Silver Bullet eXtreme

VACUUM FAB
MOTION CONTROL & OPTICS

Stage code matrix						
	stroke (mm)			environment	home switch	
SB-X	13	26	52	**V** > 10^{-6} mbar	NCC-R **R**EED	NCC-X **I**nvictus
				HV > 10^{-7} mbar		
				UHV > 10^{-9} mbar		
				UHVS < 10^{-9} mbar	Dry lubrication	
				UHVC > 10^{-9} mbar >77°K		
	▸ **eg. SB-X-13-HV-I = Silver Bullet eXtreme with 13mm stroke for HV 10^{-7} mbar, Invictus home switch**					
	▸ **eg. SB-X-26-V-R = Silver Bullet eXtreme with 26mm stroke for Vacuum 10^{-6} mbar, REED home switch**					

Silver bullet eXtreme are narrow, compact, stiff and accurate motorized actuators designed for extreme environments such as Vacuum, High Vacuum, UHV and also Cryo temperatures.
Silver bullet eXtreme are driven by special vacuum stepper motors and integrate home reference switch, they are available with two strokes: 13mm, 26mm and 52mm.
The mounting interface is the standard 9.5mm shaft with fixing ring.

Micrometer replacement actuators

- Not rotating 6mm dimeter tip
- 13mm,26mm and 52mm stroke
- Sub-micron resolution
- Compact and narrow
- wide environmental range

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Silver Bullet eXtreme

Motion		Remark
Stroke	13, 26 and 52mm	
Resolution	51nm (gear-head) - 2.5um (direct drive)	full step theoretical resolution
Minimum incremental motion	1nm (gear-head) - 50nm (direct drive)	achievable in Closed Loop on external measurement system
Repeatability	+/-1 um	open loop
	+/- minimum incremental motion	Closed Loop: depending on controller and measurement system
Homing repeatability	Invictus NCCX mechanical micro switch: 0.5 µm	
	contactless NCCR REED micro switch: 50 µm	limited temperature range 0-110°C
Holding Force	24N	self-locking mechanics when unpowered

Mechanical properties

Max Load Capacity	**24N**	push only, no side force
Material	Stainless Steel, Aluminium, Copper, PEEK, ceramic, gold	

Environmental properties

type	V	HV	UHV	UHVS	UHVC	
vacuum pressure	10^{-6}mbar	10^{-7}mbar	10^{-9}mbar	<10^{-9}mbar	10^{-9}mbar	
bake-out temperature	80°C	200°C *			100°C	* recommended option Invictus NCCX
recommended working temperature	50°C lower than bake-out temperature*				77K**	*temperature sensor option - ** 4K upon request as special project

Electric specifications

type	V	HV	UHV	UHVS	UHVC	
motor	hybrid 2 phase stepper motor, 200 steps per revolution	hybrid 2 phase stepper motor 200 steps per revolution + 49:1 gearbox				
homing sensor	Normally Closed Contact - 2 wires					
vacuum side wiring	kapton insulated braided cable with open end to the feed-through					typical length 3m, any length available upon request
feed-through	6 contact required on the connector					1 piece per each 3 axis assembly

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Questionnaire

Fill in this questionnaire and mail it to ufficiovendite@vacuumfab.it to get our consultancy for the positioning system design, free of charges:

CUSTOMER'S REFERENCE

Name, surname: Institute/company:
Phone Number: Email:

WEIGHT/SPECIMEN INFORMATION

Dimensions (mm): lenght width height
Shape: (description or better attach drawing)
Weight (g):
Center of gravity coordinates from the center of the carrier (mm): X Y Z

Notes:

POSITIONING REQUIREMENT

Travel range required (mm):
Positioning resolution required (µm):
Repeatability required (µm): ☐ uni-directional ☐ bi-directional
Applied force (N): Fx Fy Fz
Applied Moment (Nm): Mx My Mz
Speed required (mm/s):
Acceleration required (mm/s²):
Duty Cycle:
Other degrees of freedom required: please specify and possibly add a sketch and a description f the application

WIRING REQUIREMENT

Cable lenght in air from the mechanics to the controller (m):

CONTROLLER REQUIREMENT

Motion control type: ☐ point to point ☐ linear interpolation ☐ contouring
Positioning application type: ☐ high resolution ☐ high repeatability
Computer connection port: ☐ Ethernet ☐ USB ☐ other (specify)
Software compatibility: ☐ DLL ☐ LabVIEW ☐ EPICS ☐ TANGO

Notes:

Date and signature:

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