

# Technical Note

M404T0008, valid for M-404.xVP / M-404.xVG  
 MMa, 2015-12-01

## M-404.xVP / M-404.xVG

### Precision Translation Stage for Vacuum Applications ( $p > 1 \text{ E } -6 \text{ mbar}$ )

#### INFORMATION

Besides the topics described below, the descriptions and instructions given in the following document apply:

*User Manual MP79E for the M-404 Linear Positioning Stages*

## Modifications Compared to the Standard Product

Characteristic differences to the standard products *M-404.xPD* and *M-404.x DG* are:

- Modified materials
- Modified specifications
- Specific available accessories

## Materials

	M-404.xVP / M-404.xVG	Remark
Base materials	Aluminum alloy, black anodized or blank	
Bearings	Chrome steel	
Drive train elements	Chrome steel (leadscrew)	
<b>Electrical components</b>		
Cable insulation	PTFE	
Heat shrink tube	PVDF	
Solder	Sn95.5Ag3.8Cu0.7	
Connector type / housing material	Type AMP HD20 / Zn	Die-cast, nickel plated
<b>Grease</b>	Molykote HP-300, Torrlube	
<b>Adhesive</b>	Huntsman Araldite 2014-1	

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	M-404.xVP / M-404.xVG	Remark
<b>Drive</b>		
Manufacturer	Faulhaber	
Motor model	3557K024 ( M-404.xVP) 2233L012S (M-404.xVG)	
Gear model	23/1 (M-404.xVG)	
Gear ratio	43:1 (M-404.xVG)	

## Specifications

	M-404.1VP / M-404.2VP / M-404.4VP / M-404.6VP / M-404.8VP	M-404.1VG / M-404.2VG / M-404.4VG / M-404.6VG / M-404.8VG	Unit	Tolerance
	with ActiveDrive	with DC gear motor		
Active axes	X	X		
<b>Motion and positioning</b>				
Travel range	25 / 50 / 100 / 150 / 200	25 / 50 / 100 / 150 / 200	mm	
Min. incremental motion	0.25	0.1	µm	typ.
Backlash	0.5	2	µm	typ.
Unidirectional repeatability	0.5	1	µm	typ.
Pitch over 100 mm travel	75	75	µrad	typ.
Yaw over 100 mm travel	75	75	µrad	typ.
Velocity	10	1.2	mm/s	max.
Reference point switch repeatability	1	1	µm	typ.
<b>Mechanical properties</b>				
Thread pitch	1	1	mm/rev.	
Gear ratio	–	43:1		
Stiffness in motion direction	3500	3500	N/µm	±20 %
Load capacity*	200	200	N	max.
Push / pull force	50	50	N	max.
Lateral force	100	100	N	max.

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<b>Drive properties</b>				
Drive type	DC motor, ActiveDrive	DC gear motor		
Operating voltage	24 (PWM)	0-12 (differential; polarity determines direction)	V	
Motor power	26	2.5	W	nominal
<b>Vacuum compliance limit</b>	$10^{-6}$	$10^{-6}$	mbar	
<b>Miscellaneous</b>				
Operating temperature range	-20 to 65 °C	-20 to 65 °C		
Outbaking temperature	80	80	°C	
	176	176	F	
Mass	1.8 / 1.9 / 2.2 / 2.3 / 2.6	1.8 / 1.9 / 2.2 / 2.3 / 2.6	kg	±5 %
Connector	Sub-D 15 (m)	Sub-D 15 (m)		
	Lemo	Lemo		
Recommended controller / driver	C-863 (single-axis)	C-863 (single-axis)		
	C-843 PCI board, for up to 4 axes	C-843 PCI board, for up to 4 axes		

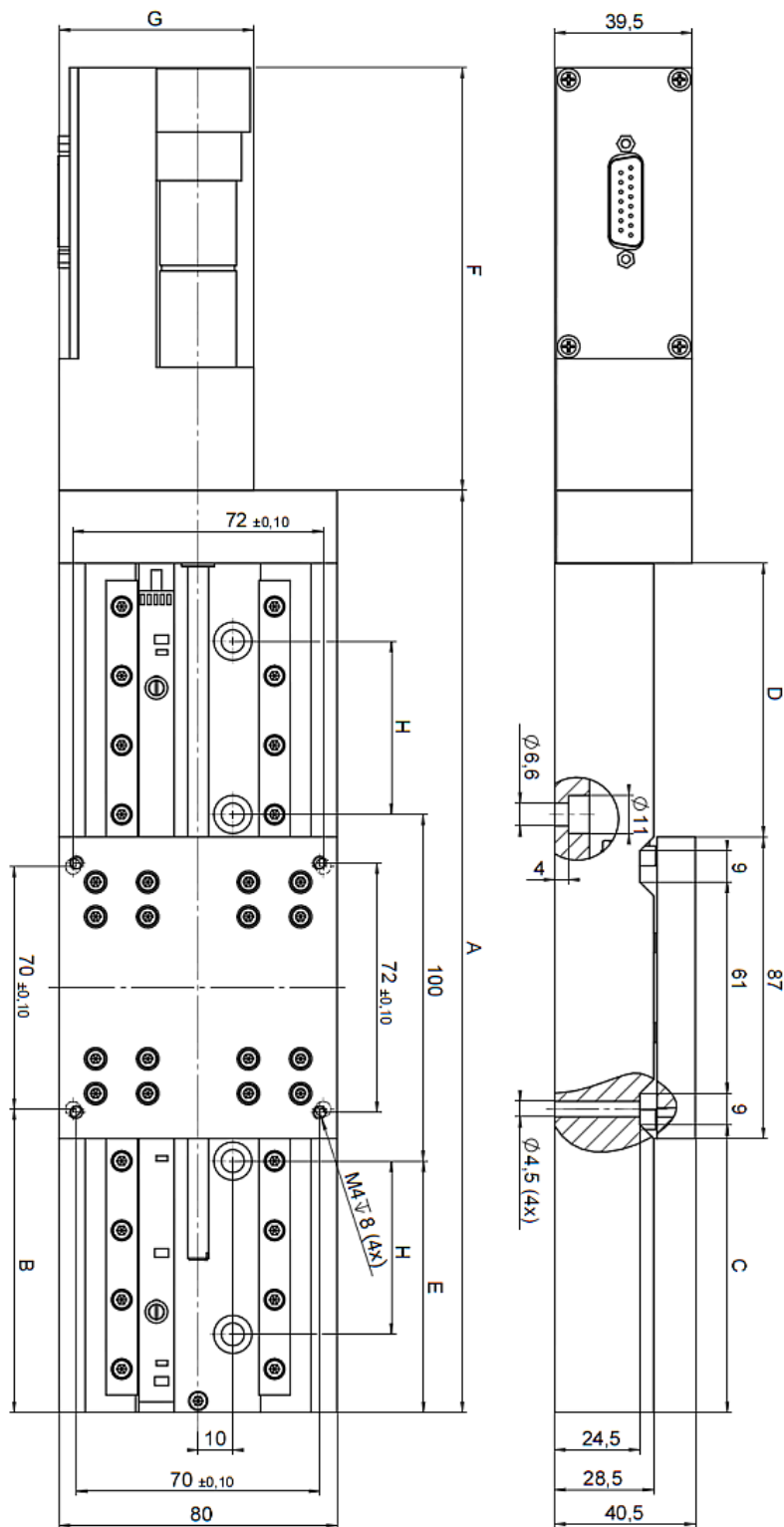
\* Max. normal load capacity: Centered, vertical load (horizontal installation of the stage).

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## Dimensions

Values in mm. Decimal places separated by commas. Values for the variables: see tables below.



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	M-404.1xx	M-404.2xx	M-404.4xx	M-404.6xx	M-404.8xx
<b>A</b>	141	166	216	266	316
<b>B</b>	25	37.5	62.5	87.5	112.5
<b>C</b>	20.5	33	58	83	108
<b>D</b>	16.5 (±12,5)	29 (±25)	54 (±50)	79 (±75)	104 (±100)
<b>E</b>	10	22.5	47.5	72.5	97.5

	M-404.1xVP	M-404.xVG
<b>F</b>	114	128.5
<b>G</b>	59.5	56

## Available Accessories

The following additional accessories are available:

- Motor cable, vacuum compatible, D- Sub- 15 connectors m/f, length 3m (order no. C-815.38V)
- Hermetic feed-through, D- Sub- 15 connectors m/f (order no. C-815.VF)

## EC Conformity

For the M-404 linear stage series, an EC Declaration of Conformity has been issued in accordance with the following European directives:

- 2004/108/EC, EMC Directive
- 2011/65/EU, RoHS Directive

The applied standards certifying the conformity are listed below.

- EMC: EN 61326-1:2013
- Safety: EN 61010-1:2010
- RoHS: EN 50581:2012