ZT COMBINED MODULE

ASME-NNNN-03-0012-0004xx

Data sheet

Version 1.2

ETEL
MOTION TECHNOLOGY

HIGH PRECISION POSITIONING STAGE

ASME-NNNN-03-0012-0004xx-ZT COMBINED MODULE

AXIS DESIGNATION			
Number of controlled axes	3		
Axes name	Fine Z	Coarse Z	Theta
Thrust transmitter: DD (direct drive) or ID (indirect drive)	DD	ID	DD

DIMENSIONAL DATA	UNIT	VALUES		
Stage width	mm (in)	297 (11.6)		
Stage length	mm (in)	342.8 (13.4)		
Stage height	mm (in)	123 0/+12 (4.8 0/+0.48) (with fine Z centered, without chuck)		
Total stroke	mm (in)	4 (0.16)	12 (0.47)	Infinite
Moving mass (with rated payload)	kg (lbs)	6.3 (13.8)	1.7 (3.7)	-
Total mass (with rated payload)	kg (lbs)	9.6 (21.1)		
Rotor inertia (with rated payload)	$kg.m^2$	-	-	0.012

FORCE / TORQUE CAPABILITIES (1)	UNIT	VALUES		
Fp/Tp Peak force / torque	N or Nm	94.5 (31.52*3)	132	3.32
Fc/Tc Continuous force / torque (2)	N or Nm	24.4 (8.15*3)	-	1.22

LOAD CAPACITIES (3)	UNIT	VALUES		
Rated payload	kg (lbs)	1 (2.2)		
Rated inertia	$kg.m^2$	-	-	0.007

DYNAMIC PERFORMANCE	UNIT	VALUES		
Maximum speed	m/s (in/s) or rad/s	0.1 (3.93)	0.02 (0.78)	15.7
Maximum acceleration (4)	m/s^2 (in/s^2) or rad/s^2	2 (78.74)	1 (39.37)	104.7
Typical position stability (5)	nm or arcsec	±5	-	±0.2

STAGE ACCURACY (6)(7)	UNIT	VALUES		
Positioning accuracy full stroke	arcsec	-	-	±30
Positioning accuracy full stroke w/ calibration	µm or arcsec	±0.6	-	±3
Unidirectional repeatability	µm or arcsec	-	±0.25 (top position)	±1
Bidirectional repeatability	µm or arcsec	±0.3	-	±2
Horizontal straightness / radial runout	µm	±1.8	-	±2.5
Vertical straightness / axial runout	µm	-	-	±2.5
Tilt	arcsec	±5	-	-

ENCODER CHARACTERISTICS	UNIT	VALUES		
Encoder type	-	Optical	Inductive	Optical
Output signal	-	1 Vpp	TTL	1 Vpp
Signal period / number of lines	µm or period/turn	2	18.8	18'000
Reference mark	-	One	One	One

WORKING ENVIRONMENT	
Clean room compatibility	ISO 1 with vacuum suction
Maximum ambient temperature	32 °C

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ELECTRICAL SPECIFICATIONS (1)		UNIT			
	Motor type	-	3 moving coils (values given per motor)	Stepper	Toothless
Kt	Force constant	N/Arms or Nm/Arms	10.72	-	0.704
Ku	Back EMF constant (8)	Vrms/(m/s) or Vrms(rad/s)	10.73	-	0.407
R20	Electrical resistance at 20°C (8)	Ohm	3.3	1.56	9.06
L1	Electrical inductance (8)	mH	6.4	1.9	2.49
Ip	Peak current	Arms	3	1.5	4.97
Ic	Continuous current (2)	Arms	0.8	-	1.82
Udc	Nominal input voltage	VDC	48	96	48
Pc	Max. cont. power dissipation (2)	W	2	7	54.1
2p	Number of poles	-	-	100	20
	Number of phases	-	1	2	3

FEATURES		UNIT			
Vacuum feedthrough to wafer chuck					
V_c	Vacuum	bars	-0.6 (indicative value)		
Fv_c	Vacuum flow	l/min	10 (required)		
Gravity compensation		-	Calibrated for rated payload		

TYPICAL MOVE AND SETTLE TIMES (5)			
Move 1	1 µm in 40 ms within ±30 nm	-	1° in 100 ms within ±60 µdeg
Move 2	100 µm in 100 ms within ±30 nm	-	10° in 200 ms within ±60 µdeg
Move 3	1 mm in 200 ms within ±30 nm	-	180° in 700 ms within ±60 µdeg

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 'Integration 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.

(1) Hypothesis and tolerances are in ETEL's Handbook.

(2) Coils at suitable temperature for semiconductor application.

(3) Indicative load capacity with a payload centered on the carriage. Please contact ETEL for any other requirement.

(4) Recommended value. Please contact ETEL for any other case.

(5) Measured at encoders with ETEL AccurET 300 controllers for T axes and AccurET VHP48 for fine Z axis.

(6) Values given at 3 sigmas. Specifications measured on a precision mounting surface, uniformly supported over the 4 corners mounting interface with vibration insulation. Specifications measured with ETEL's electronics 12 mm above the top surface (coarse Z at top position) at an ambient temperature of 22°C±1°C.

(7) Tool point location on top of ZT box.

(8) Terminal to terminal

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