

Mechatronics Actuators & Robot Modules

Mechatronics Actuator | low voltage joint modules | robot modules





ABOUT US

About us

Founded in 2012, Shenzhen Tongchuan Technology Co., Ltd. (TC Drive) specializes in the R&D and manufacturing of core components for robotics and intelligent equipment. It is recognized as a National High-Tech Enterprise and a National-Level Specialized, Refined, Distinctive, and Innovative “Little Giant” enterprise.

The company’s main products include harmonic reducers, robotic joints, and mechatronic actuators, widely used in industrial robots, collaborative robots, humanoid robots, industrial machine tools, smart equipment, aerospace, new energy, and other high-end manufacturing fields.

TC Drive has established comprehensive R&D capabilities covering materials, gear transmission, motor drives, sensors, and production processes. With an annual production capacity of over 300,000 units of reducers and actuators, it is supported by key resources such as heat treatment, precision machining, measurement, and clean assembly.

Driven by innovation, TC Drive is committed to enhancing the reliability, lightweight design, modularization, and sensor integration of precision transmission components. The company aims to become a global leader in robotic core components, contributing to smarter work and human progress.

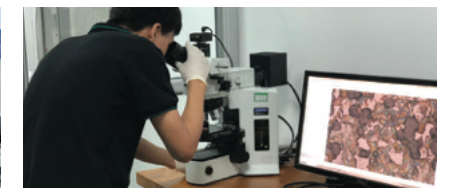
A pioneer in China in adopting advanced Japanese gear manufacturing equipment.



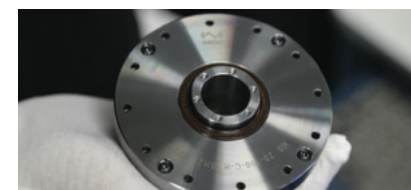
By 2025, annual capacity reach 300,000 units.



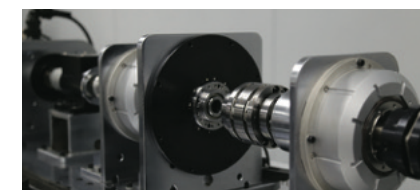
In-house heat-treatment shop & lab, reliability controllable and verifiable.



In 2017, our first precision harmonic reducer with a patented 3D conjugate double-arc tooth profile was launched.



All R&D test equipment is developed and built in-house.



From design to mass production, continuous testing ensures compliance with design.



Coding Rules

Standard model example

TCHA-25-101-FL-AC220-B01-HFSR-A0-SPxxx

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	TC:TC Drive							9	X:without brake B:with brake						
2	Reducer Series: H:Harmonic Reducer P:Planetary Reducer							10	Encoder type: 00:without encorder 01:17-bit Single-turn Absolute 02:17-bit Single-turn Absolute,16-bit multi-turn Absolute 03:Incremental Encoder 04:23-bit Single-turn Absolute, 16-bit multi-turn Absolute 05:Dual Encoder 17-bit single-turn absolute 06:Dual encoder,23-bit single-turn absolute						
3	Actuator Series: A Series: Standard industrial actuator B Series: High-performance Industrial Actuator R Series: Joint Modules L Series: HarmoCore™ lightweight modules Planetary modules: Default							11	H:hollow S:solid						
								12	structure type: I:Straight cylinder T: T type structure F:flange						
								13	Wiring outlet type B:bottom wiring outlet S:side wiring outlet						
4	H: Reducer size P:Outer diameter							14	Communication method: C:CAN BUS E:EtherCAT R:RS485 P:Pulse No Built-in Driver:Default						
5	Reduction Ratio							15	Version number: A0:standard type TA0,with torque sensor M0:customzied type TM0,with torque sensor H0:customized type TH0,with torque sensor						
6	Motor type SR:servo motor FL:frameless torque motor ST:stepper motor BL:BLDC Motor							16	blank: standard type SP***:customized type						
7	Motor voltage type: AC DC														
8	Motor voltage: 220:220V 48:48V														

Legacy to New Product Code Conversion Table

Product	series	Abbreviation of old model	Abbreviation of new model
Industrial Standard Rotary Actuator	HSA	HSA14	TCHA-14H
		HSA17	TCHA-17H
		HSA20	TCHA-20H
		HSA25	TCHA-25H
		HSA32	TCHA-32H
Industrial high performance Rotary Actuator	HRA	HSA40	TCHA-40H
		HRA25	TCHB-25H
Industrial high performance Rotary Actuator	SRA	HRA32	TCHB-32H
		SRA20	TCHB-20S
		SRA25	TCHB-25S
Standdard servo harmonic actuator	SSA	SRA32	TCHB-32S
		SSA11	TCHA-11S
		SSA14	TCHA-14S
		SSA17	TCHA-17S
		SSA20	TCHA-20S
		SSA25	TCHA-25S
Low voltage joint modules	TCM	SSA32	TCHA-32S
		TCM14	TCHR-14I
		TCM17	TCHR-17I
		TCM20	TCHR-20I
		TCM25	TCHR-25I
Cobot Joint Module	TRM	TCM32	TCHR-32I
		TRM14	TCHR-14T
		TRM17	TCHR-17T
		TRM20	TCHR-20T
		TRM25	TCHR-25T
		TRM32	TCHR-32T

Contents

- 01 TCHA-H
Industrial Standard Rotary Actuator



- 17 TCHB-H
Industrial high performance Rotary Actuator



- 23 TCHB-S
Industrial high performance Rotary Actuator



- 31 TCHA-S
Standard Servo-Harmonic Reducer Module



- 47 TCHR-I
Low voltage joint modules



- 59 TCHR-T
Cobot Joint Module



- 70 TCP
Planetary modules



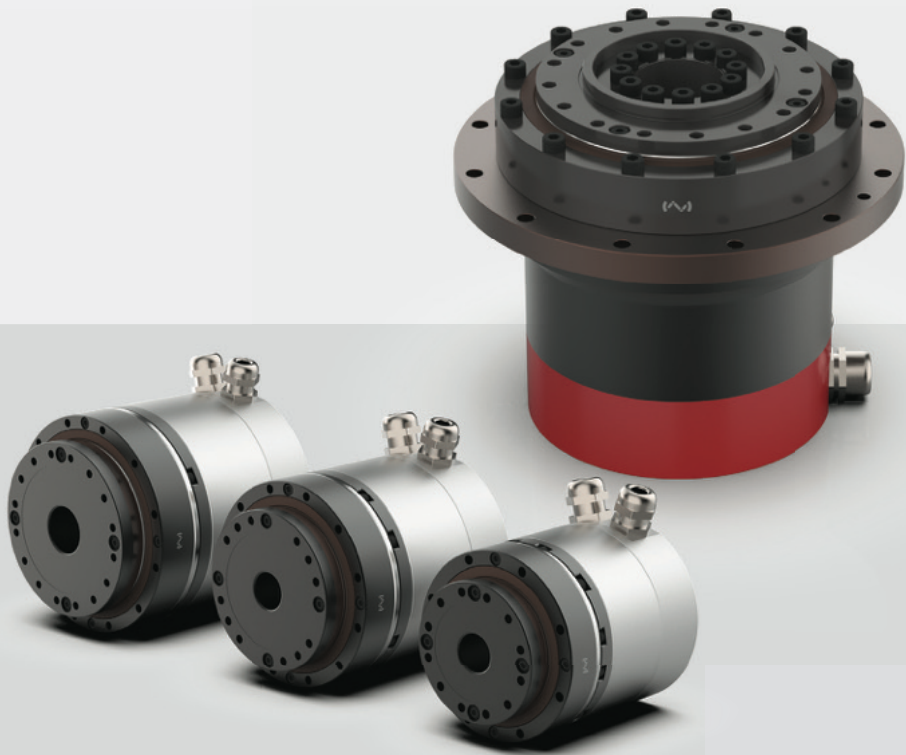
- 84 TCHL HarmoCore™
Lightweight harmonic actuator



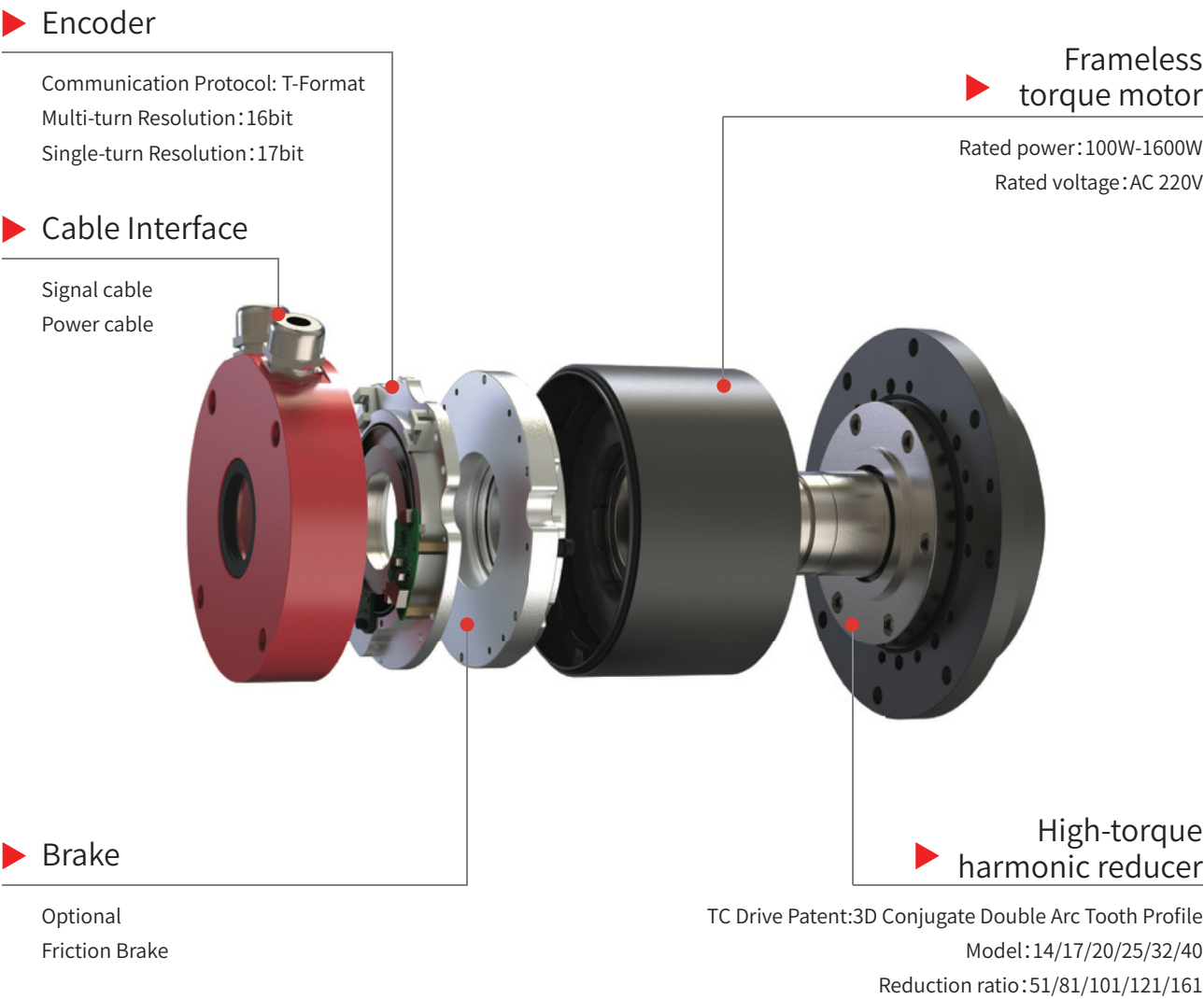
TCHA-H
Industrial Standard Rotary Actuator

TC Drive offers an integrated solution for rotary drive requirements in industrial automation by combining harmonic reducers with standard servo or stepper motors. This system delivers a highly compact form factor alongside high torque, precision, and rigidity. These actuators provide an ideal solution for applications with limited space, heavy load, and high precision requirements.

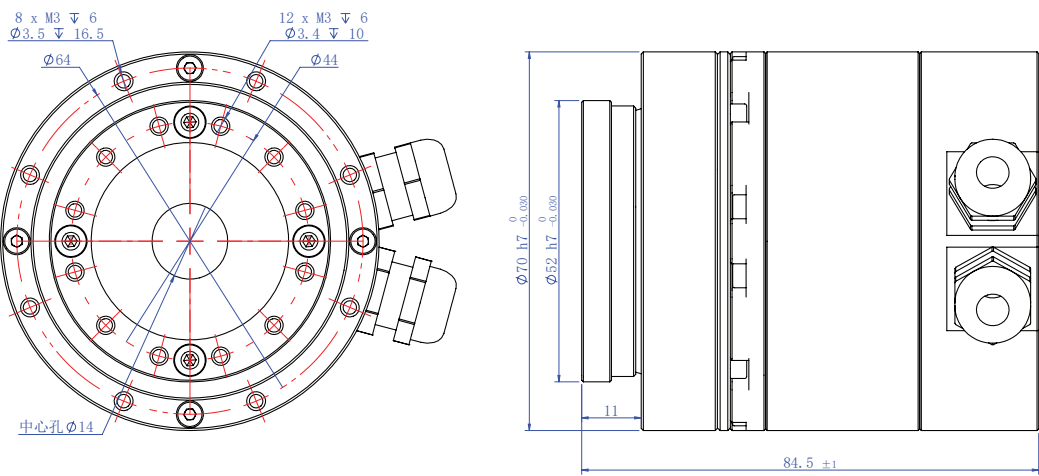
Our products can effectively replace several direct-drive motors, hollow rotary actuators, precision cam indexers, and servo-integrated high-ratio planetary gearboxes.



TCHA-H Structural Schematic Diagram

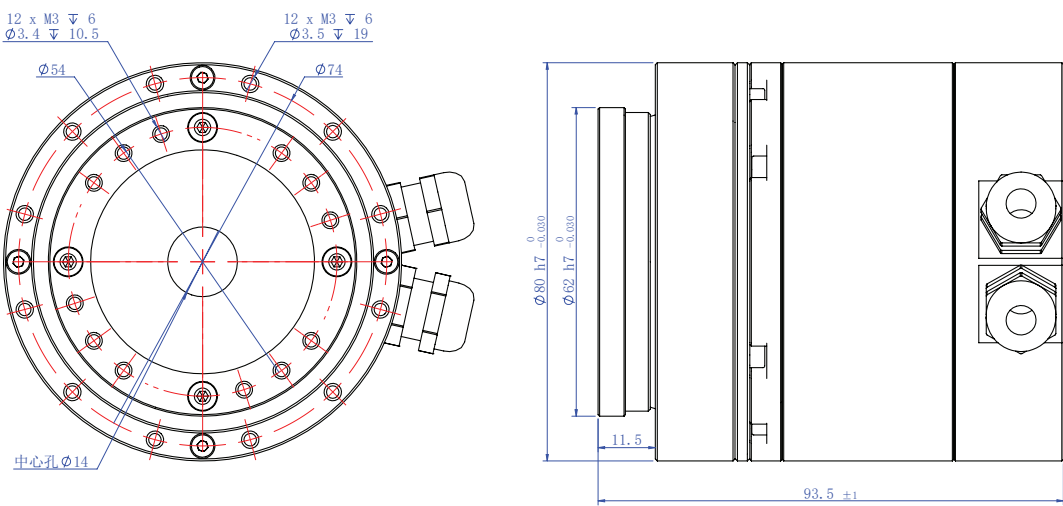


TCHA-H
Size 14



Prameters	Unit	TCHA-14H-51	TCHA-14H-81	TCHA-14H-101
Ratio		51	81	101
Maximum Allowable Average Load Torque	Nm	8.6	13.3	13.3
Peak torque for Start/Stop	Nm	21.9	28.5	34.2
Rated Speed	rpm	58.8	37	29.7
Maximum Speed	rpm	117.6	74	59.4
Rated Current	A	0.86	0.84	0.67
Maximum Current	A	2.58	2.52	2.01
Rated Voltage	V	AC 220		
Output Moment of Inertia (without brake)	kg·m^2	0.12	0.31	0.48
Output Moment of Inertia (with brake)	kg·m^2	0.13	0.35	0.54
Allowable Static Overturning Moment	Nm	74		
Reducer Backlash	arcsec	≤10		
Positioning Accuracy	arcsec	90		
Design Life	h	10000		
Weight(without brake)	kg	0.93		
Weight(with brake)	kg	0.98		
IP Protection Grade		IP65		
Encoder		Tamagawa Protocol,Multi-turn 16 bit,single-turn 17 bit		
Operating Environmental Conditions		Operating/Storage Temperature :0~40℃/-20~60℃ Operating/Storage Humidity:20~80%RH((non-condensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist,Indoor use only, avoid direct sunlight. Altitude below 1000 meters.		
Motor Insulation		Insulation Resistance:above 100MΩ(DC500V) Insulation Voltage:AC1500V/1MIN Insulation level:A class:A class		

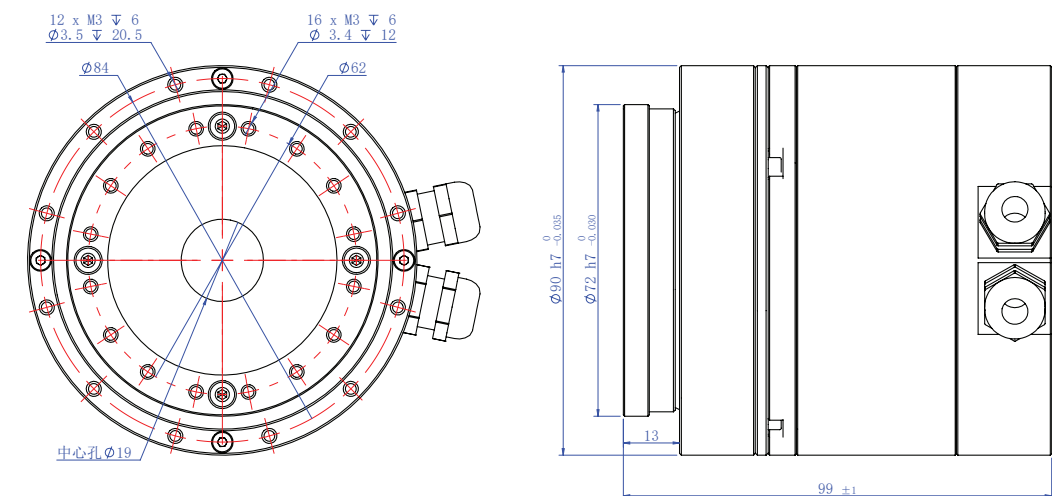
TCHA-H
Size 17



Prameters	Unit	TCHA-17H-51	TCHA-17H-81	TCHA-17H-101	TCHA-17H-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	25.5	33	48	48
Peak torque for Start/Stop	Nm	42	53	67	67
Rated Speed	rpm	58.8	37	29.7	24.7
Maximum Speed	rpm	117.6	74	59.4	49.5
Rated Current	A	1.66	1.35	1.58	1.32
Maximum Current	A	4.98	4.05	4.4	2.9
Rated Voltage	V	AC 220			
Output Moment of Inertia (without brake)	kg·m^2	0.17	0.43	0.67	0.97
Output Moment of Inertia (with brake)	kg·m^2	0.18	0.47	0.73	1.05
Allowable Static Overturning Moment	Nm	124			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	90			
Design Life	h	10000			
Weight(without brake)	kg	1.4			
Weight(with brake)	kg	1.5			
IP Protection Grade		IP65			
Encoder		Tamagawa Protocol,Multi-turn 16 bit,single-turn 17 bit			
Operating Environmental Conditions		Operating/Storage Temperature :0~40℃/-20~60℃ Operating/Storage Humidity:20~80%RH((non-condensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist,Indoor use only, avoid direct sunlight. Altitude below 1000 meters.			
Motor Insulation		Insulation Resistance:above 100MΩ(DC500V) Insulation Voltage:AC1500V/1MIN Insulation level:A class:A class			

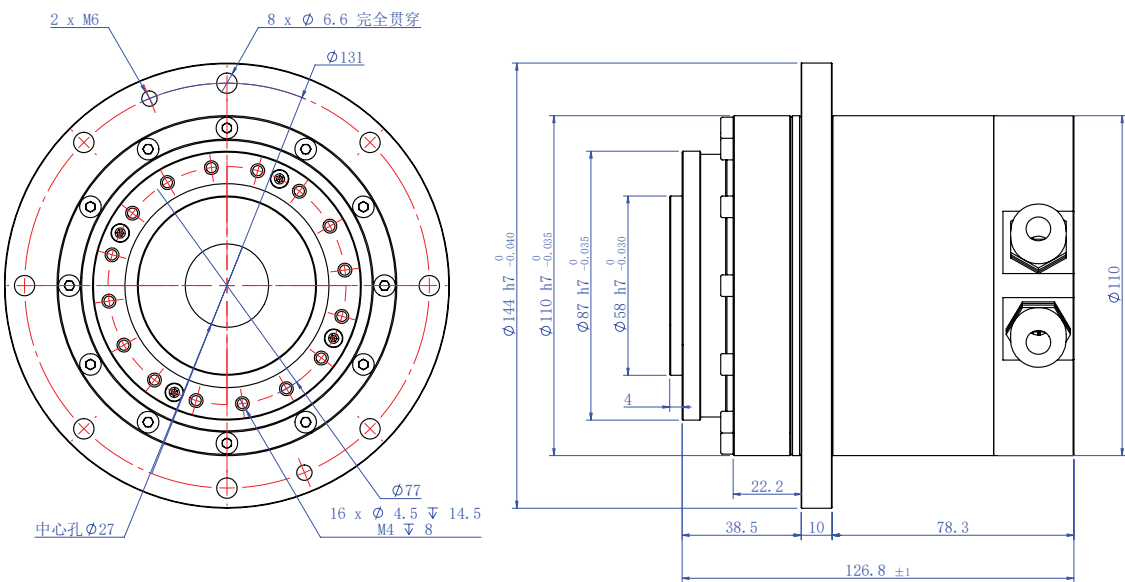
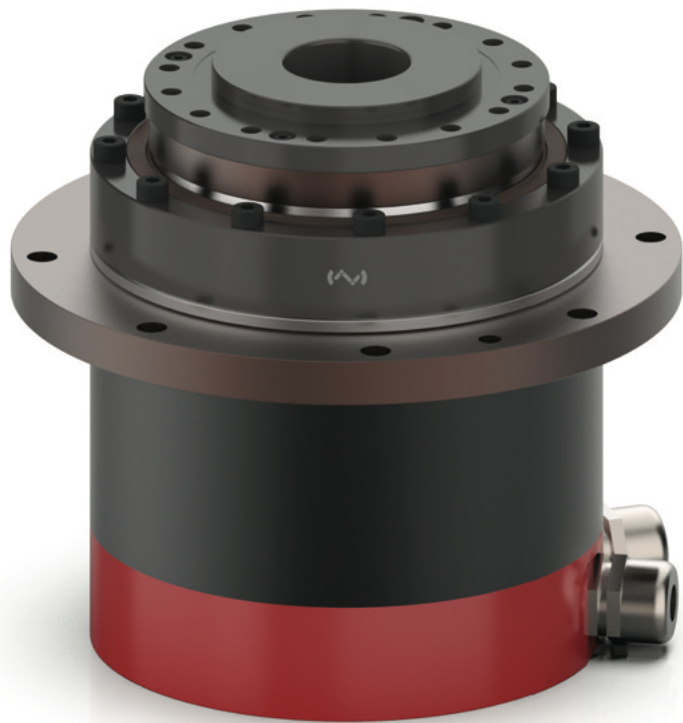
TCHA-H

Size 20



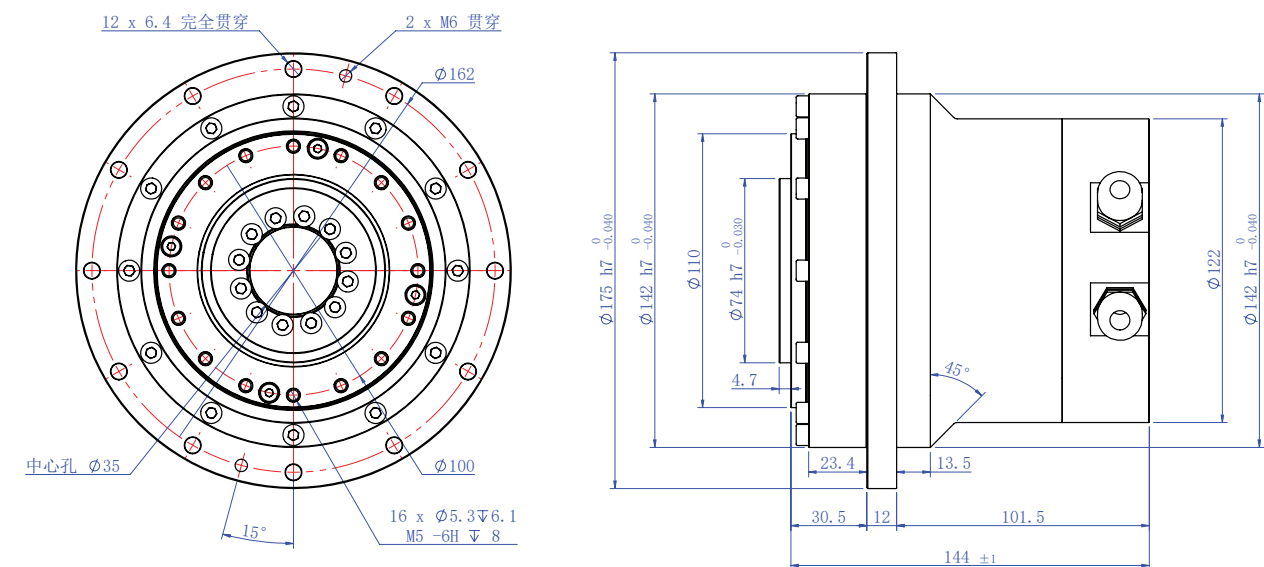
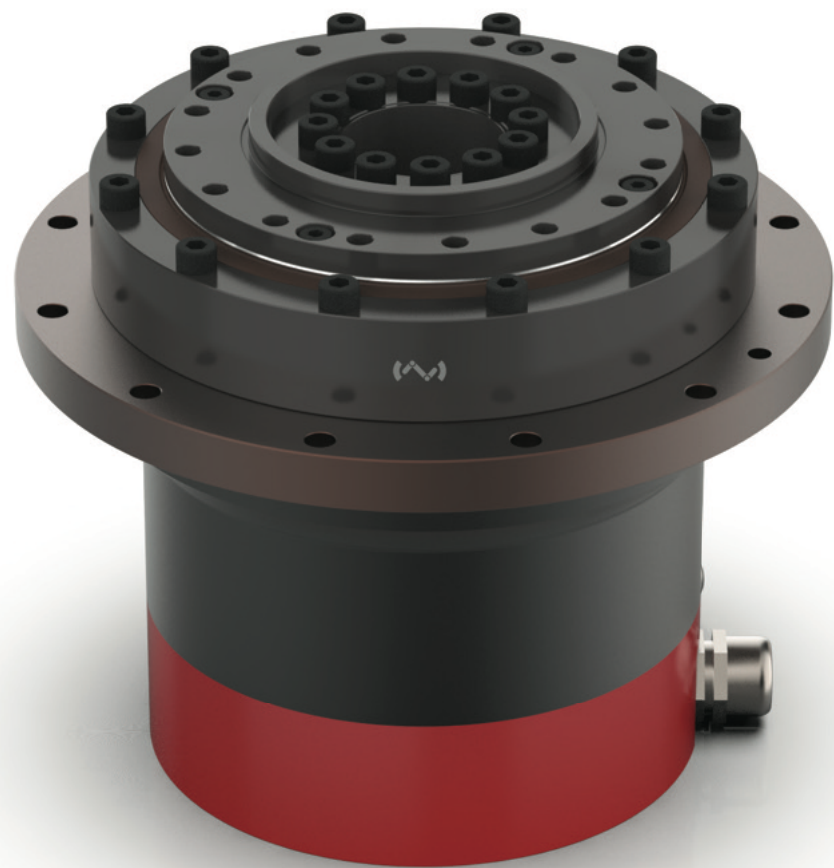
Prameters	Unit	TCHA-20H-51	TCHA-20H-81	TCHA-20H-101	TCHA-20H-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	42	58	61	61
Peak torque for Start/Stop	Nm	69	91	102	107
Rated Speed	rpm	58.8	37	29.7	24.7
Maximum Speed	rpm	117.6	74	59.4	49.5
Rated Current	A	1.56	1.36	1.15	0.96
Maximum Current	A	4.5	3.6	3.4	2.8
Rated Voltage	V	AC 220			
Output Moment of Inertia (without brake)	kg·m^2	0.36	0.93	1.44	2.07
Output Moment of Inertia (with brake)	kg·m^2	0.42	1.06	1.65	2.38
Allowable Static Overturning Moment	Nm	187			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Design Life	h	10000			
Weight(without brake)	kg	1.5			
Weight(with brake)	kg	1.6			
IP Protection Grade		IP65			
Encoder	Tamagawa Protocol,Multi-turn 16 bit,single-turn 17 bit				
Operating Environmental Conditions		Operating/Storage Temperature :0~40℃/-20~60℃ Operating/Storage Humidity:20~80%RH((non-condensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist,Indoor use only, avoid direct sunlight. Altitude below 1000 meters.			
Motor Insulation	Insulation Resistance:above 100MΩ (DC500V) Insulation Voltage:AC1500V/1MIN Insulation level:A class:A class				

TCHA-H
Size 25



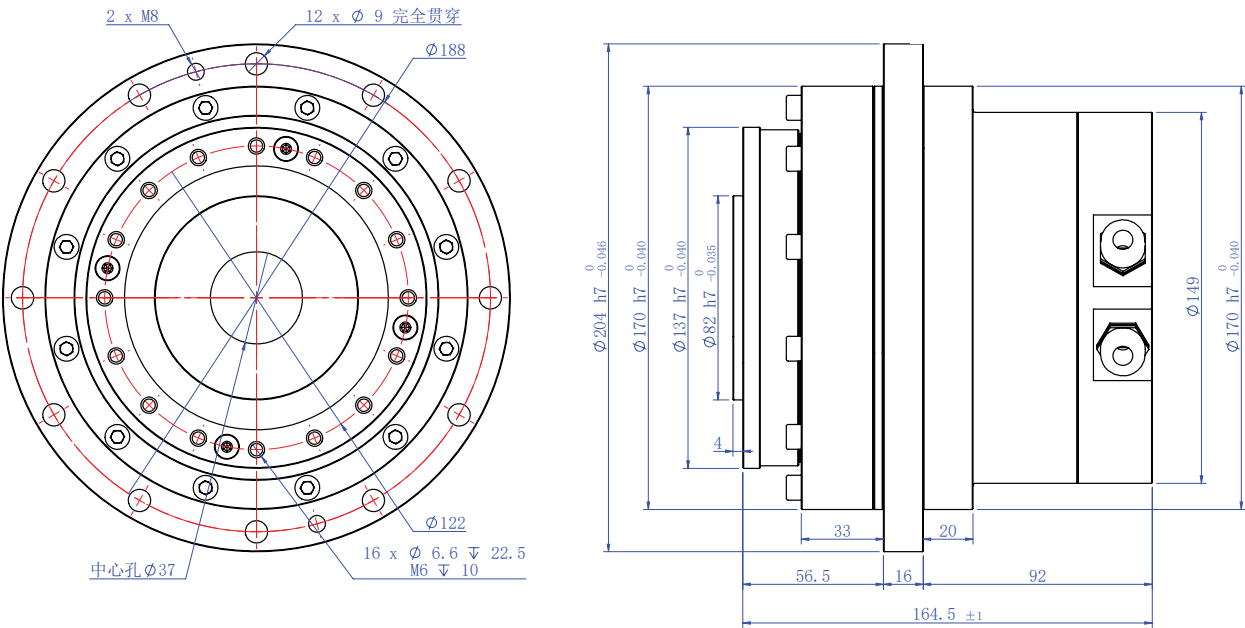
Prameters	Unit	TCHA-25H-51	TCHA-25H-81	TCHA-25H-101	TCHA-25H-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	68	107	133	133
Peak torque for Start/Stop	Nm	121	169	194	206
Rated Speed	rpm	58.8	37	29.7	24.7
Maximum Speed	rpm	98	61.7	49.5	41.3
Rated Current	A	2.84	2.8	2.8	2.33
Maximum Current	A	8.52	8.2	7.3	6.5
Rated Voltage	V	AC 220			
Output Moment of Inertia (without brake)	kg·m^2	0.71	1.79	2.79	4.00
Output Moment of Inertia (with brake)	kg·m^2	0.83	2.10	3.26	4.69
Allowable Static Overturning Moment	Nm	258			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Design Life	h	10000			
Weight(without brake)	kg	4.7			
Weight(with brake)	kg	5.1			
IP Protection Grade		IP65			
Encoder		Tamagawa Protocol,Multi-turn 16 bit,single-turn 17 bit			
Operating Environmental Conditions		Operating/Storage Temperature :0~40°C/-20~60°C Operating/Storage Humidity:20~80%RH((non-condensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist,Indoor use only, avoid direct sunlight. Altitude below 1000 meters.			
Motor Insulation		Insulation Resistance:above 100MΩ (DC500V) Insulation Voltage:AC1500V/1MIN Insulation level:A class:A class			

TCHA-H
Size 32



Prameters	Unit	TCHA-32H-51	TCHA-32H-81	TCHA-32H-101	TCHA-32H-121	TCHA-32H-161
Ratio		51	81	101	121	161
Maximum Allowable Average Load Torque	Nm	122	194	242	267	267
Peak torque for Start/Stop	Nm	267	375	411	436	460
Rated Speed	rpm	58.8	37	29.7	24.7	18.6
Maximum Speed	rpm	94.1	59.2	47.5	39.6	29.8
Rated Current	A	5.2	5.2	5.2	4.8	3.6
Maximum Current	A	15.6	15.6	15.6	14.4	11.4
Rated Voltage	V	AC 220				
Output Moment of Inertia (without brake)	kg·m^2	1.48	3.74	5.82	8.35	14.79
Output Moment of Inertia (with brake)	kg·m^2	1.69	4.28	6.65	9.55	16.92
Allowable Static Overturning Moment	Nm	580				
Reducer Backlash	arcsec	≤10				
Positioning Accuracy	arcsec	60				
Design Life	h	10000				
Weight(without brake)	kg	8.2				
Weight(with brake)	kg	8.6				
IP Protection Grade		IP65				
Encoder		Tamagawa Protocol,Multi-turn 16 bit,single-turn 17 bit				
Operating Environmental Conditions		Operating/Storage Temperature :0~40℃/-20~60℃ Operating/Storage Humidity:20~80%RH((non-condensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist,Indoor use only, avoid direct sunlight. Altitude below 1000 meters.				
Motor Insulation		Insulation Resistance:above 100MΩ (DC500V) Insulation Voltage:AC1500V/1MIN Insulation level:A class:A class				

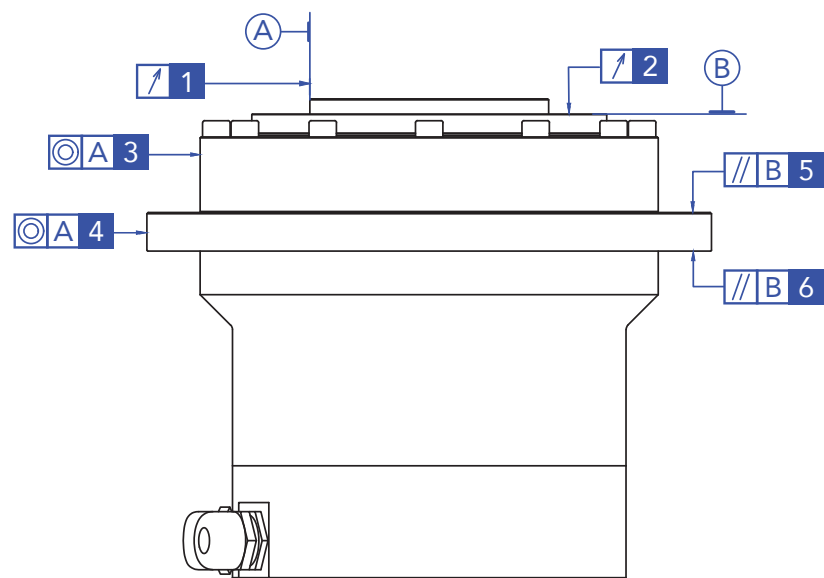
TCHA-H
Size 40



Prameters	Unit	TCHA-40H-51	TCHA-40H-81	TCHA-40H-101	TCHA-40H-121	TCHA-40H-161
Ratio		51	81	101	121	161
Maximum Allowable Average Load Torque	Nm	242	351	460	557	557
Peak torque for Start/Stop	Nm	497	641	701	762	799
Rated Speed	rpm	39.2	24.6	19.8	16.5	12.4
Maximum Speed	rpm	78.4	49.3	39.6	33	24.8
Rated Current	A	9.3	8.5	8.9	9	6.8
Maximum Current	A	27.9	25.5	25.8	23.5	17.7
Rated Voltage	V	AC 220				
Output Moment of Inertia (without brake)	kg·m^2	4.40	11.12	19.29	24.82	43.94
Output Moment of Inertia (with brake)	kg·m^2	4.62	11.66	18.13	26.02	46.07
Allowable Static Overturning Moment	Nm	849				
Reducer Backlash	arcsec	≤10				
Positioning Accuracy	arcsec	60				
Design Life	h	10000				
Weight(without brake)	kg	13				
Weight(with brake)	kg	13.6				
IP Protection Grade		IP65				
Encoder		Tamagawa Protocol,Multi-turn 16 bit,single-turn 17 bit				
Operating Environmental Conditions		Operating/Storage Temperature :0~40℃/-20~60℃ Operating/Storage Humidity:20~80%RH((non-condensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist,Indoor use only, avoid direct sunlight. Altitude below 1000 meters.				
Motor Insulation		Insulation Resistance:above 100MΩ (DC500V) Insulation Voltage:AC1500V/1MIN Insulation level:A class:A class				

TCHA-H

Mechanical Accuracy



No. [mm]	TCHA-14H	TCHA-17H	TCHA-20H	TCHA-25H	TCHA-32H	TCHA-40H
1	0.035	0.035	0.039	0.041	0.047	0.050
2	0.033	0.038	0.040	0.046	0.054	0.057
3	0.038	0.038	0.047	0.049	0.054	0.060
4	0.053	0.050	0.059	0.061	0.072	0.075
5	0.064	0.071	0.079	0.085	0.104	0.111
6	0.064	0.071	0.079	0.085	0.104	0.111

TCHB-H Industrial high performance Rotary Actuator

The TCHB-H series adopts an optical encoder and is equipped with a brake.

It features ultra-high precision and a compact structure, along with an optimized hollow bore diameter that provides ample space for various wiring and cable routing requirements.

Compared with standard Tongchuan actuators, this series delivers approximately 100% higher transmission stiffness and 50% improved transmission accuracy, making it ideal for application scenarios such as machine tool rotary tables and laser cutting equipment.



TCHB-H Structural Schematic Diagram

Cable Interface

Signal Cable
Power Cable

Hollow Bore Diameter
27-35mm

High Accuracy Optical Encoder

Communication Protocol: Tamagawa Protocol
Multi-turn resolution: 16bit
Single-turn resolution: 23bit

Brake

Optional
Friction Brake

High-torque
harmonic reducer

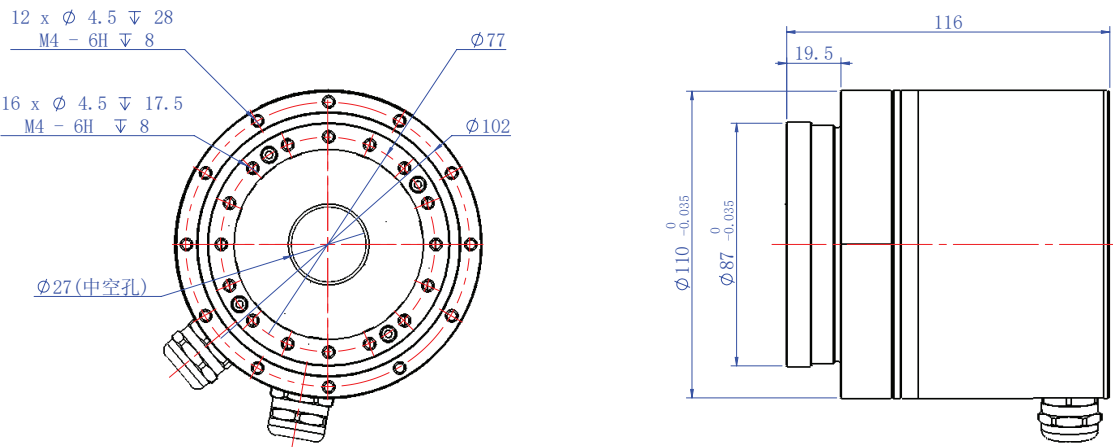
TC Drive Patent: 3D Conjugate Double Arc Tooth Profile
Model: 25/32
Ratio: 51/81/101/121

Frameless
torque motor

Rated power: 530W/900W
Rated voltage: AC 220V

TCHB-H

Size 25

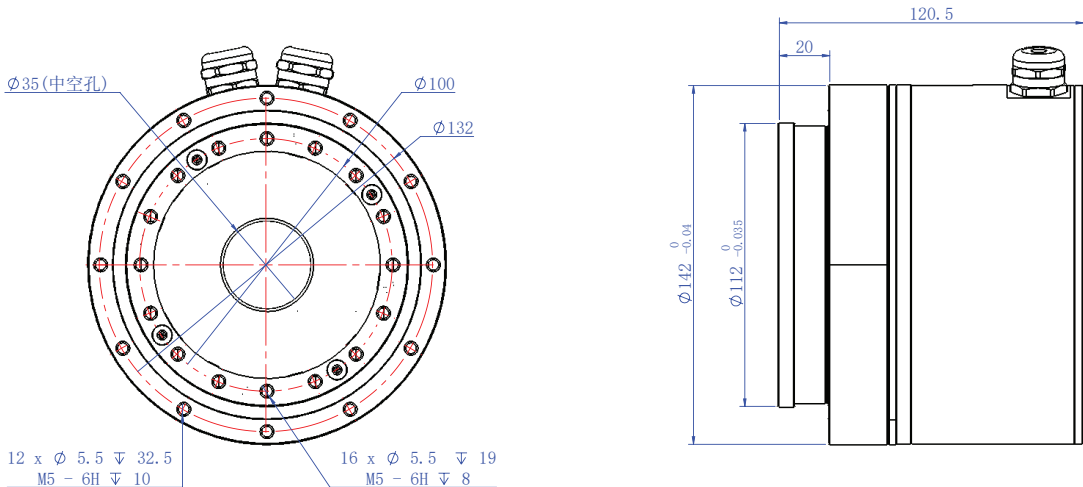


Prameters	Unit	TCHB-25H-51	TCHB-25H-81	TCHB-25H-101	TCHB-25H-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	68	107	133	133
Peak torque for Start/Stop	Nm	121	169	194	206
Rated Speed	rpm	58.8	37.0	29.7	24.7
Maximum Speed	rpm	98.0	61.7	49.5	41.3
Rated Current	A	2.82	2.80	2.79	2.33
Maximum Current	A	5.02	4.42	4.07	3.61
Rated Voltage	V	AC 220			
Output Moment of Inertia	kg·m^2	0.78	1.97	3.10	4.30
Allowable Static Overturning Moment	Nm	258			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Design Life	h	10000			
Weight	kg	3.8			
IP Protection Grade		IP 65			
Encoder		Tamagawa Protocol,Multi-turn 16 bit,single-turn 17 bit			
Operating Environmental Conditions		Operating/Storage Temperature :0~40°C/-20~60°C Operating/Storage Humidity:20~80%RH((non-condensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist,Indoor use only, avoid direct sunlight. Altitude below 1000 meters.			
Motor Insulation		Insulation Resistance:above 100MΩ (DC500V) Insulation Voltage:AC1500V/1MIN Insulation level:A class:A class			

TCHB-H
Size 32



TCHB-H



Prameters	Unit	TCHB-32H-51	TCHB-32H-81	TCHB-32H-101	THCB-32H-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	133	206	267	267
Peak torque for Start/Stop	Nm	267	375	411	436
Rated Speed	rpm	47.1	29.6	23.8	19.8
Maximum Speed	rpm	63.7	40.1	32.2	26.9
Rated Current	A	3	2.9	3	2.5
Maximum Current	A	8.9	8.7	9	7.5
Rated Voltage	V	AC 220			
Output Moment of Inertia	kg·m^2	10.4	26.2	40.8	58.5
Allowable Static Overturning Moment	Nm	580			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Design Life	h	10000			
Weight	kg	6.5			
IP Protection Grade		IP 65			
Encoder		Tamagawa Protocol,Multi-turn 16 bit,single-turn 17 bit			
Operating Environmental Conditions		Operating/Storage Temperature :0~40℃/-20~60℃ Operating/Storage Humidity:20~80%RH((non-condensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist,Indoor use only, avoid direct sunlight. Altitude below 1000 meters.			
Motor Insulation		Insulation Resistance:above 100MΩ (DC500V) Insulation Voltage:AC1500V/1MIN Insulation level:A class:A class			

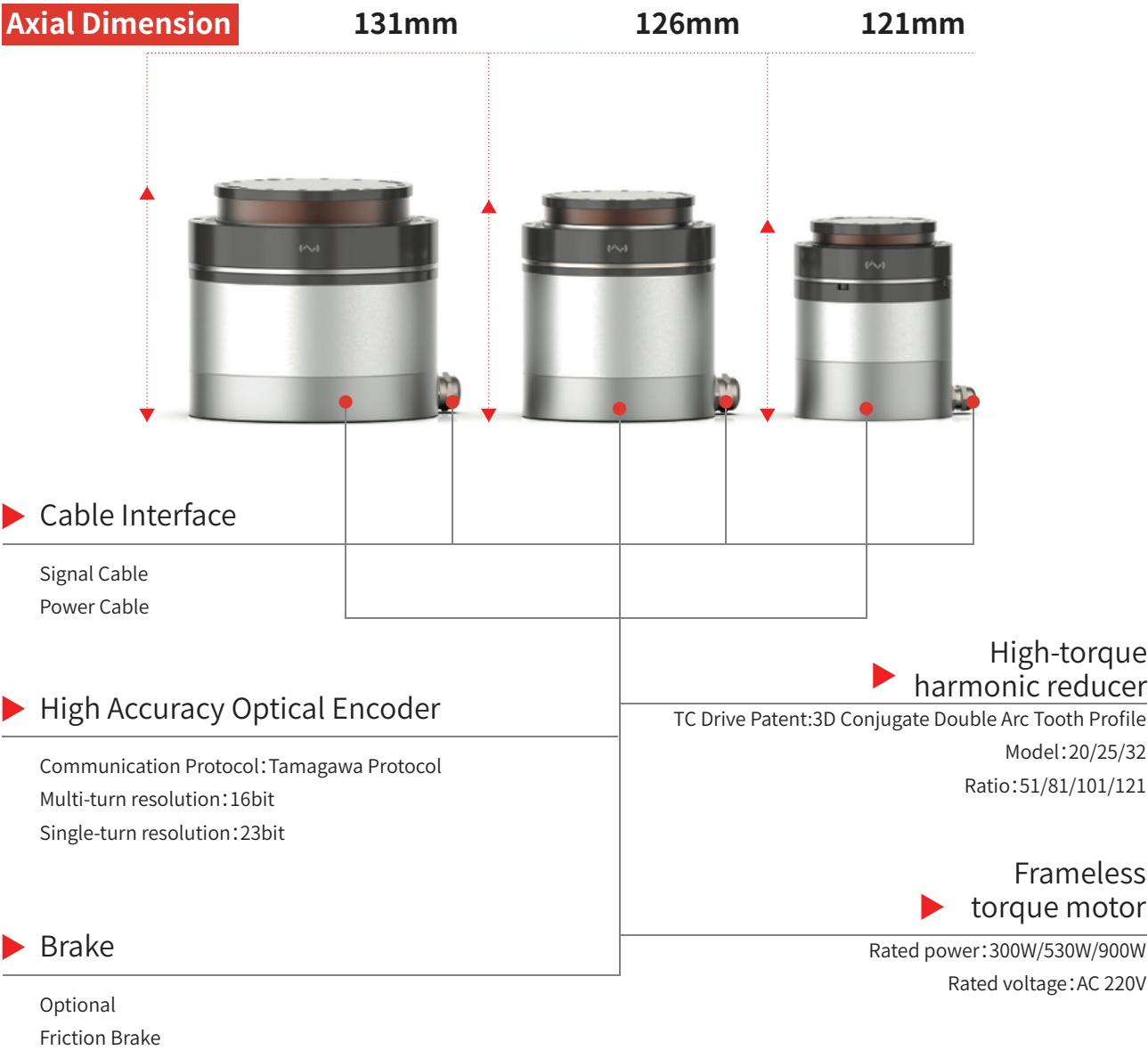
TCHB-S
Industrial high performance Rotary Actuator

The TCHB-S series adopts an optical encoder. It features ultra-high precision and a compact structure, along with compact axial dimension, ideal for installation spaces with limited actuator height.

Compared with standard Tongchuan actuators, this series delivers approximately 100% higher transmission stiffness and 50% improved transmission accuracy, making it ideal for application scenarios such as machine tool rotary tables and laser cutting equipment.



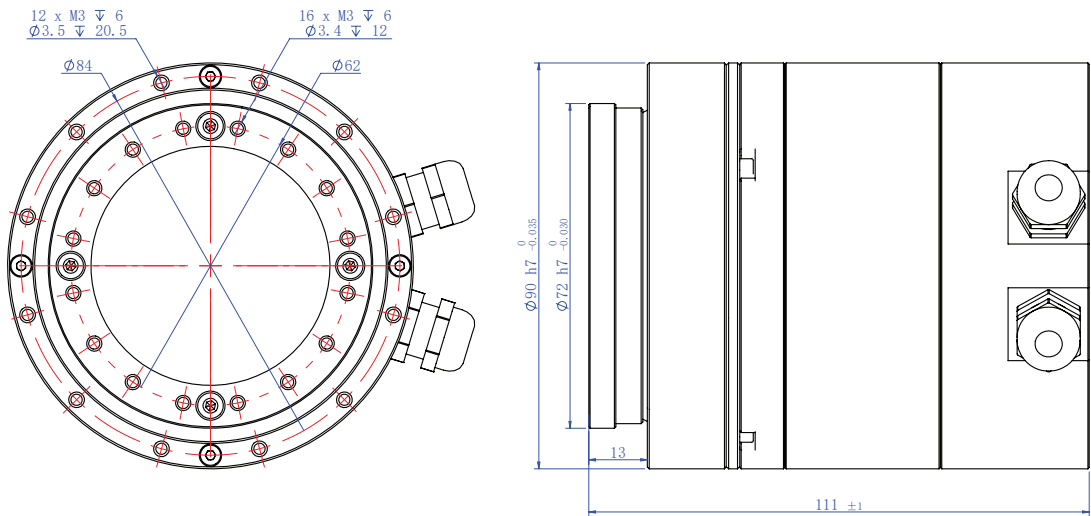
TCHB-S Structural Schematic Diagram



TCHB-S
Size 20



TCHB-S

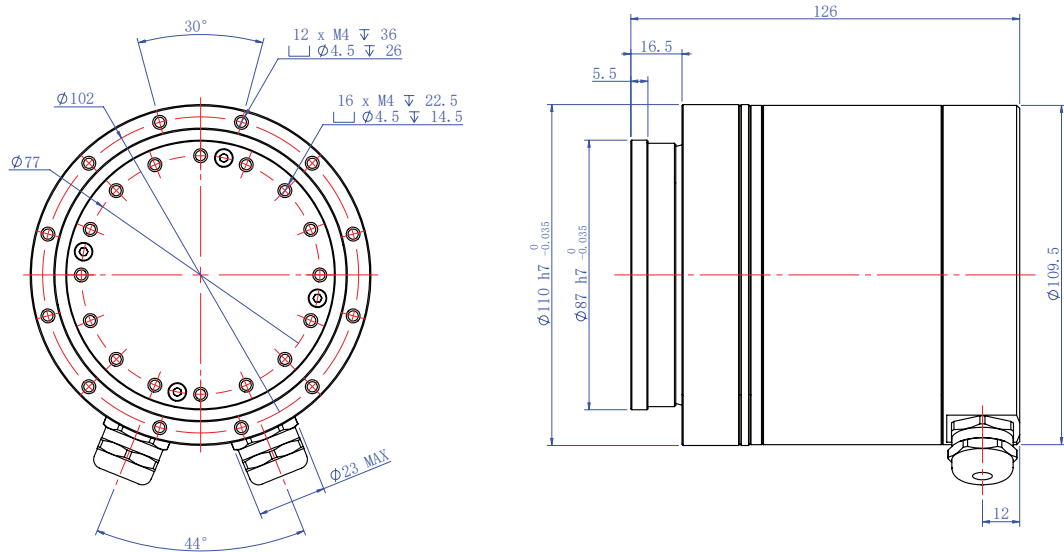


Parameters	Unit	TCHB-20S-51	TCHB-20S-81	TCHB-20S-101	TCHB-20S-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	42	58	61	61
Peak torque for Start/Stop	Nm	69	91	102	107
Rated Speed	rpm	58.8	37.0	29.7	24.7
Maximum Speed	rpm	117.6	74.0	59.4	49.5
Rated Current	A	1.56	1.36	1.15	0.96
Maximum Current	A	4.5	3.6	3.4	2.8
Rated Voltage	V	AC 220			
Output Moment of Inertia	kg·m^2	0.42	1.06	1.65	2.38
Allowable Static Overturning Moment	Nm	187			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Design Life	h	10000			
Weight	kg	1.9			
IP Protection Grade		IP 65			
Encoder		Tamagawa Protocol,Multi-turn 16 bit,single-turn 23bit			
Operating Environmental Conditions		Operating/Storage Temperature :0~40℃/-20~60℃ Operating/Storage Humidity:20~80%RH((non-condensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist,Indoor use only, avoid direct sunlight. Altitude below 1000 meters.			
Motor Insulation		Insulation Resistance:above 100MΩ (DC500V) Insulation Voltage:AC1500V/1MIN Insulation level:A class:A class			

TCHB-S
Size 25



TCHB-S

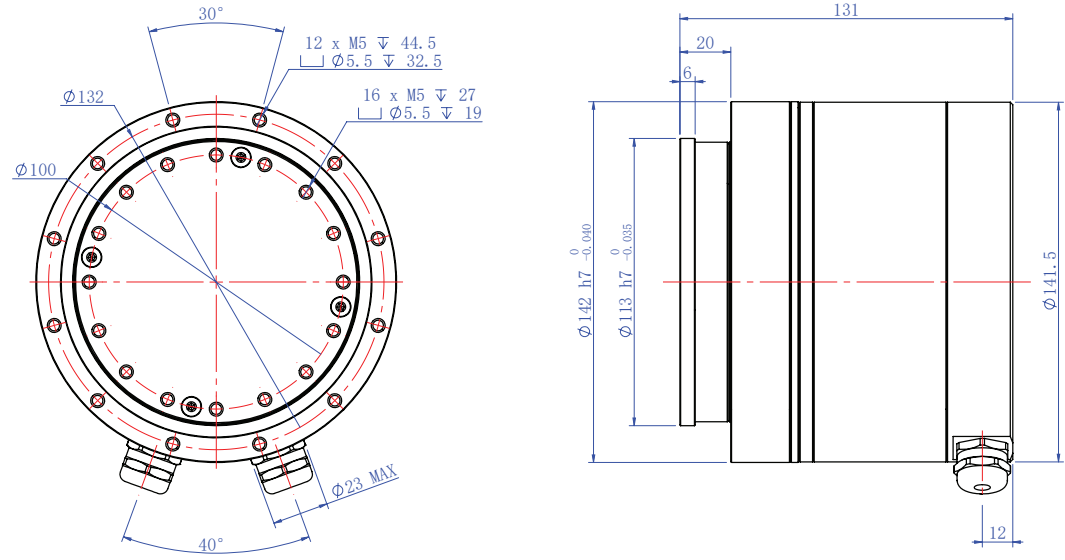


Prameters	Unit	TCHB-25S-51	TCHB-25S-81	TCHB-25S-101	TCHB-25S-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	68	107	133	133
Peak torque for Start/Stop	Nm	121	169	194	206
Rated Speed	rpm	58.8	37.0	29.7	24.8
Maximum Speed	rpm	98.0	61.7	49.5	41.3
Rated Current	A	2.8	2.8	2.8	2.3
Maximum Current	A	5	4.4	4	3.6
Rated Voltage	V	AC 220			
Output Moment of Inertia	kg·m^2	0.44	1.11	1.73	2.48
Allowable Static Overturning Moment	Nm	258			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Design Life	h	10000			
Weight	kg	3.9			
IP Protection Grade		IP 65			
Encoder		Tamagawa Protocol,Multi-turn 16 bit,single-turn 23bit			
Operating Environmental Conditions		Operating/Storage Temperature :0~40℃/-20~60℃ Operating/Storage Humidity:20~80%RH((non-condensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist,Indoor use only, avoid direct sunlight. Altitude below 1000 meters.			
Motor Insulation		Insulation Resistance:above 100MΩ (DC500V) Insulation Voltage:AC1500V/1MIN Insulation level:A class:A class			

TCHB-S
Size 32



TCHB-S



Parameters	Unit	TCHB-32S-51	TCHB-32S-81	TCHB-32S-101	TCHB-32S-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	133	206	267	267
Peak torque for Start/Stop	Nm	267	375	411	436
Rated Speed	rpm	47.1	29.6	23.8	19.8
Maximum Speed	rpm	63.7	40.1	32.2	26.9
Rated Current	A	3	2.9	3	2.5
Maximum Current	A	10.5	9.9	9	8
Rated Voltage	V	AC 220			
Output Moment of Inertia	kg·m^2	0.44	1.11	1.73	2.48
Allowable Static Overturning Moment	Nm	580			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Design Life	h	10000			
Weight	kg	6.8			
IP Protection Grade		IP 65			
Encoder		Tamagawa Protocol,Multi-turn 16 bit,single-turn 23bit			
Operating Environmental Conditions		Operating/Storage Temperature :0~40℃/-20~60℃ Operating/Storage Humidity:20~80%RH((non-condensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist,Indoor use only, avoid direct sunlight. Altitude below 1000 meters.			
Motor Insulation		Insulation Resistance:above 100MΩ (DC500V) Insulation Voltage:AC1500V/1MIN Insulation level:A class:A class			

TCHA-S Standard Servo-Harmonic Reducer Module

TC Drive integrates harmonic reducers with standard servo motors or stepper motors, providing an all-in-one solution with ultra-compact size, high torque, high precision and high rigidity for rotary transmission demands in the industrial automation field.



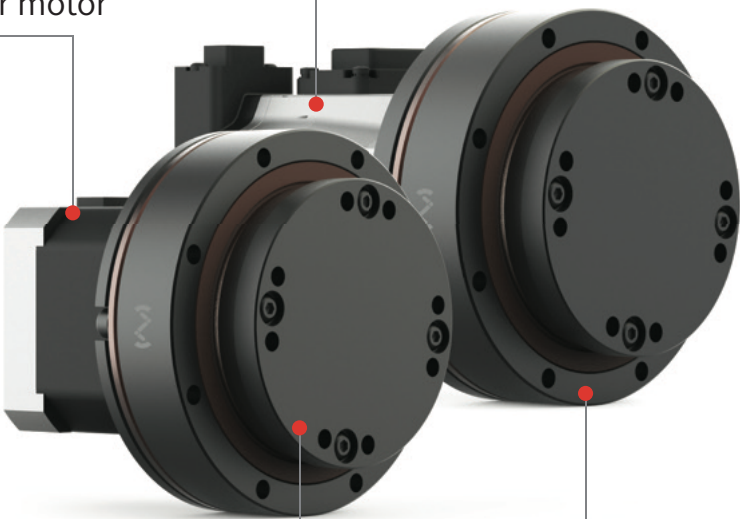
TCHA-S Structural Schematic Diagram

► Standard servo motor

Rated power: 100W/200W/400W/750W
Rated voltage: AC 220V
Optional

► Standard stepper motor

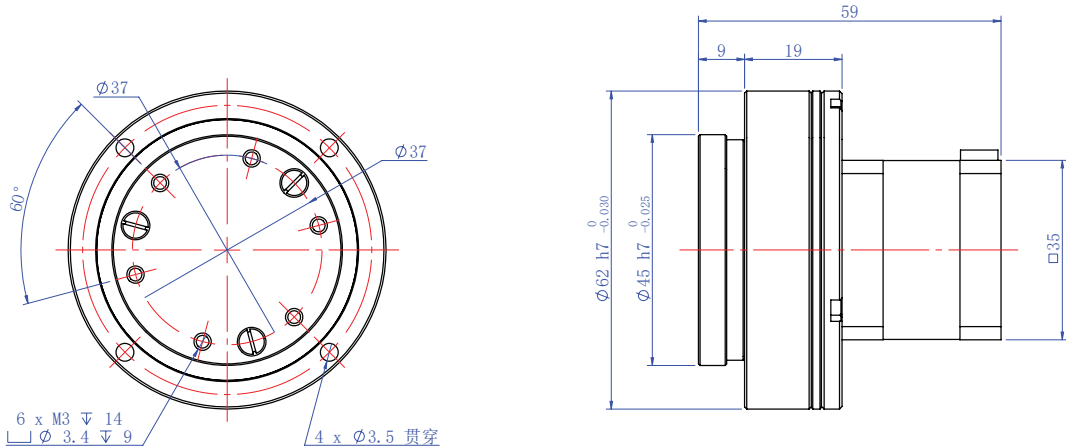
Rated voltage: DC 24V
Driver optional



► High-torque
harmonic reducer

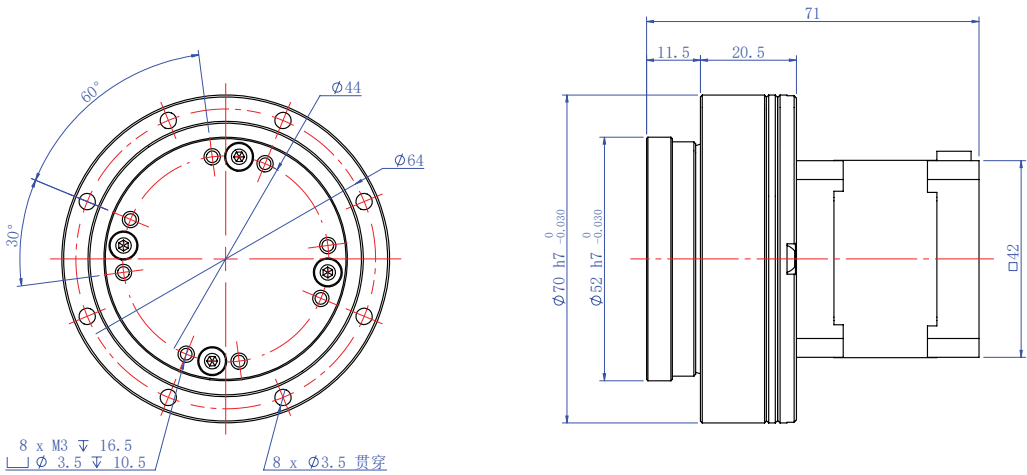
TC Drive Patent: 3D Conjugate Double Arc Tooth Profile
Model: 11/14/17/20/25/32
Ratio: 31/51/81/101/121/161

TCHA-S
Size 11 (stepper motor)



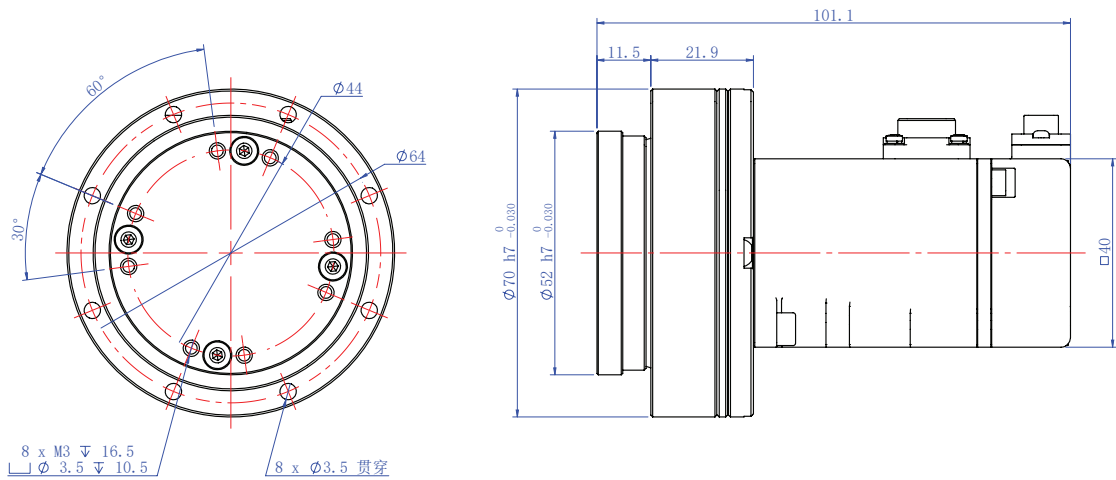
Parameters	Unit	TCHA-11S-31	TCHA-11S-51	TCHA-11S-101
Ratio		31	51	101
Maximum Allowable Average Load Torque	Nm	3.1	5.5	8.9
Peak Torque for Start/Stop	Nm	4.5	7.6	11
Rated voltage	V	DC 24		
Output Moment of Inertia	kg·m^2	0.004	0.011	0.045
Allowable Static Overturning Moment	Nm			
Reducer Backlash	arcsec	≤10		
Positioning Accuracy	arcsec	90		
Motor Step Angle	deg	1.8		
Frame Size		35		
Design Life	h	10000		
Weight	kg	0.59		
Operating Environmental Conditions		Operating/Storage Temperature:0~40℃/-20~40℃ Operating/Storage Humidity:20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist- Indoor use only, avoid direct sunlight.		
Optional motor				

TCHA-S
Size 14 (stepper motor)



Parameters	Unit	TCHA-14S-51	TCHA-14S-81	TCHA-11S-101
Ratio		51	81	101
Maximum Allowable Average Load Torque	Nm	8.6	13.3	13.3
Peak Torque for Start/Stop	Nm	20.4	28.5	34.2
Rated voltage	V	DC 24		
Output Moment of Inertia	kg·m^2	0.038	0.097	0.15
Allowable Static Overturning Moment	Nm	64		
Reducer Backlash	arcsec	≤10		
Positioning Accuracy	arcsec	90		
Motor Step Angle	deg	1.8		
Frame Size		42		
Design Life	h	10000		
Weight	kg	0.87		
Operating Environmental Conditions		Operating/Storage Temperature:0~40°C/-20~40°C		
		Operating/Storage Humidity:20~80%RH(noncondensation)		
		Free of dust, metal powder, corrosive gas, flammable gas and oil mist-		
		Indoor use only, avoid direct sunlight.		
Optional motor				

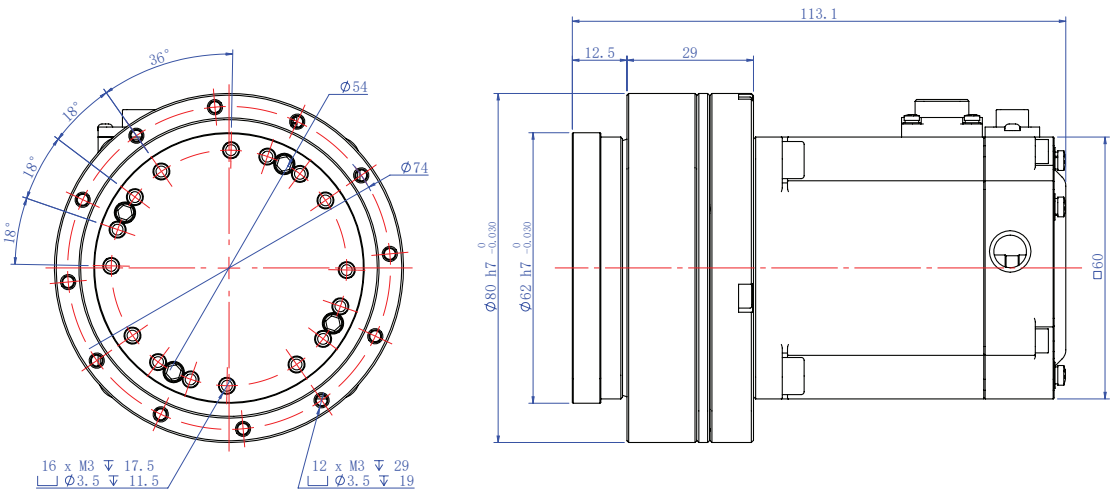
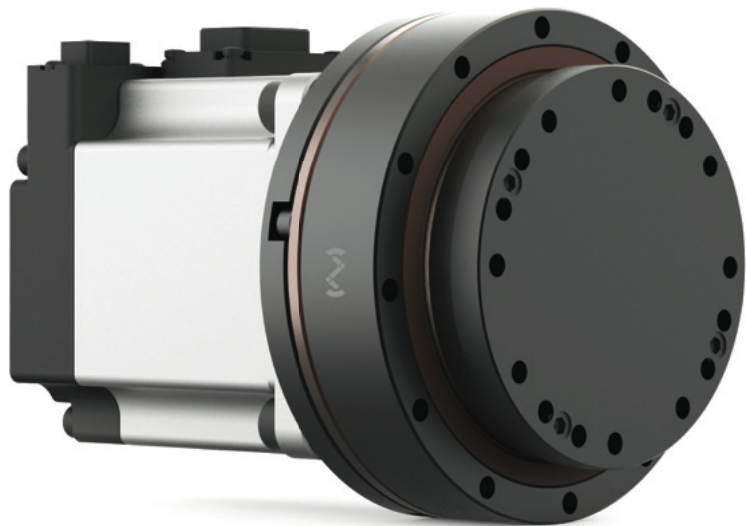
TCHA-S
Size 14 (stepper motor)



Parameters	Unit	TCHA-14S-51	TCHA-14S-81	TCHA-14S-101
Ratio		51	81	101
Maximum Allowable Average Load Torque	Nm	8.6	13.3	13.3
Peak Torque for Start/Stop	Nm	21.9	28.5	34.2
Rated Speed	rpm	58.8	37.0	29.7
Maximum Speed	rpm	98.0	61.7	49.5
Motor power	W	100		
Rated voltage	V	AC 220		
Output Moment of Inertia	kg·m^2	0.027	0.068	0.106
Allowable Static Overturning Moment	Nm	64		
Reducer Backlash	arcsec	≤10		
Positioning Accuarcy	arcsec	90		
Design life	h	10000		
Weight	kg	1.03		
IP Protection Grade		IP65		
Encoder		Optional		
Operating Environmental Conditions		Operating/Storge Temperature:0~40°C/-20~40°C Operating/Storge Humidity:20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist- Indoor use only, avoid direct sunlight.		

Optional motor

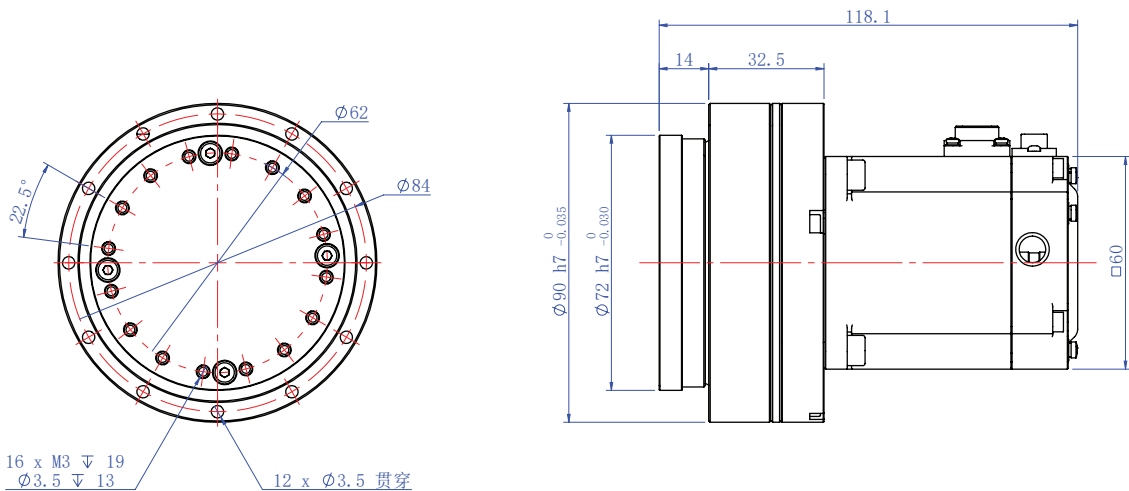
TCHA-S
Size 17 (servo motor)



Parameters	Unit	TCHA-17S-51	TCHA-17S-81	TCHA-17S-101	TCHA-17S-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	32	33	48	48
Peak Torque for Start/Stop	Nm	42	53	67	67
Rated Speed	rpm	58.8	37.0	29.7	24.8
Maximum Speed	rpm	98.0	61.7	49.5	41.3
Motor power	W	200			
Rated voltage	V	AC 220			
Output Moment of Inertia	kg·m^2	0.11	0.28	0.43	0.62
Allowable Static Overturning Moment	Nm	112			
Reducer Backlash	arcsec	≤10			
Positioning Accuarcy	arcsec	90			
Design life	h	10000			
Weight	kg	2.07			
IP Protection Grade		IP65			
Encoder		Optional			
Operating Environmental Conditions		Operating/Storage Temperature:0~40°C/-20~40°C Operating/Storage Humidity:20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist- Indoor use only, avoid direct sunlight.			

Optional motor

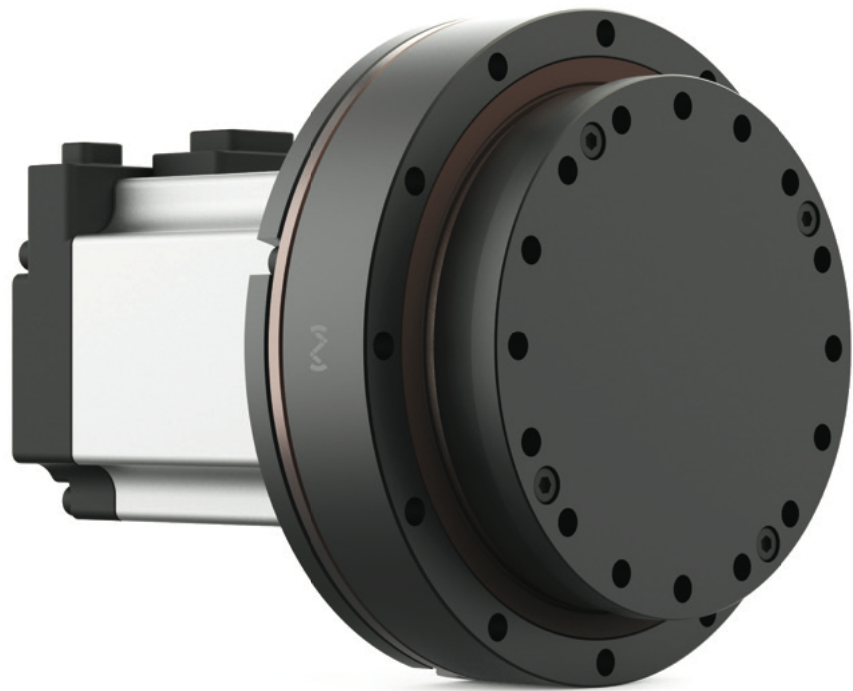
TCHA-S
Size 20 (servo motor)



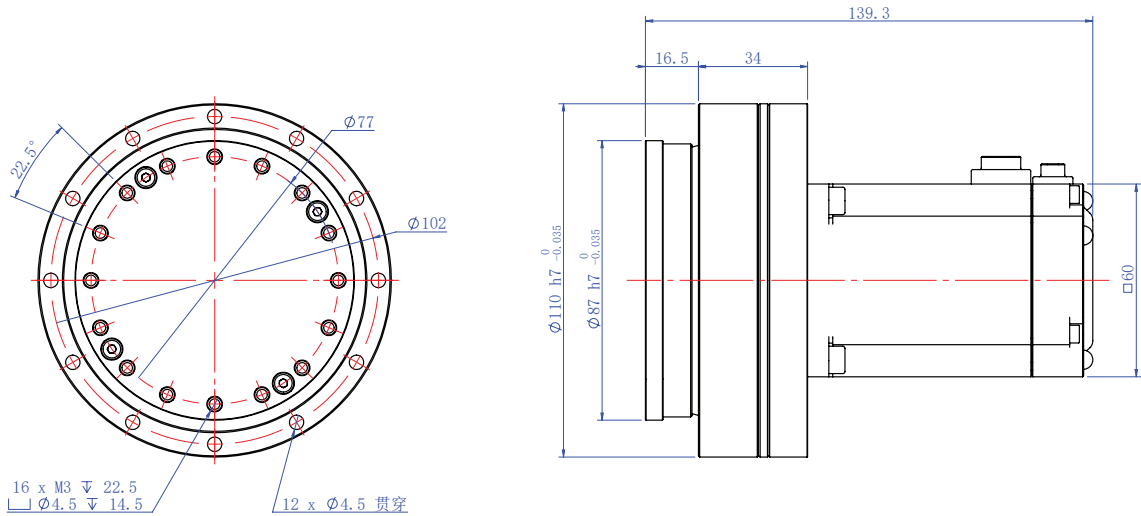
Parameters	Unit	TCHA-20S-51	TCHA-20S-81	TCHA-20S-101	TCHA-20S-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	33	52	61	61
Peak Torque for Start/Stop	Nm	69	91	102	107
Rated Speed	rpm	58.8	37.0	29.7	24.8
Maximum Speed	rpm	98.0	61.7	49.5	41.3
Motor power	W	200			
Rated voltage	V	AC 220			
Output Moment of Inertia	kg·m^2	0.14	0.35	0.54	0.77
Allowable Static Overturning Moment	Nm	187			
Reducer Backlash	arcsec	≤10			
Positioning Accuarcy	arcsec	60			
Design life	h	10000			
Weight	kg	2.36			
IP Protection Grade		IP65			
Encoder		Optional			
Operating Environmental Conditions		Operating/Storage Temperature:0~40°C/-20~40°C Operating/Storage Humidity:20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist- Indoor use only, avoid direct sunlight.			

Optional motor

TCHA-S
Size 25 (servo motor)



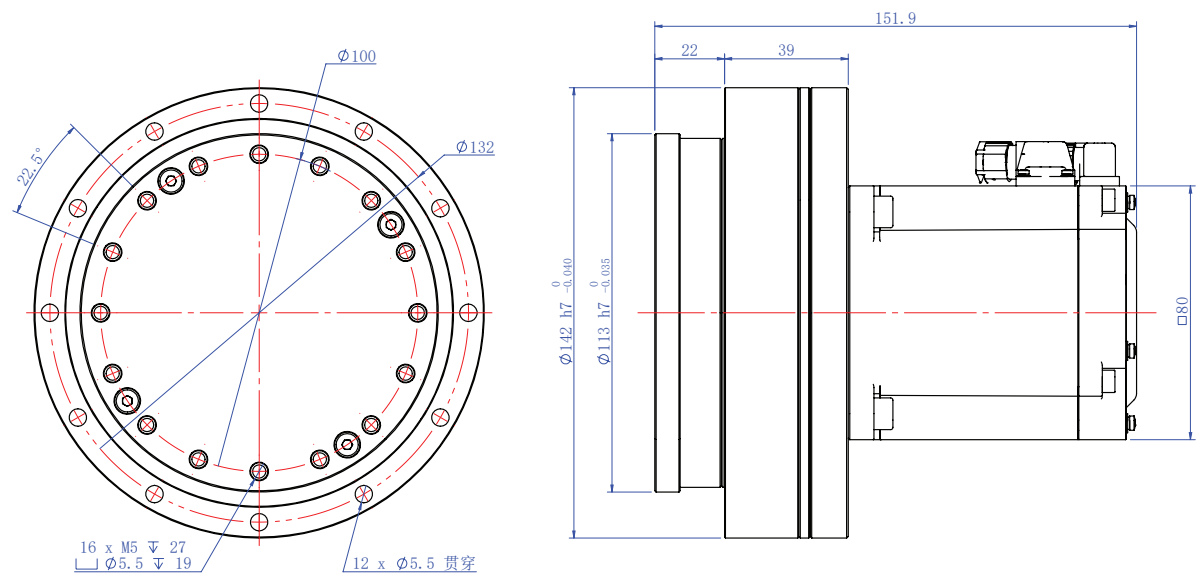
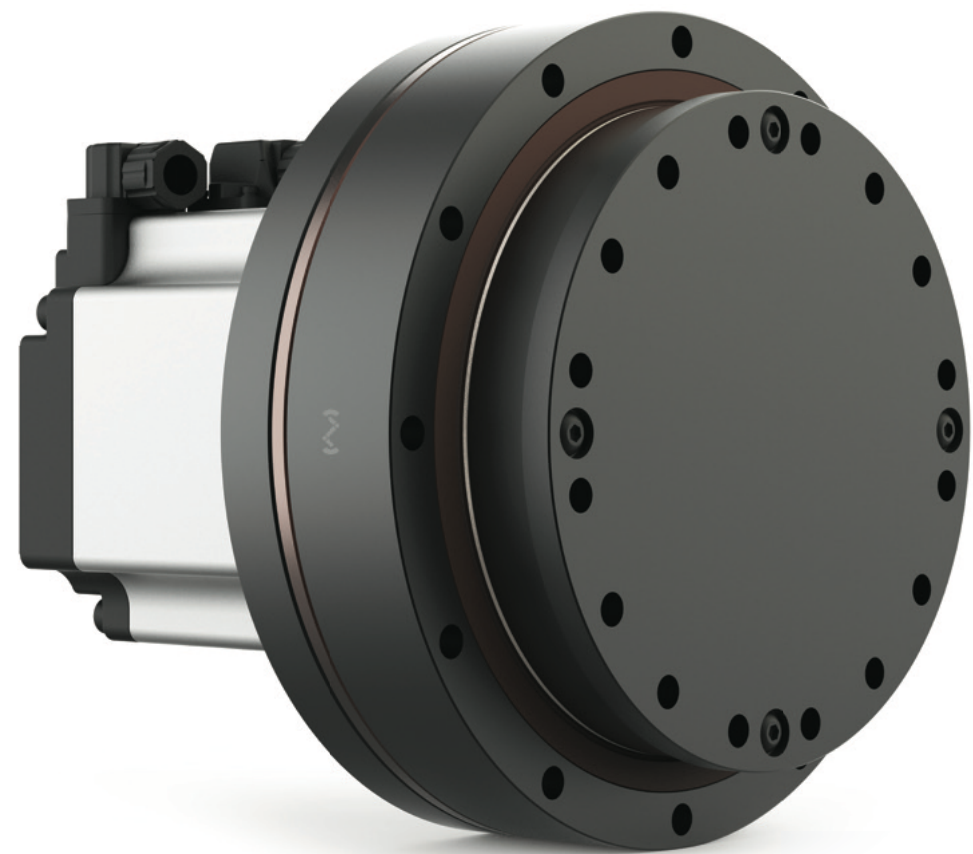
TCHA-S



Parameters	Unit	TCHA-25S-51	TCHA-25S-81	TCHA-25S-101	TCHA-25S-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	65	103	128	133
Peak Torque for Start/Stop	Nm	121	169	194	206
Rated Speed	rpm	58.8	37.0	29.7	24.8
Maximum Speed	rpm	98.0	61.7	49.5	41.3
Motor power	W	400			
Rated voltage	V	AC 220			
Output Moment of Inertia	kg·m^2	0.29	0.73	1.14	1.64
Allowable Static Overturning Moment	Nm	258			
Reducer Backlash	arcsec	≤10			
Positioning Accuarcy	arcsec	60			
Design life	h	10000			
Weight	kg	3.52			
IP Protection Grade		IP65			
Encoder		Optional			
Operating Environmental Conditions		Operating/Storage Temperature:0~40°C/-20~40°C Operating/Storage Humidity: 20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist- Indoor use only, avoid direct sunlight.			

Optional motor

TCHA-S
Size 32 (servo motor)



Parameters	Unit	TCHA-32S-51	TCHA-32S-81	TCHA-32S-101	TCHA-32S-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	122	194	241	267
Peak Torque for Start/Stop	Nm	267	375	411	436
Rated Speed	rpm	58.8	37.0	29.7	24.8
Maximum Speed	rpm	98.0	61.7	49.5	41.3
Motor power	W	750			
Rated voltage	V	AC 220			
Output Moment of Inertia	kg·m^2	0.88	2.23	3.46	4.97
Allowable Static Overturning Moment	Nm	580			
Reducer Backlash	arcsec	≤10			
Positioning Accuarcy	arcsec	60			
Design life	h	10000			
Weight	kg	6.92			
IP Protection Grade		IP65			
Encoder		Optional			
Operating Environmental Conditions		Operating/Storage Temperature:0~40°C/-20~40°C Operating/Storage Humidity:20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist- Indoor use only, avoid direct sunlight.			

Optional motor

TCHR-I Low voltage joint modules

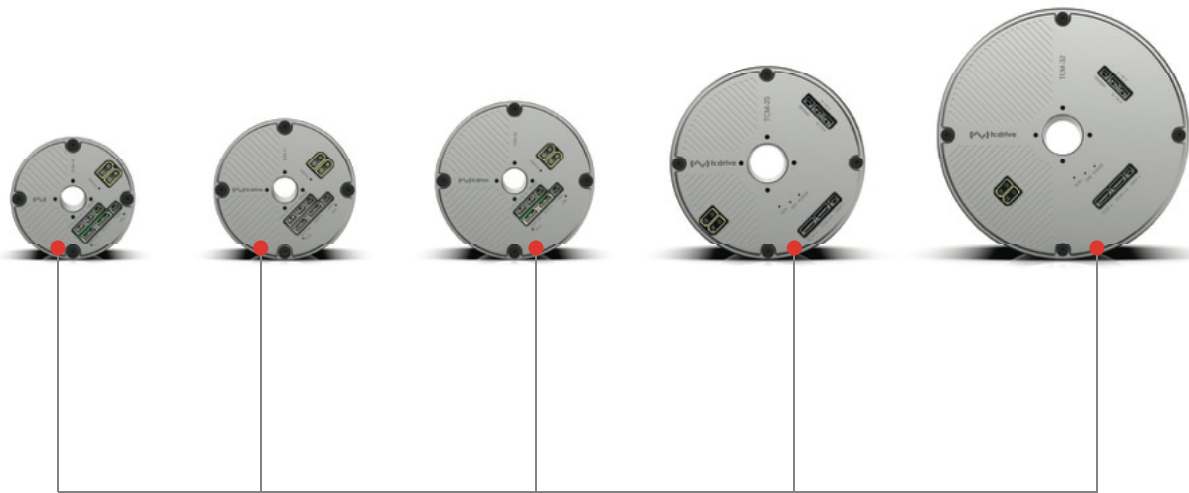
The TCHR-I series of low-voltage module products utilizes a dual magnetic encoder and is equipped with a brake. With full closed-loop control, it offers high-precision transmission performance and exceptional overload resistance.

With a complete range of models, from 11 to 40, it is an ideal choice for building robotic arms of various load levels.



TCHR-I Structural Schematic Diagram

Hollow bore diameter 14-22mm



► Dual Encoders

Dual encoders at input and output sides
Multi-turn resolution: 16bit
Single-turn resolution: 17/19/21bit

► Brake

Optional
Friction Brake

► High-torque harmonic reducer

TC Drive Patent: 3D Conjugate Double Arc Tooth Profile
model: 11/14/17/20/25/32/40
ratio: 51/81/101/121/161

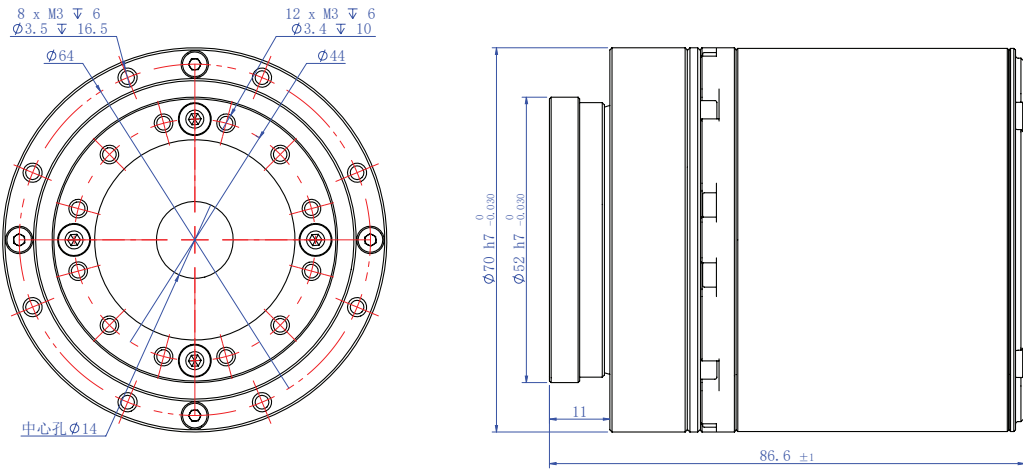
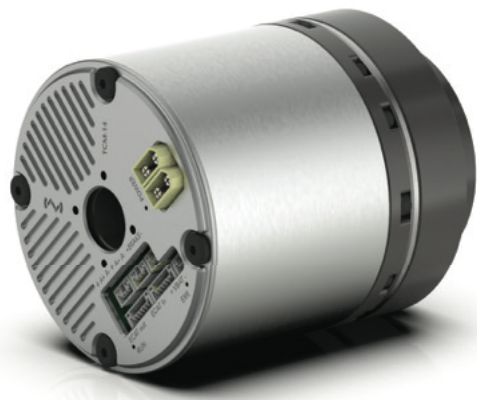
► Frameless torque motor

Rated power: 100W/150W/300W/630W/900W/1600W
Rated voltage: DC 48V

► Driver

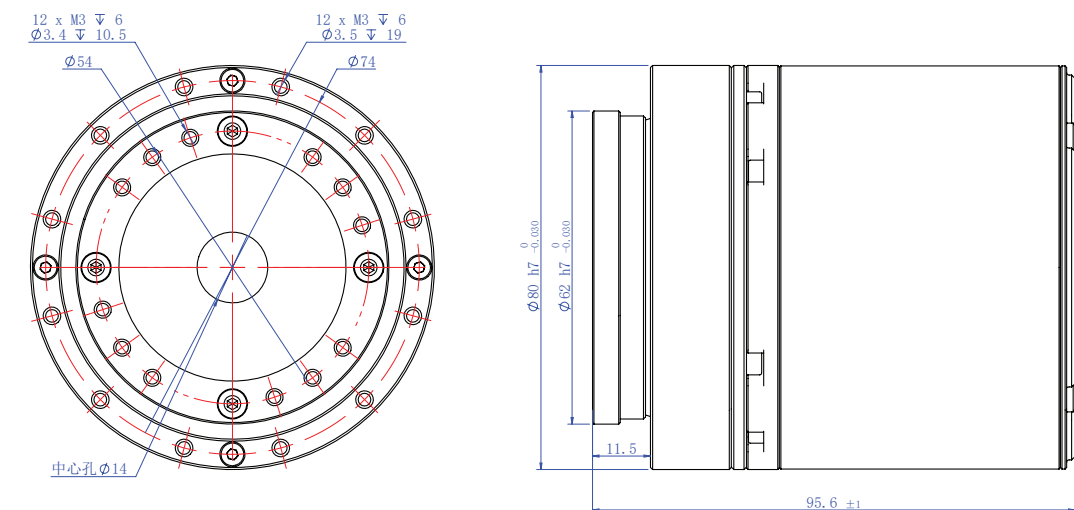
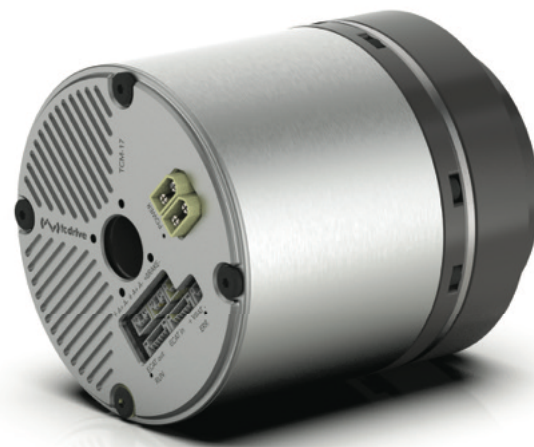
Communication Protocol: Ether CAT
Rated voltage: DC 48V

TCHR-I
Size 14



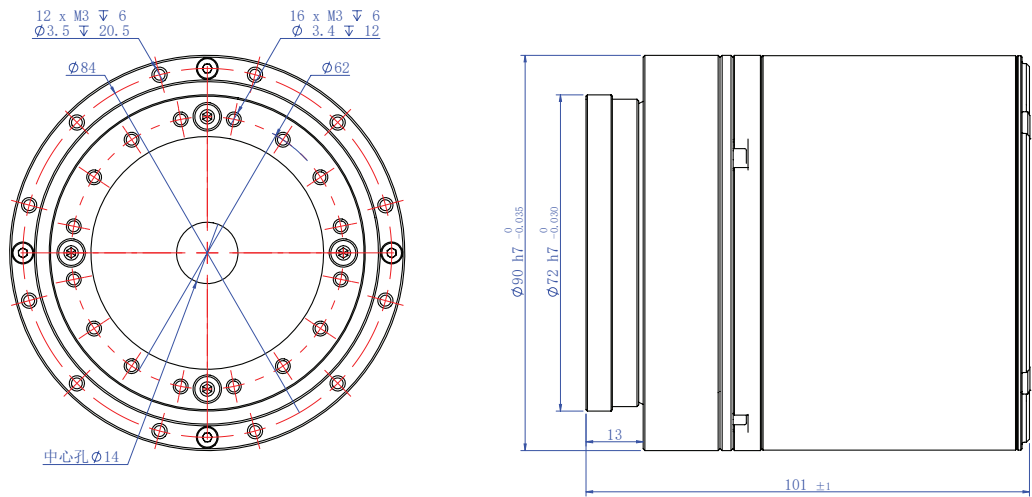
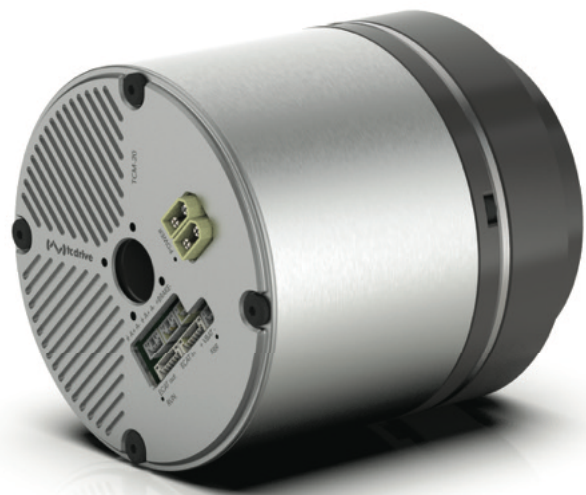
Parameters	Unit	TCHR-14I-51	TCHR-14I-81	TCHR-14I-101
Ratio		51	81	101
Maximum Allowable Average Load Torque	Nm	8.6	13.3	13.3
Peak Torque for Start/Stop	Nm	21.9	28.5	34.2
Rated Speed	rpm	58.8	37	29.7
Maximum Speed	rpm	78.4	49.3	39.6
Rated Current	A	1.3	1.3	1.1
Maximum Current	A	4	4	3.2
Rated Voltage	V	DC 48		
Output Moment of Inertia	kg·m^2	0.13	0.35	0.54
Allowable Static Overturning Moment	Nm	74		
Reducer Backlash	arcsec	≤10		
Positioning Accuracy	arcsec	90		
Positioning Accuracy	h	10000		
Weight	kg	0.95		
Operating Environmental Conditions		Operating/Storage Temperature: 0~40℃/-20~60℃ Operating/Storage Humidity: 20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist- Indoor use only, avoid direct sunlight. Altitude below 1000 meters		
Motor Insulation		Insulation Resistance: above 100MΩ(DC500V) Insulation Voltage: AC1500V/1MIN Insulation Level: A class		

TCHR-I
Size 17



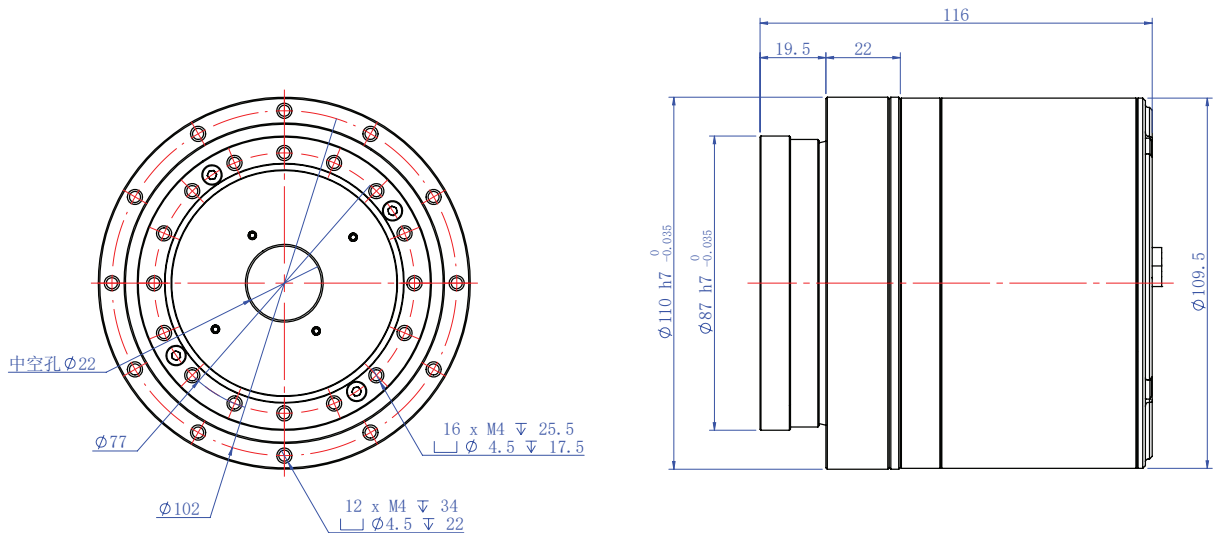
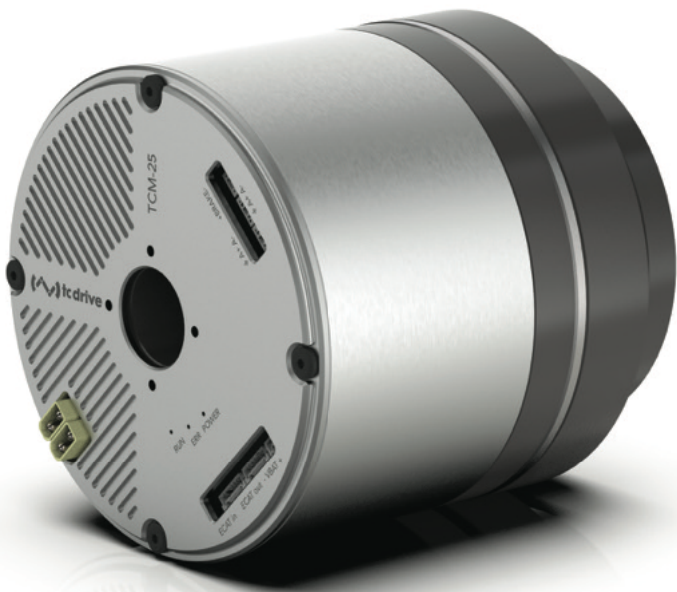
Parameters	Unit	TCHR-17I-51	TCHR-17I-81	TCHR-17I-101	TCHR-17I-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	22.9	33	45.4	48
Peak Torque for Start/Stop	Nm	42	53	67	67
Rated Speed	rpm	58.8	37	29.7	24.7
Maximum Speed	rpm	90.1	56.7	45.5	38
Rated Current	A	4.2	3.8	4.2	3.7
Maximum Current	A	12.6	11.4	12.5	8.2
Rated Voltage	V	DC 48			
Output Moment of Inertia	kg·m^2	0.18	0.47	0.73	1.05
Allowable Static Overturning Moment	Nm	124			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	90			
Positioning Accuracy	h	10000			
Weight	kg	1.4			
Operating Environmental Conditions		Operating/Storage Temperature: 0~40°C/-20~60°C Operating/Storage Humidity: 20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist- Indoor use only, avoid direct sunlight. Altitude below 1000 meters			
Motor Insulation		Insulation Resistance: above 100MΩ(DC500V) Insulation Voltage: AC1500V/1MIN Insulation Level: A class			

TCHR-I
Size 20



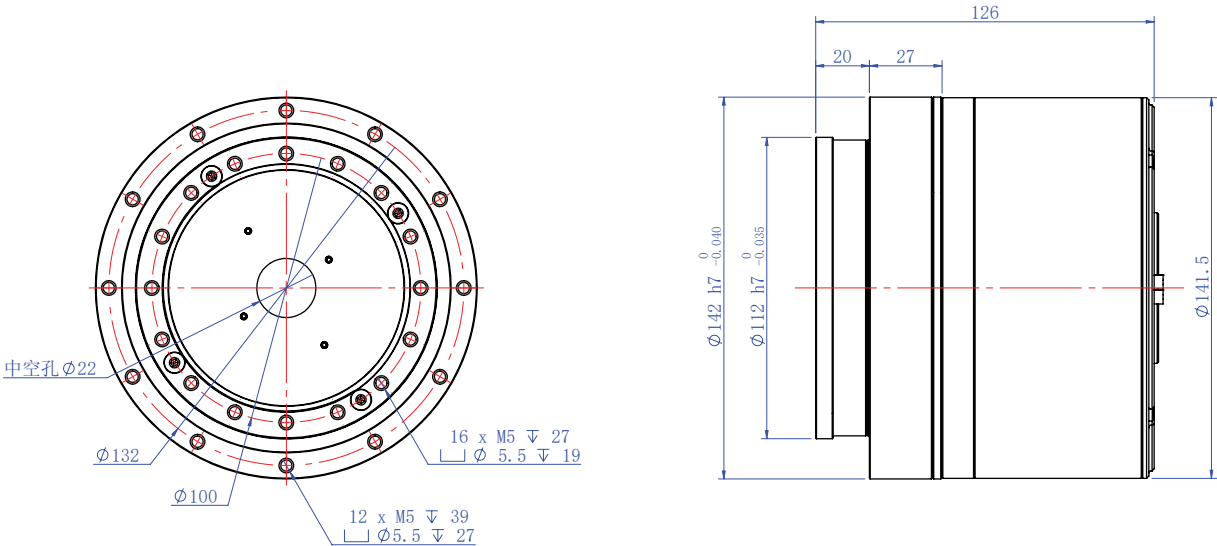
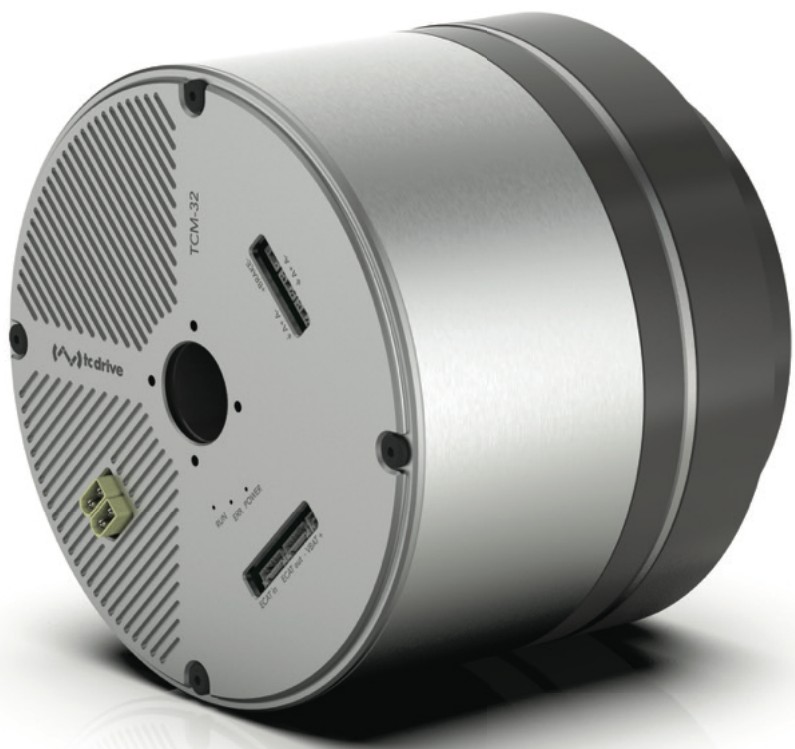
Parameters	Unit	TCHR-20I-51	TCHR-20I-81	TCHR-20I-101	TCHR-20I-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	42	58	61	61
Peak Torque for Start/Stop	Nm	69	91	102	107
Rated Speed	rpm	58.8	37	29.7	24.7
Maximum Speed	rpm	78.4	49.3	39.6	33
Rated Current	A	6.3	5.5	4.6	3.85
Maximum Current	A	18	14.8	13.7	11.4
Rated Voltage	V	DC 48			
Output Moment of Inertia	kg·m^2	0.42	1.06	1.65	2.38
Allowable Static Overturning Moment	Nm	187			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Positioning Accuracy	h	10000			
Weight	kg	1.9			
Operating Environmental Conditions		Operating/Storage Temperature: 0~40°C/-20~60°C Operating/Storage Humidity: 20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist- Indoor use only, avoid direct sunlight. Altitude below 1000 meters			
Motor Insulation		Insulation Resistance: above 100MΩ(DC500V) Insulation Voltage: AC1500V/1MIN Insulation Level: A class			

TCHR-I
Size 25



Parameters	Unit	TCHR-25I-51	TCHR-25I-81	TCHR-25I-101	TCHR-25I-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	68	107	133	133
Peak Torque for Start/Stop	Nm	121	169	194	206
Rated Speed	rpm	58.8	37	29.7	24.8
Maximum Speed	rpm	78.4	49.4	39.6	33.1
Rated Current	A	10.8	10.7	10.67	8.9
Maximum Current	A	19.2	16.9	15.6	13.8
Rated Voltage	V	DC 48			
Output Moment of Inertia	kg·m^2	0.93	2.34	3.63	5.21
Allowable Static Overturning Moment	Nm	258			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Positioning Accuracy	h	10000			
Weight	kg	4.0			
Operating Environmental Conditions		Operating/Storage Temperature: 0~40°C/-20~60°C Operating/Storage Humidity: 20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist- Indoor use only, avoid direct sunlight. Altitude below 1000 meters			
Motor Insulation		Insulation Resistance: above 100MΩ(DC500V) Insulation Voltage: AC1500V/1MIN Insulation Level: A class			

TCHR-I
Size 32



Parameters	Unit	TCHR-32I-51	TCHR-32I-81	TCHR-32I-101	TCHR-32I-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	133	206	267	267
Peak Torque for Start/Stop	Nm	267	375	411	436
Rated Speed	rpm	47.1	29.6	23.8	19.8
Maximum Speed	rpm	63.7	40.1	32.2	26.9
Rated Current	A	17.4	17	17.6	14.7
Maximum Current	A	34.9	30.9	27.1	24
Rated Voltage	V	DC 48			
Output Moment of Inertia	kg·m ²	2.16	5.44	8.46	12.14
Allowable Static Overturning Moment	Nm	580			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Positioning Accuracy	h	10000			
Weight	kg	6.9			
Operating Environmental Conditions		Operating/Storage Temperature: 0~40°C/-20~60°C Operating/Storage Humidity: 20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mist- Indoor use only, avoid direct sunlight. Altitude below 1000 meters			
Motor Insulation		Insulation Resistance: above 100MΩ(DC500V) Insulation Voltage: AC1500V/1MIN Insulation Level: A class			

TCHR-T Cobot Joint Modules

The TCHR series of low voltage modules utilize dual magnetic encoders and are equipped with brakes.

Featuring full closed-loop control, they deliver high precision transmission performance and exceptional overload resistance. With a complete model range available (sizes 11-40), they are an ideal choice for constructing robotic arms across various load grades.

TCHR-T Structural Schematic Diagram

► High-torque harmonic reducer

TC Drive Patent: 3D Conjugate
Double Arc Tooth Profile
Model: 14/17/20/25/32/40
Ratio: 51/81/101/121/161

► Brake

Friction Brake

► Frameless torque motor

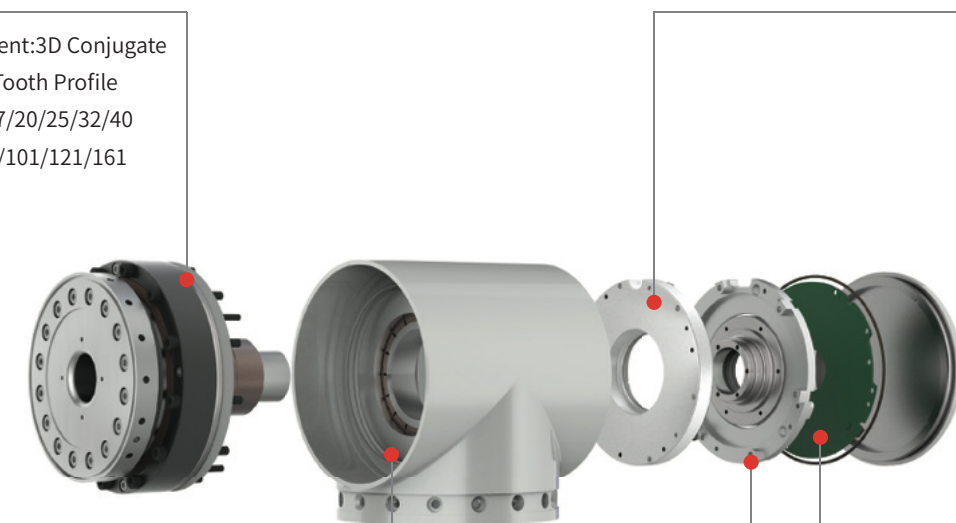
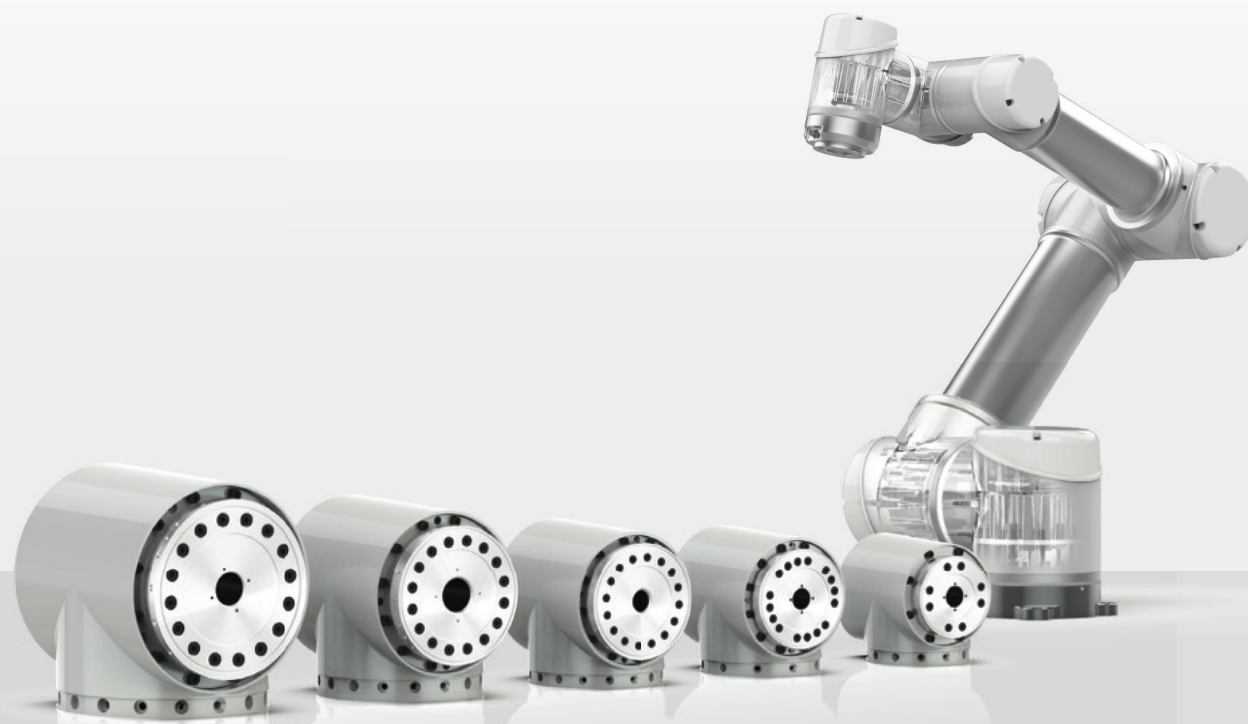
Rated power: 100W/150W/300W/630W/900W/1600W
Rated voltage: DC 48V

► Dual Encoders

Dual encoders at input and output sides.
Multi-turn Resolution: 16bit
Single-turn Resolution: 17/19/21bit

► Driver

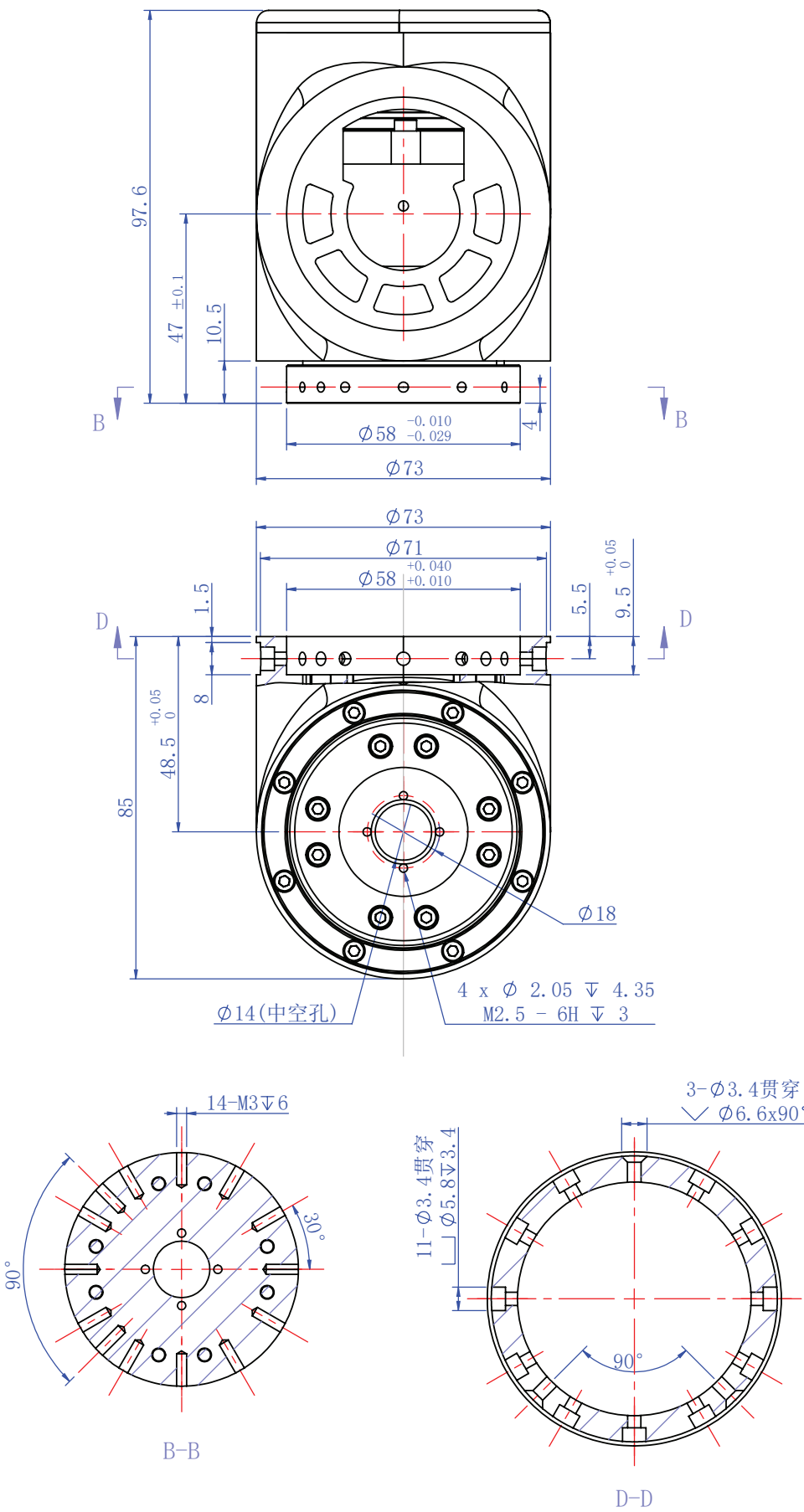
Communication Protocol: Ether CAT
Rated Voltage: DC 48V



TCHR-T
Size 14



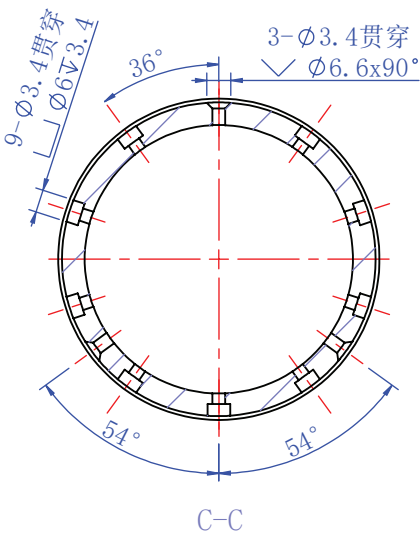
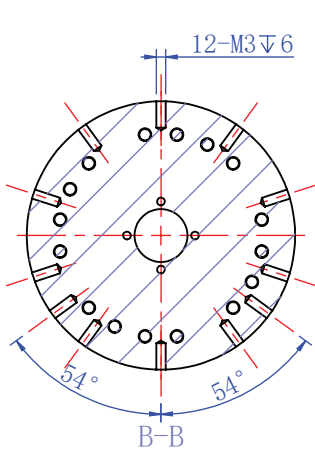
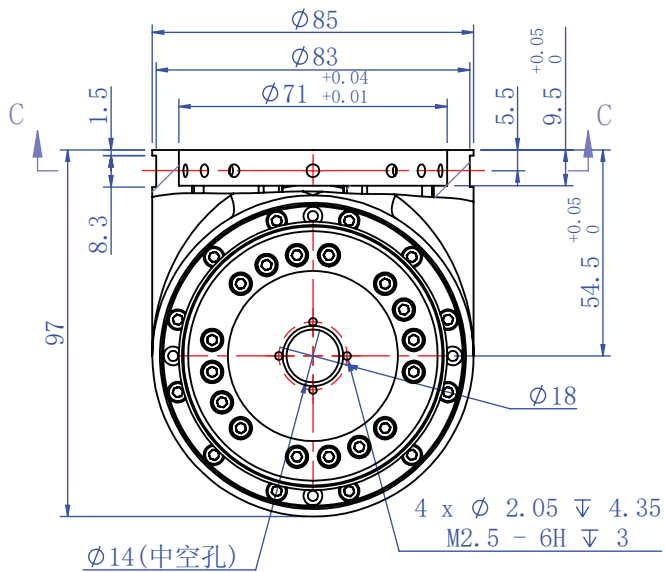
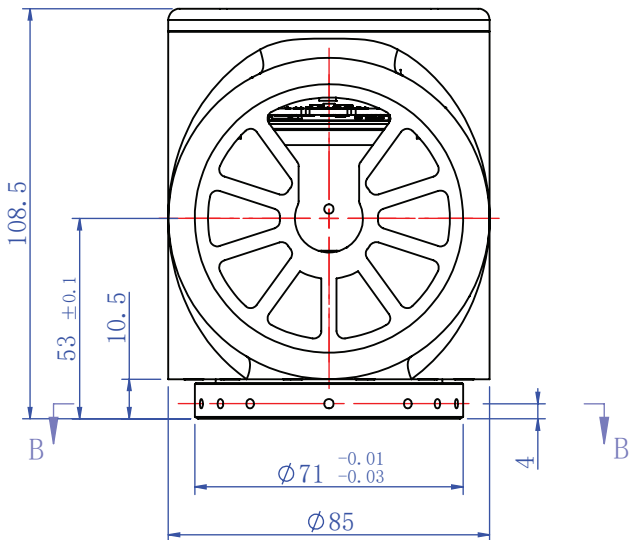
Parameters	Unit	TCHR-14T-51	TCHR-14T-81	TCHR-14T-101
Ratio		51	81	101
Maximum Allowable Average Load Torque	Nm	8.6	13.3	13.3
Peak Torque for Start/Stop	Nm	21.9	28.5	34.2
Rated Speed	rpm	58.8	37	29.7
Maximum Speed	rpm	78.4	49.3	39.6
Rated Current	A	1.34	1.31	1.05
Maxumum Current	A	3.42	2.8	2.7
Rated Voltage	V	DC 48V		
Output Moment of Inertia	kg·m^2	0.13	0.35	0.54
Allowable Static Overturning Moment	Nm	74		
Reducer Backlash	arcsec	≤10		
Positioning Accuracy	arcsec	90		
Design life	h	10000		
Weight	kg	1.1		
Operating Environmental Conditions		Operating/Storage Temperature: 0~40°C/-20~60°C Operating/Storage Humidity: 20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mistIndoor use only, avoid direct sunlight. Altitude below 1000 meters		
Motor Insulation		Insulation Resistance: above 100MΩ(DC500V) Insulation Voltage: AC1500V/1MIN Insulation Level: A class		



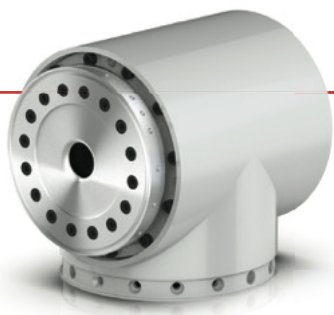
TCHR-T
Size 17



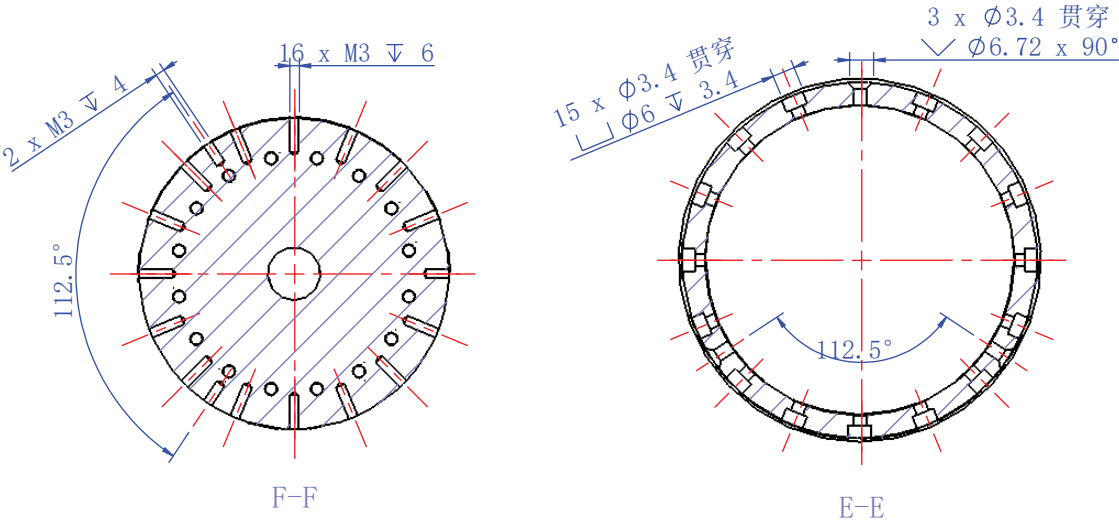
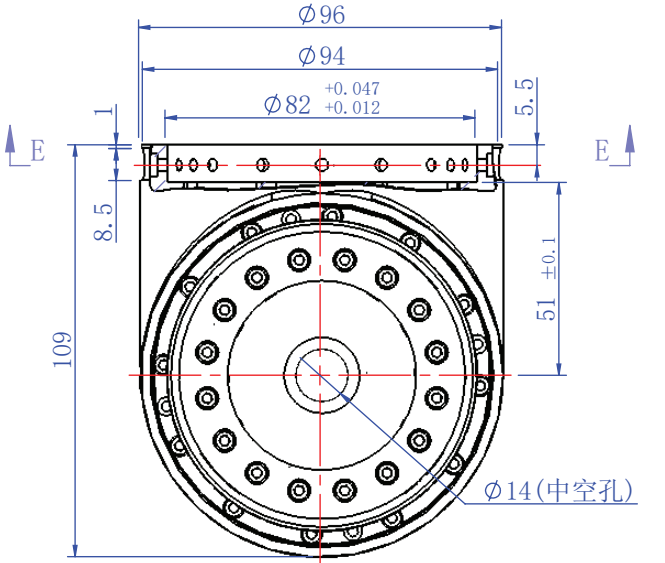
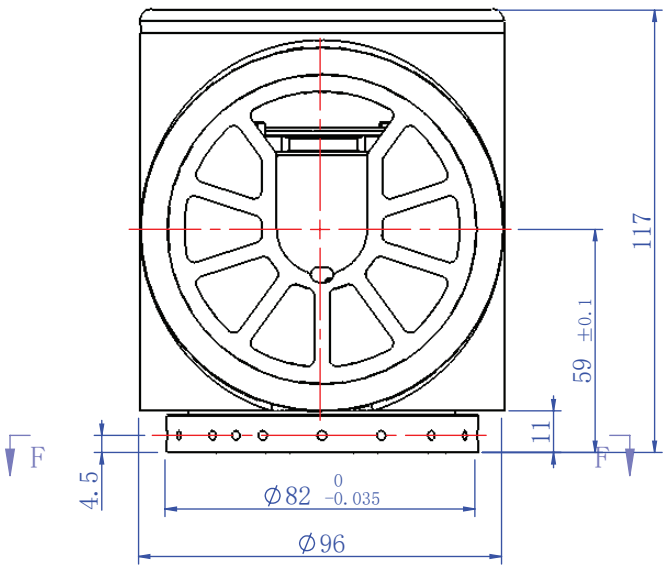
Parameters	Unit	TCHR-17T-51	TCHR-17T-81	TCHR-17T-101	TCHR-17T-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	22.9	33	45.4	48
Peak Torque for Start/Stop	Nm	42	53	67	67
Rated Speed	rpm	58.8	37	29.7	24.7
Maximum Speed	rpm	90.1	56.7	45.5	38
Rated Current	A	4.2	3.8	4.2	3.7
Maxumum Current	A	7.7	6.1	6.2	5.2
Rated Voltage	V	DC 48V			
Output Moment of Inertia	kg·m^2	0.18	0.47	0.73	1.05
Allowable Static Overturning Moment	Nm	124			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	90			
Design life	h	10000			
Weight	kg	1.6			
Operating Environmental Conditions		Operating/Storage Temperature:0~40°C/-20~60°C Operating/Storage Humidity:20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mistIndoor use only, avoid direct sunlight. Altitude below 1000 meters			
Motor Insulation		Insulation Resistance:above 100MΩ(DC500V) Insulation Voltage:AC1500V/1MIN Insulation Level: A class			



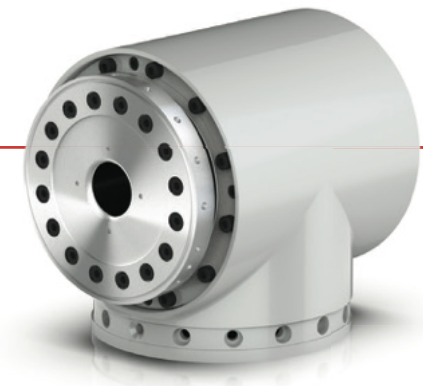
TCHR-T
Size 20



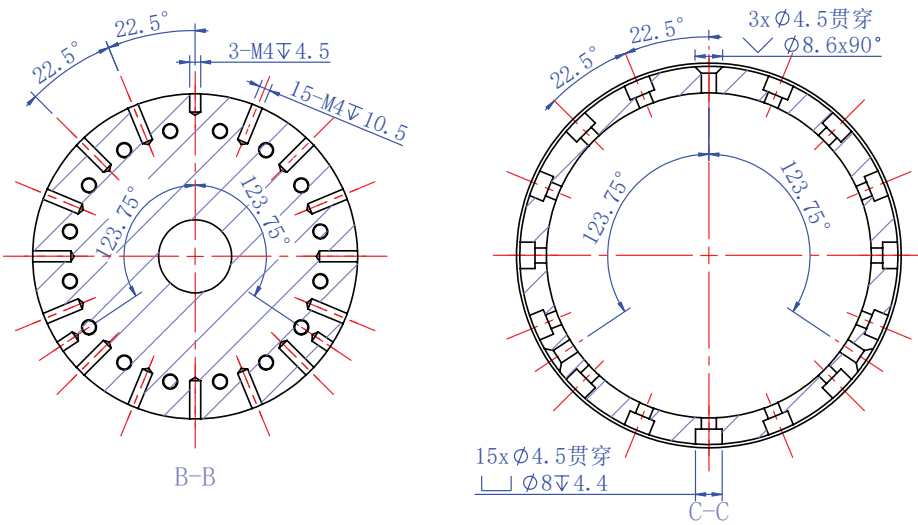
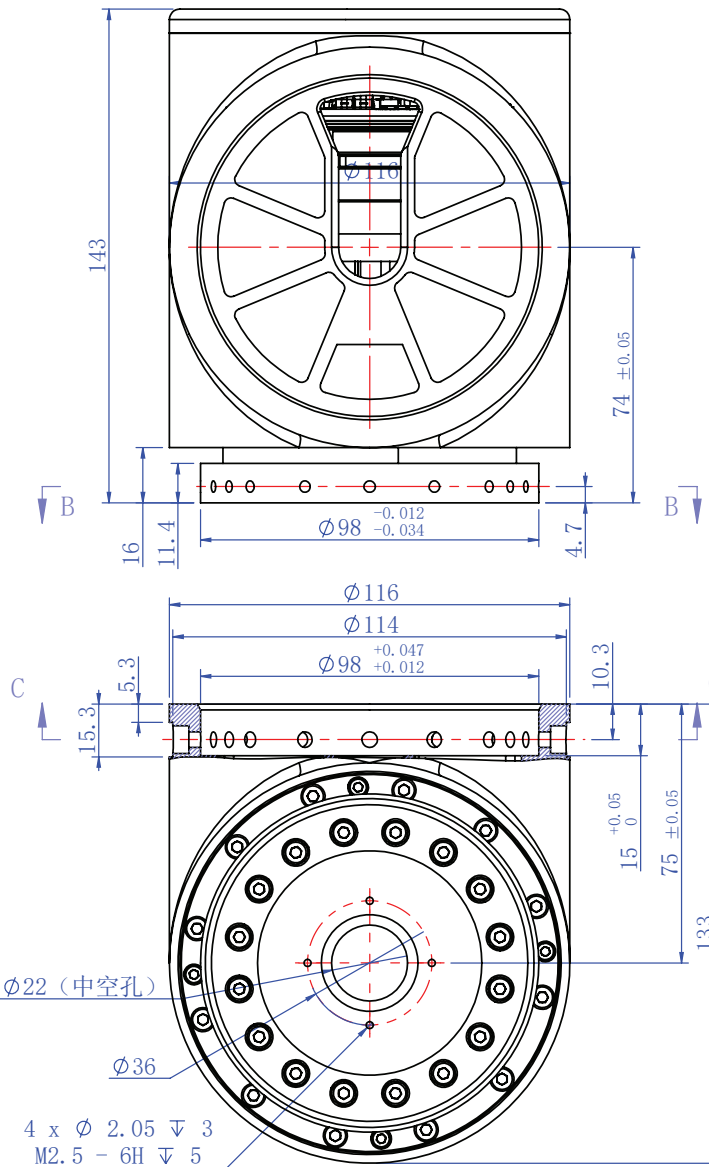
Parameters	Unit	TCHR-20T-51	TCHR-20T-81	TCHR-20T-101	TCHR-20T-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	42	58	61	61
Peak Torque for Start/Stop	Nm	69	91	102	107
Rated Speed	rpm	58.8	37	29.7	24.7
Maximum Speed	rpm	78.4	49.3	39.6	33
Rated Current	A	6.3	5.5	4.6	3.85
Maxumum Current	A	10.35	8.6	7.7	6.8
Rated Voltage	V	DC 48V			
Output Moment of Inertia	kg·m^2	0.42	1.06	1.65	2.38
Allowable Static Overturning Moment	Nm	187			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Design life	h	10000			
Weight	kg	2,2			
Operating Environmental Conditions		Operating/Storage Temperature: 0~40°C/-20~60°C Operating/Storage Humidity: 20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mistIndoor use only, avoid direct sunlight. Altitude below 1000 meters			
Motor Insulation		Insulation Resistance: above 100MΩ(DC500V) Insulation Voltage: AC1500V/1MIN Insulation Level: A class			



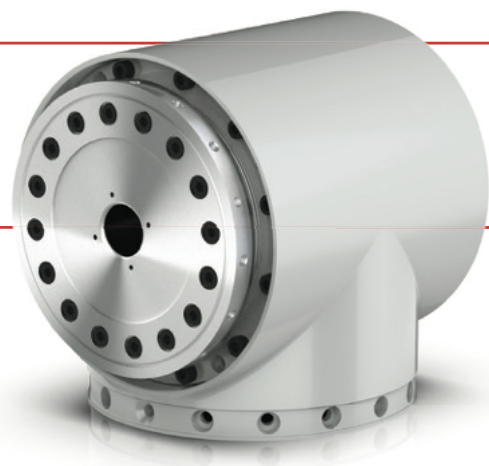
TCHR-T
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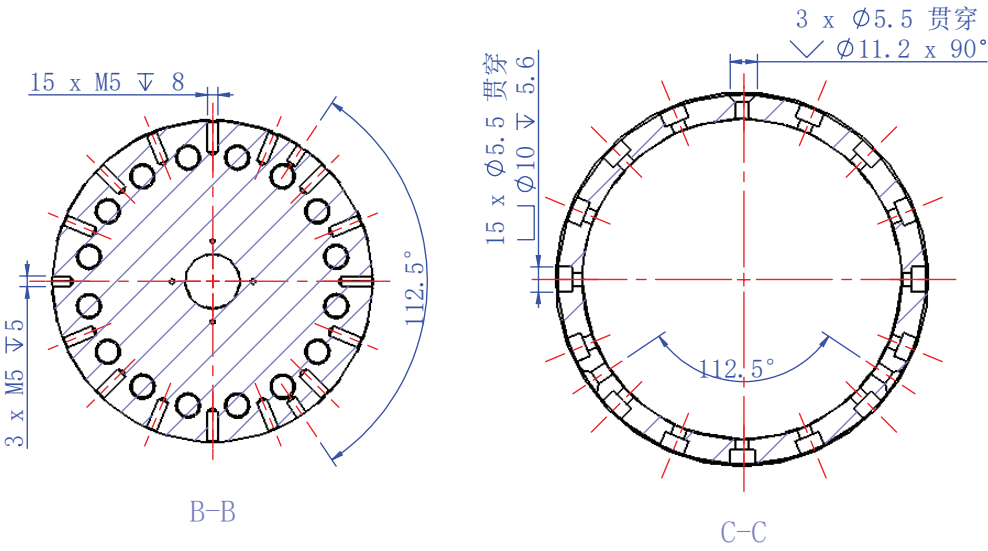
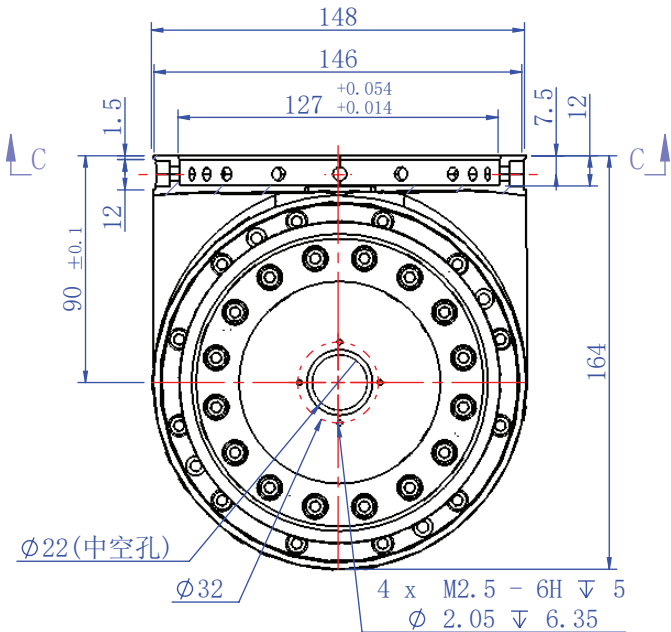
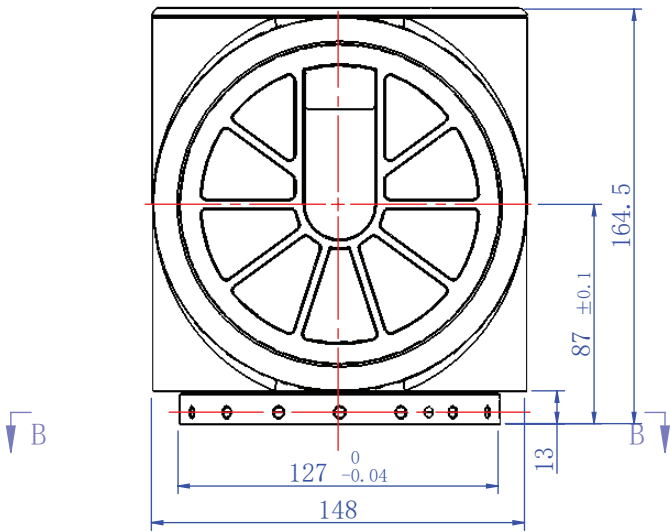
Parameters	Unit	TCHR-25T-51	TCHR-25T-81	TCHR-25T-101	TCHR-25T-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	68	107	133	133
Peak Torque for Start/Stop	Nm	121	169	194	206
Rated Speed	rpm	58.8	37	29.7	24.8
Maximum Speed	rpm	78.4	49.4	39.6	33.1
Rated Current	A	10.8	10.7	10.67	8.9
Maxumum Current	A	19.22	16.9	15.56	13.79
Rated Voltage	V	DC 48V			
Output Moment of Inertia	kg·m^2	0.93	2.34	3.63	5.21
Allowable Static Overturning Moment	Nm	258			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Design life	h	10000			
Weight	kg	4.5			
Operating Environmental Conditions		Operating/Storage Temperature: 0~40°C/-20~60°C Operating/Storage Humidity: 20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mistIndoor use only, avoid direct sunlight. Altitude below 1000 meters			
Motor Insulation		Insulation Resistance: above 100MΩ(DC500V) Insulation Voltage: AC1500V/1MIN Insulation Level: A class			



TCHR-T
Size 32



Parameters	Unit	TCHR-32T-51	TCHR-32T-81	TCHR-32T-101	TCHR-32T-121
Ratio		51	81	101	121
Maximum Allowable Average Load Torque	Nm	133	206	267	267
Peak Torque for Start/Stop	Nm	267	375	411	436
Rated Speed	rpm	47.1	29.6	23.8	19.8
Maximum Speed	rpm	63.7	40.1	32.2	26.9
Rated Current	A	17.39	16.95	17.62	14.71
Maxumum Current	A	34.9	30.86	27.13	24.02
Rated Voltage	V	DC 48V			
Output Moment of Inertia	kg·m^2	2.16	5.44	8.46	12.14
Allowable Static Overturning Moment	Nm	580			
Reducer Backlash	arcsec	≤10			
Positioning Accuracy	arcsec	60			
Design life	h	10000			
Weight	kg	8.1			
Operating Environmental Conditions		Operating/Storage Temperature:0~40°C/-20~60°C Operating/Storage Humidity:20~80%RH(noncondensation) Free of dust, metal powder, corrosive gas, flammable gas and oil mistIndoor use only, avoid direct sunlight. Altitude below 1000 meters			
Motor Insulation		Insulation Resistance:above 100MΩ(DC500V) Insulation Voltage:AC1500V/1MIN Insulation Level: A class			



TCP Planetary Modules

TCHA-H

TCHB-H

TCHB-S

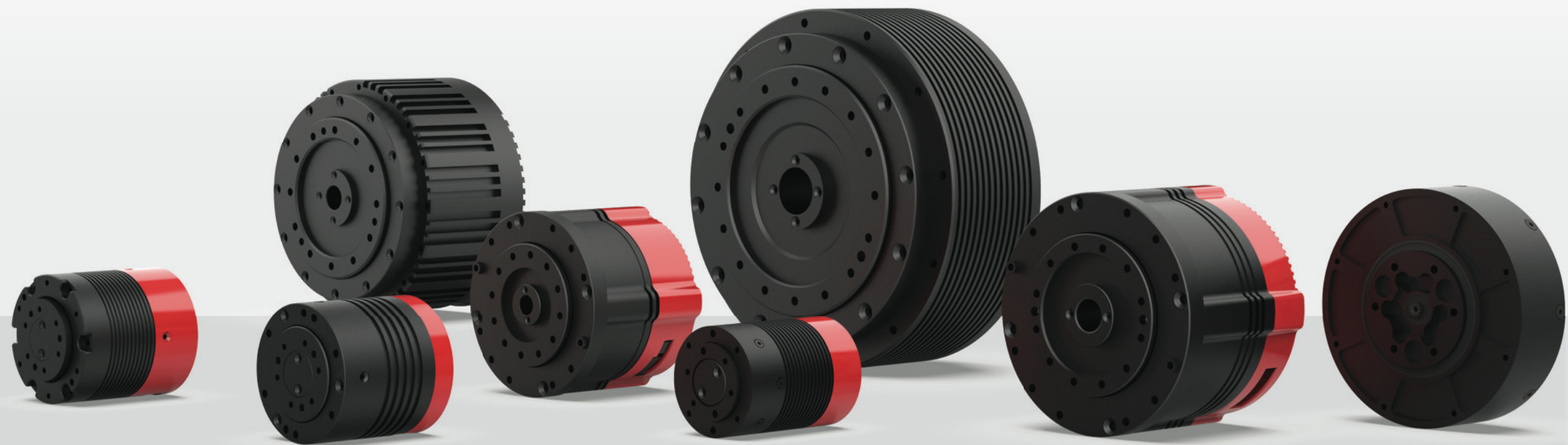
TCHA-S

TCHR-I

TCHR-T

TCP

TCHL



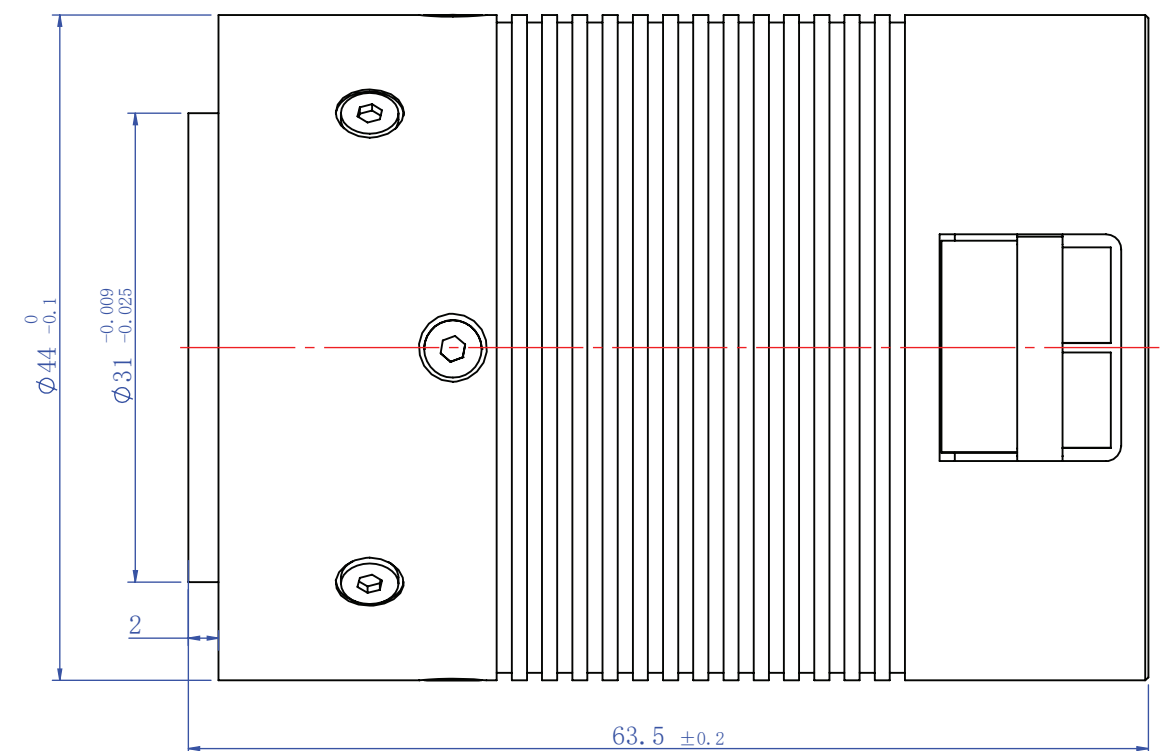
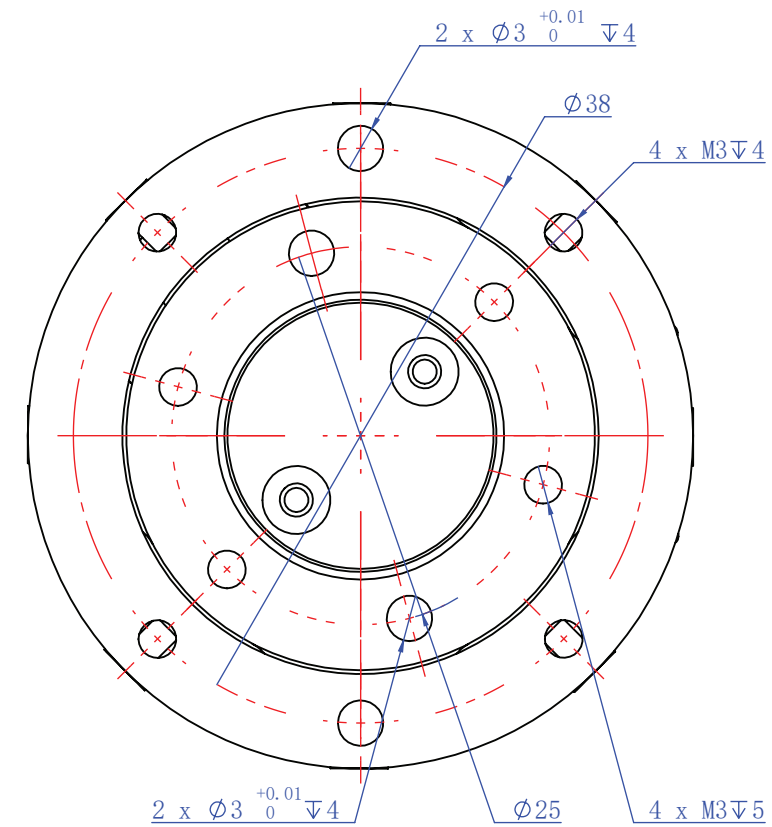
TCP

Size 44

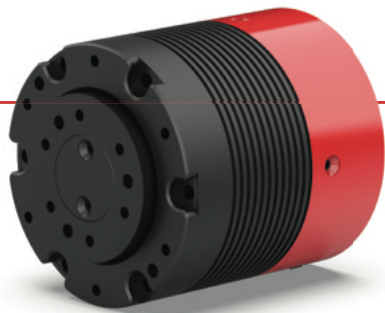


Parameters	unit	TCP-44
Ratio	-	28.17
Output voltage	V	24
No-load Speed	PRM	178
No-load input current	A	1
Rated Speed	RPM	142
Rated Torque	N.m	2.5
Rated Output power	W	37
Rated Phase Current	A(rms)	3
Peak torque	N.m	7
Peak phase current	A(rms)	8.1
Efficiency	%	63
Back EMF Constant	Vdc/krpm	4.3
Module Torque Constant	N.m/A	0.8
Phase resistance	Ω	0.61
Phase Inductance	mH	0.13

Parameters	unit	TCP-44
Pole Pairs	-	13
Cogging Torque	mN.m	20
Wiring method	-	Y
Back-driving Torque	N.m	0.4
Backlash	Arcmin	12
Axial Load Tension	KN	0.25
Axial Load Compression	KN	0.25
Radial Load	KN	1
Moment of Inertia	Kg.cm ²	0.17
Encoder Type and Interface	-	Dual Encoder ABS-17BIT/18BIT
Repetitive Positioning Accuracy	Degree	<0.01
Communication Method	-	CAN/EtherCAT
Weight	kg	0.25
Insulation level	-	F

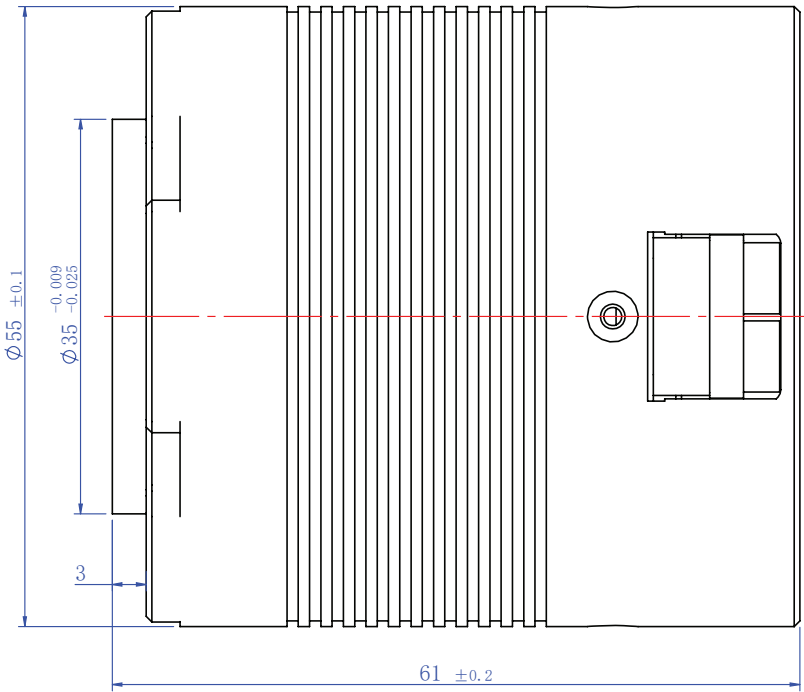
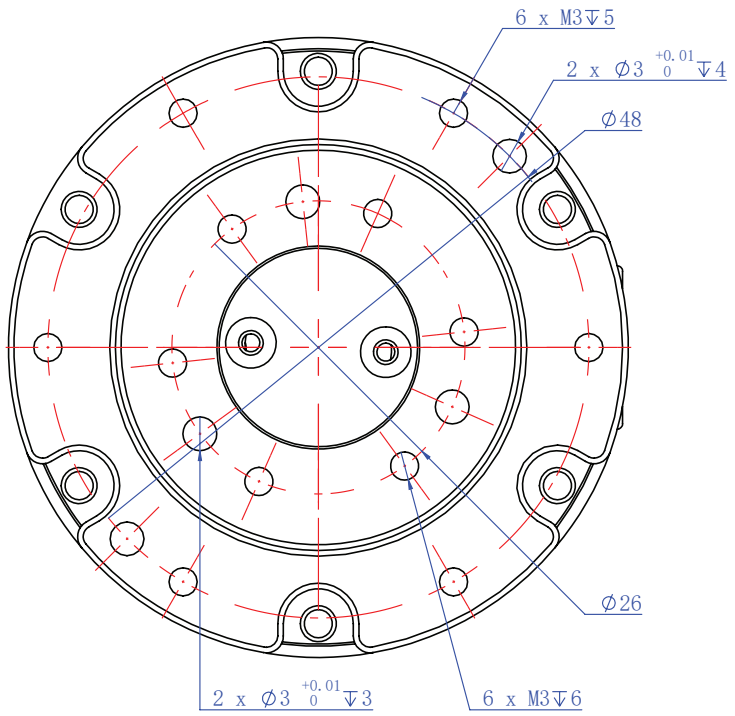


TCP
Size 55



Parameters	unit	TCP-55
Ratio	-	36
Output voltage	V	24
No-load Speed	PRM	111
No-load input current	A	0.9
Rated Speed	RPM	83
Rated Torque	N.m	11.5
Rated Output power	W	100
Rated Phase Current	A(rms)	6.1
Peak torque	N.m	34
Peak phase current	A(rms)	21.5
Efficiency	%	63.1
Back EMF Constant	Vdc/krpm	6
Module Torque Constant	N.m/A	1.9
Phase resistance	Ω	0.35
Phase Inductance	mH	0.17

Parameters	unit	TCP-55
Pole Pairs	-	13
Cogging Torque	mN.m	50
Wiring method	-	Y
Back-driving Torque	N.m	1.14
Backlash	Arcmin	10
Axial Load Tension	KN	1.3
Axial Load Compression	KN	1.3
Radial Load	KN	1.5
Moment of Inertia	Kg.cm ²	0.3
Encoder Type and Interface	-	Dual Encoder ABS-17BIT/18BIT
Repetitive Positioning Accuracy	Degree	<0.01
Communication Method	-	CAN/EtherCAT
Weight	kg	0.36
Insulation level	-	F



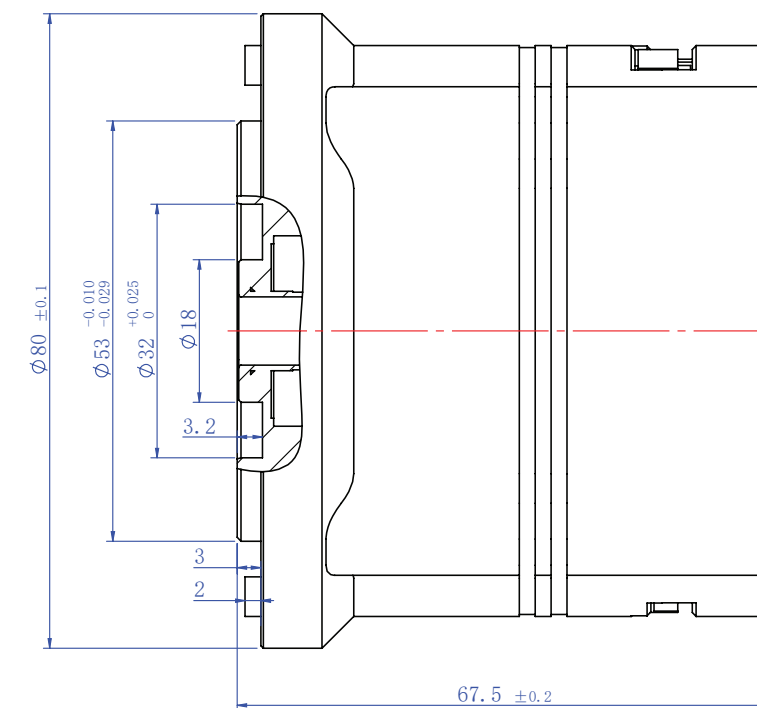
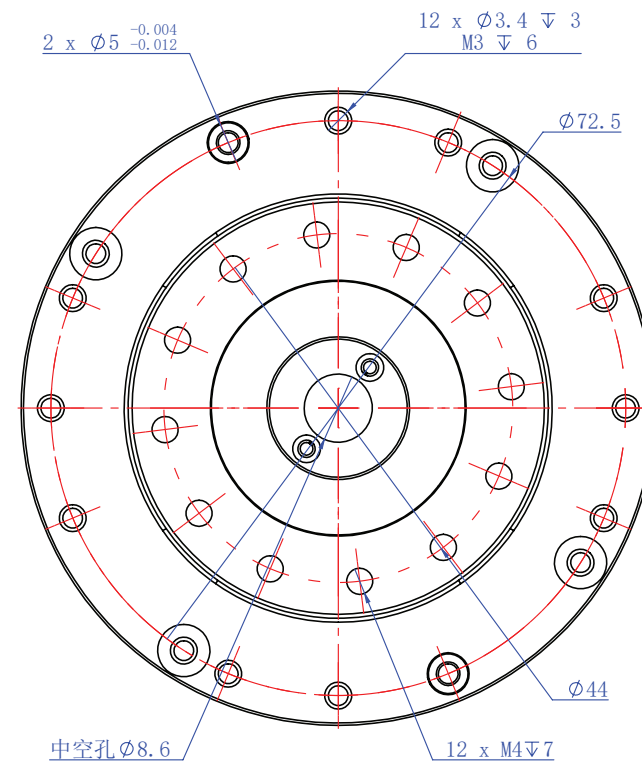
TCP

Size 80



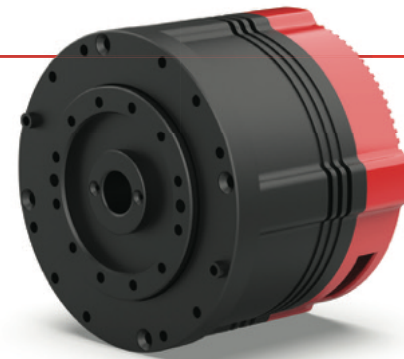
Parameters	unit	TCP-80
Ratio	-	19.612
Output voltage	V	48
No-load Speed	PRM	176
No-load input current	A	0.9
Rated Speed	RPM	153
Rated Torque	N.m	20
Rated Output power	W	320
Rated Phase Current	A(rms)	9.5
Peak torque	N.m	60
Peak phase current	A(rms)	29.1
Efficiency	%	72.7
Back EMF Constant	Vdc/krpm	16
Module Torque Constant	N.m/A	2.1
Phase resistance	Ω	0.41
Phase Inductance	mH	0.51

Parameters	unit	TCP-80
Pole Pairs	-	10
Cogging Torque	mN.m	30
Wiring method	-	Y
Back-driving Torque	N.m	1.6
Backlash	Arcmin	10
Axial Load Tension	KN	1.8
Axial Load Compression	KN	0.8
Radial Load	KN	2
Moment of Inertia	Kg.cm ²	0.66
Encoder Type and Interface	-	Dual Encoder ABS-17BIT/18BIT
Repetitive Positioning Accuracy	Degree	<0.01
Communication Method	-	CAN/EtherCAT
Weight	kg	0.82
Insulation level	-	F



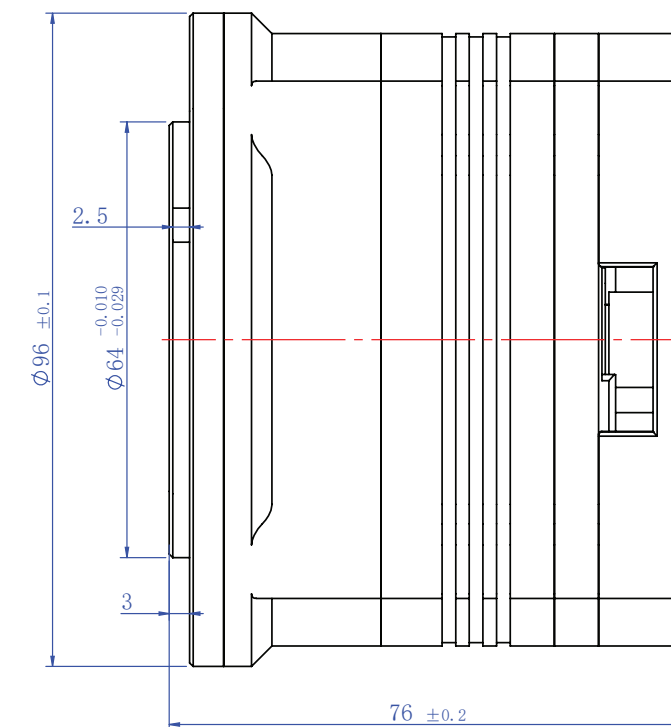
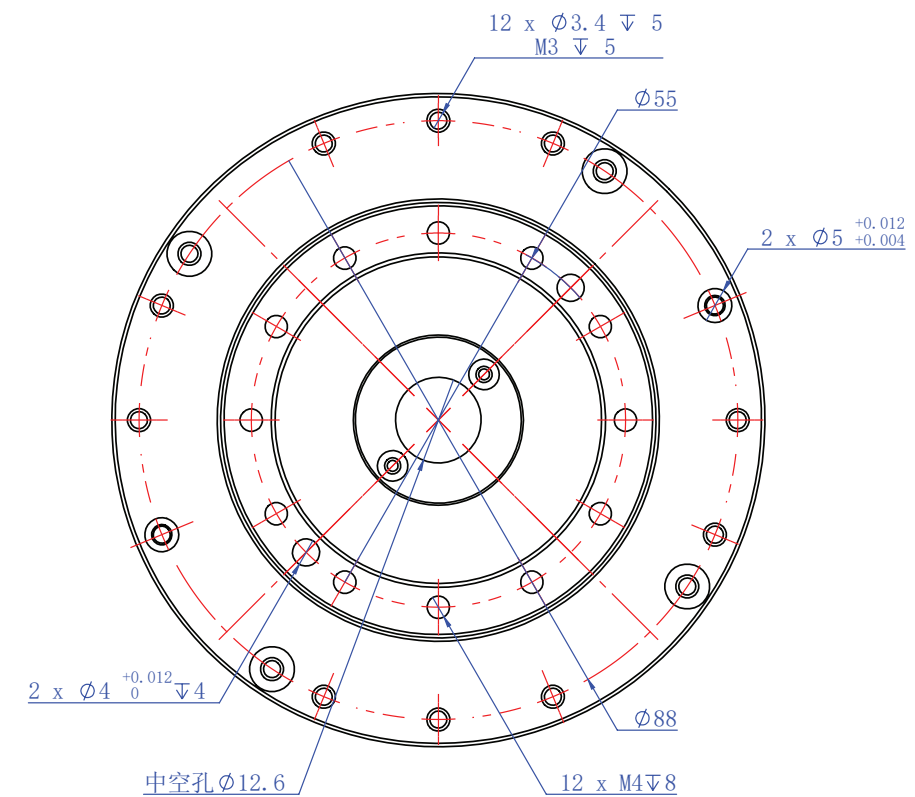
TCP

Size 96



Parameters	unit	TCP-96
Ratio	-	19.612
Output voltage	V	48
No-load Speed	PRM	158
No-load input current	A	1.6
Rated Speed	RPM	127
Rated Torque	N.m	43
Rated Output power	W	574
Rated Phase Current	A(rms)	17.6
Peak torque	N.m	110
Peak phase current	A(rms)	43.8
Efficiency	%	79
Back EMF Constant	Vdc/krpm	19.2
Module Torque Constant	N.m/A	2.4
Phase resistance	Ω	0.18
Phase Inductance	mH	0.31

Parameters	unit	TCP-96
Pole Pairs	-	10
Cogging Torque	mN.m	50
Wiring method	-	Y
Back-driving Torque	N.m	3.21
Backlash	Arcmin	10
Axial Load Tension	KN	4
Axial Load Compression	KN	1
Radial Load	KN	4.5
Moment of Inertia	Kg.cm ²	1.5
Encoder Type and Interface	-	Dual Encoder ABS-17BIT/18BIT
Repetitive Positioning Accuracy	Degree	<0.01
Communication Method	-	CAN/EtherCAT
Weight	kg	1.4
Insulation level	-	F

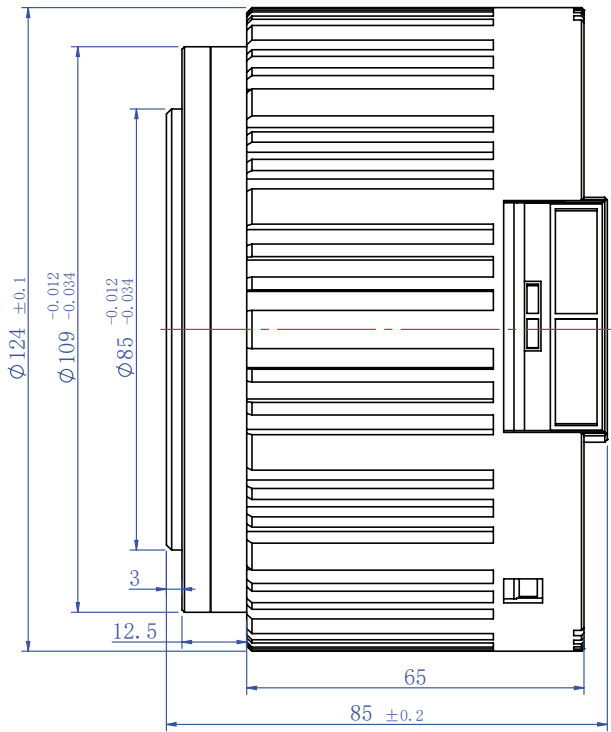
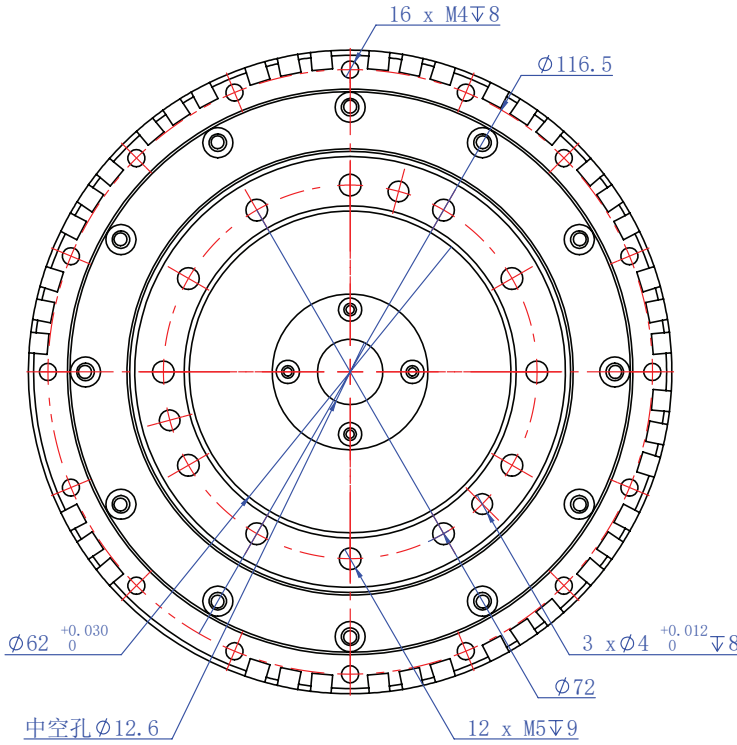


TCP
Size 124

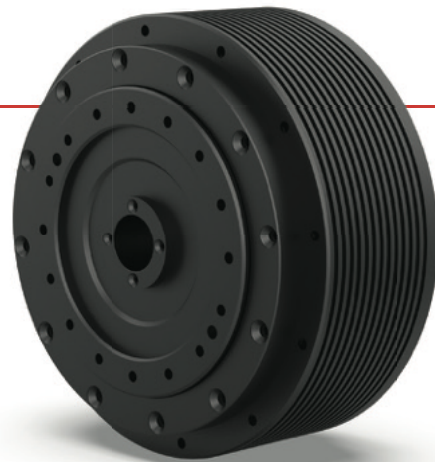


Parameters	unit	TCP-124
Ratio	-	20
Output voltage	V	48
No-load Speed	PRM	125
No-load input current	A	2.7
Rated Speed	RPM	100
Rated Torque	N.m	100
Rated Output power	W	1000
Rated Phase Current	A(rms)	30
Peak torque	N.m	320
Peak phase current	A(rms)	100
Efficiency	%	75
Back EMF Constant	Vdc/krpm	17.9
Module Torque Constant	N.m/A	3.3
Phase resistance	Ω	0.12
Phase Inductance	mH	0.05

Parameters	unit	TCP-124
Pole Pairs	-	20
Cogging Torque	mN.m	1420
Wiring method	-	Y
Back-driving Torque	N.m	3.8
Backlash	Arcmin	10
Axial Load Tension	KN	4.5
Axial Load Compression	KN	4.5
Radial Load	KN	5
Moment of Inertia	Kg.cm ²	12.9
Encoder Type and Interface	-	Dual Encoder ABS-17BIT/18BIT
Repetitive Positioning Accuracy	Degree	<0.01
Communication Method	-	CAN/EtherCAT
Weight	kg	2.6
Insulation level	-	F

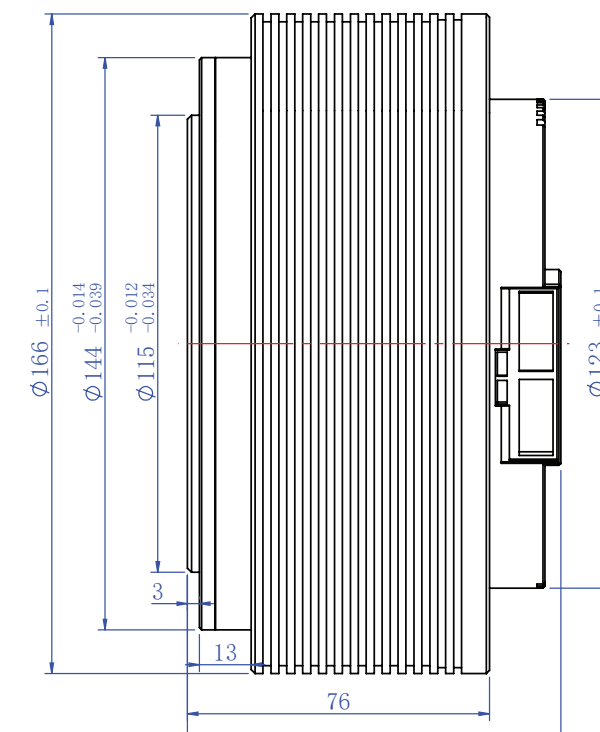
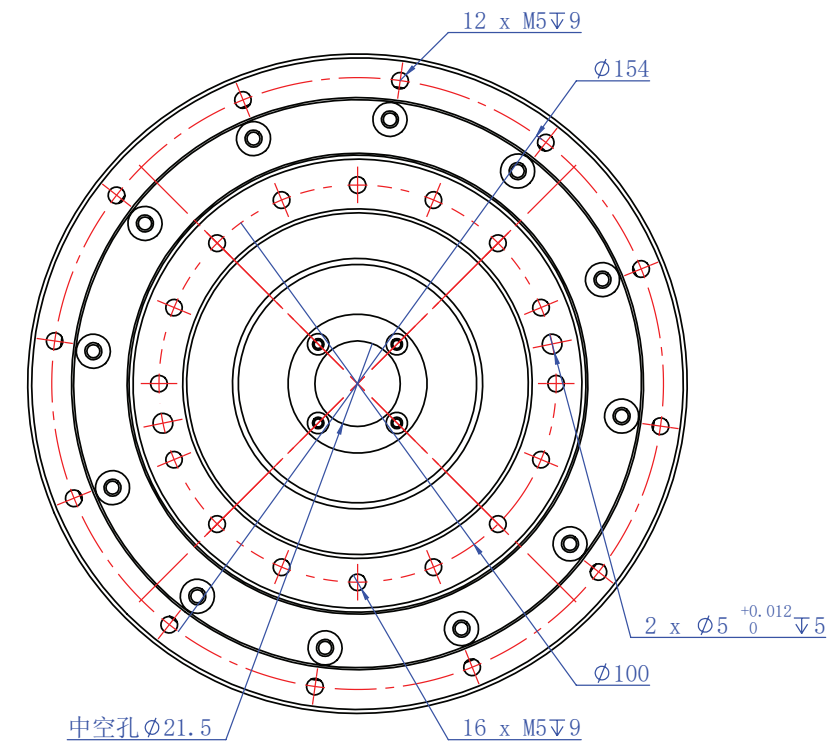


TCP
Size 166



Parameters	unit	TCP-166
Ratio	-	20.25
Output voltage	V	72
No-load Speed	PRM	93
No-load input current	A	3.5
Rated Speed	RPM	74
Rated Torque	N.m	145
Rated Output power	W	1124
Rated Phase Current	A(rms)	25
Peak torque	N.m	450
Peak phase current	A(rms)	69.2
Efficiency	%	82.4
Back EMF Constant	Vdc/krpm	29.9
Module Torque Constant	N.m/A	5.8
Phase resistance	Ω	0.08
Phase Inductance	mH	0.14

Parameters	unit	TCP-166
Pole Pairs	-	20
Cogging Torque	mN.m	1480
Wiring method	-	Y
Back-driving Torque	N.m	4
Backlash	Arcmin	10
Axial Load Tension	KN	5.4
Axial Load Compression	KN	5.4
Radial Load	KN	6
Moment of Inertia	Kg.cm ²	31.6
Encoder Type and Interface	-	Dual Encoder ABS-17BIT/18BIT
Repetitive Positioning Accuracy	Degree	<0.01
Communication Method	-	CAN/EtherCAT
Weight	kg	3.6
Insulation level	-	F



HarmoCore™ Lightweight Harmonic Actuator

Designed specifically for embodied-AI applications, the joint minimizes size and weight while providing comprehensive mounting interfaces, enabling users to systematically reduce the weight and machining complexity of connecting hardware. It also integrates an output torque sensor without increasing the joint's mass or envelope, giving robots higher dynamic response, superior data acquisition quality, and greater payload-handling capability.



HarmoCore™ Structural Schematic Diagram

► Harmonic reducer
With Torque sensor

► Frameless Motor

Rated voltage: DC 48V
Rated power: 100W/150W/300W/630W/900W

► Shell

► Encoder

Encoders at input and output sides.
Single-turn absolute value, resolution 17 bit

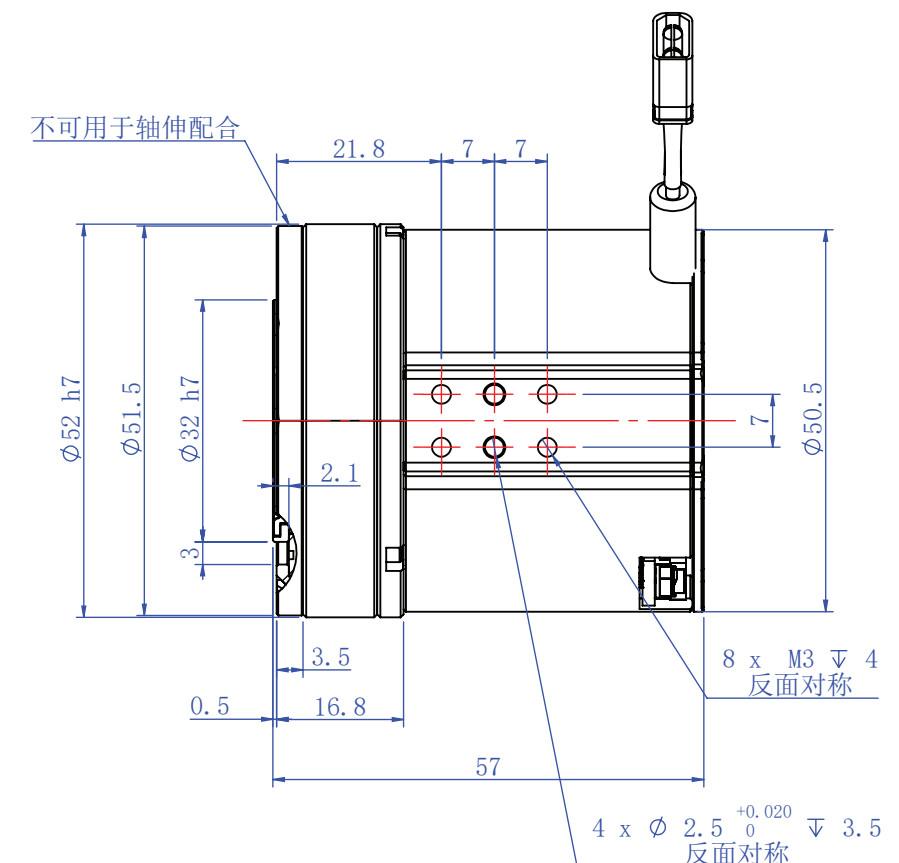
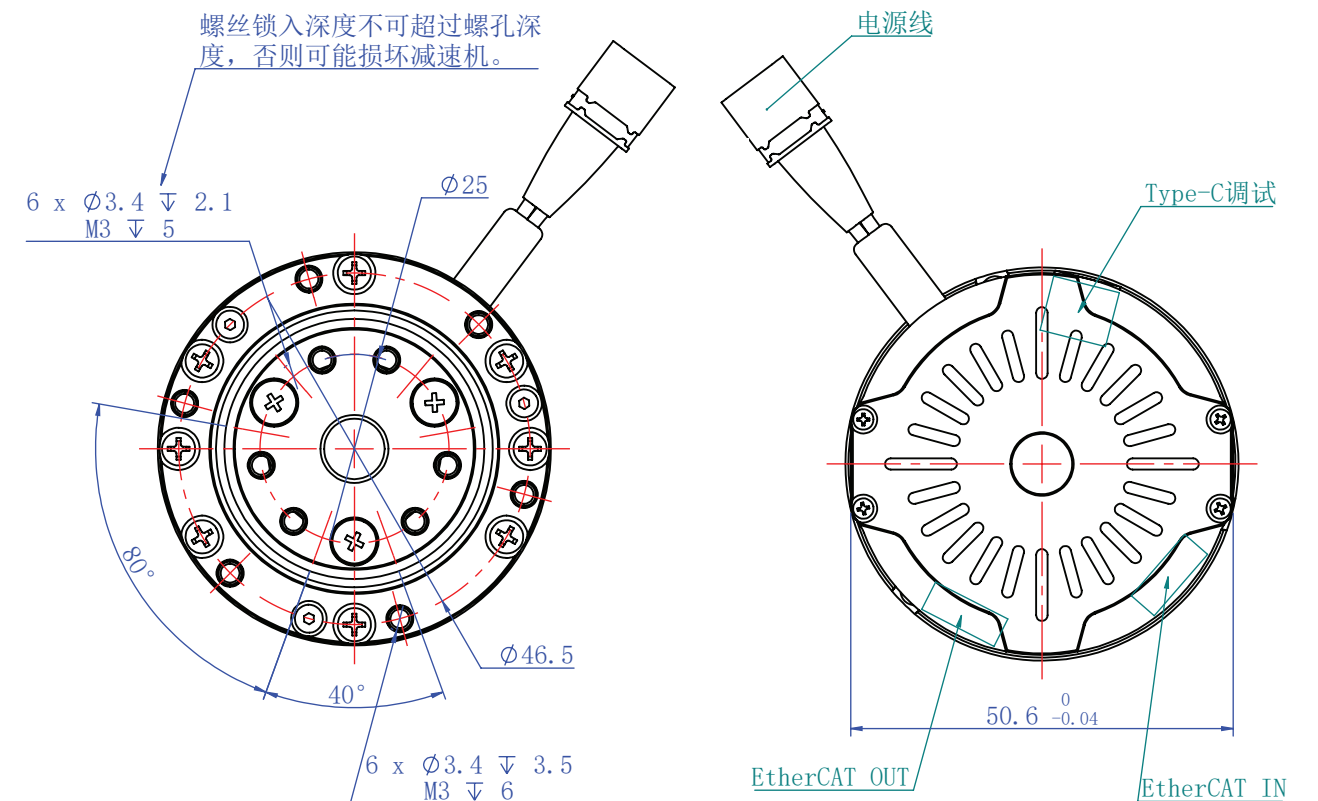
► Drive Board

EtherCAT/CAN FD

HarmoCore™ Size 11



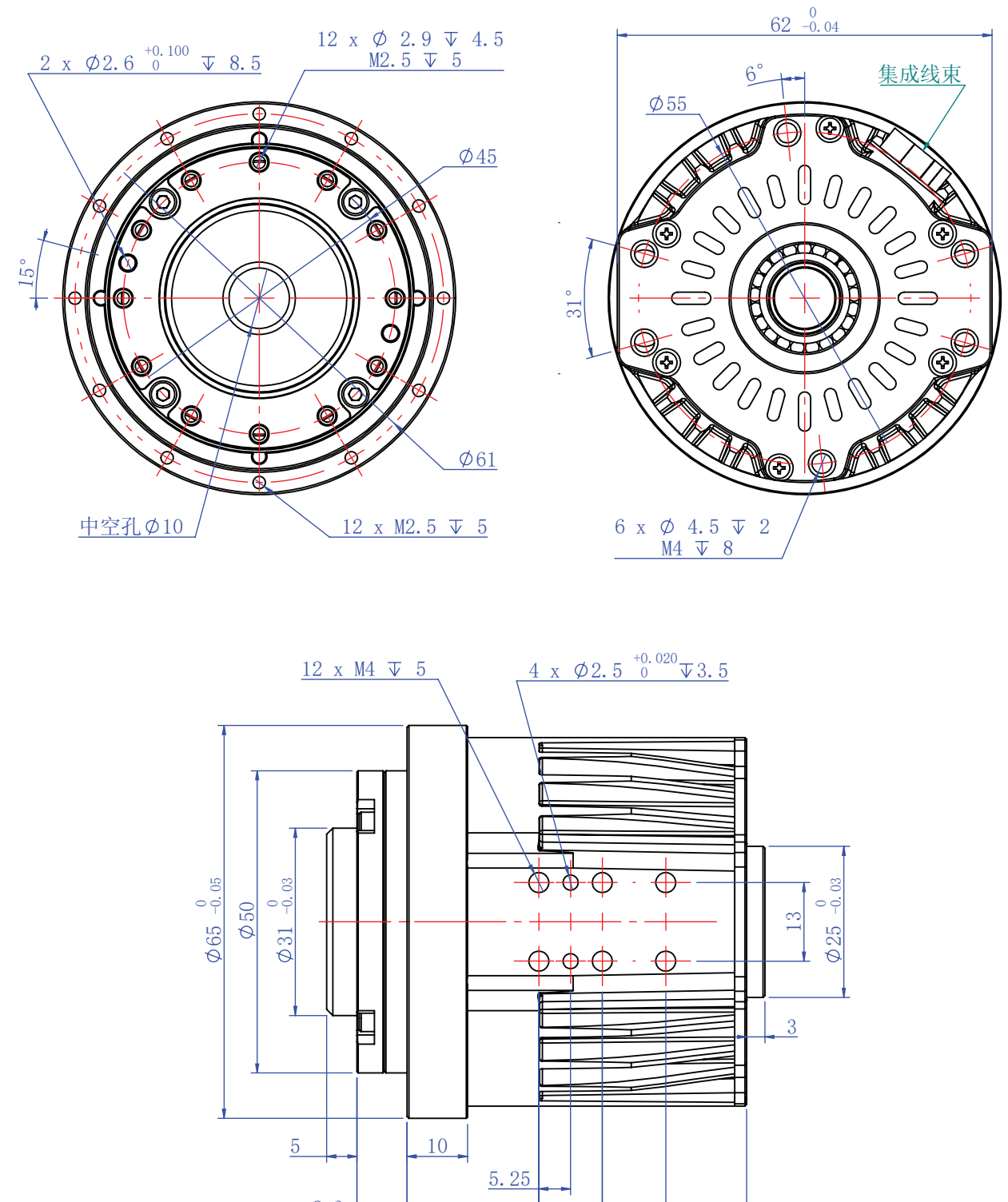
Parameters	Unit	TCHL-11-50	TCHL-11-80	TCHL-11-100
Ratio	-	50	80	100
Rated Torque at 2000rpm input speed	N.m	3.6	5.1	5.3
Maximum Allowable Average Load Torque	N.m	4.8	7.7	7.7
Peak Torque for Start/Stop		12	16	19
Peak Output Torque	N.m	12.5	20	25
Rated Output Speed	rpm	60	37.5	30
Peak Output Speed	rpm	80	50	40
Rated Voltage	V	DC 48		
Output Moment of Inertia	Kg·m^2	0.012	0.030	0.048
Allowable Overturning Moment	N.m	25		
Torque Sensor	-	Optional		
Repeatable positioning accuracy	-	≤10		
Transmission accuracy	arcsec	≤60		
Encoder	-	I/O Dual encoder, Single-turn Absolute Encoder, 17 bits		
Driver Board Protocol	-	EtherCAT/CanFd		
IP Protection Grade	-	IP54, and IP65 after updating the connector		
Outer Dimension	mm	φ52*57		
Hollow Diameter	mm	φ8		
Weight	Kg	0.37		
Operating Environmental Temperature	°C	-20°C~50°C		



HarmoCore™
Size 14



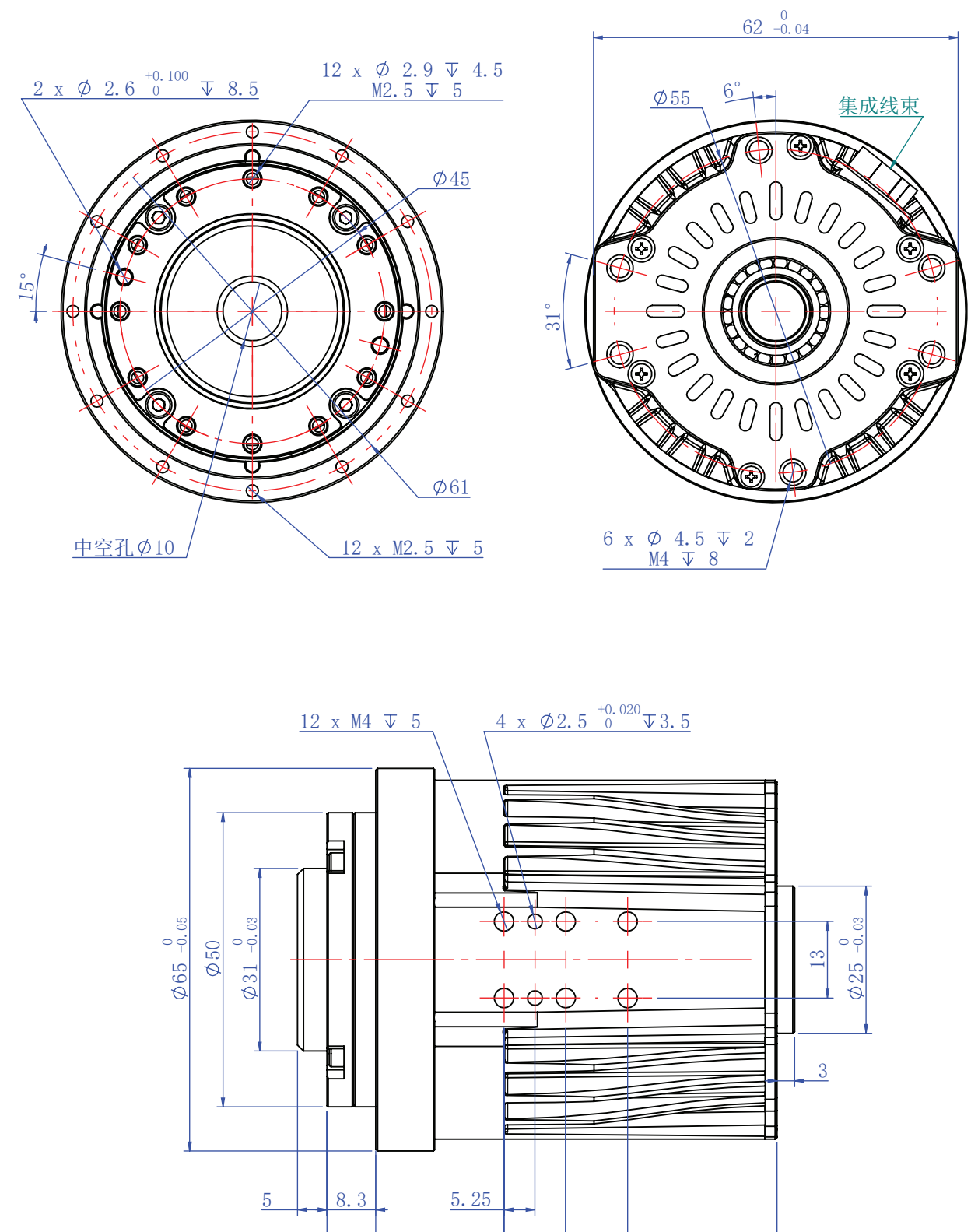
Parameters	Unit	TCHL-14-51	TCHL-14-81	TCHL-14-101
Ratio	-	51	81	101
Rated Torque at 2000rpm input speed	N.m	4.5	6.5	6.5
Maximum Allowable Average Load Torque	N.m	6	8	9.5
Peak Torque for Start/Stop		15	19	24
Peak Output Torque	N.m	19	30	36
Rated Output Speed	rpm	58.8	37	29.7
Peak Output Speed	rpm	78.4	49.3	39.6
Rated Voltage	V	DC48		
Output Moment of Inertia	Kg·m^2	0.025	0.064	0.100
Allowable Overturning Moment	N.m	30		
Torque Sensor	-	Optional		
Repeatable positioning accuracy	-	≤10		
Transmission accuracy	arcsec	≤60		
Encoder	-	I/O Dual encoder, Single-turn Absolute Encoder, 17 bits		
Driver Board Protocol	-	EtherCAT/CanFd		
IP Protection Grade	-	IP54, and IP65 after updating the connector		
Outer Dimension	mm	φ65*55		
Hollow Diameter	mm	φ10		
Weight	Kg	0.45		
Operating Environmental Temperature	°C	-20°C~50°C		



HarmoCore™
Size 14(with brake)



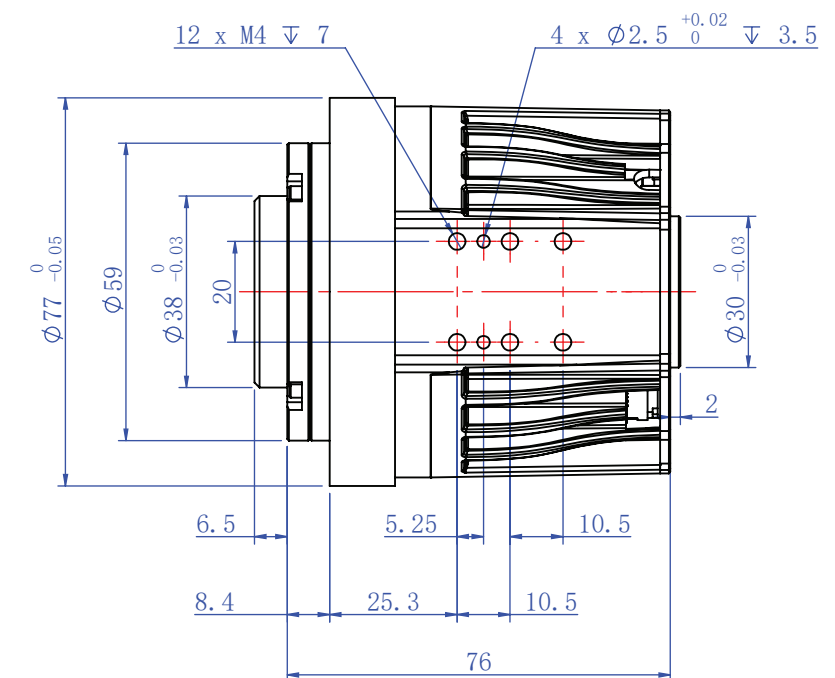
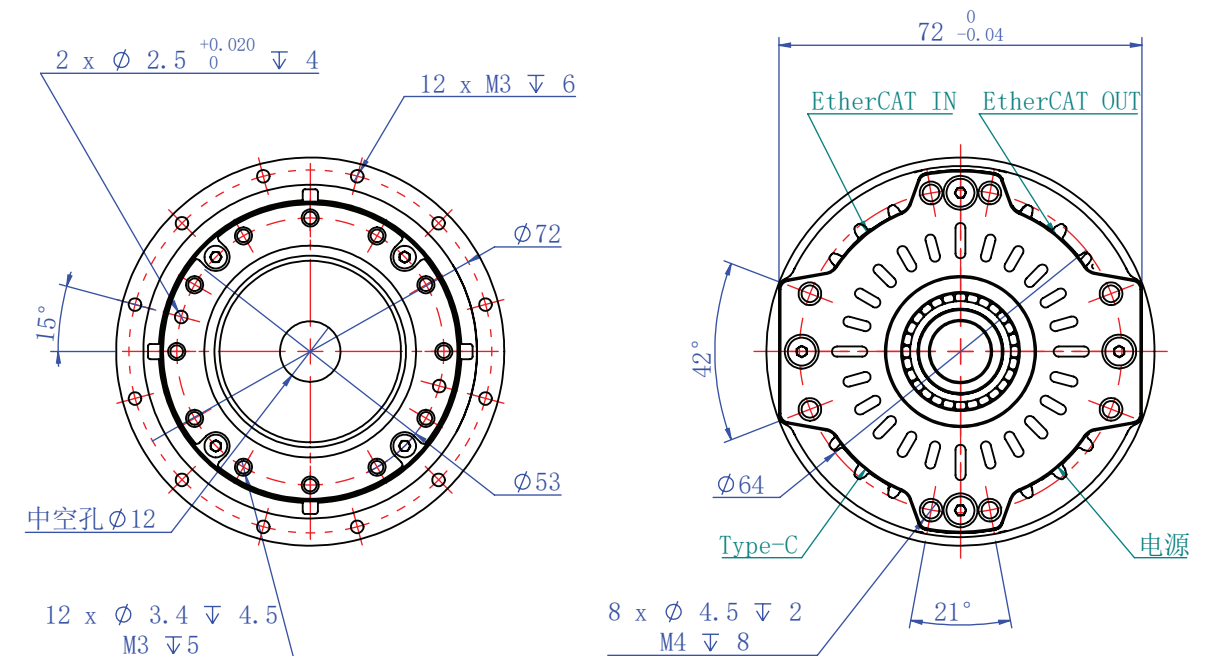
Parameters	Unit	TCHL-14-51-B	TCHL-14-81-B	TCHL-14-101-B
Ratio	-	51	81	101
Rated Torque at 2000rpm input speed	N.m	4.5	6.5	6.5
Maximum Allowable Average Load Torque	N.m	6	8	9.5
Peak Torque for Start/Stop		15	19	24
Peak Output Torque	N.m	19	30	36
Rated Output Speed	rpm	58.8	37	29.7
Peak Output Speed	rpm	78.4	49.3	39.6
Rated Voltage	V	DC48		
Output Moment of Inertia	Kg·m^2	0.027	0.068	0.116
Allowable Overturning Moment	N.m	30		
Torque Sensor	-	Optional		
Repeatable positioning accuracy	-	≤10		
Transmission accuracy	arcsec	≤60		
Encoder	-	I/O Dual encoder, Single-turn Absolute Encoder, 17 bits		
Driver Board Protocol	-	EtherCAT/CanFd		
IP Protection Grade	-	IP54, and IP65 after updating the connector		
Outer Dimension	mm	φ65*67		
Hollow Diameter	mm	φ10		
Weight	Kg	0.55		
Operating Environmental Temperature	°C	-20°C~50°C		



HarmoCore™ Size 17



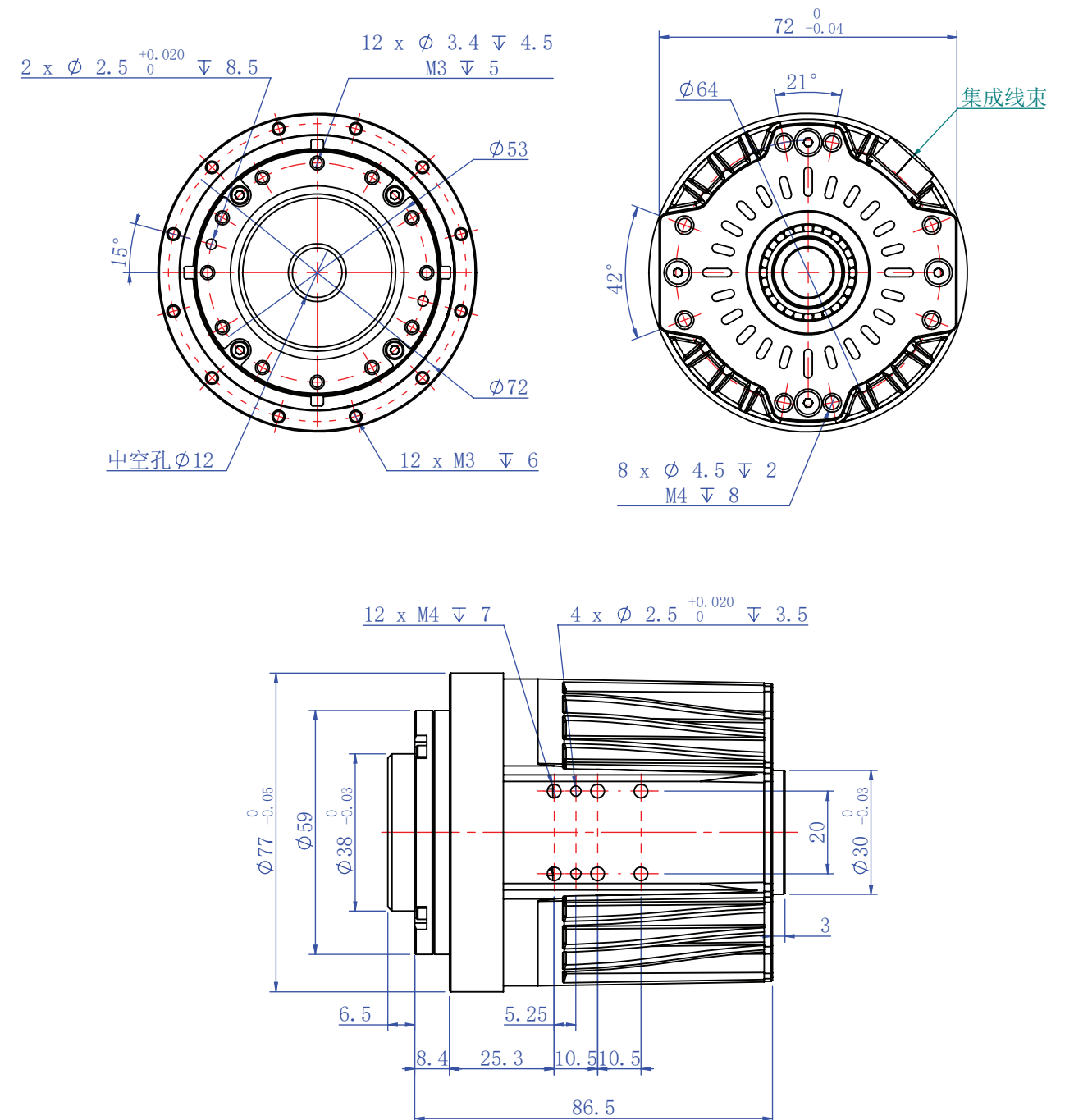
Parameters	Unit	TCHL-17-51	TCHL-17-81	TCHL-17-101
Ratio	-	51	81	101
Rated Torque at 2000rpm input speed	N.m	20	28	29
Maximum Allowable Average Load Torque	N.m	32	33	48
Peak Torque for Start/Stop		42	53	67
Peak Output Torque	N.m	86	107	136
Rated Output Speed	rpm	58.8	37	29.7
Peak Output Speed	rpm	78.4	49.3	39.6
Rated Voltage	V	DC 48		
Output Moment of Inertia	Kg·m ²	0.115	0.289	0.450
Allowable Overturning Moment	N.m	93		
Torque Sensor	-	Optional		
Repeatable positioning accuracy	-	≤10		
Transmission accuracy	arcsec	≤60		
Encoder	-	I/O Dual encoder, Single-turn Absolute Encoder, 17 bits		
Driver Board Protocol	-	EtherCAT/CanFd		
IP Protection Grade	-	IP54, and IP65 after updating the connector		
Outer Dimension	mm	φ77*76		
Hollow Diameter	mm	φ12		
Weight	Kg	0.93		
Operating Environmental Temperature	°C	-20°C~50°C		



HarmoCore™ Size 17(with brake)



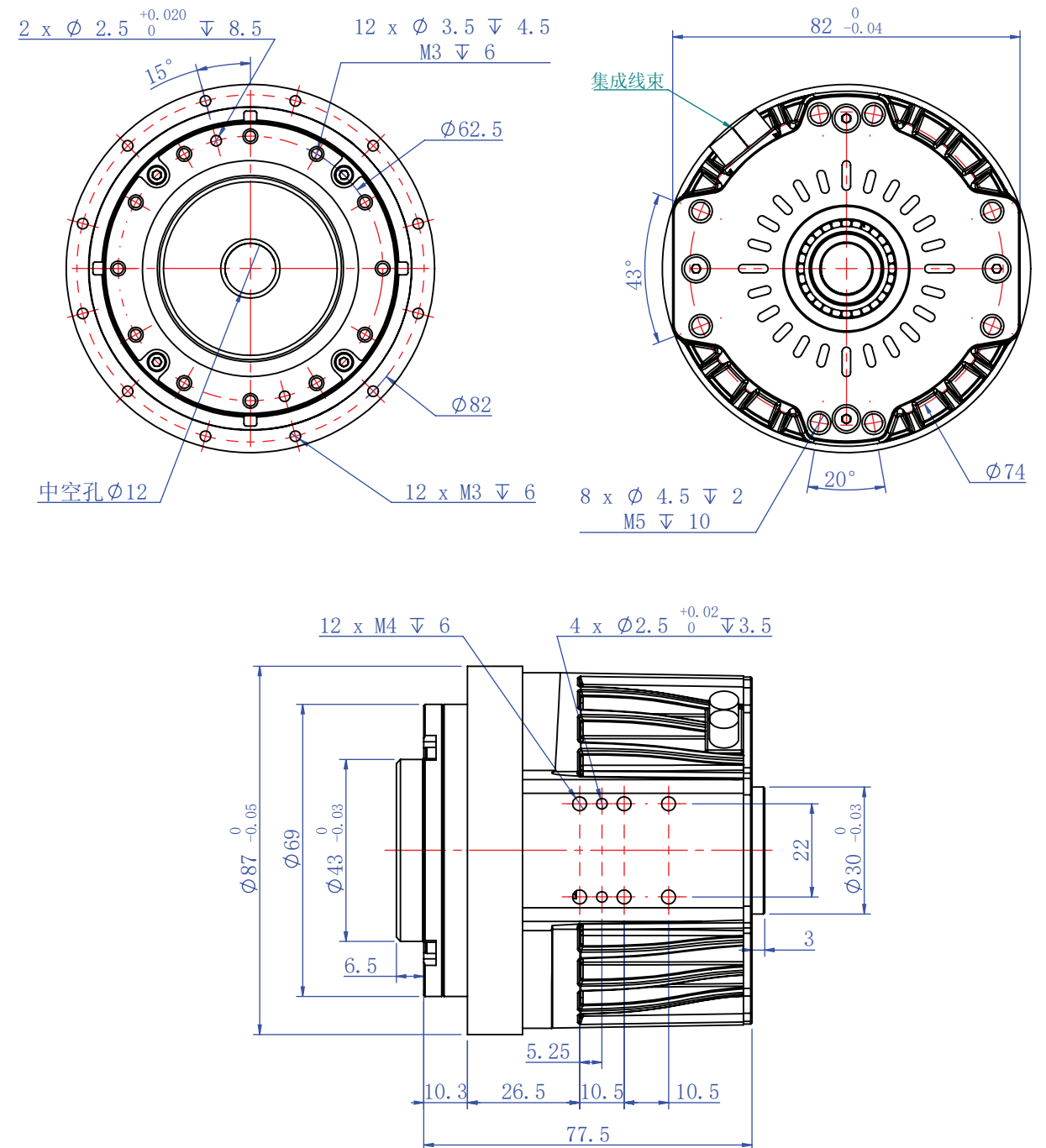
Parameters	Unit	TCHL-17-51-B	TCHL-17-81-B	TCHL-17-101-B
Ratio	-	51	81	101
Rated Torque at 2000rpm input speed	N.m	20	28	29
Maximum Allowable Average Load Torque	N.m	32	33	48
Peak Torque for Start/Stop		42	53	67
Peak Output Torque	N.m	86	107	136
Rated Output Speed	rpm	58.8	37	29.7
Peak Output Speed	rpm	78.4	49.3	39.6
Rated Voltage	V	DC 48		
Output Moment of Inertia	Kg·m^2	0.117	0.296	0.460
Allowable Overturning Moment	N.m	93		
Torque Sensor	-	Optional		
Repeatable positioning accuracy	-	≤10		
Transmission accuracy	arcsec	≤60		
Encoder	-	I/O Dual encoder, Single-turn Absolute Encoder, 17 bits		
Driver Board Protocol	-	EtherCAT/CanFd		
IP Protection Grade	-	IP54, and IP65 after updating the connector		
Outer Dimension	mm	φ77*86.5		
Hollow Diameter	mm	φ12		
Weight	Kg	1.05		
Operating Environmental Temperature	°C	-20°C~50°C		



HarmoCore™ Size 20



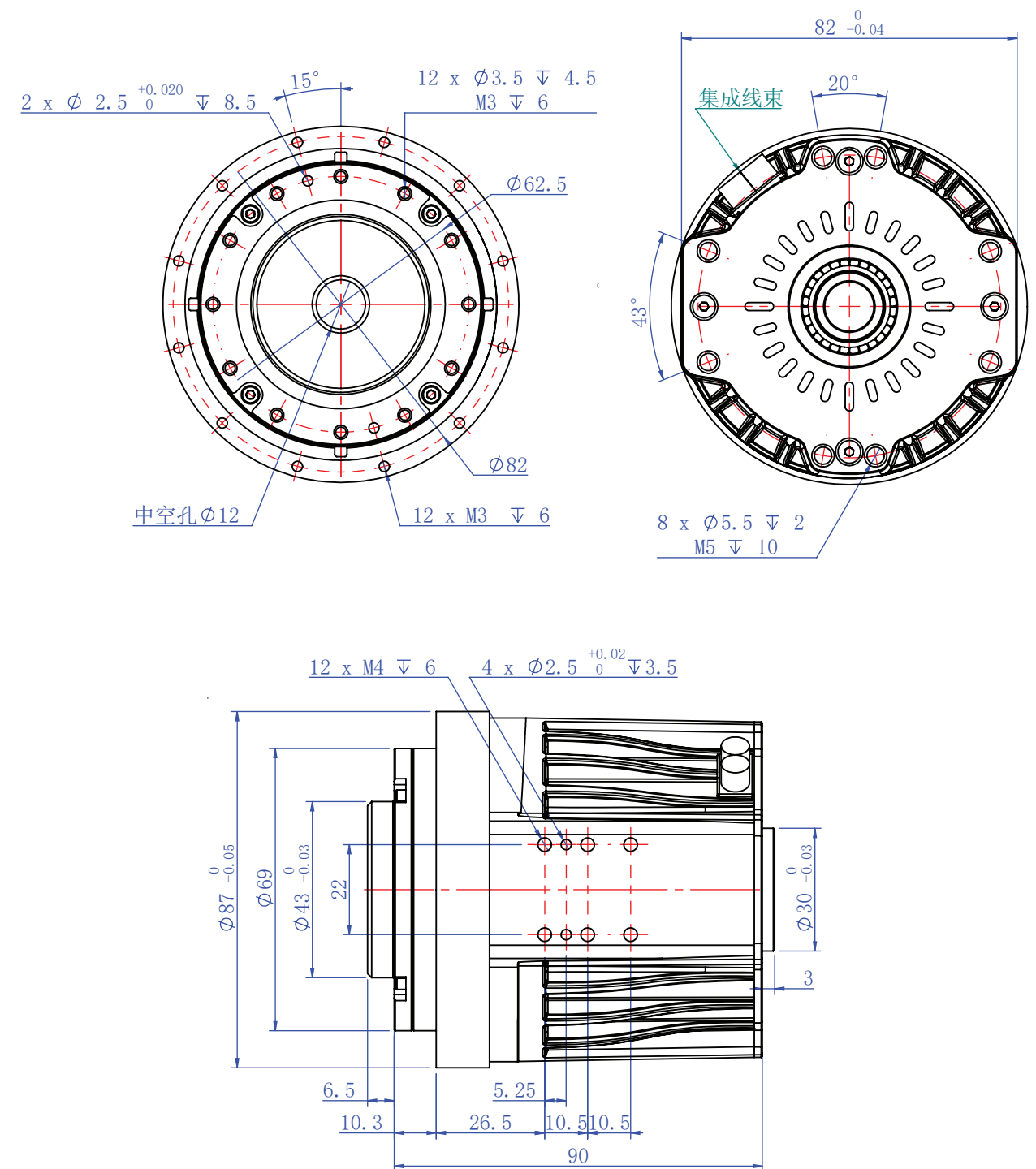
Parameters	Unit	TCHL-20-51	TCHL-20-81	TCHL-20-101
Ratio	-	51	81	101
Rated Torque at 2000rpm input speed	N.m	31	42	49
Maximum Allowable Average Load Torque	N.m	35	56	61
Peak Torque for Start/Stop		69	91	102
Peak Output Torque	N.m	105	157	181
Rated Output Speed	rpm	58.8	37	29.7
Peak Output Speed	rpm	78.4	49.3	39.6
Rated Voltage	V	DC 48		
Output Moment of Inertia	Kg·m^2	0.178	0.450	0.700
Allowable Overturning Moment	N.m	120		
Torque Sensor	-	Optional		
Repeatable positioning accuracy	-	≤10		
Transmission accuracy	arcsec	≤60		
Encoder	-	I/O Dual encoder, Single-turn Absolute Encoder, 17 bits		
Driver Board Protocol	-	EtherCAT/CanFd		
IP Protection Grade	-	IP54, and IP65 after updating the connector		
Outer Dimension	mm	φ87*77.5		
Hollow Diameter	mm	φ12		
Weight	Kg	1.28		
Operating Environmental Temperature	°C	-20°C~50°C		



HarmoCore™
Size 20(with brake)



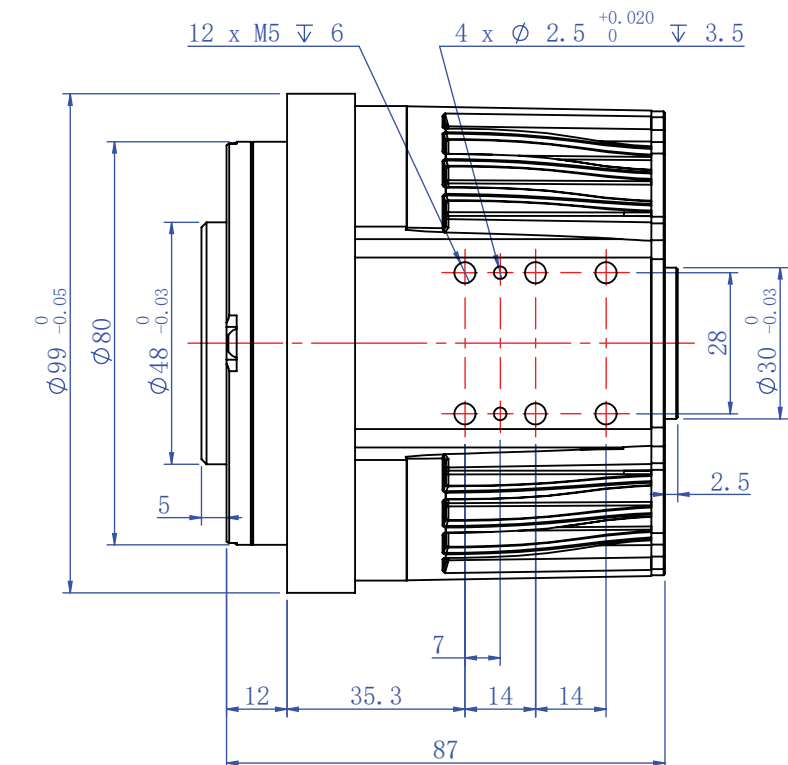
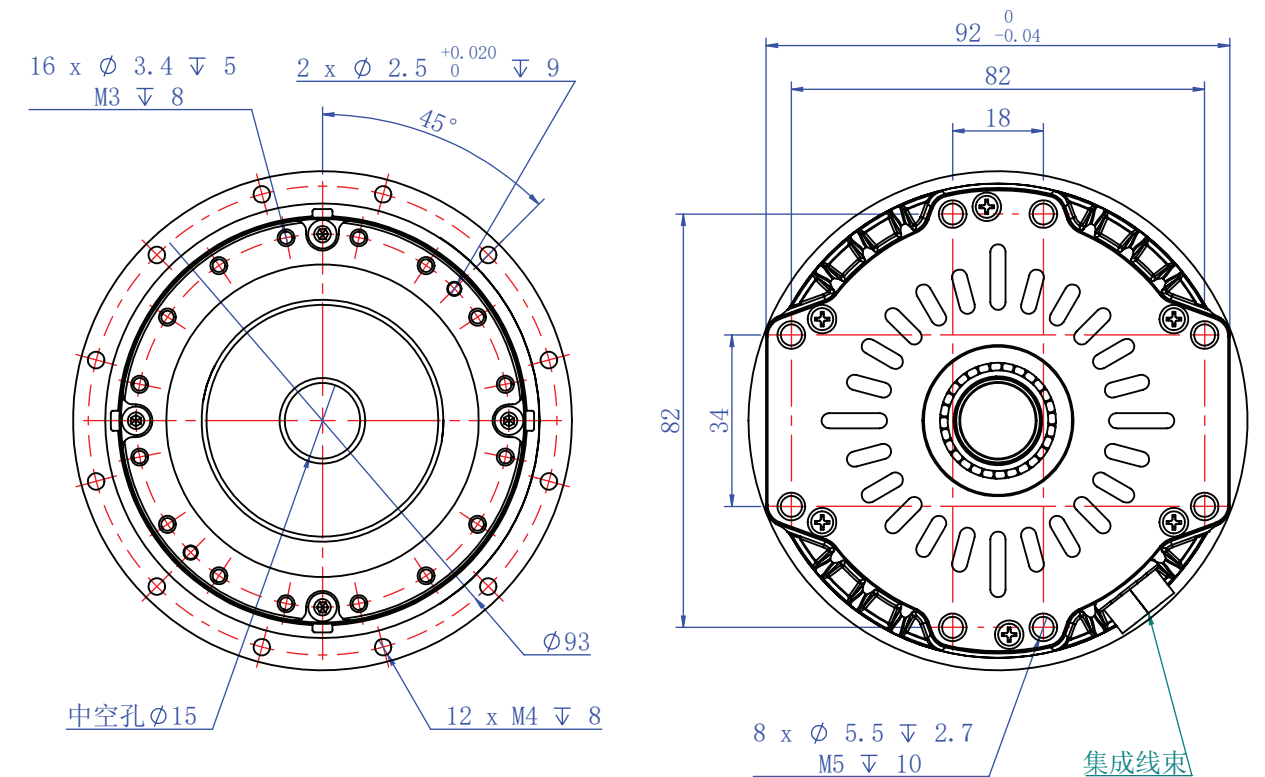
Parameters	Unit	TCHL-20-51-B	TCHL-20-81-B	TCHL-20-101-B
Ratio	-	51	81	101
Rated Torque at 2000rpm input speed	N.m	31	42	49
Maximum Allowable Average Load Torque	N.m	35	56	61
Peak Torque for Start/Stop		69	91	102
Peak Output Torque	N.m	105	157	181
Rated Output Speed	rpm	58.8	37	29.7
Peak Output Speed	rpm	78.4	49.3	39.6
Rated Voltage	V	DC 48		
Output Moment of Inertia	Kg·m^2	0.191	0.482	0.750
Allowable Overturning Moment	N.m	120		
Torque Sensor	-	Optional		
Repeatable positioning accuracy	-	≤10		
Transmission accuracy	arcsec	≤60		
Encoder	-	I/O Dual encoder, Single-turn Absolute Encoder, 17 bits		
Driver Board Protocol	-	EtherCAT/CanFd		
IP Protection Grade	-	IP54, and IP65 after updating the connector		
Outer Dimension	mm	φ87*90		
Hollow Diameter	mm	φ12		
Weight	Kg	1.45		
Operating Environmental Temperature	°C	-20°C~50°C		



HarmoCore™ Size 25



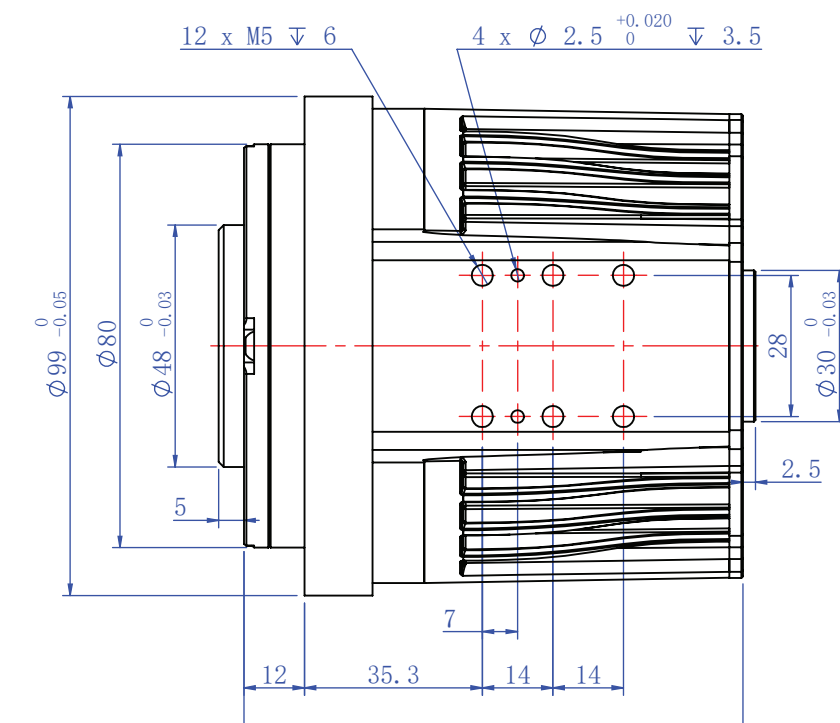
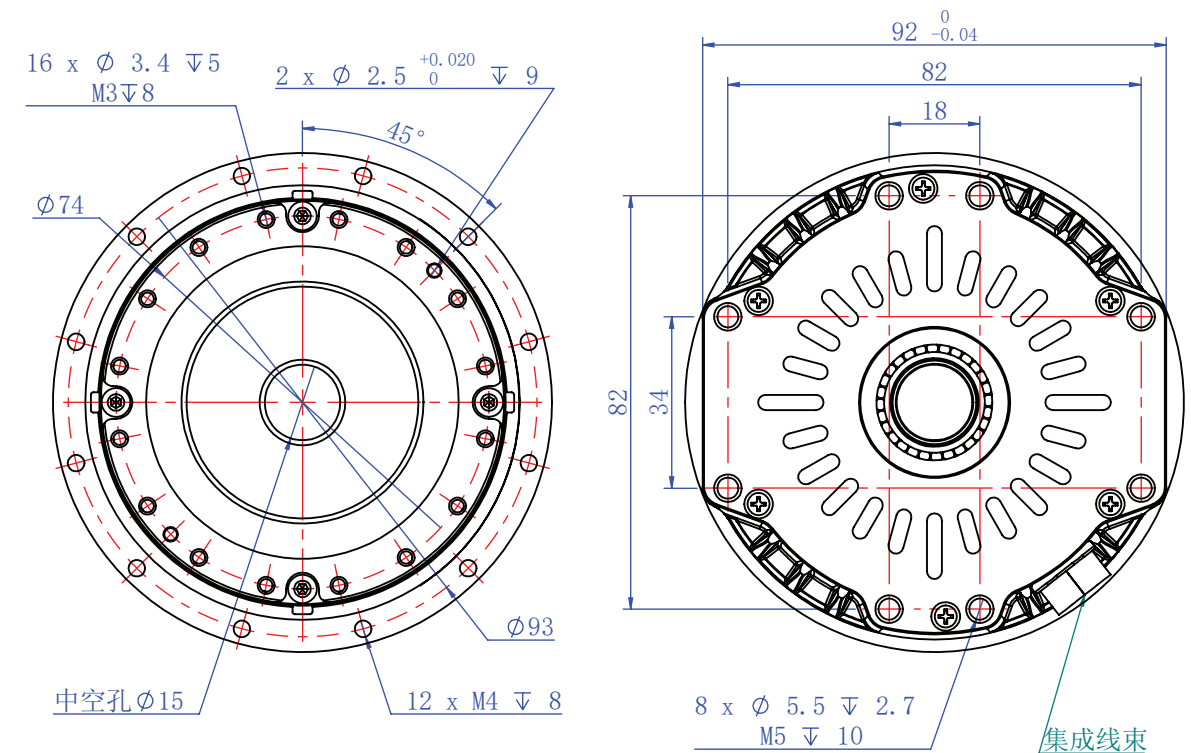
Parameters	Unit	TCHL-25-81	TCHL-25-101	TCHL-25-121
Ratio	-	81	101	121
Rated Torque at 2000rpm input speed	N.m	78	83	83
Maximum Allowable Average Load Torque	N.m	107	133	133
Peak Torque for Start/Stop		169	194	206
Peak Output Torque	N.m	283	351	375
Rated Output Speed	rpm	37	29.7	24.7
Peak Output Speed	rpm	49.3	39.6	33
Rated Voltage	V	DC 48		
Output Moment of Inertia	Kg·m^2	1.222	1.900	2.727
Allowable Overturning Moment	N.m	150		
Torque Sensor	-	Optional		
Repeatable positioning accuracy	-	≤10		
Transmission accuracy	arcsec	≤60		
Encoder	-	I/O Dual encoder, Single-turn Absolute Encoder, 17 bits		
Driver Board Protocol	-	EtherCAT/CanFd		
IP Protection Grade	-	IP54, and IP65 after updating the connector		
Outer Dimension	mm	φ99*87		
Hollow Diameter	mm	φ15		
Weight	Kg	1.85		
Operating Environmental Temperature	°C	-20°C~50°C		



HarmoCore™ Size 25(with brake)



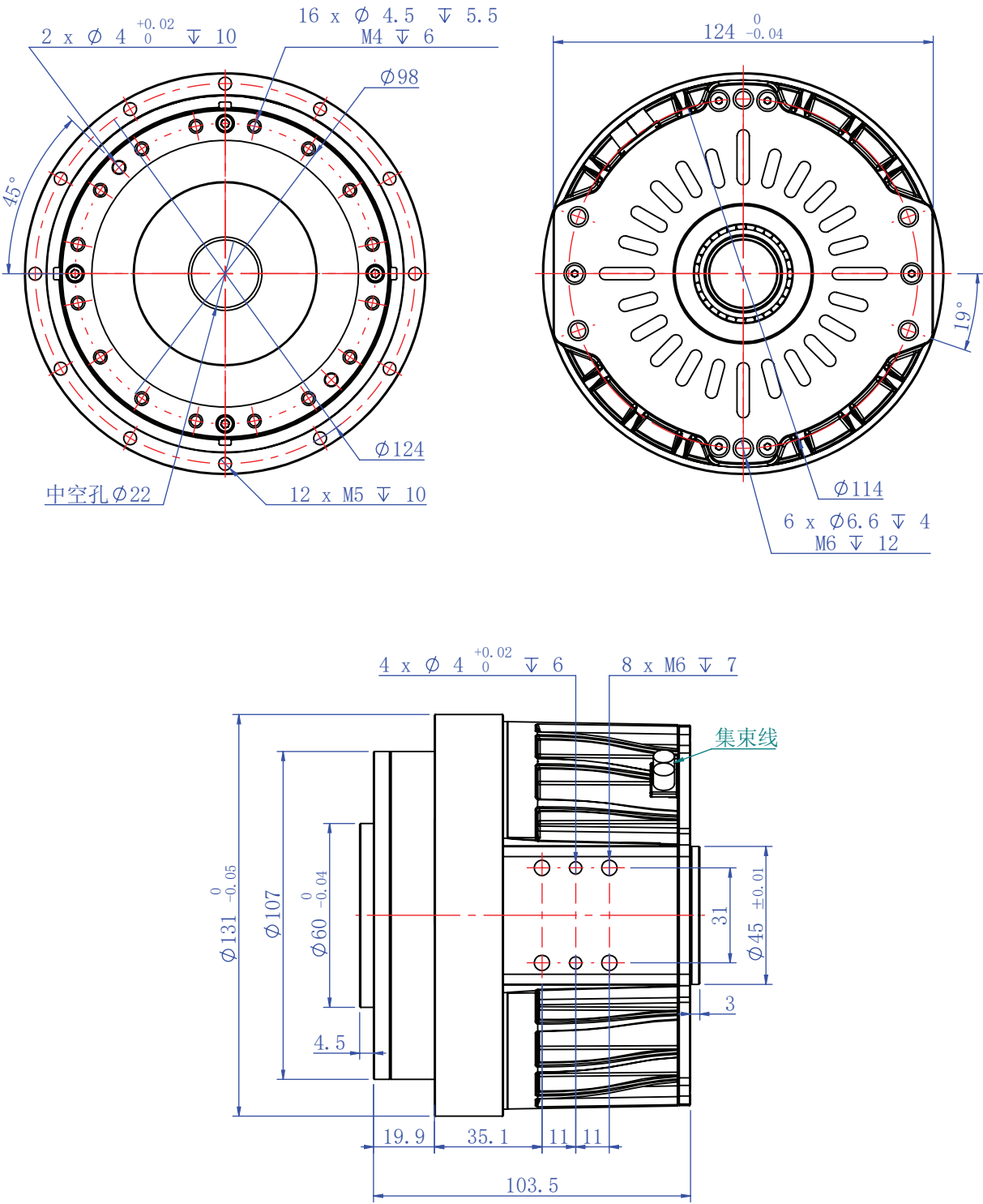
Parameters	Unit	TCHL-25-81-B	TCHL-25-101-B	TCHL-25-121-B
Ratio	-	81	101	121
Rated Torque at 2000rpm input speed	N.m	78	83	83
Maximum Allowable Average Load Torque	N.m	107	133	133
Peak Torque for Start/Stop		169	194	206
Peak Output Torque	N.m	283	351	375
Rated Output Speed	rpm	37	29.7	24.7
Peak Output Speed	rpm	49.3	39.6	33
Rated Voltage	V	DC 48		
Output Moment of Inertia	Kg·m^2	1.286	2.000	2.871
Allowable Overturning Moment	N.m	150		
Torque Sensor	-	Optional		
Repeatable positioning accuracy	-	≤10		
Transmission accuracy	arcsec	≤60		
Encoder	-	I/O Dual encoder, Single-turn Absolute Encoder, 17 bits		
Driver Board Protocol	-	EtherCAT/CanFd		
IP Protection Grade	-	IP54, and IP65 after updating the connector		
Outer Dimension	mm	φ99*99		
Hollow Diameter	mm	φ15		
Weight	Kg	2.1		
Operating Environmental Temperature	°C	-20°C~50°C		



HarmoCore™
Size 32



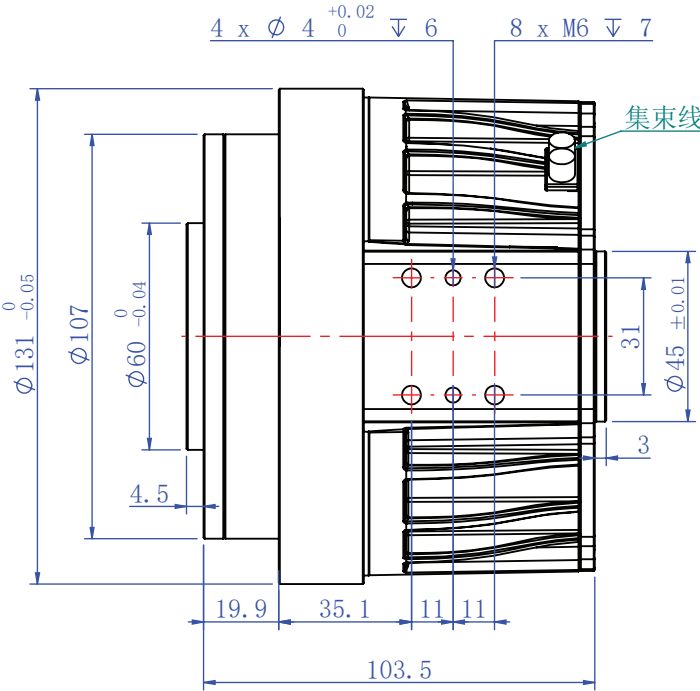
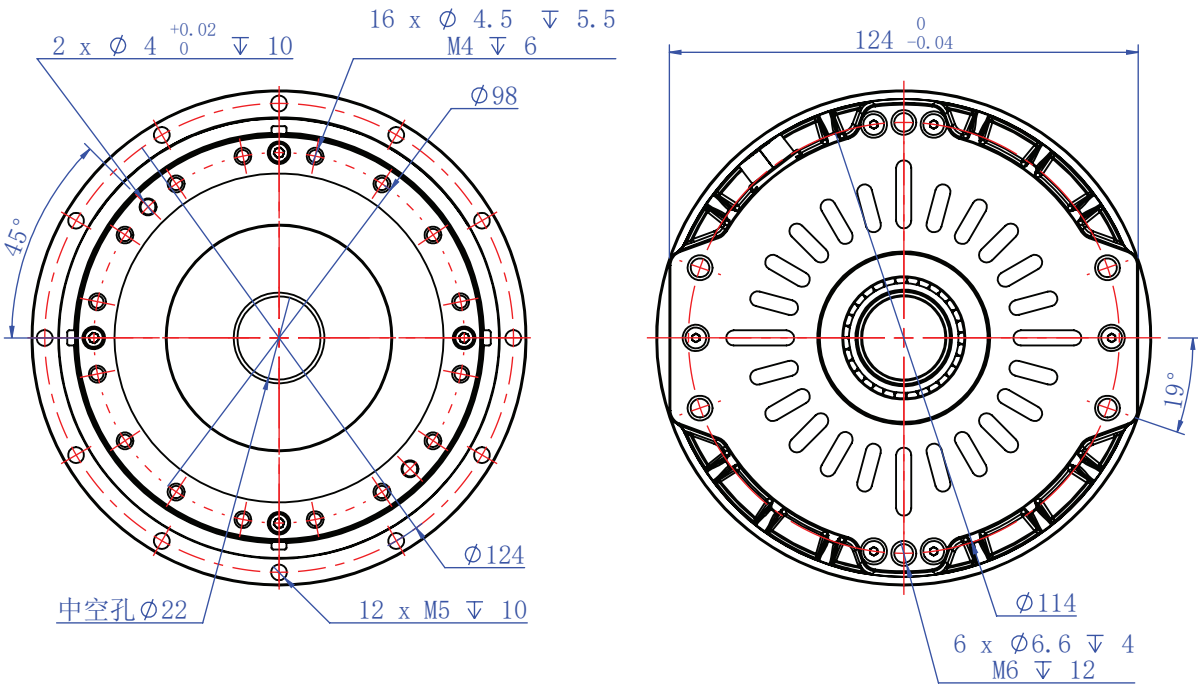
Parameters	Unit	TCHL-32-81	TCHL-32-101	TCHL-32-121
Ratio	-	81	101	121
Rated Torque at 2000rpm input speed	N.m	145	169	169
Maximum Allowable Average Load Torque	N.m	206	267	267
Peak Torque for Start/Stop		375	411	436
Peak Output Torque	N.m	701	799	847
Rated Output Speed	rpm	37	29.7	24.7
Peak Output Speed	rpm	49.3	39.6	33
Rated Voltage	V	DC 48		
Output Moment of Inertia	Kg·m^2	3.859	6.000	8.612
Allowable Overturning Moment	N.m	210		
Torque Sensor	-	Optional		
Repeatable positioning accuracy	-	≤10		
Transmission accuracy	arcsec	≤60		
Encoder	-	I/O Dual encoder, Single-turn Absolute Encoder, 17 bits		
Driver Board Protocol	-	EtherCAT/CanFd		
IP Protection Grade	-	IP54, and IP65 after updating the connector		
Outer Dimension	mm	φ131*103.5		
Hollow Diameter	mm	φ22		
Weight	Kg	3.3		
Operating Environmental Temperature	°C	-20°C~50°C		



HarmoCore™
Size 32(with brake)



Parameters	Unit	TCHL-32-81-B	TCHL-32-101-B	TCHL-32-121-B
Ratio	-	81	101	121
Rated Torque at 2000rpm input speed	N.m	145	169	169
Maximum Allowable Average Load Torque	N.m	206	267	267
Peak Torque for Start/Stop		375	411	436
Peak Output Torque	N.m	701	799	847
Rated Output Speed	rpm	37	29.7	24.7
Peak Output Speed	rpm	49.3	39.6	33
Rated Voltage	V	DC 48		
Output Moment of Inertia	Kg·m^2	3.981	6.190	8.884
Allowable Overturning Moment	N.m	210		
Torque Sensor	-	Optional		
Repeatable positioning accuracy	-	≤10		
Transmission accuracy	arcsec	≤60		
Encoder	-	I/O Dual encoder, Single-turn Absolute Encoder, 17 bits		
Driver Board Protocol	-	EtherCAT/CanFd		
IP Protection Grade	-	IP54, and IP65 after updating the connector		
Outer Dimension	mm	φ131*103.5		
Hollow Diameter	mm	φ22		
Weight	Kg	3.6		
Operating Environmental Temperature	°C	-20°C~50°C		



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