

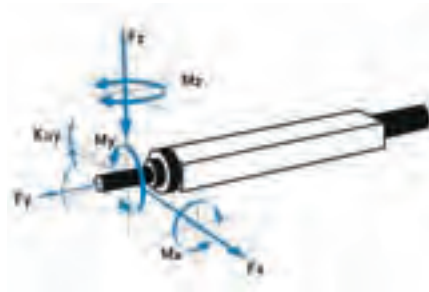


# Precision Motorized Linear Actuators

# MP-15 Micro Motorized Linear Actuator

## FACTS

Load characteristics	$F_{x(N)}$	$F_{y(N)}$	$F_{z(N)}$
DC-B-008	0	10	0
2Phase-005	0	10	0



The MP-15 micro pusher was specifically designed to motorize manual drives or mirror mounts. It is an ideal component for limited space conditions. The MP-15 micro pusher is equipped with a 0.5 mm fine-pitch screw thread resulting in a quiet and homogeneous smooth motion. The MP-15 is offered with DC or 2-phase geared stepper motor and is delivered with two integrated limit switches.



## KEY FEATURES

- Travel range up to 12.7 mm
- Uni-directional repeatability down to 0.5  $\mu\text{m}$
- Maximum speed 0.3 mm/sec
- Force max. 10 N
- Integrated hall limit switches

## TECHNICAL DATA

Travel range (mm)	6	12.7
Weight (kg)	0.1	0.15
Motor (Pitch 0.5 mm)	DC-B-008	2Phase-005
Speed max. (mm/sec)	0.3	0.1
Resolution calculated ( $\mu\text{m}$ )	0.0488281 (RE)	0.0976563 (FS)
Resolution typical ( $\mu\text{m}$ )	0.2	0.2
Bi-directional Repeatability ( $\mu\text{m}$ )	$\pm 10$	$\pm 10$
Uni-directional Repeatability ( $\mu\text{m}$ )	0.5	0.5
Nominal Current (A)	0.08	0.25
Voltage Range (V)	12	
Accuracy	on request	
Velocity range (mm/sec)	0.001 ... 0.3	
Material	Aluminum, black anodized	

Note: FS = full step, RE = rotary encoder

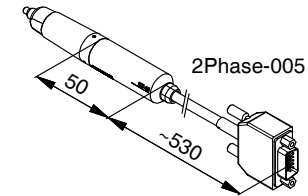
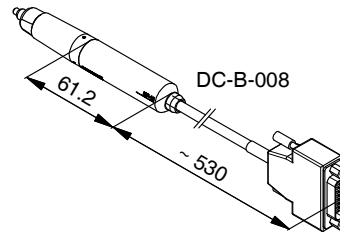
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

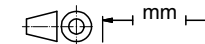
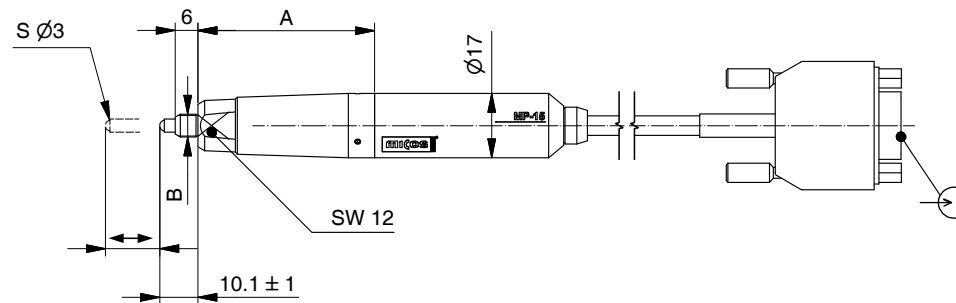
# MP-15 Micro Motorized Linear Actuator



Travel (mm)	6	12.7
A	33.5	47



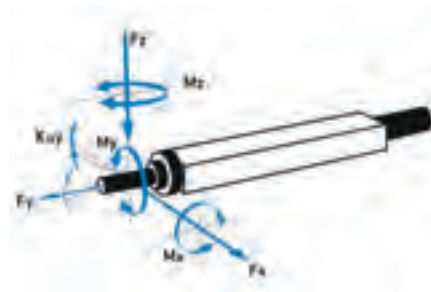
Order No.	5663-9-		0		
DC-B-008		1			
2Phase-005		2			
6 mm		1			
12.7 mm		2			
HLS-010, Hall limit switches		1			
Mounting surface B=Ø6 mm		1			
Mounting surface B=Ø9.5 mm		2			
Mounting surface B=M8x0.35 mm		3			
Mounting surface B=M6x0.5 mm		4			



# MP-15 Vacuum Compatible Linear Actuator

## FACTS

Load characteristics	$F_{x(N)}$	$F_{y(N)}$	$F_{z(N)}$
FV	0	10	0
10-6	0	10	0



The MP-15 Vacuum micro pusher is equipped with a 0.5 mm fine-pitch screw thread resulting in a quiet and homogeneous smooth motion. The MP-15 is offered with 2-phase geared stepper motor and is delivered with two integrated limit switches.



## KEY FEATURES

- Vacuum up to 10<sup>-6</sup> hPa
- Travel range up to 12.7 mm
- Uni-directional repeatability down to 0.5 μm
- Maximum speed 0.03 mm/sec
- Force max. 10 N
- Integrated limit switches

## TECHNICAL DATA

Travel range (mm)	6	12.7
Weight (kg)	0.1	0.17
Vacuum type	FV	10-6
Speed max. (mm/sec)	0.03	0.01
Resolution calculated (μm)	0.0976563 (FS)	0.0976563 (FS)
Resolution typical (μm)	0.2	0.2
Bi-directional Repeatability (μm)	± 10	± 10
Uni-directional Repeatability (μm)	0.5	0.5
Nominal Current (A)	0.25	0.25
Accuracy	on request	
Velocity range (mm/sec)	0.001 ... 0.1	
Material	Aluminum or Stainless steel, suitable for vacuum	

**Vacuum Note:** FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

# PI

**AM1020**

**AM1020**

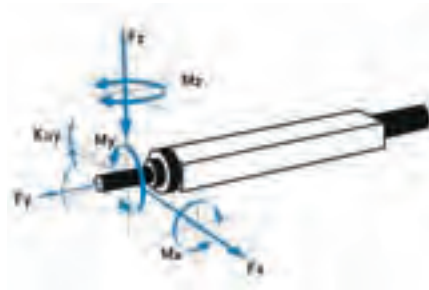


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# MP-20 Precision Linear Actuator

## FACTS

Load characteristics	$F_{x(N)}$	$F_{y(N)}$	$F_{z(N)}$
DC-B-010	1	125	1
2Phase-010	1	125	1
2Phase-017	1	30	1



The new MP-20 micro pusher is designed to motorize manual drives or mirror mounts and it is an ideal component for limited space conditions. Small light components such as mirrors and diodes can be directly mounted to the tip. The MP-20 micro pusher is equipped with a re-circulating ball screw for a quiet, precise and homogeneous smooth motion and has a non-rotating tip. The MP-20 micro pushers are offered with DC or 2-phase geared stepper motor combination or with a gearless 2-phase stepper motor. Round or flat ground inserts can be attached to the tip. The side-mounted design of model MP-20 B results in much shorter length.



## KEY FEATURES

- Travel range up to 72 mm (3")
- Uni-directional repeatability down to 0.3  $\mu\text{m}$
- Maximum speed 12 mm/sec
- Force max. 125 N
- Integrated hall limit switches

## TECHNICAL DATA

Travel range (mm)	13	26	52	76
Motor (Pitch 1 mm)	DC-B-010	2Phase-010	2Phase-017	
Speed max. (mm/sec)	3.5	0.8	12	
Resolution calculated ( $\mu\text{m}$ )	0.0221608 (RE)	0.5490171 (FS)	5 (FS)	
Resolution typical ( $\mu\text{m}$ )	0.1	0.1	0.1	
Bi-directional Repeatability ( $\mu\text{m}$ )	$\pm 1$	$\pm 1$	$\pm 1$	
Uni-directional Repeatability ( $\mu\text{m}$ )	0.3	0.3	0.3	
Nominal Current (A)	0.32	0.25	0.6	
Voltage Range (V)	12			
Accuracy	on request			
Velocity range (mm/sec)	0.001 ... 12			
Material	Stainless steel			

Note: FS = full step, RE = rotary encoder

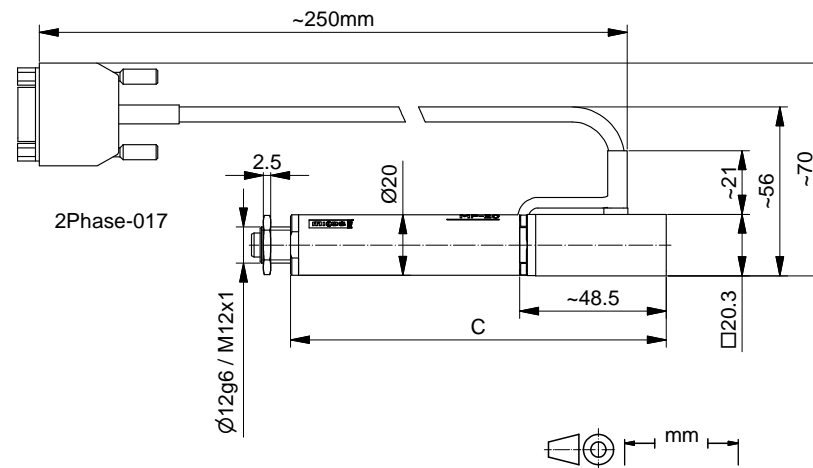
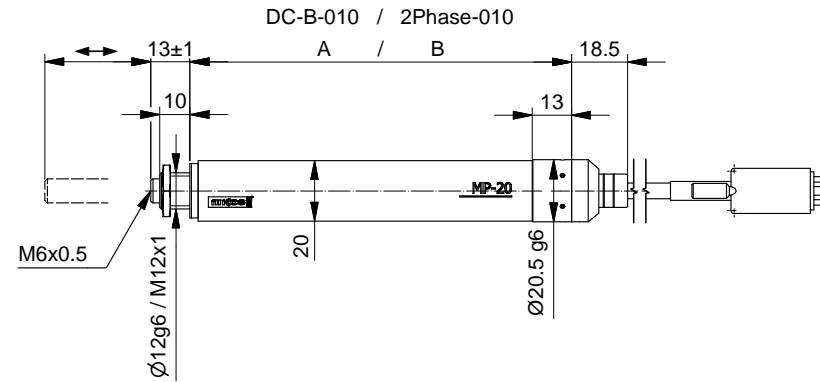
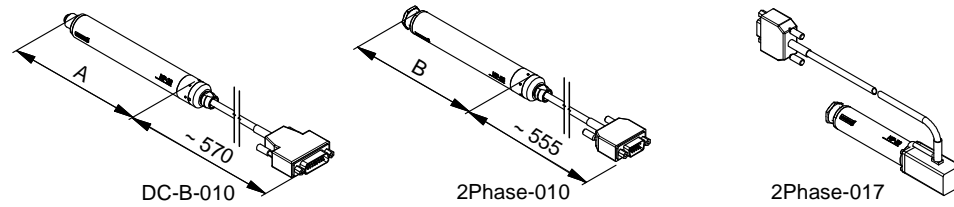
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

# MP-20 Precision Linear Actuator



Travel (mm)	13	26	52	76
A	133	146.5	171.5	196.5
B	126	139.5	164.5	189.5
C	124.5	137.7	162.7	187.7

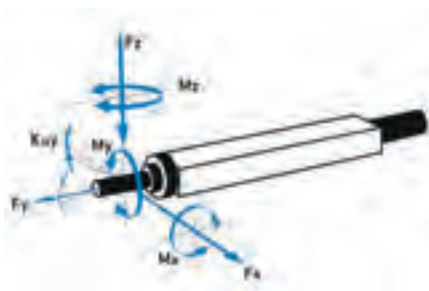


Order No.	5701-9-			0	1
DC-B-010		1			
2Phase-010		2			
2Phase-017		3			
13 mm (1/2")		1			
26 mm (1")		2			
52 mm (2")		3			
72 mm (3")		4			
12g6		1			
M12x1		2			

# MP-20 Vacuum Compatible Linear Actuator

## FACTS

Load characteristics	$F_{x(N)}$	$F_{y(N)}$	$F_{z(N)}$
FV	1	125	1
10-6	1	125	1
HV	1	125	1
UHV	1	125	1



The MP-20 Vacuum micro pusher is equipped with a re-circulating ball screw for a quiet, precise and homogeneous smooth motion and has a non-rotating tip. The MP-20 Vacuum micro pushers are offered with 2-phase geared stepper vacuum motor combination or with a gearless 2-phase stepper vacuum motor. Round or flat ground inserts can be attached to the tip. The side-mounted design of model MP-20 B Vacuum results in much shorter length.



## KEY FEATURES

- Vacuum up to 10<sup>-9</sup> hPa
- Travel range up to 72 mm (3")
- Uni-directional repeatability 0.5 μm
- Maximum speed 0.2 mm/sec
- Force max. 125 N
- Integrated limit switches

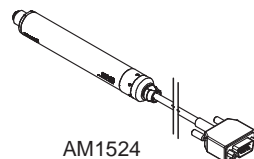
## TECHNICAL DATA

Travel range (mm)	13	26	52	77
Weight (kg)	0.22	0.26	0.28	0.29
Vacuum type	FV	10-6	HV	UHV
Speed max. (mm/sec)	0.2	0.1	0.1	0.1
Resolution calculated (μm)	0.5490171 (FS)	0.5490171 (FS)	5 (FS)	5 (FS)
Resolution typical (μm)	0.1	0.1	0.1	0.1
Bi-directional Repeatability (μm)	± 1	± 1	± 1	± 1
Uni-directional Repeatability (μm)	0.3	0.3	0.3	0.3
Nominal Current (A)	0.25	0.25	1.2	1.2
Accuracy	on request			
Velocity range (mm/sec)	0.001 ... 4			
Material	Aluminum or Stainless steel, suitable for vacuum			

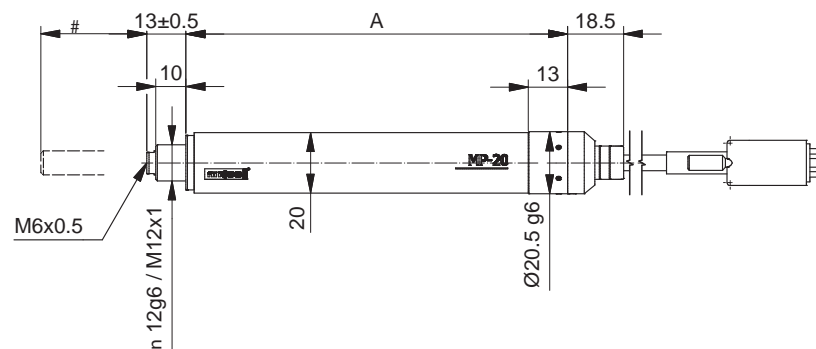
**Vacuum Note:** FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.



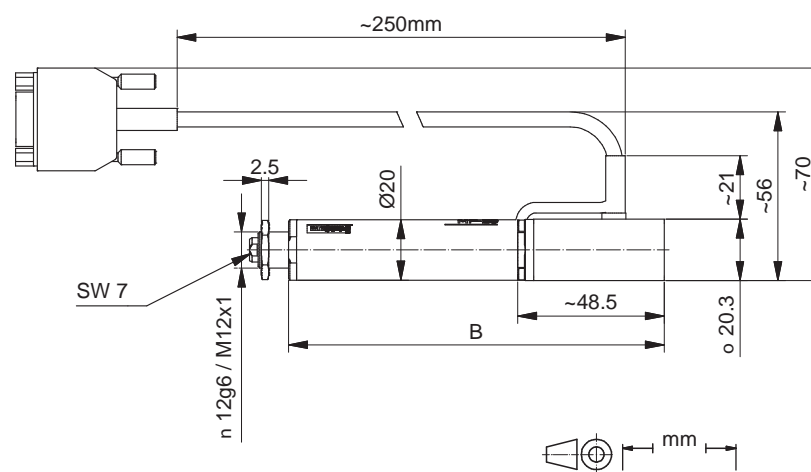
<b>Travel (mm)</b>	<b>13</b>	<b>26</b>	<b>52</b>	<b>77</b>
<b>A</b>	126	139,5	164,5	189,5
<b>B</b>	124,5	137,7	162,7	187,7



drawings for the corresponding vacuum class must be requested separately. The installed motor types are:  
AM1524 for FV  
VSS 32.200.1.2-E for HV & UHVG



Order No.	5701-V-			0		0
FV	1					
HV	2					
UHVG	3					
10-6	6					
13 mm (1/2")	1					
26 mm (1")	2					
52 mm (2")	3					
77 mm (3")	4					
12g6	1					
M12x1	2					

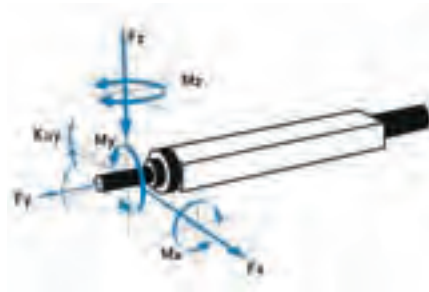


# MP-20-B Precision Linear Actuator



## FACTS

Load characteristics	$F_{x(N)}$	$F_{y(N)}$	$F_{z(N)}$
DC-B-010	1	110	1
2Phase-010	1	110	1
2Phase-017	1	25	1



The new MP-20 B micro pusher is designed to motorize manual drives or mirror mounts and it is an ideal component for limited space conditions. Small light components such as mirrors and diodes can be directly mounted to the tip. The MP-20 B micro pusher is equipped with a re-circulating ball screw for a quiet, precise and homogeneous smooth motion and has a non-rotating tip. The MP-20 B micro pushers are offered with DC or 2-phase geared stepper motor combination or with a gearless 2-phase stepper motor. Round or flat ground inserts can be attached to the tip. The side-mounted design of model MP-20B results in much shorter length.



## KEY FEATURES

- Travel range up to 76 mm ( 3" )
- Uni directional repeatability down to 0.3  $\mu\text{m}$
- Max. speed 10 mm/sec
- Force 110 N
- Integrated limit switches (hall)

## TECHNICAL DATA

Travel range (mm)	13	26	52	76
Motor (Pitch 1 mm)	DC-B-010	2Phase-010	2Phase-017	
Speed max. (mm/sec)	2.5	0.6	10	
Resolution calculated ( $\mu\text{m}$ )	0.0221608	0.5490171 (FS)	5 (FS)	
Resolution typical ( $\mu\text{m}$ )	0.2	0.2	0.2	
Bi-directional Repeatability ( $\mu\text{m}$ )	$\pm 1.5$	$\pm 1.5$	$\pm 1.5$	
Uni-directional Repeatability ( $\mu\text{m}$ )	0.5	0.5	0.5	
Nominal Current (A)	0.32	0.25	0.6	
Voltage Range (V)	12			
Accuracy	on request			
Velocity range (mm/sec)	0.002 ... 10			
Material	Stainless steel			

Note: FS = full step, RE = rotary encoder

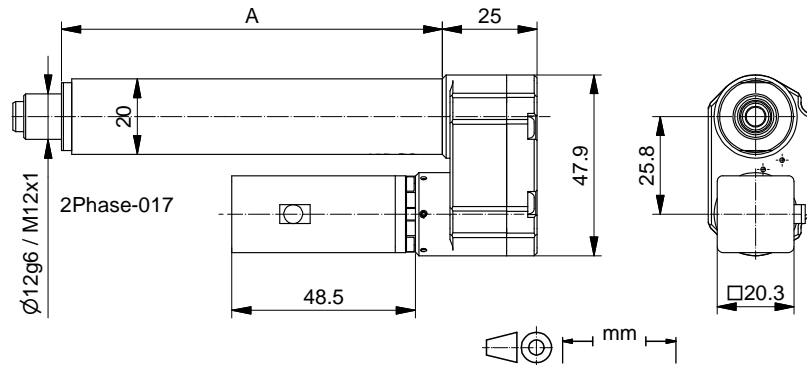
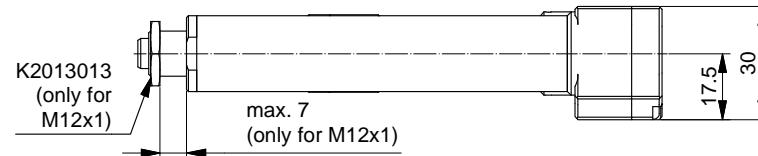
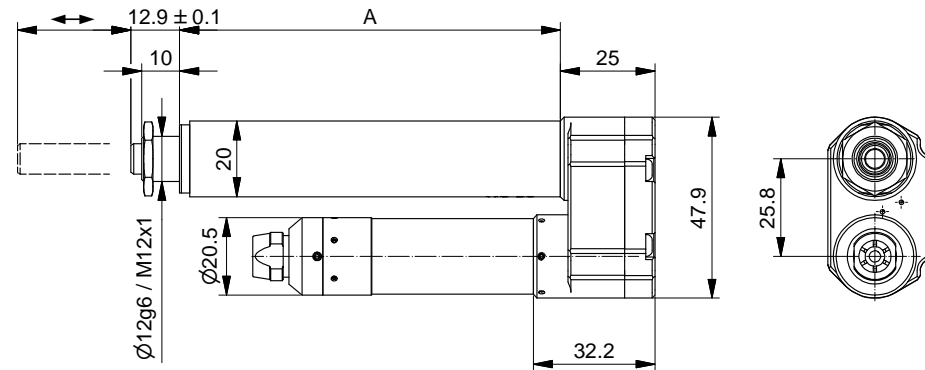
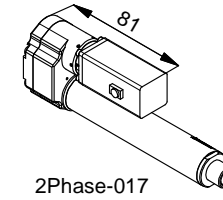
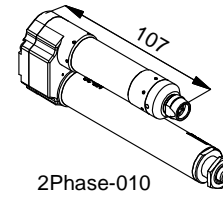
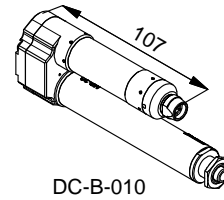
More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

# MP-20-B Precision Linear Actuator



Travel (mm)	13	26	52	76
A	63	76	101	126



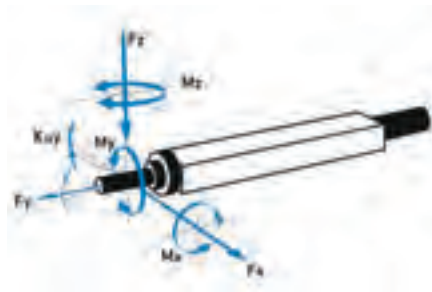
Order No.	5696-9-			0	1
DC-B-010		1			
2Phase-010		2			
2Phase-017		3			
13 mm (1/2")		1			
26 mm (1")		2			
52 mm (2")		3			
72 mm (3")		4			
12g6		1			
M12x1		2			

# MP-20-B Vacuum Compatible Precision Linear Actuator



## FACTS

Load characteristics	$F_{x(N)}$	$F_{y(N)}$	$F_{z(N)}$
FV	1	125	1
10-6	1	125	1



The new MP-20 B Vacuum micro pusher is designed to motorize manual drives or mirror mounts and it is an ideal component for limited space conditions. Small light components such as mirrors and diodes can be directly mounted to the tip. The MP-20 B Vacuum micro pusher is equipped with a re-circulating ball screw for a quiet, precise and homogeneous smooth motion and has a non-rotating tip. The MP-20 B Vacuum micro pushers are offered with a 2-phase geared stepper vacuum motor combination or with a gearless 2-phase stepper vacuum motor. Round or flat ground inserts can be attached to the tip. The side-mounted design of model MP-20 B results in much shorter length.

## TECHNICAL DATA

Travel range (mm)	13	26	52	77
Weight (kg)	0.24	0.26	0.28	0.29
Vacuum type	FV		10-6	
Speed max. (mm/sec)	0.2		0.07	
Resolution calculated (µm)	0.5490171 (FS)		0.5490171 (FS)	
Resolution typical (µm)	0.2		0.2	
Bi-directional Repeatability (µm)	± 1.5		± 1.5	
Uni-directional Repeatability (µm)	0.5		0.5	
Nominal Current (A)	0.25		0.25	
Accuracy	on request			
Velocity range (mm/sec)	0.001 ... 0.6			
Material	Aluminum or Stainless steel, suitable for vacuum			

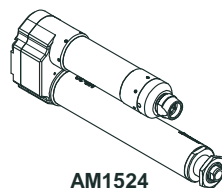
**Vacuum Note:** FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.

## KEY FEATURES

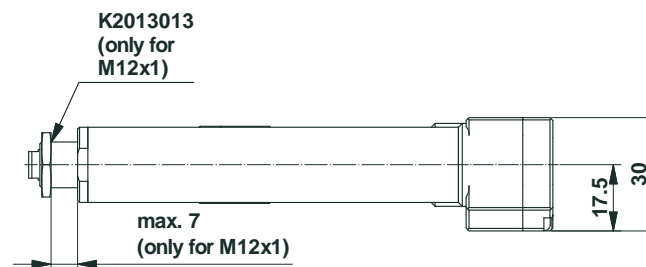
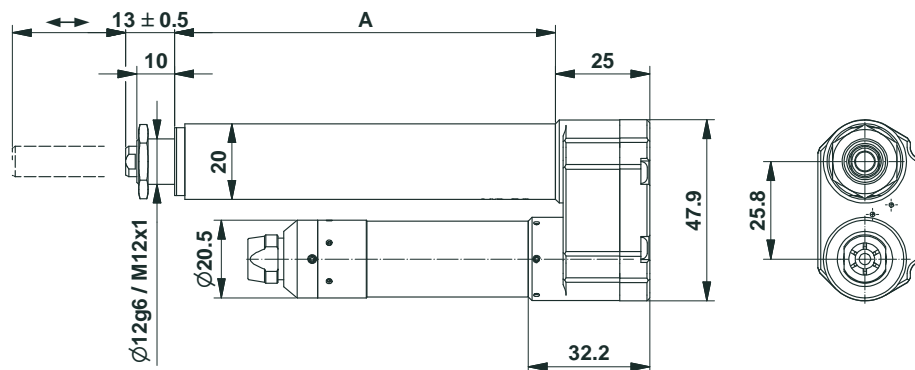
- Vacuum up to 10-6 hPa
- Travel range up to 76 mm ( 3" )
- Uni directional repeatability 0.5  $\mu\text{m}$
- Max. speed 0.2 mm/sec
- Force 125 N
- Integrated limit switches

# MP-20-B Vacuum Compatible Precision Linear Actuator

Travel (mm)	13	26	52	77
A	63	76	101	125,5



drawings for the corresponding vacuum class must be requested separately.  
The installed motor type is:  
AM1524 for FV



Order No.	5696-V-			0	0
FV	1				
10-6	6				
13 mm (1/2")	1				
26 mm (1")	2				
52 mm (2")	3				
77 mm (3")	4				
12g6	1				
M12x1	2				

# MA-35 High Force Precision Linear Actuator

## FACTS

Load characteristics	$F_{x(N)}$	$F_{y(N)}$	$F_{z(N)}$
DC-B-013	10	500	10
DC-B-031	10	200	10
2Phase-045	10	300	10



## KEY FEATURES

- Travel range 52 mm (2")
- Uni-directional repeatability down to 0.2  $\mu\text{m}$
- Maximum speed 100 mm/sec
- Force max. 500 N
- Integrated hall / mechanical limit switches
- High resolution

from the drive. Compared to other pushers, the standard force is very high (200 N) and can be increased. The MA-35 actuators are motorized with DC gear-motor with encoder or 2-phase gear-motor combination or as direct drive DC with encoder or 2-phase stepper motor. The motorized drives can be combined with a ground preloaded re-circulating ball screw with 1 mm or 2 mm pitch. Depending on the requirement, the actuator can be configured for high pushing forces, high resolution or high speed. The travel range is 52 mm (2"). Two integrated mechanical or optional hall limit switches prevent damage from accidental over-travel. All critical elements are made of stainless steel.

## TECHNICAL DATA

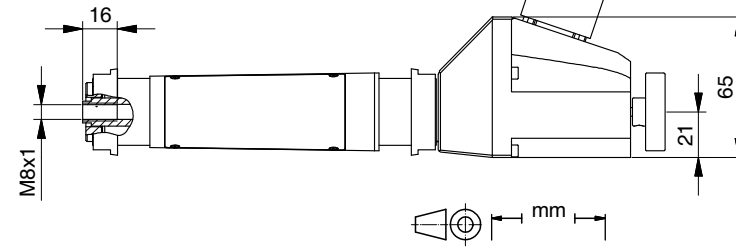
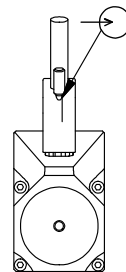
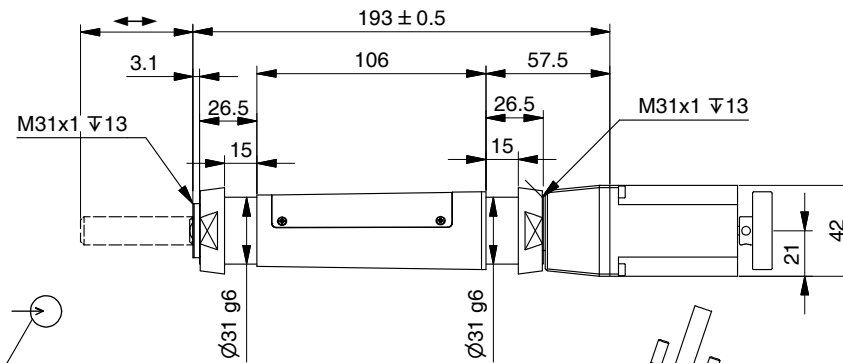
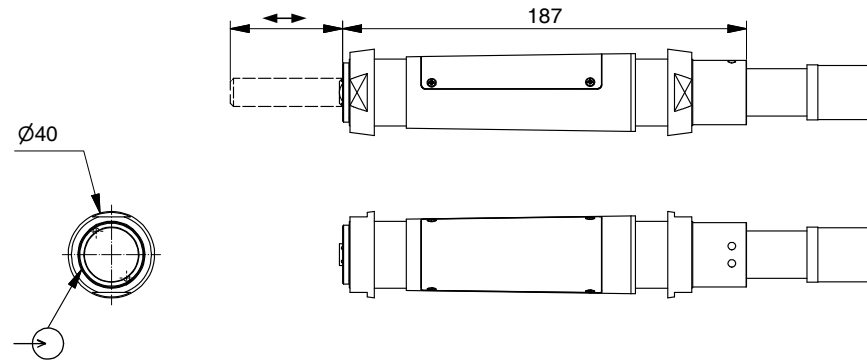
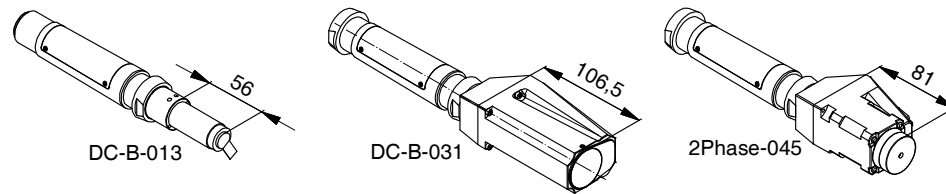
Travel range (mm)	52					
Weight (kg)	2					
Motor (Pitch 1   2 mm)	DC-B-013		DC-B-031		2Phase-045	
Speed max. (mm/sec)	2.5	5	50	90	25	45
Resolution calculated (µm)	0.0164726	0.0329 (RE)	0.5	1 (RE)	5	10 (FS)
Resolution typical (µm)	0.1	0.2	0.5	1	0.1	0.2
Bi-directional Repeatability (µm)	± 1		± 1		± 1	
Uni-directional Repeatability (µm)	0.2		0.5	1	0.2	
Nominal Current (A)	0.28		1.96		1.2	
Voltage Range (V)	24		24			
Accuracy	on request					
Velocity range (mm/sec)	0.001 ... 100					
Material	Stainless steel					

Note: FS = full step, RE = rotary encoder

More info: Detailed information concerning motors and encoders, see appendix.

Error and technical modifications are subject to change

# MA-35 High Force Precision Linear Actuator

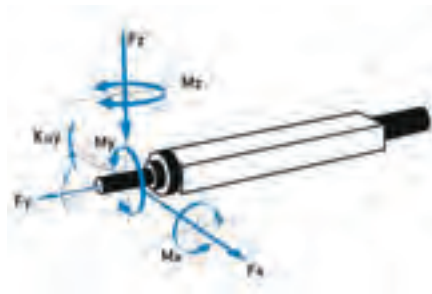


Order No.	5702-9-		0
DC-B-013	1		
DC-B-031	2		
2Phase-045	5		
52 mm (2")	1		
Pitch 1 mm / mechanical limit switches	0		
Pitch 2 mm / mechanical limit switches	1		
Pitch 1 mm / hall limit switches	2		
Pitch 2 mm / hall limit switches	3		

# MA-35 High Force Precision Linear Actuator / Vacuum Version

## FACTS

Load characteristics	$F_{x(N)}$	$F_{y(N)}$	$F_{z(N)}$
FV	10	200	10
HV	10	200	10
UHVG	10	200	10



## KEY FEATURES

- Vacuum up to 10<sup>-9</sup> hPa
- Travel range 52 mm (2")
- Uni-directional repeatability down to 0.2 μm
- Maximum speed 8 mm/sec
- Force max. 300 N
- Integrated limit switches
- High resolution

The MA-35 Vacuum actuators are motorized with a special 2-phase gear-motor vacuum combination or as direct drive 2-phase stepper vacuum motor. The motorized drives can be combined with a ground pretrained re-circulating ball screw with 1 mm pitch. Depending on the requirement, the actuator can be configured for high pushing forces, high resolution or higher speed. The travel range is 52 mm (2"). Two integrated limit switches prevent damage from accidental over-travel. All critical elements are made of stainless steel.

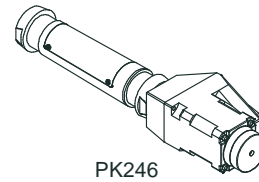
## TECHNICAL DATA

Travel range (mm)	52		
Weight (kg)	2		
Vacuum type	FV	HV	UHVG
Speed max. (mm/sec)	8	3	3
Resolution calculated (μm)	5 (FS)	5 (FS)	5 (FS)
Resolution typical (μm)	0.1	0.1	0.1
Bi-directional Repeatability (μm)	± 1	± 1	± 1
Uni-directional Repeatability (μm)	0.2	0.2	0.2
Nominal Current (A)	1.2	1.2	1.2
Accuracy	on request		
Velocity range (mm/sec)	0.001 ... 6		
Material	Aluminum or Stainless steel, suitable for vacuum		

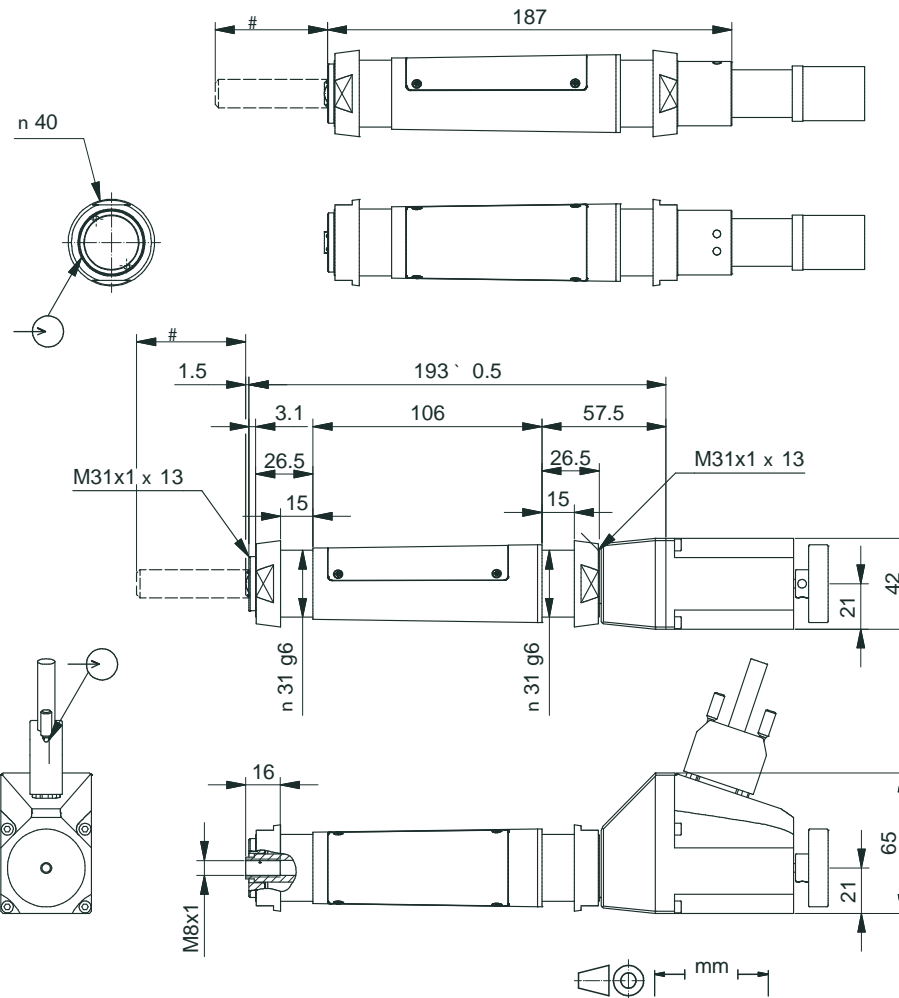
**Vacuum Note:** FS = full step, RE = rotary encoder  
More info: Detailed information concerning motors and encoders, see appendix.



# MA-35 High Force Precision Linear Actuator / Vacuum Version



drawings for the corresponding vacuum class must be requested separately.  
The installed motor types are:  
PK246 for FV  
VSS 43.200.1.2-E for HV & UHVG



Order No.	5702-V-			0	0	0
FV	1					
HV	2					
UHVG	3					
52 mm (2")	1					

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