

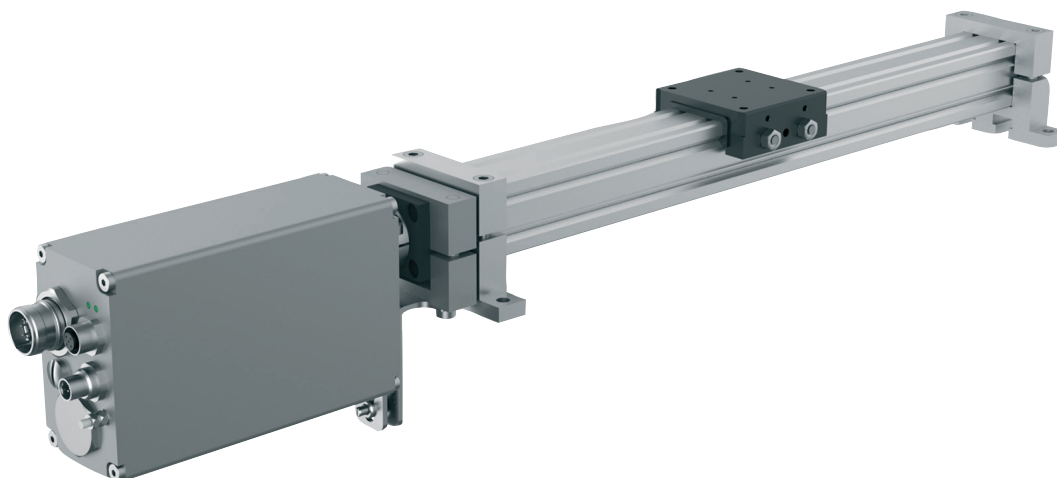
Technical information on actuators

Actuators are compact mechatronic units that contain a DC motor, microprocessor, powerful output stage and efficient drive train, as well as a magnetic absolute multi-turn encoder. They offer active protection against thermal overload and a comprehensive system software that enables load-dependent duty cycles of over 25% DC. The robust metal housing with high IP rating (IP 67) ensures versatile use in various industrial sectors and makes the actuators ideal for demanding applications in automation technology. Actuators are complete mechatronic systems consisting of a battery-free multi-turn encoder, gears, a motor and integrated power and control electronics.

Actuators are intelligent adjustment units that can be attached to the end of a machine shaft or mounted onto a machine shaft or spindle. They convert incoming drive signals into mechanical rotary motion to drive the machine shaft. The mounting set (85000-51), consisting of a torque arm and mounting bracket, is used to prevent the drive from rotating with the machine shaft.

Note:

The actuators require two power supplies in the range 24 V to 30 V DC. The logic supply powers the control electronics, while the power voltage supplies the power electronics of the motor. In addition, the drives are equipped with a mechanical emergency manual override that enables manual operation in the event of a malfunction, e.g. power failure. The drives can also be configured using the support tool via the service plug (mini-USB).



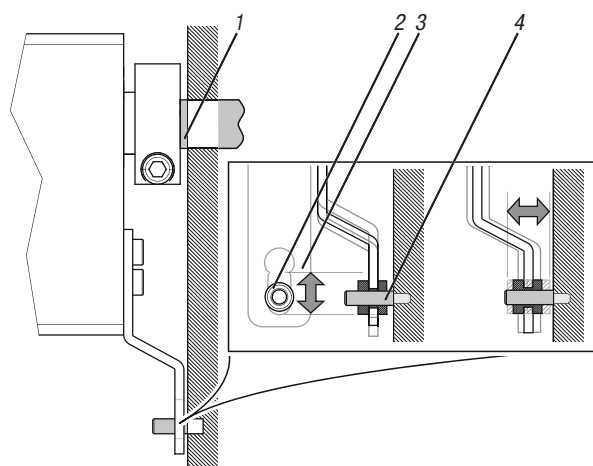
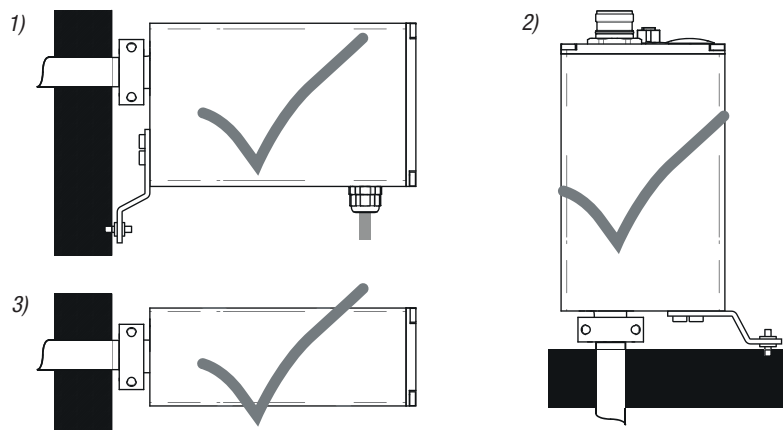
Stainless steel or aluminium actuators for linear actuators 85000-50 mounted on square aluminium linear actuator 29104.

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Assembly:

The actuators can be mounted either with the narrow side horizontal (1) or vertical (2) to the machine shaft. In order to minimise the mechanical stress on all components, it is important that the output shaft (fixed bearing) and the attachment point of the torque support (floating bearing) are aligned. For horizontal installation (1), the actuators must be installed with the narrow side facing upwards. Installation in a transverse position (3), i.e. with the wide side facing upwards, is only permitted after careful assessment of the installation situation and subsequent approval by the manufacturer.

The mounting concept envisages a fixed/floating bearing arrangement. The fixed bearing supports the weight of the actuator by mounting the actuator directly onto the machine shaft via a hollow shaft with clamping ring. The torque arm prevents the actuator from rotating and acts as a floating bearing to compensate for any unbalanced movements on the output shaft.



- 1) Machine shaft
- 2) Plain bearing
- 3) Torque support
- 4) Shaft screw

Technical information on actuators

Combination options with linear actuators

Motor	Connection technology	Installation set	Linear actuator
85000-50-0082	PROFIBUS	85000-51-030	29105-300001Xxxx; 29105-300101Xxxx; 29105-1300101Xxxx
85000-50-1082	EtherCAT	85000-51-030	29105-300001Xxxx; 29105-300101Xxxx; 29105-1300101Xxxx
85000-50-2082	IO-Link	85000-51-030	29105-300001Xxxx; 29105-300101Xxxx; 29105-1300101Xxxx
85000-50-0081	PROFIBUS	85000-51-030	29105-300001Xxxx; 29105-300101Xxxx; 29105-1300101Xxxx
85000-50-1081	EtherCAT	85000-51-030	29105-300001Xxxx; 29105-300101Xxxx; 29105-1300101Xxxx
85000-50-2081	IO-Link	85000-51-030	29105-300001Xxxx; 29105-300101Xxxx; 29105-1300101Xxxx
85000-50-0082	PROFIBUS	85000-51-130	21250-030Xxxx; 21250-130Xxxx; 21250-01-030Xxxx; 21250-01-130Xxxx
85000-50-0082	EtherCAT	85000-51-130	21250-030Xxxx; 21250-130Xxxx; 21250-01-030Xxxx; 21250-01-130Xxxx
85000-50-0082	IO-Link	85000-51-130	21250-030Xxxx; 21250-130Xxxx; 21250-01-030Xxxx; 21250-01-130Xxxx
85000-50-0081	PROFIBUS	85000-51-130	21250-030Xxxx; 21250-130Xxxx; 21250-01-030Xxxx; 21250-01-130Xxxx
85000-50-1081	EtherCAT	85000-51-130	21250-030Xxxx; 21250-130Xxxx; 21250-01-030Xxxx; 21250-01-130Xxxx
85000-50-2081	IO-Link	85000-51-130	21250-030Xxxx; 21250-130Xxxx; 21250-01-030Xxxx; 21250-01-130Xxxx
85000-50-0082	PROFIBUS	85000-51-230	29104-030Xxxx; 29104-130Xxxx
85000-50-1082	EtherCAT	85000-51-230	29104-030Xxxx; 29104-130Xxxx
85000-50-2082	IO-Link	85000-51-230	29104-030Xxxx; 29104-130Xxxx
85000-50-0081	PROFIBUS	85000-51-230	29104-030Xxxx; 29104-130Xxxx
85000-50-1081	EtherCAT	85000-51-230	29104-030Xxxx; 29104-130Xxxx
85000-50-2081	IO-Link	85000-51-230	29104-030Xxxx; 29104-130Xxxx

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Combination options with linear actuators

Motor	Connection technology	Installation set	Linear actuator
85000-50-0102	PROFIBUS	85000-51-040	29105-400001Xxxx; 29105-400101Xxxx; 29105-1400101Xxxx;
85000-50-1102	EtherCAT	85000-51-040	29105-400001Xxxx; 29105-400101Xxxx; 29105-1400101Xxxx;
85000-50-2102	IO-Link	85000-51-040	29105-400001Xxxx; 29105-400101Xxxx; 29105-1400101Xxxx;
85000-50-0101	PROFIBUS	85000-51-040	29105-400001Xxxx; 29105-400101Xxxx; 29105-1400101Xxxx;
85000-50-1101	EtherCAT	85000-51-040	29105-400001Xxxx; 29105-400101Xxxx; 29105-1400101Xxxx;
85000-50-2101	IO-Link	85000-51-040	29105-400001Xxxx; 29105-400101Xxxx; 29105-1400101Xxxx;
85000-50-0102	PROFIBUS	85000-51-140	21250-040Xxxx; 21250-140Xxxx; 21250-01-040Xxxx; 21250-01-140Xxxx
85000-50-1102	EtherCAT	85000-51-140	21250-040Xxxx; 21250-140Xxxx; 21250-01-040Xxxx; 21250-01-140Xxxx
85000-50-2102	IO-Link	85000-51-140	21250-040Xxxx; 21250-140Xxxx; 21250-01-040Xxxx; 21250-01-140Xxxx
85000-50-0101	PROFIBUS	85000-51-140	21250-040Xxxx; 21250-140Xxxx; 21250-01-040Xxxx; 21250-01-140Xxxx
85000-50-1101	EtherCAT	85000-51-140	21250-040Xxxx; 21250-140Xxxx; 21250-01-040Xxxx; 21250-01-140Xxxx
85000-50-2101	IO-Link	85000-51-140	21250-040Xxxx; 21250-140Xxxx; 21250-01-040Xxxx; 21250-01-140Xxxx
85000-50-0102	PROFIBUS	85000-51-240	29104-040Xxxx; 29104-140Xxxx
85000-50-1102	EtherCAT	85000-51-240	29104-040Xxxx; 29104-140Xxxx
85000-50-2102	IO-Link	85000-51-240	29104-040Xxxx; 29104-140Xxxx
85000-50-0101	PROFIBUS	85000-51-240	29104-040Xxxx; 29104-140Xxxx
85000-50-1101	EtherCAT	85000-51-240	29104-040Xxxx; 29104-140Xxxx
85000-50-2101	IO-Link	85000-51-240	29104-040Xxxx; 29104-140Xxxx

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Combination options with linear actuators

Motor	Connection technology	Installation set	Linear actuator
85000-50-0122	PROFIBUS	85000-51-050	29105-500001Xxxx; 29105-500101Xxxx
85000-50-1122	EtherCAT	85000-51-050	29105-500001Xxxx; 29105-500101Xxxx
85000-50-2122	IO-Link	85000-51-050	29105-500001Xxxx; 29105-500101Xxxx
85000-50-0121	PROFIBUS	85000-51-050	29105-500001Xxxx; 29105-500101Xxxx
85000-50-1121	EtherCAT	85000-51-050	29105-500001Xxxx; 29105-500101Xxxx
85000-50-2121	IO-Link	85000-51-050	29105-500001Xxxx; 29105-500101Xxxx
85000-50-0122	PROFIBUS	85000-51-250	29104-050Xxxx; 29104-150Xxxx
85000-50-1122	EtherCAT	85000-51-250	29104-050Xxxx; 29104-150Xxxx
85000-50-2122	IO-Link	85000-51-250	29104-050Xxxx; 29104-150Xxxx
85000-50-0121	PROFIBUS	85000-51-250	29104-050Xxxx; 29104-150Xxxx
85000-50-1121	EtherCAT	85000-51-250	29104-050Xxxx; 29104-150Xxxx
85000-50-2121	IO-Link	85000-51-250	29104-050Xxxx; 29104-150Xxxx

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Technical data:

Nominal torque	5 Nm
Electrical data:	
Logic circuit supply voltage:	24 V ... 30 V DC (nominal supply voltage: 24 V DC)
Power circuit supply voltage:	24 V ... 30 V DC (nominal supply voltage: 24 V DC)
Logic circuit max. power consumption ⁽¹⁾⁽²⁾ :	400mA
Power circuit current consumption ⁽¹⁾⁽²⁾ (max. consumption):	3,6A (7,5A)
Duty cycle (DC) in % (load-dependent) ⁽¹⁾ :	DC = 25 % at 100 % load torque, Nominal operating mode S2 „Base time 4 min: Duty cycle (DC) = 1 minute, Pause duration (PD) = 3 minutes“ DC up to 50% at reduced load torque, depending on ambient parameters and application
Communication interfaces:	IO-Link
Communication interfaces: Fieldbus	PROFIBUS-DP (V0/V1)
Communication interfaces: Industrial Ethernet	EtherCAT
Mechanical data	
Rated torque output shaft ⁽¹⁾ :	5 Nm at 100 rpm
Output shaft:	Push-on hollow shaft
Housing material:	Stainless steel 1.4301 Aluminium, anodised
Mass stainless steel/aluminium in kg ⁽³⁾ :	3,5/2,0
Encoder data	
Resolution:	1000 increments per 360°
Detection range:	342 revolutions, even when not powered
Adjustment range:	No limit ⁽⁴⁾

⁽¹⁾ At nominal supply voltage

⁽²⁾ External fuse required

⁽³⁾ Depending on the housing material (stainless steel/aluminium) and the connection technology

⁽⁴⁾ When the logic circuit supply voltage is applied, an electronic totaliser detects the actuating range beyond the detection range of the measuring system.

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Technical data:

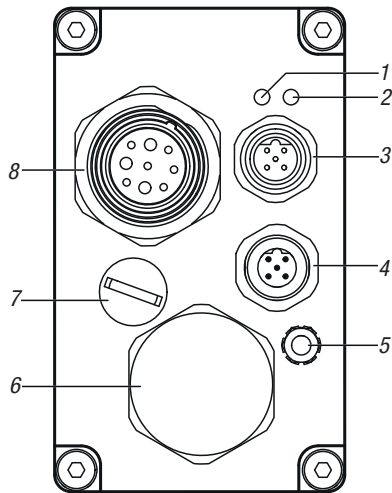
Ambient data	
Working temperature:	0 °C ... +60 °C
Operating temperature:	-10 °C ... +60 °C
Storage temperature:	-20 °C ... +85 °C
Maximum relative humidity:	95 %
Condensation:	Not permitted (condensation protection on request)
Rating ⁽¹⁾ :	IP 67, DIN EN 60529:2014-09, shaft seal (material: FKM)
Insulation resistance:	$\sqrt{2}$ x 500 V DC; acc. to DIN EN 61439-1:2012-06
EMC ⁽²⁾ :	Interference suppression DIN EN 61000-6-1:2007-10, EN 61000-6-1:2007, DIN EN 61000-6-2:2006-03 + amendment 1:2011-06; EN 61000-6-2:2005 + AC:2005 IO-Link: DIN EN 61000-4-5:2019-03 (± 1 kV Line-Earth/ ± 0.5 kV Line-Line) Interference emission DIN EN 61000-6-3:2011-09 + amendment 1:2012-11, EN 61000-6-3:2007 + A1:2011 + AC:2012, DIN EN 61000-6-4:2011-09, EN 61000-6-4:2007 + A1:2011
Vibration resilience:	50 m/s ² ($\approx 5g$), 10 ... 50 Hz; acc. to DIN EN 60068-2-6:2008-10
Shock resistance:	150 m/s ² ($\approx 15g$), acc. to DIN EN 60068-2-27:2010-02
Approvals:	
European Economic Community	Conformity acc. to - EMC Directive 2012/30/EU - Machinery Directive 2006/42/EC 
USA and Canada	UL/CSA version optional

⁽¹⁾ The IP rating/housing protection class is only ensured if all blind plugs are screwed in and all unused connectors (Form A/Form B connector technology) are covered.

⁽²⁾ Use only shielded cables.

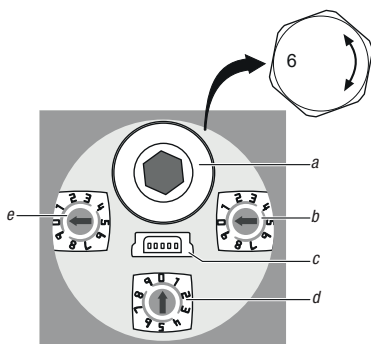
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Connector technology Form A:



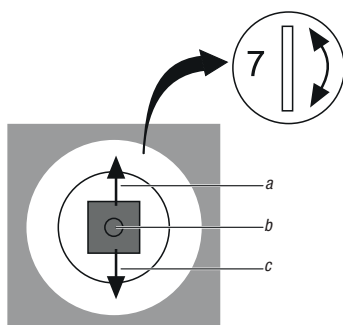
- 1) Status indicator - device (LED1)
- 2) Status indicator - communication (LED2)
- 3) M12 socket_ communication interface (IN)
- 4) M12 socket: communication interface (OUT)
- 5) M4 grub screw (functional earth)
- 6) Removable blind plug for adjustment elements
- 7) Removable blind plug for manual adjustment
- 8) M23 power socket: power supply
 - Logic circuit supply voltage
 - Power circuit supply voltage

Adjustment elements fieldbus variant Form A:



- a) Emergency manual override
- b) Rotary switch bus address 1 digit
- c) Service port (mini USB)
- d) Rotary switch configuration
 - 0...8 Baud rate
 - 9 service mode (no bus operation; tap mode)

Manual adjustment fieldbus variant Form A:



Joystick ⁽¹⁾

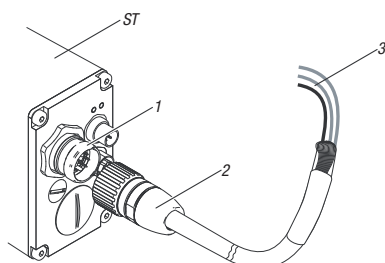
- a) Jog mode ⁽²⁾ Clockwise rotation (when viewing the output shaft)
- b) Error confirmation (press)
- c) Jog mode ⁽²⁾ Anti-clockwise rotation

⁽¹⁾ The joystick can only be used in service mode.

⁽²⁾ Jog mode: Move joystick in the direction indicated by the arrow.

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Connection accessories plug connector M23x1 with screw lock 80150-30



Plug connector for actuator Form A

Actuator Form A

ST Actuator
1 Supply socket

Cable 80150-30

2 Plug connector 1
3 Plug connector 2: L (open cable end)

Connection accessories: Mating connector for power supply (M23 plug)

Technical data:

Technical data - Mating power supply connector (plug size M23)	
Rated voltage	150V
Maximum connection cross-section	6 x 1,0 mm ² [18 AWG]/3 x 2,5 mm ² [14 AWG]
Contact type	Socket contact
Housing material:	Metal (GD-ZN/CuZn Ni)
Ambient temperature	-40 °C ... +100°C
Rating ⁽¹⁾ :	IP 67
Plug-in cycles	50
Certification	cULus Recognized Component (Nr. E153698)

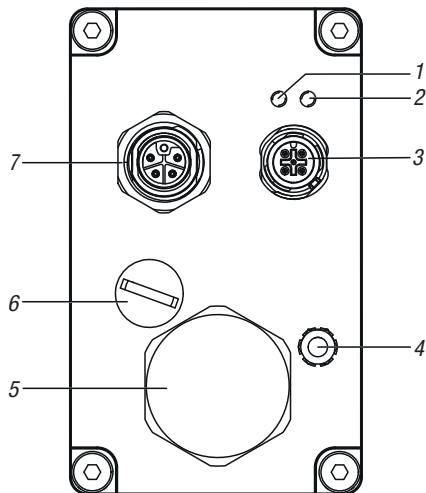
⁽¹⁾ When screwed in, acc. to DIN EN 60529/DIN 40050

Pin assignment

Mating power supply connector (plug view)	Pin designation	Signal designation
M23 Socket contact	1	+ 24 V logic
	6	+ 24 V power
	8	GND logic and GND power
	GND signals internal in the actuator.	

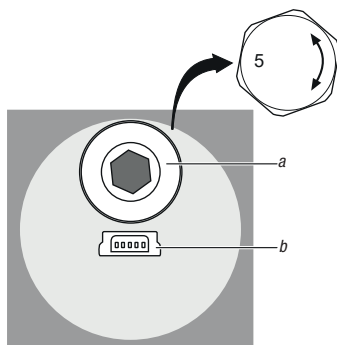
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Connection technology: Form B



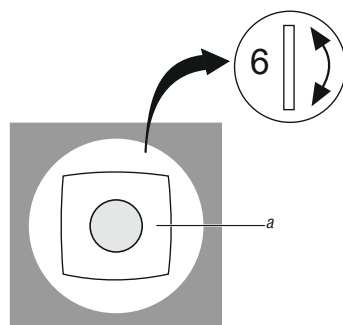
- 1) Status indicator - IO-Link status (LED1)
- 2) Status indicator - IO-Link communication (LED2)
- 3) M12 socket: communication interface
- 4) M4 grub screw (functional earth)
- 5) Removable blind plug for setting elements
- 6) Removable blind plug for servicing
- 7) M12 supply socket: Power supply
 - Logic circuit supply voltage
 - Power circuit supply voltage

Setting elements IO-Link Form B:



- a) Emergency manual override
- b) Service port (mini-USB)

Servicing for IO-Link Form B:

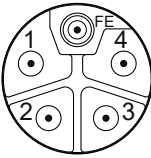


- a) Button (for servicing) ⁽¹⁾

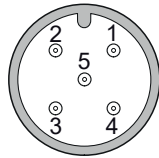
⁽¹⁾ The button may only be activated by the manufacturer.

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Pin assignment of supply connector

Pin plug, M12 L-coded (plug view)	Pin designation	Signal designation
	1	+24 V logic
	2	GND power
	3	GND logic
	4	+24 V power
	FE	Functional earth
	Plug housing	Functional earth

Pin assignment of IO-Link communication interface

Pin plug, M12 A-coded (plug view)	Pin designation	Signal designation
	1	U_B
	2	Not assigned
	3	GND
	4	IO- Link C/Q
	5	Not assigned
	Plug housing	Functional earth