Powerful Fiber Alignment System

Ideal for Applications in Photonics

F-131

- Long lifetime due to NanoCube®

- Safety due to integrated sensor technology

- Long travel ranges to 15 mm

- Inexpensive

Fast and high-precision drives

The basis of the fiber alignment system is an XYZ setup consisting of three motorized linear stages from the M-111 series for rough alignment and a P-611 NanoCube® nanopositioner. The motorized drives make longer travel ranges possible and at the same time, the NanoCube® nanopositioner ensures fast scanning motion and precision positioning. Flexure guides and all-ceramic insulated PICMA® actuators guarantee a long lifetime. Because all drives are equipped with position sensors, it is possible for example, to reliably prevent collisions with expensive silicon wafers.

High-performance scan routines

The highly developed scan routine is integrated directly in the controller for controlling the P-611 NanoCube® nanopositioner. The performance is improved considerably and integration simplified. This allows ideal management of all applications where analog signal optimization is the basis such as for example, in the field of photonics.

Complete package

The fiber alignment system is supplied as a complete package with the required C-884.4DC and E-727.AS controllers as well as with extensive software including the PIMikroMove graphic user software for startup and operation of all PI systems. Programming interfaces are included in the software package that allow the user to integrate a PI controller into their own user programs. The control of the positioning system therefore becomes part of the user program. Interfaces are available for all common programming languages including NI LabVIEW and Matlab.
Furthermore, there is an option to purchase the C-990.FA1 software. It provides a particularly convenient method for setting up the axes for scanning, performing the scans, and displaying the results.

Additional, high resolution analog input

The optical intensity signal is made available to the controllers directly via their analog inputs. The E-727.AS controller that controls the NanoCube® nanopositioner is equipped with an extremely high-resolution and high dynamics analog input. This makes it possible to acquire the optical signal quickly and precisely and find the maximum intensity automatically.

Application fields

Alignment of optical components, qualification of optical components in silicon photonics

Specifications

Motion and positioning	F-131.3SD1	Unit
Number of active axes	6	
Rough positioning		
Active axes	X, Y, Z	
Travel range in X, Y, Z	15, 15, 15	mm
Typical minimum incremental motion	0.05	µm
Design resolution	0.0069	µm
Typical unidirectional repeatability	0.25	µm
Typical backlash X, Y, Z	3	µm
Max. velocity	1.5	mm/s
Sensor type	Rotary encoder	
Guide	Ball guide	
Drive type	DC gear motor	
Fine positioning		
Active axes	X, Y, Z	
Travel range in X, Y, Z, closed loop	100	µm
Typical resolution, open loop	0.2	nm
Typical resolution, closed loop	1	nm
Typical linearity error, for the entire travel range	0.1	%
Typical repeatability (bidirectional)	<10	nm
Sensor type	SGS	
Drive type	PICMA®	

Alignment	F-131.3SD1	Unit
Scanning time for spiraled area scan 500 µm Ø, 20 µm line distance	<10*	s
Scanning time for spiraled area scan 100 µm Ø, 10 µm line distance	<1*	s
Scanning time for spiraled area scan 10 µm Ø, 1 µm line distance	<0.5*	s

Mechanical properties	F-131.3SD1	Unit
Load capacity	6**	N

| Miscellaneous	F-131.3SD1	Unit
Operating temperature range, mechanics	-20 to 65	°C
Operating temperature range, C-884.4DC controller	5 to 50	°C
Operating temperature range, E-727.AS controller	5 to 40	°C
Mass	1.55	kg
Cable length	3	m

Technical data specified at 20±3 °C.

* Typical time span for scanning the entire area and moving to the highest intensity

** A mass of maximum 200 g is recommended for dynamic operation

Ask about customized versions.

Drawings / Images
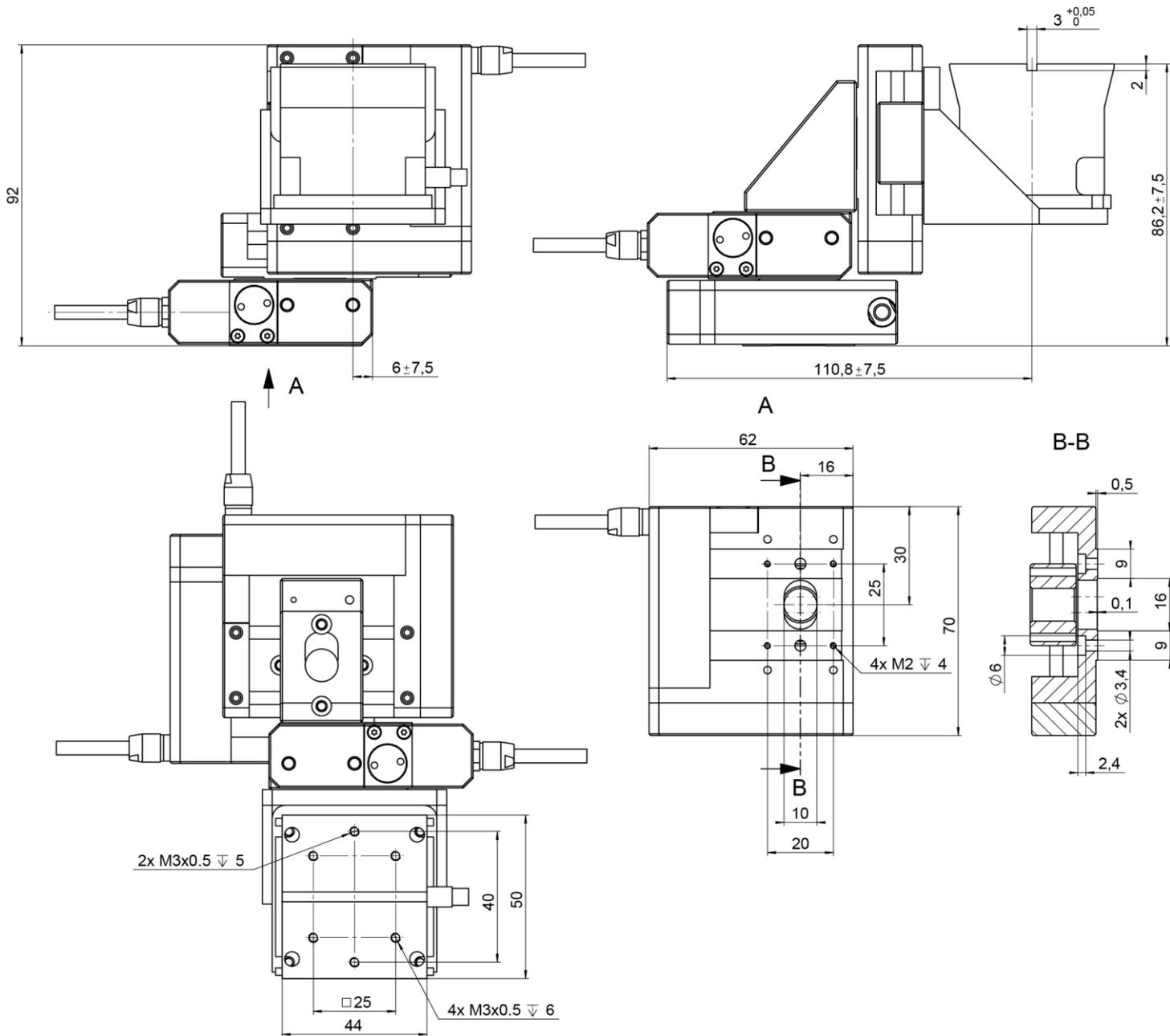
F-131.3SD1, Dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.

F-131.3SD1 overall system

Ordering Information

F-131.3SD1
Fiber alignment system consisting of stacked M-111 linear stages and NanoCube® Nanopositioner P-611, C-884.4DC controller for DC motors, E-727 digital controller for multi-axis piezo nanopositioning systems, linear stages to 15 mm in rough positioning, travel ranges to 100 µm in fine positioning

Accessories

C-990.FA1
PI FA1 Alignment Tool, software for aligning optoelectronic components; for use with the C-884 controller for motorized axes and the E-727.AS controller with fast alignment routines (spiraled area scan) for piezo axes with strain gauge sensor.

C-887.MC2
Manual control unit for hexapods, USB connector with 3 m connection cable, rotary knobs for all Cartesian axes, buttons for motion stop and referencing, position display