



CHARON2 XZ3TM with AccurET Modular / VHP

Data Sheet

AXIS DESIGNATION

Number of controlled axes	5			
Axes name	X (bottom axis)	Fine Z	Tip-Tilt	Theta
Thrust transmitter: DD (direct drive) or ID (indirect drive)	DD	DD	DD	DD

TESTING CONDITIONS

	UNIT			
Position controller	-	Modular 300 7/15 Arms	VHP 48 5/10 Arms	Modular 300 4/7.5 Arms
Motion controller	-	UltimET		
Rated payload (1)	kg	2		
Rated inertia (1)	kg.m ²	-	-	0.018
Rated input voltage	VDC	96	48	96
Tool point position	mm	230 (above bottom surface)		
Ambient temperature	°C	22 ±1		
Isolation system	-	QuiET		

DIMENSIONAL DATA

	UNIT			
Width	mm	383		
Length	mm	593 (with handles) / 527 (without handles)		
Height	mm	179		
Total stroke	mm or °	205	±2	±0.08
Moving mass (without payload)	kg	15	4.2	-
Total mass (without payload)	kg	33		
Rotor inertia (without payload)	kg.m ²	-	-	0.004

FORCE / TORQUE CAPABILITIES (2)

	UNIT			
Peak force / torque	N or Nm	332	65.3	-
Continuous force / torque	N or Nm	130	15.7	-
Standstill force / torque	N or Nm	98	-	-
Max. detent force / torque (average to peak)	N or Nm	7.1	-	-
Static friction (maximal value)	N or Nm	22	-	-
Dynamic friction (maximal value)	N/(m/s) or Nm/(rad/s)	60	-	-

LOAD CAPACITIES

	UNIT			
Maximum axial load	N	-	-	30
Maximum payload	kg	2		

DYNAMIC PERFORMANCE

	UNIT			
Duty cycle	%	25	-	10
Maximum speed	m/s or rad/s	1	0.1	30
Maximum acceleration	m/s ² or rad/s ²	20	3	180
Typical position stability at 2kHz	nm or arcsec	±10	±3	±0.08

ACCURACY

	UNIT			
Positioning accuracy (without mapping)	µm or arcsec	±15	-	-
Positioning accuracy (with mapping)	µm or arcsec	±1	-	-
Bidirectional repeatability	µm or arcsec	±0.3	±0.03	±2
Horizontal straightness / radial runout	µm	±2.5	-	±3.5
Vertical straightness / total axial error at tool point	µm	±2	-	±3
XY displacement while moving in Z	µm	-	±0.1	-
Roll	arcsec	±3	-	-
Pitch	arcsec	±3.5	-	-
Yaw	arcsec	±5	-	-

WORKING ENVIRONMENT

Clean room compatibility (3)	ISO 2
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ELECTRICAL SPECIFICATIONS (2)		UNIT	X (bottom axis)	Fine Z	Tip-Tilt	Theta
	Motor type	-	Ironcore	Electro-Magnet		Toothless
	Motor model	-	LMG10-030-3QB	EMF-14.5-058-1NA-219		TTB0126-030-3NA
	Number of phases	-	3	3x single phase		3
Kt	Force constant	N/Arms or Nm/Arms or N/A _{DC}	26.6	19.6		1.23
Ku	Back EMF constant (4)	Vrms/(m/s) or Vrms/(rad/s) or V _{DC} /(m/s)	16.2	19.6		0.71
Km	Motor constant	Nm/√W	16.8	8.34		-
R20	Electrical resistance at 20 °C (4)	Ohm	1.68	5.50		10.50
L1	Electrical inductance (4)	mH	9.02	13.50		2.65
Ip	Peak current	Arms or A _{DC}	30.0	3.38		6.90
Ic	Continuous current	Arms or A _{DC}	5.00	0.80		1.47
Is	Standstill current	Arms or A _{DC}	3.79	-		1.11
ns	Standstill speed	mm/s or rad/s	0.22	-		0.0016
Um	Max. input voltage	VDC	100	48		100
Pc	Max. cont. power dissipation	W	77.6	3.88		41.9
2τp	Magnetic period	mm	32	-		-
2p	Number of poles	-	-	-		28

ENCODER CHARACTERISTICS		UNIT			
	Encoder and signal type	-	Optical - incremental	Optical - incremental	Optical - incremental
	Output signal	-	1 Vpp	1 Vpp	1 Vpp
	Signal period or line count	μm or period/turn	4	4	18000
	Reference mark	-	One	One centered in Z	One
	Power supply	V	5	5	5

TYPICAL MOVE AND SETTLE TIMES		UNIT				
	Move 1: 10 μm within ±100 nm window	ms	40	-	-	-
	Move 2: 25 mm within ±100 nm window	ms	130	-	-	-
	Move 3: 80 mm within ±100 nm window	ms	185	-	-	-
	Move 4: 100 μm within ±30 nm window	ms	-	60	-	-
	Move 5: 1 mm within ±30 nm window	ms	-	100	-	-
	Move 8: 90 deg within ±40 μdeg	ms	-	-	-	360
	Move 7: 180 deg within ±40 μdeg	ms	-	-	-	525
	Move 6: 360 deg within ±40 μdeg	ms	-	-	-	850

GUIDING ELEMENTS			
Type	Ball bearing	Flexures	Crossed roller bearing

MATERIAL AND FINISH			
Baseplate	Granite	Anodized aluminium	-
Carriage	Stainless steel	Anodized aluminium	Stainless steel

According to the Machinery Directive 2006/42/EC, the system presently described falls into the "partly completed machinery" category and fully complies with it as long as the system is operated according to the working conditions described in the corresponding manual. Customer is responsible for setting safeties/limitations that will keep the motor in its safe operating area. ETEL cannot be held responsible if the system is used in an improper way.

Notes: The specifications given may be mutually exclusive. Unless stated otherwise, all measurements are made within the testing conditions.

- (1) Payload can be assimilated to a cylinder of diameter 270 mm, 19 mm thick, weighting 2 kg. Inertia is expressed with respect to the center of gravity of the payload, Z being the axis of rotation.
- (2) Tolerances on electrical parameters are available on request.
- (3) Under laminar flow conditions at 0.25 m/s along Y axis. Measured at 230 mm from the bottom surface of the stage. Contact ETEL for more details.
- (4) Terminal to terminal.