



Superior Clamping and Gripping

# **Product data sheet**

Magnetic gripper EGM

# Strong. Simple Control. Compact. Magnet gripper EGM

Electro-permanent magnetic gripper for energy-efficient handling of ferromagnetic workpieces

# Field of application

Universal compact gripper for large diversity of parts in clean to slightly contaminated work environment



### Advantages – Your benefits

High holding forces at lowest space for reliable part handling in compact machines

Low weight for high dynamics in challenging applications

**Reliable holding force maintenance** to ensure process reliable operation even in scenarios with emergency stop Energy efficiency: electricity is only required for magnetization and demagnetization for an economic and careful managment of resources

Variable number of magnetic poles and adaptation possibilities to any common robot to ensure the optimum adaption to each application

Workpiece accessibility from five sides free from interfering contours by unnecessary gripper fingers







Max. workpiece weight 118 kg



Max. magnetic surface 196 cm<sup>2</sup>

# **Functional description**

The function of the magnetic gripper bases on the combination of AlNiCo and neodymium magnets. The magnetic flux of the AlNiCo magnets passes the neodymium magnet in the deactivated state, and closes the magnetic circuit over the gripper base body made of steel. To activate the system, an electric current pulse is conducted through the coil, which reverses the polarity of the AlNiCo magnets accordingly.

The magnetic flux can not pass the Neodym magnets anymore and has to pass via the workpiece into the opposite pole, creating a holding force.



- Steel poles with bore for comfortable adaption of individualized pole extensions
- ② **Polarity reversible AlNiCo-magnet** surrounded by an electromagnetic coil
- ③ **One-piece base body made of steel** for optimal guidance of the magnetic flux

- Potting compound of synthetic resin
   Prevents the penetration of coolant and chips
- ⑤ Copper coil for pole reversal of the AlNiCo-magnets
- 6 **Cable connector of Harting** ensures safe connection
- ⑦ Non-pole reversing neodymium permanent magnets lead the magnetic flux via the workpiece

# **Detailed functional description**

#### Gripping metal sheets or round components



The magnetic gripper EGM can be arranged or equipped as appropriate for the workpiece. The monopole grippers EGM-M are ideal for metal sheets, and are also suitable for handling larger sheets in multiple arrangements. Using pole extensions, the bi-poles EGM-B can also handle round workpieces. The pole extensions are supplied with mounting materials.

- Magnetic gripper EGM-M
- O Pole extensions PVL

Ø Workpiece

- 2 Adapter plate (customized) for EGM
- 3 Magnetic gripper EGM-B

#### Plug-in connector for EGM



Magnetic grippers EGM are directly equipped with plug-in connectors. For the magnetic monopole grippers (EGM-M), these are attached to the gripper via a connection cable. This allows for flexible routing. For the bi-pole grippers EGM-B, the plug connectors are connected to the housing. The cable outlet can be turned in 90° increments.

- Magnetic gripper EGM-M
- Magnetic gripper EGM-B

#### Selecting the magnet controller



To control the magnetic gripper, three controllers are available each in two performance categories. The standard controller ECG-C is used to magnetize/ demagnetize and can be actuated via digital I/O. For the controller ECG-R, the output of the magnetic gripper can be controlled with up to eight levels via digital signals. The controller ECG-W is particularly designed for applications in the direct welding area.

- Magnetic controller ECG-C
- Magnetic controller ECG-R
- 3 Magnetic controller ECG-W

#### Simultaneous actuation of several EGMs

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The magnetic gripper EGM is controlled by an control unit ECG. A control unit can be used to control up to 32 magnetic grippers, depending on the size. A simple connection of up to eight magnets is possible using a junction box. This can be positioned freely in the field.

1 Control unit ECG

- 3 Magnet gripper EGM
- 2 Distributor box JBOX

# Ordering example

	EGM	-	М	-	Q	-	8	-	1	-	FX
Description											
EGM											
Magnet type											
M= monopole											
B= Bipole (with threads for pole extension)											
Pole form											
Q = square											
L= oblong											
Pole width											
8 mm											
15 mm											
30 mm											
32 mm											
50 mm											
70 mm											
Number of poles, pole arrangement											
1= one pole											
1 x 2= one row, two poles											
1 x 4= one row, four poles											
2 x 2= two rows, two poles											
Electrical interface											

FX= fixed cable outlet (30 cm cable)

-= Connection plug on EGM

## General notes about the series

**Operating principle:** Magnetization of permanent magnets

Housing material: Steel

Base jaw material: Steel

Actuation: Electrical current pulse for activation and deactivation of the system

Warranty: 24 months Service life characteristics: on request Scope of delivery: Accessory kit with centering sleeves



## **Application example**

Electrically drive three-axis gantry with double gripper unit comprising electric magnetic gripper and pneumatic gripper, for the handling of a wide variety of workpieces.

- 1 Magnet gripper EGM
- Swivel head SRH-plus
- **3** 2-finger parallel gripper PGN-plus
- Compensation unit AGE-XY
- **G** Room gantry, electric RPE

### SCHUNK offers more ...

The following components make the product even more productive - the suitable addition for the highest functionality, flexibility, reliability, and controlled production.





magnetic controller

Distributor box









Power cable

Pole extension

Gaussmeter

① For more information on these products can be found on the following product pages or at schunk.com.

# **Options and special information**

Control via external controller: Electrical control of the gripper takes place via the controller, which is separately available on request. The interface to the control unit is provided by digital I/0.



#### Dimensions



For values see technical data table

#### Technical data

Description		EGM-M-Q-30-1-FX	EGM-M-Q-50-1-FX	EGM-M-Q-70-1-FX
ID		0306350	0306351	0306352
Weight	[kg]	1.3	3.45	7.1
Number of poles		2	2	2
Magnet area	[cm <sup>2</sup> ]	18.4	50.4	98.1
Minimum workpiece thickness	[mm]	6	12	16
Payload for horizontal magnet surface	[kg]	18	80	165
Payload for vertical magnet surface	[kg]	7	32	65
Max. activations/minute	[1/min]	20	6	10
Module temperature increasement in case of 5/15 activations/minute	[°C]	13/33	37/80	24/53
IP protection class		54	54	54
Current consumption upon activation/deactivation	[A]	3	2.3	3.1
Cable length	[cm]	30	30	30
Dimensions Ø D x Z	[mm]	58 x 60	98 x 65	129.5 x 75
Magnet controller data				
Magnet controller type		ECG 01	ECG 02	ECG 02
Nominal voltage	[V AC]	400	400	400
Max. current	[A]	32	32	32
Max. number of modules per controller		28	26	19

#### EGM-M 30Q-1FX main view





Magnetic gripper

#### EGM-M 50Q-1FX main view



0

(24) Bolt circle(72) Fit for centering sleeves

80 Depth of the centering sleeve hole in the counter part

any additional accessories.

#### EGM-M 70Q-1FX main view

any additional accessories.



(72) Fit for centering sleeves

(80) Depth of the centering sleeve hole in the counter part

Magnetic gripper

#### **Connection cables**



(6) Connection module side

(21) Connection controller side

Please observe the min. bending radius for cable track-compatible cables or the max. torsion angle for torsion-compatible cables. These are generally 10 times the cable diameter or +/- 180°/m.

Description	ID	11
		[m]
Connection cable EGM		
KA GLNQSO3-LK-00500-J	0306302	5
KA GLNQSO3-LK-01000-J	0306303	10
KA GLNQSO3-LK-01500-J	0306304	15
KA GLNQSO3-LK-02000-J	0306305	20

#### Magnetic controller ECG-W



(90) Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. Version "W" enables digital switching of the EGM while holding a workpiece during the welding process.

Description	ID	Power supply (load)					
		[V AC]					
Magnetic controller for EGM with digital switch during the welding process							
ECG-W 01	0306395	400					
ECG-W 02	0306396	400					

① One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

#### Magnetic controller ECG-C



(90) Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. The "C" version allows digital switching of the EGM.

Description	ID	Power supply (load)					
		[V AC]					
Magnetic controller for EGM with digital switch							
ECG-C 01	0306300	400					
ECG-C 02	0306301	400					

One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

#### Magnetic controller ECG-R



#### (90) Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. Version "R" enables force control in eight force levels.

Description	ID	Power supply (load)					
		[V AC]					
Magnetic controller for EGM with force control							
ECG-R 02	0306391	400					

One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

#### 2-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID				
2-way distributor box					
EGM-JB 2	0306432				

#### 8-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID
8-way distributor box	(
EGM-JB 8	0306438

#### 4-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID									
4-way distributor bo										
EGM-JB 4	0306434									

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#### Dimensions



Technical data

Description		EGM-M-L-08-1-FX	EGM-M-L-15-1-FX	EGM-M-L-30-1-FX
ID		0306360	0306361	0306362
Weight	[kg]	1	2.1	3.1
Number of poles		2	2	2
Magnet area	[cm <sup>2</sup> ]	12	22.5	36.9
Minimum workpiece thickness	[mm]	3	5	10
Payload for horizontal magnet surface	[kg]	10	22	60
Payload for vertical magnet surface	[kg]	4	9	24
Max. activations/minute	[1/min]	16	16	12
Module temperature increasement in case of 5/15 activations/minute	[°C]	18/39	15/40	22/49
IP protection class		54	54	54
Current consumption upon activation/deactivation	[A]	3.7	2.6	2.2
Cable length	[cm]	30	30	30
Dimensions X x Y x Z	[mm]	98 x 26 x 58	105 x 47 x 79	96 x 66 x 71
Magnet controller data				
Magnet controller type		ECG 01	ECG 02	ECG 02
Nominal voltage	[V AC]	400	400	400
Max. current	[A]	32	32	32
Max. number of modules per controller		23	17	32

#### EGM-M 08L-1FX main view



The drawing shows the magnet gripper in basis configuration, without any additional accessories.

(72) Fit for centering sleeves

(80) Depth of the centering sleeve hole in the counter part



Magnetic gripper

#### EGM-M 15L-1FX main view



any additional accessories.

(72) Fit for centering sleeves

(80) Depth of the centering sleeve hole in the counter part

#### EGM-M 30L-1FX main view



The drawing shows the magnet gripper in basis configuration, without any additional accessories.

(72) Fit for centering sleeves

(80) Depth of the centering sleeve hole in the counter part

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#### **Connection cables**



(6) Connection module side

(21) Connection controller side

Please observe the min. bending radius for cable track-compatible cables or the max. torsion angle for torsion-compatible cables. These are generally 10 times the cable diameter or +/- 180°/m.

Description	ID	11
		[m]
Connection cable EGM		
KA GLNQSO3-LK-00500-J	0306302	5
KA GLNQSO3-LK-01000-J	0306303	10
KA GLNQSO3-LK-01500-J	0306304	15
KA GLNQSO3-LK-02000-J	0306305	20

#### Magnetic controller ECG-W



(90) Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. Version "W" enables digital switching of the EGM while holding a workpiece during the welding process.

Description	ID	Power supply (load)					
		[V AC]					
Magnetic controller for EGM with digital switch during the welding process							
ECG-W 01	0306395	400					
ECG-W 02	0306396	400					

① One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

#### Magnetic controller ECG-C



(90) Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. The "C" version allows digital switching of the EGM.

Description	ID	Power supply (load)						
		[V AC]						
Magnetic controller for EGM with digital switch								
ECG-C 01	0306300	400						
ECG-C 02	0306301	400						

One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

#### Magnetic controller ECG-R



#### (90) Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. Version "R" enables force control in eight force levels.

Description	ID	Power supply (load)						
		[V AC]						
Magnetic controller for EGM with force control								
ECG-R 02	0306391	400						

One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

#### 2-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID				
2-way distributor box					
EGM-JB 2	0306432				

#### 8-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID							
8-way distributor bo								
EGM-JB 8	0306438							

#### 4-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID									
4-way distributor bo										
EGM-JB 4	0306434									

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#### Dimensions



#### Technical data

Description		EGM-B-Q-50-1x2	EGM-B-Q-50-1x4	EGM-B-Q-50-2x2	EGM-B-Q-70-1x2	EGM-B-Q-70-1x4	EGM-B-Q-70-2x2
ID		0306370	0306372	0306371	0306380	0306382	0306381
Weight	[kg]	5.5	13	12	9	25	18
Number of poles		2	4	4	2	4	4
Magnet area	[cm <sup>2</sup> ]	50	100	100	98	196	196
Minimum workpiece thickness	[mm]	12	14	14	14	18	18
Payload for horizontal magnet surface	[kg]	75	175	175	120	296	290
Payload for vertical magnet surface	[kg]	30	70	70	48	118	115
Max. activations/minute	[1/min]	20	8	8	15	10	10
Module temperature increasement in case of 5/15 activations/minute	[°C]	12/30	30/68	30/68	15/40	24/60	24/60
IP protection class		52	52	52	52	52	52
Current consumption upon activation/deactivation	[A]	2.9	9.5	9.5	6.4	12.3	12.3
Dimensions X x Y x Z	[mm]	170 x 95 x 61	290 x 95 x 61	170 x 150 x 61	210 x 115 x 61	370 x 115 x 61	210 x 195 x 61
Magnet controller data							
Magnet controller type		ECG 02					
Nominal voltage	[V AC]	400	400	400	400	400	400
Max. current	[A]	32	32	32	32	32	32
Max. number of modules per controller		25	7	7	9	4	5

#### EGM-B 50Q-1x2 main view





#### EGM-B 50Q-1x4 main view



#### EGM-B 50Q-2x2 main view



#### EGM-B 70Q-1x2 main view



(72) Fit for centering sleeves
(80) Depth of the centering sleeve hole in the counter part

#### EGM-B 70Q-1x4 main view



- (80) Depth of the centering sleeve hole in the counter part

#### EGM-B 70Q-2x2 main view



any additional accessories.

- 80 Depth of the centering sleeve hole in the counter part
- (91) fitting for pole extension

#### **Pole extension**



(90) Magnet gripper EGM(91) Pole extension

(92) Screws(93) Centring screw

Prismatic pole extensions enable the gripping of round workpieces. The mounting material and centering elements are included in the scope of delivery.

Description	ID	Dimensions L x W x H
		[mm]
Pole extension		
PVL B-Q-50-1x2	0306383	170/50/19
PVL B-Q-50-1x4	0306384	290/50/19
PVL B-Q-70-1x2	0306387	210/70/19
PVL B-Q-70-1x4	0306388	370/70/19

When using pole extensions, the max. payload is reduced by up to 75%.

#### Connection cables



(6) Connection module side

(21) Connection controller side

Please observe the min. bending radius for cable track-compatible cables or the max. torsion angle for torsion-compatible cables. These are generally 10 times the cable diameter or +/- 180°/m.

Description	ID	L1
		[m]
Connection cable EGM		
KA GLNQSO3-LK-00500-J	0306302	5
KA GLNQSO3-LK-01000-J	0306303	10
KA GLNQSO3-LK-01500-J	0306304	15
KA GLNQSO3-LK-02000-J	0306305	20

#### Magnetic controller ECG-C



(90) Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. The "C" version allows digital switching of the EGM.

Description	ID	Power supply (load)					
		[V AC]					
Magnetic controller for EGM with digital switch							
ECG-C 02	0306301	400					

① One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

#### Magnetic controller ECG-W



(90) Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. Version "W" enables digital switching of the EGM while holding a workpiece during the welding process.

Description	ID	Power supply (load)							
		[V AC]							
Magnetic controller for EGM with digital switch during the welding process									
ECG-W 02	0306396	400							

① One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

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## EGM B-Q

Magnetic gripper

#### Magnetic controller ECG-R



90 Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. Version "R" enables force control in eight force levels.

Description	ID	Power supply (load)					
		[V AC]					
Magnetic controller for EGM with force control							
ECG-R 02	0306391	400					

One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

#### 4-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID	
4-way distributor box	K	
EGM-JB 4	0306434	

#### 2-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID	
2-way distributor box	(	
EGM-JB 2	0306432	

#### 8-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID
8-way distributor box	x
EGM-JB 8	0306438





#### Dimensions



#### Technical data

Description		EGM-B-L-30-1x2	EGM-B-L-30-1x4
ID		0306373	0306374
Weight	[kg]	6.5	11.5
Number of poles		2	4
Magnet area	[cm <sup>2</sup> ]	36	72
Minimum workpiece thickness	[mm]	8	8
Payload for horizontal magnet surface	[kg]	60	110
Payload for vertical magnet surface	[kg]	20	40
Max. activations/minute	[1/min]	15	20
Module temperature increasement in case of 5/15 activations/minute	[°C]	15/35	12/32
IP protection class		52	52
Current consumption upon activation/deactivation	[A]	3.1	6.5
Dimensions X x Y x Z	[mm]	190 x 75 x 61	330 x 75 x 61
Magnet controller data			
Magnet controller type		ECG 02	ECG 02
Nominal voltage	[V AC]	400	400
Max. current	[A]	32	32
Max. number of modules per controller		24	13

#### EGM-B 30L-1x2 main view





Magnetic gripper

#### EGM-B 30L-1x4 main view



#### **Pole extension**



(90) Magnet gripper EGM

(92) Screws

(91) Pole extension

(93) Centring screw

Prismatic pole extensions enable the gripping of round workpieces. The mounting material and centering elements are included in the scope of delivery.

Description	ID	Dimensions L x W x H
		[mm]
Pole extension		
PVL B-L-30-1x2	0306385	190/30/19
PVL B-L-30-1x4	0306386	330/30/19

() When using pole extensions, the max. payload is reduced by up to 75%.

215 8.9 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	90 (e) (e)

#### (90) Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. The "C" version allows digital switching of the EGM.

Description	ID	Power supply (load)	
		[V AC]	
Magnetic controller for EGM with digital switch			
ECG-C 02	0306301	400	

① One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

#### **Connection cables**



(6) Connection module side

(21) Connection controller side

Please observe the min. bending radius for cable track-compatible cables or the max. torsion angle for torsion-compatible cables. These are generally 10 times the cable diameter or +/- 180°/m.

Description	ID	11
		[m]
Connection cable EGM		
KA GLNQSO3-LK-00500-J	0306302	5
KA GLNQS03-LK-01000-J	0306303	10
KA GLNQSO3-LK-01500-J	0306304	15
KA GLNQSO3-LK-02000-J	0306305	20



#### (90) Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. Version "W" enables digital switching of the EGM while holding a workpiece during the welding process.

Description	ID	Power supply (load)
		[V AC]
lagnetic controller for EGM with digital switch during the welding process		
ECG-W 02	0306396	400

① One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

### Magnotic controllor ECG\_C

### EGM B-L

Magnetic gripper

#### Magnetic controller ECG-R



90 Mounting on top-hat rail

An ECG control unit is required for actuating the EGM. Version "R" enables force control in eight force levels.

Description	ID	Power supply (load)
		[V AC]
Magnetic controller for EGM with force control		
ECG-R 02	0306391	400

① One ECG can control several magnets at the same time. For independent actuation of several magnets, several control units are needed.

#### 4-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID	
4-way distributor box		
EGM-JB 4	0306434	

#### 2-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID		
2-way distributor box			
EGM-JB 2	0306432		

#### 8-way distributor box



(90) Cable length 10 m, open wires

Several EGMs can be connected to the distributor box. This simplifies the wiring of the EGMS with the ECG controller.

Description	ID	
8-way distributor box		
EGM-JB 8	0306438	





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