



# **XZ3™ STACKED SYSTEM**

**ASME-NNNN-05-0205-0000xx**

**CHARON2 XZ3™ with AccurET VHP**

Data sheet

Version 1.0

***ETEL***

### 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	-	VHP 100 10/30 Arms	VHP 48 5/10 Arms		VHP 48 5/10 Arms
Motion controller	-	UltimET (TCP-IP / PCI / PCIe)			
Rated payload	kg	2			
Rated inertia	kg.m <sup>2</sup>	-	-	-	0.018
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	Infinite
Moving mass (without payload)	kg	15	4.2	-	-
Total mass (without payload)	kg	33			
Rotor inertia (without payload)	kg.m <sup>2</sup>	-	-	-	0.004

### FORCE / TORQUE CAPABILITIES (1)

	UNIT				
Peak force / torque	N or Nm	512	65.3	-	7.87
Continuous force / torque	N or Nm	130	15.7	-	1.74
Standstill force / torque	N or Nm	98	-	-	1.32
Max. detent force / torque (average to peak)	N or Nm	7.1	-	-	0
Static friction (maximal value)	N or Nm	22	-	-	1
Dynamic friction (maximal value)	N/(m/s) or Nm/(rad/s)	22	-	-	0.03

### LOAD CAPACITIES

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

### DYNAMIC PERFORMANCE

	UNIT				
Maximum speed	m/s or rad/s	1	0.1	-	41.8
Maximum acceleration	m/s <sup>2</sup> or rad/s <sup>2</sup>	20	3	-	1000
Typical position stability at 2kHz	nm or arcsec	±2	±3	-	±0.02

### ACCURACY

	UNIT				
Duty cycle	%	25	-	-	-
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 (2)	ISO 2			
------------------------------	-------	--	--	--

ELECTRICAL SPECIFICATIONS (1)		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 <sub>DC</sub>		26.6	19.6		1.23
Ku Back EMF constant (3)	Vrms/(m/s) or Vrms/(rad/s) or V <sub>DC</sub> /(m/s)		16.2	19.6		0.71
Km Motor constant	Nm/√W		16.8	8.34		-
R20 Electrical resistance at 20°C (3)	Ohm		1.68	5.50		10.50
L1 Electrical inductance (3)	mH		9.02	13.50		2.65
I <sub>p</sub> Peak current	Arms or A <sub>DC</sub>		30.0	3.38		6.90
I <sub>c</sub> Continuous current	Arms or A <sub>DC</sub>		5.00	0.80		1.47
I <sub>s</sub> Standstill current	Arms or A <sub>DC</sub>		3.79	-		1.11
n <sub>s</sub> Standstill speed	m/s or rad/s		0.22	-		0.02
U <sub>dc</sub> Nominal input voltage	VDC		96	48		48
P <sub>c</sub> Max. cont. power dissipation	W		77.6	3.88		41.9
2τ <sub>p</sub> 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: 1mm within ±30 nm window	ms		-	100	-	-
Move 6: 90 deg within ±40 μdeg	ms		-	-	-	360
Move 7: 180 deg within ±40 μdeg	ms		-	-	-	525
Move 8: 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) Tolerances on electrical parameters are available on request.

(2) 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.

(3) Terminal to terminal.