



XYT STACKED PLATFORM

ASME-NNNN-04-0365-0355xx

Vulcano XYT (RTTB)

Data sheet

Version 1.1

ETEL

AXIS DESIGNATION

Number of controlled axes	4		
Axes name	Y1-Y2	X	Theta
Thrust transmitter: DD (direct drive) or ID (indirect drive)	DD	DD	DD

TESTING CONDITIONS

	UNIT			
Position controller	-	VHP100 10/30A	VHP100 10/30A	VHP48 05/10A
Motion controller	-	UltimET		
Rated payload	kg (lbs)	-	-	1 (2.2)
Rated inertia	kg.m ²	-	-	0.0077
Rated acceleration	m/s ² (in/s ²) or rad/s ²	25 (984.2)	25 (984.2)	55
Rated speed	m/s (in/s) or rad/s	1 (39.3)	1 (39.3)	6.28 (60 rpm)
Tool point position	mm	52 mm centered above Theta		
Ambient temperature	°C	22 ±1		
Isolation system	-	QuiET		

DIMENSIONAL DATA (1)

	UNIT			
Stage width	mm (in)	753 (29.64)		
Stage length	mm (in)	916 (36.06)		
Stage height	mm (in)	200 (7.87)		
Total stroke	mm (in)	365 (14.37)	355 (13.97)	367° ±2°
Moving mass (without payload)	kg (lbs)	26 (57.32)	13.5 (29.7)	-
Total mass (without payload)	kg (lbs)	91 (200.62)		
Rotor inertia (without payload)	kg.m ²	-	-	5.68 E-3

FORCE / TORQUE CAPABILITIES

	UNIT			
Fp/Tp Peak force / torque	N or Nm	1800	519	4.05
Fc/Tc Continuous force / torque	N or Nm	380	122	1.96
Fs/Ts Stall force / torque	N or Nm	286	92.7	1.48
Fd/Td Max. detent force / torque (average to peak)	N	24	7.2	-
Static friction (maximal value)	N	15	12	-
Dynamic friction (maximal value)	N/(m/s)	34	45	<0.03 Nm

LOAD CAPACITIES

	UNIT			
Maximum payload	kg (lbs)	-	-	30 (66.13)

DYNAMIC PERFORMANCE

	UNIT			
Maximum acceleration	m/s ² (in/s ²) or rad/s ²	25 (984.2)	25 (984.2)	169
Maximum speed	m/s (in/s) or rad/s	1.5 (59)	1.5 (59)	6.28 (60 rpm)
Typical position stability	nm or arcsec	±1.1	±0.8	±2.59 E-3 (±1.9 nm at R=150 mm)
Typical speed stability (tracking error at 10% of rated speed)	nm or arcsec	1300	1000	-

STAGE ACCURACY (2)

	UNIT			
Positioning accuracy (with mapping)	µm or arcsec	±0.8		-
Bidirectional repeatability (3)	µm or arcsec	±0.35		±0.3
Horizontal straightness / radial runout	µm	-	-	±0.5
Vertical straightness / total axial error	µm	-	-	±2
Roll	arcsec	±20	±20	-
Pitch	arcsec	±20	±20	-
Yaw	arcsec	±1.5	±14.5	-

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ELECTRICAL SPECIFICATIONS		UNIT	Y1-Y2	X	Theta
	Motor type	-	Ironcore	Ironcore	Toothless
	Motor model	-	LMG10-050-3UA-H01	LMG10-030-3QB-H01	TTB0180-020-2PA
	Number of phases	-	3	3	2
Kt	Force constant	N/Arms or Nm/Arms	35.4	26.6	1.96
Ku	Back EMF constant (5)	Vrms/(m/s) or Vrms/(rad/s)	21.4	16.2	0.98
R20	Electrical resistance at 20°C (5)	Ohm	1.46	1.68	6.90
L1	Electrical inductance (5)	mH	8.54	9.10	3.70
Ip	Peak current	Arms	39.2	31.1	2.07
Ic	Continuous current	Arms	5.54	4.70	1.00
Is	Stall current	Arms	4.20	3.56	0.76
ns	Stall speed	m/s or rad/s	350 E-6	420 E-6	17.8 E-3 (0.017 rpm)
Udc	Nominal input voltage	VDC	96	96	48
Pc	Max. cont. power dissipation	W	96.5	79.6	14.9
2τp	Magnetic period	mm	32	32	-
2p	Number of poles	-	-	-	30

ENCODER CHARACTERISTICS		UNIT			
	Encoder and signal type	-	Optical / sin-cos	Optical / sin-cos	Optical / sin-cos
	Output signal	-	1 Vpp	1 Vpp	1 Vpp
	Signal period or line count	μm or period/turn	4	4	360'000
	Reference mark	-	one (center of stroke)	one (center of stroke)	no
	Power supply	V	5	5	5

WORKING ENVIRONMENT				
	Clean room compatibility (4)			ISO 1

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

TYPICAL MOVE AND SETTLE TIMES		UNIT			
	Move 1: 10μm within ±100 nm	ms	50	50	-
	Move 2: 25 mm within ±100 nm	ms	140	140	-
	Move 3: 80 mm within ±100 nm	ms	170	170	-
	Move 1: 0.001° within ±1.92 μ°	ms	-	-	60
	Move 2: 180° within ±20 μ°	ms	-	-	750

GUIDING ELEMENTS				
	Type		Recirculating bearings (3x)	Recirculating bearings (2x) Integrated rotary bearing

MATERIAL AND FINISH				
	Baseplate		Stainless steel	-
	Carriage		-	Anodized aluminum (6) 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. Hypothesis, tolerances and definition are in ETEL systems documentation.

- (1) With bumpers compressed (except for total stroke) and without any additional customer part attached to the mobile interface.
- (2) Values given at 3 sigmas.
- (3) Repeatability measured with 10m/s² acceleration
- (4) Under laminar flow conditions at 0.25 m/s along Y axis. Measured 12 mm above customer mobile interface. Contact ETEL for more details.
- (5) Terminal to terminal.
- (6) Contact ETEL if you consider mounting payload on this axis

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