Product data sheet

ARS60-F4R03600

ARS60

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.

Illustration may differ

Ordering information

Type	Part no.
ARS60-F4R03600	1031599

Other models and accessories → www.sick.com/ARS60

Detailed technical data

Performance

Number of steps per revolution (max. resolution)	3,600
Measuring step	360° /number of steps
Measuring step deviation	0.016° non-binary number of steps
Error limits G	0.046° (non-binary number of steps) [1]
Repeatability standard deviation σ_r	0.005° [2]

[1] In accordance with DIN ISO 1319-1, position of the upper and lower error limit depends on the installation situation, specified value refers to a symmetrical position, i.e. deviation in upper and lower direction is the same.
[2] In accordance with DIN ISO 55350-13; 68.3% of the measured values are inside the specified area.

Interfaces

Communication interface	Parallel data world
Initialization time	80 ms [1]
Code type	Gray
Code sequence parameter adjustable	CW (clockwise) increasing when viewing the clockwise rotating shaft
Measured value backlash	0.005°
Response threshold	0.003°

[1] Valid positional data can be read once this time has elapsed.

Electrical data

Connection type	Cable, 22-wire, axial, 1.5 m
Supply voltage	10 ... 32 V
Operating current	Typ. 90 mA
MTTFd: mean time to dangerous failure	300 years (EN ISO 13849-1) [1]
Switching level of control inputs	Logic H = 0.7 x U_S, Logic L = 0 V ... 0.3 x U_S
Actuation of set button	≥ 100 ms [2]

[1] This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40 °C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.
[2] Only with shaft stationary (note initialisation time).

Mechanical data

Mechanical design	Solid shaft, face mount flange
Shaft diameter	10 mm
Shaft length	19 mm
Weight	Approx. 0.3 kg [1]
Housing material	Aluminum die cast
Start up torque	Typ. 0.4 Ncm
Operating torque	Typ. 0.3 Ncm
Permissible shaft loading	20 N (radial) 10 N (axial)
Operating speed	≤ 6,000 min^{-1} with shaft seal ≤ 10,000 min^{-1} without shaft seal [2]
Moment of inertia of the rotor	54 gcm^2
Bearing lifetime	3.6 x 10^9 revolutions
Angular acceleration	≤ 500,000 rad/s^2

[1] Based on devices with male connector.
[2] If the shaft seal has been removed by the customer.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3 [1]
Enclosure rating	IP66, cable (IEC 60529)
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	–20 °C ... +85 °C
Storage temperature range	–40 °C ... +100 °C, without package
Resistance to shocks	50 g, 11 ms (EN 60068-2-27)
Resistance to vibration	20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

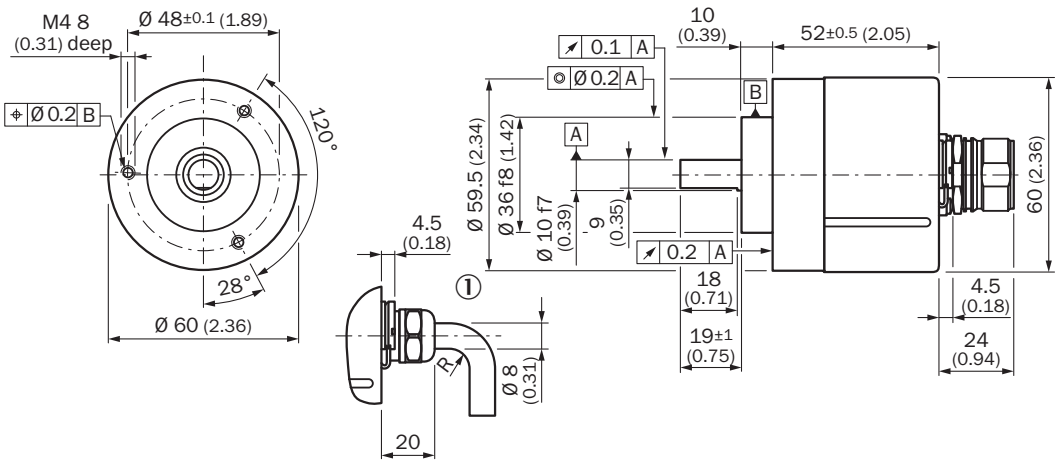
[1] EMC according to the standards quoted is achieved if shielded cables are used.

Classifications

ECLASS 5.0	27270502
ECLASS 5.1.4	27270502
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270502
ECLASS 8.0	27270502
ECLASS 8.1	27270502
ECLASS 9.0	27270502
ECLASS 10.0	27270502
ECLASS 11.0	27270502
ECLASS 12.0	27270502
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486

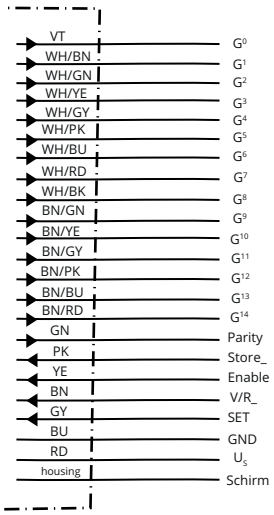
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing (Dimensions in mm (inch))



General tolerances according to DIN ISO 2768-mk
① R = min. bending radius 40 mm

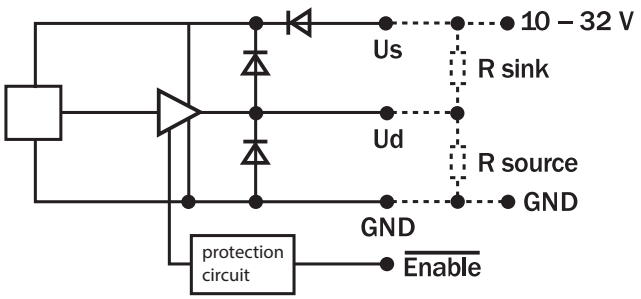
PIN assignment



PIN	Wire colors (cable connection)	Signal Binary	Signal Gray	Signal BCD	
1	Violet	2^0	G^0	2^0 v. 10^0	
2	White/brown	2^1	G^1	2^1 v. 10^0	
3	White/green	2^2	G^2	2^2 v. 10^0	
4	White/yellow	2^3	G^3	2^3 v. 10^0	
5	White/grey	2^4	G^4	2^0 v. 10^1	

PIN	Wire colors (cable connection)	Signal Binary	Signal Gray	Signal BCD	
6	White/pink	2^5	G^5	2^1 v. 10^1	
7	White/blue	2^6	G^6	2^2 v. 10^1	
8	White/red	2^7	G^7	2^3 v. 10^1	
9	White/black	2^8	G^8	2^0 v. 10^2	
10	Brown/green	2^9	G^9	2^1 v. 10^2	
11	Brown/yellow	2^{10}	G^{10}	2^2 v. 10^2	
12	Brown/gray	2^{11}	G^{11}	2^3 v. 10^2	
13	Brown/pink	2^{12}	G^{12}	2^0 v. 10^3	
14	Brown/blue	2^{13}	G^{13}	2^1 v. 10^3	
15	Brown/red	2^{14}	G^{14}	2^2 v. 10^3	
16	Green	Parity	Parity		
17	Pink	Store			
18	Yellow	Enable			
19	Brown	CW/CCW (V/R)			
*	Gray	SET			
20	Blue	GND			
21	Red	U_S			

Diagrams



Recommended accessories

Other models and accessories ➜ www.sick.com/ARS60

	Brief description	Type	Part no.
Flanges			
	Flange adapter, adaptation of face mount flange with 36 mm centering hub to 50 mm servo flange, aluminum, including 3 flat head screws M4 x 10, Aluminum, including 3 countersunk screws M3 x 10	BEF-FA-036-050	2029160

	Brief description	Type	Part no.
	Flange adapter, adaptation of face mount flange with 36 mm centering hub to 60 mm square mounting plate, aluminum, including 3 flat head screws M4 x 8, Aluminum, including 3 countersunk screws M4 x 8	BEF-FA-036-060REC	2029162
	Flange adapter, adaptation of face mount flange with 36 mm centering hub to 58 mm square mounting plate with shock absorbers, aluminum, Aluminum	BEF-FA-036-060RSA	2029163
	Flange adapter, adaptation of face mount flange with 36 mm centering hub to 100 mm servo flange with 60 mm centering hub, aluminum, Aluminum	BEF-FA-036-100	2029161
Mounting brackets and plates			
	Mounting bracket for encoder with spigot 36 mm for face mount flange, mounting kit included	BEF-WF-36	2029164
Shaft adaptation			
	Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial ± 0.25 mm, axial ± 0.4 mm, angular +/- 4°; max. speed 10,000 rpm, –30 °C to +120 °C, max. torque 120 Ncm; material: stainless steel bellows, aluminum hub	KUP-0610-B	5312982
	Spring washer coupling, shaft diameter 6 mm / 10 mm, Maximum shaft offset: radial +/- 0.3 mm, axial +/- 0.4 mm, angular +/- 2.5°; max. speed 12,000 rpm, –10° to +80 °C, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin	KUP-0610-F	5312985
	Bellows coupling, shaft diameter 10 mm/10 mm; maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4°; max. revolutions 10,000 rpm, –30° to +120 °C, max. torque 120 Ncm; material: stainless steel bellows, aluminum clamping hubs	KUP-1010-B	5312983
	Spring washer coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset, radial ± 0.3 mm, axial ± 0.4 mm, angle ± 2.5°, torsion spring stiffness 30 Nm/rad; material: aluminum flange, glass-fiber reinforced polyamide membrane and hardened steel coupling pin	KUP-1010-F	5312986
	10 mm / 12 mm; maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4°; max. revolutions 10,000 rpm, –30° to +120 °C, max. torque 120 Ncm; material: stainless steel bellows, aluminum clamping hubs	KUP-1012-B	5312984
Others			
	• **Connection type head A:** Flying leads • **Connection type head B:** Flying leads • **Signal type:** Parallel • **Items supplied:** By the meter • **Cable:** 22-wire, PUR, halogen-free • **Description:** Parallel, shielded	LTG-2622-MW	6027532

SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. 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 a wide range of 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 complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

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