

M-229 Stepper-Mike Linear Actuator

Compact & Cost-Effective with Limit Switches, Force up to 50 N



M-229 high-load stepper mike with C-663 Mercury™ Step stepper motor controller

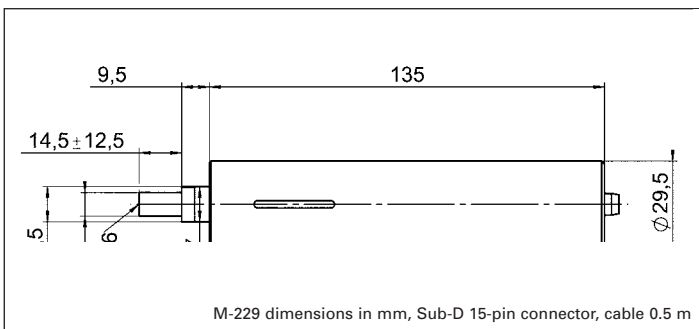
- **Cost-Efficient Design**
- **25 mm Travel Range**
- **46 nm Resolution (with C-663 Controller)**
- **50 N Load Capacity**
- **Non-Rotating Tip**
- **Max. Velocity 1.5 mm/s**
- **Non-Contact Limit and Reference Switches**
- **Compact Design**

M-229 series linear actuators provide a travel range of 25 mm (more than M-228) and are equipped with high-resolution stepper motors with gear-boxes. This means the M-229 mike actuator driven by a C-663 stepper motor controller can push and pull loads up to 50 N with a position resolution of 46 nm. The cost-effective design offers many useful features such as a non-rotating tip, limit and reference switches and a mechanical position display.

Non-Rotating Tip

Compared to conventional rotating-tip micrometer drives, the non-rotating-tip design offers several advantages:

- Elimination of torque-induced positioning errors
- Elimination of sinusoidal motion errors
- Elimination of wear at the contact point
- Elimination of tip-angle-dependent wobble



M-229 dimensions in mm, Sub-D 15-pin connector, cable 0.5 m

Limit and Reference Switches

For the protection of your equipment, non-contact Hall-effect limit and reference switches are installed. The direction-sensing reference switch supports advanced automation applications with high precision.

Ordering Information

M-229.25S
Stepper-Mike Linear Actuator,
25 mm, Limit Switches

Ask about custom designs!

Linear Actuators & Motors

PiezoWalk® Motors / Actuators

PLine® Ultrasonic Motors

DC-Servo & Stepper Actuators

Piezo Actuators & Components

Guided / Preloaded Actuators

Unpackaged Stack Actuators

Patches/Benders/Tubes/Shear..

Nanopositioning / Piezoelectrics

Nanometrology

Micropositioning

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Technical Data

Model	M-229.25S	Units
Active axes	X	
Motion and positioning		
Travel range	25	mm
Design resolution	0.046*	µm
Min. incremental motion	0.15*	µm
Backlash	10**	µm
Unidirectional repeatability	±2	µm
Max. velocity	1.5*	mm/s
Origin repeatability	1	µm
Mechanical properties		
Drive screw	Leadscrew	
Thread pitch	0.5	mm/rev.
Gear ratio	28.44444:1	
Motor resolution	384*	steps/rev.
Load capacity	50	N
Push/pull force	50	N
Max. lateral force	0.5	N
Drive properties		
Motor type	2-phase stepper motor	
Operating voltage	24***	V
Limit and reference switches	Hall-effect	
Miscellaneous		
Operating temperature range	-20 to +65	°C
Material	Al (anodized), steel, brass	
Mass	0.4	kg
Recommended controller/driver	C-663 single-axis (see p. 4-112)	

*with C-663 Mercury™ Step controller

**with preload

***2-phase stepper motor, 24 V chopper voltage, max. 0.25 A/phase, 24 full steps/rev.

C-663 Mercury™ Step Controller 1-Axis Networkable Stepper-Motor Controller



C-663 Mercury™ Step stepper motor controller for cost-sensitive micropositioning tasks

- High Performance at Low Cost
- Stand-Alone Functionality
- Network Capability for Multi-Axis Applications
- Compatible and Networkable with C-863 Mercury™ DC-Motor Controllers
- Joystick Port for Manual Control
- Non-Volatile Macro Memory
- Parameters Changeable On-the-Fly

The Mercury™ Step stepper motor controller is the perfect solution for cost-effective and flexible motion control applications where a precision positioner is to be controlled by a PC or PLC (programmable

logic controller). The C-663 supplements the successful C-863 Mercury™ servo motor controller.

Microstepping of 1/16 full step (up to 6400 steps/rev. with PI

stepper motors) provides for ultra-smooth, high-resolution motion.

Multi-Axis Control, Combination of DC & Stepper Motors

The networking feature allows the user to start out with one Mercury™ controller and add more units later for multi-axis setups.

The Mercury™ Step stepper motor controller shares its programming language with the well-established Mercury™ DC-motor controller. Up to 16 Mercury™ controllers (DC and stepper) can be daisy chained and operated from one computer.

Flexible Automation

The C-663 offers a number of features to achieve automation and handling tasks in a very cost-effective way. Programming is facilitated by the high-level mnemonic command language with macro and compound-command functionality. Macros can be stored in the non-volatile memory for later recall.

For easy synchronization of motion with internal or external trigger signals four input and four output lines are provided. A joystick can also be connected for manual control.

Stand-alone capability is provided by a user-programmable autostart macro to run automation tasks at power up (no runtime computer communication required!).

User-Friendly: Comprehensive Software Package and Two Interface Options

Easy data interchange with laptop or PC is possible via the USB interface. To facilitate industrial applications, an RS-232 interface is also standard.

The included software supports networking of multiple controller devices. LabVIEW™ drivers and Windows DLLs allow for easy programming and integration into your system. Mercury™ Step controllers can also be operated using the PI General Command Set (GCS) via a DLL. PI-GCS allows networking of different PI-con-

Ordering Information

C-663.10
Mercury™ Step Stepper Motor Controller with Wide-Range Power Supply, 24 V

C-819.20
2-Axis Analog Joystick for Mercury™ Controller

C-819.20Y
Y-Cable for Connecting 2 Controllers to C-819.20

C-170.IO
I/O cable, 2 m, open end

C-170.PB
Push Button Box, 4 Buttons and 4 LEDs

trollers such as piezo drivers and multi-axis servo controllers with minimal programming effort.

Contents of Delivery

Each Mercury™ Step comes with a wide-range power supply, RS-232 communications cables, a USB cable and a comprehensive software package.

Application Examples

- Flexible automation
- Handling
- Quality control
- Testing equipment
- Photonics applications
- Fiber positioning



Mercury™ Step controller with M-403.62S precision translation stage

Technical Data

Model	C-663.10
Function	Stepper motor controller, stand-alone capability
Drive type	2-phase stepper motor
Channels	1
Motion and control	
Trajectory profile modes	Trapezoidal, point-to-point
Microstep resolution	1/16 full step
Limit switches	2 x TTL, programmable
Reference switches	1 x TTL, programmable
Motor brake	1 x TTL, programmable
Electrical properties	
Operating voltage	15 to 30 V
Current limitation per motor phase	1000 mA
Interface and operation	
Interface/Communication	USB, RS-232 (bus architecture)
Motor connector	Sub-D 15 (f)
Controller network	Up to 16 units* on single interface
I/O ports	4 analog/digital in, 4 digital out
Command set	Mercury™ native command set, GCS
User software	MMCRun, PIMikroMove®
Software drivers	GCS (PI General Command Set)-DLL, LabVIEW drivers, native Mercury™ DLL
Supported functionality	Start-up macro
Manual control	Joystick, Y-cable for 2D motion, pushbutton box
Miscellaneous	
Operating temperature range	0 to 50 °C
Mass	0.3 kg
Dimensions	130 x 76 x 40 mm ³

*16 with USB; 6 with RS-232 (depending on RS-232 output driver of PC)