

ROBOTIC ACTUATORS Specifications



ASBISc Enterprises PLC
1, Iapetou Street Agios Athanasios,
4101 Limassol, Cyprus
Web: www.asbis.com

Office: +357 25 857 000
E-mail: m.zakharanka@asbis.com

Actuator structure elements:

Motor - high-torque brushless motor

Gear - strain wave harmonic reducer

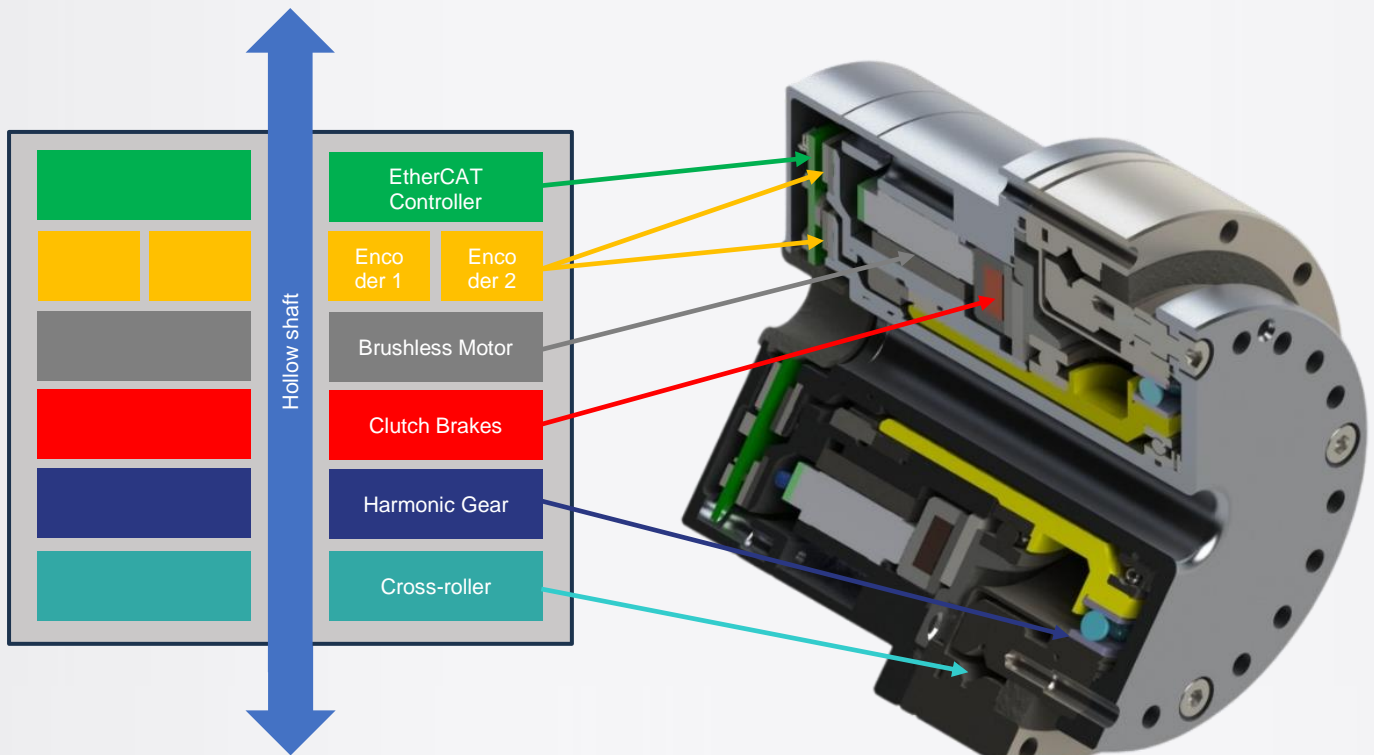
Brakes - electromagnetic clutch tailored to motor torque

EtherCAT Controller - drive unit to run the servomotor

Encoders - pair of 19-bit absolute multiturn magnetic encoders

Cross-roller bearing – handles high moments

Hollow shaft - runs wires or media through servomotor



Applications to leverage actuators:

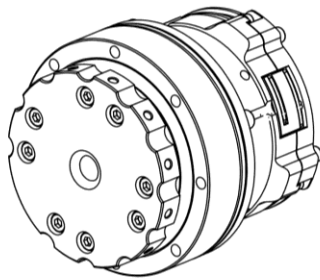
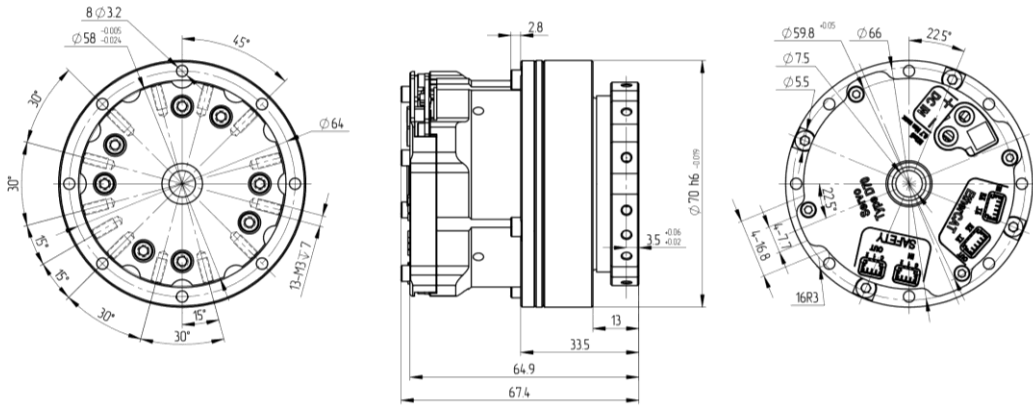
- Humanoid robots
- Active exoskeletons
- Robotic arms
- Harvesting robotic platforms
- Inspection and rescue robots
- Surgery robotics
- UAV Drones
- Robotic engineering companies

How is it different from others?

Considering the structure with clutch brakes, EtherCAT controller, and hollow shaft, there are no actuators with such a high torque density on the market. Moreover, actuator length and diameter have a 1:1 ratio, which provides design, footprint, and weight advantages for your robotic product.

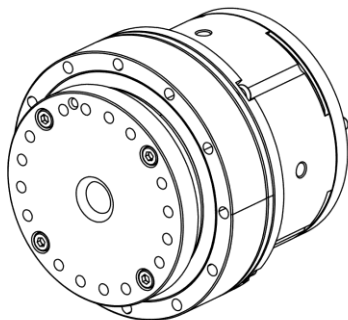
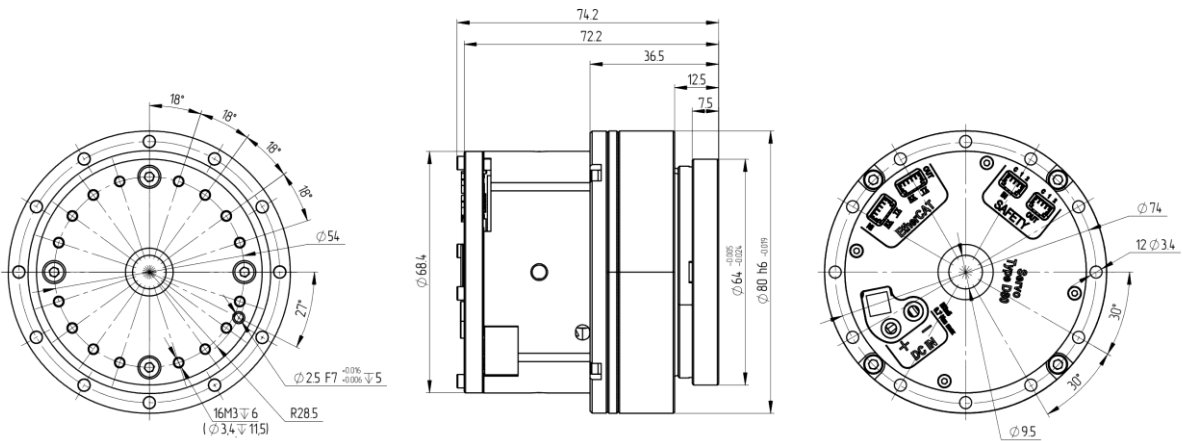
	Parameter	Units	D70 CM.1.1.6.1	D80 CM.1.2.1.1	D90 CM.1.3.1.1	D110 CM.1.4.1.1	Note
PHYSICAL PROPERTIES	Mass	kg	0.8	1.12	1.68	2.56	
	Hollow shaft diam.	mm	7.5	9.5	11.5	13	
	Rated torque	Nm	16	49	62	137	
	Peak torque	Nm	37	66	108	205	
	Permissible static tilting moment	Nm	144	328	515	1070	
	Permissible dynamic tilting moment	Nm	74	124	187	258	
	Gear ratio		100:1	100:1	100:1	1:100	
	Gear pitch diameter	inch (mm)	1.4 (35)	1.7 (43)	2.0 (51)	2.5 (64)	
	Max speed	RPM	50	35	35	25	
	Brakes holding torque	Nm	40	70	100	200	
	Fast rotating parts Inertia, I _f	kg*m ²	3.20E-05	5.70E-05	1.10E-04	2.30E-04	
	Slow rotating parts Inertia, I _s	kg*m ²	7.60E-05	1.50E-04	3.10E-04	7.50E-04	
INTERFACE	Communication		EtherCAT, CoE, FoE				
POWER	Nominal voltage	V	48				
	Under-voltage limit	V	20				
	Over-voltage limit	V	60				
OUTPUT POSITION SENSOR	Fast (motor) shaft position sensor		Absolute magnetic encoder				
	Output position sensor		Dual absolute multi-turn magnetic encoder with backup battery input (3.7V lithium)				
	Output position resolution	bit	19				
	Position accuracy	deg	0.005				Calibrated against external encoder
OTHER	Brakes		Magnetic clutch				
	PWM frequency	kHz	20				
	Current/velocity loop frequency	kHz	20				
	Working modes		Synchronous cyclic torque/synchronous cyclic velocity with feed-forward				
	Protection		Comm. cycle time/over-current/over-voltage/under-voltage/motor over-temperature/switches over-temperature				
	Standard safety functions		STO and FSoE				
	Lifetime (rated), h		10000				At nominal torque
SOFTWARE	Controller features		Cogging torque compensation, output position calibration map, dynamic current limits, current feed-forward, redundant output position feedback, output encoder eccentricity compensation, hardware torque-off during undervoltage				
	Control software		Tunning utility/GUI (Windows/Linux), C/C++/python examples using open-source SOEM EtherCAT master				
CONNECTORS	Power terminals		M3 standoffs (suitable for M3 O-type terminals)				
	EtherCAT connectors		Molex PicoBlade 4-pin 1.25mm pitch				
	Multiturn battery connector		Molex PicoBlade 2-pin 1.25mm pitch				
	Load mounting		Radially oriented M3 bolts	Axially oriented M3 bolts			
ENVIRONMENT	Operating temperature (environment)	deg C	0-50				When mounted on the heatsink > 400cm ² (TBD)
	Operating temperature (case)	deg C	0-80				
	Operating ambient humidity (no condensation)						
	Storage Temperature (no condensation)	deg C					
	IP rating		IP20	IP30	IP30	IP30	Output shaft and bearings are sealed. IP could be improved up to IP65 by external housing.

D70 (CM.1.1.6.1)



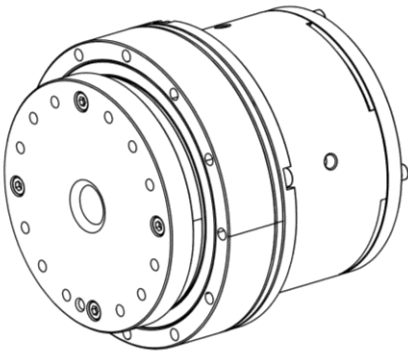
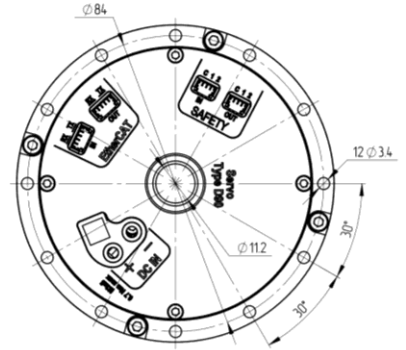
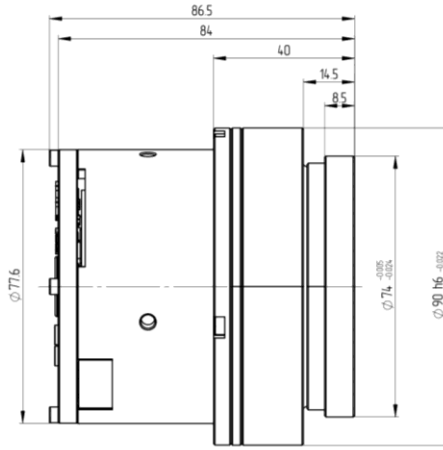
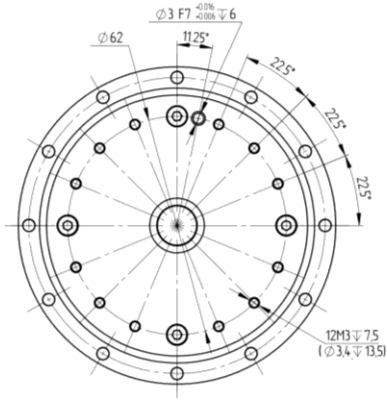
1. DC power supply connection M3x5 max.

D80 (CM.1.2.1.1)



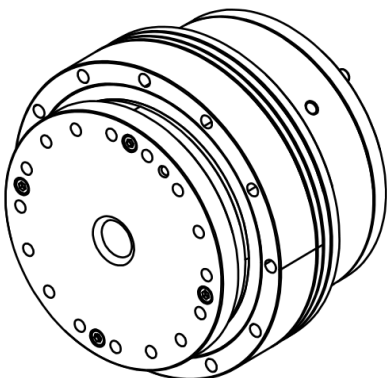
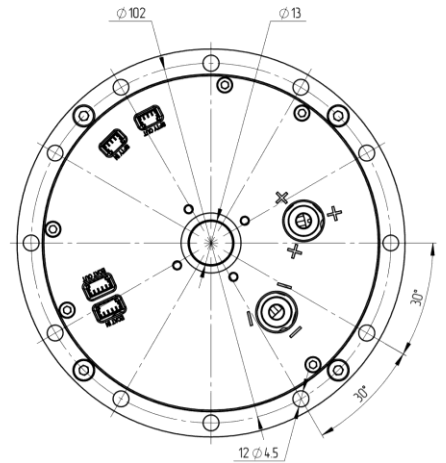
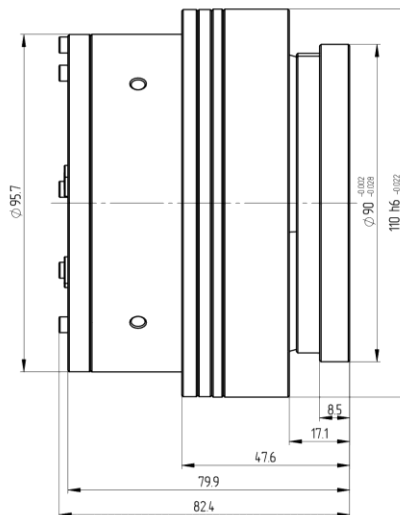
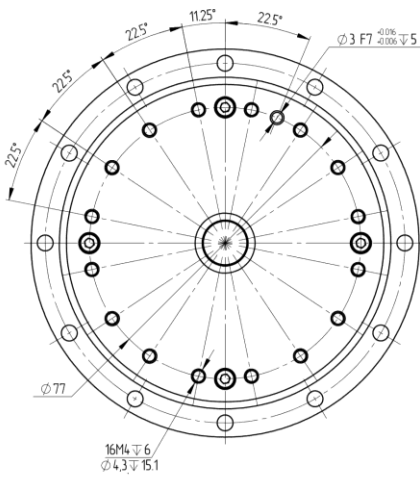
1. DC power supply connection M3x5 max.

D90 (CM.1.3.1.1)



1. DC power supply connection M3x5 max.

D110 (1.4.1.1)



1. DC power supply connection M3x5 max.