



MOTOR FEEDBACK SYSTEMS



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Ordering information

Туре	Part no.
EKS36-2KF0A0S13	1081628

M3 mounting screws for stator coupling not included with delivery.

Other models and accessories → www.sick.com/EKS_EKM36

Illustration may differ



Detailed technical data

Features

Special device	✓
Specialty	High impedance capacitive connection between encoder housing and encoder GND Possibility to connect cable shield to housing potential on PIN4 of DSL connector
Standard reference device	EKS36-2KF0A018A, 1054315
Items supplied	M3 mounting screws for stator coupling not included with delivery.

Safety-related parameters

Safety integrity level	Safe increment SIL2 (IEC 61508), SILCL2 (EN 62061) $^{1)}$	
Category	3 (EN ISO 13849)	
Test rate	1 h	
Maximum demand rate	216 µs	
Performance level	PL d (EN ISO 13849)	
Safety-related resolution	Channel 1 = 18 bit or 20 bit, channel 2 = 9 bit	
PFH (mean probability of a dangerous fail- ure per hour)	4 x 10 ^{-8 2)}	
T _M (mission time)	20 years (EN ISO 13849)	
$\mathrm{MTTF}_{\mathrm{D}}$ (mean time to dangerous failure)	500 years (EN ISO 13849)	

¹⁾ For more detailed information on the exact configuration of your machine/unit, please consult your relevant SICK branch office.

 $^{2)}$ The values displayed apply to a diagnostic degree of coverage of 90%, which must be achieved by the external drive system.

Performance

Position	
Resolution per revolution	18 bit
System accuracy	± 120 ″
Signal noise (ơ)	± 5 " (See "signal noise" and "attenuation" diagrams)
Number of the absolute ascertainable revolu- tions	
Available memory area	8,192 Byte
Measurement step per revolution	262,144
Measurement principle	Optical

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Interfaces

Type of code for the absolute value	Binary	
Code sequence	Increasing, when turning the shaft For clockwise rotation, looking in direction "A" (see dimensional drawing)	
Communication interface	HIPERFACE DSL [®]	
Initialization time	Max. 500 ms ¹⁾	
Measurement external temperature resis- tance	32 bit value, without prefix (1 Ω) 0 209.600 Ω At -40 °C +160 °C: NTC +-2K; PTC+-3K	

¹⁾ From reaching a permitted operating voltage.

Electrical data

Connection type	Male connector, 4-pin
Supply voltage	7 V 12 V
Warm-up time voltage ramp	Max. 180 ms ¹⁾
Recommended supply voltage	8 V
Current consumption	\leq 150 mA (See current consumption diagram) ²⁾
Output frequency for the digital positionval- ue	0 kHz 75 kHz

 $^{(1)}$ Duration of voltage ramp between 0 and 7.0 V.

 $^{2)}$ Current rating applies when using interface circuit suggestions as shown in HIPERFACE DSL $\ensuremath{ interface}$ manual (8017595).

Mechanical data

Shaft version	Tapered shaft	
Dimensions	See dimensional drawing	
Weight	0.1 kg	
Moment of inertia of the rotor	4.5 gcm ²	
Operating speed	≤ 12,000 min ⁻¹	
Angular acceleration	≤ 500,000 rad/s²	
Operating torque	0.2 Ncm	
Start up torque	0.3 Ncm	
Permissible movement static	± 0.1 mm radial	
Permissible movement dynamic	± 0.05 mm radial ± 0.1 mm axial	
Life of ball bearings	3.6 x 10^9 revolutions	
Ambient data		
Operating temperature range	-20 °C +115 °C ¹⁾	

Storage temperature range	-40 °C +125 °C ²⁾
Relative humidity/condensation	90 %, Condensation not permitted
Resistance to shocks	100 g, 6 ms (according to EN 60068-2-27)

1) Given typical thermal connection between motor flange and encoder stator coupling. The max. internal sensor temperature may not exceed 125 °C.

²⁾ Without package.

³⁾ The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen. The GND-(0 V) connection of the supply voltage is also grounded here. If other shielding concepts are used, users must perform their own tests.

 $^{\rm 4)}$ With mating connector inserted and closed cover.

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Frequency range of resistance to vibrations	50 g, 10 Hz 2,000 Hz (EN 60068-2-6)
EMC	According to EN 61000-6-2, EN 61000-6-4 and IEC 61326-3 $^{3)}$
Enclosure rating	IP40, with mating connector inserted and closed cover (IEC 60529-1) $^{ m 4)}$

¹⁾ Given typical thermal connection between motor flange and encoder stator coupling. The max. internal sensor temperature may not exceed 125 °C.

²⁾ Without package.

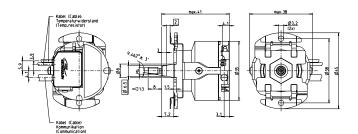
³⁾ The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen. The GND-(0 V) connection of the supply voltage is also grounded here. If other shielding concepts are used, users must perform their own tests.

 $^{\rm 4)}$ With mating connector inserted and closed cover.

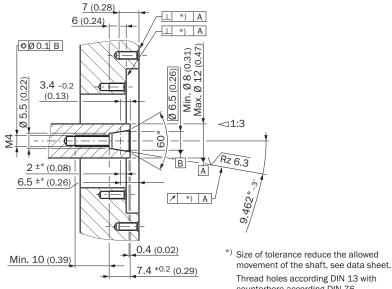
Classifications

ECLASS 5.0	27270590
ECLASS 5.1.4	27270590
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270590
ECLASS 8.0	27270590
ECLASS 8.1	27270590
ECLASS 9.0	27270590
ECLASS 10.0	27273805
ECLASS 11.0	27273901
ECLASS 12.0	27273901
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))



Attachment specifications



Thread holes according DIN 13 with counterbore according DIN 76 min. 1.05 x diameter of thread.

① Nominal position

② The size of the tolerance reduces the permissible wave movement, see data sheet

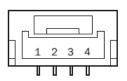
③ Threaded holes in accordance with DIN 13 with recesses in accordance with DIN 76 min. 1.05 x thread diameter

PIN assignment

Temperature sensor pin assignment

0	0
2	1

PIN	Signal	Explanation
1		Not Connected
2	+Us/DSL+	Power supply/DSL-Data
3	GND/DSL-	Ground connection/DSL-Data
4	Housing	Cable Shield



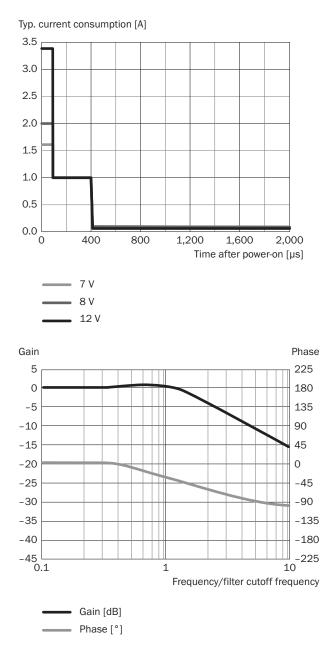
Recommended outer diameter of stranded cable: 4 mm +0/-0.3 recommended mating connector: JST (GHR-04V-S)

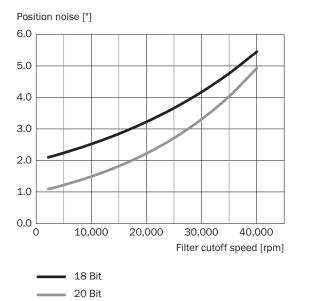
PIN	Signal	Explanation
1	T+	Thermistor connection
2	T-	Thermistor connection (to ground)
Recommended outer diameter of set of stranded wires: 2.2 mm ± 0.1 mm		

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Diagrams





Signal noise is measured as 1 standard deviation (σ) of the value distribution. Position filter cutoff speed is set by ressource 10Ah, see page 11.

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Adjustments

Supported resources for HIPERFACE DSL®

RID	Name	time overrun [ms]	Description
0x000	ROOT	75	Top node of ressource tree (all nodes reachable from here)
0x001	IDENT	75	Node with pointers to all identification ressources
0x002	MONITOR	75	Node with pointers to all monitoring ressources
0x003	ADMIN	75	Node with pointers to all administration ressources
0x004	COUNTER	75	Node with pointers to all counter ressources
0x005	DATA	75	Node with pointers to all user file ressources
0x006	SENSHUB	75	Node with pointers to all SensorHub ressources
0x080	ENCTYPE	255	Base functionality of encoder
0x081	RESOLUTN	255	Number of steps per turn
0x082	RANGE	255	Number of encoded revolutions
0x083	TYPECODE	255	Type name of encoder
0x084	SERIALNO	255	Serial no of encoder
0x085	FWREVNO	70	Firmware and hardware revision of encoder
0x086	FWDATE	70	Firmware date of encoder
0x087	EESIZE	255	Total amount of memory for user files
0x089	VPOS2RES	255	Number of steps per turn (DSL Safe Position 2)
0x0c0	TEMPRNG	255	Min and max allowed ambient temperature of encoder
0x0c1	TEMPRTUR	70	Actual ambient temperature of encoder
0x0c2	LEDRANGE	255	Min and max allowed LED current of encoder
0x0c3	LEDCURR	70	Actual LED current of encoder
0x0c4	SUPRANGE	255	Min and max allowed supply voltage of encoder
0x0c5	SUPVOLT	70	Actual supply voltage of encoder
0x0c6	SPEEDRNG	255	Max allowed shaft speed of encoder
0x0c0	SPEED	70	Actual shaft speed of encoder
0x0c7	ACCRANGE	255	Max allowed shaft acceleration of encoder
0,000	ACCIAINCE	233	Operating time and total shaft turns of encoder. For safety variants
0x0cb	LIFETIME	70	also remaining mission time is indicated.
0x0cc	ERRORLOG	195	Stored error messages of encoder
0x0cd	HISTOGRM	70	Usage history of encoder in histogram form
0x0d5	ERRLOGFI	255	Filters the error log entries
0x100	RESET	255	Reset or shutdown of encoder
0,100	RESET	255	Set encoder position to arbitrary preset value. Offset of position
0x101	SETPOS	255	can be read back.
0x104	SETACCES	70	Set or read back access level
0x105	CHNGEKEY	255	Change password for access level
0x107	UWARNING	255	Set or read back user-defined warning boundaries
0x108	FACRESET	255	Reset user settings of encoder to factory defaults
0x109	ENCIDENT	255	Set or read back user-defined encoder index (for multi-axis systems)
0x10a	POSFILT	255	Set or read back position filter settings
0x112	LOCKINTU	255	Possibility to lock/unlock internal access levels
0x11d	FEATURES	90	Set or read back encoder features
0x11f	BOOTLOAD	255	Bootloader access for end user (planned)
0x120	READCNT	140	Read user counter value
0x121	INCCOUNT	140	Increment user counter value
0x122	RESETCNT	140	Reset user counter value
0x130	LOADFILE	255	Load user file
0x131	RWFILE	255	Read from or write to user file
0x132	FILESTAT	70	Read status of user file
0x132	MAKEFILE	255	Create, change or delete user file
0x133	DIR	130	Read directory of accessible user files
0x134	FILEBACK	255	Set or read back status of user file backup
0x130	ACCESSIO	70	Access to simple I/Os connected directly to encoder
0x200	MANAGEIO	255	Manage simple I/Os
0/201		200	Manage simple i Os

Operation note

Overview of warnings and fault indications

Position (incremental)00h0A Protocol reset was executed00h1Acceleration verflow, invalid position00h2Test running00h6Internal error in angular tracking, invalid position00h6Internal error in position counce, invalid position00h6Internal error in position counce, invalid position00h7Internal error in position counce, invalid position00h7Internal error in position counce, invalid position00h7Internal error in absolute position in several rotations01h0Error 1 in absolute position in several rotations01h1Position coss check error (only safety versions)01h3Error 3 in absolute position in several rotations01h4Position cross check error (only safety versions)02h0Switch-on self-test undertaken (only safety versions)02h1Warning safety parameter: error could not be rectified (only safety versions)02h2Internal communications error 102h3Error calibration data02h4Internal communications error 202h6Internal error03h1Critical temperature03h3Critical collection03h4Critical collection03h5Critical collection03h6Internal error during resource access03h6Internal controret acces field03h6Internal er	Error type	Error register	Error bit	Description	
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resources04h2Internal error during resoure access04h3Error when accessing a user file07h0User-defined warning 0User defined07h1User-defined warning 1Warnings07h2User-defined warning 2		04h	0	Invalid argument given during resource access procedure	
O4h3Error when accessing a user file04h0User-defined warning 0User defined07h1User-defined warning 1Warnings07h2User-defined warning 2		04h	1	Resource access refused due to incorrect access level	
O7hOUser-defined warning 0User defined07h1User-defined warning 1Warnings07h2User-defined warning 2		04h	2	Internal error during resoure access	
User defined07h1User-defined warning 1Warnings07h2User-defined warning 2		04h	3	Error when accessing a user file	
User defined07h1User-defined warning 1Warnings07h2User-defined warning 2		07h	0	User-defined warning 0	
Warnings 07h 2 User-defined warning 2	User defined	07h	1	-	
07h 3 User-defined warning 3	Warnings	07h	2	-	
		07h	3	User-defined warning 3	

Supported access levels

Access level	User	Standard access key
0	Execute (default setting)	0000 (30 30 30 30h)
1	Bediener	1111 (31 31 31 31h)
2	Wartung	2222 (32 32 32 32h)
3	Berechtigter Client	3333 (33 33 33 33h)
4	Benutzerservice	4444 (34 34 34 34h)

MOTOR FEEDBACK SYSTEMS

Recommended accessories

Other models and accessories → www.sick.com/EKS_EKM36

	Brief description	Туре	Part no.		
Other mounting accessories					
	Mounting tools	BEF-MW-EKX36	2060224		
Others					
	 Connection type head A: Female connector, stranded wire, 2-pin, straight Connection type head B: Flying leads Signal type: HIPERFACE DSL[®] Cable: 0.2 m, 2-wire Description: HIPERFACE DSL[®], twisted, unshielded 	DOL-0B02-G0M2XC1	2062083		
		DOL-0B02-G0M4XC1	2086286		
$\langle \cdot \rangle$		DOL-0B03-G0M4XC1	2087314		
		DOL-0B02-G0M3XC1	2091818		
		DOL-0B02-G0M3AC2	2108944		

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."

WORLDWIDE PRESENCE:

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Online data sheet

