

PIFOC Scanner System for Microscope Objectives

Dynamic focus scanner of the entry-level class for travel ranges up to 400 µm, incl. controller



P-725.xCDE1S

- Travel range 100 µm or 400 µm
- Significantly faster response and longer lifetime than motorized drives
- Fine positioning of objectives with sub-nm resolution
- Large clear aperture with Ø 29 mm

Application fields

- Super-resolution microscopy
- Light disk microscopy
- Confocal microscopy
- 2-photon microscopy
- 3D imaging
- Screening
- Interferometry
- Measuring technology
- Autofocus systems
- Biotechnology
- Semiconductor inspection

PIFOC scanner system of the entry-level class

System consisting of P-725.xCDE1 PIFOc scanner and E-709.1C1L controller.

Outstanding lifetime thanks to PICMA® piezo actuators

PICMA® piezo actuators are all-ceramic insulated. This protects them against humidity and failure resulting from an increase in leakage current. PICMA® actuators offer an up to ten times longer lifetime than conventional polymer-insulated actuators. 100 billion cycles without a single failure are proven.

Subnanometer resolution with capacitive sensors

Capacitive sensors measure with subnanometer resolution without contacting. They guarantee excellent linearity of motion, long-term stability, and a bandwidth in the kHz range.

High guide accuracy due to zero-play flexure guides

Flexure guides are free of maintenance, friction, and wear, and do not require lubrication. Their stiffness allows high load capacity and they are insensitive to shock and vibration. They work in a wide temperature range.

Motion	Unit	Tolerance	P-725.1CDE1S	P-725.4CDE1S
Active axes			Z	Z
Travel range in Z	µm	+20 / -0 %	100	400
Travel range in Z, open loop	µm	±20%	120	420
Linearity error in Z	%	Max.	0.2	0.2

Positioning	Unit	Tolerance	P-725.1CDE1S	P-725.4CDE1S
Minimum incremental motion in Z	nm		2	2
Point repeatability, 10% step, 1 sigma	nm	Max.	20	20
Integrated sensor			Capacitive, direct position measuring	Capacitive, direct position measuring
Sensor noise, 1 sigma	nm	Max.	5	5

Drive Properties	Unit	Tolerance	P-725.1CDE1S	P-725.4CDE1S
Drive type			PICMA®	PICMA®
Electrical capacitance in Z	µF	±20%	3.2	6.2

Mechanical Properties	Unit	Tolerance	P-725.1CDE1S	P-725.4CDE1S
Stiffness in Z	N/µm	Min.	0.23	0.12
Resonant frequency in Z, unloaded	Hz	Min.	470	230
Resonant frequency in Z, under load with 150 g	Hz	Min.	185	120
Permissible push force in Z	N	Max.	100	100
Permissible pull force in Z	N	Max.	20	20
Guide			Flexure guide with lever amplification	Flexure guide with lever amplification
Overall mass	g	±5%	280	280
Material			Stainless steel, aluminum	Stainless steel, aluminum
Objective diameter	mm	Max.	39	39

Miscellaneous	Unit	Tolerance	P-725.1CDE1S	P-725.4CDE1S
Operating temperature range	°C		10 to 70	10 to 70
Connector			D-sub 7W2 (m)	D-sub 7W2 (m)
Cable length	m	+50 / -0 mm	1.5	1.5

Controller	Unit	Tolerance	P-725.1CDE1S	P-725.4CDE1S
Controller type			E-709.1C1L	E-709.1C1L
Communication interfaces			RS-232 SPI USB	RS-232 SPI USB
I/O lines			4 digital inputs, 4 digital outputs, 1 servo cycle output, 1 reset input (each TTL). I/O for external synchronization of the servo cycle (100 kHz). RxD and TxD for RS-485.	4 digital inputs, 4 digital outputs, 1 servo cycle output, 1 reset input (each TTL). I/O for external synchronization of the servo cycle (100 kHz). RxD and TxD for RS-485.
Command set			GCS 2.0	GCS 2.0
User software			PIMikroMove	PIMikroMove
Software drivers			GCS DLL (with code examples for the most common programming languages such as C++, C#, VB.NET, Python, Delphi), driver for NI LabVIEW, MATLAB library	GCS DLL (with code examples for the most common programming languages such as C++, C#, VB.NET, Python, Delphi), driver for NI LabVIEW, MATLAB library
Application-related functions			Data recorder	Data recorder
Controller's dimensions			160 mm × 104 mm × 44 mm	160 mm × 104 mm × 44 mm

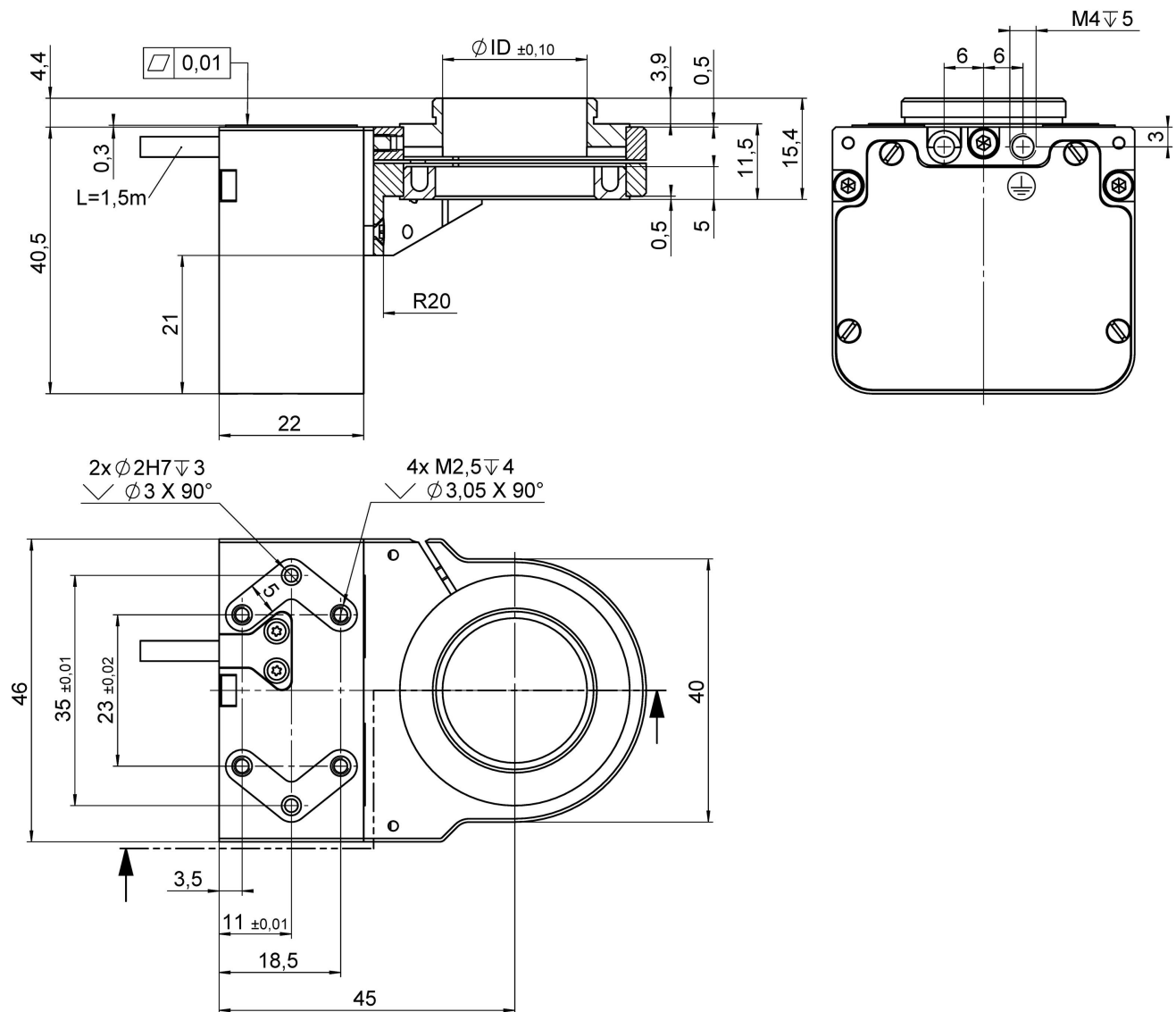
Linearity error: The specified value can only be reached with recommended digital controllers.
 Position noise: 1 sigma
 The objective is not included in the scope of delivery.

Drawings / Images

Thread	Microscope Side Thread Adapter		Objective / Lens Side Thread Adapter	Objective Spacer for Correcting the Parfocal Length
	P-725.xxM	ID in mm	P-725.xxL	P-725.xxS
M26 x 0.75	P-725.02M	22	P-725.02L	P-725.02S
M27 x 0.75	P-725.03M	22	P-725.03L	P-725.03S
M28 x 0.75	P-725.04M	22	P-725.04L	P-725.04S
M32 x 0.75	P-725.05M	25	P-725.05L	P-725.05S
M26 x 1/36"	P-725.06M	22	P-725.06L	P-725.06S
M19 x 0.75	P-725.08M	15	P-725.08L	P-725.08S
M25 x 0.75	P-725.11M	22	P-725.11L	P-725.11S
W0.8 x 1/36"	P-725.12M	16	P-725.12L	P-725.12S
SM1 (1.035"-40)	P-725.13M	22	P-725.13L	P-725.13S
M34 x 1	P-725.14M	28	P-725.14L	P-725.14S

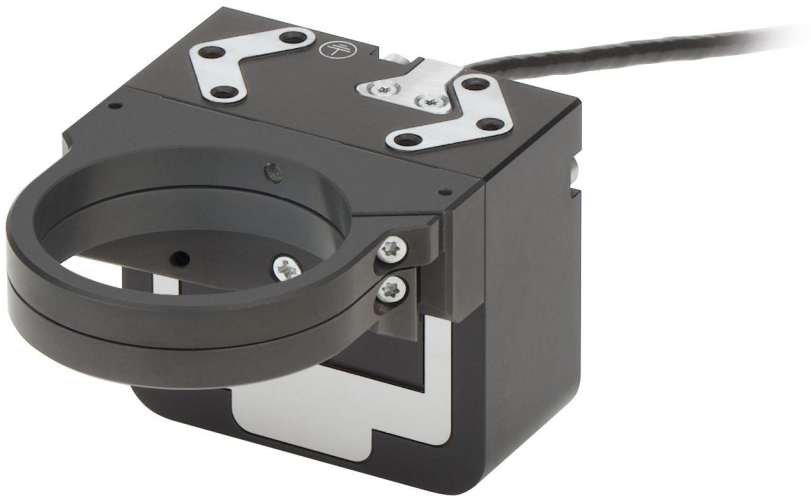
Threaded adapter and spacers for P-725.xCDEx

Drawings / Images



P-725.1CDE2 and P-725.4CDE2, dimensions in mm (please order the adapter and spacers separately). Note that a comma is used in the drawings instead of a decimal point.

Drawings / Images



P-725.1CDE1 / P-725.4CDE1



P-725.8CDE2 with P-725.03x thread adapters and P-725.03S spacer inserted between the revolving nosepiece of the microscope and the objective

Order Information

P-725.1CDE1S

PIFOC scanner system for microscope objectives; fast step-and-settle; 100 μm travel range; capacitive, direct position measuring; D-sub 7W2 (m) connector; 1.5 m cable length. System consisting of P-725.1CDE1 PIFOC scanner and E-709.1C1L controller.

P-725.4CDE1S

PIFOC scanner system for microscope objectives; fast step-and-settle; 400 μm travel range; capacitive, direct position measuring; D-sub 7W2 (m) connector; 1.5 m cable length. System consisting of P-725.4CDE1 PIFOC scanner and E-709.1C1L controller.