Product data sheet

# EDM35-0KF0A0S02

EDS/EDM35

MOTOR FEEDBACK SYSTEMS

SICK
Sensor Intelligence.

Illustration may differ

## Ordering information

| Type | Part no. |
|---|---|
| EDM35-0KF0A0S02 | 1134471 |

M3 mounting screws for stator coupling not included with delivery.

Other models and accessories ➜ www.sick.com/EDS_EDM35

## Detailed technical data

### Features

| | |
|---|---|
| **Special device** | ✓ |
| **Specialty** | Customer specific hollow shaft, without stator coupling [1]<br>Max. force on the ball bearings radial: 40 N<br>Max. force on the ball bearings axial: 20 N<br>Minimum order quantity 40 pcs. |
| **Standard reference device** | EDM35-0KF0A020A, 1090709 |
| **Items supplied** | M3 mounting screws for stator coupling not included with delivery. |

[1] The max. force on the ball bearing is 40 N radial and 20 N in axial direction.Furthermore our validation test regarding shock and vibration are based on mounting an encoder with our standard stator coupling, so the usability in the application needs to be evaluated and tested by TG drives.

### Safety-related parameters

| | |
|---|---|
| **$MTTF_D$ (mean time to dangerous failure)** | 145 years (EN ISO 13849) [1] |

[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 60 °C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

### Performance

| | |
|---|---|
| **Position** | |
| Resolution per revolution | 20 bit |
| System accuracy | ± 80 ″ [1] |
| Signal noise (σ) | ± 3 ″ [2] |
| Number of the absolute ascertainable revolutions | 4,096 |
| Available memory area | 8,192 Byte |
| Measurement principle | Optical |

[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] Repeatability standard deviation in accordance with DIN 1319-1:1995.

### Interfaces

| | |
|---|---|
| **Code sequence** | Increasing, when turning the shaft For clockwise rotation, looking in direction “A” (see dimensional drawing) |

[1] From reaching a permitted operating voltage.

[2] Without sensor tolerance; at –40 °C ... +160 °C: NTC +-2K; PTC+-3K (KTY84-130/PT1000). For additional conversion function of PT1000 to KTY84/130, see technical description.

| | |
|---|---|
| **Communication interface** | HIPERFACE DSL® |
| **Initialization time** | ≤ 500 ms [1] |
| **Measurement external temperature resistance** | 32-bit value, without prefix (1 Ω) 0 ... 209.600 Ω [2] |

[1] From reaching a permitted operating voltage.
[2] Without sensor tolerance; at –40 °C ... +160 °C: NTC +-2K; PTC+-3K (KTY84-130/PT1000). For additional conversion function of PT1000 to KTY84/130, see technical description.

## Electrical data

| | |
|---|---|
| **Connection type** | Male connector, 4-pin |
| **Supply voltage** | 7 V ... 12 V |
| **Warm-up time voltage ramp** | Max. 180 ms [1] |
| **Current consumption** | ≤ 150 mA [2] |

[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 ® manual (8017595).

## Mechanical data

| | |
|---|---|
| **Shaft version** | Customer specific hollow shaft |
| **Flange type / stator coupling** | Stator coupling |
| **Dimensions** | See dimensional drawing |
| **Weight** | ≤ 100 g |
| **Moment of inertia of the rotor** | 5 gcm² |
| **Operating speed** | ≤ 9,000 min⁻¹ |
| **Angular acceleration** | ≤ 250,000 rad/s² |
| **Start up torque** | ≤ 0.6 Ncm, +20 °C |
| **Permissible movement static** | ± 1 mm axial [1] |
| **Permissible movement dynamic** | ± 0.1 mm radial |
| **Life of ball bearings** | 50,000 h at 6,000 min$^{-1}$ (at a flange temperature of 70 °C) |

[1] Temperature expansion, mechanical attachment.

## Ambient data

| | |
|---|---|
| **Operating temperature range** | –40 °C ... +115 °C [1] |
| **Storage temperature range** | –40 °C ... +125 °C, without package |
| **Relative humidity/condensation** | 90 %, Condensation not permitted |
| **Resistance to shocks** | 100 g, 6 ms (according to EN 60068-2-27) |
| **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 [2] |
| **Enclosure rating** | IP40, When cover is closed and mating connector is attached (IEC 60529-1) |

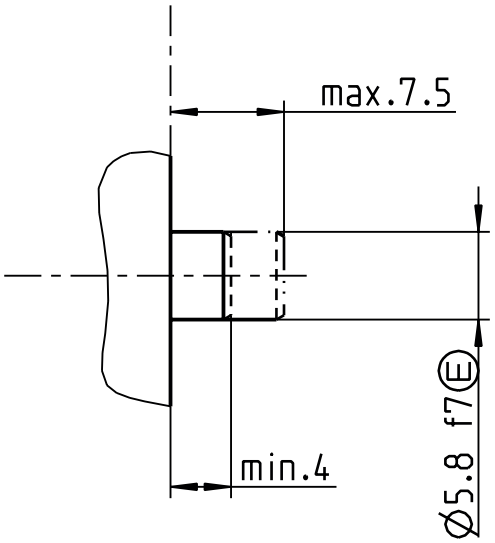
[1] Given typical thermal connection between motor flange and encoder stator coupling. The max. internal sensor temperature may not exceed 125 °C.
[2] According to the listed standards, EMC is guaranteed if the motor feedback system with mating connector inserted is connected to the central grounding point of the motor controller via a cable shield. If other shielding concepts are used, users must perform their own tests. Class A device.

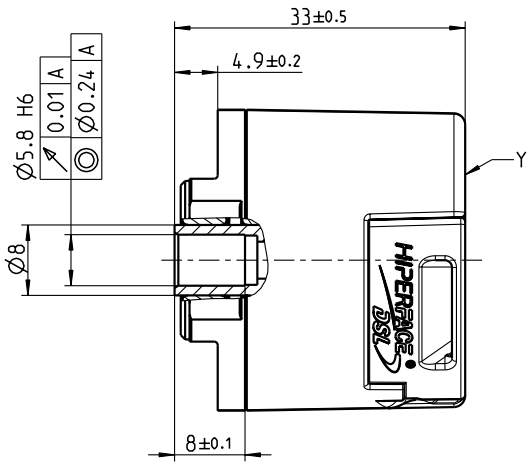
## Classifications

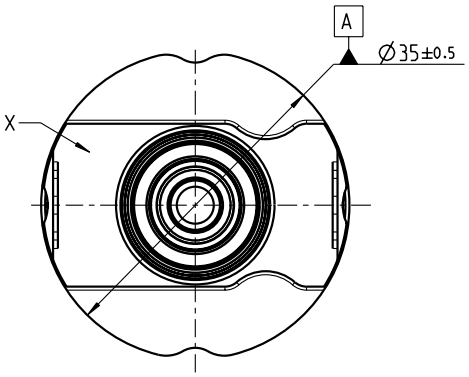
| | |
|---|---|
| **ECLASS 5.0** | 27270590 |
| **ECLASS 5.1.4** | 27270590 |

| | |
|---|---|
| **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))



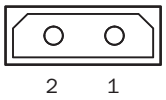



X = Messpunkt für Arbeitstemperatur
Measuring point for operaiting temperatur
Y = Messpunkt für Vibrationen
Measuring point for vibrations

## PIN assignment

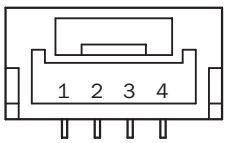
Temperature sensor pin assignment




K connection type

| 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 | | |
| Recommended mating connector: Harwin M80-8990205 | | |

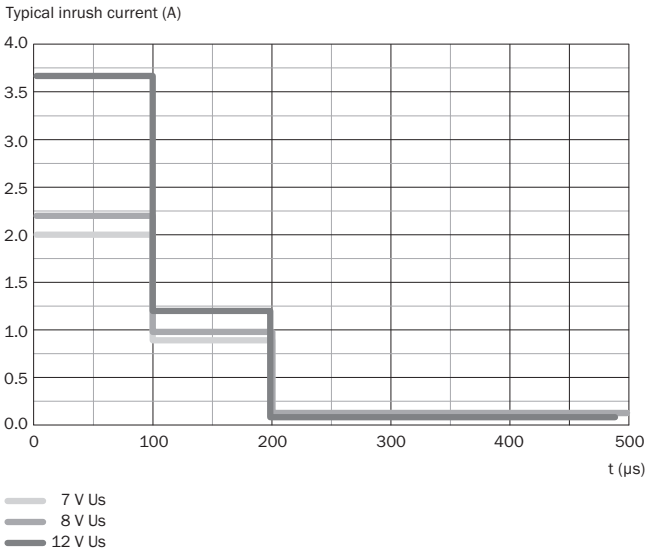
Supply/Communication pin assignment




Integrated in motor cable = K

| PIN | Signal | Explanation |
|---|---|---|
| 1 | | Not connected - no function |
| 2 | $+U_S$/DSL+ | Supply 7 V ... 12 V |
| 3 | GND/DSL- | Ground connection |
| 4 | | Not connected - no function |
| Recommended outer diameter of set of stranded wires: 2.8 mm ±0.3 mm | | |
| Recommended mating connector: JST (GHR-04V-S) | | |

## Diagrams




## Operation note

Supported access levels

| Access level | User | Standard access key |
|---|---|---|
| 0 | Execute (default setting) | - (no key required) |
| 1 | Operator | 1111 (31 31 31 31h) |
| 2 | Maintenance | 2222 (32 32 32 32h) |
| 3 | Authorized client | 3333 (33 33 33 33h) |
| 4 | User service | 4444 (34 34 34 34h) |

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 | 120 | Base functionality of encoder |
| 0x081 | RESOLUTN | 120 | Number of steps per turn |
| 0x082 | RANGE | 120 | Number of encoded revolutions |
| 0x083 | TYPECODE | 120 | Type name of encoder |
| 0x084 | SERIALNO | 120 | Serial no of encoder |
| 0x085 | FWREVNO | 120 | Firmware and hardware revision of encoder |
| 0x086 | FWDATE | 120 | Firmware date of encoder |
| 0x087 | EESIZE | 120 | Total amount of memory for user files |
| 0x089 | VPOS2RES | 120 | Number of steps per turn (DSL Safe Position 2) |
| 0x0c0 | TEMPRNG | 90 | Min and max allowed ambient temperature of encoder |
| 0x0c1 | TEMPRTUR | 70 | Actual ambient temperature of encoder |
| 0x0c2 | LEDRANGE | 90 | Min and max allowed LED current of encoder |
| 0x0c3 | LEDCURR | 70 | Actual LED current of encoder |
| 0x0c4 | SUPRANGE | 90 | Min and max allowed supply voltage of encoder |
| 0x0c5 | SUPVOLT | 70 | Actual supply voltage of encoder |
| 0x0c6 | SPEEDRNG | 90 | Max allowed shaft speed of encoder |
| 0x0c7 | SPEED | 70 | Actual shaft speed of encoder |
| 0x0c8 | ACCRANGE | 90 | Max allowed shaft acceleration of encoder |
| 0x0cb | LIFETIME | 70 | Operating time and total shaft turns of encoder. For safety variants also remaining mission time is indicated. |
| 0x0cc | ERRORLOG | 100 | Stored error messages of encoder |
| 0x0cd | HISTOGRM | 70 | Usage history of encoder in histogram form |
| 0x0d5 | ERRLOGFI | 100 | Filters the error log entries |
| 0x100 | RESET | 240 | Reset or shutdown of encoder |
| 0x101 | SETPOS | 200 | Set encoder position to arbitrary preset value. Offset of position can be read back. |
| 0x104 | SETACCES | 70 | Set or read back access level |
| 0x105 | CHNGEKEY | 90 | Change password for access level |
| 0x107 | UWARNING | 90 | Set or read back user-defined warning boundaries |
| 0x108 | FACRESET | 1100 | Reset user settings of encoder to factory defaults |
| 0x109 | ENCIDENT | 90 | Set or read back user-defined encoder index (for multi-axis systems) |
| 0x10a | POSFILT | 90 | Set or read back position filter settings |
| 0x10f | SHUBTOUT | 90 | Access to sHub time-out settings |
| 0x111 | ENCINDEX | 90 | Set or read back user-defined encoder index (for multi-axis systems) |
| 0x11d | FEATURES | 90 | Set or read back encoder features |
| 0x11f | BOOTLOAD | 200 | Bootloader access for end user (planned) |
| 0x120 | READCNT | 90 | Read user counter value |
| 0x121 | INCCOUNT | 90 | Increment user counter value |
| 0x122 | RESETCNT | 90 | Reset user counter value |
| 0x130 | LOADFILE | 900 | Load user file |
| 0x131 | RWFILE | 260 | Read from or write to user file |
| 0x132 | FILESTAT | 70 | Read status of user file |
| 0x133 | MAKEFILE | 1100 | Create, change or delete user file |
| 0x134 | DIR | 150 | Read directory of accessible user files |
| 0x136 | FILEBACK | 90 | Set or read back status of user file backup |
| 0x200 | ACCESSIO | 70 | Access to simple I/Os connected directly to encoder |
| 0x201 | MANAGEIO | 180 | Manage simple I/Os |
| 0x202 | IDENTIO | 70 | Identify simple I/Os |
| 0x210 | SH_RESET | 180 | Reset of sHub |
| 0x218 | SH_FACSE | 255 | Reset user settings of sHub to factory defaults |
| 0x21d | SH_FEATS | 90 | Set or read back encoder features |
| 0x280 | SH_TYPE | 180 | Base functionality of sHub |
| 0x283 | SH_TYPCO | 180 | Type name of sHub |
| 0x284 | SH_SERNO | 180 | Serial no of sHub |
| 0x285 | SH_FWREV | 70 | Firmware and hardware revision of sHub |
| 0x286 | SH_FWDAT | 70 | Firmware date of sHub |
| 0x2c0 | SH_TEMPR | 180 | Min and max allowed ambient temperature of sHub |
| 0x2c4 | SH_SUPR | 180 | Min and max allowed supply voltage of sHub |
| 0x2cb | SH_LIFET | 70 | Operating time of sHub |
| 0x2cc | SH_ERRLG | 220 | Stored error messages of sHub |

Overview of warnings and fault indications

| Error type | Error register | Error bit | Description |
|---|---|---|---|
| Position (incremental) | 40h | 0 | A Protocol reset was executed |
| | 40h | 1 | Acceleration overflow, invalid position |
| | 40h | 2 | Test running |
| | 40h | 4 | Internal error in angular tracking, invalid position |
| | 40h | 5 | Internal error in vector length, invalid position |
| | 40h | 6 | Internal error in position counter, invalid position |
| | 40h | 7 | Internal error in position synchronization, invalid position |
| Position (absolute) | 41h | 0 | Error in absolute position in a rotation |
| | 41h | 1 | Multiturn amplitude error |
| | 41h | 2 | Multiturn sync error |
| | 41h | 3 | Multiturn vector length error |
| | 41h | 4 | Position cross check error |
| Initialization | 42h | 0 | Switch-on self-test undertaken (only safety versions) |
| | 42h | 1 | Warning safety parameter: error could be rectified (only safety variants) |
| | 42h | 2 | Error safety parameter: error cannot be rectified (only safety variants) |
| | 42h | 3 | Standard parameter error |
| | 42h | 4 | Internal communications error 1 |
| | 42h | 5 | Internal communications error 2 |
| | 42h | 6 | Internal general error |
| Checking | 43h | 0 | Critical temperature |
| | 43h | 1 | Critical LED current |
| | 43h | 2 | Critical supply voltage |
| | 43h | 3 | Critical speed |
| | 43h | 5 | Counter overflow |
| | 43h | 6 | Internal monitoring error |
| Access to resources | 44h | 0 | Invalid argument given during resource access procedure |
| | 44h | 1 | Resource access refused due to incorrect access level |
| | 44h | 2 | Internal error during resoure access |
| | 44h | 3 | Error when accessing a user file |
| User-defined warnings | 47h | 0 | User-defined warning 0 |
| | 47h | 1 | User-defined warning 1 |
| | 47h | 2 | User-defined warning 2 |
| | 47h | 3 | User-defined warning 3 |

## Recommended accessories

Other models and accessories ➜ www.sick.com/EDS_EDM35

| | Brief description | Type | Part no. |
|---|---|---|---|
| Nuts and screws | | | |
|  | 500 pieces, Screws with Precote 85-8 coating; M4*48 (4093779) | BEF-MK-S09 | 2103244 |
| | 100 pieces, Screws with Precote 85-8 coating; M4*48 (4093779) | BEF-MK-S10 | 2103272 |
| | 10 pieces, Screws with Precote 85-8 coating; M4*48 (4093779) | BEF-MK-S11 | 2103274 |

| | Brief description | Type | Part no. |
|---|---|---|---|
| Others | | | |
|  | • **Connection type head A:** Female connector, stranded wire, 4-pin, straight<br>• **Connection type head B:** Flying leads<br>• **Signal type:** HIPERFACE DSL®<br>• **Cable:** 0.2 m, 2-wire<br>• **Description:** HIPERFACE DSL®, unshielded | DOL-0B02-G0M2XC2 | 2079920 |
|  | • **Connection type head A:** Female connector, stranded wire, 4-pin, straight<br>• **Connection type head B:** Flying leads<br>• **Signal type:** HIPERFACE DSL®<br>• **Cable:** 0.36 m, 2-wire<br>• **Description:** HIPERFACE DSL®, twisted, shielded | 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:

Contacts and other locations –www.sick.com