

XYZ3TM+ STACKED SYSTEM

ASME-YGAW-07-0365-0355xx

1384813-01

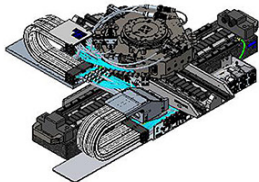
**FULLY INTEGRATED CHARON2 XYZ3TM+
with AccurET VHP, QUIET and frame**

Data sheet

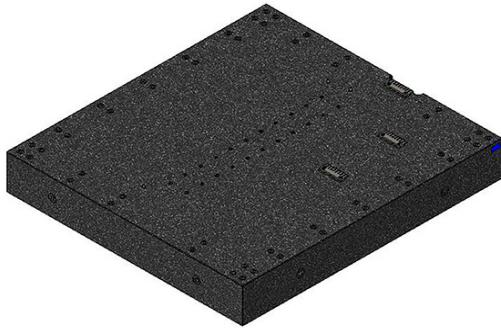
Version 1.0

ETEL

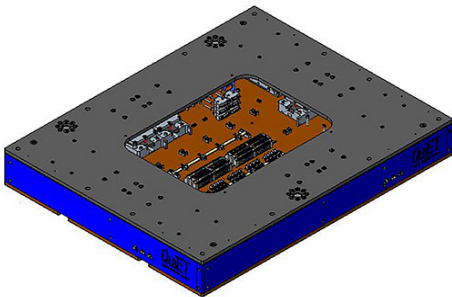
SCOPE OF SUPPLY



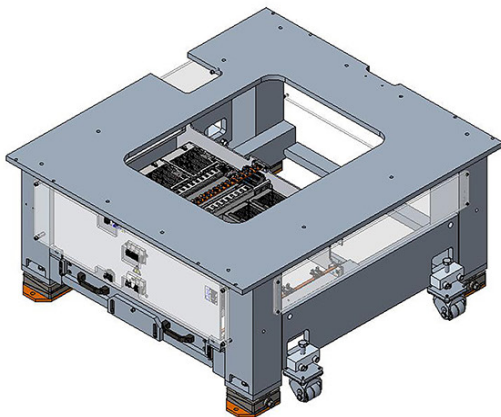
XY stage: CHARON2
Module: Z3TM+



Base: Granite



Isolation system: QUIET sandwich 6DOF



Frame: Steel welded
Control: VHP, ULTIMET, power supplies and connecting cables integrated in the drawer inside the frame

AXIS DESIGNATION						
Number of controlled axes	7					
Axes name	X (bottom axis)	Y (top axis)	Fine Z	Tip-Tilt	Coarse Z	Theta
Thrust transmitter: DD (direct drive) or ID (indirect drive)	DD	DD	DD	DD	DD	DD

TESTING CONDITIONS			UNIT			
Position controller	-	VHP 100 (10/30A)	VHP 48 (5/10A)		VHP 100 (7/15A)	
Motion controller	-	ULTIMET				
Rated payload	kg	2			0.25	2
Rated inertia	kg.m ²	-	-	-	-	0.018
Rated input voltage	VDC	96		48		96
Tool point position	mm	270 above bottom surface				
Ambient temperature	°C	22 ± 1				
Isolation system	-	QUIET 6DOF Sandwich				

DIMENSIONAL DATA		UNIT					
Width	mm	1100					
Length	mm	1160					
Height	mm	1040					
Total stroke	mm or °	475	410	±2	±0.08	12	364°
Moving mass (without payload)	kg	27.4	14.8	5	-	0.6	3
Total mass (without payload)	kg	900					
Rotor inertia (without payload)	kg.m ²	-	-	-	-	-	0.004

FORCE / TORQUE CAPABILITIES (1)		UNIT					
Peak force / torque	N or Nm	512	298	65.3	-	34.4	7.36
Continuous force / torque	N or Nm	130	54.3	15.7	-	11.3	0.831
Standstill force / torque	N or Nm	98	40.9	-	-	-	0.669
Max. detent force / torque (average to peak)	N or Nm	7.1	7.9	-	-	-	0
Static friction (maximal value)	N or Nm	22	22	-	-	5	0.2
Dynamic friction (maximal value)	N/(m/s) or Nm/(rad/s)	22	22	-	-	3	0.2

LOAD CAPACITIES		UNIT					
Maximum axial load	N	-	-	-	-	4	25

DYNAMIC PERFORMANCE		UNIT					
Duty cycle	%	18	17	-	-	70	6
Maximum speed	m/s or rad/s	1	1	0.1	-	0.25	10
Maximum acceleration	m/s ² or rad/s ²	10	10	3	-	8	180
Typical position stability at 2 kHz	nm or arcsec	±2	±2	±3	-	±50	±0.025

ACCURACY		UNIT					
Positioning accuracy (without mapping)	µm	±20		-	-	-	±30
Positioning accuracy (with mapping)	µm	±1		-	-	-	-
Unidirectional repeatability	µm	-	-	-	-	±10 ⁽²⁾ / ±5 ⁽³⁾	-
Bidirectional repeatability	µm or arcsec	±0.4		±0.03	-	±15 ⁽²⁾ / ±7.5 ⁽³⁾	±2
Horizontal straightness / radial runout	µm	±3	±3.5	-	-	-	±3.5
Vertical straightness / total axial error at tool point	µm	±2.5	±5	-	-	-	±3
XY displacement while moving in Z (4)	µm	-	-	±0.1	-	±15	-
Orthogonality	arcsec	±15		-	-	-	-
Roll	arcsec	±5	±10	-	-	-	-
Pitch	arcsec	±5	±15	-	-	-	-
Yaw	arcsec	±10	±10	-	-	-	-

ELECTRICAL SPECIFICATIONS (1)		UNIT	X (bottom axis)	Y (top axis)	Fine Z	Tip-Tilt	Coarse Z	Theta
	Motor type	-	Ironcore	Ironcore	Electro-Magnet		Electro-Magnet	Ironless
	Motor model	-	LMG10-030-3QB	LMG05-030-3RA	EMF-14.5-058-1NA-219		EMG012-.075	SLICE0109-015
	Number of phases	-	3	3	3 x single-phase		1	3
Kt	Force constant	N/Arms or Nm/Arms	26.6	24.6	19.6		10.7	0.646
Ku	Back EMF constant (5)	Vrms/(m/s) or Vrms/(rad/s)	16.2	14.9	19.6		10.9	0.372
Km	Motor constant	Nm/√W	16.8	13.2	8.34		6.11	0.309
R20	Electrical resistance at 20°C (5)	Ohm	1.68	2.31	5.5		3.06	2.92
L1	Electrical inductance (5)	mH	9.02	10.8	13.5		8.97	5.52
Ip	Peak current	Arms	30	19.9	3.38		3.49	11.8
Ic	Continuous current	Arms	5.00	2.26	0.8		1.05	1.33
Is	Standstill current	Arms	3.79	1.71	-		-	1.01
ns	Standstill speed	mm/s	0.22	0.2	-		-	-
Um	Max. input voltage	VDC	100	100	48		100	100
Pc	Max. cont. power dissipation	W	77.6	20.4	3.88		3.93	8.75
2τp	Magnetic period	mm	32	32	-		-	-
2p	Number of poles	-	-	-	-		-	32

VACUUM CHARACTERISTICS		UNIT						
Vacuum supply for wafer chuck								
	Vacuum at interface output	bar	-	-	-0.6			
Vacuum supply for axis cleanliness								
	Vacuum flow	l/min	20	20	-	5	5	

ENCODER CHARACTERISTICS		UNIT						
	Encoder and signal type	-	Optical - incremental		Optical - incremental		Optical absolute	Optical incremental
	Output signal	-	1 Vpp	1 Vpp	1 Vpp		EnDat 2.2	1 Vpp
	Signal period or line count	µm or period/turn	4	4	4		10	18'000
	Reference mark	-	One	One	One centered in Z		Absolute	One
	Power supply	V	5					

WORKING ENVIRONMENT							
	Clean room compatibility (6)	-	ISO 2				

TYPICAL MOVE AND SETTLE TIMES		UNIT					
	Move 1: 10 µm within ±100 nm window	ms	50	-	-	-	-
	Move 2: 25 mm within ±100 nm window	ms	170	-	-	-	-
	Move 3: 80 mm within ±100 nm window	ms	250	-	-	-	-
	Move 4: 100 µm within ±30 nm window	ms	-	-	60	-	-
	Move 5: 1 mm within ±30 nm window	ms	-	-	100	-	-
	Move 6: 1 deg within ±40 µdeg	ms	-	-	-	-	70
	Move 7: 180 deg within ±40 µdeg	ms	-	-	-	-	450
	Move 8: 10 mm within ±500 nm	ms	-	-	-	-	180

GUIDING ELEMENTS							
	Type	-	Ball bearing	Ball bearing	Flexures	Ball bearing	Ball bearing

MATERIAL AND FINISH							
	Baseplate	-	Granite	Aluminium &	Anodized aluminum	Stainless steel	-
	Carriage	-	Aluminium	Stainless steel	Anodized aluminum	Stainless steel	Stainless steel

OPTIONS / ACCESSORIES / FEATURES								
	Gravity compensation	N	-	-	Yes	-	Yes	-

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) Measured at a radius of 150 mm.
- (3) Measured at a radius of 150 mm other a limited stroke of 0 to + 3 mm.
- (4) Maximum displacement measured over a 100 µm sliding window, wherever the position on the fine Z stroke.
- (5) Terminal to terminal.
- (6) Under vertical laminar flow conditions at 0.5 m/s. Measured at tool point level. Contact ETEL for more details.

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