STS

PERFECT FOR USE WHERE OTHERS REACH THEIR LIMITS.

Motor feedback system rotary HIPERFACE®

SICK
Sensor Intelligence.

PERFECT FOR USE WHERE OTHERS REACH THEIR LIMITS.

Product description

The trend toward highly dynamic drive systems has clearly strengthened in recent years. The STS absolute motor feedback system ensures maximum flexibility and precision when measuring the position and speed of hollow shaft motors and direct drives. The non-contact magnetic measurement principle works without causing wear. A scalable measurement system, the STS adapts to different hollow shaft diameters of the application. In addition, the STS scores points with its particularly flat design and compact dimensions, making it the ideal solution for tight installation situations. Thanks to the standardized HIPERFACE® interface, the motor feedback system can be easily integrated into nearly any industrial environment.

At a glance

- Non-contact and bearing-free measurement of speed and position
- Resolutions up to 12,672 measurement steps per revolution
- Accuracy of up to ± 0.05°
- For hollow shaft diameters from 30 mm to 500 mm
- Reliable in harsh ambient conditions
- HIPERFACE® interface with extended type label
- For internal and external rotor motors

Your benefits

- Flat, compact motor design due to maximum flexibility and installation of the motor feedback system with millimeter precision
- Increase in dynamics and PSDI times due to the elimination of mechanical components, such as belts
- Bearing-free technology maximizes the service life and machine availability of the overall system
- Use of hollow shafts to feed through hoses and cables saves valuable installation space
- Safe Motion for safe monitoring of machine movements and optimal interaction between man and machine

HIPERFACE®
by SICK

Additional information

➜ www.sick.com/STS

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.

Fields of application

- Ideal for integration into servo hollow shaft motors
- Direct drives, e.g. torque motors
- Rotational and swivel axes, e.g. extruders
- Robot joints
- Drive systems in the field of AGVs and mobile platforms

Detailed technical data

Performance

	STS084
Sine/cosine periods per revolution	158
Number of the absolute ascertainable revolutions	1
Total number of steps	5,056 via RS485
Measuring step	2 ″ For interpolation of the sine/cosine signals with, e. g., 12 bits
System accuracy	± 0.054°
Repeatability	0.01°
Pin length	2 mm

[1] Typical values with mechanical runout of the system of ≤ 50 μm and +20 °C..

Interfaces

	STS084
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®
Available memory area	128 Byte

Electrical data

	STS084
Connection type	Male connector, 8-pin
Supply voltage	7 V DC ... 12 V DC
Recommended supply voltage	8 V DC
Power consumption	250 mA [1]
MTTF: mean time to dangerous failure	190 years (EN ISO 13849) [2]

[1] Without load.

[2] 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.

Mechanical data

	STS084
Shaft version	Through hollow shaft
Material, sensor head	Aluminum
Material, magnetic tape	17410 Hard ferrite 9/28 P
Material, ring	Aluminum
Dimensions	See dimensional drawing
Weight	≤ 0.15 kg (sensor head) ≤ 0.75 kg
Moment of inertia of the rotor	1.525 gcm²
Operating speed	4,700 min⁻¹

[1] Relative to the installation position, as described in the assembly instructions (order nr. 8026831) and in the proposed customer fitting.

Permissible radial shaft movement	≤ 0.6 mm [1]
Permissible axial shaft movement	± 0.5 mm [1]

[1] Relative to the installation position, as described in the assembly instructions (order nr. 8026831) and in the proposed customer fitting.

Ambient data

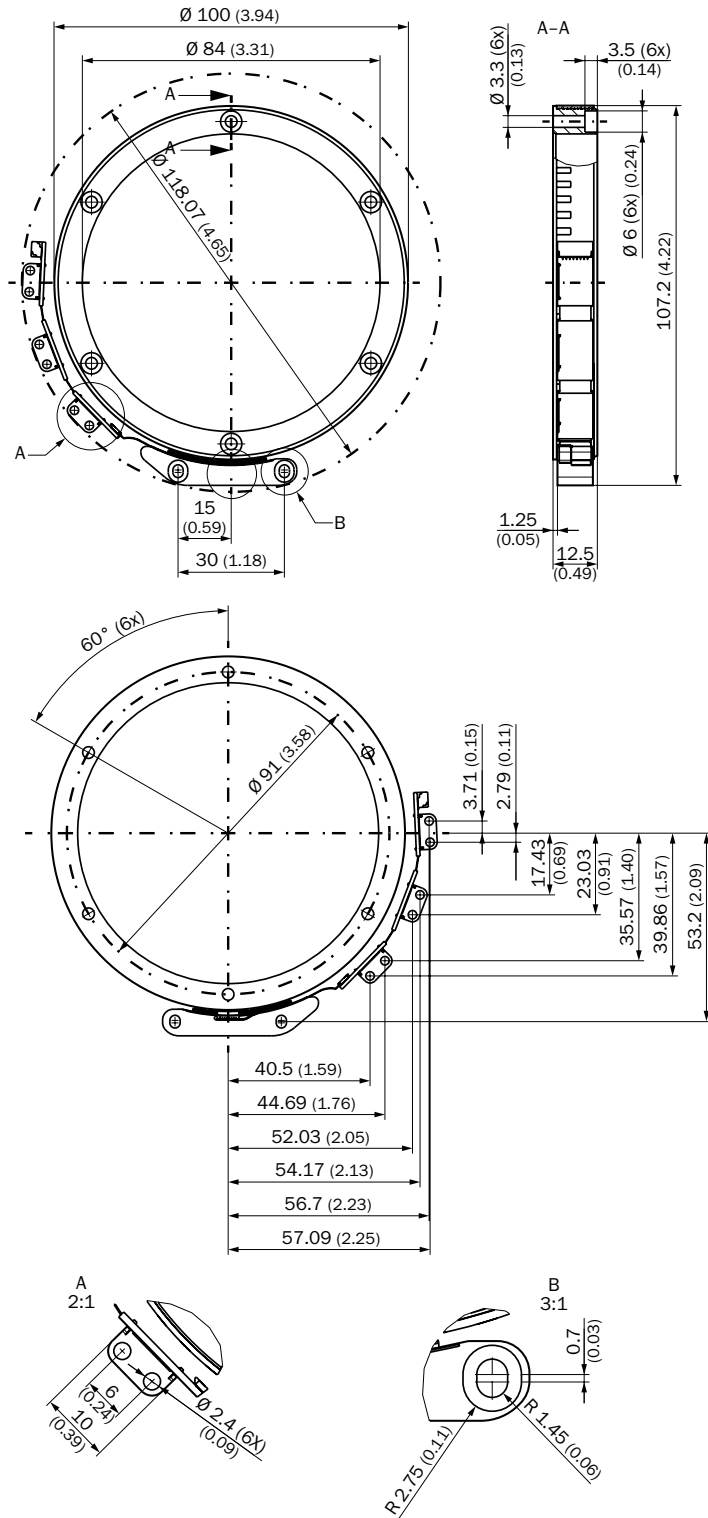|	STS084
Operating temperature range	–30 °C … +105 °C, sensor head –30 °C … +100 °C, magnet tape ring
Storage temperature range	–30 °C … +100 °C, without package
Relative humidity/condensation	95 %, Condensation not permitted
Resistance to shocks	100 g, 6 ms (according to EN 60068-2-27)
Frequency range of resistance to vibrations	20 g, 10 Hz … 2,000 Hz (according to EN 60068-2-6)
EMC	According to EN 61000-6-2 and EN 61000-6-4 [1]
Enclosure rating	IP00
Temperature coefficient magnetic tape	(11 ± 1) µm/K/m
Maximum permitted ambient field strength	< 3 kA/m … 4 kA/m (3.8 mT … 5 mT), to guarantee compliance with the quoted accuracy values [2]
Maximum permitted field strength	< 150 kA/m (< 190 mT), to ensure that the magnetic tape is not permanently damaged

[1] EMC in accordance with the specified standards is ensured if the motor feedback system is mounted in an electrically conductive housing that is connected to the central grounding point of the motor controller via a cable shield. Please observe the information in the installation instructions (part number 8026831).

[2] The maximum permitted external field influence is reached when the position value deviates from the original value (without external field influence) by more than 5 µm. This value is reached when, at the sensor location, a field strength of 3 kA/m to 4 kA/m (3.8 mT to 5 mT) occurs in addition to the field strength of the magnetic tape.
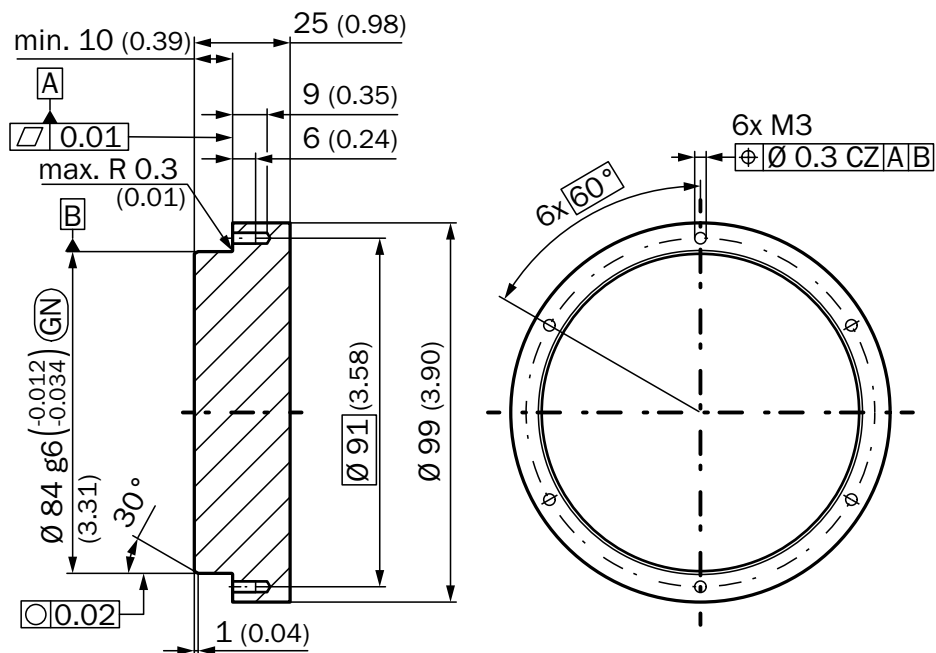
Ordering information

System part	Inner diameter hollow shaft	Connection type	Type	Part no.
Sensor head	–	Male connector, 8-pin	STS084-HN084-AK22	1121159
Magnetic tape	84 mm	–	MBR-084-KLB	6079317

Dimensional drawings (Dimensions in mm (inch))

Attachment specifications

min. 10 (0.39)
25 (0.98)

A
9 (0.35)
⬜ 0.01
6 (0.24)
max. R 0.3
(0.01)
B

6x M3
⊕ Ø 0.3 CZ A B

6x 60°

Ø 84 g6 $\left(\substack{-0.012 \\ -0.034}\right)$ (GN)
(3.31)
30°
Ø 91 (3.58)
Ø 99 (3.90)

◯ 0.02
1 (0.04)

Position tolerance

≤ 0,6 mm ①

± 0,5 mm ②

< ± 1°
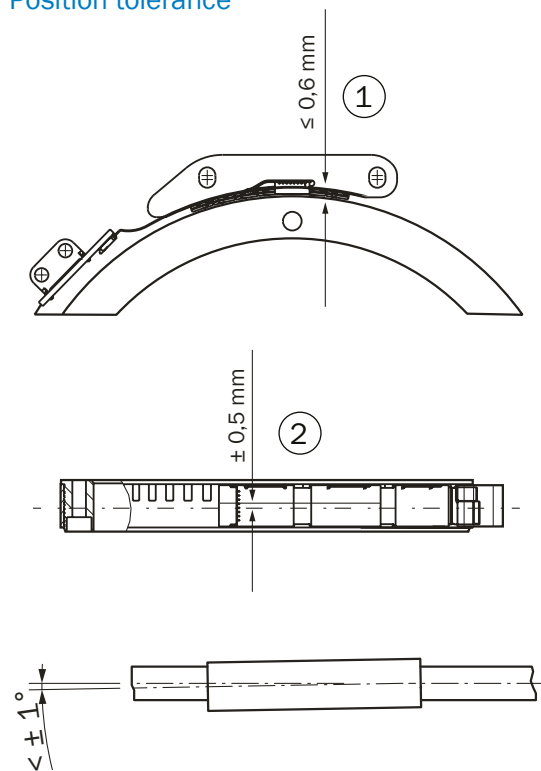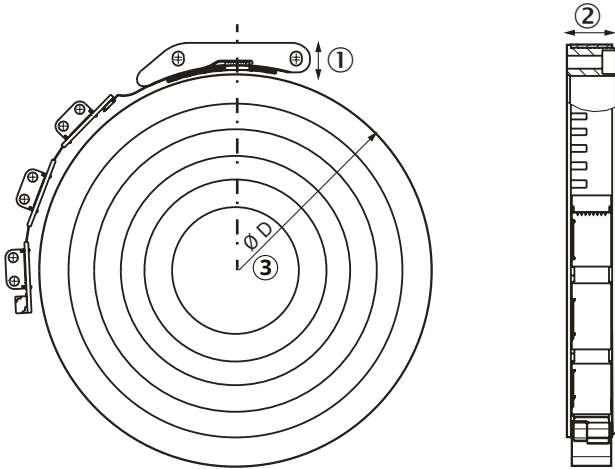
① Distance between sensor head and magnetic ring
② Axial tolerances

Note on the sizes

① Height 10 mm
② Encoder width 12. mm
③ Magnet ring sizes

Parameter	Inner diameter
D4	84 mm
Dx	Weitere Ringgrößen auf Anfrage

PIN assignment

View of the plug-in face
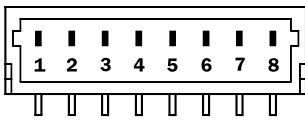
PIN	Signal	Wire colors (cable connection)	Explanation
1	U_S	Red	Supply voltage
2	+ SIN	White	Process data channel
3	REFSIN	Brown	Process data channel
4	+ COS	Pink	Process data channel
5	REFCOS	Black	Process data channel
6	GND	Blue	Ground connection
7	Data +	Gray or yellow	Parameter channel RS 485
8	Data -	Green or purple	Parameter channel RS 485
The GND connection (0 V) of the supply voltage is not connected to the housing			

Overview of supported commands for HIPERFACE®

Command byte	Function	Comments
42h	Read position	
43h	Set position	
44h	Read analog value	
		Channel number 48h - Temperature in °C
		F0h - Temperature compatible to product families SCx °C * 2,048 - 40
46h	Read counter	

Command byte	Function	Comments
47h	Increment Counter	
49h	Delete counter	
4Ah	Read data	
4Bh	Store data	
4Ch	Determine status of a data field	
4Dh	Create data field	
4Eh	Determine available memory area	
4Fh	Change access code	
50h	Read encoder status	
52h	Read out type label	Encoder type = FFh
53h	Encoder reset	
55h	Allocate encoder address	
56h	Read serial number and program version	
6Ch	Read Synchronization Offset	

Overview of warnings and fault indications

	Status code	Description
Error type	00h	The encoder has not detected any faults
Initialization	01h	Incorrect alignment data
	02h	Incorrect internal angular offset
	03h	Data field partitioning table destroyed
	04h	Analog limit values not available
	05h	Internal I2C bus inoperative
	06h	Internal checksum error
Protocol	07h	Encoder reset occurred as a result of program monitoring
	09h	Parity error
	0Ah	Checksum of transmitted data is incorrect
	0Bh	Unknown command code
	0Ch	Number of transmitted data is incorrect
	0Dh	Transmitted command argument is not allowed
Data	0Eh	The selected data field may not be written to
	0Fh	Incorrect access code
	10h	Size of specified data field cannot be changed
	11h	Specified word address lies outside the data field
	12h	Access to non-existent data field
Position	01h	Analog signals outside specification
	1Fh	Speed too high, no position formation possible
	20h	Singleturn position unreliable
Other	1Ch	Value monitoring of the analog signals (process data)
	1Dh	Transmitter current critical or P2RAM-Error
	1Eh	Encoder temperature critical
	08h	Counter overflow
For more information on the interface see HIPERFACE® - description, part no. 8010701		

Accessories

Plug connectors and cables

Plug connectors and cables

Connecting cables

Figure	Brief description	Type	Part no.
	Head A: female connector, JST, 8-pin, straight Head B: Flying leads Cable: HIPERFACE®, unshielded, 0.2 m	DOL–0J08–G0M5AB6	2124447

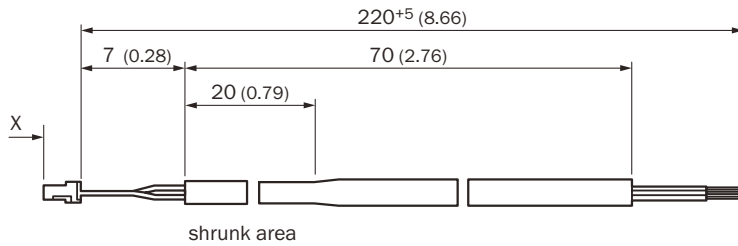Dimensional drawings ➜ page 9

Connection cables

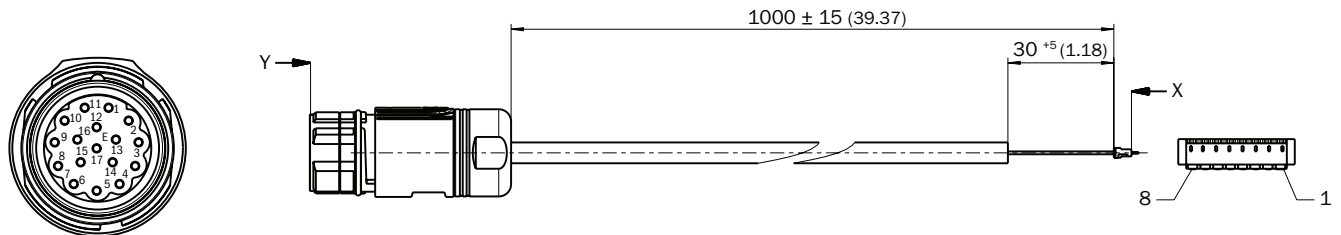| Figure	Brief description	Type	Part no.
	Head A: female connector, JST, 8-pin, straight Head B: male connector, M23, 17-pin, straight Cable: HIPERFACE®, unshielded, 1 m	DSL-2317-G01MJB6	2071327

Dimensional drawings ➜ page 9

Dimensional drawings for accessories (Dimensions in mm (inch))

Plug connectors and cables

DOL–0J08–G0M5AB6

DSL-2317-G01MJB6

② blu
③ red
⑦ blk
⑪ pnk
⑫ vi
⑭ yel
⑮ brn
⑯ wht

NOTES

WORKING WITH SICK IN A DIGITAL WORLD
Making your digital business environment comfortable

Find a suitable solution in next to no time
Often we know best what we need – but not necessarily where to find it right away. SICK will support you with its in-depth expertise.

- Online product catalog – our digital flagship
  ➜ www.sick.com/products
- Application Solver – the right sensor for selected applications ➜ www.sick.com/applicationBased
- Online configurators and selectors – exactly the right sensor for your needs

My SICK is your personal self-service portal
My SICK is your personal self-service portal with lots of helpful information and your own individual access to the web shop. Take advantage of the wide variety of exclusive advantages on offer:

Your benefits
- Open around the clock
- Clear product information
- Company-specific price conditions
- Convenience during the ordering process
- Document overview
- Availability and delivery times

Register now:
➜ www.sick.com/myBenefits

Get ahead with digital knowledge transfer and digital services
- Digital Customer Trainings ➜ www.sick.com/c/g300887
- Digital Service Catalog ➜ cloud.sick.com
- SICK AppPool ➜ apppool.cloud.sick.com

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 10,400 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its 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.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the 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 SICK a reliable supplier and development partner.

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

That is "Sensor Intelligence."

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, 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 further locations ➜ **www.sick.com**

SICK
Sensor Intelligence.

SICK AG | Waldkirch | Germany | www.sick.com