

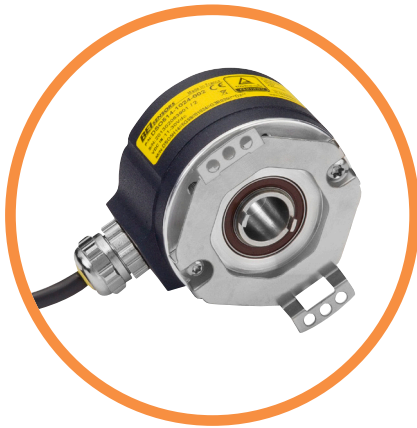


DSO5H MODELS

SIL3 PLe INCREMENTAL ENCODERS

Introduction

When an automation system requires a high degree of risk mitigation of failure modes, often times Functional Safety equipment can be a part of the solution. Sensata | BEI Sensors offers a wide range of Functional Safety encoders to fit most any application or electrical interface requirement. Rated at SIL3 (PLe), these encoders allow safe operation in set-up, production and maintenance modes, significantly reducing operational risks. All encoders have the option of a Digital HTL or TTL operation as an alternative to the Sine/Cosine outputs found on most Functional Safety encoders. This makes them a compatible replacement for existing encoders when migrating to a higher safety level of operation. The DSO5H series incorporates a hollow shaft-style mounting that can accept shafts of 14 mm in diameter. It is mounted with a stator coupling kit and a clamp to secure it to the shaft. The encoder body is 58mm in diameter.



Features

- Usable up to SIL3 and Cat.4 / PLe according to IEC 61508 / EN ISO 13849
- Suitable for safe motor feedback according to IEC 61800-5-2
- Robust and excellent resistance to shock and vibration
- High protection level: IP65
- High temperature performance -20°C to $+85^{\circ}\text{C}$
- 58mm standard size encoder
- Through hollow shaft 14mm
- Wide choice of connection configurations
- Power supply 5Vdc or 11 - 30Vdc
- Digital TTL/RS422, HTL or sine/cosine 1Vpp output
- Resolutions up to 2500ppr

Applications

- Industrial automation
- Automated guided vehicles
- Mills for lumber, steel and other metals
- Printing and packaging equipment
- Food processing equipment
- Forming and die presses

SPECIFICATIONS

Mechanical

	DSO5H
Material	Cover: Powder coated aluminum Body: aluminum Shaft: AISI 303 stainless steel
Bearings	6803 series - sealed
Maximum Loads	Axial: 20 N Radial: 40 N
Shaft Inertia	< 9,500 g.mm ²
Static/Dynamic torque	10 / 85 mN.m
Permissible max. speed	9,000 RPM
Continuous max. speed	4,000 RPM
Theoretical mechanical lifetime L_{10h} ^(A)	> 24 X 10 ⁹ turns / 100,000 hours
Encoder weight (approx.)	0.28 kg

^(A) **Continuous max. speed – ½ max. load – according to ISO 281:** 1990, L₁₀

Electrical Characteristics / Functional Safety Parameters ^(B)

Electronic Version	Output signals	Operating Voltage +V	Supply current	Current per channel pair	Short circuit protected	Reverse polarity protected	PFD	PFH	MTTFd	DC
2G2	Digital TTL RS422	5V +/-5% ^(C)	100mA with no load	40mA	Yes	Yes	7.51E-05	8.58E-10	1331	HIGH
5G2		11-30V ^(C)			Not to +V		9.52E-05	1.09E-09	1050	
5G5	Digital HTL				Yes		9.52E-05	1.09E-09	1050	
2WT	Sine Cosine 1Vpp	5V +/-5% ^(C)	70mA with no load	10mA	Yes		4.29E-05	4.90E-10	2328	
5WT		11-30V ^(C)			Not to +V		6.60E-05	7.53E-10	1515	

^(B) Safety mission time: 20 years

^(C) Device must be supplied by a Class 2 LPS or SELV/PELV limited energy source ≤60V.

Environmental & Standards Conformity

	DS05H
Protection (EN 60529)	IP65
Salt Spray (EN 60068-2-11 part 2)	96h
Humidity (EN 60068-2-38)	93% @ 65°C
Shock (EN 60068-2-27)	≤ 500m.s ⁻² (6 ms, half sine)
Vibration (EN 60068-2-6)	≤200m.s ⁻² (10...2000Hz)
Operating temperature	-20 to 85°C (encoder T°)
Storage temperature	-20 to 85°C
EMC Immunity Test	EN 61000-6-2, increased levels
EMC Emission Test	EN 61000-6-4, increased levels
Isolation	1000 Veff
Functional safety	IEC 61508
	IEC 62061
	ISO 13849-1
	IEC 61800-5-2
Encoders usable up to SIL3 / PLe with specific requirements, see safety user manual for details.	
Z and Z/ are not safety signals.	



STANDARD CONNECTIONS

		0V	+V	A or S	B or C	Z	A/ or S/	B/ or C/	Z/	Ground
G6	M23 - 12 pins CW	1	2	3	4	5	6	7	8	Connector body
G8	M23 - 12 pins CCW	10 + 11	2 + 12	8	5	3	1	6	4	Connector body
G3	PVC cable 8 wires 8230/020	WH white	BN brown	GN green	YE yellow	GY grey	PK pink	BU blue	RD red	General shielding
GP	PUR cable 12 wires 8230/050	WH white + WH/GN white /green	BU blue + BN/GN brown / green	GY grey	BN brown	RD red	PK pink	GN green	BK black	General shielding

Note: All connections are UL certified, except G3 and GP



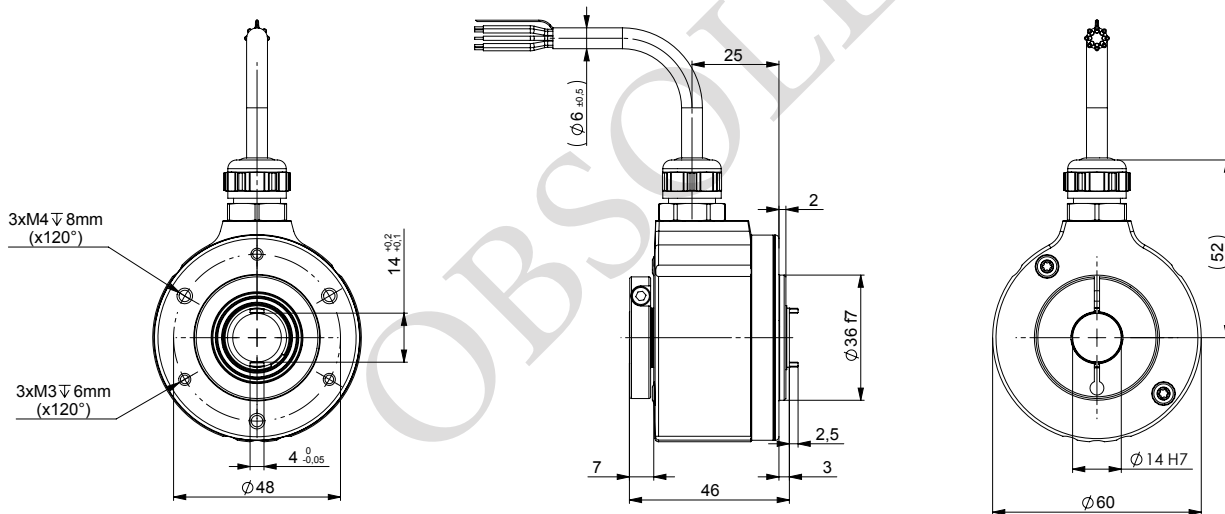
RESOLUTIONS

250 256 360 500 512 1000 1024 1500 2000 2048 2500

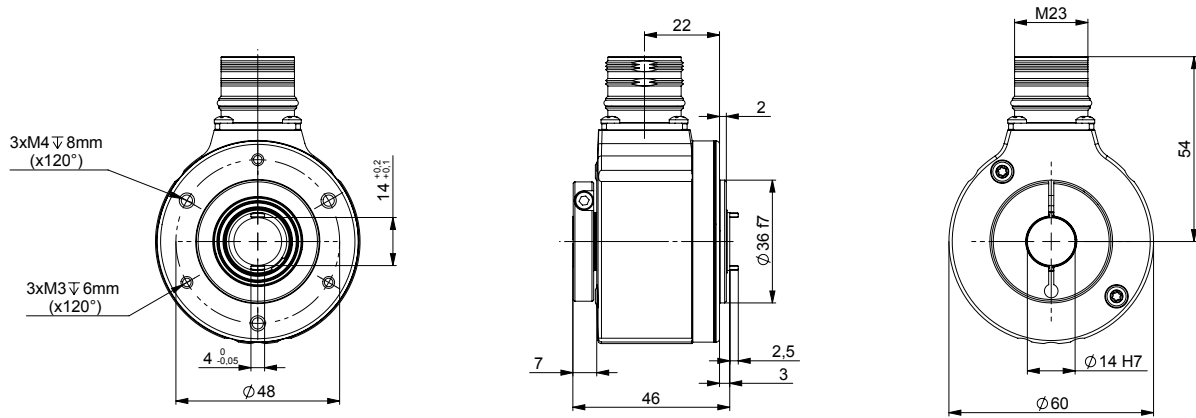


DIMENSIONS

DS05H14 - Through hollow shaft 14mm - Cable output Radial (G3R)



DS05H14 - Through hollow shaft 14mm - M23 Connector output Radial - With stator coupling 9445/044



		9445/044	9445/047
Permissible misalignments	Axial	+/- 1mm	+/- 1mm
	Radial	+/- 0.2mm	+/- 0.2mm
	Perpend.	+/- 2°	+/- 5°
	Runout	0.1mm	0.1mm
Angular rigidity		600 N.m/rad	100 N.m/rad

GENERAL NOTES

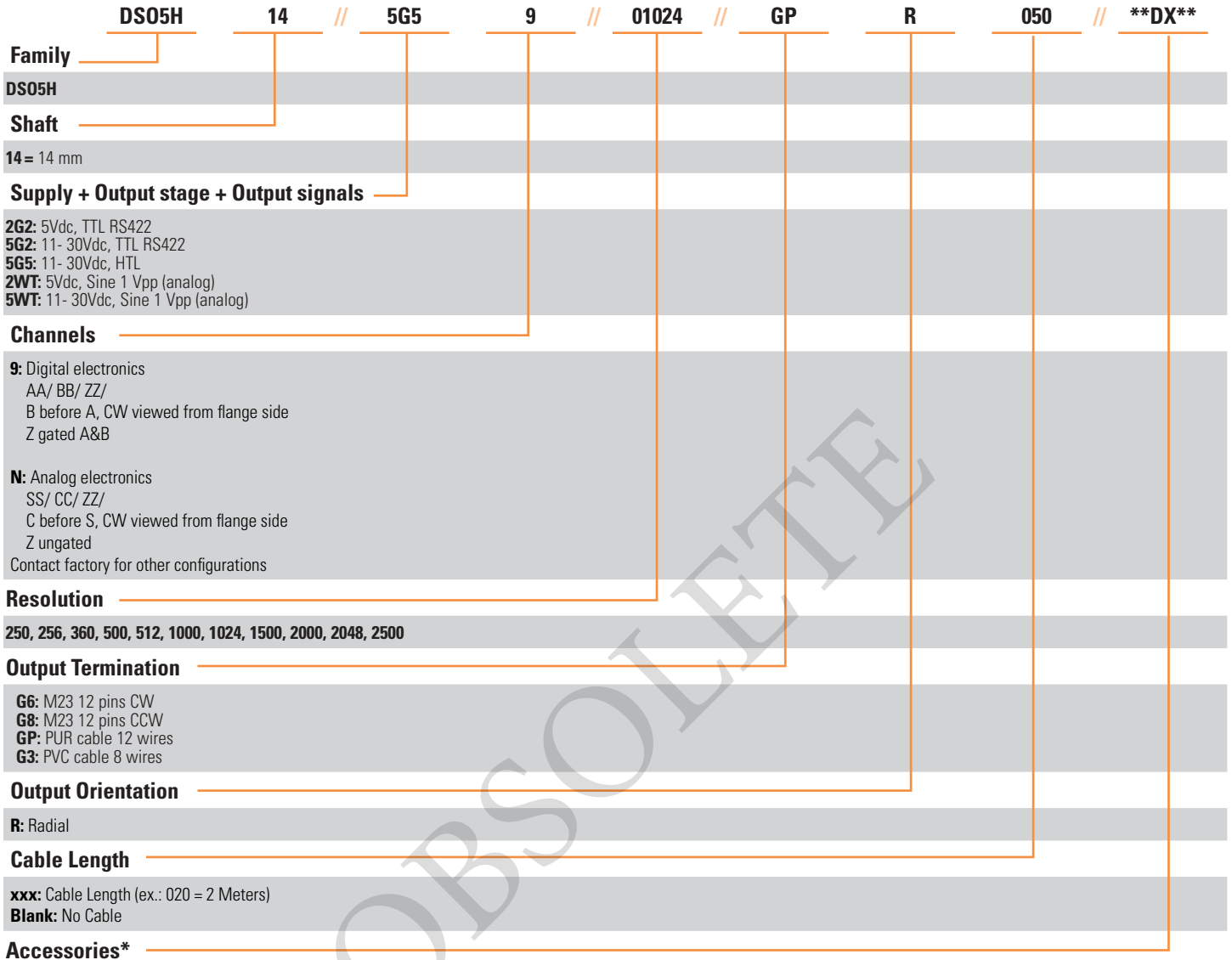
For a safe installation according to the required safety level needed in the application, refer to the user safety User Manual. The safety User Manual provides the technical information (drawings, electrical data, etc...) for a safe integration. A quick installation guide is provided with each encoder for use by the technician who installs the device on the equipment.



DSO5H ORDERING OPTIONS

Example : DSO5H14 // 5G59 // 01024 // GPR050 // **DX**

Contact the factory for special versions, ex: resolution, connection, flange...



* Parts mounted on encoder and fasteners included in the encoder box.



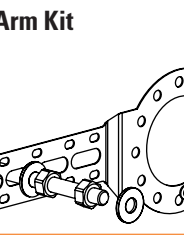
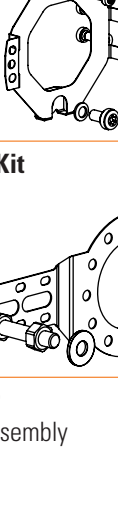
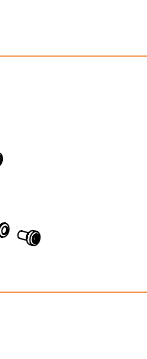
AGENCY APPROVALS & CERTIFICATIONS



BEI Sensors SAS Sensata Technologies

Espace Européen de l'Entreprise
9, rue de Copenhague
B.P. 70044 Schiltigheim
F 67013 Strasbourg Cedex

Tél : +33 (0)3 88 20 80 80
Fax : +33 (0)3 88 20 87 87
Mail : position-info.eu@sensata.com
Web : www.sensata.com

Description	Part Number
<p>Safety Rated Flexmount Kit Hardware included</p> 	<p>M9445/044</p>
<p>Safety Encoder Tether Arm Kit Hardware included</p> 	<p>M9445/047</p>
<p>Standard Mating Connector 2m, 5m, 10m Mating Cable Assembly</p> 	<p>Extension cords compatible with G6 connection option: RAL-020-001 = M23, PVC cable, 2m RAL-050-001 = M23, PVC cable, 5m RAL-100-001 = M23, PVC cable, 10m</p> <p>Extension cords compatible with G8 connection option: RAL-020-012 = M23, PUR cable, 2m RAL-050-020 = M23, PUR cable, 5m RAL-100-028 = M23, PUR cable, 10m</p>

OBSOLETE

Sensata Technologies, Inc. ("Sensata") data sheets are solely intended to assist designers ("Buyers") who are developing systems that incorporate Sensata products (also referred to herein as "components"). Buyer understands and agrees that Buyer remains responsible for using its independent analysis, evaluation and judgment in designing Buyer's systems and products. Sensata data sheets have been created using standard laboratory conditions and engineering practices. Sensata has not conducted any testing other than that specifically described in the published documentation for a particular data sheet. Sensata may make corrections, enhancements, improvements and other changes to its data sheets or components without notice.

Buyers are authorized to use Sensata data sheets with the Sensata component(s) identified in each particular data sheet. HOWEVER, NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE TO ANY OTHER SENSATA INTELLECTUAL PROPERTY RIGHT, AND NO LICENSE TO ANY THIRD PARTY TECHNOLOGY OR INTELLECTUAL PROPERTY RIGHT, IS GRANTED HEREIN. SENSATA DATA SHEETS ARE PROVIDED "AS IS". SENSATA MAKES NO WARRANTIES OR REPRESENTATIONS WITH REGARD TO THE DATA SHEETS OR USE OF THE DATA SHEETS, EXPRESS, IMPLIED OR STATUTORY, INCLUDING ACCURACY OR COMPLETENESS. SENSATA DISCLAIMS ANY WARRANTY OF TITLE AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUIET ENJOYMENT, QUIET POSSESSION, AND NON-INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY RIGHTS WITH REGARD TO SENSATA DATA SHEETS OR USE THEREOF.

All products are sold subject to Sensata's terms and conditions of sale supplied at www.sensata.com SENSATA ASSUMES NO LIABILITY FOR APPLICATIONS ASSISTANCE OR THE DESIGN OF BUYERS' PRODUCTS. BUYER ACKNOWLEDGES AND AGREES THAT IT IS SOLELY RESPONSIBLE FOR COMPLIANCE WITH ALL LEGAL, REGULATORY AND SAFETY-RELATED REQUIREMENTS CONCERNING ITS PRODUCTS, AND ANY USE OF SENSATA COMPONENTS IN ITS APPLICATIONS, NOTWITHSTANDING ANY APPLICATIONS-RELATED INFORMATION OR SUPPORT THAT MAY BE PROVIDED BY SENSATA.

Mailing Address: Sensata Technologies, Inc., 529 Pleasant Street, Attleboro, MA 02703, USA.

CONTACT US

Americas

+1 (800) 350 2727
sensors@sensata.com

Europe, Middle East & Africa

+33 (3) 88 20 8080
position-info.eu@sensata.com

Asia Pacific

sales.isasia@list.sensata.com
 China +86 (21) 2306 1500
 Japan +81 (45) 277 7117
 Korea +82 (31) 601 2004
 India +91 (80) 67920890
 Rest of Asia +886 (2) 27602006
 ext 2808