



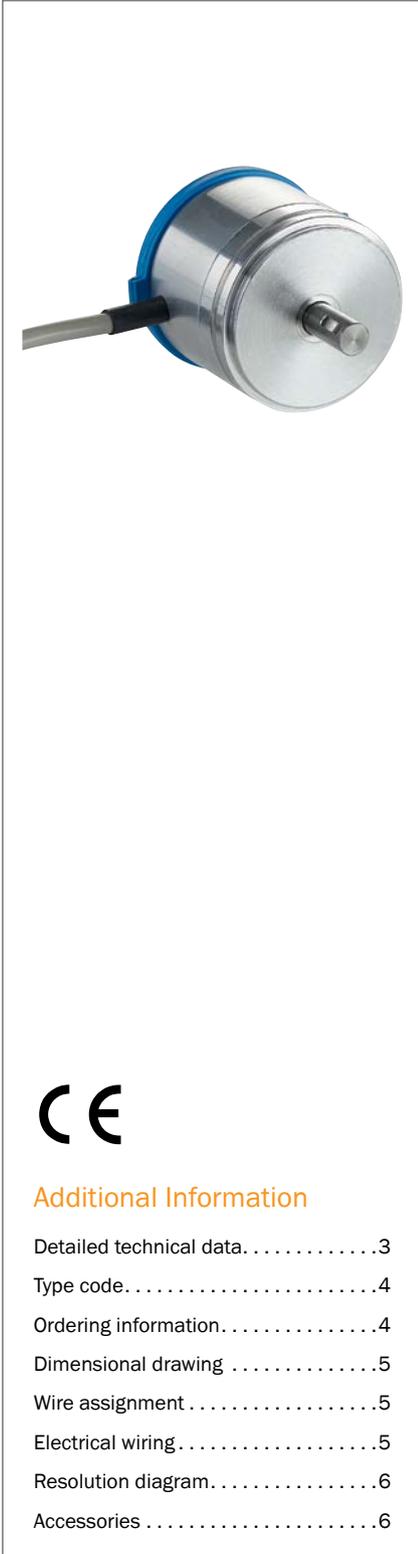
# ACS/ACM36, ACM60

COMPACT, UNIVERSAL, INTUITIVE

Absolute encoder

**SICK**  
Sensor Intelligence.

# COMPACT, UNIVERSAL, INTUITIVE



### Product description

The ACS36 (singleturn) and ACM36 (multiturn) encoder families have an analog interface with a maximum resolution of up to 3723 steps (for singleturn and multiturn). Using the teach-in function on the membrane keyboard, the measuring

range can be intuitively programmed directly on the device in just a few clicks. A current signal of 4-20 mA or a voltage signal of 0-10 V is output depending on the device version.

### At a glance

- Compact 36 mm absolute encoder with up to 3723 steps (for singleturn and multiturn)
- Servo flange
- Radial cable outlet
- Analog interface 4 to 20 mA or 0 to 10 V
- Programming via keypad on the encoder
- IP 65 protection class
- Operating temperature: -30 °C to +80 °C

### Your benefits

- Intuitive configuration of the measuring range directly on the device using membrane keyboard (teach-in function) saves time and requires no special expertise.
- The compact size (36-mm format) allows the encoder to be used in confined spaces and thus provides greater freedom for development and machine design.
- The analog interfaces (current/voltage) offer a low-cost solution for detecting the position and path, and thereby help to reduce overall system costs.

→ [www.mysick.com/en/ACS\\_ACM36](http://www.mysick.com/en/ACS_ACM36)

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



## Detailed technical data

## Performance

	ACS36-K1K0-K01	ACS36-L1K0-K01	ACM36-K1K0-K01	ACM36-L1K0-K01
Max. number of revolutions	1		16	
Resolution per measuring step	5.4 ... 40.2 $\mu\text{A}$ <sup>1)</sup>	2.7 ... 25.1 mV <sup>1)</sup>	5.2 $\mu\text{A}$ <sup>1)</sup>	2.7 mV <sup>1)</sup>
Measuring range	0° ... 360°, programmable		0° ... 5,760°, programmable	
Minimum measuring range	35°		336°	
Accuracy	± 0.2 %, based on the programmed angle			

<sup>1)</sup> See measuring step diagram/calculation formula for details

## Interfaces

	ACS36-K1K0-K01	ACS36-L1K0-K01	ACM36-K1K0-K01	ACM36-L1K0-K01
Electrical interface	Analog, 4 mA ... 20 mA	Analog, 0 V ... 10 V	Analog, 4 mA ... 20 mA	Analog, 0 V ... 10 V

## Mechanical data

	ACS36-K1K0-K01	ACS36-L1K0-K01	ACM36-K1K0-K01	ACM36-L1K0-K01
Length of the shaft	12.4 mm			
Mass	0.1 kg			
Shaft material	Stainless steel 1.4305			
Flange material	AlMgSi			
Housing design	36 mm			
Housing material	AlMgSi			
Cable material	PVC			
Startup torque	0.5 Ncm (+20 °C)			
Operating torque	0.2 Ncm (+20 °C)			
Permissible shaft loading	20 N (axial) 40 N (radial)			
Maximum operating speed	3,000 rpm		10,000 rpm	
Rotor moment of inertia	10 gcm <sup>2</sup>			
Bearing lifetime	1 x 10 <sup>6</sup> revolutions			
Max. angular acceleration	≤ 500,000 rad/s <sup>2</sup>			

## Electrical data

	ACS36-K1K0-K01	ACS36-L1K0-K01	ACM36-K1K0-K01	ACM36-L1K0-K01
Connection type	Cable, radial, 1.5 m			
Operating voltage range	19 V DC ... 33 V DC			
Current consumption	< 80 mA			
Min. load resistance	-	≥ 10 k $\Omega$	-	≥ 10 k $\Omega$
Max. load resistance	≤ 600 $\Omega$	-	≤ 600 $\Omega$	-
Code sequence	CW <sup>1)</sup>			
Reverse polarity protection	✓			
Electrical wiring	3-wire			

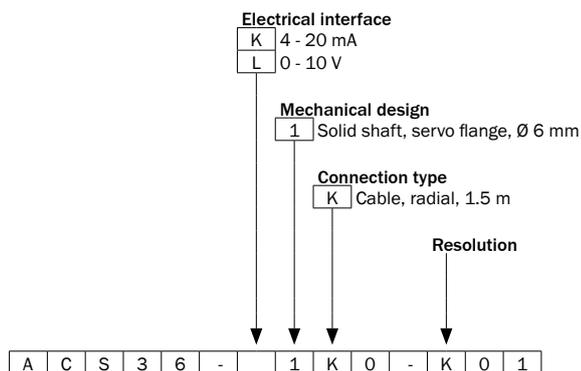
<sup>1)</sup> Factory setting is CW – CCW can be programmed on the encoder

Ambient data

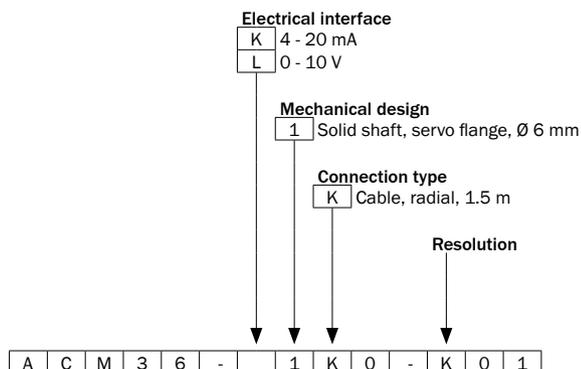
EMC	EN 61000-6-2, EN 61000-6-4
Enclosure rating	IP65
Permissible relative humidity	90%
Operating temperature range	-30 °C ... +80 °C
Storage temperature range	-40 °C ... +100 °C, without packaging
Resistance to shocks	25 g, 11 ms (EN 60068-2-27)
Resistance to vibrations	4 g, 5 Hz ... 100 Hz (EN 60068-2-6)

Type code

Singleturn



Multiturn



Ordering information

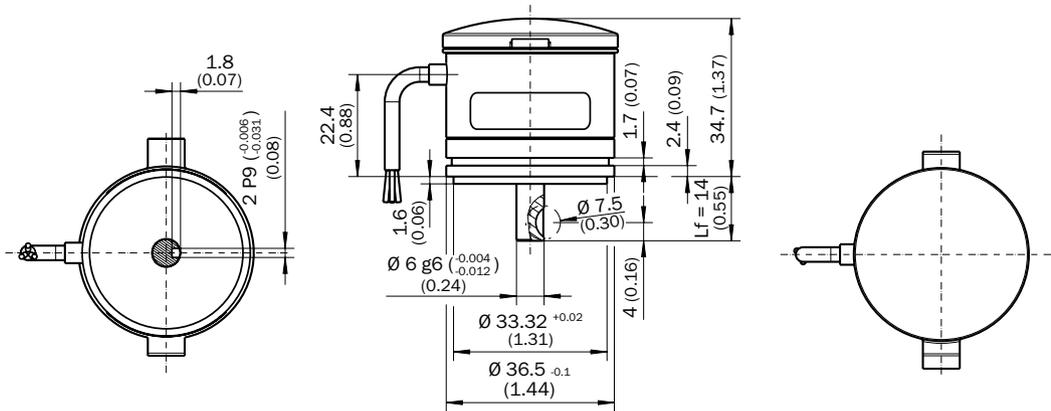
Other device versions available here → [www.mysick.com/en/ACS\\_ACM36](http://www.mysick.com/en/ACS_ACM36)

- **Shaft diameter:** 6 mm, 12.4 mm
- **Connection type:** cable, radial, 1.5 m

Electrical interface	Number of steps	Resolution	Type	Part no.
Analog, 4 mA ... 20 mA	2979	0.09° ... 0.12° <sup>1)</sup>	ACS36-K1K0-K01	6053311
Analog, 0 V ... 10 V	3723	0.09° ... 0.10° <sup>1)</sup>	ACS36-L1K0-K01	6052345
Analog, 4 mA ... 20 mA	2979	0.11° ... 1.93° <sup>1)</sup>	ACM36-K1K0-K01	6039751
Analog, 0 V ... 10 V	3723	0.09° ... 1.55° <sup>1)</sup>	ACM36-L1K0-K01	6039752

<sup>1)</sup> See resolution diagram

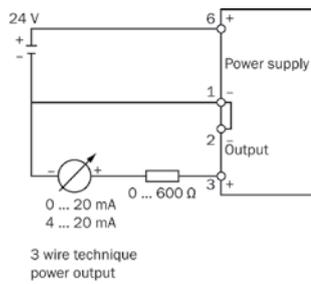
Dimensional drawing (dimensions in mm)



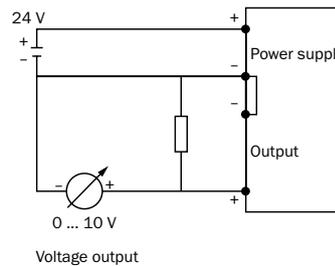
Wire assignment

gn	+24 V
ws	Output
br	0 V

Electrical wiring



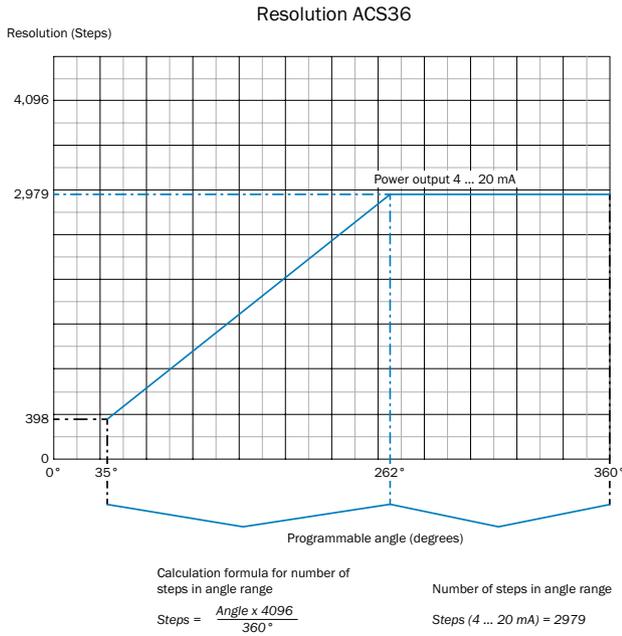
At a supply voltage of 18 V, the internal resistance of the measuring device must not exceed 600 ohm.



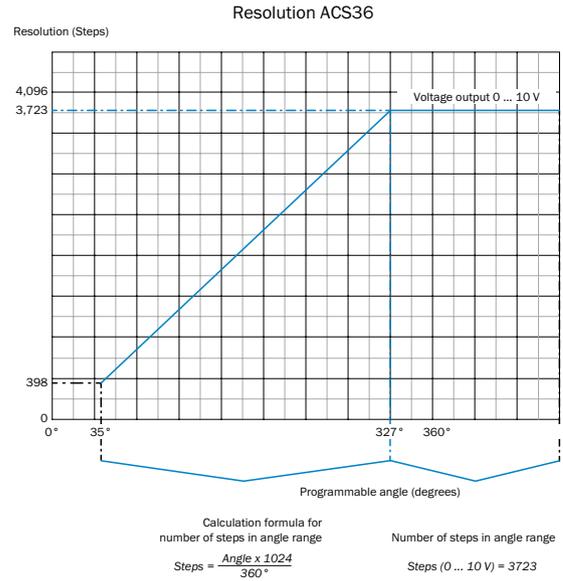
For an accurate measurement, the internal resistance of the measuring device must be equal to 10 kilohm.

## Resolution diagram

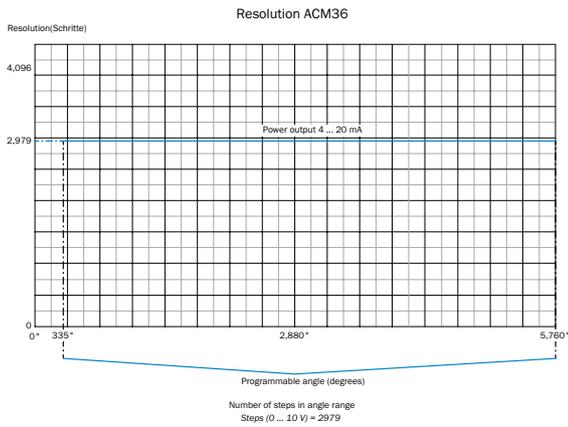
### Singleturn, current output



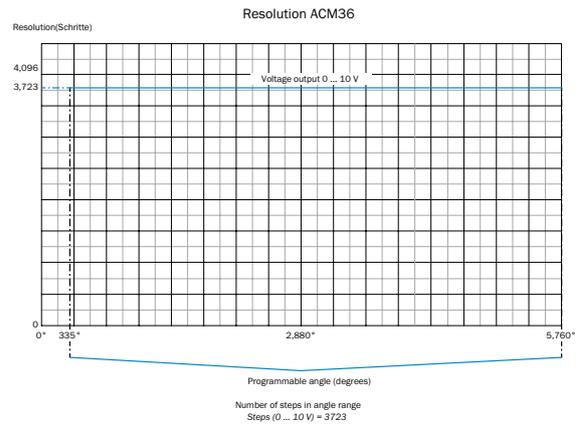
### Singleturn, voltage output



### Multiturn, current output



### Multiturn, voltage output



## Accessories

### Plug connectors and cables

Female connector (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: female connector, M12, 5-pin, straight Head B: -	DOS-1205-G	6009719

Male connector (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: male connector, M12, 5-pin, straight Head B: -	STE-1205-G	6022083

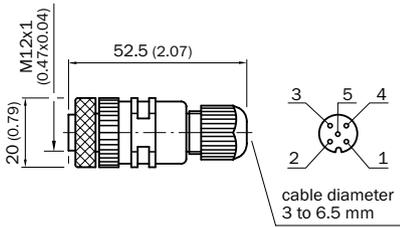
Shaft adaptation

Shaft couplings

Figure	Brief description	Type	Part no.
	Bellows coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial $\pm 0.25$ mm, axial $\pm 0.4$ mm, angular $\pm 4^\circ$ ; max. speed 10,000 rpm, $-30^\circ$ to $+120^\circ$ Celsius, max. torque 80 Ncm; material: stainless steel bellows, aluminum hub	KUP-0606-B	5312981
	Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial $\pm 0.25$ mm, axial $\pm 0.4$ mm, angular $\pm 4^\circ$ ; max. speed 10,000 rpm, $-30^\circ$ to $+120^\circ$ Celsius, max. torque 80 Ncm; material: stainless steel bellows, aluminum hub	KUP-0610-B	5312982
	Spring washer coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial $\pm 0.3$ mm, axial $\pm 0.4$ mm, angular $\pm 2.5^\circ$ ; max. speed 12,000 rpm, $-10^\circ$ to $+80^\circ$ Celsius, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin	KUP-0610-F	5312985

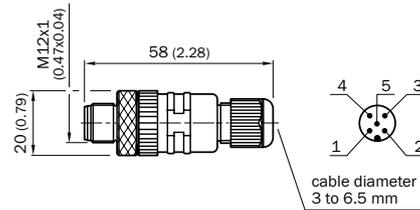
Dimensional drawings for plug connectors and cables: female connectors (ready to assemble)

DOS-1205-G



Dimensional drawings for plug connectors and cables: male connectors (ready to assemble)

STE-1205-G

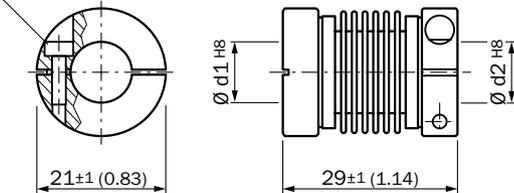


Dimensional drawings for shaft adaptation: shaft couplings

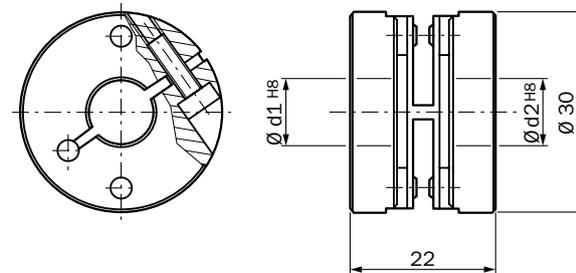
KUP-0606-B

KUP-0610-B

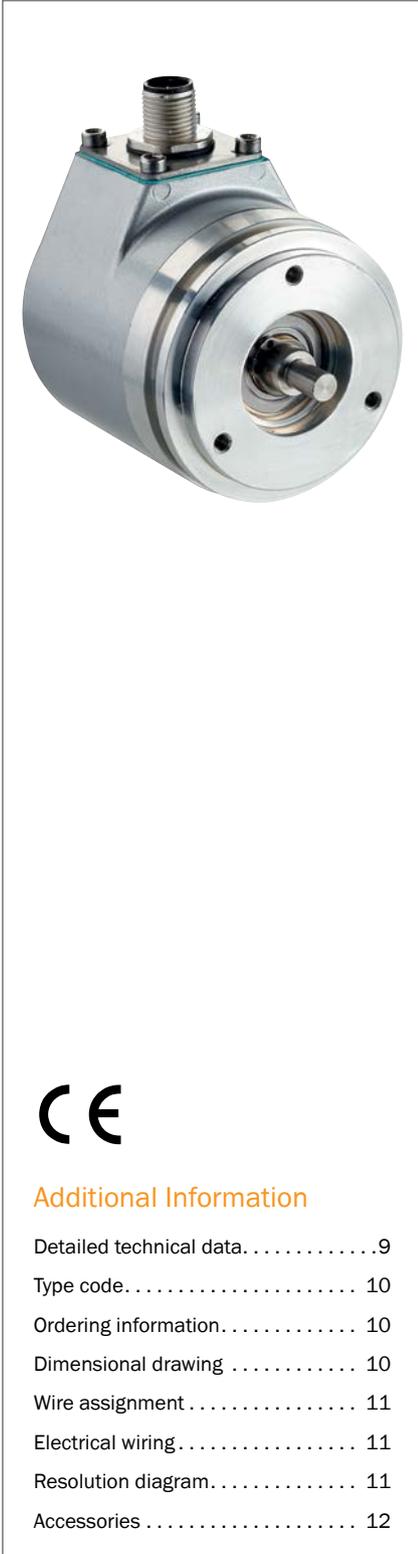
Cheese-head screw  
M2.5 x 8, DIN 912 A2



KUP-0610-F



# COMPACT, UNIVERSAL, INTUITIVE



### Additional Information

Detailed technical data.....9  
 Type code..... 10  
 Ordering information..... 10  
 Dimensional drawing ..... 10  
 Wire assignment..... 11  
 Electrical wiring..... 11  
 Resolution diagram..... 11  
 Accessories ..... 12

### Product description

The ACM60 (multiturn) encoder family has an analog interface with a maximum overall resolution of up to 13107 steps. Using the teach-in function on the membrane keyboard, the measuring range

can be intuitively programmed directly on the device with just a few clicks. A current signal of 4-20 mA or a voltage signal of 0-10 V is output depending on the device version.

### At a glance

- Compact 60 mm absolute encoder with up to 13107 steps
- Servo flange
- Radial connector outlet
- Analog interface 4 to 20 mA or 0 to 10 V
- Programming via keypad on the encoder
- IP 68 protection class
- Operating temperature: -30 °C to +80 °C

### Your benefits

- Intuitive configuration of the measuring range directly on the device using membrane keyboard (teach-in function) saves time and requires no special expertise.
- The compact size (including M12 connection technology) allows the encoder to be used in confined spaces and thus provides greater freedom for development and machine design.
- The analog interfaces (current/voltage) offer a low-cost solution for detecting the position and path, and thereby help to reduce overall system costs.

→ [www.mysick.com/en/ACM60](http://www.mysick.com/en/ACM60)

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



## Detailed technical data

## Performance

	ACM60B-S1KE13x06	ACM60B-S1LE13x06
Number of revolutions	64	
Resolution per measuring step	1.5 ... 8.8 $\mu\text{A}$ <sup>1)</sup>	0.8 ... 5.5 mV <sup>1)</sup>
Measuring range	0° ... 23,040°, programmable	
Minimum measuring range	640°	
Accuracy	± 0.1 %, based on the programmed angle	

<sup>1)</sup> See measuring step diagram/calculation formula for details

## Interfaces

	ACM60B-S1KE13x06	ACM60B-S1LE13x06
Electrical interface	Analog, 4 mA ... 20 mA	Analog, 0 V ... 10 V

## Mechanical data

Length of the shaft	10 mm
Mass	0.4 kg
Shaft material	Stainless steel
Flange material	Aluminum
Housing design	60 mm
Housing material	Aluminum die cast
Start up torque	0.05 Ncm (+20 °C)
Operating torque	0.3 Ncm (+20 °C)
Permissible shaft loading	30 N (axial) 60 N (radial)
Maximum operating speed	10,000 rpm
Rotor moment of inertia	30 gcm <sup>2</sup>
Bearing lifetime	2 x 10 <sup>9</sup> revolutions
Max. angular acceleration	≤ 500,000 rad/s <sup>2</sup>

## Electrical data

	ACM60B-S1KE13x06	ACM60B-S1LE13x06
Connection type	M12 male connector, 5-pin, radial	
Operating voltage range	18 V DC ... 33 V DC	
Current consumption	< 80 mA	
Min. load resistance	–	≥ 10 k $\Omega$
Max. load resistance	≤ 600 $\Omega$	–
Code sequence	CW <sup>1)</sup>	
Reverse polarity protection	✓	
Electrical wiring	3- or 4-wire, see figure	4-wire, see figure

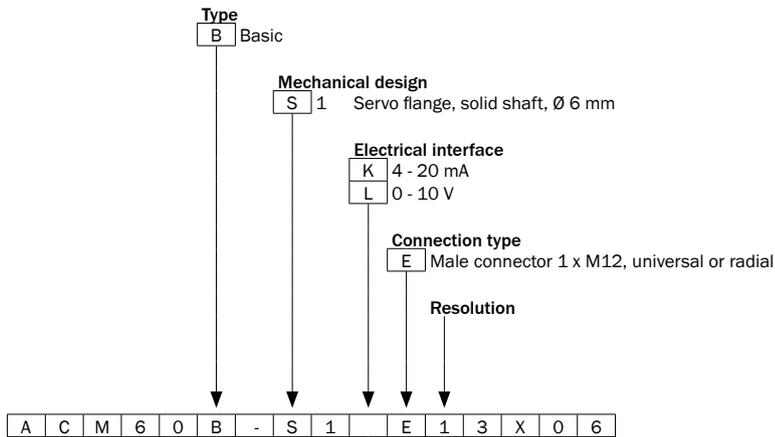
<sup>1)</sup> Factory setting is CW – CCW can be programmed on the encoder

## Ambient data

EMC	EN 61000-6-2, EN 61000-6-4
Enclosure rating	IP 68
Permissible relative humidity	90%
Operating temperature range	–30 °C ... +80 °C

Storage temperature range	-40 °C ... +100 °C, without packaging
Resistance to shocks	25 g, 11 ms (EN 60068-2-27)
Resistance to vibrations	4 g, 5 Hz ... 100 Hz (EN 60068-2-6)

## Type code



## Ordering information

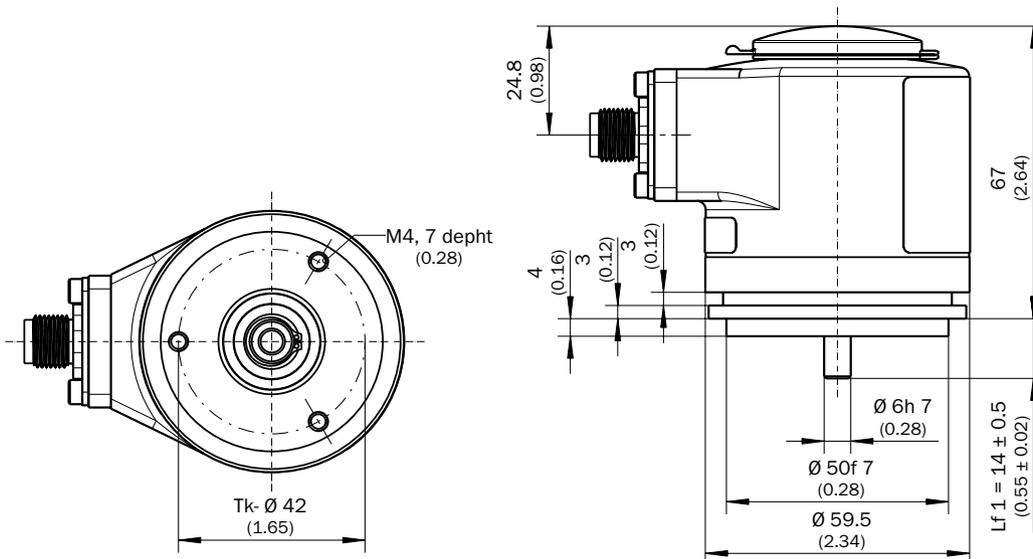
Other device versions available here → [www.mysick.com/en/ACM60](http://www.mysick.com/en/ACM60)

- **Shaft diameter:** 6 mm, 10 mm
- **Connection type:** M12 male connector, 5-pin, radial

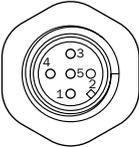
Electrical interface	Number of steps	Resolution	Type	Part no.
Analog, 4 mA ... 20 mA	≤ 10,485	0.35° ... 2.20° <sup>1)</sup>	ACM60B-S1KE13x06	6045312
Analog, 0 V ... 10 V	≤ 13,107	0.35° ... 1.76° <sup>1)</sup>	ACM60B-S1LE13x06	6045313

<sup>1)</sup> See resolution diagram

## Dimensional drawing (dimensions in mm)



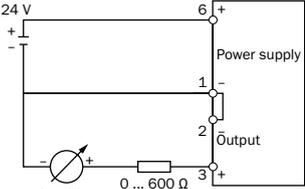
Wire assignment



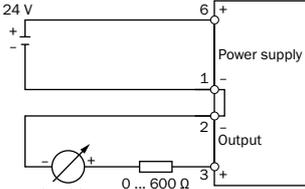
1	GND
2	24 V
3	Output GND
4	Output 4 ... 20 mA
5	n.c.

Electrical wiring

Power output



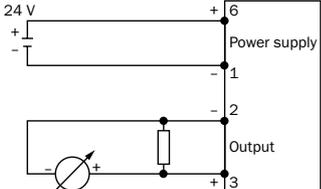
3 wire technique power output



4 wire technique power output

At a supply voltage of 18 V, the internal resistance of the measuring device must not exceed 600 ohm.

Voltage output

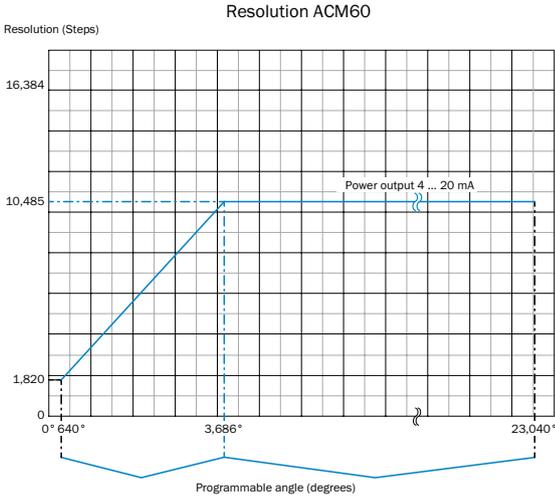


4 wire technique voltage output

For an accurate measurement, the internal resistance of the measuring device must be equal to 10 kilohm.

Resolution diagram

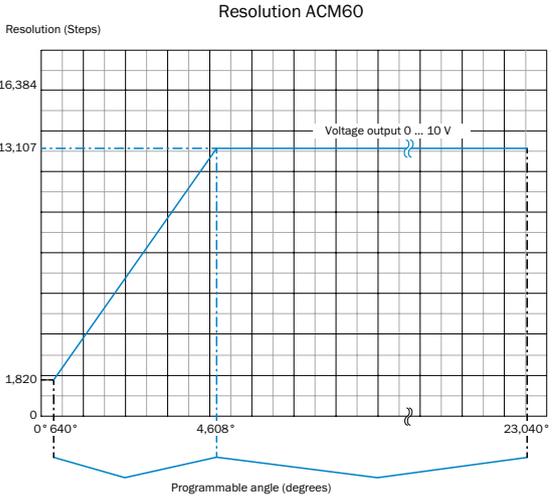
Power output



Calculation formula for number of steps in angle range  

$$\text{Steps} = \frac{\text{Angle} \times 1024}{360^\circ}$$
 Number of steps in angle range  
 Steps (0 ... 10 V) = 10485

Voltage output



Calculation formula for number of steps in angle range  

$$\text{Steps} = \frac{\text{Angle} \times 1024}{360^\circ}$$
 Number of steps in angle range  
 Steps (0 ... 10 V) = 13107

Accessories

Plug connectors and cables

Connecting cables with female connector

Figure	Brief description	Type	Part no.
	Head A: female connector, M12, 5-pin, straight, A-coded Head B: cable Cable: analog, suitable for drag chain, PUR, halogen-free, shielded, 1.5 m	DOL-1205-G1M5ACSCO	6049451
	Head A: female connector, M12, 5-pin, straight, A-coded Head B: cable Cable: analog, suitable for drag chain, PUR, halogen-free, shielded, 3 m	DOL-1205-G03MACSCO	6049452
	Head A: female connector, M12, 5-pin, straight, A-coded Head B: cable Cable: analog, suitable for drag chain, PUR, halogen-free, shielded, 5 m	DOL-1205-G05MACSCO	6049453
	Head A: female connector, M12, 5-pin, straight, A-coded Head B: cable Cable: analog, suitable for drag chain, PUR, halogen-free, shielded, 10 m	DOL-1205-G10MACSCO	6049454
	Head A: female connector, M12, 5-pin, angled, A-coded Head B: cable Cable: analog, suitable for drag chain, PUR, halogen-free, shielded, 1.5 m	DOL-1205-W1M5ACSCO	6049455
	Head A: female connector, M12, 5-pin, angled, A-coded Head B: cable Cable: analog, suitable for drag chain, PUR, halogen-free, shielded, 3 m	DOL-1205-W03MACSCO	6049456
	Head A: female connector, M12, 5-pin, angled, A-coded Head B: cable Cable: analog, suitable for drag chain, PUR, halogen-free, shielded, 5 m	DOL-1205-W05MACSCO	6049457
	Head A: female connector, M12, 5-pin, angled, A-coded Head B: cable Cable: analog, suitable for drag chain, PUR, halogen-free, shielded, 10 m	DOL-1205-W10MACSCO	6049458

Female connector (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: female connector, M12, 5-pin, straight Head B: -	DOS-1205-G	6009719

Male connector (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: male connector, M12, 5-pin, straight Head B: -	STE-1205-G	6022083

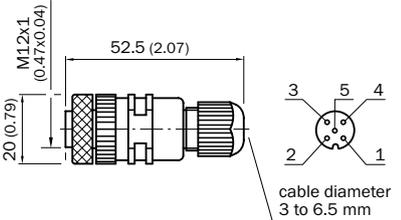
Shaft adaptation

Shaft couplings

Figure	Brief description	Type	Part no.
	Bellows coupling, shaft diameter 6 mm / 6 mm	KUP-0606-B	5312981
	Bellows coupling, shaft diameter 6 mm / 10 mm	KUP-0610-B	5312982
	Spring washer coupling, shaft diameter 6 mm / 10 mm	KUP-0610-F	5312985

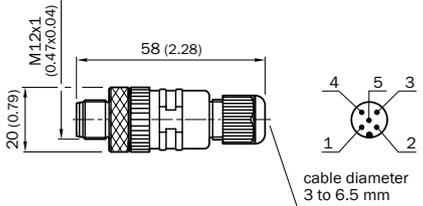
Dimensional drawings for plug connectors and cables: female connectors (ready to assemble)

DOS-1205-G



Dimensional drawings for plug connectors and cables: male connectors (ready to assemble)

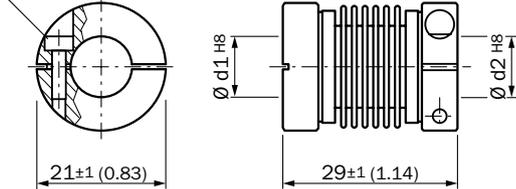
STE-1205-G



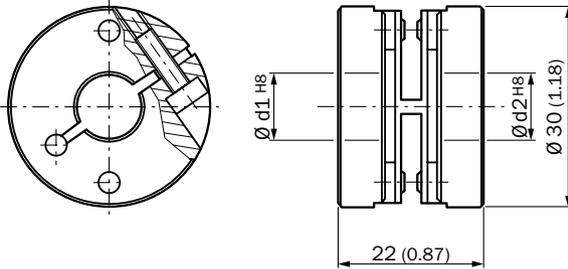
Dimensional drawings for shaft adaptation: shaft couplings

KUP-0606-B  
KUP-0610-B

Cheese-head screw  
M2.5 x 8, DIN 912 A2



KUP-0610-F





## REGISTER NOW AT WWW.SICK.COM AND ENJOY ALL THE BENEFITS

- Select products, accessories, documentation and software simply and quickly.
- Create, save and share personalized wish lists.
- See the net price and delivery date for each product.
- Simple quote request, ordering and delivery tracking.
- Overview of all quotes and orders.
- Direct ordering: even large orders can be placed quickly.
- View the status of quotes and orders at any time. Notification by e-mail in the event of status changes.
- Easily reuse previous orders.
- Convenient export of quotes and orders in the right format for your systems.



## SERVICES FOR MACHINES AND SYSTEMS: SICK LifeTime Services

The sophisticated and versatile LifeTime Services from SICK are the perfect complement to our extensive product lineup. Available services range from product-independent consultations to traditional product service offerings.



-  **Consulting and design**  
Secure and professional
-  **Product and system support**  
Reliable, fast and on-site
-  **Verification and optimization**  
Safe and regularly inspected
-  **Upgrade and retrofits**  
Simple, safe and economical
-  **Training and education**  
Practical, focused and professional

## SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With almost 7,000 employees and over 50 subsidiaries and equity investments as well as numerous representative offices worldwide, we are always close to our customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services round out our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

**For us, that is “Sensor Intelligence.”**

### **Worldwide presence:**

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and additional representatives → [www.sick.com](http://www.sick.com)