

AXIS DESIGNATION			
Number of controlled axes	3		
Axes name	X (bottom axis)	Y (top axis)	Theta
Thrust transmitter: DD (direct drive) or ID (indirect drive)	DD	DD	DD

TESTING CONDITIONS			UNIT	
Position controller	-	Modular 300 7/15 Arms	Modular 300 7/15 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	96	96
Tool point position	mm	247 mm above bottom surface		
Ambient temperature	°C	22 ±1		
Isolation system	-	QuiET		

DIMENSIONAL DATA			UNIT	
Stage width	mm	772		
Stage length	mm	958		
Stage height	mm	227		
Total stroke	mm	475	410	Infinite
Moving mass (without payload)	kg	22.4	9.8	-
Total mass (without payload)	kg	54.7		
Rotor inertia (without payload)	kg.m ²	-	-	0.004

FORCE / TORQUE CAPABILITIES (2)			UNIT	
Peak force / torque	N or Nm	332	254	7.87
Continuous force / torque	N or Nm	123	74.3	1.74
Standstill force / torque	N or Nm	92.9	56.1	1.32
Max. detent force / torque (average to peak)	N or Nm	7.1	7.9	0
Static friction (maximal value)	N or Nm	22	22	1
Dynamic friction (maximal value)	N/(m/s) or Nm/(rad/s)	22	22	0.03

LOAD CAPACITIES			UNIT	
Maximum payload	kg	30		

DYNAMIC PERFORMANCE			UNIT	
Duty cycle	%	25	25	10
Maximum speed	m/s or rad/s (rpm)	1	1	30
Maximum acceleration	m/s ² or rad/s ²	10	10	180
Typical position stability at 2 kHz	nm or arcsec	±10	±10	±0.08

ACCURACY			UNIT	
Positioning accuracy (without mapping)	µm or arcsec	±20		±30
Positioning accuracy (with mapping)	µm or arcsec	±1		±3
Unidirectional repeatability	µm or arcsec	-		±1
Bidirectional repeatability	µm or arcsec	±0.4		±2
Horizontal straightness / radial runout	µm	±3	±3.5	±3.5
Vertical straightness / total axial error at R = 42.5 mm	µm	±2.5	±5	±3
Orthogonality	arcsec	±15		-
Roll	arcsec	±5	±10	-
Pitch	arcsec	±5	±15	-
Yaw	arcsec	±10	±10	-

WORKING ENVIRONMENT		
Clean room compatibility (3)	ISO 2	

ELECTRICAL SPECIFICATIONS (2)		UNIT	X (bottom axis)	Y (top axis)	Theta
	Motor type	-	Ironcore	Ironcore	Toothless
	Motor model	-	LMG10-030-3QB-H01	LMG05-030-3RA-H01	TTB0126-030-3NA-239
	Number of phases	-	3	3	3
Kt	Force constant	N/Arms or Nm/Arms	26.6	24.6	1.23
Ku	Back EMF constant (4)	Vrms/(m/s) or Vrms/(rad/s)	16.2	14.9	0.712
Km	Motor constant	N/√W or Nm/√W	16.8	13.2	-
R20	Electrical resistance at 20°C (4)	Ohm	1.68	2.31	10.50
L1	Electrical inductance (4)	mH	9.05	10.8	2.65
Ip	Peak current	Arms	15.0	15.0	6.90
Ic	Continuous current	Arms	4.79	3.13	1.47
Is	Standstill current	Arms	3.62	1.71	1.11
vs	Standstill speed	mm/s or rad/s	0.22	0.20	0.0016
Um	Max. input voltage	VDC	300	300	100
Pc	Max. cont. power dissipation	W	77.6	48.5	41.9
2τp	Magnetic period	mm	32	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	18 000
	Reference mark	-	One	One	One
	Power supply	V	5	5	5

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: 1 deg within ±40 μdeg	ms	-	-	100
	Move 5: 180 deg within ±40 μdeg	ms	-	-	500

GUIDING ELEMENTS					
	Type		Ball bearing	Ball bearing	Crossed roller bearing

MATERIAL AND FINISH					
	Baseplate		Granite	Aluminum & Silicon alloy	Aluminum alloy
	Carriage		Aluminum & Silicon alloy	Stainless steel	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.