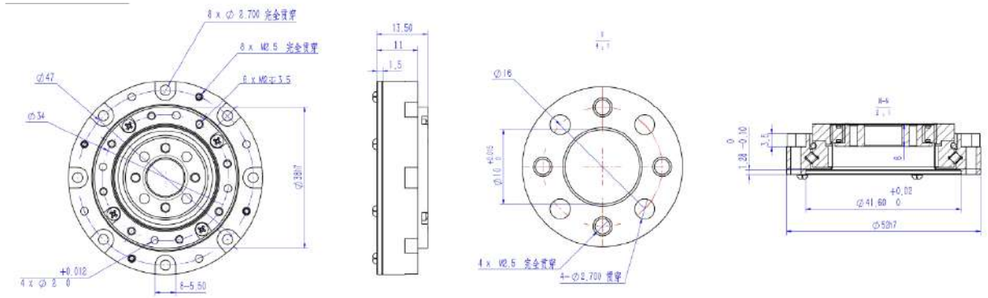
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allow able Input Speed Average	Moment of Inertia (1/4GD)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
5	30	0.23	0.47	0.35	0.85	10000	6500	2.5×10^{-4}	≤20
	50	0.38	0.87	0.50	1.70				≤20
	80	0.50	1.20	0.82	2.20				≤10

SHD-08-xxx Series Harmonic Drives

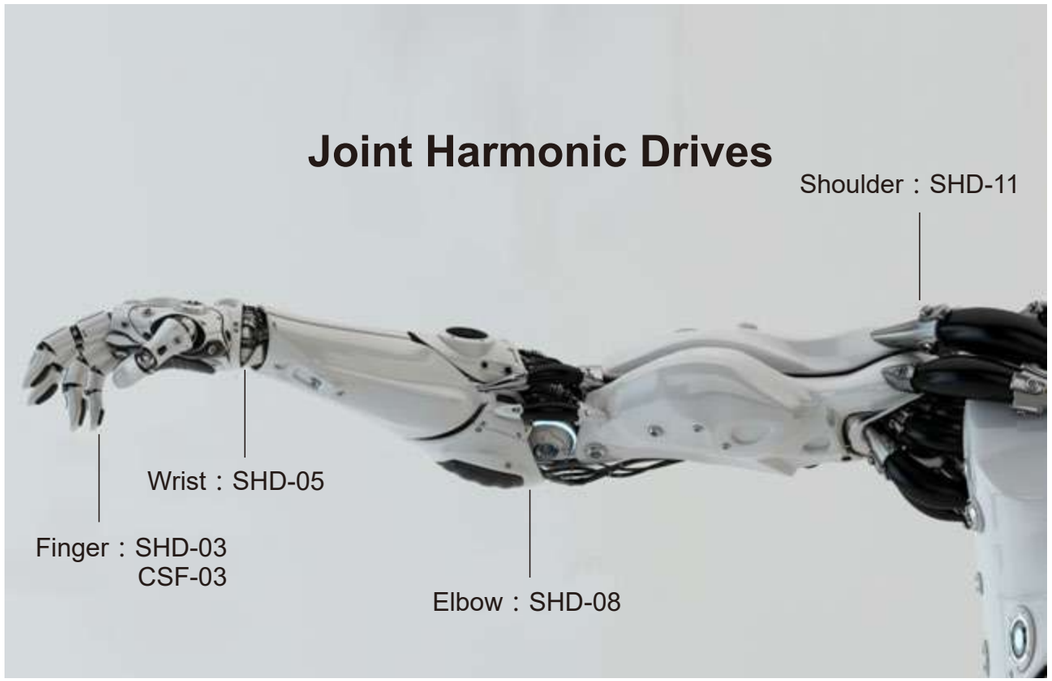


Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
8	30	0.80	1.60	1.30	3.20	8500	3500	3.2×10^{-3}	≤20
	50	1.60	3.15	2.10	6.10			3.0×10^{-3}	≤20
	100	2.40	4.60	3.20	8.70				≤10

SHD-11-xxx Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	$kgcm^2$	arcsec
11	30	2.10	4.10	3.10	8.20	8500	3500	1.4×10^{-2}	≤20
	50	3.20	7.80	5.10	15.00			1.2×10^{-2}	≤20
	100	4.80	10.50	8.70	23.00				≤10



SHD

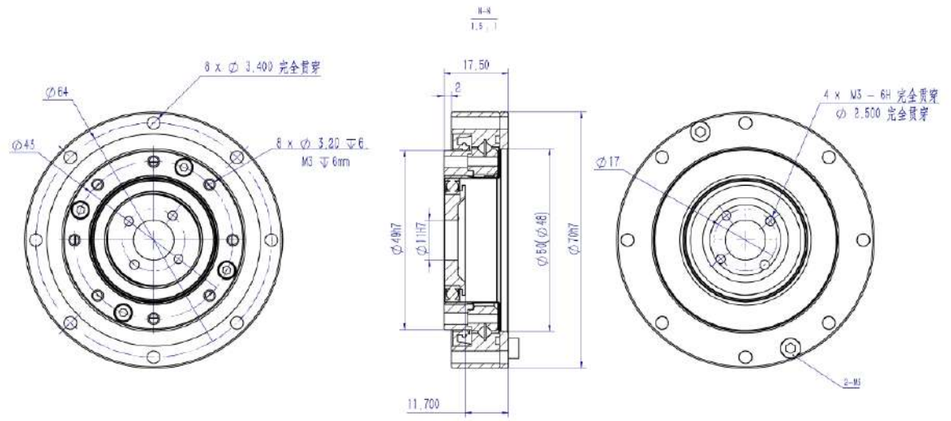
SHD

Regular Type

I Product Features

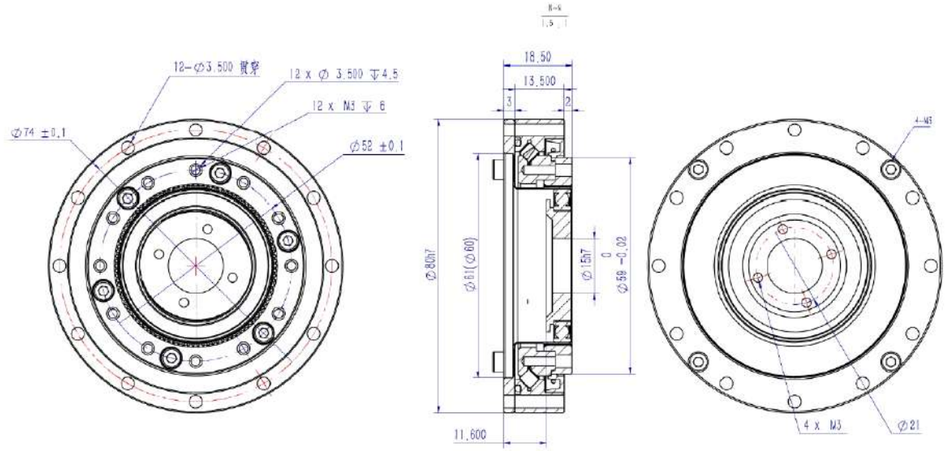
Ultrathin Hollow Structure	Compact Structure	High Torque Capacity	High Rigidity	Excellent positioning accuracy and rotation accuracy

SHD-14 Series Harmonic Drives



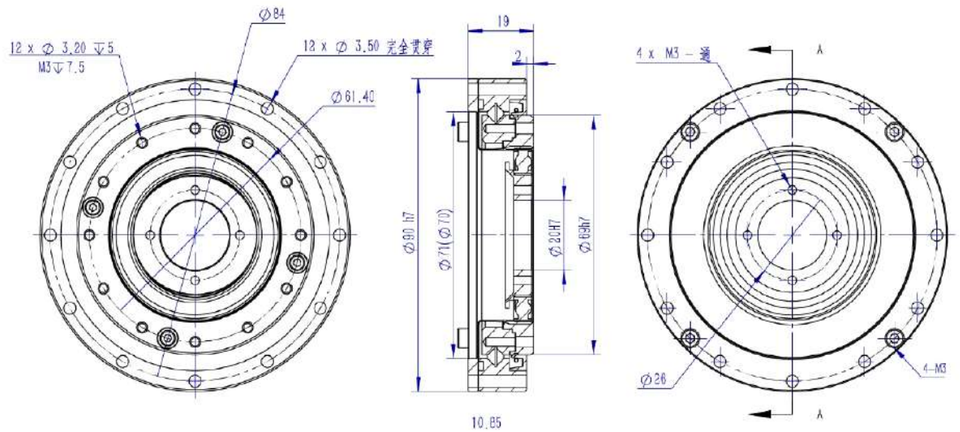
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	$kgcm^2$	arcsec
14	30	3.80	8.7	6.20	15.00	8500	3500	3.4×10^{-1}	≤20
	50	4.80	16.00	6.80	32.00			3.3×10^{-1}	≤20
	80	6.40	22.00	9.50	45.00				≤10
	100	7.40	26.00	10.80	50.00				≤10

SHD-17 Series Harmonic Drives



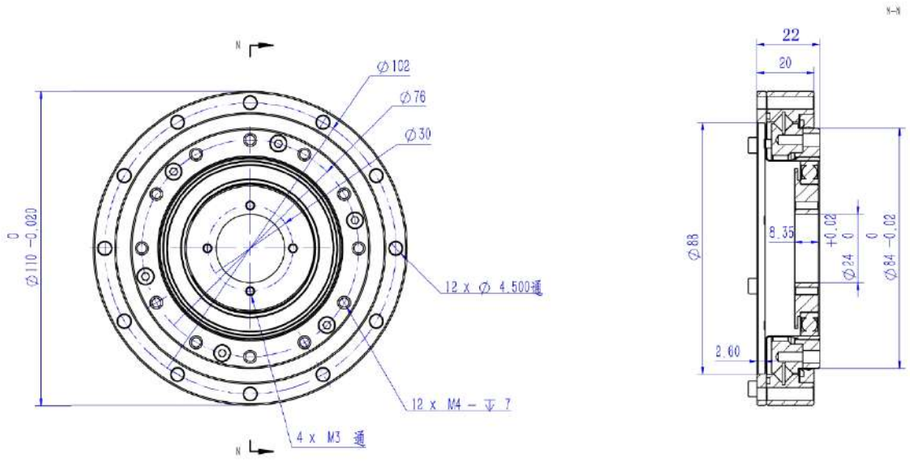
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Input Speed Average	Moment of Inertia (1/4GD)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
17	30	6.60	13.80	10.80	28.80	7000	3500	0.054(I×10^{-4}kgm^2) 0.055(J×10^{-4}kgfms^2)	≤20
	50	11.00	23.00	18.00	48.00				≤20
	80	12.80	29.60	21.60	56.80				≤10
	100	16.00	37.00	27.80	71.00				≤10

SHD-20 Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
20	30	10.20	23.40	14.40	41.40	7000	3500	0.009(I×10^{-4}kgm^2) 0.092(J×10^{-4}kgfms^2)	≤20
	50	17.00	39.00	24.00	69.00				≤20
	80	22.40	45.60	27.20	76.00				≤10
	100	28.00	57.00	34.80	95.00				≤10
	120	28.00	61.00	34.80	95.00				≤10

SHD-25 Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD^2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
25	50	27.00	69.00	38.00	127.00	5600	3500	0.282(I×10^{-4}kgm^2) 0.288(J×10^{-4}kgfms^2)	≤20
	80	76.80	88.00	60.00	147.20				≤10
	100	96.00	110.00	75.00	184.00				≤10
	120	115.66	132.53	90.36	221.68				≤10
	160	130.66	147.53	105.36	241.68				≤10

Notice: Ratio 160 no stock. Production time 10-15 days. Contact sales before placing order.

SHF

Harmonic Drive Series

SHF-I
Spindle Adjustable
Series

SHF-II
Hollow
Series

SHF-III
Integrated
Series

SHF-IV
Shaft Input
Series

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SHF

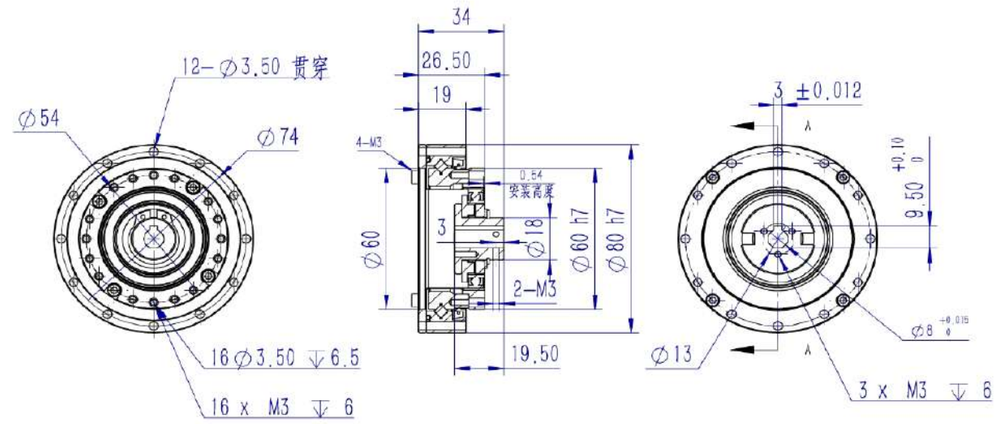
SHF-I

Spindle Adjustable Type

I Product Features

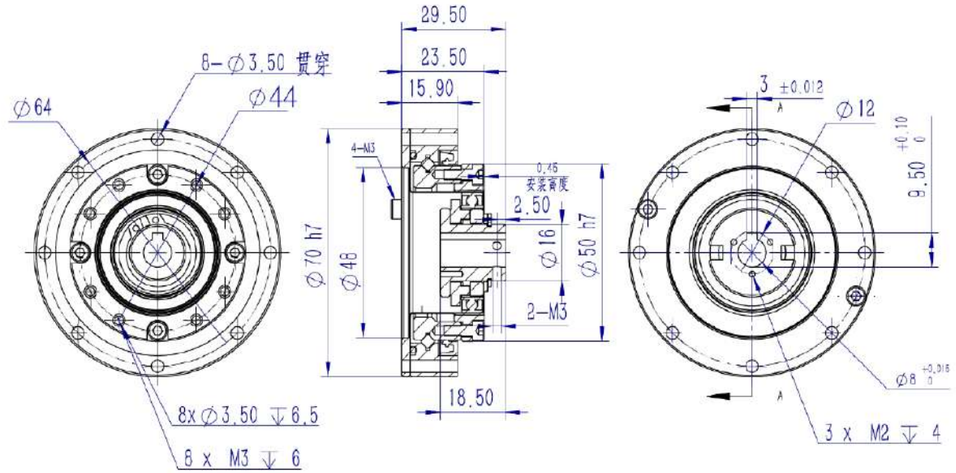
Compact Structure	High Torque Capacity	Rigidity High	Spindle, Easy to Use Automatic Adjust Wave Generator

SHF-17-I Series Harmonic Drives



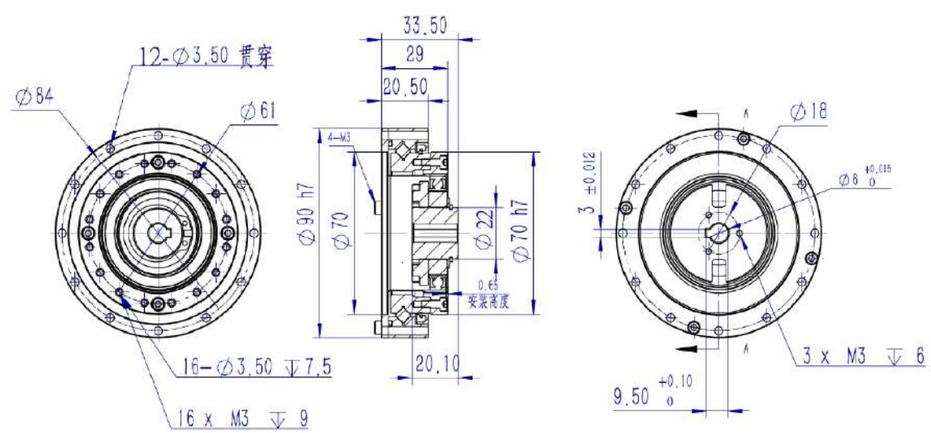
Model \ Items	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
17	30	8.4	15.2	11.5	29	7000	3500	≦20	10000
	50	15.2	32	25	66			≦20	10000
	80	21	41	26	83			≦10	15000
	100	23	52	38	108			≦10	10000

SHF-14-I Series Harmonic Drives



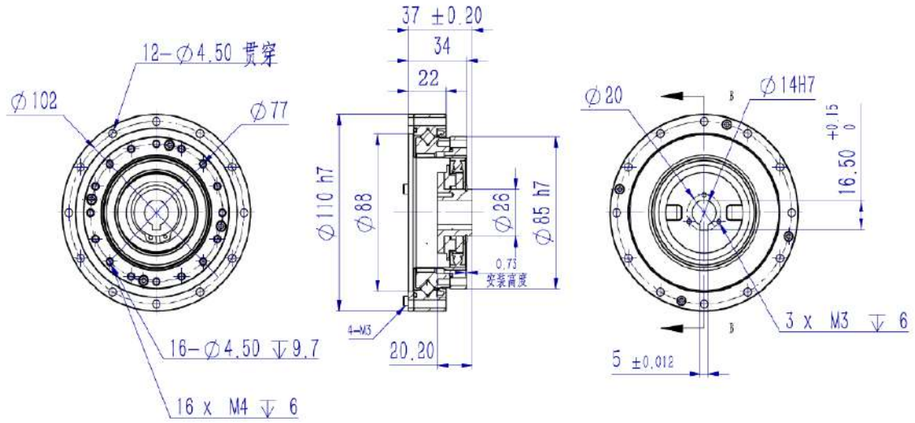
Model \ Items	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
14	30	3.8	8.6	7.8	16	8000	3500	≦20	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

SHF-20-I Series Harmonic Drives



Model \ Items	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
20	30	14	26	19	48	6000	3500	≦20	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

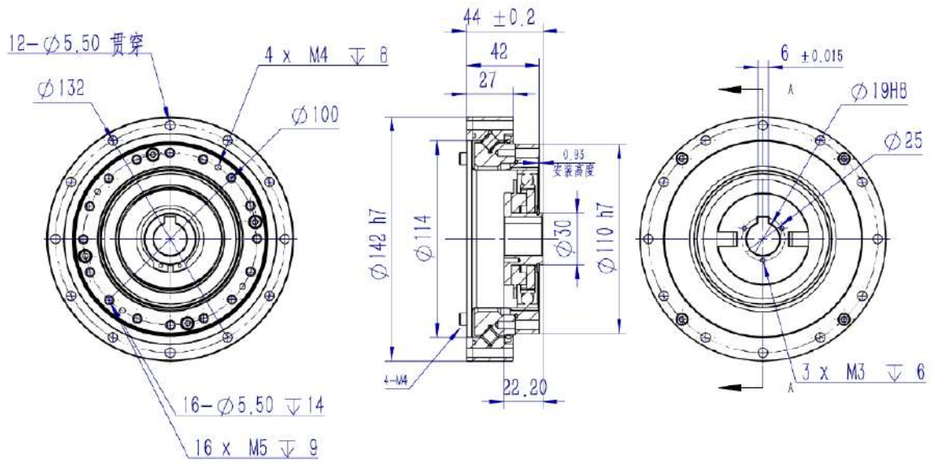
SHF-25-I Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
25	30	26	48	36	90	5500	3500	≤20	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	79	174	118	309			≦10	15000

Notice: Ratio 160 no stock. Production time 10-15 days. Contact sales before placing order.

SHF-32-I Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
32	50	72	205	103	363	4500	3500	≤20	10000
	80	112	289	159	540			≦10	15000
	100	130	325	208	635			≦10	15000
	120	130	335	205	652			≦10	15000

SHF

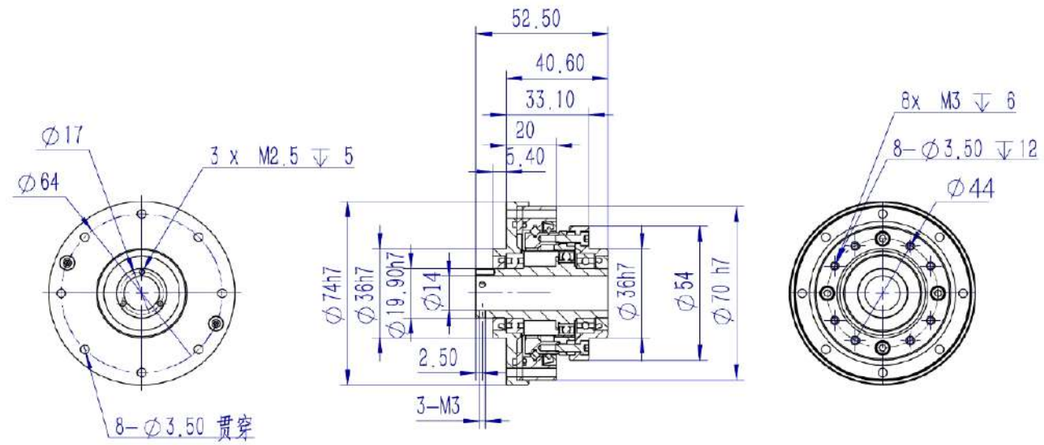
SHF-II

Hollow Type

I Product Features

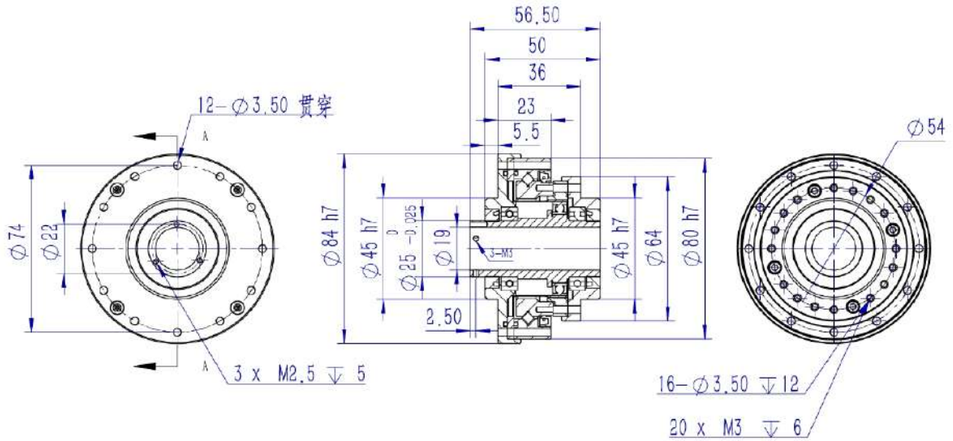
Compact Structure	High Torque Capacity	Rigidity High	Central Opening Structure Large Aperture

SHF-14-II Series Harmonic Drives



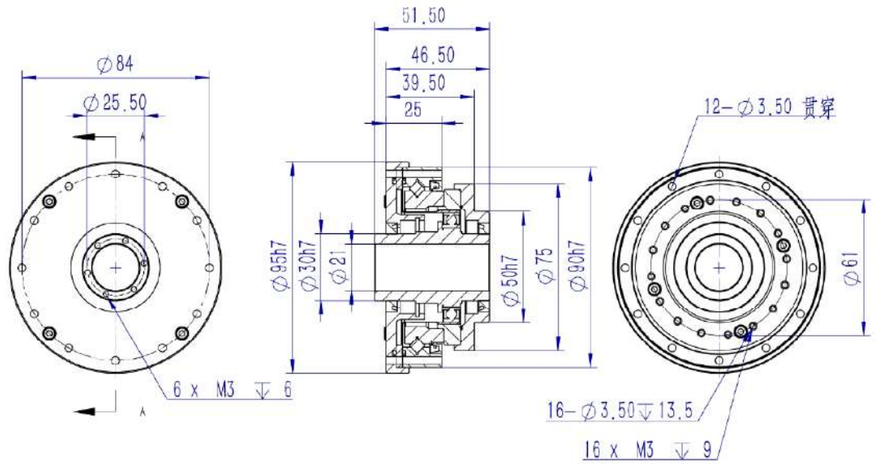
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
14	30	3.8	8.6	7.8	16	8000	3500	≤20	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

SHF-17-II Series Harmonic Drives



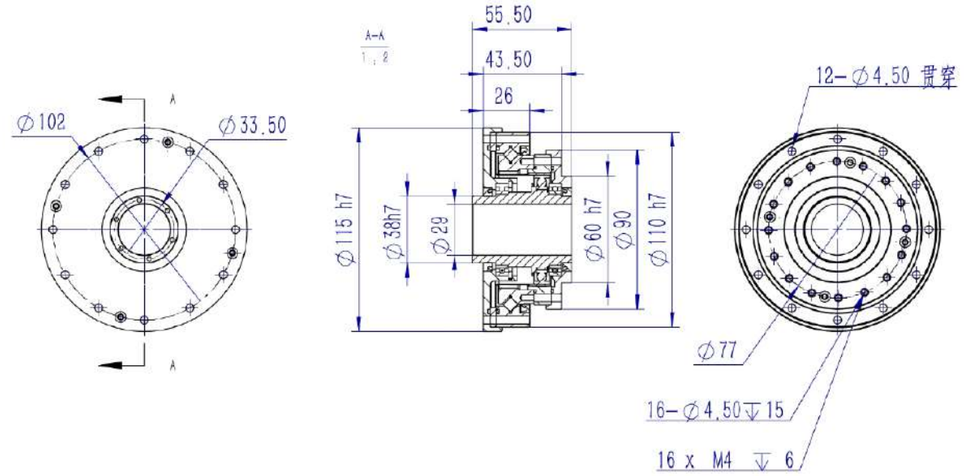
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
17	30	8.4	15.2	11.5	29	7000	3500	≦20	10000
	50	15.2	32	25	66			≦20	10000
	80	21	41	26	83			≦10	15000
	100	23	52	38	108			≦10	10000

SHF-20-II Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
20	30	14	26	19	48	6000	3500	≦20	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

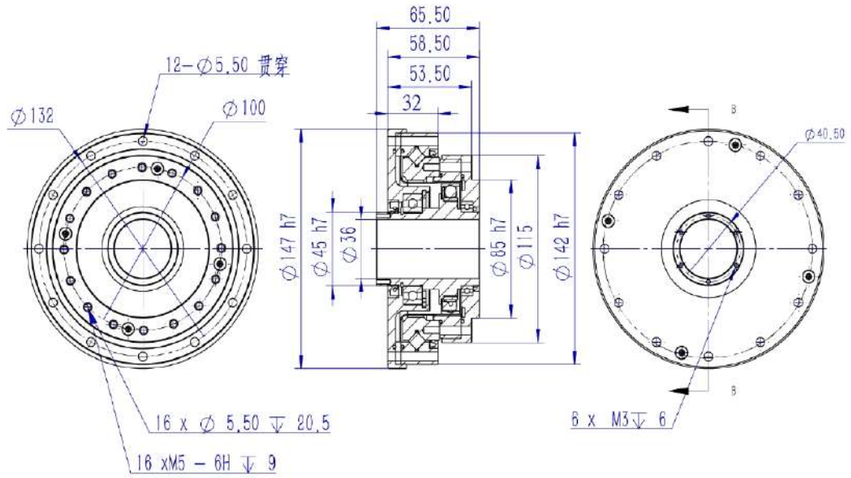
SHF-25-II Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
25	30	26	48	36	90	5500	3500	≦20	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	79	174	118	309			≦10	15000

Notice: Ratio 160 no stock. Production time 10-15 days. Contact sales before placing order.

SHF-32-II Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
32	50	72	205	103	363	4500	3500	≦20	10000
	80	112	289	159	540			≦10	15000
	100	130	325	208	635			≦10	15000
	120	130	335	205	652			≦10	15000

SHF

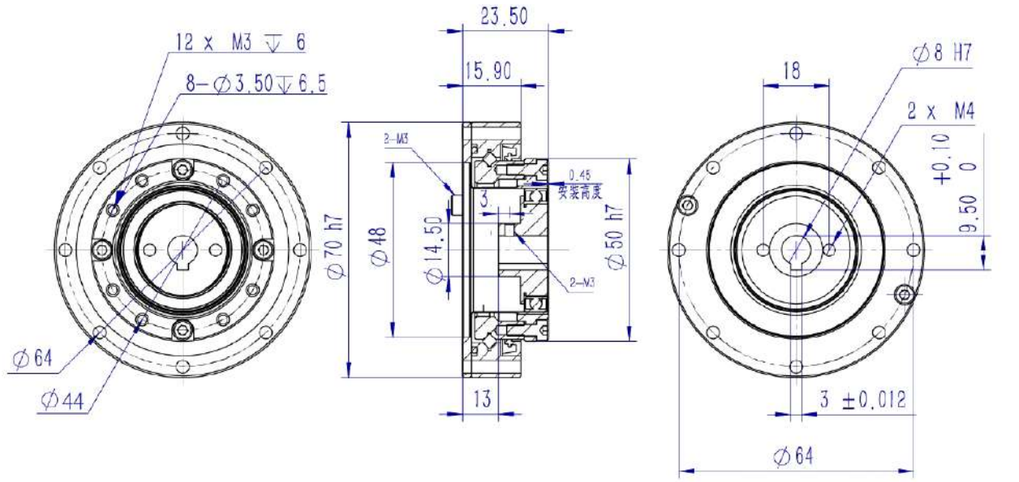
SHF-III

Integrated Type

I Product Features

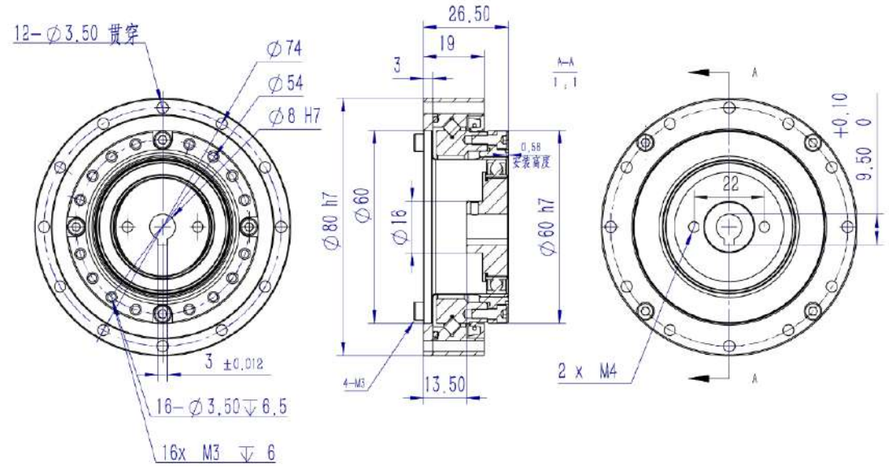
Compact Design	High Torque Capacity	High Rigidity	Wave Generator Flat Integrated Type

SHF-14-III Series Harmonic Drives



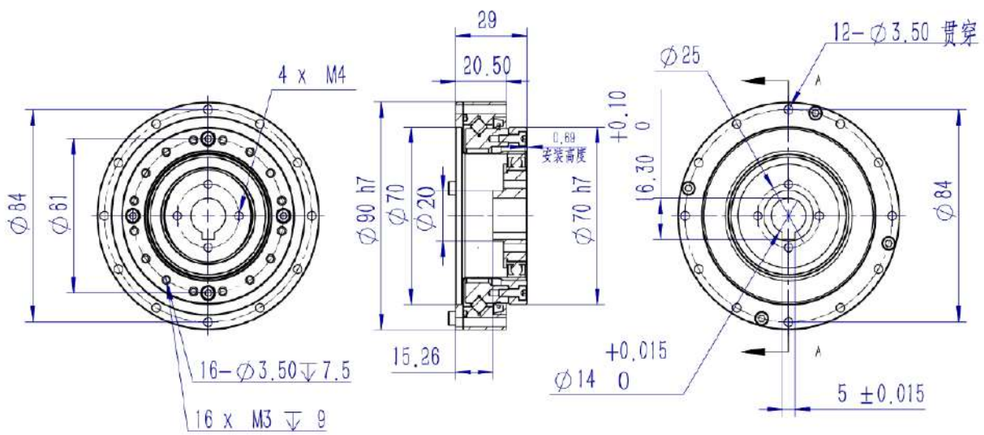
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
14	30	3.8	8.6	7.8	16	8000	3500	≦20	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

SHF-17-III Series Harmonic Drives



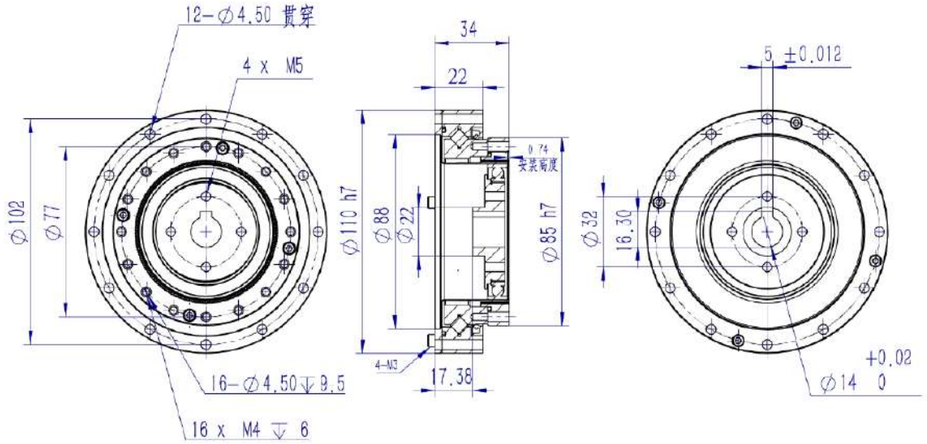
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
17	30	8.4	15.2	11.5	29	7000	3500	≦20	10000
	50	15.2	32	25	66			≦20	10000
	80	21	41	26	83			≦10	15000
	100	23	52	38	108			≦10	10000

SHF-20-III Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
20	30	14	26	19	48	6000	3500	≦20	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

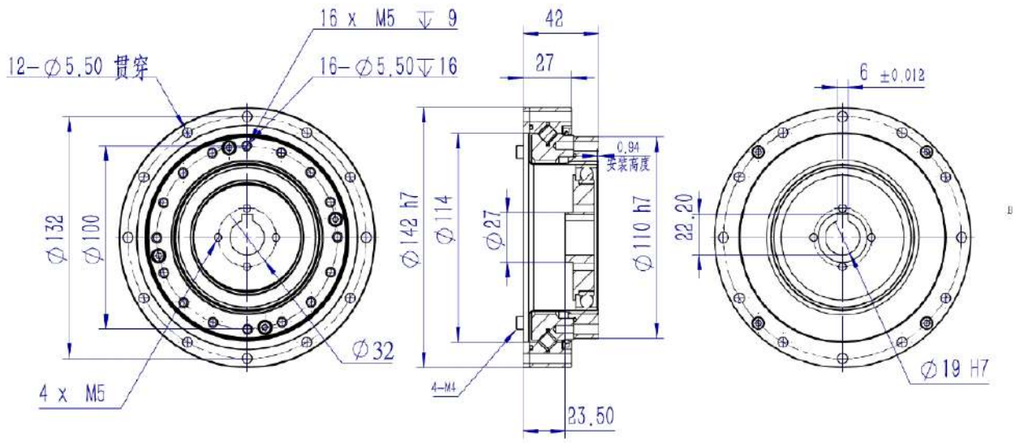
SHF-25-III Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
25	30	26	48	36	90	5500	3500	≦20	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	79	174	118	309			≦10	15000

Notice: Ratio 160 no stock. Production time 10-15 days. Contact sales before placing order.

SHF-32-III Series Harmonic Drives

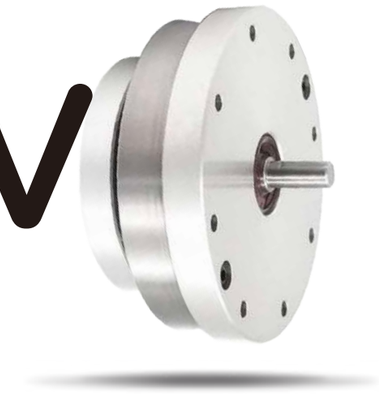


Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
32	50	72	205	103	363	4500	3500	≦20	10000
	80	112	289	159	540			≦10	15000
	100	130	325	208	635			≦10	15000
	120	130	335	205	652			≦10	15000

SHF

SHF-IV

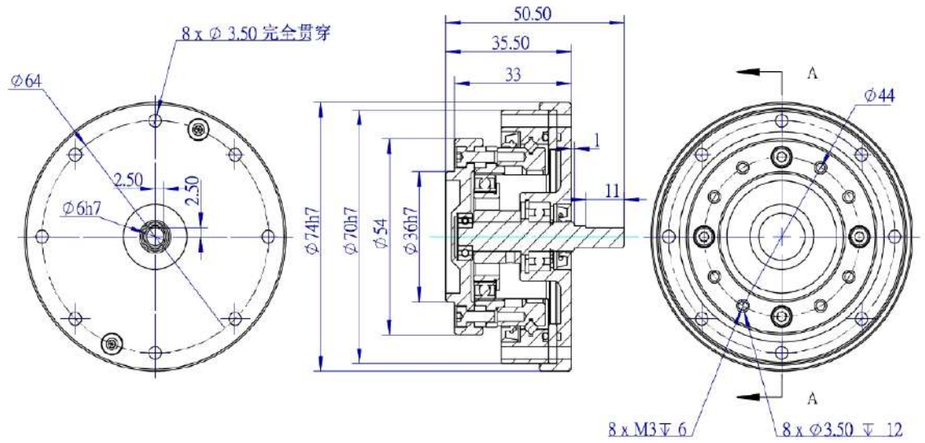
Shaft Input Type



I Product Features

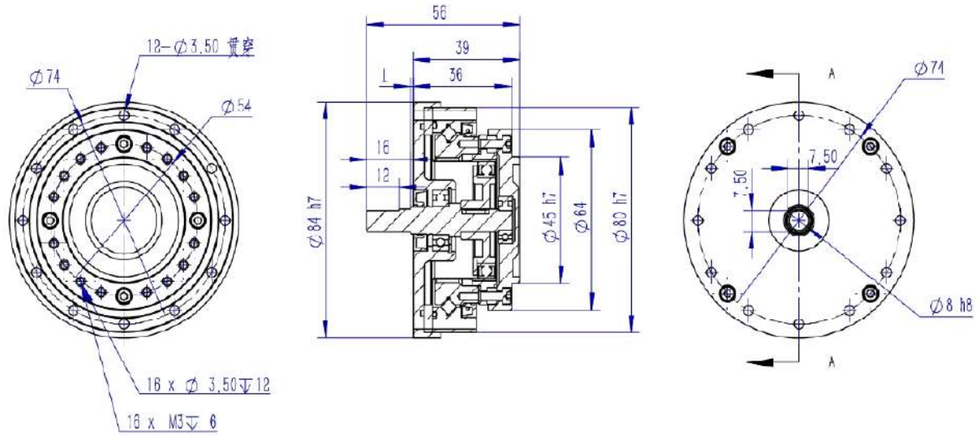
Compact Design	High Torque Capacity	High Rigidity	Coaxial of Input & Output

SHF-14-IV Series Harmonic Drives



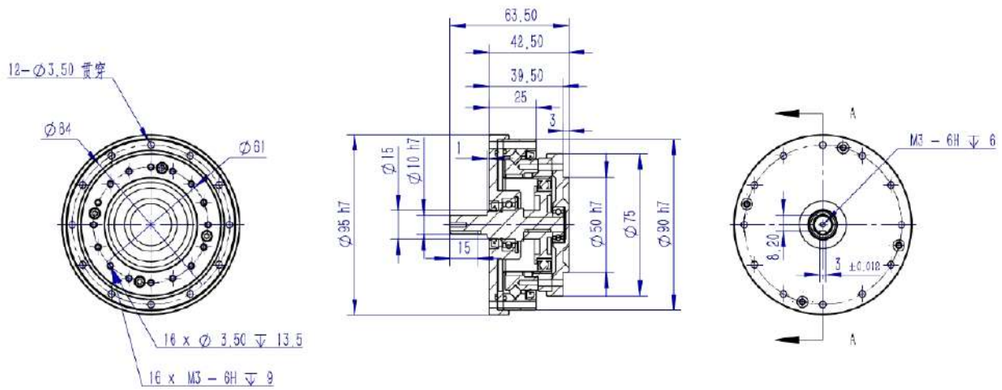
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
14	30	3.8	8.6	7.8	16	8000	3500	≦20	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

SHF-17-IV Series Harmonic Drives



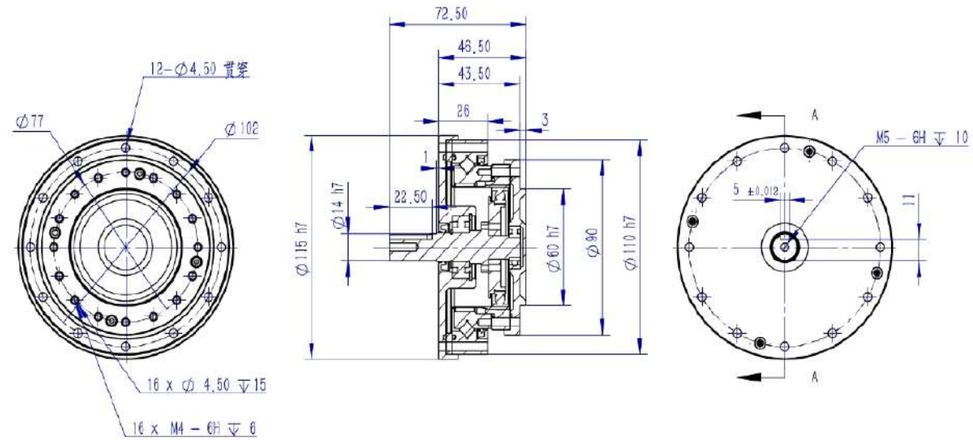
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
17	30	8.4	15.2	11.5	29	7000	3500	≦20	10000
	50	15.2	32	25	66			≦20	10000
	80	21	41	26	83			≦10	15000
	100	23	52	38	108			≦10	10000

SHF-20-IV Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
20	30	14	26	19	48	6000	3500	≦20	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

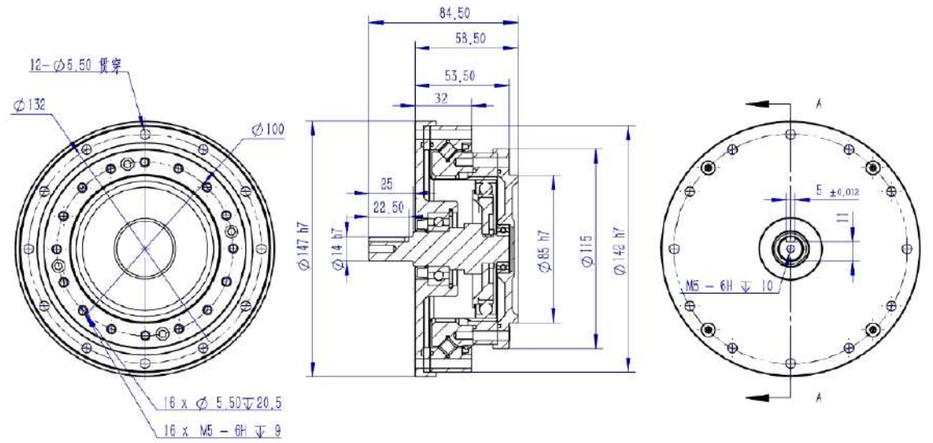
SHF-25-IV Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
25	30	26	48	36	90	5500	3500	≦20	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	79	174	118	309			≦10	15000

Notice: Ratio 160 no stock. Production time 10-15 days. Contact sales before placing order.

SHF-32-IV Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
32	50	72	205	103	363	4500	3500	≦20	10000
	80	112	289	159	540			≦10	15000
	100	130	325	208	635			≦10	15000
	120	130	335	205	652			≦10	15000

CSF

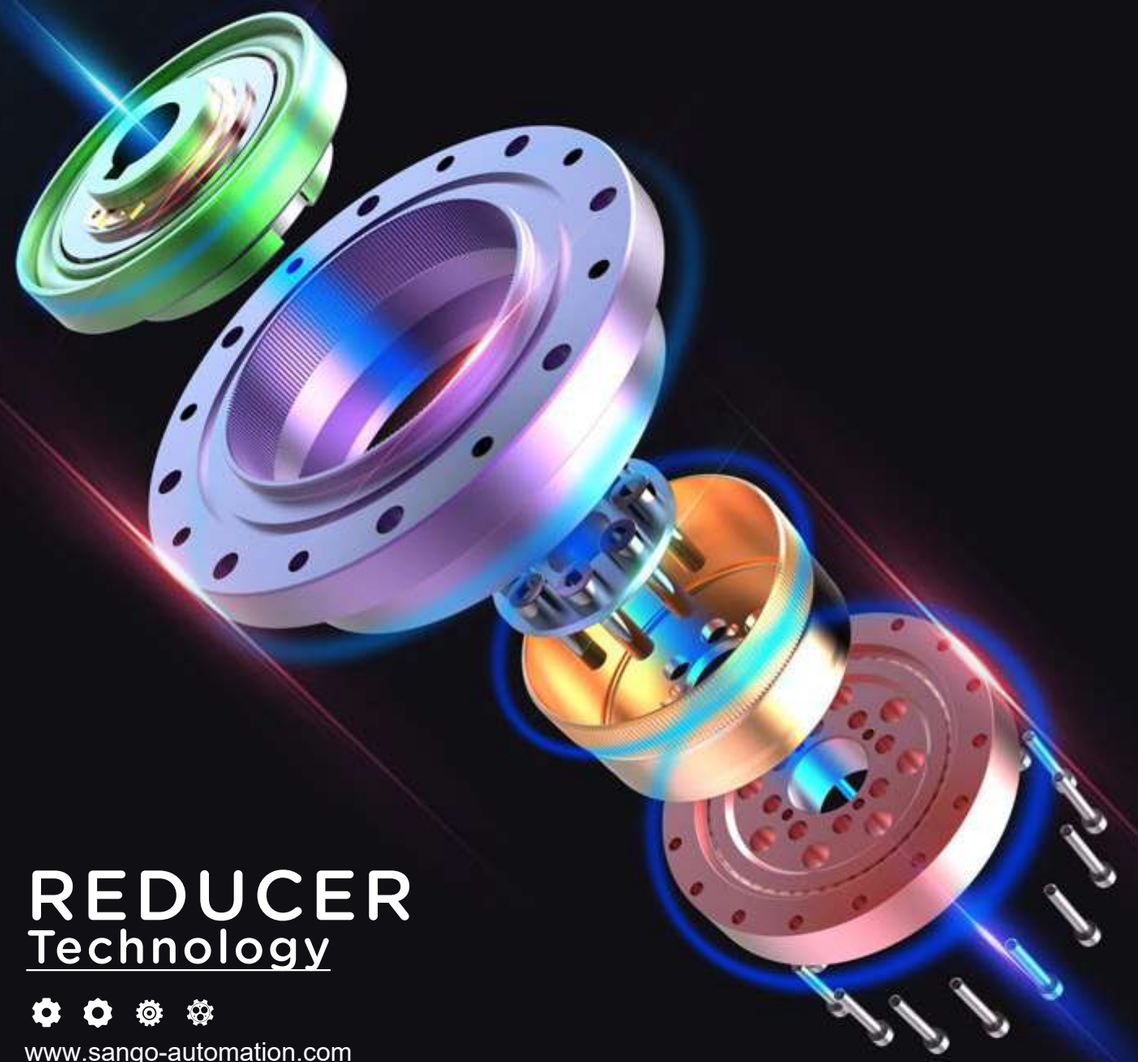
Harmonic Drive Series

CSF-I
Spindle Adjustable Series

CSF-II
Integrated
Series

CSF-MINI
Series

INNOVATIVE
STRUCTURAL DESIGN



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THE FUTURE

CSF

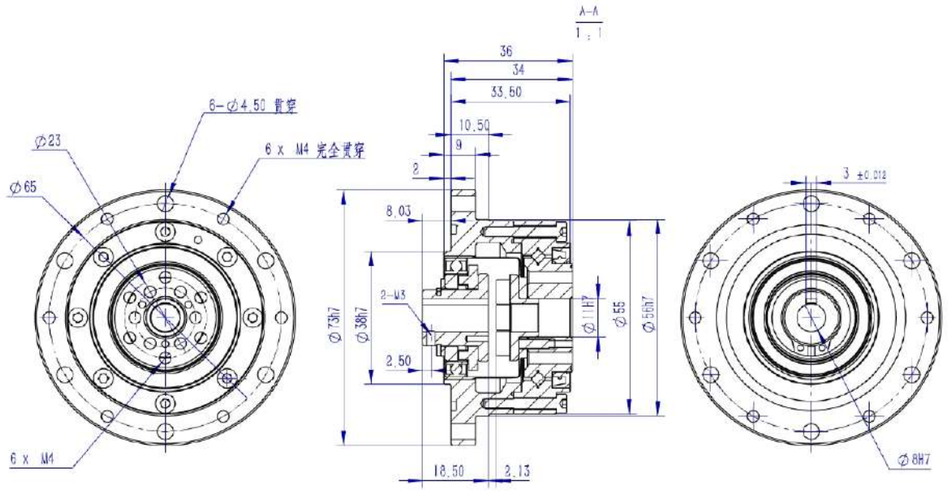
CSF-I

Spindle Adjustable Type

I Product Features

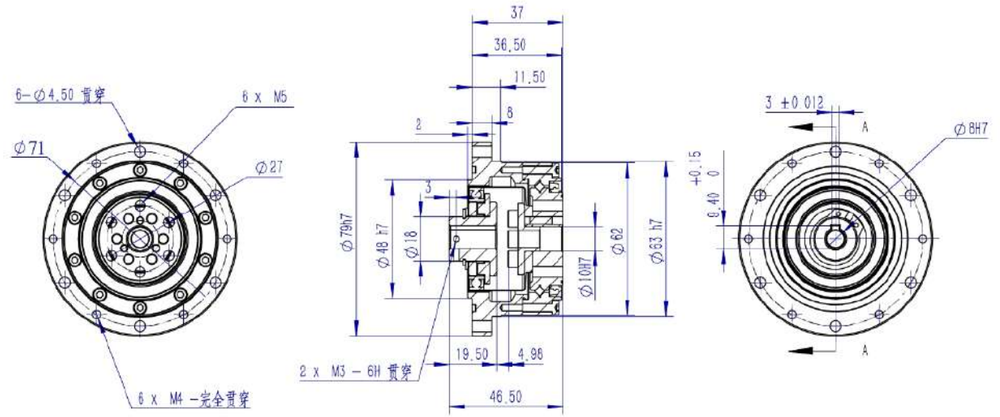
Compact Design	High Torque Capacity	High Rigidity	Excellent Positioning Accuracy	Automatic Adjust Spindle

CSF-14-I Series Harmonic Drives



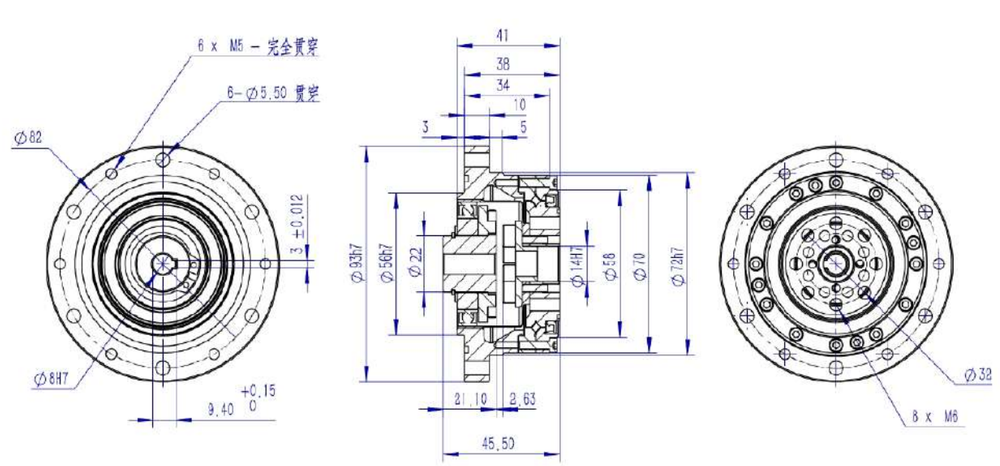
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
14	30	4.0	9	6.8	17	8000	3500	≦20	10000
	50	5.4	18	6.9	35			≦20	10000
	80	7.8	23	11	47			≦10	15000
	100	7.8	28	11	54			≦10	15000

CSF-17-I Series Harmonic Drives



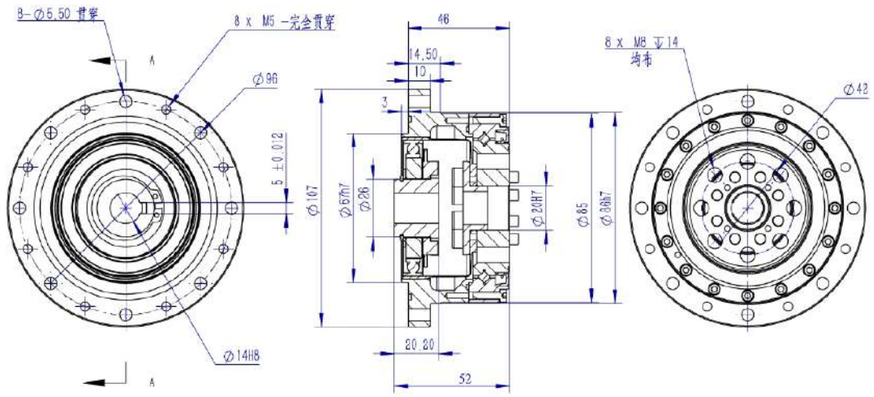
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
17	30	8.8	16	12	30	7000	3500	≦20	10000
	50	16	34	26	70			≦20	10000
	80	22	43	27	87			≦10	15000
	100	24	54	39	108			≦10	15000

CSF-20-I Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
20	30	15	27	20	50	6000	3500	≦20	10000
	50	25	56	34	98			≦20	10000
	80	34	74	47	121			≦10	15000
	100	40	82	49	147			≦10	15000
	120	40	87	49	147			≦10	15000

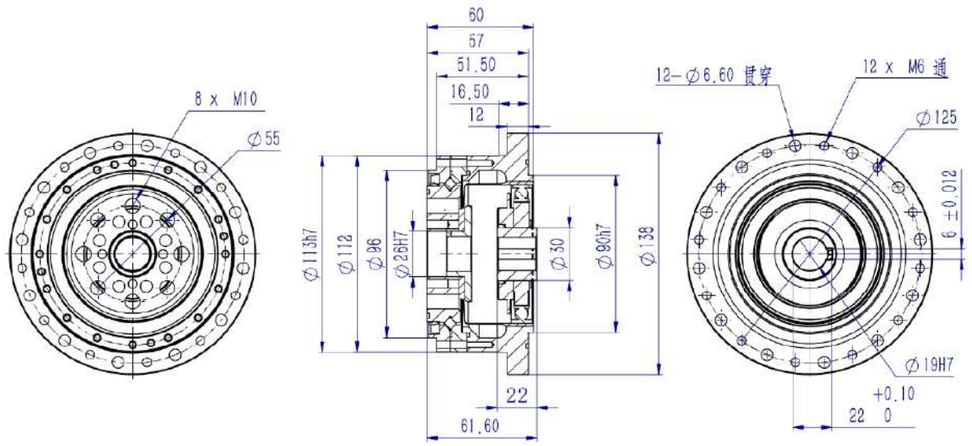
CSF-25-I Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
25	30	27	50	38	95	5500	3500	≦20	10000
	50	39	98	55	186			≦20	10000
	80	63	137	87	255			≦10	15000
	100	67	157	108	304			≦10	15000
	120	67	167	108	289			≦10	15000
	160	82	182	123	309			≦10	15000

Notice: Ratio 160 no stock. Production time 10-15 days. Contact sales before placing order.

CSF-32-I Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
32	50	76	216	75	200	4500	3500	≦20	10000
	80	118	304	167	568			≦10	15000
	100	137	353	216	647			≦10	15000
	120	137	353	216	686			≦10	15000

CSF

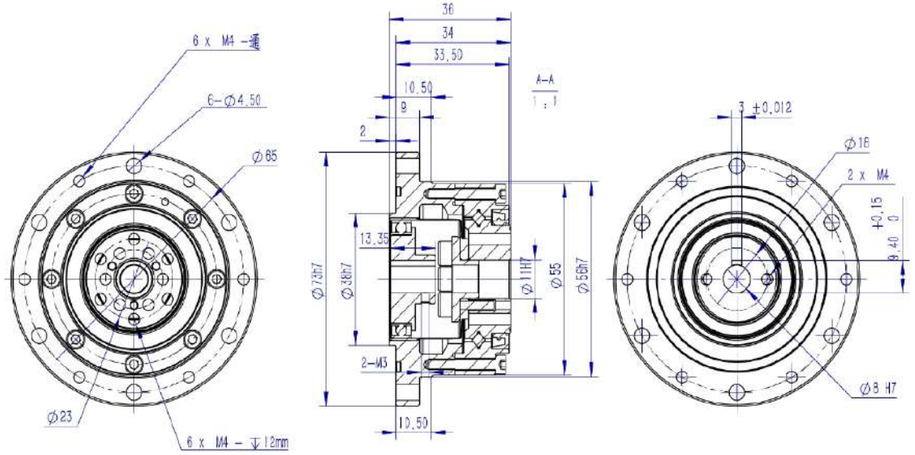
CSF-II

Integrated Type

I Product Features

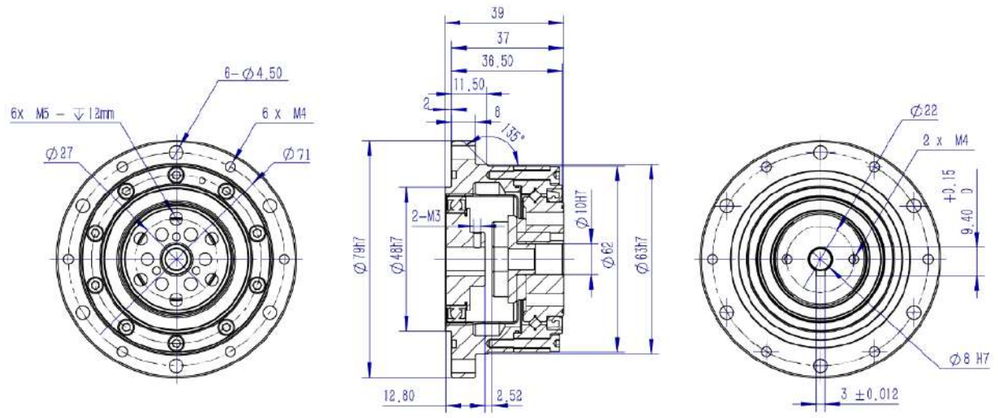
Compact Design | High Torque Capacity | High Rigidity | Excellent Positioning Accuracy | Flat Integrated

CSF-14-II Series Harmonic Drives



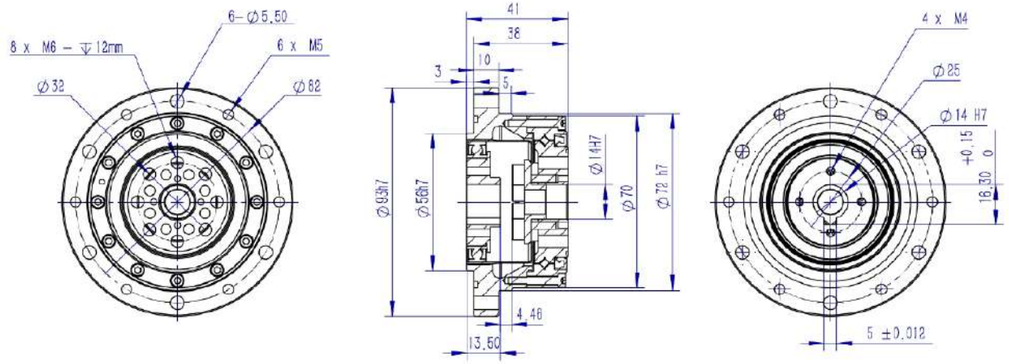
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
14	30	4.0	9	6.8	17	8000	3500	≦20	10000
	50	5.4	18	6.9	35			≦20	10000
	80	7.8	23	11	47			≦10	15000
	100	7.8	28	11	54			≦10	15000

CSF-17-II Series Harmonic Drives



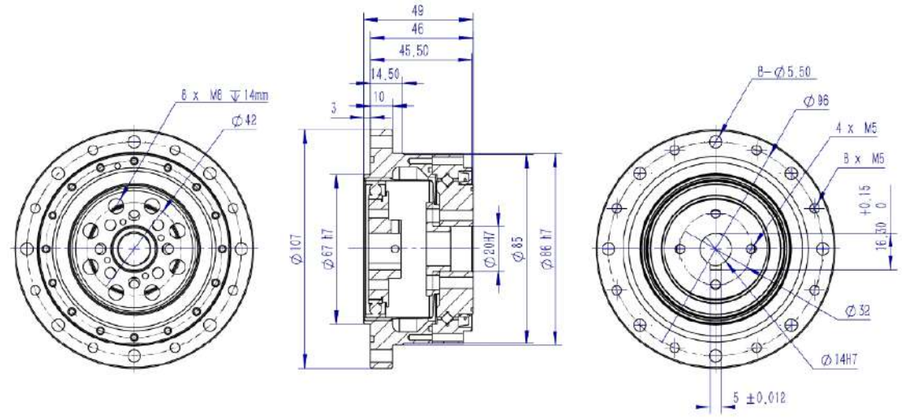
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
17	30	8.8	16	12	30	7000	3500	≦20	10000
	50	16	34	26	70			≦20	10000
	80	22	43	27	87			≦10	15000
	100	24	54	39	108			≦10	10000

CSF-20-II Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
20	30	15	27	20	50	6000	3500	≦20	10000
	50	25	56	34	98			≦20	10000
	80	34	74	47	121			≦10	15000
	100	40	82	49	147			≦10	15000
	120	40	87	49	147			≦10	15000

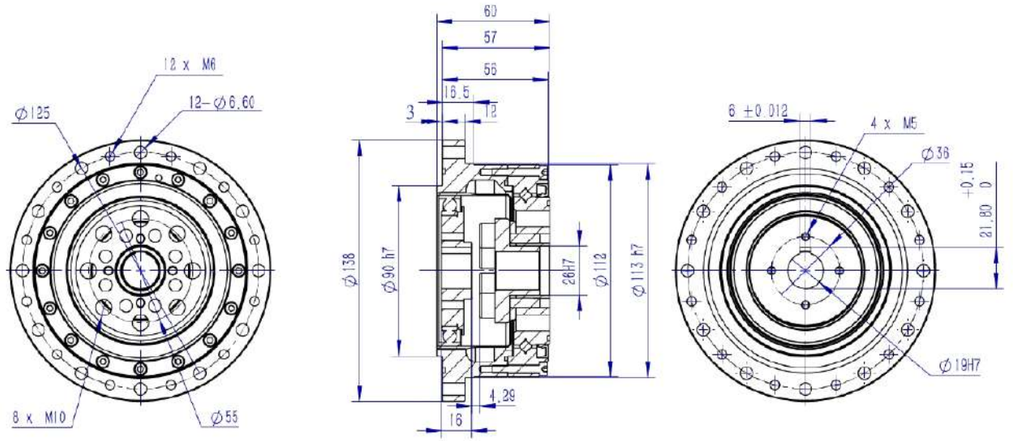
CSF-25-II Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
25	30	27	50	38	95	5500	3500	≦20	10000
	50	39	98	55	186			≦20	10000
	80	63	137	87	255			≦10	15000
	100	67	157	108	304			≦10	15000
	120	67	167	108	289			≦10	15000
	160	82	182	123	309			≦10	15000

Notice: Ratio 160 no stock. Production time 10-15 days. Contact sales before placing order.

CSF-32-II Series Harmonic Drives

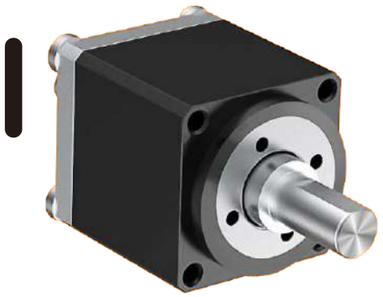


Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
32	50	76	216	75	200	4500	3500	≦20	10000
	80	118	304	167	568			≦10	15000
	100	137	353	216	647			≦10	15000
	120	137	353	216	686			≦10	15000

CSF

CSF-MINI

Series



I Product features

Light	Small	High Torque	High Ridigity	None-backlash	AccuracyExcellent Positioning	Coaxial Input & Output

The CSF series is a combination product with the smallest model and is easy to use. The main bearing uses the "small 4-point contact ball shaft" independently developed by our company. It can directly support external loads.

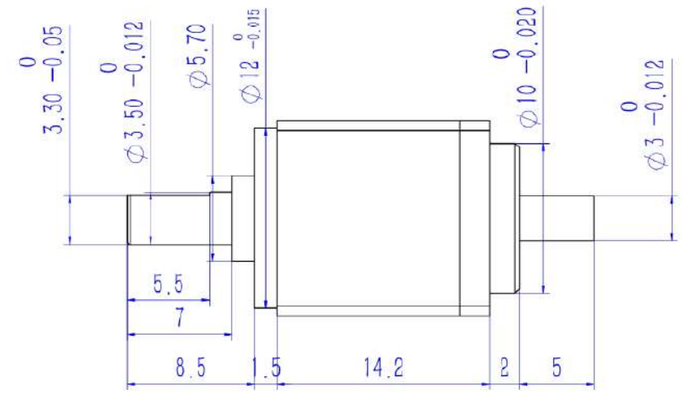
The CSF series includes two types: motor mounting type (2XH) and shaft input type (1U) that can support input forms such as belts, gears, and couplings. Please select the most suitable model according to the design needs of the mechanical device.

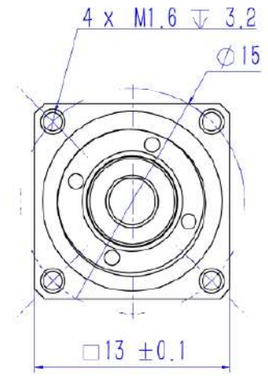
CSF - 05 - XXX - 2XH - A

Series	Model	Ratio	Form
CSF	03 05 08 11	30 50 80 100	1U - U 1U - C 1U - D 1U - E 2XH - A 2XH - B

*Note: The CSF series can be divided into 4 categories according to the model and 6 types according to the form, with rich variable options. Please refer to the above symbols when ordering.

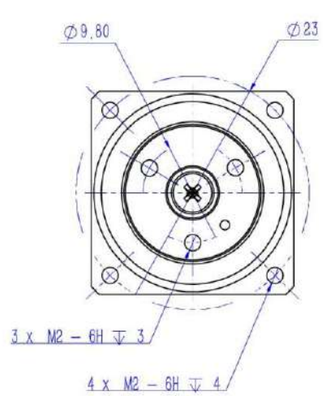
CSF-03-XX-1U-U Series Harmonic Drives

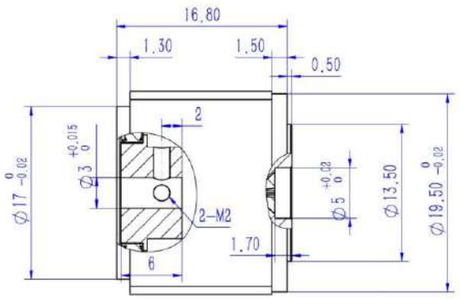


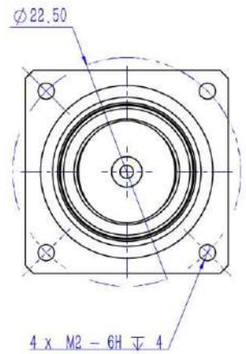


Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	$kgcm^2$	Arc sec
3	30	0.06	0.13	0.10	0.22	10000	6500	$5.3x10^{-7}$	≤20
	50	0.11	0.21	0.13	0.41				≤20

CSF-05-XX-1U-D Series Harmonic Drives

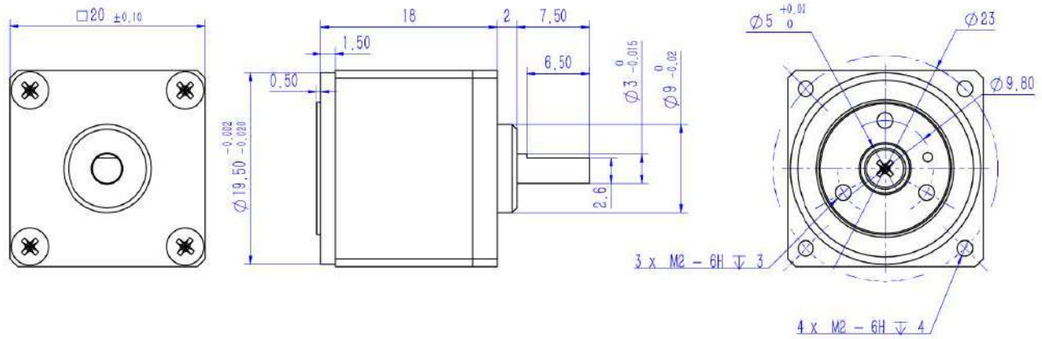






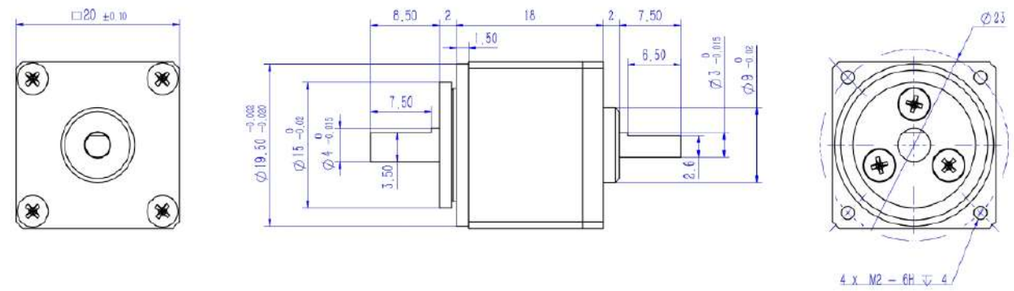
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	$kgcm^2$	Arc sec
5	30	0.25	0.50	0.38	0.9	10000	6500	$2.5x10^{-4}$	≤20
	50	0.40	0.90	0.53	1.8				≤20
	80	0.52	1.35	0.84	2.5				≤10

CSF-05-XX-1U-E Series Harmonic Drives



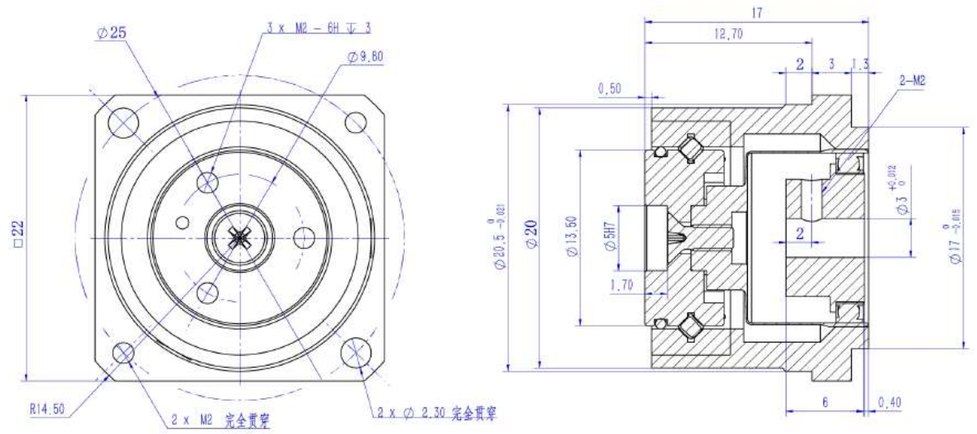
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	$kgcm^2$	Arc sec
5	30	0.25	0.50	0.38	0.9	10000	6500	$2.5x10^{-4}$	≦20
	50	0.40	0.90	0.53	1.8				≦20
	80	0.52	1.35	0.84	2.5				≦10

CSF-05-XX-1U-U Series Harmonic Drives



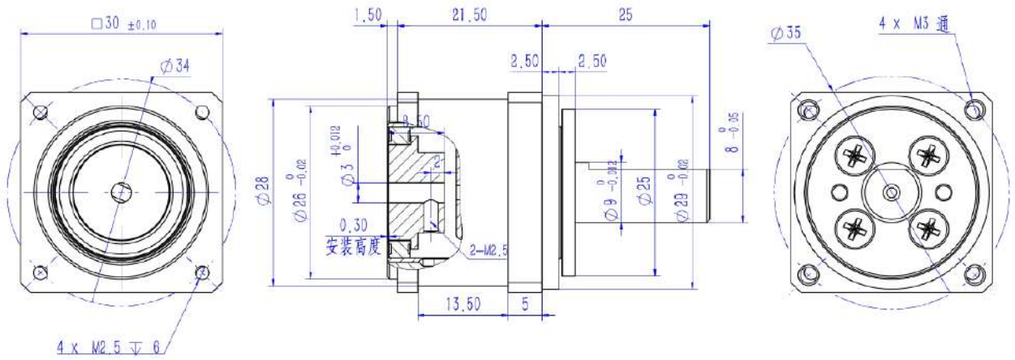
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	$kgcm^2$	Arc sec
5	30	0.25	0.50	0.38	0.9	10000	6500	$2.5x10^{-4}$	≦20
	50	0.40	0.90	0.53	1.8				≦20
	80	0.52	1.35	0.84	2.5				≦10

CSF-05-XX-2XH-A Series Harmonic Drives



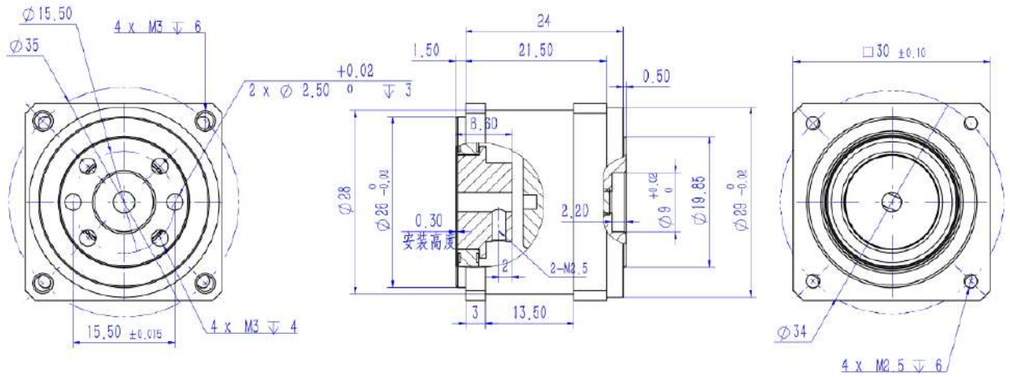
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	$kgcm^2$	Arc sec
5	30	0.25	0.50	0.38	0.9	10000	6500	$2.5x10^{-4}$	≦20
	50	0.40	0.90	0.53	1.8				≦20
	80	0.52	1.35	0.84	2.5				≦10

CSF-08-XX-1U-C Series Harmonic Drives



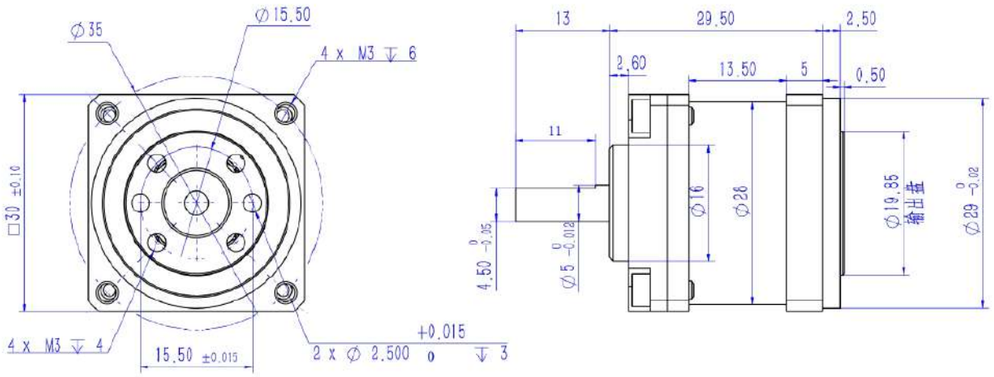
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	$kgcm^2$	arcsec
8	30	0.9	1.8	1.4	3.3	8500	3500	$3.2x10^{-3}$	≤20
	50	1.8	3.3	2.3	6.6				≤20
	80	2.2	4.3	2.9	8.0				≤10
	100	2.4	4.8	3.3	9.0				≤10

CSF-08-XX-1U-D Series Harmonic Drives



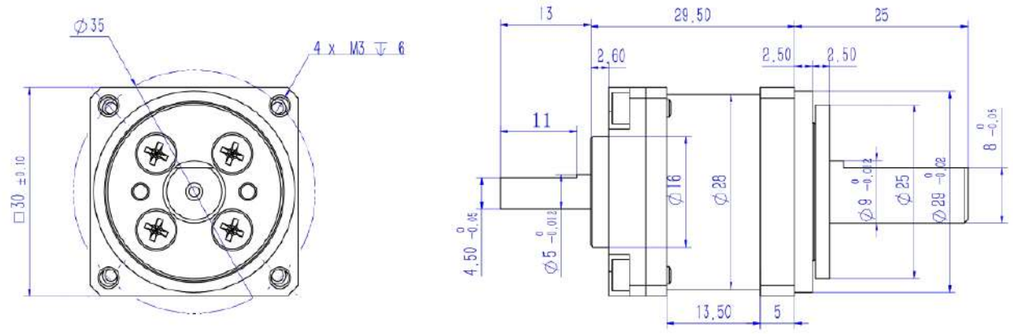
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
8	30	0.9	1.8	1.4	3.3	8500	3500	3.2x10^{-3}	≤20
	50	1.8	3.3	2.3	6.6				≤20
	80	2.2	4.3	2.9	8.0				≤10
	100	2.4	4.8	3.3	9.0				≤10

CSF-08-XX-1U-E Series Harmonic Drives



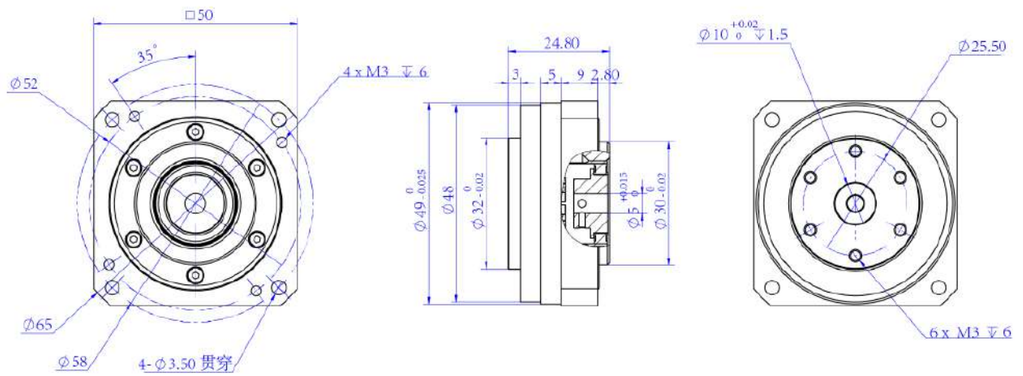
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
8	30	0.9	1.8	1.4	3.3	8500	3500	3.2x10^{-3}	≤20
	50	1.8	3.3	2.3	6.6				≤20
	80	2.2	4.3	2.9	8.0				≤10
	100	2.4	4.8	3.3	9.0				≤10

CSF-08-XX-1U-U Series Harmonic Drives



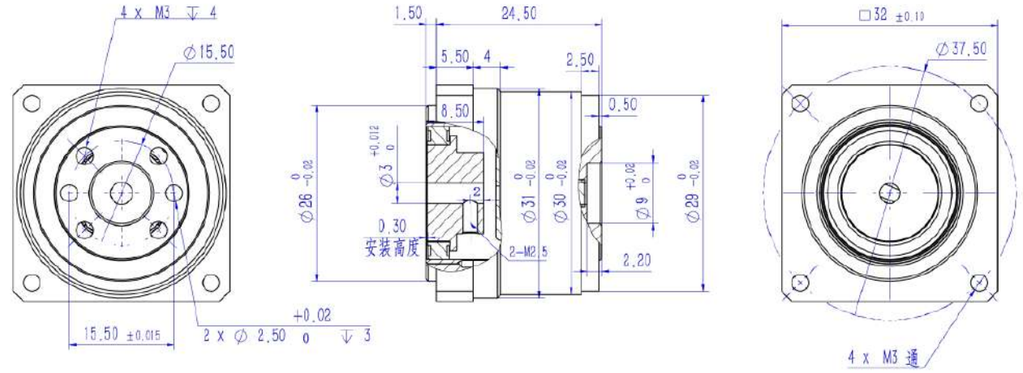
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
8	30	0.9	1.8	1.4	3.3	8500	3500	3.2x10^{-3}	≤20
	50	1.8	3.3	2.3	6.6				≤20
	80	2.2	4.3	2.9	8.0				≤10
	100	2.4	4.8	3.3	9.0				≤10

CSF-08-XX-2UP Series Harmonic Drives



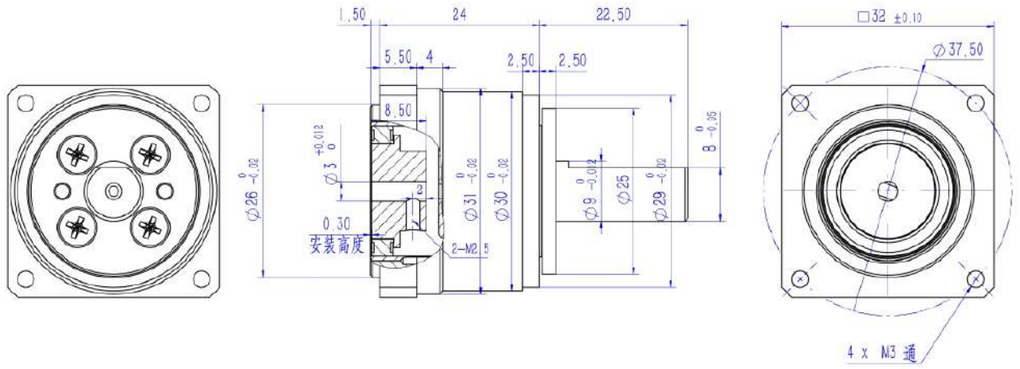
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
8	30	0.9	1.8	1.4	3.3	8500	3500	3.2x10^{-3}	≤20
	50	1.8	3.3	2.3	6.6				≤20
	80	2.2	4.3	2.9	8.0				≤10
	100	2.4	4.8	3.3	9.0				≤10

CSF-08-XX-2XH-A Series Harmonic Drives



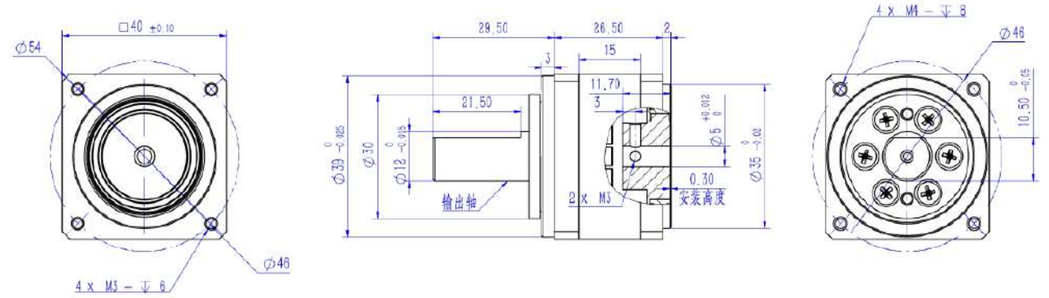
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
8	30	0.9	1.8	1.4	3.3	8500	3500	3.2x10^{-3}	≤20
	50	1.8	3.3	2.3	6.6				≤20
	80	2.2	4.3	2.9	8.0				≤10
	100	2.4	4.8	3.3	9.0				≤10

CSF-08-XX-2XH-B Series Harmonic Drives



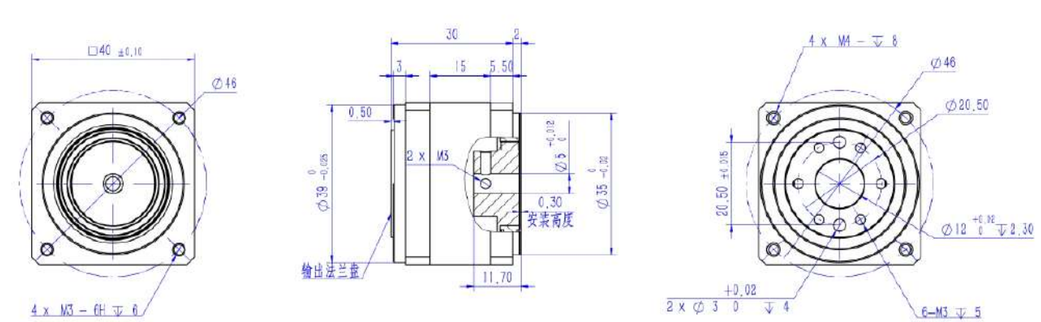
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
8	30	0.9	1.8	1.4	3.3	8500	3500	3.2x10^{-3}	≤20
	50	1.8	3.3	2.3	6.6				≤20
	80	2.2	4.3	2.9	8.0				≤10
	100	2.4	4.8	3.3	9.0				≤10

CSF-11-XX-1U-C Series Harmonic Drives



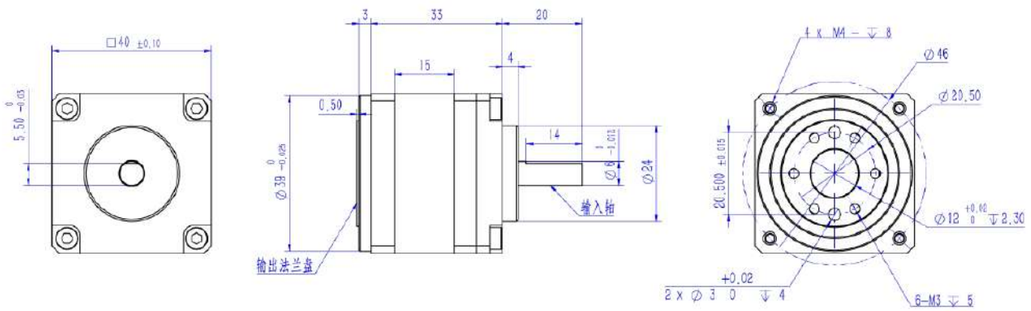
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
11	30	2.1	4.1	3.1	8.2	8500	3500	1.4x10^{-2}	≤20
	50	3.5	8.3	5.5	17.0				≤20
	80	4.5	10.2	8.5	22.0				≤10
	100	5.0	11.0	8.9	25.0				≤10

CSF-11-XX-1U-D Series Harmonic Drives



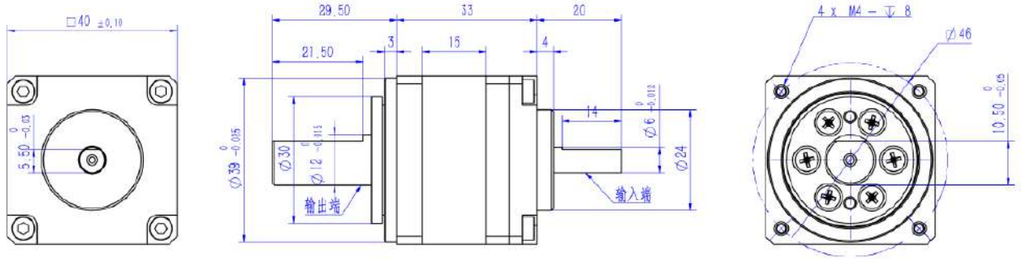
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
11	30	2.1	4.1	3.1	8.2	8500	3500	1.4x10^{-2}	≤20
	50	3.5	8.3	5.5	17.0				≤20
	80	4.5	10.2	8.5	22.0				≤10
	100	5.0	11.0	8.9	25.0				≤10

CSF-11-XX-1U-E Series Harmonic Drives



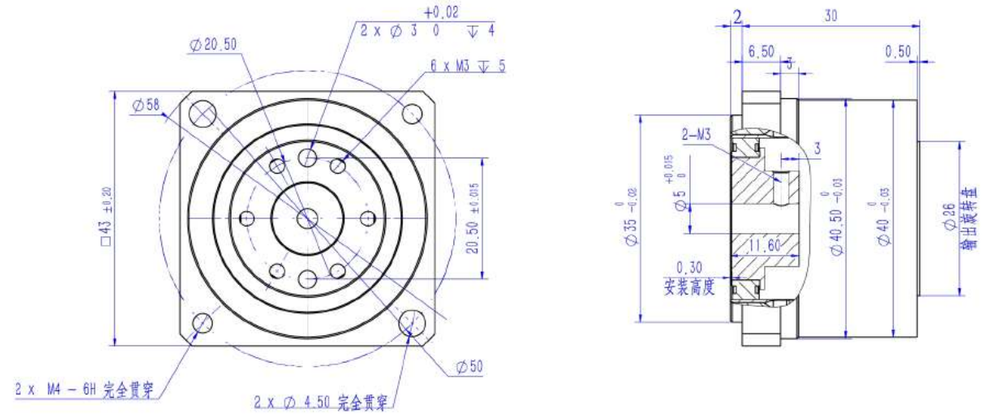
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
11	30	2.1	4.1	3.1	8.2	8500	3500	1.4x10^{-2}	≤20
	50	3.5	8.3	5.5	17.0				≤20
	80	4.5	10.2	8.5	22.0				≤10
	100	5.0	11.0	8.9	25.0				≤10

CSF-11-XX-1U-U Series Harmonic Drives



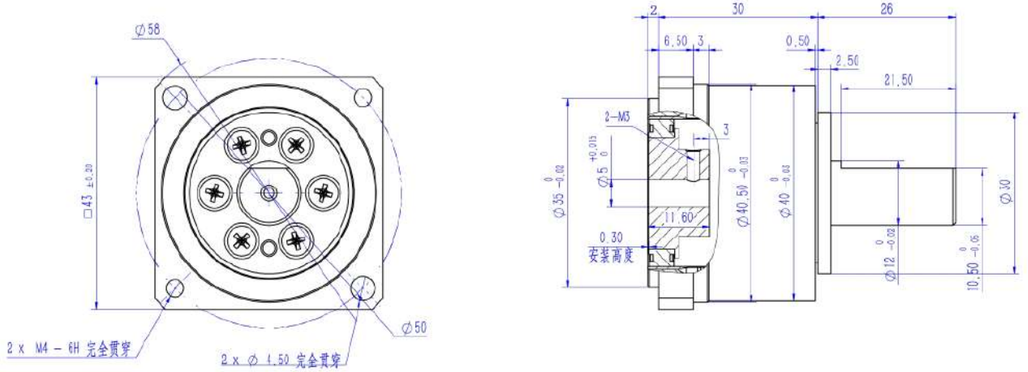
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
11	30	2.1	4.1	3.1	8.2	8500	3500	1.4x10^{-2}	≤20
	50	3.5	8.3	5.5	17.0				≤20
	80	4.5	10.2	8.5	22.0				≤10
	100	5.0	11.0	8.9	25.0				≤10

CSF-11-XX-2XH-A Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
11	30	2.1	4.1	3.1	8.2	8500	3500	1.4x10^{-2}	≤20
	50	3.5	8.3	5.5	17.0				≤20
	80	4.5	10.2	8.5	22.0				≤10
	100	5.0	11.0	8.9	25.0				≤10

CSF-11-XX-2XH-B Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Peak Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Moment of Inertia (1/4GD2)	Backlash
		Nm	Nm	Nm	Nm	r/min	r/min	kgcm^2	arcsec
11	30	2.1	4.1	3.1	8.2	8500	3500	1.4x10^{-2}	≤20
	50	3.5	8.3	5.5	17.0				≤20
	80	4.5	10.2	8.5	22.0				≤10
	100	5.0	11.0	8.9	25.0				≤10

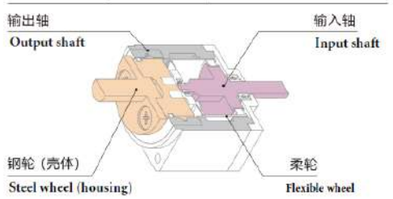
Structure and types of CSF-mini series

轴输入型 Shaft input type

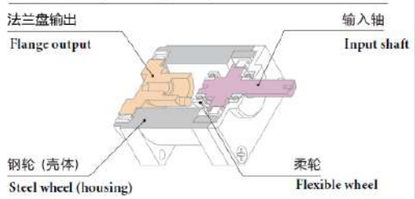
拥有输入轴的完结利组合。可支持皮带、齿轮、联轴节等输入形态。

It has a complete combination of input shafts. It can support input forms such as belts, gears, couplings, etc.

1U-U: Shaft input, shaft output



1U-E: Shaft input, flange output

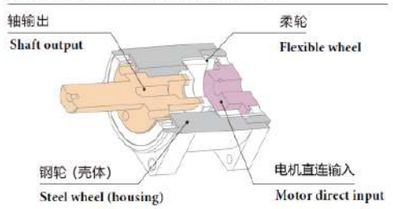


电动机安装型 Motor mounted type

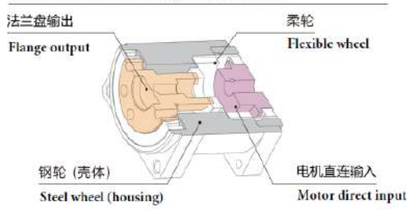
与高性能小型伺服电动机组合而成的减速机。相同尺寸的齿轮条件下，拥有最高的输出特性。

A speed reducer combined with a high-performance small servo motor. It has the highest output characteristics under the same gear size conditions.

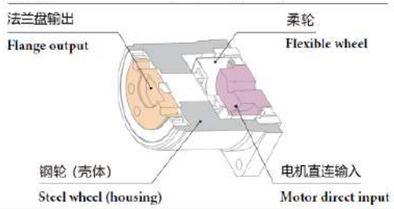
1U-C: Motor direct input, shaft output



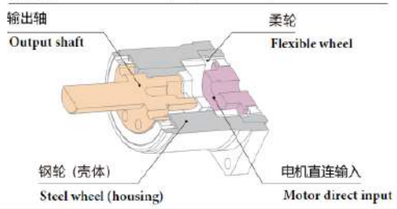
1U-D: Motor direct input, flange output



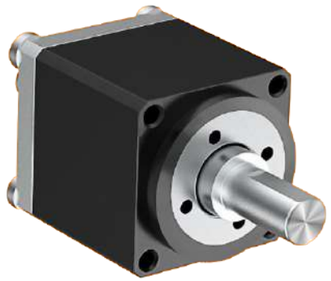
2XH-A: Motor direct input, flange output



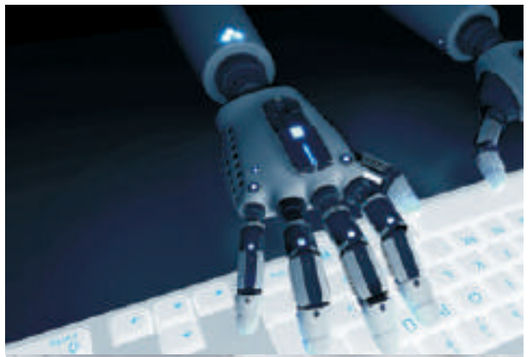
2XH-B: Motor direct input, shaft output

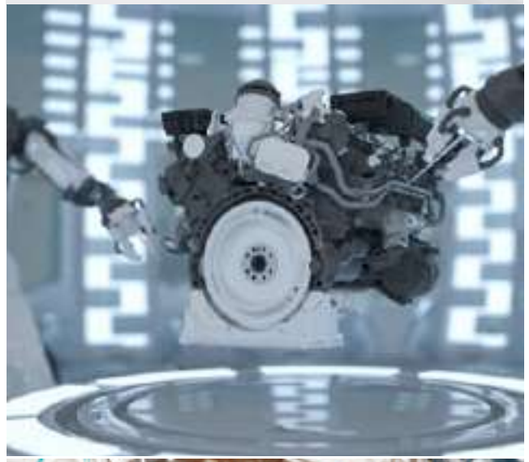


Product Photos



Application





CSD

Harmonic Drive Series

INNOVATIVE
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REDUCER
Technology

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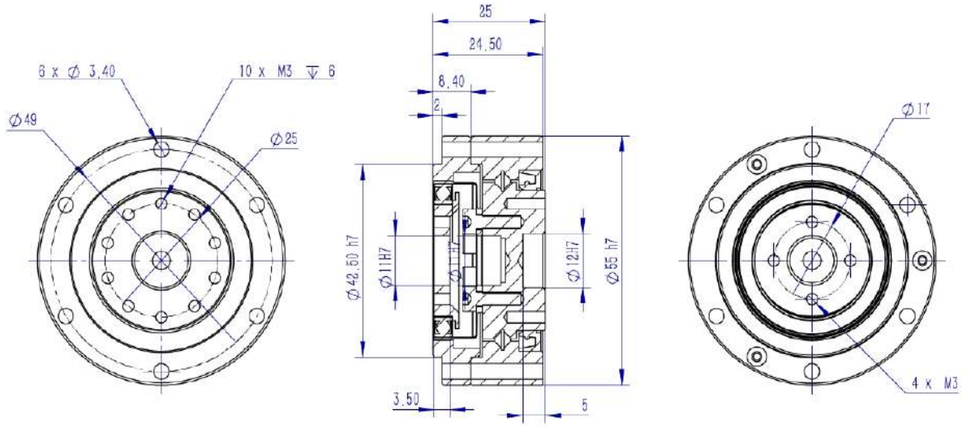
CSD
Series

I Product features

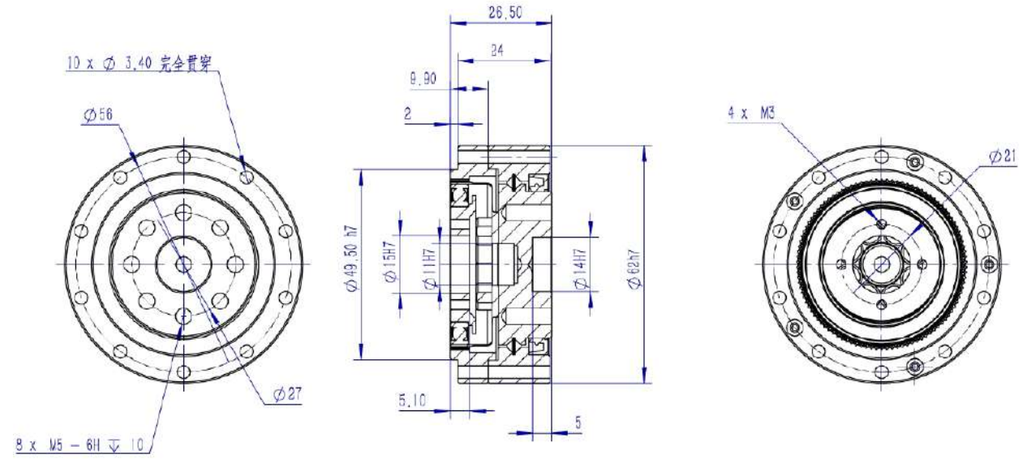
Compact Structure	Hollow Structure	High Static Torque	Output Bearing Loading Improved

CSD-14 Series Harmonic Drives



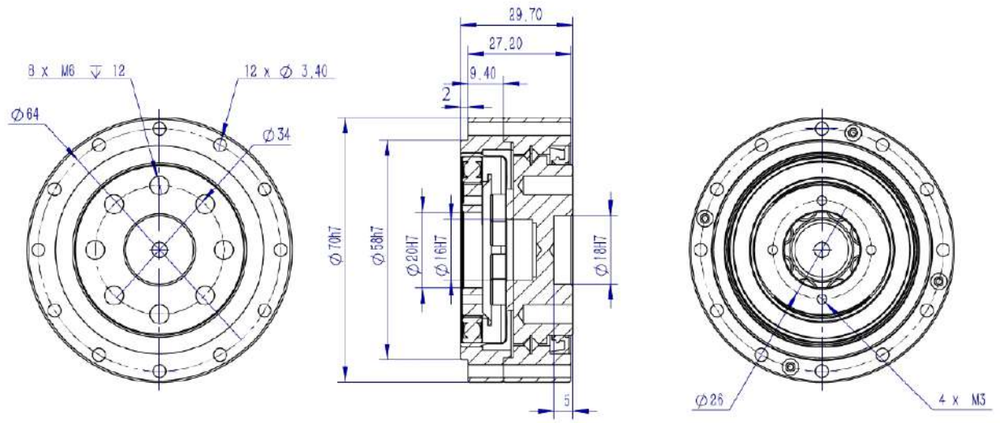
Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
14	30	2.22	11.40	2.88	14.40	8000	3500	≦20	10000
	50	3.70	19.00	4.80	24.00			≦20	10000
	80	4.32	15.20	6.16	28.00			≦10	15000
	100	5.40	19.00	7.70	35.00			≦10	15000

CSD-17 Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
17	30	6.60	13.80	10.80	28.80	7000	3500	≦20	10000
	50	11.00	23.00	18.00	48.00			≦20	10000
	80	12.80	29.60	21.60	56.80			≦10	10000
	100	16.00	37.00	27.00	71.00			≦10	10000

CSD-20 Series Harmonic Drives



Items / Model	Ratio	Rated Torque in Input 2000r/min	Allowable Max Torque When Start Stop	Max Value of Average Loading Torque	Instantaneous Allowable Max Torque	Allowable Highest Input Speed	Allowable Average Input Speed	Backlash	Design Life
		Nm	Nm	Nm	Nm	r/min	r/min	Arc sec	hour
20	30	10.20	23.40	14.40	41.40	6000	3500	≦20	10000
	50	17.00	39.00	24.00	69.00			≦20	10000
	80	22.40	45.60	27.20	76.00			≦10	10000
	100	28.00	57.00	34.00	95.00			≦10	10000
	120	28.00	61.00	34.00	95.00			≦10	10000

Product Photos

Application