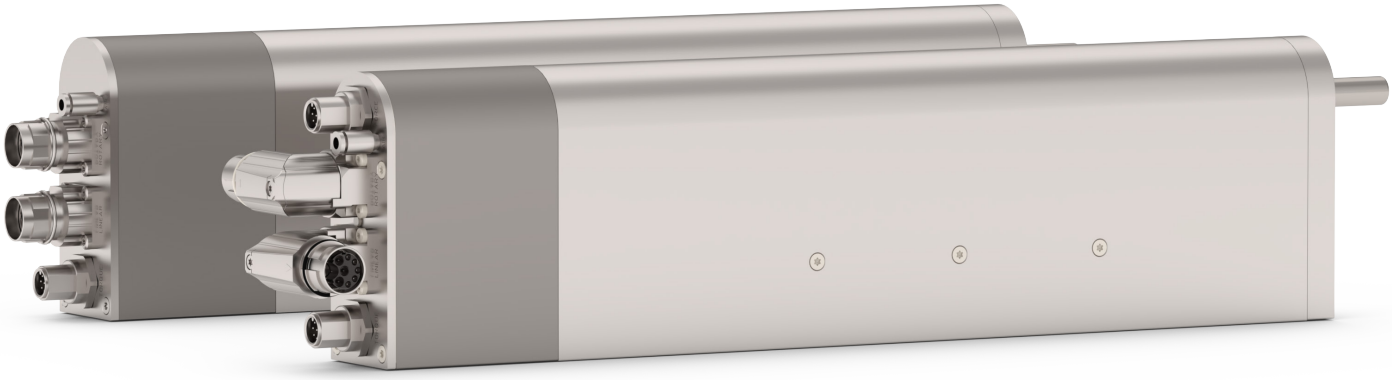
DATA SHEET
Linear Rotary Motors PR02-40

- Screwing, assembly, sealing, handling
- Independent linear and rotary movements
- Optional integrated MagSpring for load compensation (pushing or pulling)
- Optional integrated torque measurement shaft and force sensor for high-precision torque and force control and process data logging
- Optional hollow shaft for applications requiring air passage / vacuum

Product Description

LinMot expands its product range of linear motors by a further type. The new PR02-40 motor series is characterised by a new design in which the motors, including additional components, are integrated in a slim housing. In addition to the linear motor and the torque motor, further options such as an air passage, a magnetic spring "MagSpring", a torque sensor or force sensor can be installed. With the aid of the air feed through the hollow slider, pneumatic grippers can be actuated or vacuum applications can be easily implemented, among other things.

The MagSpring ensures that the weight force of the moving load is passively compensated and also prevents the axle from lowering in the de-energized state. The torque sensor and the force sensor enable precise, reproducible and recordable capping processes, as required in the pharmaceutical industry, for example. With the new design, the user benefits from the shorter installation length of the entire unit and the hygienic design with easy-to-clean surfaces.

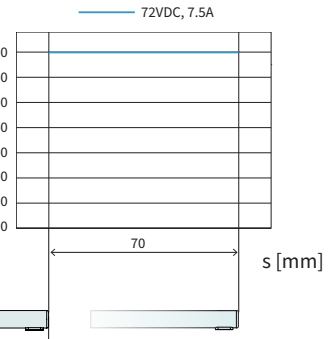


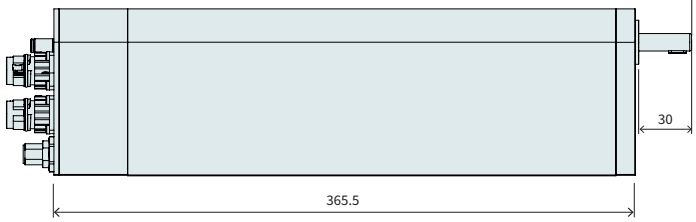
DOC-NR. 0185-0218-E / VERSION 1V1
SUBJECT TO ALTERATIONS

PR02-40x51-R_23x80F-HP-R-70(-L)_MSxx_TSxx_FSxx_PS1x(-R01)

Optional:
Hollow shaft (-L); MagSpring (_MSxx); Torque measuring shaft (_TSxx); Force sensor (_FSxx); Angled motor connector (-R01)

Max. Stroke:	70 mm
Max. Force:	67 N
Max. Torque:	1.2 Nm



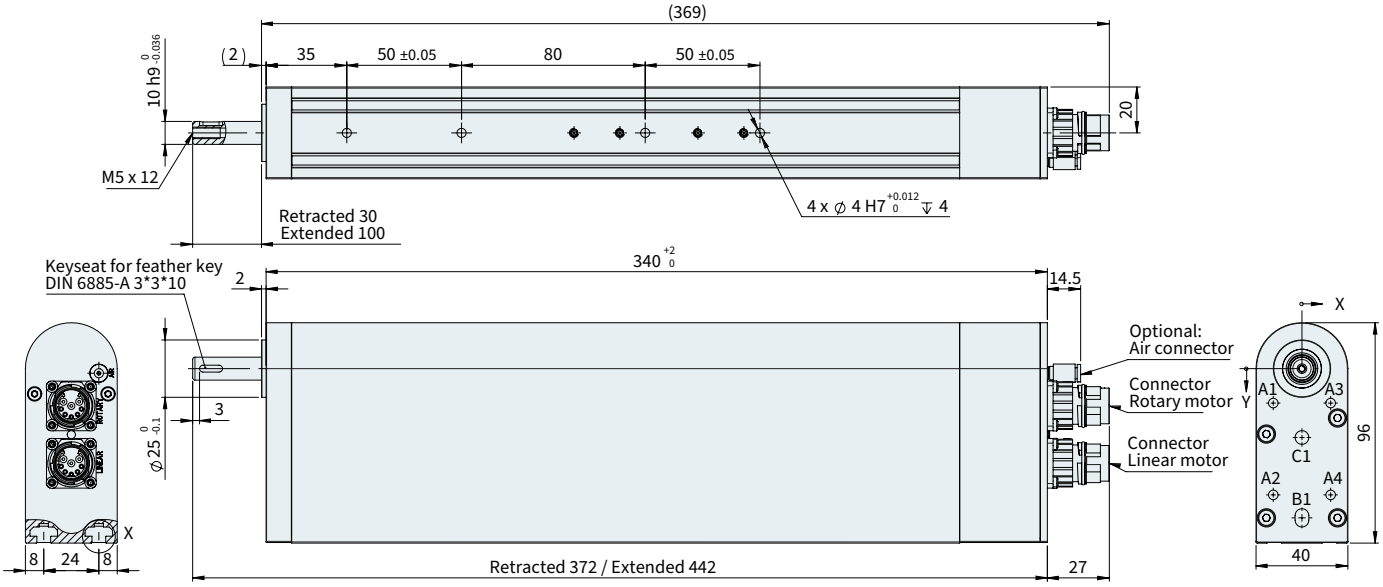


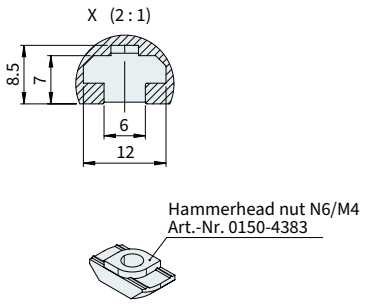
Dimensions in mm

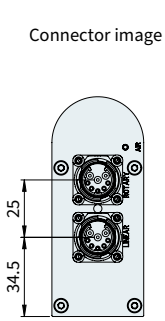
Motor Data			
Linear Motion			
Max. Stroke	mm (in)	70	(2.76)
Peak Force E12x0 - UC (± 10%)	N (lbf)	67.1	(15.1)
Constant Force @25°C [1]	N (lbf)	24.4	(5.50)
Force Constant	N/A_{pk} (lbf/A_{pk})	8.95	(2.01)
Max. Current @ 72VDC	A_{pk}	7.5	
Max. Velocity @ 72VDC	m/s (in/s)	7.3	(289.9)
Position Repeatability	mm (in)	±0.05	(±0.0020)
Linearity	%	±0.10	
Rotary Motion			
Peak Torque (± 10%)	Nm (lbfin)	1.2	(10.6)
Constant Torque (Halt) @25°C [1]	Nm (lbfin)	0.25	(2.25)
Max. Number of revolutions	rpm	1500	
Torque Constant 1	Nm/A_{rpk} ($lbfin/A_{rpk}$)	0.07	(0.62)
Torque Constant 2	Nm/A_{rms} ($lbfin/A_{rms}$)	0.1	(0.89)
Max. Current @ 72VDC	A_{pk} / A_{rms}	17 / 12	
Position Repeatability	°	±0.1	
Mechanical Data			
Width / Height	mm (in)	40 / 96	(1.57) / (3.78)
Length (without Connector)	mm (in)	342 / 367	(13.47 / 14.45)
Mass [without MagSpring / with MagSpring]	g (lb)	2430 / 2630	(5.36 / 5.80)
Linear moving mass [without MagSpring]	g (lb)	425	(0.94)
Linear moving mass [with MagSpring MS11 / MS12 / MS13]	g (lb)	517	(1.14)
Rotary Torque of Inertia	$kgcm^2$ (lbf^2)	0.038	(0.000091)
Weight Compensation Pull [Option MS11 / MS12 / MS13] [2]	N (lbf)	11 / 17 / 22	(2.48 / 3.83 / 4.95)
Weight Compensation Push [Option MS61 / MS62 / MS63] [2]	N (lbf)	-11 / -17 / -22	(-2.48 / -3.83 / -4.95)
Axle Diameter	mm (in)	10h9	(0.39)
Through bore-hole [3]		Option-L: Hole diameter 2.5 mm Connection (front) M5; (back) Connector M3	
Concentricity	mm (in)	<±0.05	(<±0.002)
Protection Class		IP64 S	
		Torque Sensor (Optional)	**Force Sensor (Optional)**
Supply Voltage	VDC	24	24
Measuring Range	Nm (lbfin) / N (lbf)	±1.2 (±10.62)	±50 (±11.24)
Boundary Frequency -3dB	kHz	1	1
Output Signal	VDC	±10	±10
Current Consumption	mA	<160	<160
Zero Offset	mV	<±100	<±200
Mechanical Overload	%	200	300
Resolution (C1200)	Bit	12	12
Linearity	Nm (lbfin) / N (lbf)	±0.012 (±0.1062)	±1 (±0.2248)

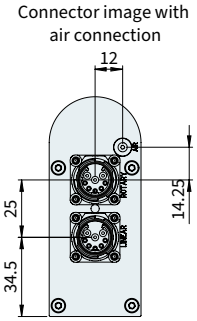
1) Value depends on 2nd motor (see LinMot Designer)
2) Effective load compensation dependent on module-specific friction and moving net mass & load mass.
3) Flow Rate @ 0.5 MPa = 35 ± 5 l/min

PR02-40x51-R_23x80F-HP-R-70(-L)_MSxx_TS00_PS1x (Straight connector without sensors)









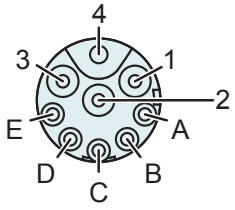
Tolerance ⌖ 0.1 for all bores on the front surface, drawn from the zero point.

	X-POS.	Y-POS.	
A1	-12.50	15	⌀ 4.2 ↧ 9.5 M5 - 6H ↧ 8
A2	-12.50	55	
A3	12.50	15	
A4	12.50	55	
B1	0	65	+0.012 6 H7 0 X 8 ↧ 8
C1	0	30	+0.012 ⌀ 6 H7 0 ↧ 8

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

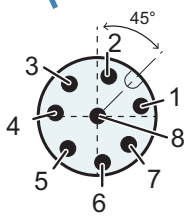
R-Connector



View: Motor connector, plug on

Connector Wiring	Torque Sensor M12 Connector	Wire Color Motor Cable
Supply GND	1	white
Supply 24V (approx. 80 mA @ 24VDC)	2	brown
Do not connect	3	green
Torque -	4	yellow
Torque +	5	grey
Do not connect	6	pink
Do not connect	7	blue
Do not connect	8	red

M12-Connector (A-coded)

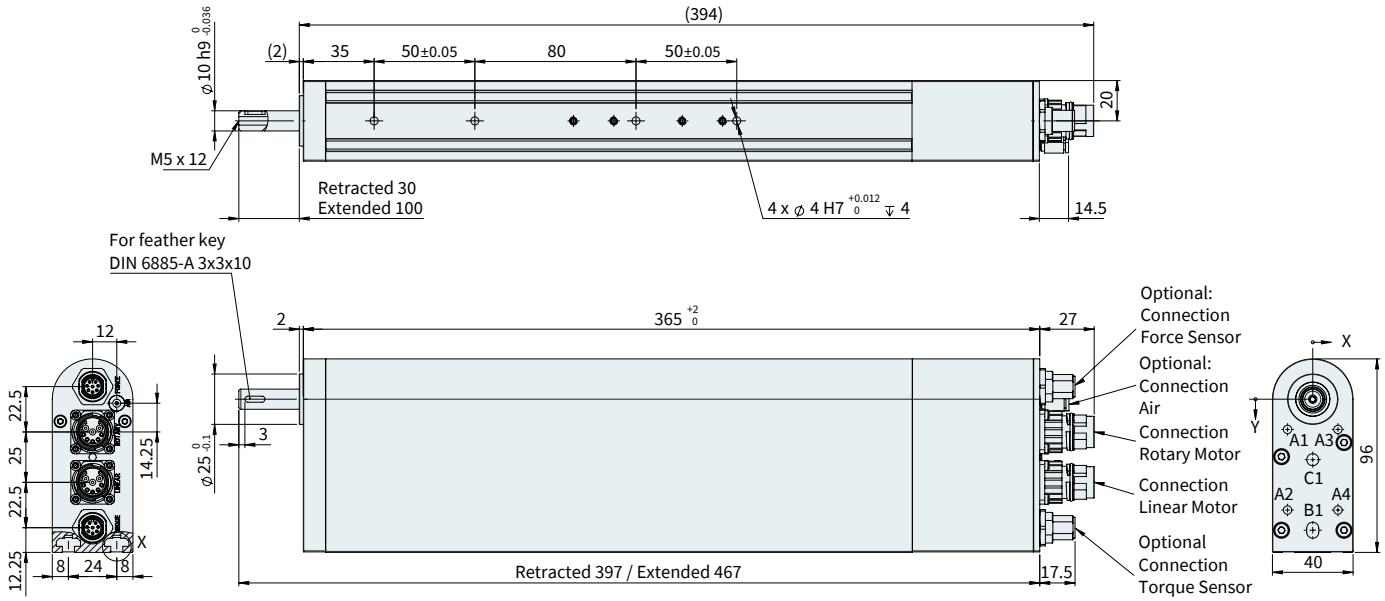


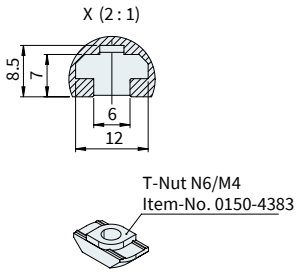
View: Motor connector, plug on

PIN 4 (torque -) and PIN 1 (ground supply) are internally galvanically isolated, bridging at the power source (not at the transducer) if required.

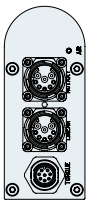
External EMC circuitry
A ceramic capacitor 100nF / 50V can be soldered between pins 4 - 5 on the evaluation to avoid wire-bound interference.

PR02-40x51-R_23x80F-HP-R-70(-L)_MSxx_TSxx_FSxx_PS1x (Straight connector with sensors)

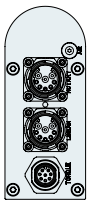




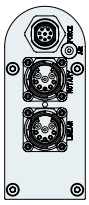
Connector image with torque sensor



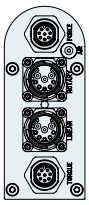
Connector image with torque sensor and air connection



Connector image with force sensor and air connection



Connector image with torque sensor, force sensor and air connection



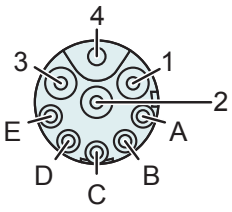
Tolerance ⌖ 0.1 for all holes on the face, which are drawn starting from the zero position.

	X-POS.	Y-POS.	SIZE
A1	-12.50	15	⌀ 4.2 ↧ 9.5 M5 - 6H ↧ 8
A2	-12.50	55	
A3	12.50	15	
A4	12.50	55	
B1	0	65	+0.012 6 H7 0 X 8 ↧ 8
C1	0	30	+0.012 ⌀ 6 H7 0 ↧ 8

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

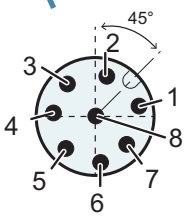
R-Connector



View: Motor connector, plug on

Connector Wiring	Torque Sensor M12 Connector	Wire Color Motor Cable
Supply GND	1	white
Supply 24V (approx. 80 mA @ 24VDC)	2	brown
Do not connect	3	green
Torque -	4	yellow
Torque +	5	grey
Do not connect	6	pink
Do not connect	7	blue
Do not connect	8	red

M12-Connector (A-coded)

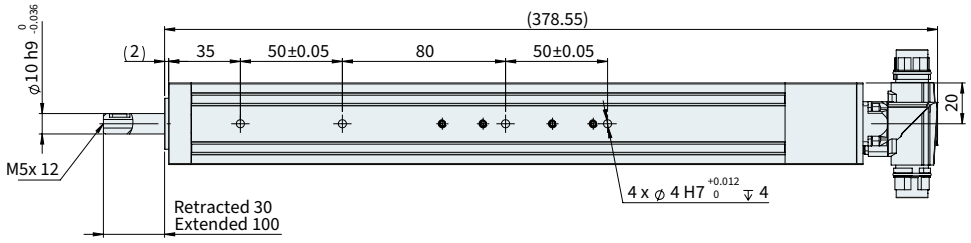


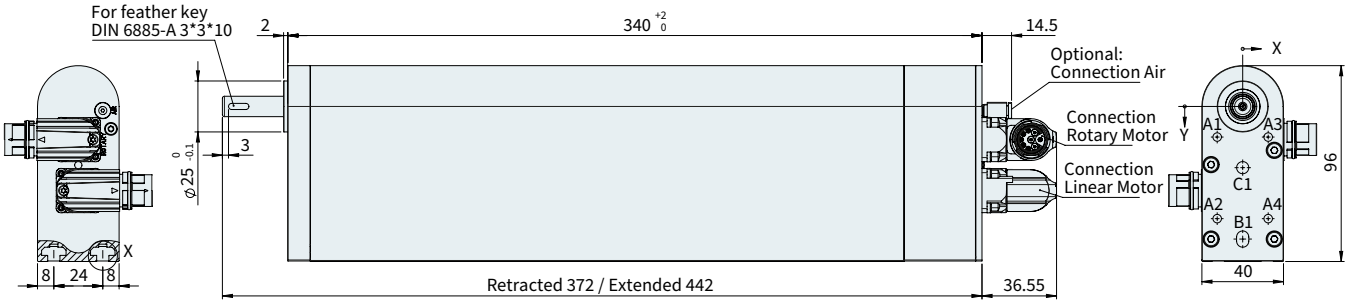
View: Motor connector, plug on

PIN 4 (torque -) and PIN 1 (ground supply) are internally galvanically isolated, bridging at the power source (not at the transducer) if required.

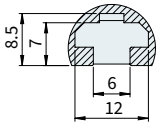
External EMC circuitry
A ceramic capacitor 100nF / 50V can be soldered between pins 4 - 5 on the evaluation to avoid wire-bound interference.

PR02-40X51-R_23X80F-HP-R-70-L_MS12_TS00-R01 (R01 angled connector without sensors)



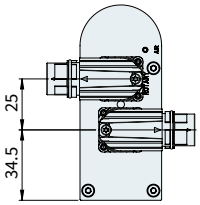


X (2 : 1)

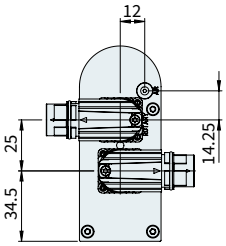


T-Nut N6/M4
Item-No. 0150-4383

Connector image



Connector image with air connection



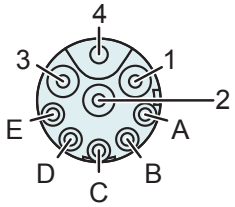
Tolerance ⌖ 0.1 for all holes on the face, which are drawn starting from the zero position.

	X-POS.	Y-POS.	
A1	-12.50	15	ø 4.2 ↧ 9.5 M5 - 6H ↧ 8
A2	-12.50	55	
A3	12.50	15	
A4	12.50	55	
B1	0	65	+0.012 6 H7 0 X 8 ↧ 8
C1	0	30	+0.012 ø 6 H7 0 ↧ 8

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

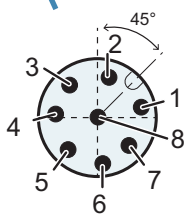
R-Connector



View: Motor connector, plug on

Connector Wiring	Torque Sensor M12 Connector	Wire Color Motor Cable
Supply GND	1	white
Supply 24V (approx. 80 mA @ 24VDC)	2	brown
Do not connect	3	green
Torque -	4	yellow
Torque +	5	grey
Do not connect	6	pink
Do not connect	7	blue
Do not connect	8	red

M12-Connector (A-coded)

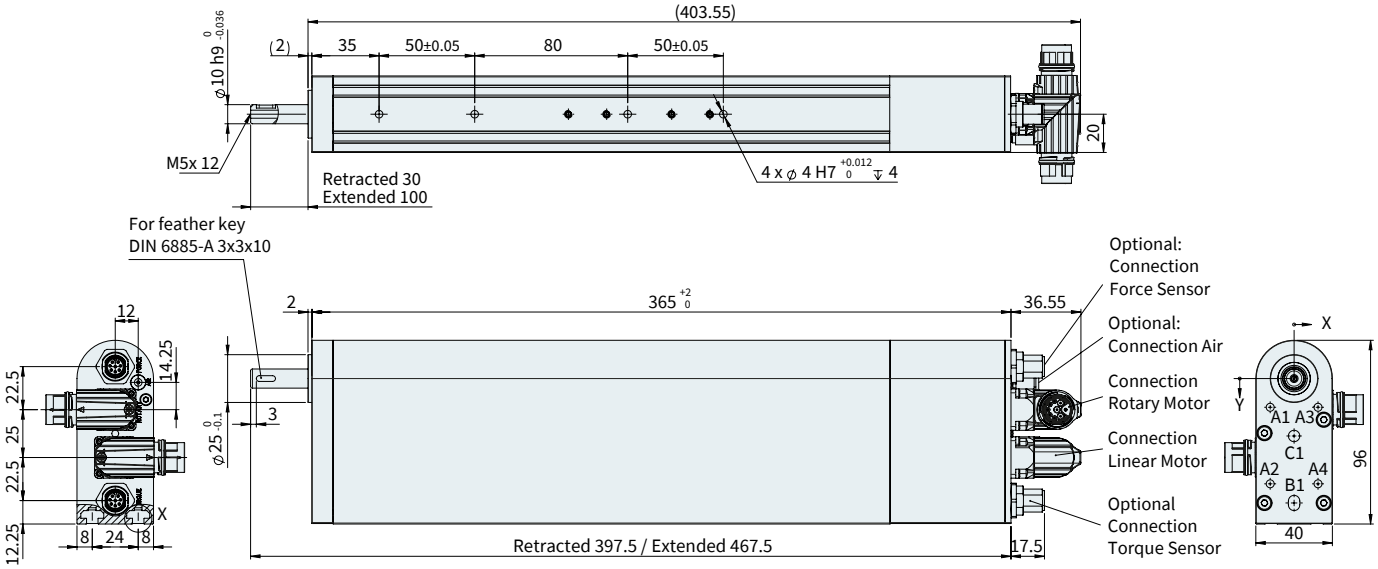


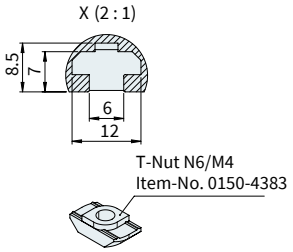
View: Motor connector, plug on

PIN 4 (torque -) and PIN 1 (ground supply) are internally galvanically isolated, bridging at the power source (not at the transducer) if required.

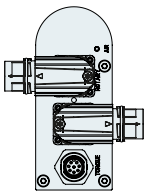
External EMC circuitry
A ceramic capacitor 100nF / 50V can be soldered between pins 4 - 5 on the evaluation to avoid wire-bound interference.

PR02-40x51-R_23x80F-HP-R-70(-L)_MSxx_TSxx_FSxx_PS1x-R01 (R01 angled connector with sensors)

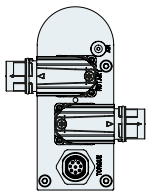




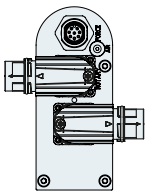
Connector image with torque sensor



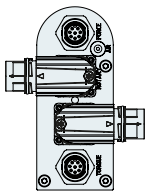
Connector image with torque sensor and air connection



Connector image with force sensor and air connection



Connector image with torque sensor, force sensor and air connection



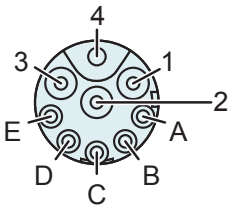
Tolerance ⌖ 0.1 for all holes on the face, which are drawn starting from the zero position.

	X-POS.	Y-POS.	SIZE
A1	-12.50	15	ø 4.2 ↧ 9.5 M5 - 6H ↧ 8
A2	-12.50	55	
A3	12.50	15	
A4	12.50	55	
B1	0	65	+0.012 6 H7 0 X 8 ↧ 8
C1	0	30	+0.012 ø 6 H7 0 ↧ 8

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

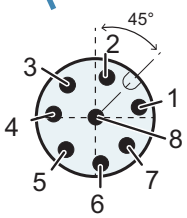
R-Connector



View: Motor connector, plug on

Connector Wiring	Torque Sensor M12 Connector	Wire Color Motor Cable
Supply GND	1	white
Supply 24V (approx. 80 mA @ 24VDC)	2	brown
Do not connect	3	green
Torque -	4	yellow
Torque +	5	grey
Do not connect	6	pink
Do not connect	7	blue
Do not connect	8	red

M12-Connector (A-coded)

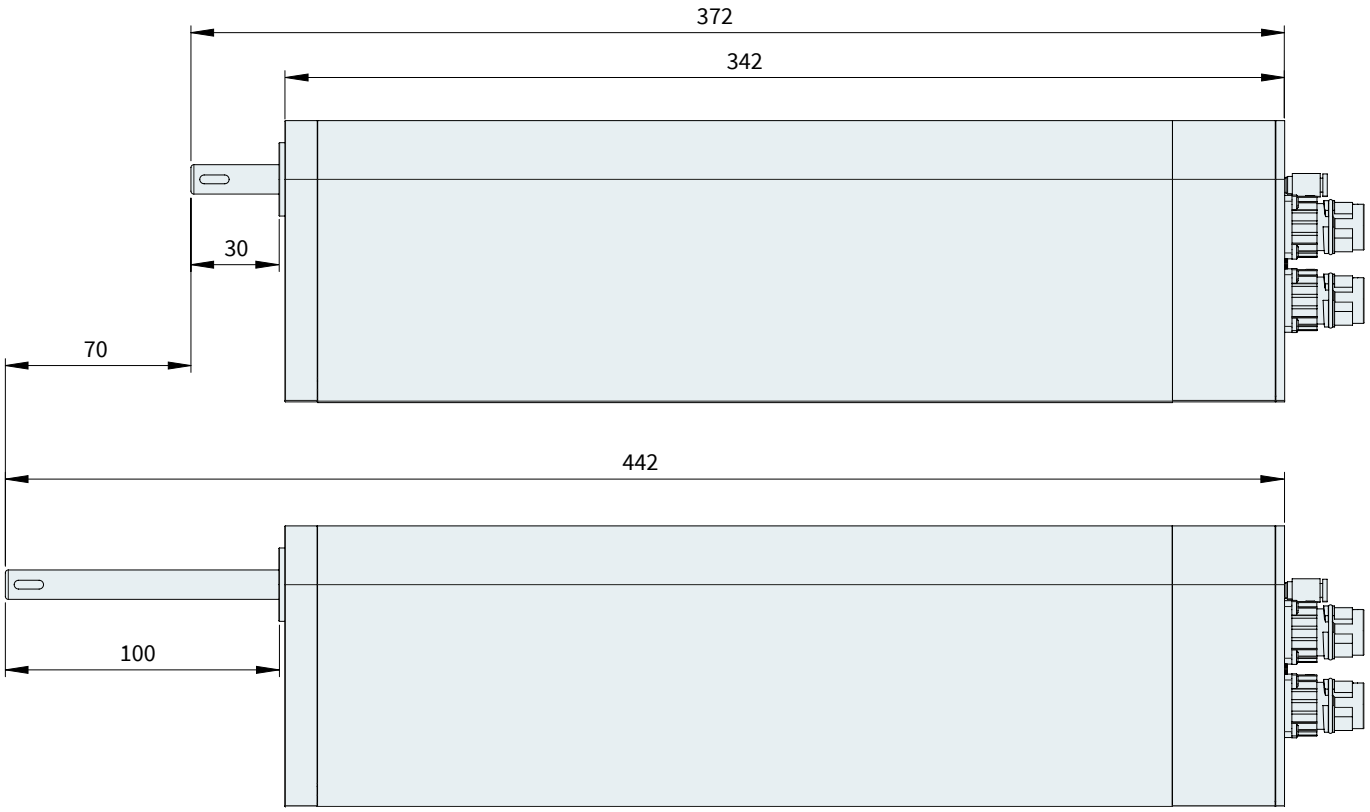


View: Motor connector, plug on

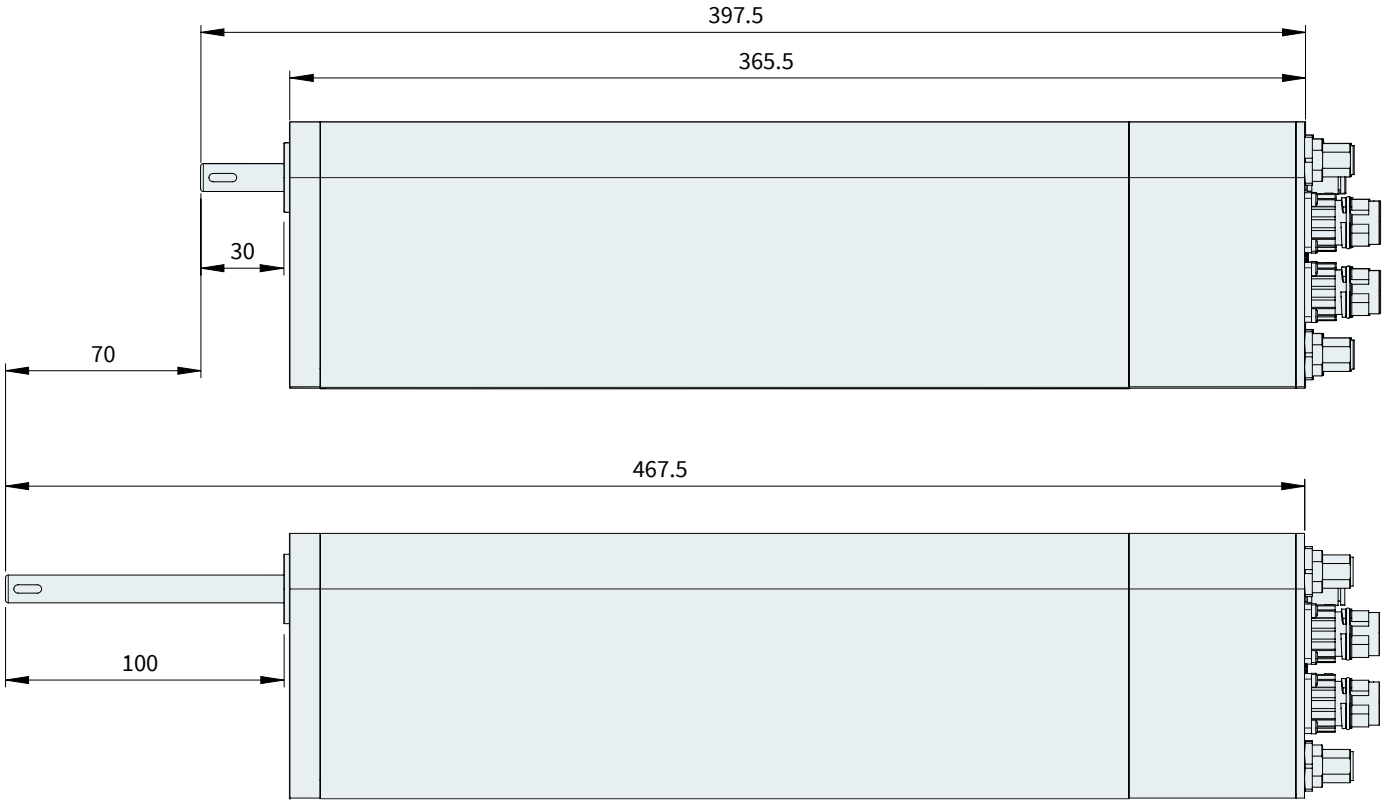
PIN 4 (torque -) and PIN 1 (ground supply) are internally galvanically isolated, bridging at the power source (not at the transducer) if required.

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 (PR02-40 WITHOUT SENSORS)



MAX. STROKE (PR02-40 WITH SENSORS)



DOC-NR. 0185-0218-E / VERSION 1V1
SUBJECT TO ALTERATIONS

ORDERING INFORMATION

LINEAR ROTARY MOTORS PR02-40 (STRAIGHT CONNECTOR)

Item	Description	Item-No.
PR02-40x51-R_23x80F-HP-R-70_MS00_TS00	Linear Rotary Motor	0150-7032
PR02-40x51-R_23x80F-HP-R-70-L_MS00_TS00	Linear Rotary Motor, Hollow Shaft	0150-7033
PR02-40x51-R_23x80F-HP-R-70_MS11_TS00	Linear Rotary Motor, MagSpring 11N	0150-7034
PR02-40x51-R_23x80F-HP-R-70_MS12_TS00	Linear Rotary Motor, MagSpring 17N	0150-7027
PR02-40x51-R_23x80F-HP-R-70_MS13_TS00	Linear Rotary Motor, MagSpring 22N	0150-7035
PR02-40x51-R_23x80F-HP-R-70-L_MS11_TS00	Linear Rotary Motor, Hollow Shaft, MagSpring 11N	0150-7036
PR02-40x51-R_23x80F-HP-R-70-L_MS12_TS00	Linear Rotary Motor, Hollow Shaft, MagSpring 17N	0150-7020
PR02-40x51-R_23x80F-HP-R-70-L_MS13_TS00	Linear Rotary Motor, Hollow Shaft, MagSpring 22N	0150-7037
PR02-40x51-R_23x80F-HP-R-70_MS00_TS03_PS10	Linear Rotary Motor, Torque Sensor	0150-6476
PR02-40x51-R_23x80F-HP-R-70-L_MS00_TS03_PS10	Linear Rotary Motor, Hollow Shaft, Torque Sensor	0150-6479
PR02-40x51-R_23x80F-HP-R-70-L_MS00_TS00_FS03_PS10	Linear Rotary Motor, Hollow Shaft, Force Sensor	0150-6483
PR02-40x51-R_23x80F-HP-R-70-L_MS00_TS03_FS03_PS10	Linear Rotary Motor, Hollow Shaft, Torque Sensor, Force Sensor	0150-6486
PR02-40x51-R_23x80F-HP-R-70_MS11_TS03_PS10	Linear Rotary Motor, MagSpring 11N, Torque Sensor	0150-6468
PR02-40x51-R_23x80F-HP-R-70_MS12_TS03_PS10	Linear Rotary Motor, MagSpring 17N, Torque Sensor	0150-6477
PR02-40x51-R_23x80F-HP-R-70_MS13_TS03_PS10	Linear Rotary Motor, MagSpring 22N, Torque Sensor	0150-6478
PR02-40x51-R_23x80F-HP-R-70-L_MS11_TS00_FS03_PS10	Linear Rotary Motor, Hollow Shaft, MagSpring 11N, Force Sensor	0150-6473
PR02-40x51-R_23x80F-HP-R-70-L_MS12_TS00_FS03_PS10	Linear Rotary Motor, Hollow Shaft, MagSpring 17N, Force Sensor	0150-6484
PR02-40x51-R_23x80F-HP-R-70-L_MS13_TS00_FS03_PS10	Linear Rotary Motor, Hollow Shaft, MagSpring 22N, Force Sensor	0150-6485
PR02-40x51-R_23x80F-HP-R-70-L_MS11_TS03_PS10	Linear Rotary Motor, Hollow Shaft, MagSpring 11N, Torque Sensor	0150-6480
PR02-40x51-R_23x80F-HP-R-70-L_MS12_TS03_PS10	Linear Rotary Motor, Hollow Shaft, MagSpring 17N, Torque Sensor	0150-6481
PR02-40x51-R_23x80F-HP-R-70-L_MS13_TS03_PS10	Linear Rotary Motor, Hollow Shaft, MagSpring 22N, Torque Sensor	0150-6482
PR02-40x51-R_23x80F-HP-R-70-L_MS11_TS03_FS03_PS10	Linear Rotary Motor, Hollow Shaft, MagSpring 11N, Torque Sensor, Force Sensor	0150-6469
PR02-40x51-R_23x80F-HP-R-70-L_MS12_TS03_FS03_PS10	Linear Rotary Motor, Hollow Shaft, MagSpring 17N, Torque Sensor, Force Sensor	0150-6487
PR02-40x51-R_23x80F-HP-R-70-L_MS13_TS03_FS03_PS10	Linear Rotary Motor, Hollow Shaft, MagSpring 22N, Torque Sensor, Force Sensor	0150-6488

LINEAR ROTARY MOTORS PR02-40 (R01 ANGLED CONNECTOR)

Item	Description	Item-No.
PR02-40x51-R_23x80F-HP-R-70_MS11_TS03_PS10-R01	Linear Rotary Motor, MagSpring 11N, Torque Sensor, Angled Con.	0150-6652
PR02-40x51-R_23x80F-HP-R-70-L_MS11_TS03_PS10-R01	Linear Rotary Motor, Hollow Shaft, MagSpring 11N, Torque Sensor, Angled Con.	0150-6647
PR02-40x51-R_23x80F-HP-R-70-L_MS11_TS00_FS03_PS10-R01	Linear Rotary Motor, Hollow Shaft, MagSpring 11N, Force Sensor, Angled Con.	0150-6654
PR02-40x51-R_23x80F-HP-R-70-L_MS11_TS03_FS03_PS10-R01	Linear Rotary Motor, Hollow Shaft, MagSpring 11N, Torque Sens., Force Sens., Angled Con.	0150-6650
PR02-40x51-R_23x80F-HP-R-70-L_MS12_TS00-R01	Linear Rotary Motor, Hollow Shaft, MagSpring 17N, Angled Con.	0150-7283
PR02-40x51-R_23x80F-HP-R-70_MS13_TS03_PS10-R01	Linear Rotary Motor, MagSpring 22N, Torque Sensor, Angled Con.	0150-6659

ORDERING INFORMATION

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 K05-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
KR05-Y-Fe/R-	Robot Cable KR05-Y-Fe/R, Custom length	0150-3512
KSS02-08-./M12A8-10	Sensor cable for PR02, 10m, open cable end	0150-2959
RS01-SS10x20	Shaft-hub clamping for 10mm shaft	0150-4531
Hammer Nut N6/M4	Hammer Nut N6 / M4	0150-4383
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

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