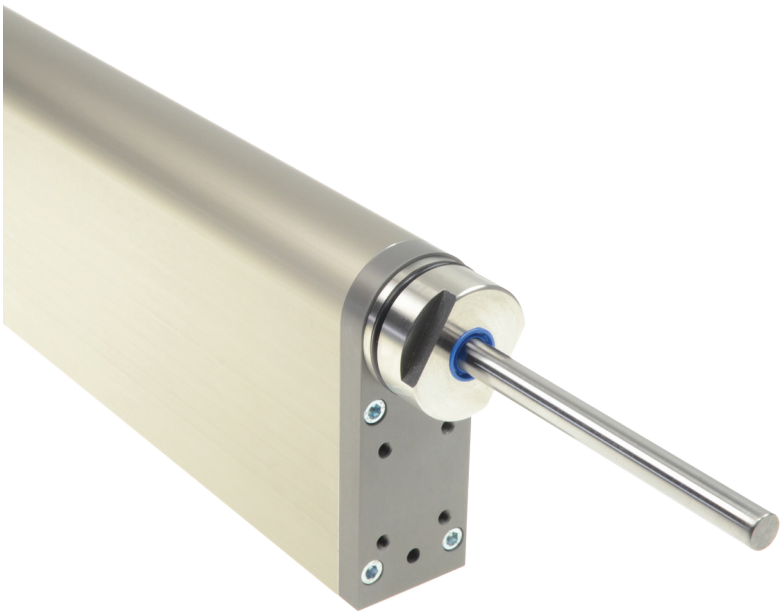
DATA SHEET
Linear Rotary Motors PR02-52

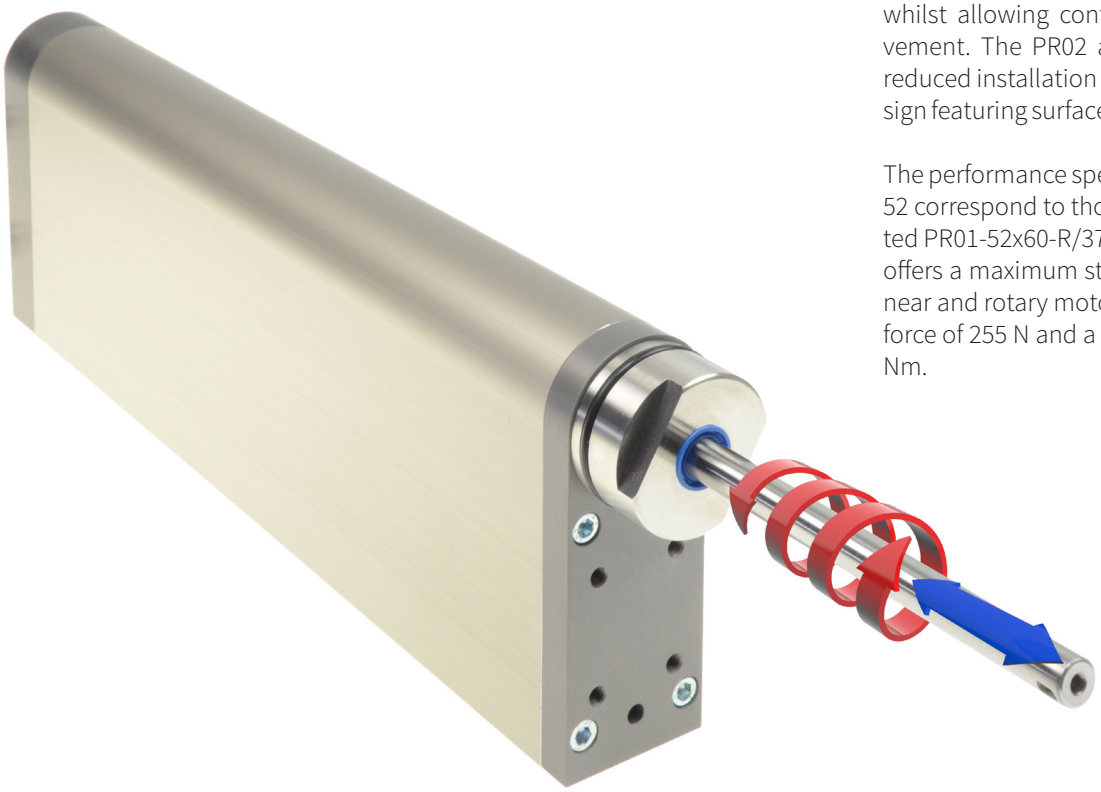
- Screwing, assembling, sealing, handling
- Independent linear and rotary motions
- Option integrated MagSpring for load compensation (pushing or pulling)
- Optional integrated torque measuring shaft and force sensor for high-precision torque or force control and process data logging
- Option hollow shaft for applications with air feed-through / vacuum
- Option pusher for opening grippers or ejecting parts
- Optional 3-finger parallel gripper
- Option front flange and linear rotary shaft in stainless steel for the food or pharmaceutical sector with special requirement for cleaning

Product description

The PR02 module series from the range of linear-rotary motors features a new, slim-line design in which the motors, including auxiliary components, are integrated into a compact housing. In addition to the linear motor and the rotary motor, options such as an air passage, a ‘MagSpring’ magnetic spring, a torque sensor or a force sensor can be integrated. The module is also available with an optional 3-finger parallel gripper.



The air passage through the hollow shaft enables the use of custom pneumatic grippers or the straightforward implementation of vacuum applications. The MagSpring passively compensates for the weight of the moving load and also prevents the axis from dropping when de-energised. Torque and force sensors enable precise, reproducible and documentable capping processes, such as those required in the pharmaceutical industry. For applications with high cleaning requirements, the front flange and the linear-rotary shaft are also available in a stainless steel version. The optional 3-finger parallel gripper is based on a double-acting pneumatic cylinder and enables controlled opening and closing of the gripper fingers whilst allowing continuous rotational movement. The PR02 also impresses with its reduced installation length and hygienic design featuring surfaces that are easy to clean.

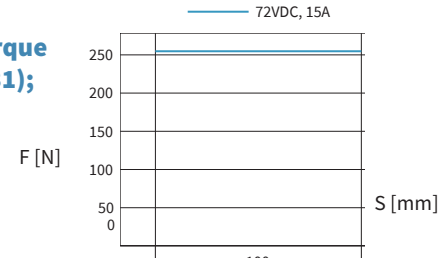


The performance specifications of the PR02-52 correspond to those of the tried-and-tested PR01-52x60-R/37x120F-HP-C-100, which offers a maximum stroke of 100 mm. The linear and rotary motors achieve a maximum force of 255 N and a maximum torque of 2.2 Nm.

PR02-52x60(-SSC)-R_37x120F-HP-R-100(-Lxx)_MSxx_TSxx_FSxx

Optional:
Stainless Steel Front/Shaft (-SSC); Hollow Shaft (-L); MagSpring (_MSxx); Torque Measuring Shaft (_TSxx); Force Sensor (_FSxx); 3-finger parallel gripper (_L31); Angled motor connector (_R01)

Max. Stroke:	100 mm
Peak Force:	255 N
Peak Torque:	2.2 Nm



Dimensions in mm

Motor Specifications			
Linear Motion			
Max. Stroke	mm (in)	100	(3.94)
Peak Forc E12x0 - UC	N (lbf)	255	(57.3)
Constant Force @25°C [1]	N (lbf)	75	(16.9)
Force Constant @25°C	N/A_{pk} (lbf/A_{pk})	17	(3.8)
Max. Current @ 72VDC	A_{pk}	15	
Max. Velocity @ 72VDC	m/s (in/s)	3.9	(154)
Position Repeatability	mm (in)	±0.05	(±0.0020)
Linearity	%	±0.10	
Rotary Motion			
Peak Torque (± 10%)	Nm (lbfin)	2.2	(19.5)
Constant Torque (Halt) @25°C [1]	Nm (lbfin)	0.55	(4.9)
Max. Number of revolutions	rpm	1500	
Torque Constant 1	Nm/A_{rpk} ($lbfin/A_{rpk}$)	0.16	(1.42)
Torque Constant 2	Nm/A_{rms} ($lbfin/A_{rms}$)	0.23	(2.04)
Max. Current @ 72VDC	A_{pk} / A_{rms}	13.5 / 9.55	
Position Repeatability	°	±0.1	

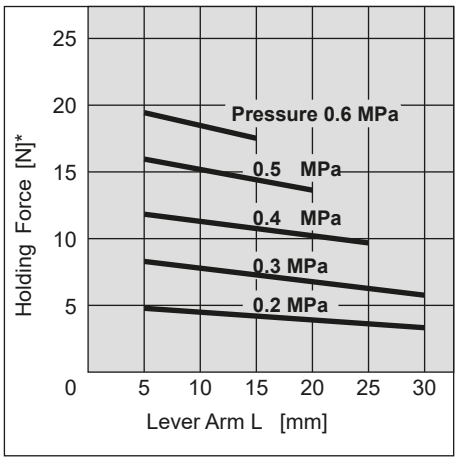
Mechanical Data									
Options		Standard/ Without	MSxx Load compensation		LXX: Linear rotary shaft		TSxx: Torque sensor	FSxx: Force sensor	
			MS01/MS51	MS04/MS54	L01 (HIlow shaft)	L31 (3-Finger Parallel gripper)	TS01	FS01	FS02
Width	mm (in)	50 (1.96)							
Height	mm (in)	135 (5.31)							
Length (without connector)	mm (in)	426 (16.77)				488 (19.21)	426 (16.77)	441 (17.36)	
Total weight Modul	g (lb)	5680 (12.5)	6570 (14.5)		5680 (12.5)	6260 (13.8)	5680 (12.5)		
Weight moving mass	g (lb)	1010 (2.2)	1200 (2.6)		1010 (2.2)	1390 (3.1)	1010 (2.2)		
Moment of inertia	kg*cm^2	0.26				0.82	0.26		
Weight Compensation MagSpring [2]	N		30 / -30	60 / -60					
Weight Compensation MagSpring [2]	lbf		6.74 / -6.74	13.5 / -13.5					
Ayle Diameter	mm (in)	12h9 (0.47)							
Through bore-hole		Option-L: Hole diameter 2.5 mm Connection (front) M5; (back) Connector M5*							
Protection Class		IP64 S							

* FlowRate @0.5 MPa = 75±5 l/min
1) Value depends on 2nd motor (see LinMot Designer)
2) Effective load compensation dependent on module-specific friction and moving net mass & load mass.

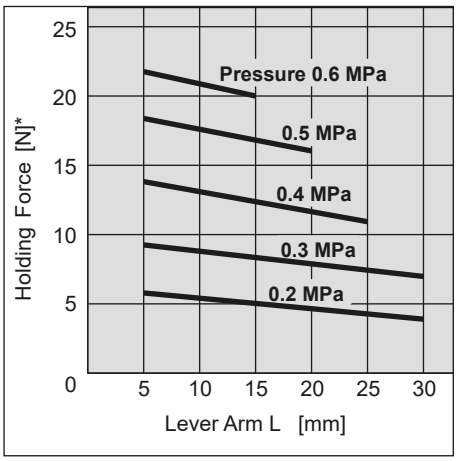
Sensors				
			Torque Sensor (Optional)	Force Sensor (Optional)
Supply Voltage	VDC		24	24
Measuring Range	Nm (lbfin)	N (lbf)	±2.5 (±21.9)	FS01 = ±100 (±22.5) / FS02 = ±250 (±56.2)
Boundary Frequency -3dB	kHz		1	1
Output Signal	VDC		±10	±10
Current Consumption	mA		<160	<160
Zero Offset	mV		<±100	<±100
Mechanical Overload	%		200	300
Resolution (C1200)	Bit		12	12
Linearity	Nm	N (lbf)	±0.025 (±0.22)	FS01 = ±1 (±0.22) / FS02 = ±2.5 (±0.56)

Technical data 3-finger parallel gripper		
Medium		Pressured air
Operating pressure	MPa	0.2 - 0.6
Ambient and media temperature	°C	-10 - 60 (not freezing)
Repeatability	mm (in)	1- 0.01
Max. operating frequency	cycles per minute	120
Lubrication		Not needed
Technology		Double-acting pneumatic cylinder
Effective holding force at a pressure of 0.5 MPa (@ 20 mm finger length)	N	Outside gripping / Inside gripping 14 / 16
Opening/closing width	mm (in ø)	10 (0.39)

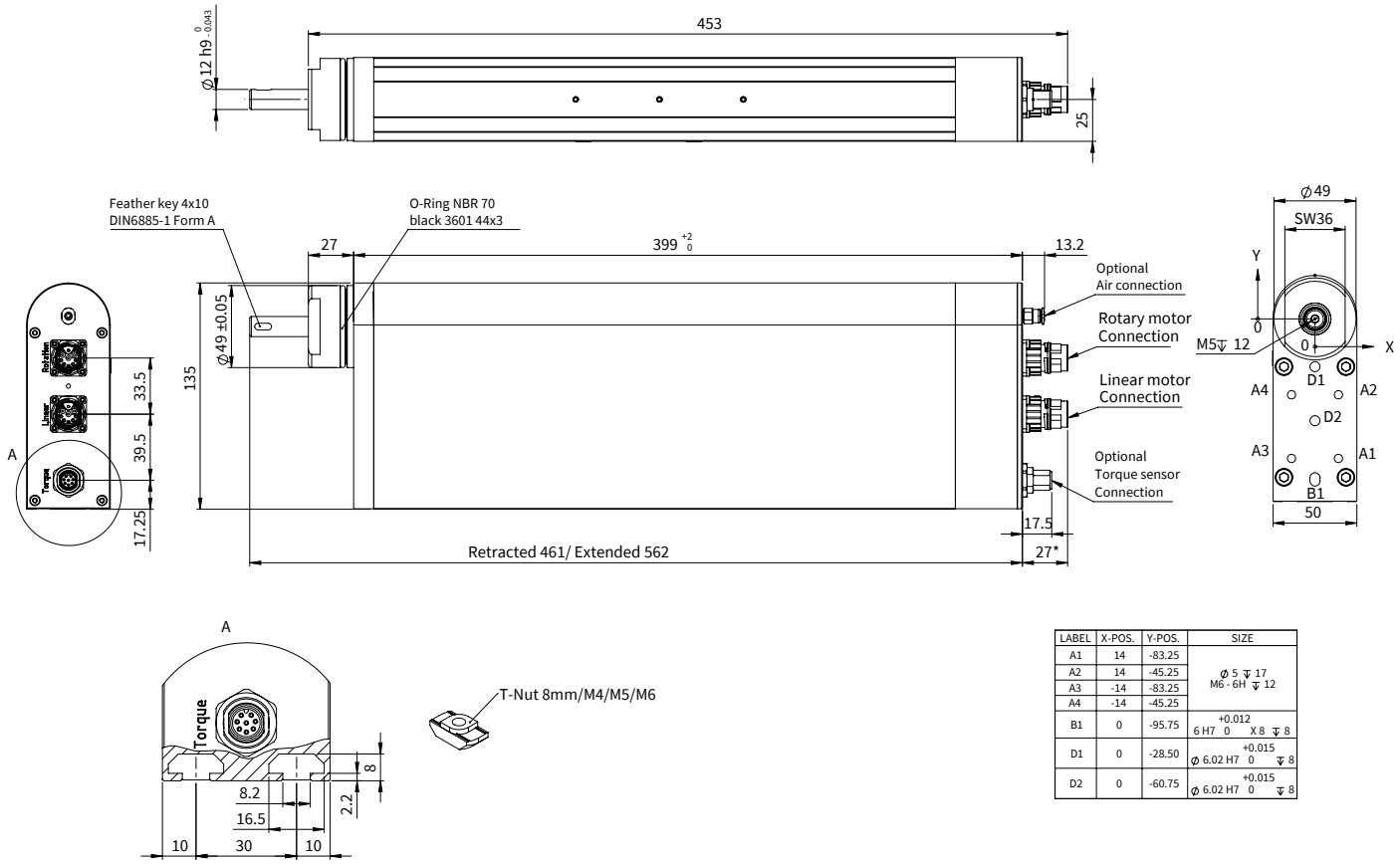
External grip



Internal grip



DIMENSIONS PR02-52X60(-SSC)-R_37X120F-HP-R-100(-L)_MSXX_TSXX

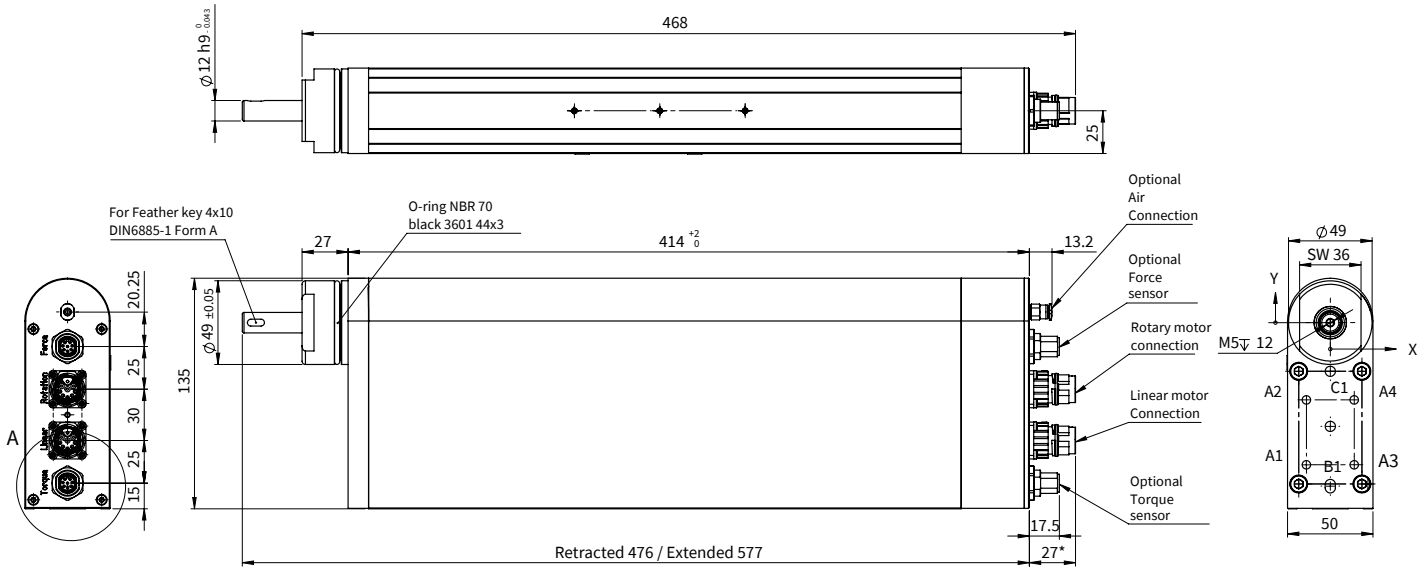


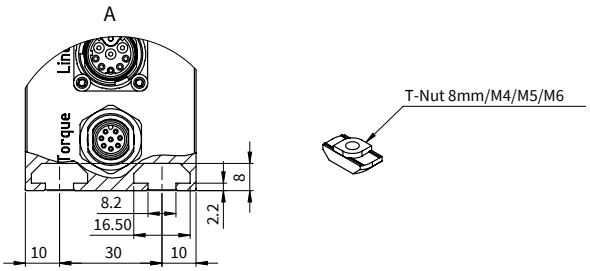
LABEL	X-POS.	Y-POS.	SIZE
A1	14	-83.25	Ø 5 ↧ 17 M6 - 6H ↧ 12
A2	14	-45.25	
A3	-14	-83.25	
A4	-14	-45.25	
B1	0	-95.75	+0.012 6 H7 0 X 8 ↧ 8
D1	0	-28.50	+0.015 Ø 6.02 H7 0 ↧ 8
D2	0	-60.75	+0.015 Ø 6.02 H7 0 ↧ 8

*) Dimension extends with option R01 (angled connector) by +10mm

Dimensions in mm

DIMENSIONS PR02-52X60(-SSC)-R_37X120F-HP-R-100(-L)_MSXX_TSXX_FSXX



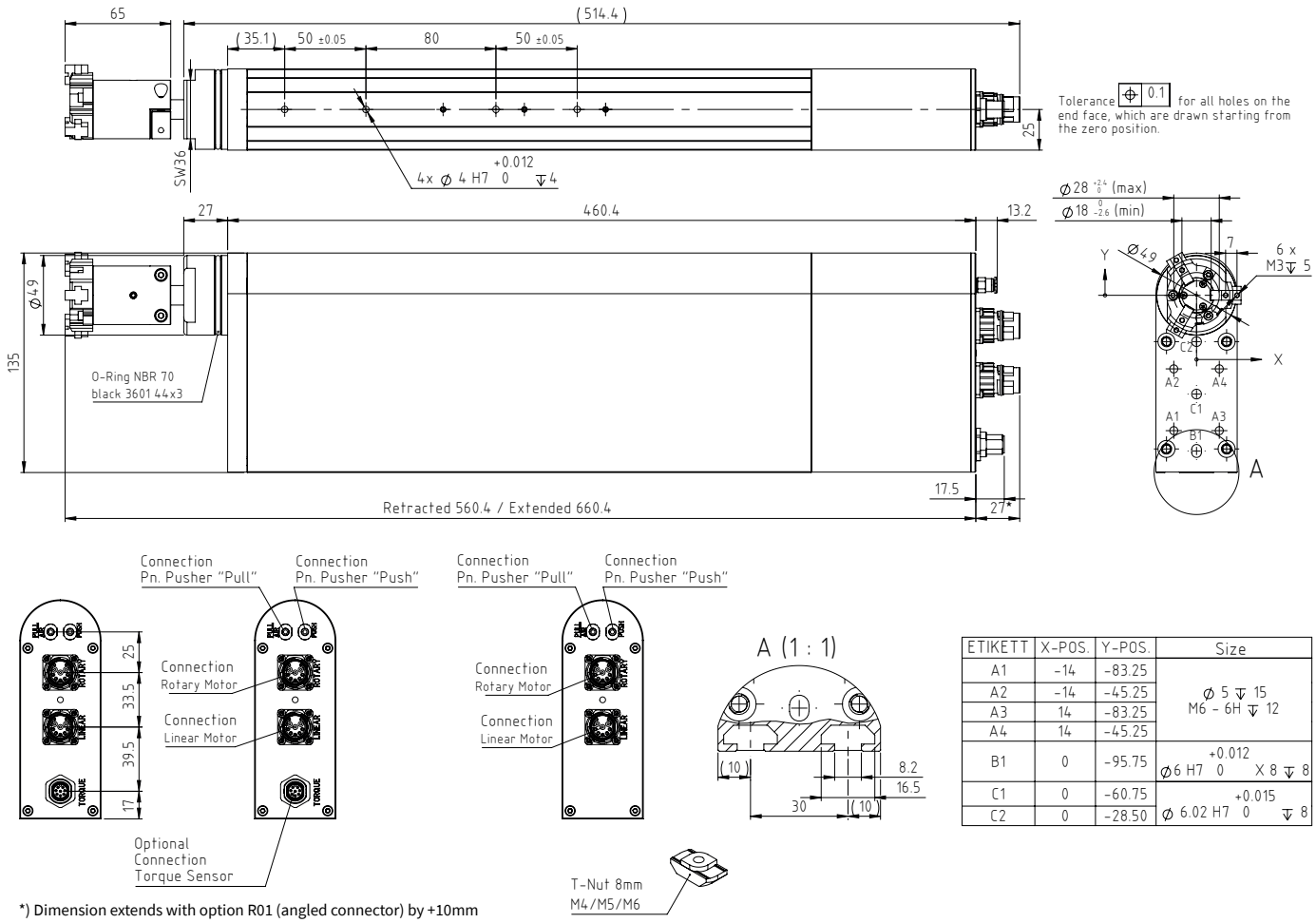


ETIKETT	X-POS.	Y-POS.	Size
A1	-14	-83.25	Ø 5 ↧ 17 M6 - 6H ↧ 12
A2	-14	-45.25	
A3	14	-83.25	
A4	14	-45.25	
B1	0	-95.75	+0.012 6 H7 0 X 8 ↧ 8
C1	0	-28.50	+0.015 Ø 6.020 H7 0 ↧ 8

*) Dimension extends with option R01 (angled connector) by +10mm

Dimensions in mm

DIMENSIONS PR02-52X60(-SSC)-R_37X120F-HP-R-100-L31_MSXX_TSXX_FSXX



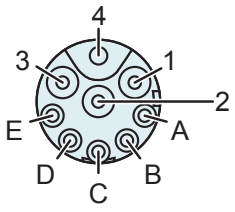
ETIKETT	X-POS.	Y-POS.	Size
A1	-14	-83.25	⌀ 5 ↧ 15 M6 - 6H ↧ 12
A2	-14	-45.25	
A3	14	-83.25	
A4	14	-45.25	
B1	0	-95.75	+0.012 ⌀6 H7 0 X 8 ↧ 8
C1	0	-60.75	+0.015 ⌀ 6.02 H7 0 ↧ 8
C2	0	-28.50	

*) Dimension extends with option R01 (angled connector) by +10mm

CONNECTORS

Motor Connector Wiring	Linear Unit: R-Connector	Rotary Unit: R-Connector	Wire Color Motor Cable
Ph 1+ / Ph A	1	1	red
Ph 1- / Ph B	2	2	pink
Ph 2+ / Ph C	3	3	blue
Ph 2- / (-)	4	4 (not connected)	grey
+5VDC	A	A	white
GND	B	B	inner shield
Sin	C	C	yellow
Cos	D	D	green
Temp.	E	E	black
Shield	Housing	Housing	outer shield

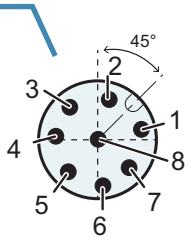
R-Connector



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)

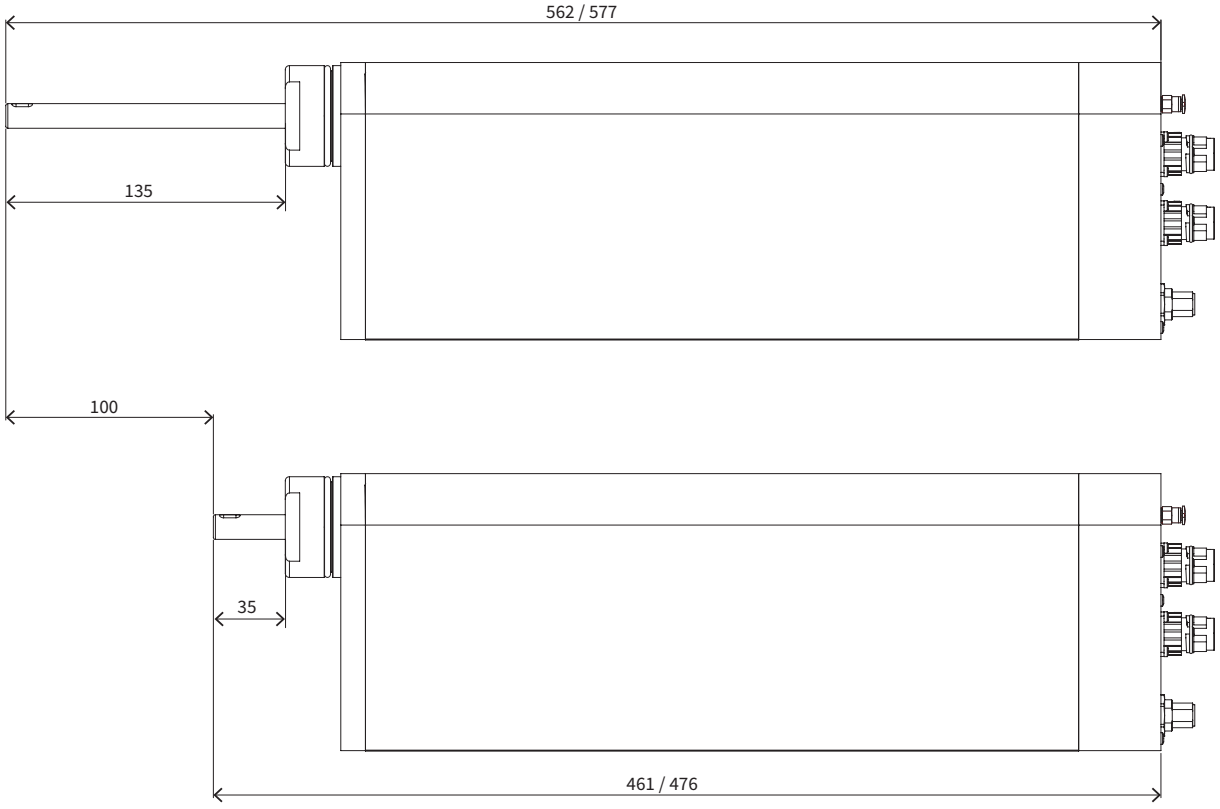


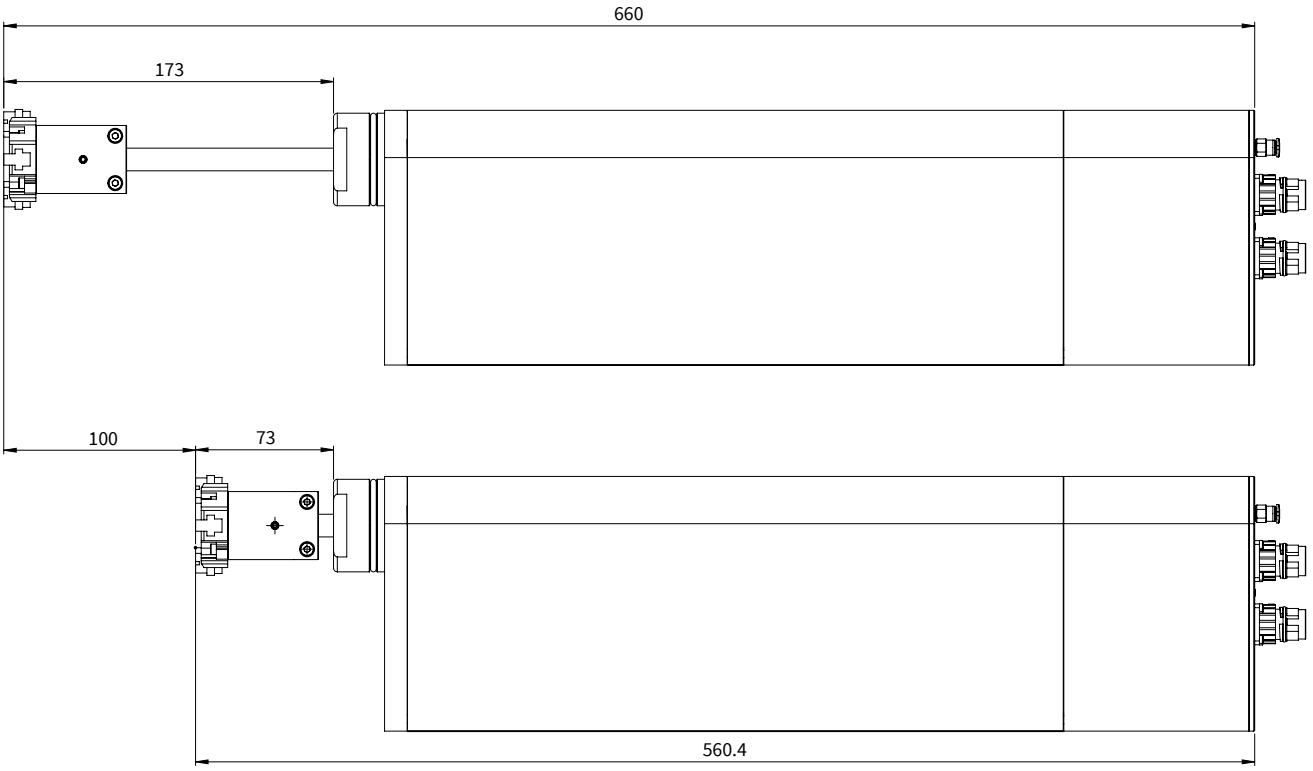
View:
Motor connector, plug on

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.

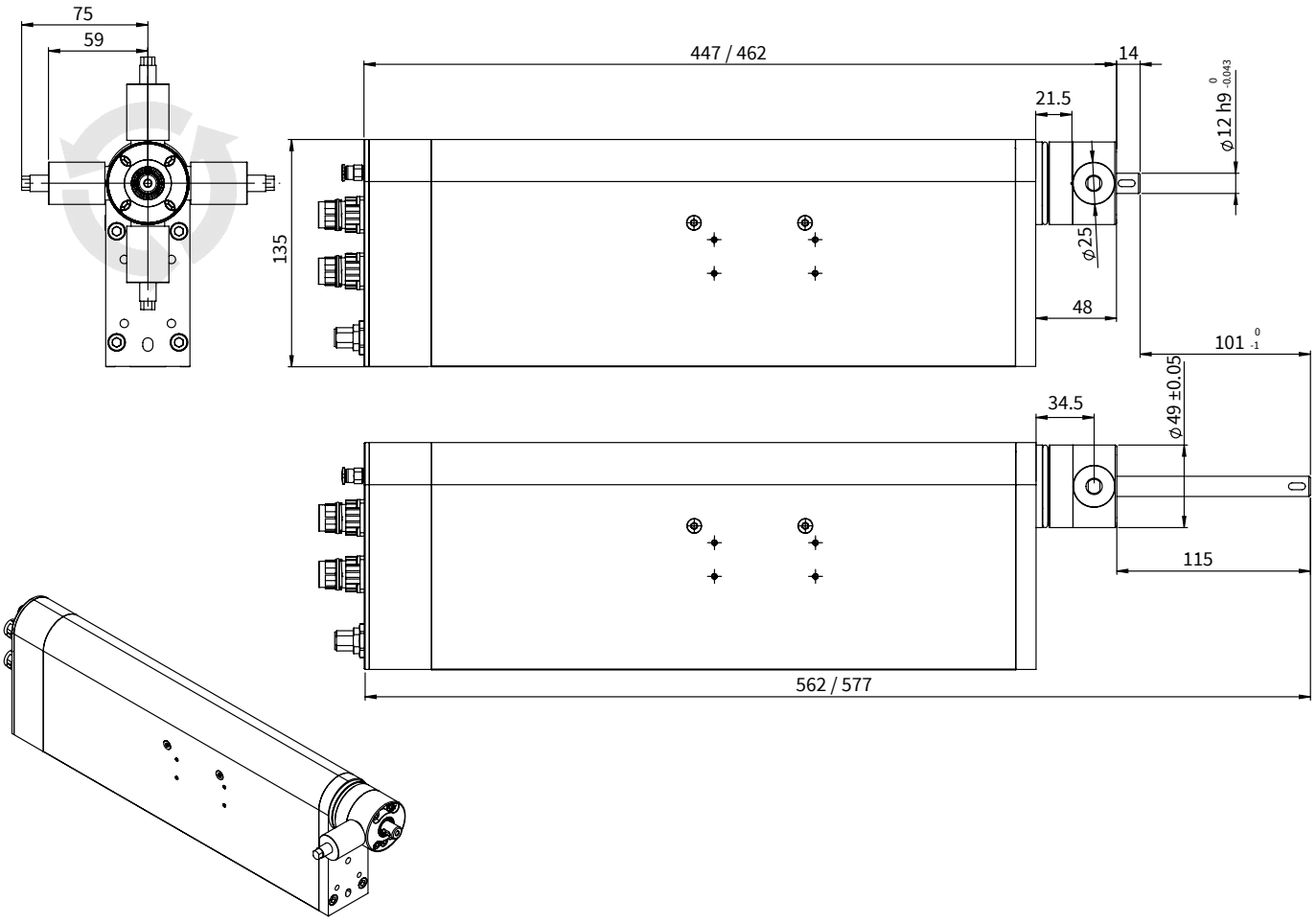
MAX. STROKE





DOC-NO. 0185-0033-E / VERSION 1V13
SUBJECT TO ALTERATIONS

DIMENSIONS OPTION HOLDING-BRAKE-KIT RS02-BK52



ORDERING INFORMATION

LINEAR ROTARY MOTORS PR02

Item	Description	Item-No.
PR02-52x60-R_37x120F-HP-R-100_MS00_TS00	Linear Rotary Motor	0150-2997
PR02-52x60-R_37x120F-HP-R-100_MS01_TS00	Linear Rotary Motor, MagSpring 30N	0150-3741
PR02-52x60-R_37x120F-HP-R-100_MS04_TS00	Linear Rotary Motor, MagSpring 60N	0150-2781
PR02-52x60-R_37x120F-HP-R-100-L_MS00_TS00	Linear Rotary Motor with hollow Shaft	0150-3725
PR02-52x60-R_37x120F-HP-R-100-L_MS01_TS00	Linear Rotary Motor with hollow Shaft, MagSpring 30N	0150-3742
PR02-52x60-R_37x120F-HP-R-100-L_MS04_TS00	Linear Rotary Motor with hollow Shaft, MagSpring 60N	0150-3758
PR02-52x60-R_37x120F-HP-R-100_MS51_TS00	Linear Rotary Motor, MagSpring -30N	0150-3967
PR02-52x60-R_37x120F-HP-R-100-L_MS51_TS00	Linear Rotary Motor with hollow Shaft, MagSpring -30N	0150-3968
PR02-52x60-R_37x120F-HP-R-100-L_MS54_TS00	Linear Rotary Motor with hollow Shaft, MagSpring -60N	0150-3971

LINEAR ROTARY MOTORS PR02 - WITH TORQUE MEASURING SHAFT (TS)

Item	Description	Item-No.
PR02-52x60-R_37x120F-HP-R-100_MS00_TS01	Linear Rotary Motor, TS 2.5Nm	0150-3726
PR02-52x60-R_37x120F-HP-R-100_MS01_TS01	Linear Rotary Motor, TS 2.5Nm, MagSpring 30N	0150-3743
PR02-52x60-R_37x120F-HP-R-100_MS04_TS01	Linear Rotary Motor, TS 2.5Nm, MagSpring 60N	0150-2884
PR02-52x60-R_37x120F-HP-R-100-L_MS00_TS01	Linear Rotary Motor with hollow Shaft, TS 2.5Nm	0150-3727
PR02-52x60-R_37x120F-HP-R-100-L_MS01_TS01	Linear Rotary Motor with hollow Shaft, TS 2.5Nm, MagSpring 30N	0150-3744
PR02-52x60-R_37x120F-HP-R-100-L_MS04_TS01	Linear Rotary Motor with hollow Shaft, TS 2.5Nm, MagSpring 60N	0150-2707
PR02-52x60-R_37x120F-HP-R-100_MS51_TS01	Linear Rotary Motor, MagSpring -30N, Torque Sensor	0150-3969
PR02-52x60-R_37x120F-HP-R-100-L_MS51_TS01	Linear Rotary Motor with hollow Shaft, MagSpring -30N, Torque Sensor	0150-3970
PR02-52x60-R_37x120F-HP-R-100-L_MS54_TS01	Linear Rotary Motor with hollow Shaft, MagSpring -60N, Torque Sensor	0150-3972
PR02-52x60-R_37x120F-HP-R-100_MS54_TS01	Linear Rotary Motor, MagSpring -60N, Torque Sensor	0150-3974

LINEAR ROTARY MOTORS PR02 - WITH STAINLESS STEEL FRONT (SSC)

Item	Description	Item-No.
PR02-52x60-SSC-R_37x120F-HP-R-100_MS00_TS00	Linear Rotary Motor Stainless Steel Front	0150-3745
PR02-52x60-SSC-R_37x120F-HP-R-100-L_MS00_TS00	Linear Rotary Motor Stainless Steel Front, Hollow Shaft	0150-3749
PR02-52x60-SSC-R_37x120F-HP-R-100-L_MS01_TS00	Linear Rotary Motor Stainless Steel Front, Hollow Shaft, MagSpring 30N	0150-4482
PR02-52x60-SSC-R_37x120F-HP-R-100-L_MS01_TS01	Linear Rotary Motor Stainless Steel Front, Hollow Shaft, MagSpring 30N, Torque Sensor	0150-3752
PR02-52x60-SSC-R_37x120F-HP-R-100-L_MS51_TS00	Linear Rotary Motor Stainless Steel Front, Hollow Shaft, MagSpring -30N	0150-4470
PR02-52x60-SSC-R_37x120F-HP-R-100_MS00_TS01	Linear Rotary Motor Stainless Steel Front, Torque Sensor	0150-3746
PR02-52x60-SSC-R_37x120F-HP-R-100_MS01_TS01	Linear Rotary Motor Stainless Steel Front, MagSpring 30N, Torque Sensor	0150-3748
PR02-52x60-SSC-R_37x120F-HP-R-100_MS01_TS00	Linear Rotary Motor Stainless Steel Front, MagSpring 30N	0150-3747
PR02-52x60-SSC-R_37x120F-HP-R-100-L_MS00_TS01	Linear Rotary Motor Stainless Steel Front, Hollow Shaft, Torque Sensor	0150-3750

LINEAR ROTARY MOTORS PR02 - WITH FORCE MEASURING SHAFT (FS)

Item	Description	Item-No.
PR02-52x60-R_37x120F-HP-R-100_MS00_TS00_FS02	Linear Rotary Motor, Force Sensor	0150-4043
PR02-52x60-R_37x120F-HP-R-100_MS01_TS00_FS01	Linear Rotary Motor, MagSpring 30N, FS 100N	0150-3792
PR02-52x60-R_37x120F-HP-R-100-L_MS51_TS00_FS01	Linear Rotary Motor with Hollow Shaft, MagSpring -30N, Force Sensor	0150-4467
PR02-52x60-R_37x120F-HP-R-100-L_MS00_TS00_FS01	Linear Rotary Motor with Hollow Shaft, Force Sensor	0150-4221
PR02-52x60-R_37x120F-HP-R-100-L_MS01_TS00_FS01	Linear Rotary Motor with Hollow Shaft, MagSpring 30N, Force Sensor	0150-4312
PR02-52x60-R_37x120F-HP-R-100-L_MS01_TS00_FS02	Linear Rotary Motor with Hollow Shaft, MagSpring 30N, Force Sensor	0150-4534
PR02-52x60-R_37x120F-HP-R-100-L_MS01_TS01_FS01	Linear Rotary Motor with Hollow Shaft, TS 2.5Nm, FS 100N, MagSpring 30N	0150-3852
PR02-52x60-R_37x120F-HP-R-100-L_MS01_TS01_FS02	Linear Rotary Motor with Hollow Shaft, TS 2.5Nm, FS 250N, MagSpring 30N	0150-3909
PR02-52x60-R_37x120F-HP-R-100-L_MS51_TS01_FS01	Linear Rotary Motor with Hollow Shaft, MagSpring -30N, Torque Sensor, Force Sensor	0150-4468
PR02-52x60-R_37x120F-HP-R-100-L_MS51_TS01_FS02	Linear Rotary Motor with Hollow Shaft, MagSpring -30N, Torque Sensor, Force Sensor	0150-4469

ORDERING INFORMATION

LINEAR ROTARY MOTORS PR02 - WITH 3-FINGER PARALLEL GRIPPER (L31)

Artikel	Beschreibung	Artikelnummer
PR02-52x60-R_37x120F-HP-R-100-L31_MS00_TS00	Linear Rotary Motor, 3-finger parallel gripper pn	0150-7215
PR02-52x60-R_37x120F-HP-R-100-L31_MS00_TS01	Linear Rotary Motor, 3-finger parallel gripper pn, Torque Sensor 2.5Nm	0150-7221
PR02-52x60-R_37x120F-HP-R-100-L31_MS01_TS00	Linear Rotary Motor, 3-finger parallel gripper pn, MagSpring 60N	0150-7024
PR02-52x60-R_37x120F-HP-R-100-L31_MS01_TS01	Linear Rotary Motor, 3-finger parallel gripper pn, MagSpring 30N,Torque Sensor	0150-7220

ACCESSORIES

Item	Description	Item-No.
K05-Y/R-2	Motor Cable Y/R, 2 m	0150-2421
K05-Y/R-4	Motor Cable Y/R, 4 m	0150-2422
K05-Y/R-6	Motor Cable Y/R, 6 m	0150-2423
K05-Y/R-8	Motor Cable Y/R, 8 m	0150-2424
K05-Y-FE/R-	Motor Cable KS05-Y-Fe/R, Custom length	0150-3501
KS05-Y/R-4	Trailing Chain Cable Y/R, 4 m	0150-2433
KS05-Y/R-6	Trailing Chain Cable Y/R, 6 m	0150-2434
KS05-Y/R-8	Trailing Chain Cable Y/R, 8 m	0150-2435
KS05-Y-Fe/R-	Trailing Chain Cable KS05-Y-Fe/R, Custom length	0150-3507
CAL01_PR02_ST02	Factory Calibration, PR02 Torque Sensor, Full Range, 1%	0120-5100
CAL01_PR02_ST02_AF01	Factory Calibration, PR02 Torque Sensor, As Found, Full Range, 1%	0120-5150
CAL01_PR02_ST01	Factory Calibration, PR02 Force Sensor, Full Range, 1%	0120-5000
CAL01_PR02_ST01_AF01	Factory Calibration, PR02 Force Sensor, As Found, Full Range, 1%	0120-5050
KSS014-06-X4/SM	Sensor cable for PR02	0150-4610
RS01-SS12x22	Shaft-hub clamping for 12mm shaft	0230-0101
Hammer Nut N8/M6	Hammer Nut N8 / M6	0150-2558
RS02-BK52	Holding brake kit for Linear Rotory Motor PR02-52	0150-2987

ALL LINEAR MOTION FROM A SINGLE SOURCE

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