The world of motor feedback systems for electric drives

Maximum performance for all applications

SICK
Sensor Intelligence.

Contents:

The standard

1985

With the patented synchronous serial interface (SSI), SICK STEGMANN GmbH created an interface which has since established itself as the indisputable standard in industrial environments.

The revolution

1996

In 1996, SICK STEGMANN set another world standard with the innovative, universal interface HIPERFACE®: only one interface is required on the drive for all applications and only one type of signal cable between the drive and feedback system is needed.

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Expertise with interfaces is part of our tradition. HIPERFACE® DSL.

The digital evolution

2011

HIPERFACE® goes digital – with HIPERFACE® DSL, SICK, the technology leader, showcases a purely digital protocol with a minimum of connection cables between the drive electronics and the motor feedback system

The HIPERFACE® interface is known for its compactness, speed and precision – the installed base is globally present.

In order to better serve customer requirements our engineers kept just a single goal in mind: to make a great system even better. They looked for areas where improvements could be made, simplified or accelerated.

The result: HIPERFACE® DSL.
This digital servo link interface enables an entirely new architecture for the servo drive with completely new options, as it is now fully digital instead of hybrid (analog/digital).

With SSI and HIPERFACE® we have succeeded in setting new industry standards. HIPERFACE® DSL fulfills all requirements to establish itself as a premium system.

For safety and productivity: SICK LifeTime Services

SICK LifeTime Services is a comprehensive set of high-quality services provided to support the entire life cycle of products and applications from system design all the way to upgrades. These services increase the safety of people, boost the productivity of machines and serve as the basis for our customers' sustainable business success.

Benefit from an array of services

Each of our products and solutions is accompanied by a comprehensive range of services tuned precisely to the requirements of the product or solution – along its entire life cycle. Backed by extensive industry know-how and more than sixty years of experience, LifeTime Services stand for maximum availability and an exceptional service life of our products and solutions.

Training & Education

- User training
- Seminars
- WebTraining

Product & System Support

- Commissioning
- Spare parts and repairs
- Remote support
- Hotline

Verification & Optimization

- Barcode checks
- Consulting/Engineering service
- Inspection
- Maintenance
- Accident analysis
- Stop time measurement
- Noise measurement

Consulting & Design

- System inspection
- Risk assessment
- Safety concepts
- Feasibility studies
- Software and hardware design

Upgrade & Retrofits

- Machine conversion
- Sensor upgrades
- Sensor replacements
- Retrofitting of technology

www.sick.com/service

Solutions for electrical drive engineering

Innovation & partnership

Progress means innovation and innovations lead to the development of new products and technologies. This has been demonstrated by SICK for decades with its range of motor feedback systems and interfaces.

It goes without saying for us that close partnerships are essential for success. The mutual development of solutions for creating successful projects and offering you the best possible service are equally important to us. This forms the basis for long-term and sustainable partnerships.

Flexibility

SICK offers you a product portfolio which combines various technologies into a minimum of mechanisms. Do you require various performance levels? We can deliver!

SICK's motor feedback systems additionally optimize your products, reduce system costs and offer you the flexibility you need to succeed in todays marketplace.

Safety

SICK's certified safety motor feedback systems are available in a broad range of performance levels, enabling individual selection in order to fulfill market requirements.

These safety components represent the state-of-the-art and facilitate easier certification of systems compared to non-certified products.
With SICK you always have a competent partner at your side.

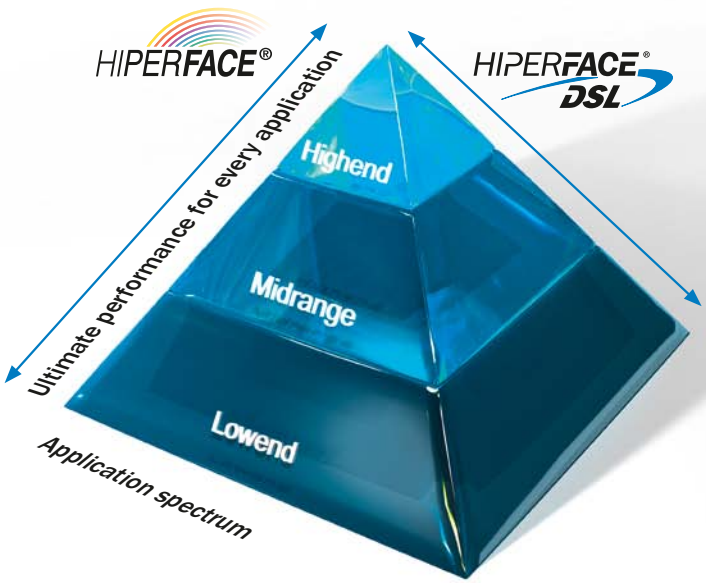
Functional Safety Type Approved
TÜVRheinland FS

The wide range of available technologies covering everything from compact servo drives through to powerful direct drives are ideal for creating bespoke solutions. A mechanical interface to the customer's equipment serves to minimize variances on-site across a broad spectrum of technologies.

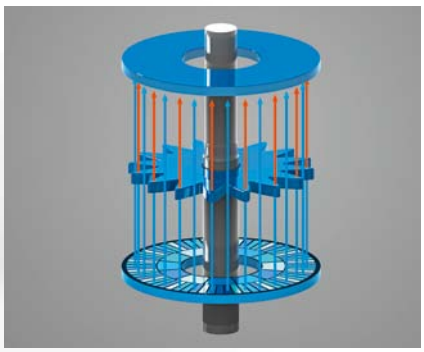
In addition to its comprehensive product portfolio, technology leader SICK also ensures for continuous development in the field of drive engineering. Building on SSI and HIPERFACE®, HIPERFACE® DSL represents the next stage of evolution in terms of drive engineering.

Speed and position measurement with ultimate precision

Motor feedback systems from SICK fulfill important requirements such as temperature resistance, high resolution, electronic type labeling, multiturn designs with mechanical gear mechanisms, high stability and last but not least, small dimensions enabling short motor lengths.



Capacitive technologies ...

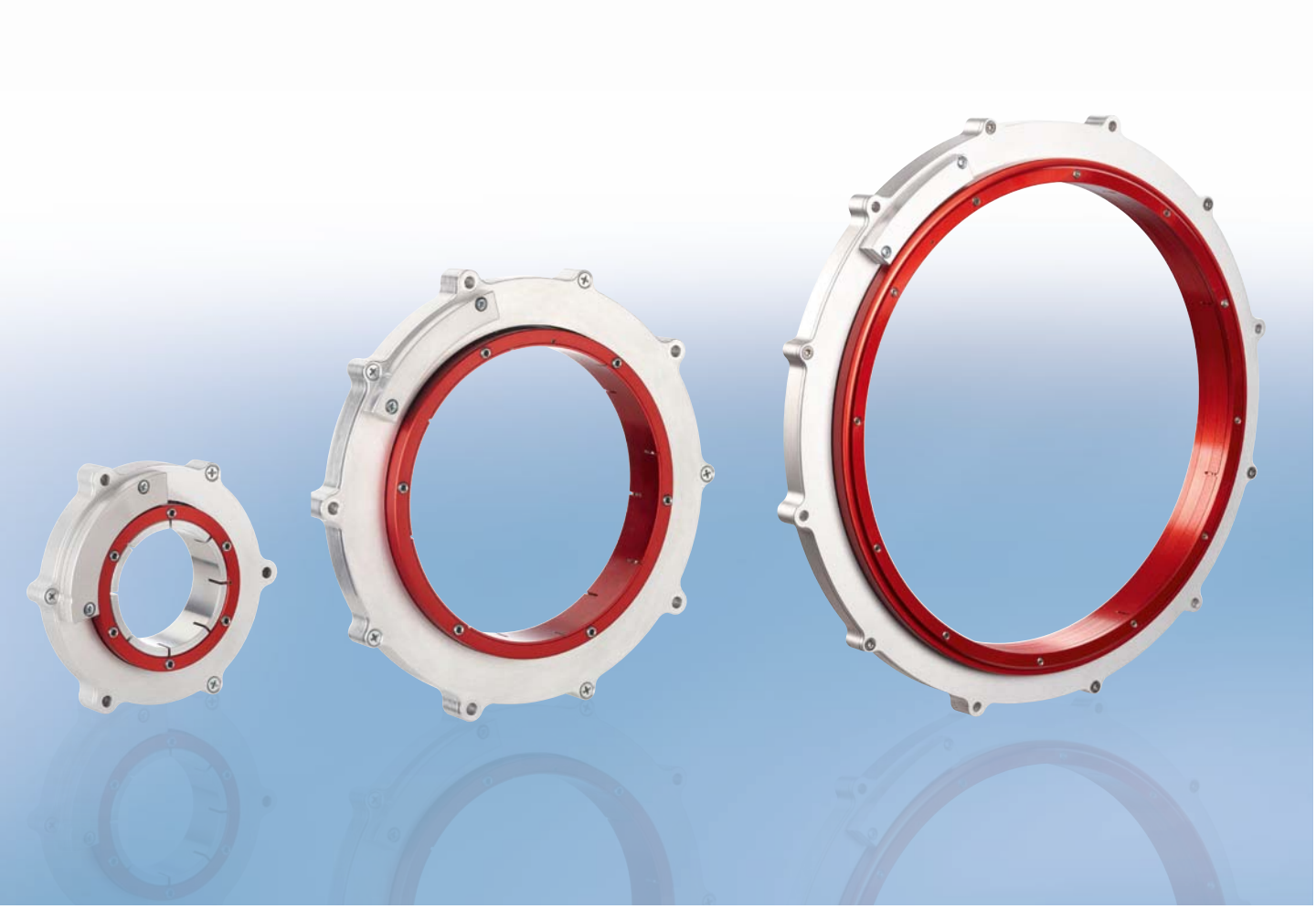


... for low-end applications

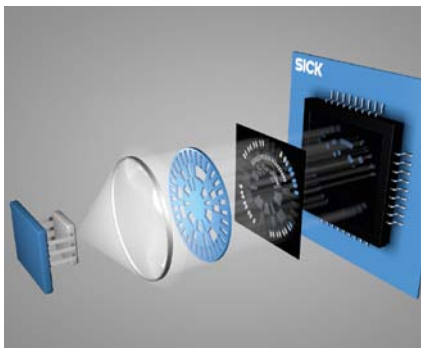
- Bearingless encoder systems
- Rugged technology

Example uses:

SEK/SEL 34
SEK/SEL 37
SEK 90 to 260



Optical technologies ...



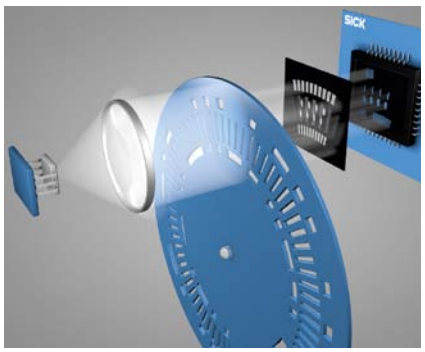
... for midrange applications

- Sensing centrally to rotary axis
- High resolution combined with compact housing design

Example uses:

SKS/SKM 36
EKS/EKM 36

Optical technologies ...



... for high-end applications

- Ultimate resolution
- Rugged, metal code disk

Example uses:

SRS/SRM 50
SFS/SFM 60

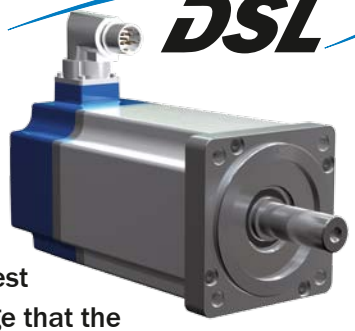
Multiturn technologies ...

... for all performance classes

- Maximum reliability through geared technology

Used for all multiturns.

Compact motor feedback system with HIPERFACE® DSL for highly dynamic servo drives



The biggest advantage that the interference-free HIPERFACE® DSL offers is that it uses just two wires for communication, which are integrated into the motor cable. This reduces connectivity on the motor to a single connector.

Features of HIPERFACE® DSL

- Based on the RS485 standard.
  This encompasses a single digital interface on the drive for effective communication to the encoder
- Cyclical data transmission at 9.375 MBaud
  Synchronous processing of encoder position and speed is possible in the feedback cycle of the drive
- Cycle times down to 11.95 µs can be supported
- Cable length between drive and motor-feedback system can be up to 100 m without derating of performance
- Pipeline channel for transmission of data from external sensors related to the motor can be linked to the motor feedback system, saving cabling and providing better condition monitoring
- The protocol is integrated into the drive as a hardware logic design, and the implementation is done through an FPGA or an ASIC

Benefits for motor, drive and system manufacturers:

- Reduce costs: The elimination of the motor feedback connector plug in the new design results in significant cost savings.
- Simplification of development: The digital interface reduces the design complexity of the drive system since servo loops can be run much faster than before.
- Quick an simple implementation: The IP core for the leading FPGAs has been developed and is available to use.
- Condition monitoring:
  A sensor hub on the encoder can be used to not only transmit the encoder feedback, but also winding temperature (torque and acceleration parameters planned for the future) through the same DSL interface.
- An overall efficient and simplified system:
  - More interpolation is done within the encoder rather than the drive, which increases noise immunity.
  - Higher dynamic system performance broadens the application space for motors and drives.

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The future of interface communication is now available: HIPERFACE® DSL

More performance:
The extremely rapid process data transmission of HIPERFACE® DSL provides incredibly high resolution and accuracy.

Reduce costs up to 50 % :
Sometimes less is more! Since there is only a single connector on the motor, cabling costs are significanty reduced.

Safety:
Easily achieve safety certification for the entire system by using SIL-rated components. The interface has the capability to reach SIL 3.

Internal diagnostics:
Quick and efficint recognition and elimination of faults via self-diagnosis for higher quality control.

Smoother running:
Your drive systems will demonstrate a new and excellent level of smooth operation.

Remote diagnostics:
Maintenance work can be done more quickly and efficienty using the convenient, internet-based remote diagnostics function.

Scheduled maintenance:
Unplanned machine downtime can be avoided through scheduled maintenance.

Higher reliability:
Greater reliability is achieved with trouble- free operation, offering higher productivity, profiability and a good investment.

Additional information

www.mysick.com

At a glance

- Motor feedback system with HIPERFACE® DSL innterface
- Compact, robust design with 36 mm diameter
- Up to 20 bit resolution per revolution and 4,096 revolutions measurable with the multiturn system
- Facility for connecting an external temperature sensor
- EEPROM with 8 kbyte of free memory space
- SIL2-certified
- Service life histogram

Your benefits

- Saving all analog components on the controller part through exclusively digital data transmission
- Enormous cost saving thanks to the separate encoder cable no longer being necessary, data transmitted synchronously to the controller cycle
- Minimal cabling thanks to integration of the encoder communication into the motor cable
- Optimization of the controller circuit via automatic synchronization with the controller cycle

Order information

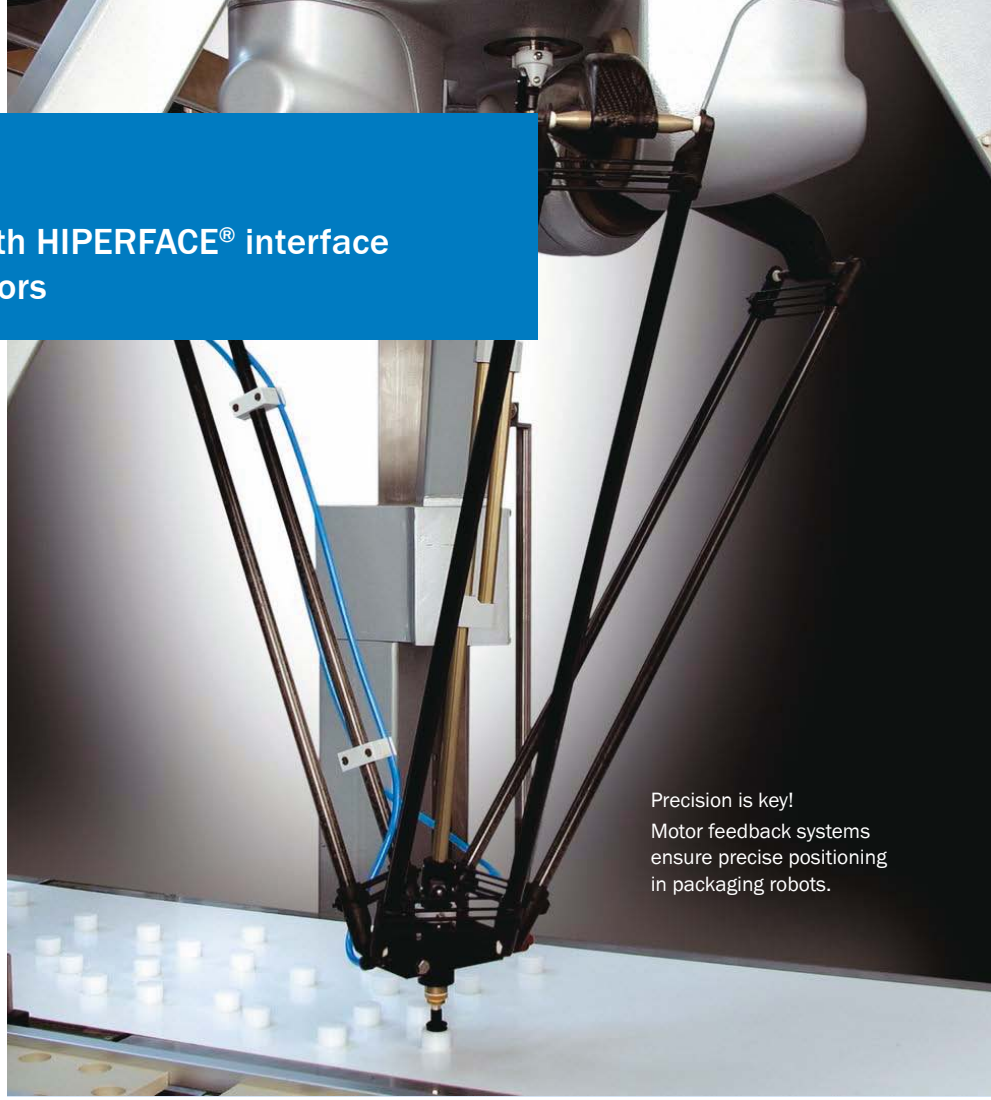
Other models available at www.mysick.com

Version	Resolution per revolution	Connection type	Model name	Part no.
Singleturn	18 bits	Integrated in the motor cable, 1 temperature sensor	EKS36-0KF0A018A	1053848
Singleturn	20 bits		EKS36-0KF0A020A	1053856
Multiturn	18 bits		EKM36-0KF0A018A	1053849
Multiturn	20 bits		EKM36-0KF0A020A	1053857
Safety version				
Singleturn	18 bits	Integrated in the motor cable, 1 temperature sensor	EKS36-2KF0A018A	1054315
Singleturn	20 bits		EKS36-2KF0A020A	1054323
Multiturn	18 bits		EKM36-2KF0A018A	1054316
Multiturn	20 bits		EKM36-2KF0A020A	1054324

Recommended accessories

Description	Model name	Part no.
Programming tool for HIPERFACE® DSL devices	PGT-09-S	1037530
Stranded cable, 4-wire, straight, 0.2 m	DOL-0B04-G0M2XC1	2058333
Assembly tool for connection types T, J, K	BEF-MW-EKX36	2060224

Motor feedback systems with HIPERFACE® interface for installation in servo motors



Precision is key!
Motor feedback systems ensure precise positioning in packaging robots.

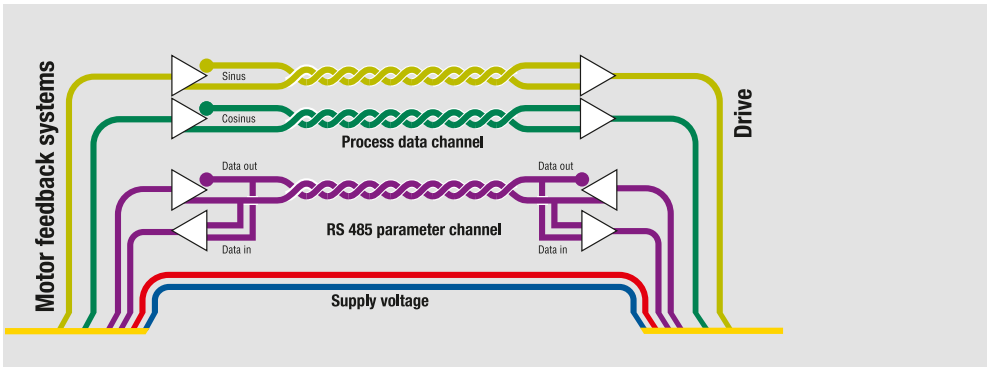
HIPERFACE® by SICK

HIPERFACE® motor feedback systems are a mix of incremental encoders and absolute encoders and combine the benefits of both encoder types.

Initially, the absolute value is only formed when the device is powered up and is communicated to the exter-nal counter in the controller via the bus-enabled RS 485 parameter interface. From this absolute value, the con-troller continues to count incrementally using the ana-logue sine/cosine signals. The use of highly-linear sine and cosine signals achieves the high resolution required for speed control (arctan formation within the controller).

However, the signal frequen-cies to be transmitted remain relatively low. For in-stance a unit with 512 periods per revo-lution, operating at a very high speed of 12,000 RPM, only generates an output frequency of 102.4 kHz which can be easily transmitted over a long distance.

HIPERFACE® retains only one interface with 8 lines, for reduced cabling work.



HIPERFACE® tranmits the following data:

- Commutation
- Absolute position
- Speed
- Data from the electronic type label

Use the benefits of HIPERFACE®

- Only one speed controller interface for all applications
- Only one type of signal line between speed controller and signal encoder
- Manual parameterisation of the speed controller is no longer required (self-initialisation)

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These renowned manufacturers offer HIPERFACE®

Additional information

www.mysick.com

At a glance

- Motor feedback system for basic performance level
- Special design for motors with 40 mm square
- 16 sine/cosine periods per revolution
- Absolute position with a resolution of 512 increments per revolution and 4,096 revolutions with the multiturn system
- Programming of the position value
- Electronic type label
- HIPERFACE® interface
- Conform to RoHS

Your benefits

- The small dimension allows manufacturers of low-power and minimal-power motors to considerably reduce the size of their motors
- The SEK/SEL34 motor feedback systems are excellently suited for use under rough environmental conditions
- The capacitive principle of measurement with holistic scanning allows for high axial and radial tolerances

Order information

Other models available at www.mysick.com

Version	Model name	Part no.
Singleturn	SEK34-HFB0K02	1053402
Multiturn	SEL34-HFB0K02	1053403

Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Stranded cable, straight, 8-wires, 8 x 0.15 mm²	8	0.2 m	DOL-0J08-G0M2XB6	2031086
Cable HIPERFACE®, 8-wires, 4 x 2 x 0.15 mm²	8	Cut material	LTG-2708-MW	6028361
Programming tool			PGT-03-S	1034252

Additional information

www.mysick.com

At a glance

- Motor feedback systems for the basic performance range
- 16 sine/cosine periods per revolution
- Absolute position with a resolution of 512 increments per revolution and 4,096 revolutions with the multiturn system
- Programming of the position value
- Electronic type label
- HIPERFACE® interface
- Installed version with tapered shaft and axial or radial connector outlet
- Conform to RoHs

Your benefits

- The small dimension allows manufacturers of low-power and minimal-power motors to considerably reduce the size of their motors
- The capacitive principle of measurement with holistic scanning allows for high axial and radial tolerances
- The consistent mechanical components in SKS/SKM36 allow for a high degree of flexibility with various encoder systems

Order information

Other models available at www.mysick.com

Version	Model name	Part no.
Singleturn, radial connector	SEK37-HFB0-K02	1037378
Multiturn, radial connector	SEL37-HFB0-K02	1037379
Singleturn, axial connector	SEK37-HFA0-K02	1037376
Multiturn, axial connector	SEL37-HFA0-K02	1037377

Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Stranded cable, straight, 8-wires, 8 x 0.15 mm²	8	0.2 m	DOL-0J08-G0M2XB6	2031086
Cable HIPERFACE®, 8-wires, 4 x 2 x 0.15 mm²	8	Cut material	LTG-2708-MW	6028361
Programming tool			PGT-03-S	1034252

Additional information

www.mysick.com

At a glance

- Motor feedback systems for the basic performance range
- 16 sine/cosine periods per revolution
- Absolute position with a resolution of 512 increments per revolution and 4,096 revolutions with the multiturn system
- Programming of the position value
- Electronic type label
- HIPERFACE® interface
- Various shaft variants:
  Hollow and tapered shaft and as shoulder clamping
- Conform to RoHs

Your benefits

- The small dimension allows manufacturers of low-power and minimal-power motors to considerably reduce the size of their motors
- The SEK/SEL52 motor feedback systems are excellently suited for use under rough environmental conditions
- The capacitive principle of measurement with holistic scanning allows for high axial and radial tolerances
- Due to the resolver-compatible mechanical components of the SEK/SEL52 motor feedback systems the encoders can be mounted immediately

Order information

Other models available at www.mysick.com

Version	Model name	Part no.
Singleturn, tapered shaft	SEK52-HFA0-K02	1037368
Multiturn, tapered shaft	SEL52-HFA0-K02	1037371
Singleturn, hollow shaft	SEK52-HNA0-K02	1037370
Multiturn, hollow shaft	SEL52-HNA0-K02	1037373
Singleturn, shoulder clamping	SEK52-H1A0-K02	1037369
Multiturn, shoulder clamping	SEL52-H1A0-K02	1037372

Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Stranded cable, straight, 8-wires, 8 x 0,15 mm²	8	0.2 m	DOL-0J08-G0M2XB6	2031086
Cable HIPERFACE®, 8-wires, 4 x 2 x 0,15 mm²	8	Cut material	LTG-2708-MW	6028361
Programming tool			PGT-03-S	1034252
Assembly tool for hollow shaft			BEF-MW-SEY52	2048235
Servo clamp for hollow shaft and tapered shaft			BEF-WK-RESOL	2039082
Servo clamp for shoulder clamping			BEF-WK-RESOL1	2048827
Cover for tapered shaft or collar clamping (cover closed)			BEF-GA-SEY52BS1	2048234
Cover for hollow shaft (cover open)			BEF-GA-SEY52TS1	2048232

Additional information

www.mysick.com

At a glance

- Motor feedback systems for the standard performance range
- 128 sine/cosine periods per revolution
- Absolute position with a resolution of 4,096 increments per revolution and 4,096 revolutions with the multiturn system
- Programming of the position value and electronic type label
- HIPERFACE® interface
- Certified according to SIL2/PL d
- Conform to RoHs

Your benefits

- The small dimension allows manufacturers of low-power and minimal-power motors to considerably reduce the size of their motors
- The SKS/SKM36 motor feedback systems have strongly penetrated the drive technology market. The consistent mechanical components in SEK/SEL37 allow for a high degree of flexibility with various encoder systems

Order information

Other models available at www.mysick.com

Version	Model name	Part no.
Singleturn, tapered shaft	SKS36-HFA0-K02	1034095
Multiturn, tapered shaft	SKM36-HFA0-K02	1034094
Safety Ausführung		
Singleturn, tapered shaft	SKS36S-HFA0-K02	1036556
Multiturn, tapered shaft	SKM36S-HFA0-K0	1036558

Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Stranded cable, straight, 8-wires, 8 x 0.15 mm²	8	0.2 m	DOL-0J08-G0M2XB6	2031086
Cable HIPERFACE®, 8-wires, 4 x 2 x 0.15 mm²	8	Cut material	LTG-2708-MW	6028361
Assembly tool			BEF-MW-SKX36	2031079
Programming tool			PGT-03-S	1034252

Additional information

www.mysick.com

At a glance

- Motor feedback systems for the top performance range
- 1,024 sine/ cosine periods per revolution
- Absolute position with a resolution of 32,768 increments per revolution and 4,096 revolutions with the multiturn system
- HIPERFACE® interface: Programming of the position value and electronic type label
- Insert shaft or tapered shaft with various torque supports
- Integrated version or mounted version
- Certified according to SIL2/PL d
- Conforms to RoHs

Your benefits

- Motor feedback system with HIPERFACE® interface
- High shock/vibration resistance thanks to built-in metal code disk
- Consistent motor design due to identical size of single and multiturn design
- Compliance with the new machine directive thanks to use of a motor feedback system certified according to SIL2/PL
- Very smooth running thanks to maximum ball bearing distance

Order information

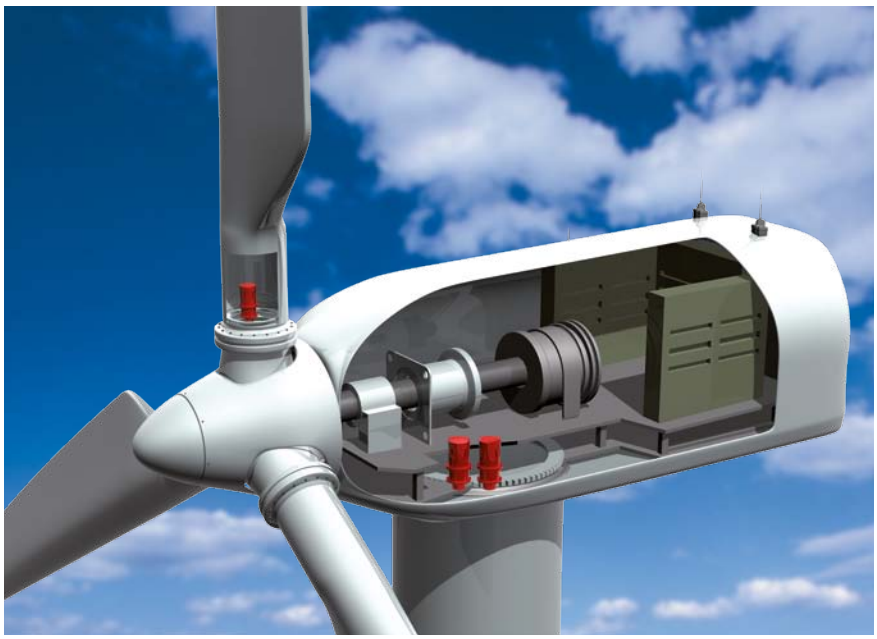
Other models available at www.mysick.com

Version	Mechanical interface	Connection	Model name	Part no.
Singleturn, 2048 EEPROM	Tapered shaft, spring mounting plate	Connector	SRS50-HFA0-K22	1037068
Singleturn, 2048 EEPROM		Stranded cable	SRS50-HFV0-K22	1037070
Multiturn, 2048 EEPROM		Connector	SRM50-HFA0-K22	1037072
Multiturn, 2048 EEPROM		Stranded cable	SRM50-HFV0-K22	1037074
Safety Version				
Singleturn, 2048 EEPROM	Tapered shaft, spring mounting plate	Connector	SRS50S-HFA0-K22	1051790
Singleturn, 2048 EEPROM		Stranded cable	SRS50S-HFV0-K22	1051792
Multiturn, 2048 EEPROM		Connector	SRM50S-HFA0-K22	1051794
Multiturn, 2048 EEPROM		Stranded cable	SRM50S-HFV0-K22	1051796

Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Stranded cable, straight, 8-wires, 8 x 0.24 mm²	8	0.2 m	DOL-0B08-G0M2XB1	2031081
Caable HIPERFACE®, 8-wires, 4 x 2 x 0.15 mm²	8	Cut material	LTG-2708-MW	6028361
Programming tool			PGT-03-S	1034252

Motor feedback systems with HIPERFACE® interface for mounting to servo motors



Single- and Multiturn versions in the compact and robust metal housing are mainly used as master encoders. Stand alone devices and a 6 or 10 mm shaft which is connected to the application using a shaft coupling.

The master encoder is used e.g. as a master for the synchronisation of several axes. Stand alone motor feedback systems are increasingly used in conventional encoder applications as these variants are compatible with commercial encoder mechanisms.

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Stand alone motor feedback systems as control and line sensors in machines and installations where the advantages of the HIPERFACE® interface are put to good use.

additional information

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At a glance

- Motor feedback systems for the standard performance range
- 128 sine/cosine periods per revolution
- Absolute position with a resolution of 4,096 increments per revolution and 4,096 revolutions with the multiturn system
- Programming of the position value and electronic type label
- HIPERFACE® interface
- Zertifiziert nach SIL2/PL d
- Conform to RoHs
- Protection class IP65

Your benefits

- The small dimension allows manufacturers of low-power and minimal-power motors to considerably reduce the size of their motors
- The stand-alone version is ideally suited as a master and path encoders
- The SKS/SKM36 motor feedback systems have strongly penetrated the drive technology market

Order information

Other models available at www.mysick.com

Version	Mechanical interface	Connection	Model name	Part no.
Singleturn, 2048 EEPROM	Stand alone, solid shaft 6 mm	Connector	SKS36-HVA0-K02	1035603
Singleturn, 2048 EEPROM		Cable 1,5 m	SKS36-HVV0-K02	1035604
Multiturn, 2048 EEPROM		Connector	SKM36-HVA0-K02	1035601
Multiturn, 2048 EEPROM		Cable 1,5 m	SKM36-HVV0-K02	1035602
Safety version				
Singleturn, 2048 EEPROM	Stand alone, solid shaft 6 mm	Connector	SKS36S-HVA0-K02	1036557
Multiturn, 2048 EEPROM		Connector	SKM36S-HVA0-K02	1036559

Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Cable HIPERFACE®, 8-wires, 4 x 2 x 0.15 mm²	8	Cut material	LTG-2708-MW	6028361
Programming tool			PGT-03-S	1034252
Servo clamps, Set			BEF-WK-RESOL	2039082
Female connector M12, straight, pre-wired with cable, 4 x 2 x 0.25 mm², screened, flexible	8	5.0 m	DOL-1208-G05MAC1	6032867

CE HIPERFACE® RoHS 2002/95/EC

Additional information

www.mysick.com

At a glance

- Motor feedback systems for the top performance range
- 1,024 sine/ cosine periods per revolution
- Absolute position with a resolution of 32,768 increments per revolution and 4,096 revolutions with the multiturn system
- HIPERFACE® interface: Programming of the position value and electronic type label
- Conform to RoHs
- Protection class IP65

Your benefits

- Motor feedback system with HIPERFACE® interface
- High shock/vibration resistance thanks to built-in metal code disk
- Consistent motor design due to identical size of single and multiturn design

Order information

Other models available at www.mysick.com

Version	Mechanical interface	Connection	Model name	Part no.
Singleturn, 2048 EEPROM	Solid shaft 10 mm; face mount flange	Connector	SRS50-HWA0-K22	1037092
Singleturn, 2048 EEPROM		Cable	SRS50-HWV0-K22	1037094
Multiturn, 2048 EEPROM		Connector	SRM50-HWA0-K22	1037096
Multiturn, 2048 EEPROM		Cable	SRM50-HWV0-K22	1037098
Singleturn, 2048 EEPROM	Solid shaft 6 mm; servo flange	Connector	SRS50-HXA0-K22	1037100
Singleturn, 2048 EEPROM		Cable	SRS50-HXV0-K22	1037102
Multiturn, 2048 EEPROM		Connector	SRS50-HXA0-K22	1037104
Multiturn, 2048 EEPROM		Cable	SRS50-HXV0-K22	1037106

Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Cable HIPERFACE®, 8-wires, 4 x 2 x 0.15 mm²	8	Cut material	LTG-2708-MW	6028361
Cable connector female M23, 12-pin, straight, cable 8-core, HIPERFACE®, screened	12	1.5 m	DOL-2308-G1M5JB2	2031069
Cable connector female M23, 12-pin, straight, cable 8-core, HIPERFACE®, screened	12	3.0 m	DOL-2308-G03MJB2	2031070
Programming tool			PGT-03-S	1034252
Servo clamps, Set			BEF-WK-SF	2029166

Additional information

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At a glance

- HIPERFACE® motor feedback system in singleturn and multiturn design, compatible with the world's leading drive systems
- 1,024 sine/ cosine periods per revolution
- Absolute position with a resolution of 32,768 increments per revolution and 4,096 revolutions with the multiturn system
- HIPERFACE® interface: Programming of the position value and electronic type label
- Mechanical flexibility through different blind hollow shaft and through hollow shaft diameters (8 to 15 mm diameter), available with various torque supports
- Unique ball bearing design, allowing for a ball bearing distance of 30 mm.
- Protection class IP65

Your benefits

- Convenient traceability and simple maintenance thanks to storage of motor-specific data in the electronic type label
- Large ball bearing distances reduce uneven wear and minimize vibration on the encoder housing, which increases the encoder's service life.
- The nickel code disk offers a high degree of vibration resistance and an extended temperature range
- Shorter development times through standardized mechanical interface
- Platform for the future, since all electrical interfaces (TTL/HTL, 1Vpp, SSI, PROFIBUS, HIPERFACE® DSL) are or will be available in this mechanical component.

Order information

Other models available at www.mysick.com

Version	Mechanical interface	Connection	Model name	Part no.
Singleturn	Through hollow shaft 15 mm	Cable 1.5 m	SFS60-HPKT0K02	1050531
	Through hollow shaft 14 mm	Cable 1.5 m	SFS60-HRKT0K02	1050528
	Through hollow shaft 12 mm	Cable 1.5 m	SFS60-HMKT0K02	1051090
Multiturn	Through hollow shaft 15 mm	Cable 1.5 m	SFM60-HPKT0K02	1051311
	Through hollow shaft 14 mm	Cable 1.5 m	SFM60-HRKT0K02	1050527
	Through hollow shaft 12 mm	Cable 1.5 m	SFM60-HMKT0K02	1051091
Singleturn	Blind hollow shaft 12 mm	Connector, M23	SFS60-HMAB0K02	1053951
	Blind hollow shaft 12 mm	Cable 1.5 m	SFS60-HMKB0K02	1054955
	Blind hollow shaft 15 mm	Connector, M23	SFS60-HPAB0K02	1053300
Multiturn	Blind hollow shaft 12 mm	Connector, M23	SFM60-HMAB0K02	1053160
	Blind hollow shaft 15 mm	Cable 1.5 m	SFM60-HPKB0K02	1053044
	Blind hollow shaft 15 mm	Connector, M23	SFM60-HPAB0K02	1053573

Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Connector M23, 12-pin, straight, screened, for rear panel installation	12	0.2 m	STE-2312-GX	6028548
Cable connector female M23, 12-pin, straight, cable 8-core, HIPERFACE®, screened	12	1.5 m	DOL-2308-G1M5JB2	2031069
Cable connector female M23, 12-pin, straight, cable 8-core, HIPERFACE®, screened	12	3.0 m	DOL-2308-G03MJB2	2031070
Programming tool			PGT-03-S	1034252

Motor feedback systems with HIPERFACE® interface for direct drives

The past years have shown a clear trend towards direct drives in the field of electronic drive engineering.

Today companies are forced to take energy efficiency into greater consideration for production in order to ensure competitiveness, as energy costs are playing an increasingly significant role in the cost structure. In doing so, they are faced with the challenge of finding the right balance between dynamic performance and productivity. This task can be ideally realized with the help of direct drives.

SICK, the innovative provider of industrial automation products, recognized this trend towards direct drives very early on and developed a range of bespoke motor feedback systems:

- Motor feedback systems SEK90, SEK160 and SEK260 for torque-motors
- Motor feedback systems TTK50 and TTK70 for linear motors

These motor feedback systems are equipped with the industry standard HIPERFACE® interface and are compatible with the world's leading drive systems.

What is direct drive?

A direct drive is a system whereby the motor (actuator) is directly fastened to the moving part (for example a rotary table).

With this design the motor and machine speed is identical, therefore there is no loss of torque due to a gear mechanism, ball joint spindle or other coupling.

Main advantages of direct drives:

- Extended service life – low maintenance
- Increased immediacy
- Precision and repeatability
- Compact design
- Energy efficiency

Source: INA — Drives & Mechatronics

Longer life — less maintenance

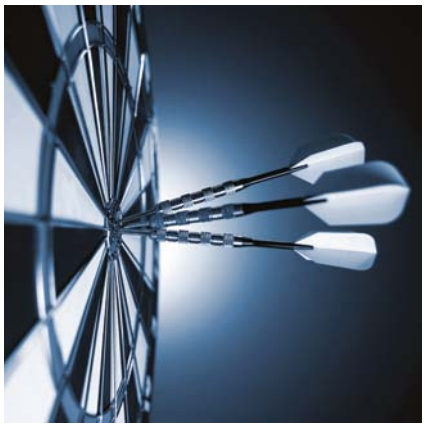
A conventional motion system with a servo motor and a gear box or lead screw is prone to wear and tear, with the gear box needing regular maintenance.

Since a direct drive excludes the gear box in the traction chain, there is very little wear. This reduces the maintenance time and cost significantly as oil changes on the gear box are no longer necessary.

Higher sensitivity

The elimination of a gear box or any coupling element in the control cycle makes a motion system more sensitive and dynamic. The ball screws limit or dampen the transmission of values such as torque and acceleration and therefore poses design limitations.

The linear drive system thus offers an attractive option to customers in terms of better sensitivity to changes and consequently time savings in production cycles.



Accuracy and repeatability

Direct drives offer better accuracy and repeatability compared to a servo motor with a gear box or a lead screw. The gear box backlash can be overcome with a complex mechanical construction, which can be very expensive to design and build.

Compact

Since the components and moving parts are reduced in a direct drive system, it makes the whole system very compact. This offers a dual advantage of easier handling for the machine manufacturer and simple integration for the end user.

Energy Savings

There is significant emphasis on creating lean and green systems in today's world. A direct drive system saves energy costs as transmission losses are almost non-existent.

CE HIPERFACE® RoHS 2002/95/EC

Additional information

www.mysick.com

At a glance

- HIPERFACE® motor feedback systems for large hollow shaft and torque motors
- 64, 128, 256 sine/cosine periods per revolution
- Absolute position with a resolution of 2.048, 4.096, 8.192 increments per revolution
- Programming of the position value and electronic type label
- HIPERFACE® interface
- Turn & play – for simple assembly without tools
- High resistance to shock and vibration due to holistic scanning
- Bearingless motor feedback system

Your benefits

- Direct seat on the drive shaft renders transmission elements such as toothed belt or coupling superfluous
- The simplified, compact design is wear-free, thus helping to reduce maintenance costs
- Measuring accuracy is no longer affected by magnetic fields thanks to the capacitive measuring principle
- Time-saving mounting, since no mounting tools are required: simply fit it on, turn it and start
- The minimal dimensions enable you to save space and weight, allowing for a more efficient use of space

Order information

Other models available at www.mysick.com

Version	Mechanical interface	Model name	Part no.
Singleturn	Hollow shaft, 50 mm	SEK90-HN050AK02	1038271
Singleturn	Hollow shaft, 110 mm	SEK160-HN110AK02	1038272
Singleturn	Hollow shaft, 210 mm	SEK260-HN210AK02	1053596

Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Stranded cable, straight, 8 wires, 8 x 0.15 mm²	8	0.2 m	DOL-0J08-G0M2XB6	2031086
Cable HIPERFACE®, 8 wires, 4 x 2 x 0.15 mm² screened	8	0.5 m	DOL-0J08G0M5XB6	2056250
Cable HIPERFACE®, 8 wires, 4 x 2 x 0.15 mm²	8	Cut material	LTG-2708-MW	6028361
Programming tool			PGT-03-S	1034252

HIPERFACE®

RoHS 2002/95/EC

Additional information

www.mysick.com

At a glance

- Absolute, non-contact, wear-free length measurement system for linear motors
- Measured lengths of up to 4 m (TTK70) and 1 m (TTK50)
- Suitable for high traverse speeds of up to 10 m/s
- Reliable location positioning even in the event of condensation and contamination of the magnetic tape
- Electronic type label and programming of the position value
- Absolute location positioning, no reference run
- HIPERFACE® interface
- Conform to RoHs

Your benefits

- Reference traverse no longer necessary due to absolute measuring system
- Maintenance-free thanks to non-contact measuring principle
- Simple integration of the system due to the HIPERFACE® interface
- Developed specifically for use in linear direct drives
- Also for use in rough ambient conditions

Order information

Other models available at www.mysick.com

Version	Mechanical interface	Model name	Part no.
TTK50 (up to 0.94 m)	Read head, 0.5 m cable	TTK50-HXJ0K02	1057791
TTK50 (up to 0.94 m)	Read head, 1.0 m cable	TTK50-HXI0K02	1057792
TTK50 (up to 0.94 m)	Read head, 2.0 m cable	TTK50-HXQ0K02	1057793
Magnetic tape for TTK50	Magnetic tape 1.0 m with adhesive tape	MVM-1M0-2MC-MKLB	6049001
TTK70 (up to 4 m)	Read head, connector	TTK70-HXA0-K02	1037434
Magnetic tape for TTK70	Magnetic tape 2.0 m with adhesive tape	MVM-02M-2MC-MKLB	6037419

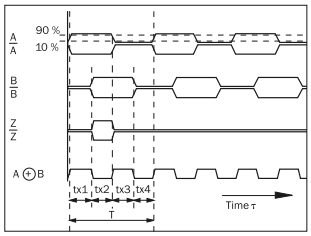
Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Cable HIPERFACE®, 8 wires, 4 x 2 x 0.15 mm²	8	Cut material	LTG-2708-MW	6028361
Female connector M12 female, 8-pin, straight, pre-wired with cable 8-wire, 4 x 2 x 0.25 mm², screened, flexible (adapter side) for TTK70	8	2.0 m	DOL-1208-G02MAC1	6032866
Right angled M12, 8-pin female connector, pre-wired with cable 8-cores, 4 x 2 x 0.25 mm², screened, suitable for use in a drag chain (adapter side) for TTK70	8	2.0 m	DOL-1208-W02MAC1	6037724
Programming tool			PGT-03-S	1034252

Motor feedback systems for installation in synchronous motors

Shock- and vibration-resistant: perfect for installation in synchronous motors.

For a reversal of the direction of current, the polarity of synchronous motors used to be reversed via so-called brushes Current reversal is required for continual rotary motion.
With the introduction of brushless motors, incremental motor feedback systems with commutation tracks have taken on this task. The mechanical commutation, which is very much prone to wear, is no longer required. This makes brushless synchronous motors practically maintenance-free.



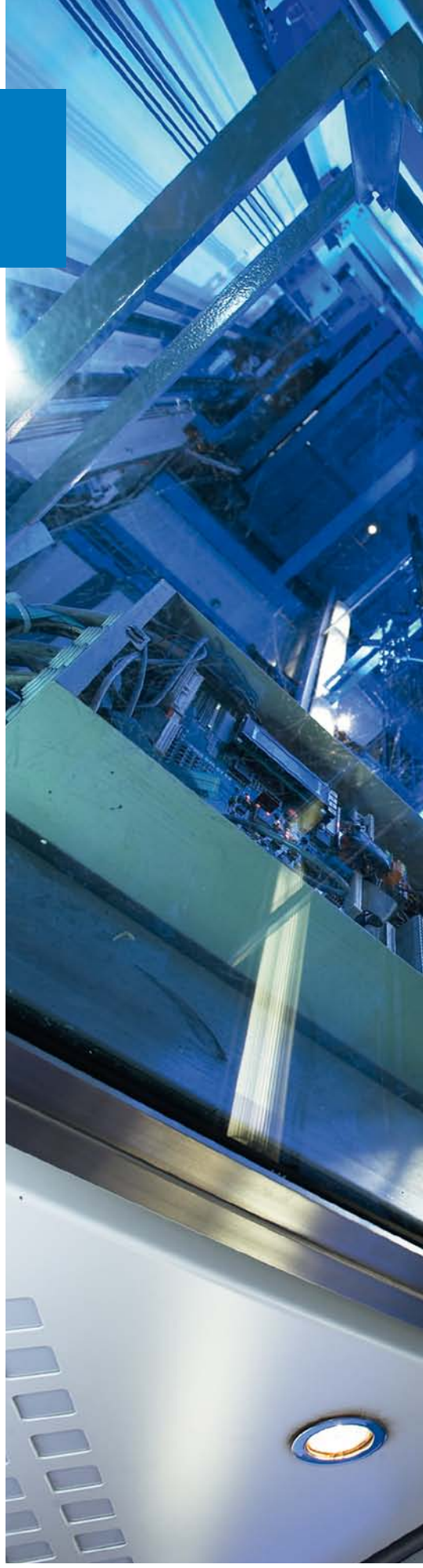
Incremental track

At constant rotational speed with regard to the input shaft and rotation in clockwise direction. By connecting the two signals A and B, an output signal arises whose period durations tx1 ... tx4 have varying lengths.

The differences are determined:

- by the pulse/pause ratio tolerance of the individual channels
- by the tolerance in the 90° phase shift between A and B
- by the frequency

The times tx1 ... tx4 ideally have to amount to 1/4 of the particular period duration T. The typical output frequency of the encoder is defined so hat the max. time tx is smaller than 1.5 x T/4.



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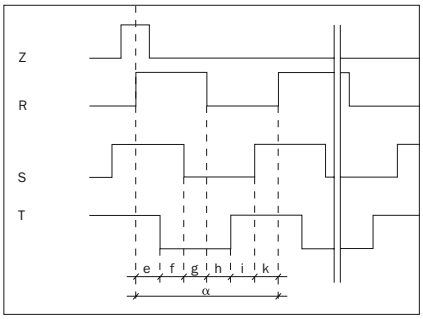
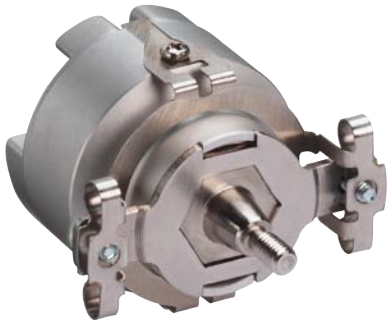


Pulse time diagram

Polepairs	Number of poles	e, f, g, h, i, k	Angle
2	4	30°	180°
3	6	20°	120°
4	8	15°	90°
6	12	10°	60°
8	16	7,5°	45°

The angle information is related to a mechanical shaft rotation. Flank precision of the signals R, S, T ±1°



Additional information

www.mysick.com

At a glance

- Output driver for incremental and commutation signals as per EIA 422
- Resolution of up to 2,048 lines per revolution
- Commutation signals up to 32 pole pairs
- Individual programming of the line count, pole pair number and zero pulse width
- High resistance to shock and vibration
- System compensates for eccentricity errors due to holistic scanning
- Allows for high angular speeds

Your benefits

- The CKS36's small dimensions allows manufacturers to considerably reduce the size of their motors
- Programmable version for a reduced product variety
- High level of compatibility thanks to standard interface

Order information

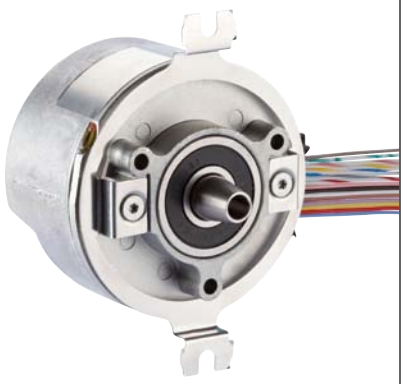
Other models available at www.mysick.com

Version	Number of lines	Pole pairs	Model name	Part no.
Programmable*	2.048	32	CKS36-PFBPROGR	1035370

*Delivery settings: 90° zero pulse width, 2,048 lines, 32 pole pairs

Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Stranded cable, straight, 14 cores, 14 x 0,15 mm²	14	0.2 m	DOL-1J14-G0M2XB7	6030948
Assembly tool			BEF-MW-SKX36	2031079
Programming- and adjustment tool			PGT-06-S	1035236



CE RoHS 2002/95/EC

Additional information

www.mysick.com

At a glance

- Output driver for incremental and commutation signals as per EIA 422
- Resolution of up to 65,536 lines per revolution
- Commutation signals up to 32 pole pairs
- Temperature range from –20 °C to +115 °C
- Various mechanical interfaces

Your benefits

- High level of flexibility due to mechanics already proven in other motor feedback systems
- Time-saving due to electrical zero adjustment
- High level of compatibility thanks to standard interface

Order information

Other models available at www.mysick.com

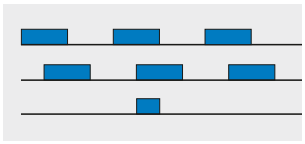
Version	Connection type	Numer of lines	Pole pairs	Model name	Part no.
Tapered shaft, spring plate support	Stranded cable outlet, 0.2 m	4096	2	CFS50-AFV12X02	1056626
Tapered shaft, spring plate support			3	CFS50-AFV12X03	1058458
Tapered shaft, spring plate support		2048	4	CFS50-AFV11X04	1059520

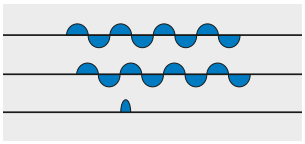
Incremental encoders for attaching to asynchronous motors

The robust solution for asynchronous motors.

Incremental motor feedback systems are measuring systems that record the position, the direction of rotation and the speed of electric motors. The number of lines per revolution determines the resolution.

The position is determined with a reference traverse. The position is then mapped as a result of the pulses being counted.





Incremental motor feedback systems are mainly used for speed control.

They are mechanically and electrically ideally suited for asynchronous motors. All the common electrical interfaces are available.

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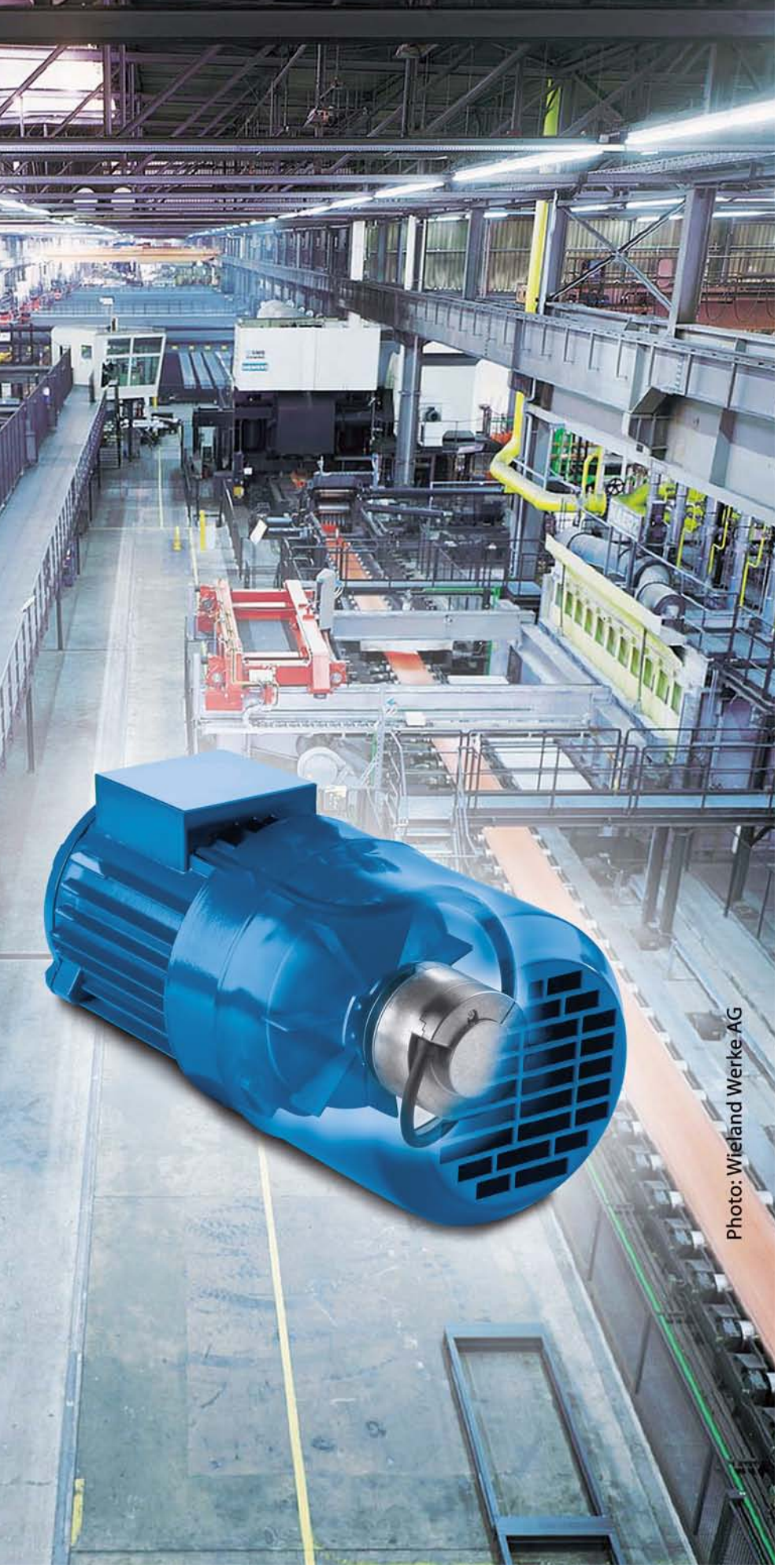
Subject to change without notice



Your benefits

Large selection of different product variants with the option of customization.

With our products and services, we pass on our many years of experience in the field of motor feedback systems.

Additional information

www.mysick.com

At a glance

- TTL, HTL or sine 0.5 Vpp interfaces
- Resolution of up to 65,536 lines per revolution
- Individual programming of the interface, line count and of the zero pulse
- Direct programming via RS485
- Excellent concentricity through large distance between the ball bearings
- Exceptional robustness
- Protection class IP65
- Mechanical flexibility through blind hollow shaft and through hollow shafts with diameters of 8 to 15 mm, available with various torque supports
- Temperature range from -30 °C to +100 °C

Your benefits

- Programmable version for a reduced product variety
- Various programming tools designed to take into account your own programming requirements
- High performance and reliability even in rough ambient conditions
- Large ball bearing distances reduce uneven wear and minimize vibration on the motor feedback housing, which increases the motor feedback system's service life.

Order information

Other models available at www.mysick.com

Version	Hollow shaft diameter	Electrical interface	Connection type	Number of lines	Model name	Part no.
VFS60 hollow shaft, programmable*	10 mm	4.5...32 V TTL/HTL	8-core cable universal 0.5 m	1024	VFS60A-TDPJ01024	1037366
VFS60 hollow shaft, programmable*	15 mm	4.5...32 V TTL/HTL	8-core cable universal 0.5 m	1024	VFS60A-THPJ01024	1051757
VFS60 hollow shaft, not programmable	15 mm	4.5...5.5 V TTL/RS422	8-core cable universal 0.5 m	1024	VFS60E-THAJ01024	1036470
VFS60 hollow shaft, not programmable	15 mm	10...32 V TTL/RS422	8-core cable universal 0.5 m	1024	VFS60E-THCJ01024	1036473
VFS60 hollow shaft, not programmable	15 mm	10...32 V HTL/Push pull	8-core cable universal 0.5 m	1024	VFS60E-THEJ01024	1036312
VFS60 hollow shaft, not programmable	15 mm	4.5...5.5 V Sinus 0,5 Vss	8-core cable universal 0.5 m	1024	VFS60E-THNJ01024	1053411

* Factory set: Output level TTl and number of lines 1,024

Recommended accessories

Description	Contacts/Wires	Wire length	Model name	Part no.
Programming tool for VFS60 (connection to commercially available PCs or notebooks)			PGT-08-S	1036616
Programming tool stand alone for VFS60			PGT-10-S	1052967
PGT-10-S adapter cable with SUB-D 9-pin cable connector, shielded, cable length of0.5 m for VFS60 with cable outlet		0.5 m	DSL-0D08-G0M5AC3	2061739
Cable connector M23, 12-pin straight, cable 8-wire incl. gasket, 4 x 2 x 0.15 mm² screened, cable diameter 5.6 mm		0.35 m	STL-2312-GM35AA3	2061621
Cable connector, straight, shielded	12		STE-2312-GX	6028548
Cable socket, straight, shielded	12		DOS-2312-G	6027538

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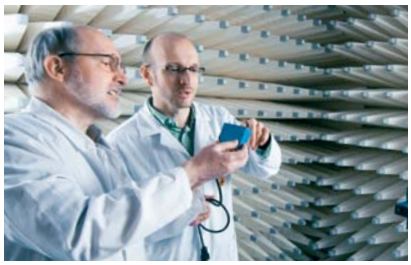
SICK at a glance



Leading technologies

With a staff of more than 5,000 and over 50 subsidiaries and representations worldwide, SICK is one of the leading and most successful manufacturers of sensor technology. The power of innovation and solution competency have made SICK the global market leader. No matter what the project and industry may be, talking with an expert from SICK will provide you with an ideal basis for your plans – there is no need to settle for anything less than the best.

Unique product range

- Non-contact detecting, counting, classifying, positioning and measuring of any type of object or media
- Accident and operator protection with sensors, safety software and services
- Automatic identification with bar code and RFID readers
- Laser measurement technology for detecting the volume, position and contour of people and objects
- Complete system solutions for analysis and flow measurement of gases and liquids

Comprehensive services

- SICK LifeTime Services – for safety and productivity
- Application centers in Europe, Asia and North America for the development of system solutions under real-world conditions
- E-Business Partner Portal www.mysick.com – price and availability of products, requests for quotation and online orders

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