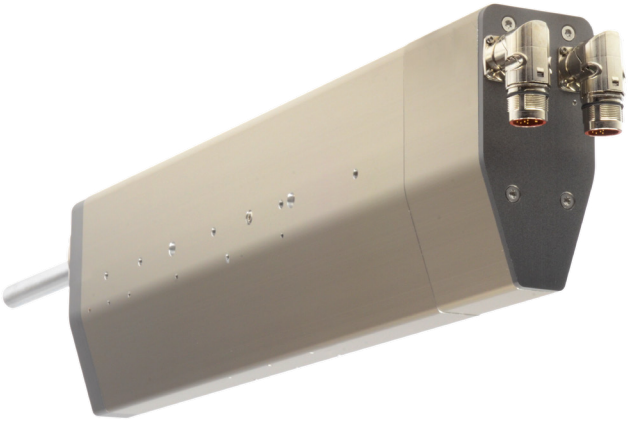
LINEAR ROTARY MOTORS
PR02-70

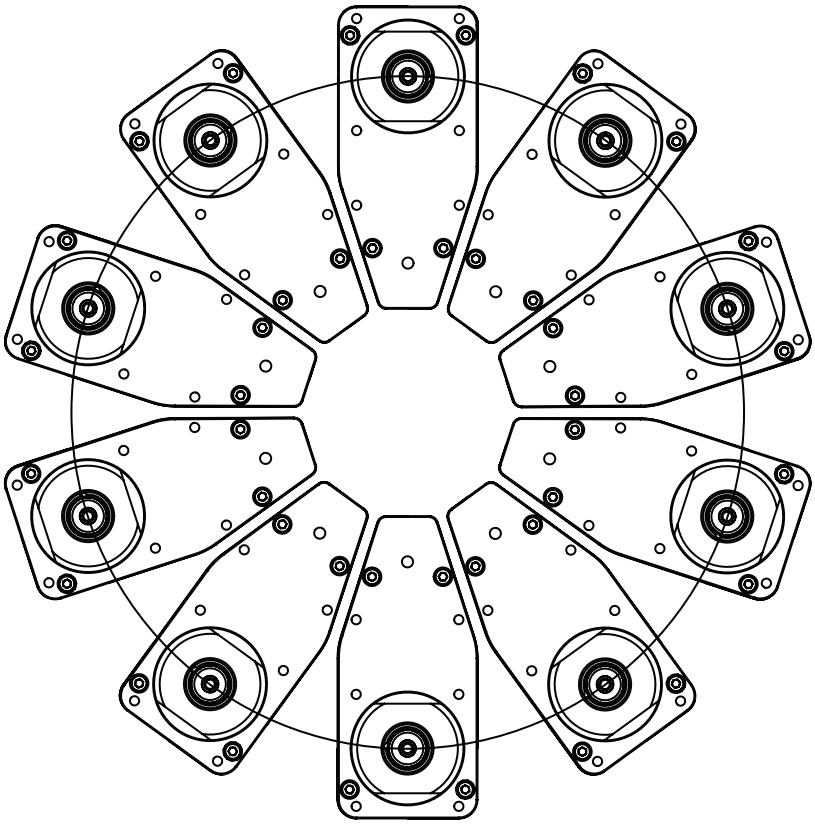
- New design principle with shorter installation length
- Special design, ideal for compact rotary transfer machines
- Independent linear and rotary movements
- Option of integrated MagSpring for load compensation
- Optional integrated torque measuring shaft and force sensor for high-precision torque or force control and process data logging
- Option hollow shaft for applications with air feed-through / vacuum
- Option pusher for opening grippers or ejecting parts
- Option stainless steel front for applications with the highest hygienic requirements

Product description

LinMot is expanding its product range of linear rotary motors with another type. The new PR02-70 motor series features a new design in which the motors including additional components are integrated in a slim housing.
In addition to the linear motor and the rotary motor, further options such as an air feed-through, a pneumatic pusher, a magnetic spring "MagSpring" and a torque and/or force sensor can be installed. With the help of the air feed-through through the hollow shaft, pneumatic grippers can be actuated or vacuum applications can be easily realised. Alternatively, the pneumatic pusher can be used as an independent second linear movement to actuate grippers in a mechanical manner, for example, or to eject gripped elements in a simple and targeted manner. An integrated MagSpring ensures that the weight force of the moving load is passively compensated and also prevents the axis from lowering in the de-energised state. The optional force and torque sensor enables precise, reproducible and recordable closing processes, as required in the pharmaceutical industry, for example. With the new design, users also benefit from the shorter installation length of the entire unit and the hygienic design with easy-to-clean surfaces. The special design enables the arrangement of several linear rotary motors on the smallest pitch circle. This makes it easy to realize new rotary transfer machines with very compact diameters.



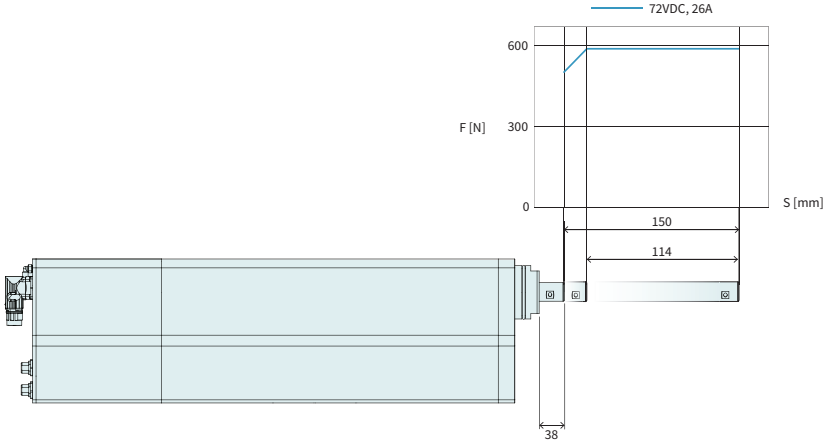
Mounting example for turntable with diameter 360mm



DOC-NO. 0185-0141-E / VERSION 1V0
SUBJECT TO ALTERATIONS

PR02-70x100(-SSC)-C_48x240F-HP-C-150-Lxx_MSxx_TS0x_FS0x

Max. Stroke: 150 mm
Max. Force: 572 N
Max. Torque: 9 Nm



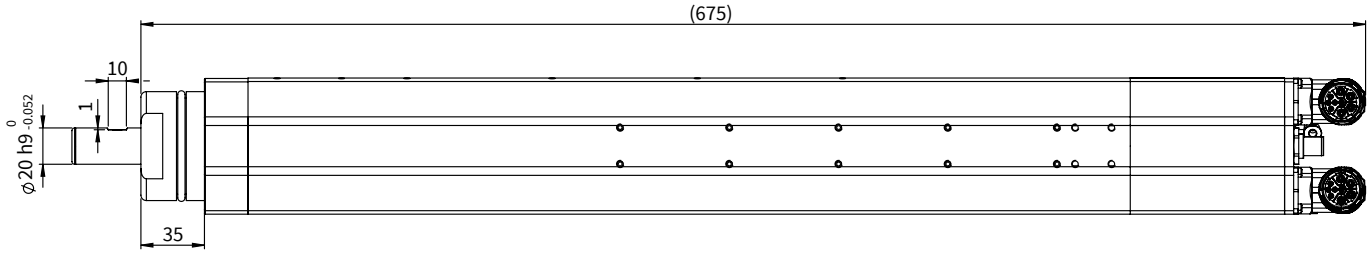
Dimensions in mm

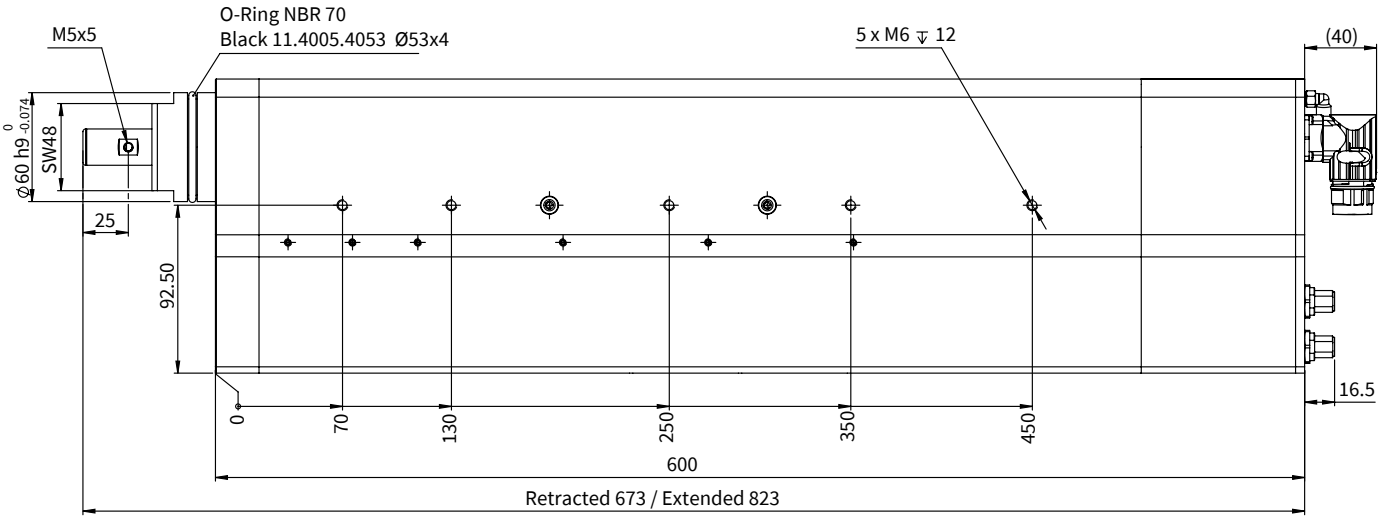
MOTOR DATA									
PR02-70x100(-SSC)-C_48x240F-HP-C-150-Lxx_MSxx_TS0x_FS0x									
Linear Motion									
Extended Stroke ES	mm (in)					150	(5.91)		
Standard Stroke SS	mm (in)					114	(4.49)		
Peak Force	N (lbf)					572	(129)		
Constant Force @ 25 °C [1]	N (lbf)					201	(45.2)		
Force Constant	N/A_{pk} (lbf/A_{pk})					22	(4.9)		
Max. Current @ 72VDC	A_{pk}					26			
Max. Velocity @ 72VDC	m/s (in/s)					3.01	(118.9)		
Position Repeatability	mm (in)					±0.05	(±0.002)		
Linearity	%					±0.5			
Rotary Motion									
Peak Torque (± 10%)	Nm (lbfin)					9	(80.1)		
Constant Torque (Halt) @ 25 °C [1]	Nm (lbfin)					2.06	(18.3)		
Max. Number of revolutions	rpm					1000			
Torque Constant 1	Nm/A_{pk} ($lbfin/A_{pk}$)					0.36	(3.19)		
Torque Constant 2	Nm/A_{rms} ($lbfin/A_{rms}$)					0.509	(4.52)		
Max. Current @ 72VDC	A_{pk} / A_{rms}					25 / 17.4			
Position Repeatability	°					±0.1			
Mechanical Data									
Width	mm (in)					75	(2.95)		
Height	mm (in)					162.5	(6.4)		
Length (without Connectors)	mm (in)					635 / 731 / 904	(25 / 28.78 / 35.59)		
Options		**without**	**MS04: Load Compensation**	**Lxx: with Linear Rotary Shaft**			**TS04**	**FS04**	**SSC**
			MagSpring 60N	Hollow Shaft -L01	Pn. Pusher -L05	El. Pusher -L15	Torque Sensor	Force Sensor	Stainless Front
Total weight Modul	g	14150	+1180	+0	tbd	tbd	+50	tbd	tbd
Weight moving mass	g	3020	+270	+0	tbd	tbd	+0	tbd	tbd
Rotary Torque of Inertia	$kgcm^2$ (lbf^2)					1.96	(0.0047)		
Through bore-hole Lxx						Hole diameter 4 mm ; Connection (front): M5 x 15, Connection (back): Push-in fitting for hose Ø4 mm			
Axle Diameter	mm (in)					20h9	(0.79)		
Protection Class						IP64 S			
Integrated Sensors						**Torque Sensor (Optional)**		**Force Sensor (Optional)**	
Supply Voltage	VDC					24			
Measuring Range	Nm (lbfin) N (lbf)					±9 (±78.8)		±300 (±67.5)	
Boundary Frequency -3dB	kHz					1		4.4	
Output Signal	VDC					±10			
Current Consumption	mA					<200			
Zero Offset	mV					<±100			
Mechanical Overload	%					200		300	
Resolution (C1200)	Bit					12			
Linearity	Nm (lbfin) N (lbf)					±0.09 (±0.81)		±3 (±0.675)	

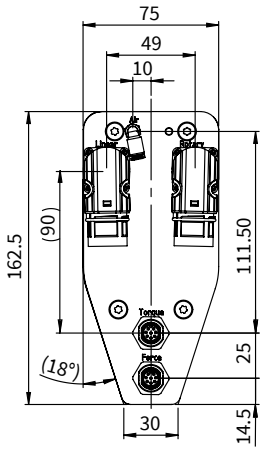
Electric / Pneumatic Pusher			
Peak Force (El. / Pn. @ 6 bar)	N (lbf)	225 / 275	(50.6 / 61.8)
Nominal Force (El. Pusher)	N (lbf)	50	(11.2)
Outer Diameter Centre Axle	mm (in)	6	(0.23)
Max. Stroke (Pusher)	mm (in)	25	(0.98)
Torsion Protection	mm (in)	2	(17.5)

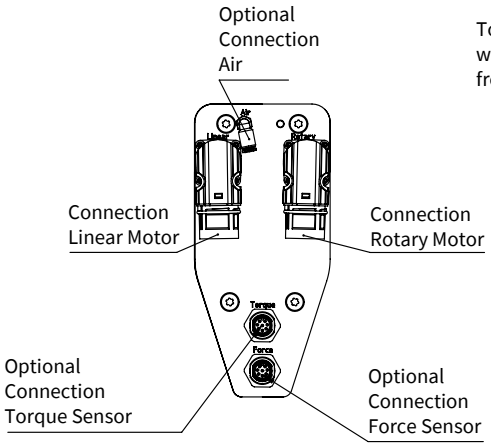
1) Nominal force depends on 2nd motor (see LinMot Designer).

DIMENSIONS PR02-70X100(-SSC)-C_48X240F-HP-C-150(-L01) (OPTION FULL SHAFT OR HOLLOW SHAFT)

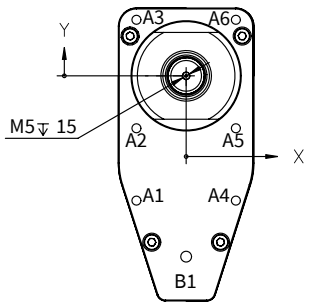






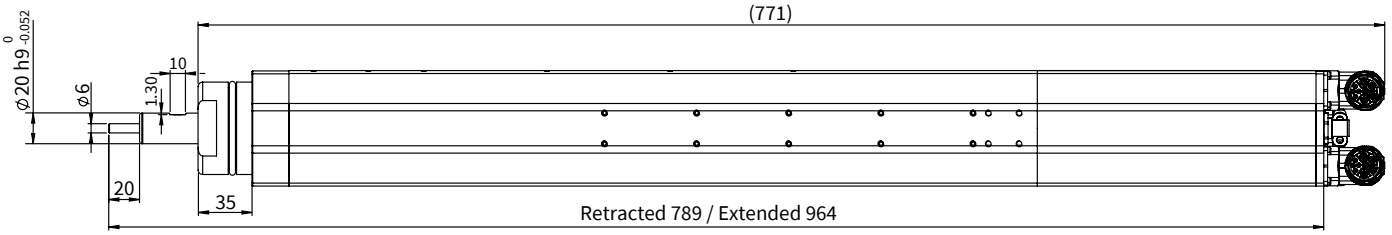


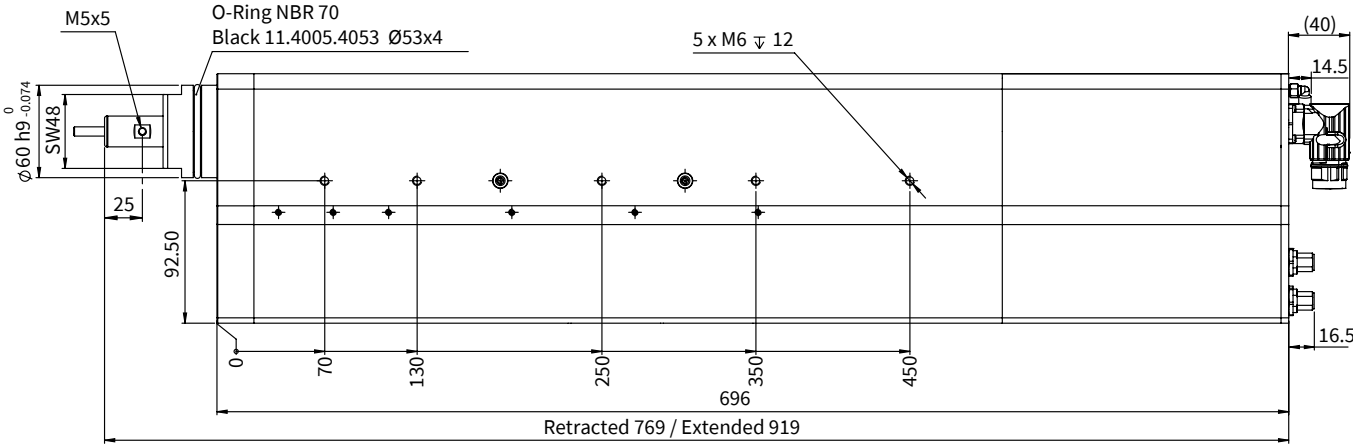
Tolerance ⌖ 0.1 for all holes on the face, which are drawn starting from the zero position.

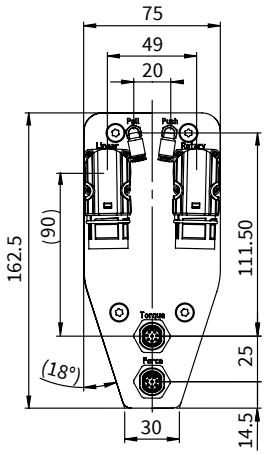


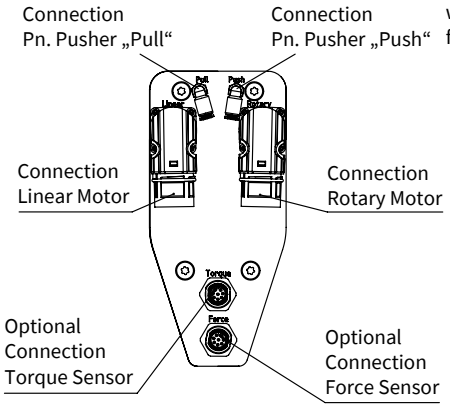
	X-Pos.	Y-Pos.	
A1	-27.50	-69	M6 ↧ 12
A2	-27.50	-29	
A3	-27.50	31	
A4	27.50	-69	
A5	27.50	-29	
A6	27.50	31	
B1	0	-90	Ø 6 H7 +0.012 0 ↧ 10

DIMENSIONS PR02-70X100(-SSC)-C_48X240F-HP-C-150-L05 (OPTION PNEUMATIC PUSHER)

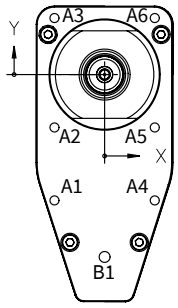






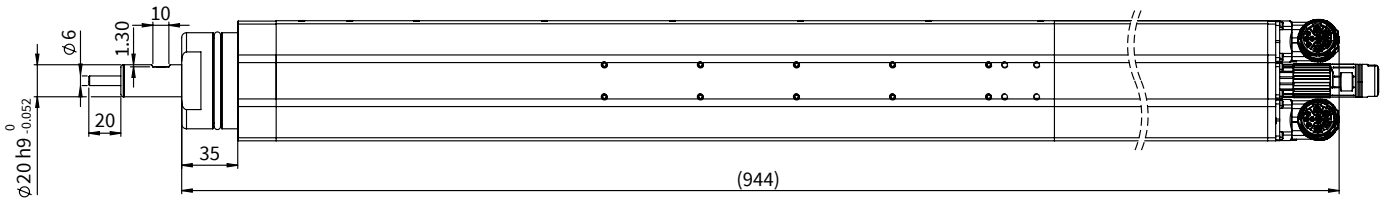


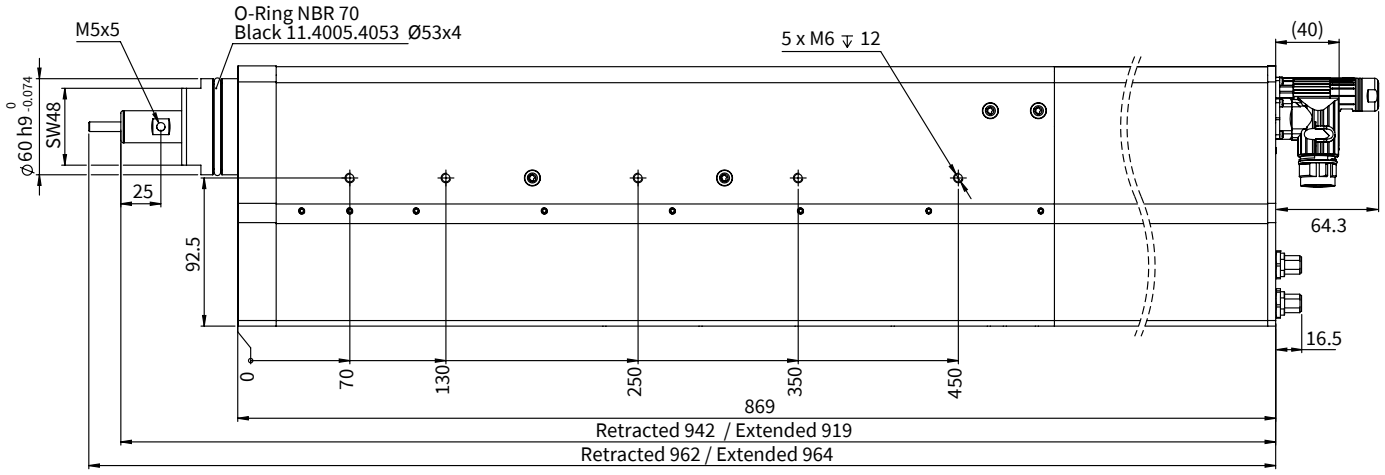
Tolerance ⌖ 0.1 for all holes on the face, which are drawn starting from the zero position.

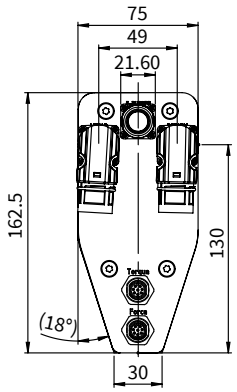


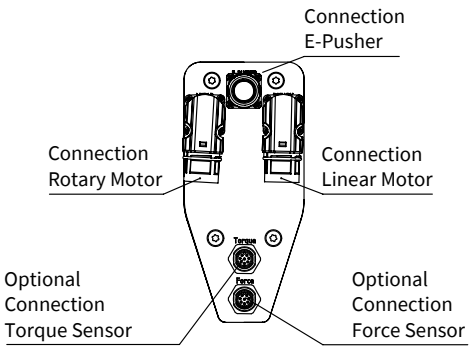
	X-Pos.	Y-Pos.	
A1	-27.50	-69	M6 ↧ 12
A2	-27.50	-29	
A3	-27.50	31	
A4	27.50	-69	
A5	27.50	-29	
A6	27.50	31	
B1	0	-90	Ø 6 H7 +0.012 0 ↧ 10

DIMENSIONS PR02-70X100(-SSC)-C_48X240F-HP-C-150-L15 (OPTION ELECTRIC PUSHER)

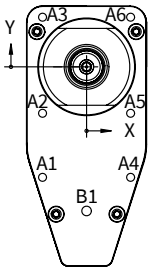








Tolerance ⌖ 0.1 for all holes on the face, which are drawn starting from the zero position.

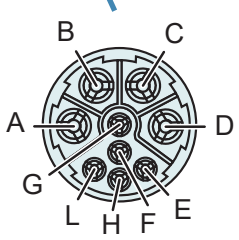


	X-Pos.	Y-Pos.	
A1	-27.50	-69	M6 ↧ 12
A2	-27.50	-29	
A3	-27.50	31	
A4	27.50	-69	
A5	27.50	-29	
A6	27.50	31	
B1	0	-90	ø 6 H7 +0.012 0 ↧ 10

CONNECTORS

Motor Connector Wiring	Linear Unit: C-Connector	Rotary Unit: C-Connector	Wire Color Motor Cable
Ph 1+ / Ph A	A	A	red
Ph 1- / Ph B	B	B	pink
Ph 2+ / Ph C	C	C	blue
Ph 2- / (-)	D	D (not connected)	grey
+5VDC	E	E	white
GND	F	F	inner shield
Sin	G	G	yellow
Cos	H	H	green
Temp.	L	L	black
Shield	Housing	Housing	outer shield

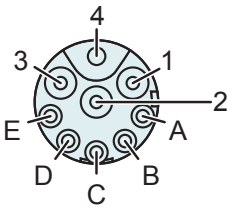
C-Connector



View: Motor connector, plug on

Connector Wiring	El. Pusher R-Connector	Wire Color Motor Cable
Ph 1+ / Ph A	1	red
Ph 1- / Ph B	2	pink
Ph 2+ / Ph C	3	blue
Ph 2- / (-)	4	grey
+5VDC	A	white
GND	B	inner shield
Sin	C	yellow
Cos	D	green
Temp.	E	black
Shield	Housing	outer shield

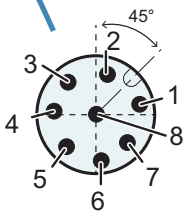
R-Connector



Ansicht: Motorstecker, steckseitig

Connector Wiring	Torque- / Force Sensor M12 Connector (A-coded)	Wire Color Sensor Cable
Supply GND	1	white
Supply 24V (approx. 80 mA @ 24VDC)	2	brown
Do not connect	3	green
Torque / Force -	4	yellow
Torque / Force +	5	grey
AGND / Reference ground for force sensor signal (Isolated from PGND, connect to reference GND of analog input on servo drive.)	6	pink
Do not connect	7	blue
Do not connect	8	red

M12-Connector (A-coded)

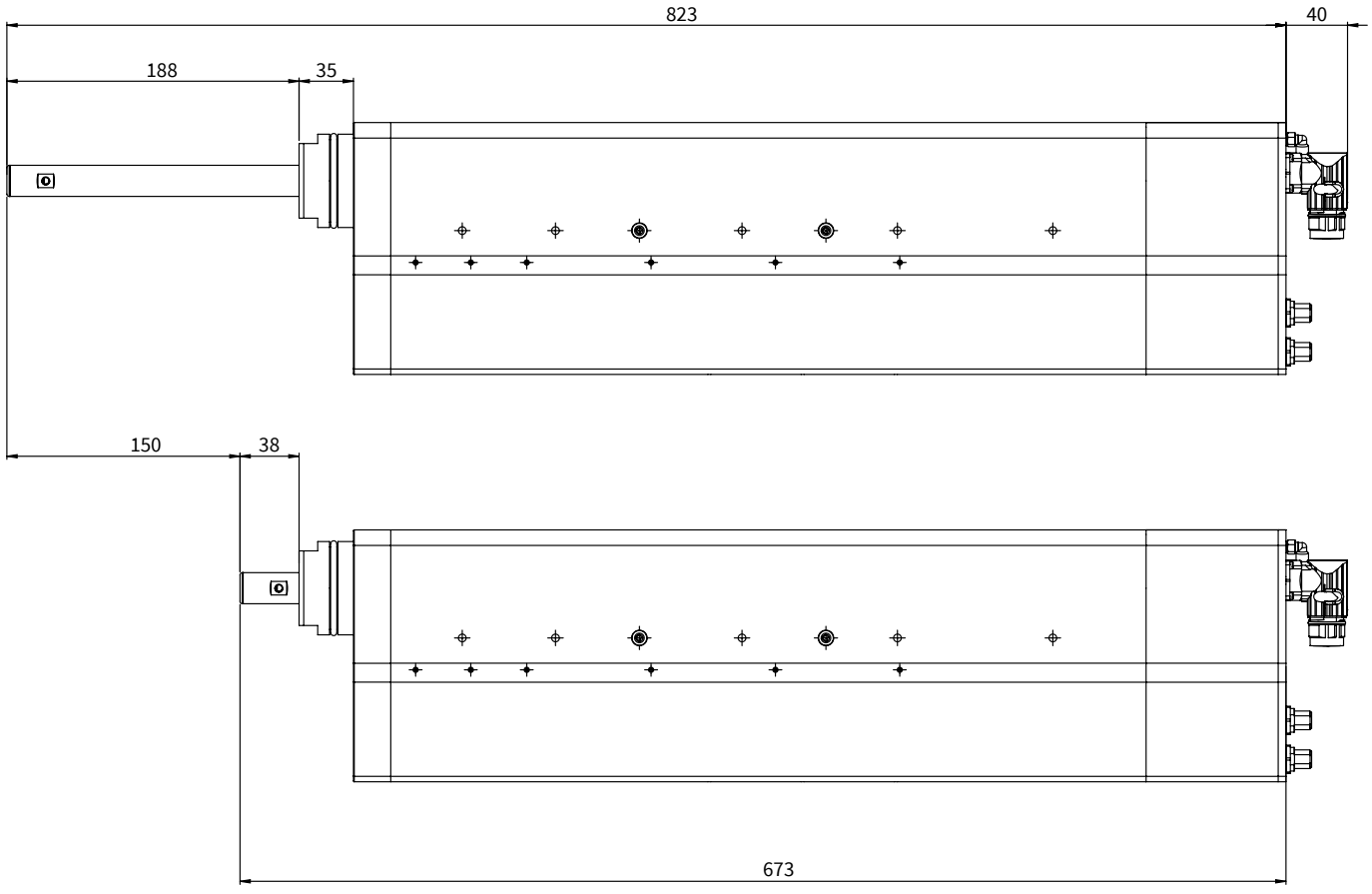


View:
Motor connector, plug on

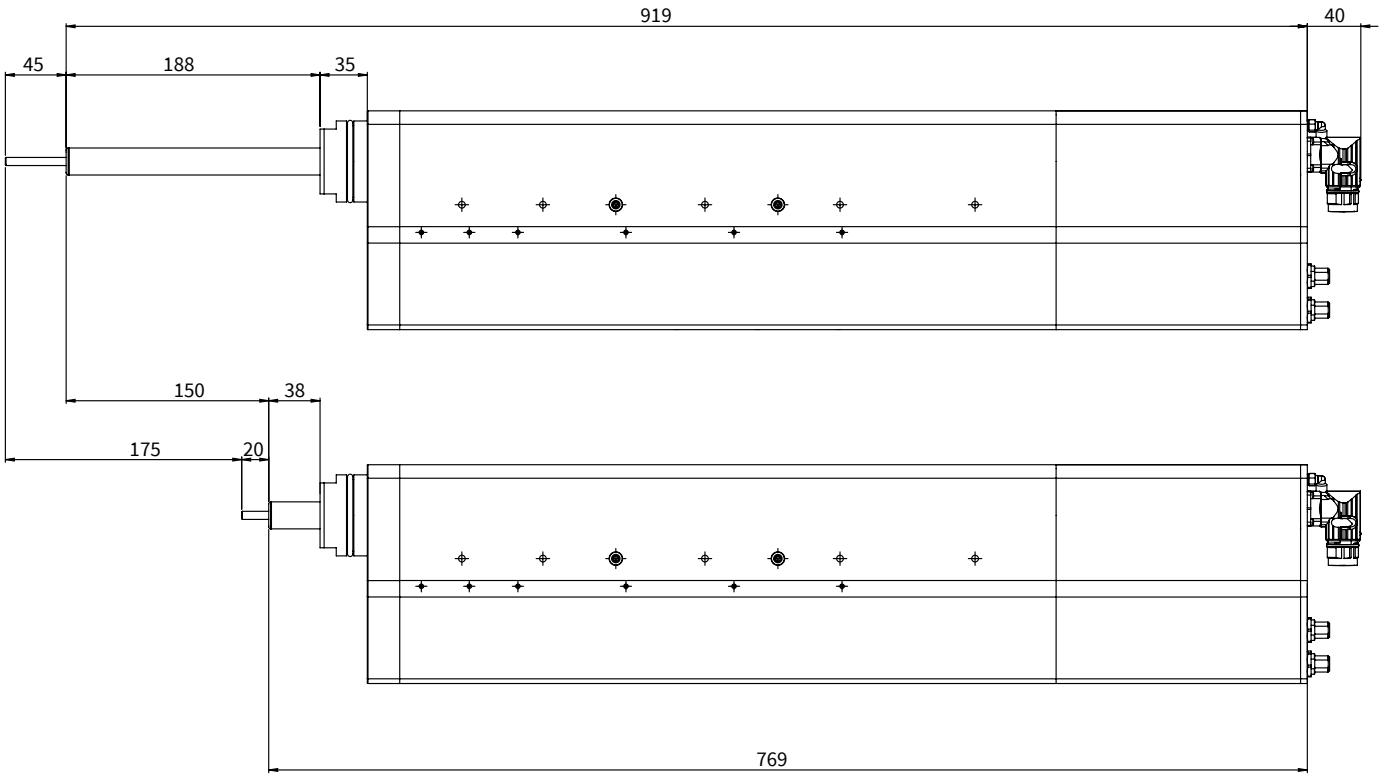
PIN 4 (torque / force -) and PIN 1 (supply GND) are internally galvanically isolated and must not be connected to each other. Please read installation guide for any exceptions.

External EMC circuitry
A ceramic capacitor 100nF / 50V can be soldered between pins 4 - 5 on the evaluation to avoid wire-bound interference.

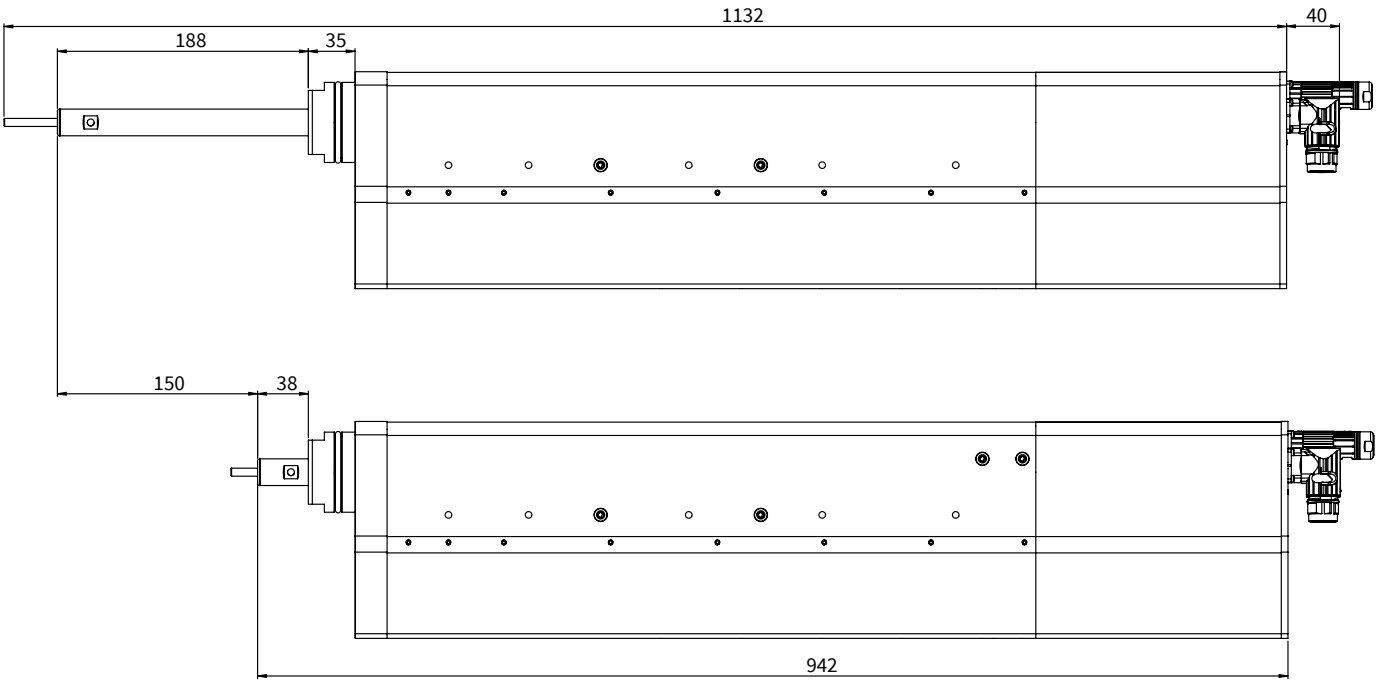
MAX. STROKE PR02-70X100(-SSC)-C_48X240F-HP-C-150(-L01) (OPTION FULL SHAFT OR HOLLOW SHAFT)



MAX. STROKE PR02-70X100(-SSC)-C_48X240F-HP-C-150-L05 (OPTION PNEUMATIC PUSHER)

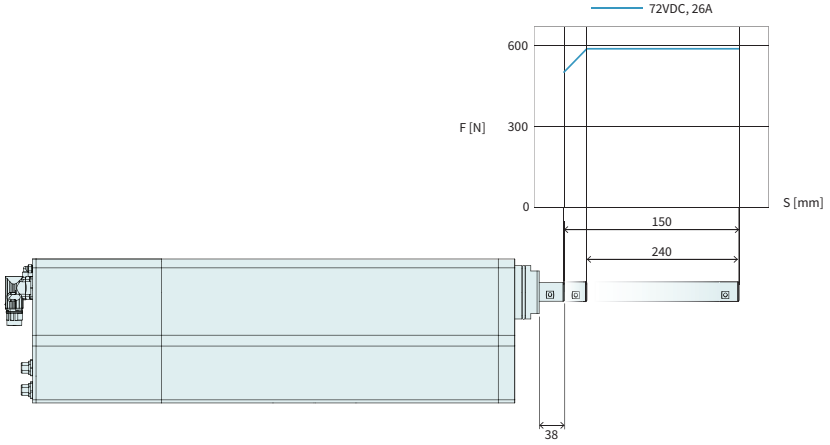


MAX. STROKE PR02-70X100(-SSC)-C_48X240F-HP-C-150-L15 (OPTION ELECTRIC PUSHER)



PR02-70x100(-SSC)-C_48x240F-HP-C-240-L0x_MSxx_TS0x_FS0x

Max. Strke: 240 mm
Max. Force: 572 N
Max. Torque: 9 Nm

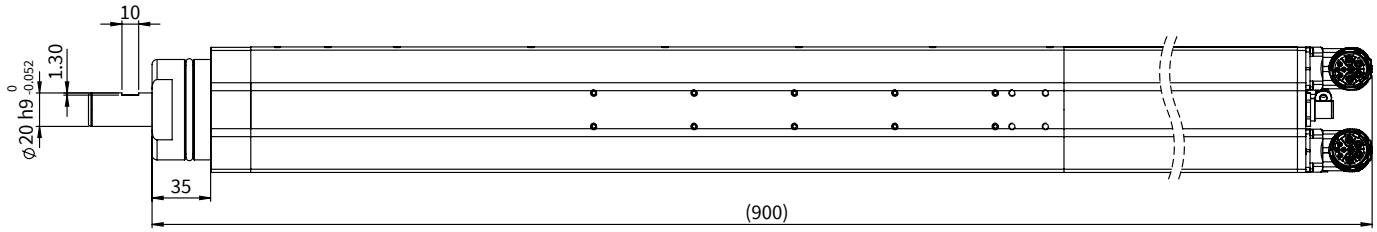


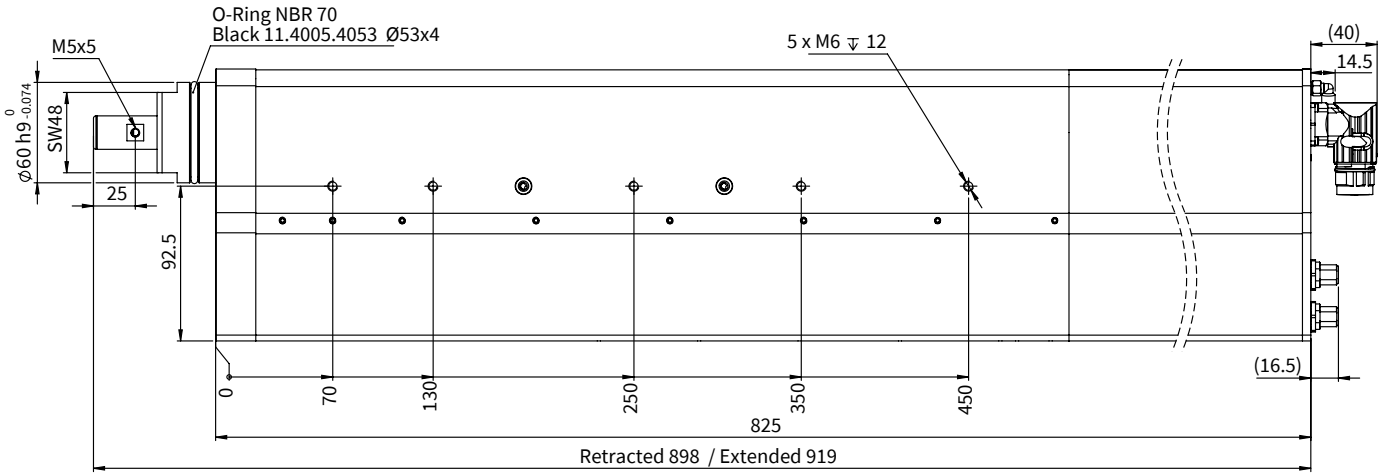
MOTOR DATA								
PR02-70x100(SSC)-C_48x240F-HP-C-240-L0x_MSxx_TS0x_FS0x								
Linear Motion								
Extended Stroke ES	mm (in)		240	(9.45)				
Standard Stroke SS	mm (in)		114	(4.49)				
Peak Force	N (lbf)		572	(129)				
Constant Force @ 25 °C [1]	N (lbf)		201	(45.2)				
Force Constant	N/A_{pk} (lbf/A_{pk})		22	(4.9)				
Max. Current @ 72VDC	A_{pk}		26					
Max. Velocity @ 72VDC	m/s (in/s)		3.01	(118.9)				
Position Repeatability	mm (in)		±0.05	(±0.002)				
Linearity	%		±0.35					
Rotary Motion								
Peak Torque (± 10%)	Nm (lbfin)		9	(80.1)				
Constant Torque (Halt) @ 25 °C [1]	Nm (lbfin)		2.06	(18.3)				
Max. Number of revolutions	rpm		1000					
Torque Constant 1	Nm/A_{pk} ($lbfin/A_{pk}$)		0.36	(3.19)				
Torque Constant 2	Nm/A_{rms} ($lbfin/A_{rms}$)		0.509	(4.52)				
Max. Current @ 72VDC	A_{pk} / A_{rms}		25 / 17.4					
Position Repeatability	°		±0.1					
Mechanical Data								
Width	mm (in)		75	(2.95)				
Height	mm (in)		162.5	(6.4)				
Length (without Connectors)	mm (in)		860	(33.86)				
Options		**without**	**MS04: Load Compensation**	**Lxx: Linear Rotary Shaft**		**TS04**	**FS04**	**SSC**
			MagSpring 60N	Hollow Shaft -L01	Pn. Pusher -L05	Torque Sensor	Force Sensor	Stainless Front
Total weight Modul	g	14150	+1180	+0	tbd	+50	+0	tbd
Weight moving mass	g	3020	+270	+0	tbd	+0	+0	tbd
Rotary Torque of Inertia	$kgcm^2$ (lbf^2)		1.96	(0.0047)				
Through bore-hole Lxx		Hole diameter 4 mm ; Connection (front): M5 x 15, Connection (back): Push-in fitting for hose Ø4 mm						
Axle Diameter	mm (in)		20h9	(0.79)				
Protection Class		IP64 S						
Integrated Sensors		**Torque Sensor (Optional)**			**Force Sensor (Optional)**			
Supply Voltage	VDC	24						
Measuring Range	Nm (lbfin) N (lbf)	±9 (±78.8)			±300 (±67.5)			
Boundary Frequency -3dB	kHz	1			4.4			
Output Signal	VDC	±10						
Current Consumption	mA	<200						
Zero Offset	mV	<±100						
Mechanical Overload	%	200			300			
Resolution (C1200)	Bit	12						
Linearity	Nm (lbfin) N (lbf)	±0.09 (±0.81)			±3 (±0.675)			

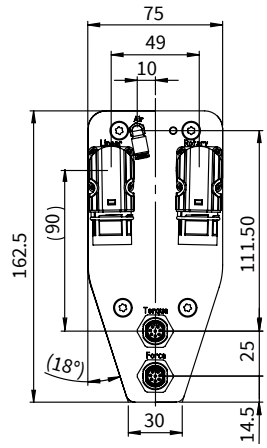
Pneumatic Pusher (Option in planning)			
Peak Force	N (lbf)	300	(67.4)
Outer Diameter Centre Axle	mm (in)	6	(0.23)
Max. Stroke (Pusher)	mm (in)	25	(0.98)
Torsion Protection	Nm (lbfin)	2	(17.5)

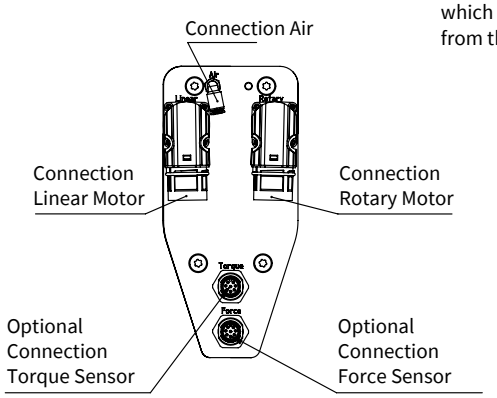
1) Nominal force depends on 2nd motor (see LinMot Designer).

DIMENSIONS PR02-70X100(-SSC)-C_48X240F-HP-C-240-(L01) (OPTION FULL SHAFT OR HOLLOW SHAFT)

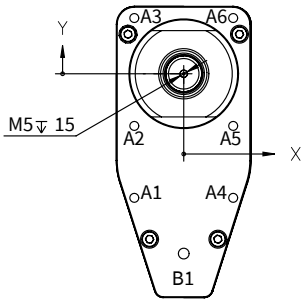








Tolerance ⌖ 0.1 for all holes on the face, which are drawn starting from the zero position.

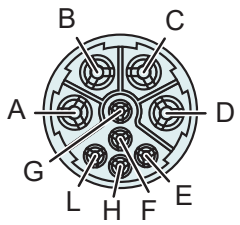


	X-Pos.	Y-Pos.	
A1	-27.50	-69	M6 ↧ 12
A2	-27.50	-29	
A3	-27.50	31	
A4	27.50	-69	
A5	27.50	-29	
A6	27.50	31	
B1	0	-90	Ø 6 H7 +0.012 0 ↧ 10

CONNECTORS

Motor Connector Wiring	Linear Unit: C-Connector	Rotary Unit: C-Connector	Wire Color Motor Cable
Ph 1+ / Ph A	A	A	red
Ph 1- / Ph B	B	B	pink
Ph 2+ / Ph C	C	C	blue
Ph 2- / (-)	D	D (not connected)	grey
+5VDC	E	E	white
GND	F	F	inner shield
Sin	G	G	yellow
Cos	H	H	green
Temp.	L	L	black
Shield	Housing	Housing	outer shield

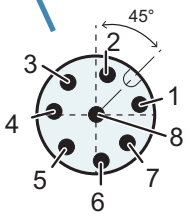
C-Connector



View: Motor connector, plug on

Connector Wiring	Torque- / Force Sensor M12 Connector (A-coded)	Wire Color Sensor Cable
Supply GND	1	white
Supply 24V (approx. 80 mA @ 24VDC)	2	brown
Do not connect	3	green
Torque / Force -	4	yellow
Torque / Force +	5	grey
AGND / Reference ground for force sensor signal (Isolated from PGND, connect to reference GND of analog input on servo drive.)	6	pink
Do not connect	7	blue
Do not connect	8	red

M12-Connector (A-coded)

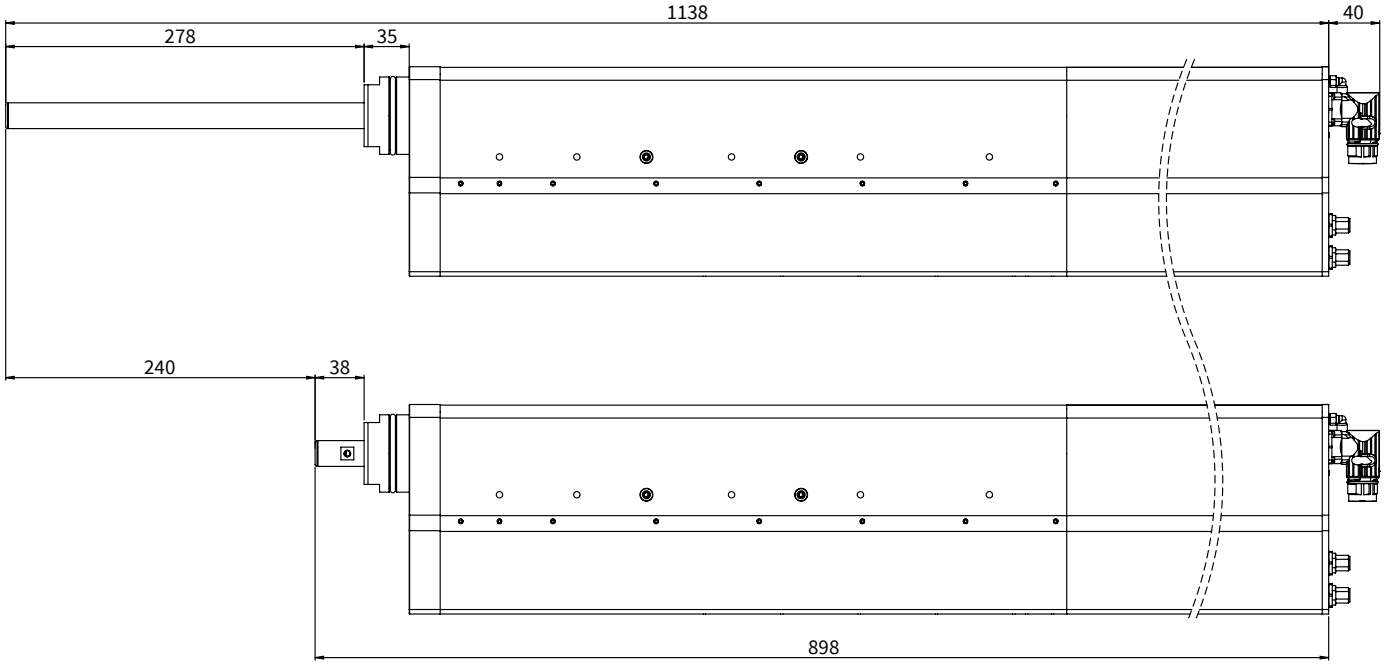


View:
Motor connector, plug on

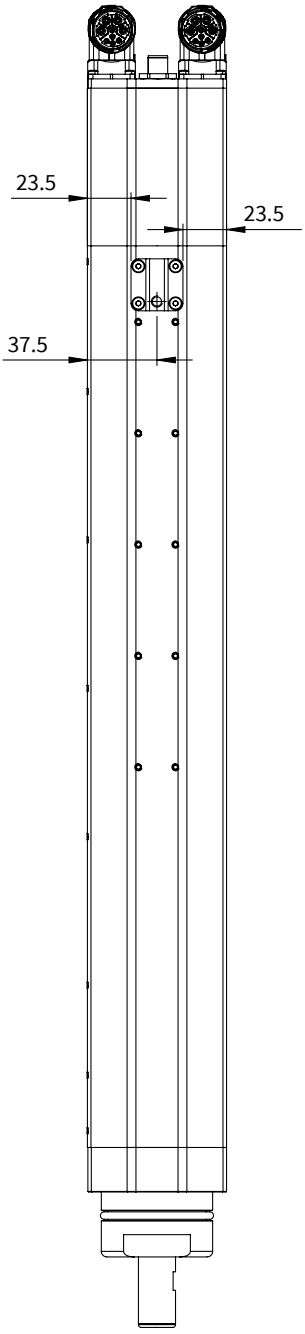
PIN 4 (torque / force -) and PIN 1 (supply GND) are internally galvanically isolated and must not be connected to each other. Please read installation guide for any exceptions.

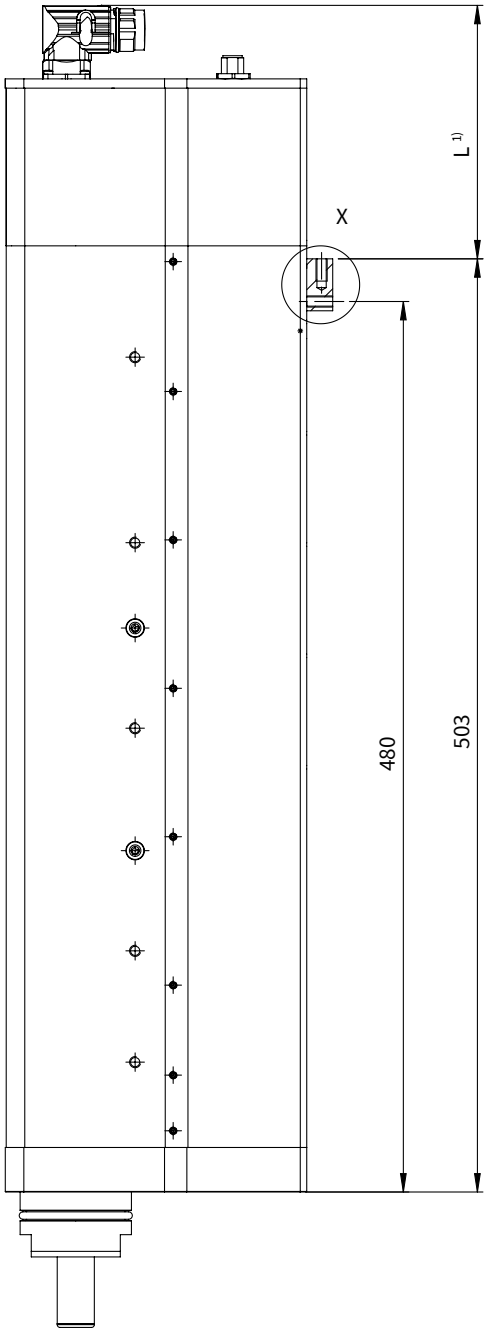
External EMC circuitry
A ceramic capacitor 100nF / 50V can be soldered between pins 4 - 5 on the evaluation to avoid wire-bound interference.

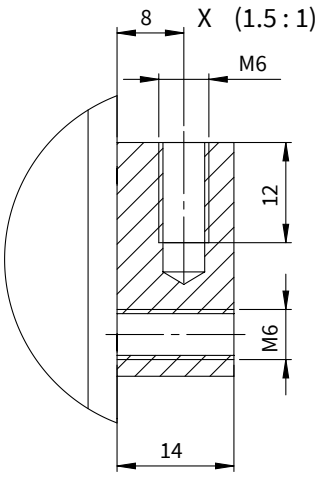
MAX. STROKE PR02-70X100(-SSC)-C_48X240F-HP-C-240(-L01) (OPTION FULL SHAFT OR HOLLOW SHAFT)



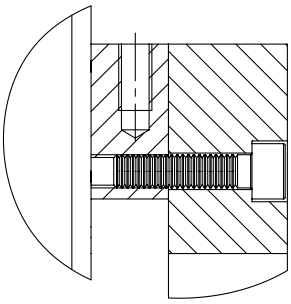
MOUNTING FLANGE



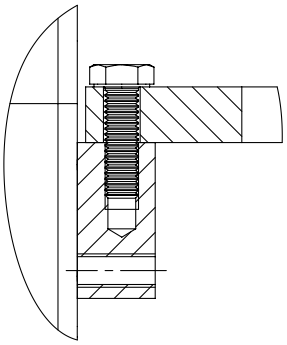




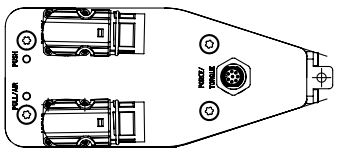
Option A



Option B



LinMot offers a mounting flange as an accessory that makes vertical assembly easy. The mounting flange is attached to the motor using the threaded holes. Then an external support can be mounted with the flange according to options A or B.



1) The length L depends on the choosen PR02-70 type.

Item	Description	Item-No.
RS02-70-BF1	Mounting flange set including screws	0150-4840

ORDERING INFORMATION

LINEAR ROTARY MOTORS PR02-70

Item	Description	Item-No.
PR02-70x100-C_48x240F-HP-C-150-L00_MS00_TS00	Linear Rotary Motor	0150-4445
PR02-70x100-C_48x240F-HP-C-150-L00_MS04_TS00	Linear Rotary Motor, MagSpring 60N	0150-4446
PR02-70x100-C_48x240F-HP-C-150-L01_MS00_TS00	Linear Rotary Motor, Hollow Shaft	0150-4449
PR02-70x100-C_48x240F-HP-C-150-L01_MS04_TS00	Linear Rotary Motor, Hollow Shaft, MagSpring 60N	0150-4450
PR02-70x100-C_48x240F-HP-C-240-L00_MS00_TS00	Linear Rotary Motor	0150-4633
PR02-70x100-C_48x240F-HP-C-240-L00_MS04_TS00	Linear Rotary Motor, MagSpring 60N	0150-4423
PR02-70x100-C_48x240F-HP-C-240-L01_MS00_TS00	Linear Rotary Motor, Hollow Shaft	0150-4972
PR02-70x100-C_48x240F-HP-C-240-L01_MS04_TS00	Linear Rotary Motor, Hollow Shaft, MagSpring 60N	0150-4973

LINEAR ROTARY MOTORS PR02-70 - OPTION STAINLESS STEEL FRONT (SSC)

Item	Description	Item-No.
PR02-70x100-SSC-C_48x240F-HP-C-150-L01_MS04_TS00	Linear Rotary Motor, Stainless Steel Front, Hollow Shaft, MagSpring 60N	0150-5355
PR02-70x100-SSC-C_48x240F-HP-C-150-L05_MS04_TS00	Linear Rotary Motor, Stainless Steel Front, Pusher, MagSpring 60N	0150-5357

LINEAR ROTARY MOTORS PR02-70 - OPTION SENSOR (FS / TS) / PUSHER (LXX)

Item	Description	Item-No.
PR02-70x100-C_48x240F-HP-C-150-L00_MS00_TS04	Linear Rotary Motor, Torque Sensor	0150-4447
PR02-70x100-C_48x240F-HP-C-150-L00_MS04_TS04	Linear Rotary Motor, MagSpring 60N, Torque Sensor	0150-4448
PR02-70x100-C_48x240F-HP-C-150-L01_MS00_TS04	Linear Rotary Motor, Hollow Shaft, Torque Sensor	0150-4451
PR02-70x100-C_48x240F-HP-C-150-L01_MS04_TS04	Linear Rotary Motor, Hollow Shaft, MagSpring 60N, Torque Sensor	0150-4452
PR02-70x100-C_48x240F-HP-C-150-L01_MS00_TS00_FS04	Linear Rotary Motor, Hollow Shaft, Force Sensor	0150-4966
PR02-70x100-C_48x240F-HP-C-150-L01_MS04_TS00_FS04	Linear Rotary Motor, Hollow Shaft, MagSpring 60N, Force Sensor	0150-4967
PR02-70x100-C_48x240F-HP-C-150-L01_MS00_TS04_FS04	Linear Rotary Motor, Hollow Shaft, Torque Sensor, Force Sensor	0150-4968
PR02-70x100-C_48x240F-HP-C-150-L01_MS04_TS04_FS04	Linear Rotary Motor, Hollow Shaft, MagSpring 60N, Torque Sensor, Force Sensor	0150-4969
PR02-70x100-C_48x240F-HP-C-150-L05_MS04_TS04	Linear Rotary Motor, Pusher, MagSpring 60N, Torque Sensor	0150-4970
PR02-70x100-C_48x240F-HP-C-150-L15_MS04_TS00_FS00	Linear Rotary Motor, E-Pusher, MagSpring 60N	0150-4829
PR02-70x100-C_48x240F-HP-C-150-L15_MS04_TS00_FS04	Linear Rotary Motor, E-Pusher, MagSpring 60N, Force Sensor	0150-5320
PR02-70x100-C_48x240F-HP-C-150-L15_MS04_TS04_FS00	Linear Rotary Motor, E-Pusher, MagSpring 60N, Torque Sensor	0150-5312
PR02-70x100-C_48x240F-HP-C-150-L15_MS04_TS04_FS04	Linear Rotary Motor, E-Pusher, MagSpring 60N, Torque Sensor, Force Sensor	0150-5313
PR02-70x100-C_48x240F-HP-C-240-L00_MS00_TS04	Linear Rotary Motor, Torque Sensor	0150-4974
PR02-70x100-C_48x240F-HP-C-240-L00_MS04_TS04	Linear Rotary Motor, MagSpring 60N, Torque Sensor	0150-4975
PR02-70x100-C_48x240F-HP-C-240-L01_MS00_TS04	Linear Rotary Motor, Hollow Shaft, Torque Sensor	0150-4976
PR02-70x100-C_48x240F-HP-C-240-L01_MS04_TS04	Linear Rotary Motor, Hollow Shaft, MagSpring 60N, Torque Sensor	0150-4977
PR02-70x100-C_48x240F-HP-C-240-L01_MS00_TS00_FS04	Linear Rotary Motor, Hollow Shaft, Force Sensor	0150-4978
PR02-70x100-C_48x240F-HP-C-240-L01_MS04_TS00_FS04	Linear Rotary Motor, Hollow Shaft, MagSpring 60N, Force Sensor	0150-4979
PR02-70x100-C_48x240F-HP-C-240-L01_MS00_TS04_FS04	Linear Rotary Motor, Hollow Shaft, Torque Sensor, Force Sensor	0150-4853
PR02-70x100-C_48x240F-HP-C-240-L01_MS04_TS04_FS04	Linear Rotary Motor, Hollow Shaft, MagSpring 60N, Torque Sensor, Force Sensor	0150-4661

ALL LINEAR MOTION FROM A SINGLE SOURCE

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