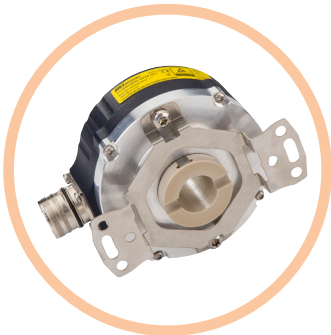


# DSU9H & DSU9X MODELS

## SIL3 PLe INCREMENTAL ENCODERS



DSU9H



DSU9X



### 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
- Especially designed for heavy-duty applications (steel, paper, wood, mills, cranes...) Compact and robust design. Excellent resistance to shock and vibration
- Stainless steel version available (DSU9X)
- 90mm encoder, 30mm standard through shaft, PEEK reduction hub available
- High protection level: IP66 (DSU9X), IP65 (DSU9H)
- High temperature performance  $-20^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Power supply 5Vdc or 11/30Vdc
- Digital TTL/RS422 or HTL Push-pull or sine/cosine 1Vpp output
- Available resolution up to 2048 ppr
- Connector or cable output – side orientation
- Adapted anti-rotation system

### SPECIFICATIONS

#### Mechanical

	DSU9H	DSU9X
<b>Material</b>	<b>Cover:</b> powder coated aluminum <b>Body:</b> aluminum	<b>Cover:</b> AISI 303 stainless steel <b>Body:</b> AISI 303 stainless steel
	<b>Shaft:</b> AISI 303 stainless steel	
<b>Ball Bearings</b>	6807 - Sealed	
<b>Maximum Loads</b>	<b>Axial:</b> 25 N <b>Radial:</b> 50 N	
<b>Shaft Inertia</b>	< 120,000 g.mm <sup>2</sup>	< 125,000 g.mm <sup>2</sup>
<b>Static/Dynamic torque</b>	30 / 300 mN.m	250 / 600 mN.m
<b>Permissible max. speed</b>	6000 RPM	3000 RPM
<b>Continuous max. speed</b>	3000 RPM	1500 RPM
<b>Theoretical mechanical lifetime L<sub>10h</sub> <sup>(A)</sup></b>	> 18 X 10 <sup>9</sup> turns / 100,000 hours	> 9 X 10 <sup>9</sup> turns / 100,000 hours
<b>Encoder weight (approx.)</b>	0.65 kg	1.3 kg

<sup>(A)</sup> **Continuous max. speed – ½ max. load – according to ISO 281: 1990, L<sub>10</sub>**

#### Temperature Conditions

<b>Operating temperature</b>	- 20 ... + 85 °C (encoder T°)
<b>Storage temperature</b>	- 20 ... + 85 °C

## Electrical Characteristics / Functional Safety Parameters <sup>(B)</sup>

Electronic Version	Output signals	Operating Voltage +V	Supply current	Current per channel pair	Short circuit proof	Reverse polarity protected	PFD	PFH	MTTFd	DC
2G2	Digital TTL	5V +/-5%	100mA with no load	40mA	Yes	Yes	5.63E-05	6.42E-10	1547	HIGH
5G2	RS422	11-30V			Not to +V		7.63E-05	8.72E-10	1180	
5G5	Digital HTL				Yes		7.63E-05	8.72E-10	1180	
2WT	Sine Cosine 1Vpp	5V +/-5%	70mA with no load	10mA	Yes		4.29E-05	4.90E-10	2328	
5WT		11-30V			Not to +V		6.60E-05	7.53E-10	1515	

<sup>(B)</sup> **Safety mission time:** 20 years

## Standards Conformity

	DSU9H	DSU9X
<b>Protection (EN 60529)</b>	IP65	IP66
<b>Humidity (EN 60068-2-38)</b>	93% @ 65°C	
<b>Shock (EN 60068-2-27)</b>	≤ 500 g (during 6 ms)	
<b>Vibration (EN 60068-2-6)</b>	≤ 200 g (10 ... 2 000 Hz)	
<b>EMC Immunity Test</b>	EN 61000-6-2, increased levels	
<b>EMC Emission Test</b>	EN 61000-6-4, increased levels	
<b>Isolation</b>	1000 Veff	
<b>Salt Spray (EN 60068-2-11 part 2)</b>	96h	168h
<b>Functional safety</b>	IEC 61508	
	IEC 62061	
	ISO 13849-1	
	IEC 61800-5-2	
	IEC 62061	
<b>Encoders usable up to SIL3 / PLe with external specific requirements, see safety user manual for details.</b>		
<b>Z and Z/ are not safety signals.</b>		

## Electrical Connections

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

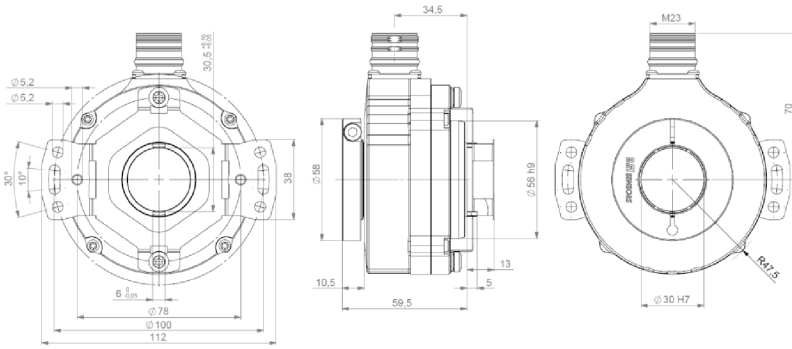
## Available Resolutions

1024 2048



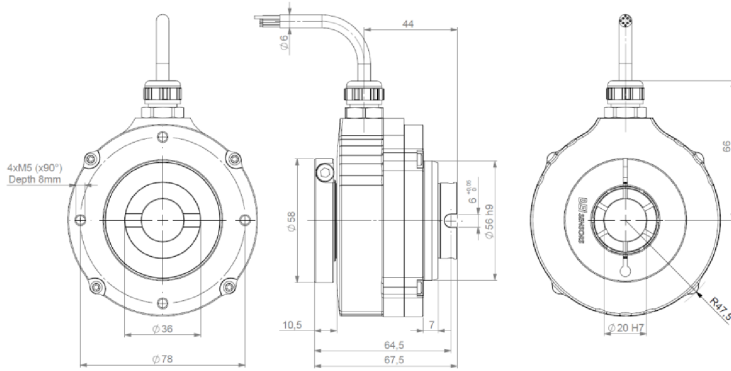
## DIMENSIONS

### DSU9H – radial M23 connector with 9445/045 anti-rotation

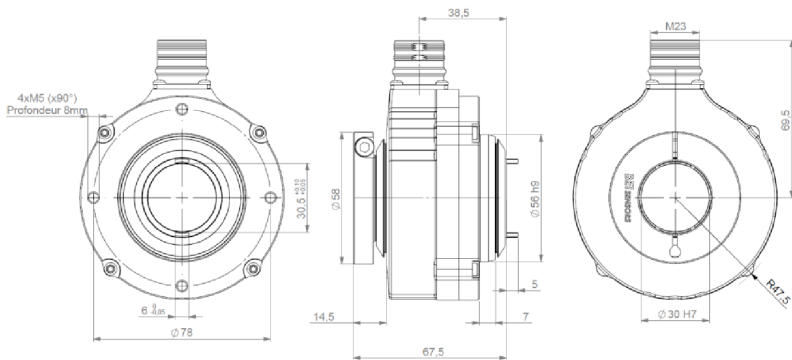


		9445/045	9445/046
<b>Permissible misalignments</b>	<b>Axial</b>	+/- .5mm	+/- 1mm
	<b>Radial</b>	+/- 0.3mm	+/- 0.2mm
	<b>Perpend.</b>	+/- 3°	+/- 5°
	<b>Runout</b>	0.1mm	0.1mm
<b>Angular rigidity</b>		540 N.m/rad	530 N.m/rad

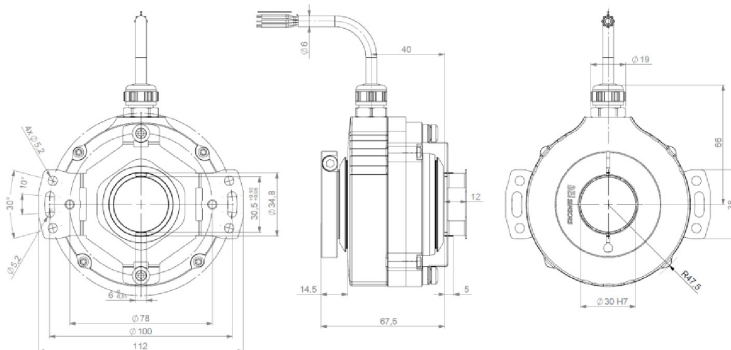
### DSU9H radial cable and 20mm reduction bulb



### DSU9X – radial M23 connector



### DSU9X radial cable and stator coupling 9445/045





# DSU9H/DSU9X ORDERING OPTIONS

Example: DSU9H30 // 5G29 // 01024 // GPR050 // \*\* DW\*\*

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

<b>Family</b>	<b>DSU9H</b>	<b>30</b>	//	<b>5G29</b>	//	<b>01024</b>	//	<b>GPR050</b>	//	<b>**</b>	<b>DW**</b>
<b>DSU9H:</b> Aluminum <b>DSU9X:</b> Stainless											
<b>Shaft</b>											
<b>30:</b> 30mm (reduction hubs, 20 mm and 25mm available)											
<b>Supply + Output stage + Output signals</b>											
<b>Digital Signals:</b> 2: 5Vdc G2: driver 5Vdc RS422 9: AA/ BB/ ZZ/ 5: 11- 30Vdc G2: driver 5Vdc RS422 G5: push-pull 9: AA/ BB/ ZZ/											
<b>Analog Sine Cosine signals:</b> 2: 5Vdc WT: sine 1Vpp N: SS/ CC/ ZZ/ 5: 11- 30Vdc WT: sine 1Vpp N: SS/ CC/ ZZ/											
<b>Resolution</b>											
<b>1024, 2048</b>											
<b>Connection + Orientation</b>											
<b>G6:</b> M23 12 pins CW R: radial <b>G8:</b> M23 12 pins CCW R: radial <b>GP:</b> PUR cable 12 wires R: radial cable (example: 020 = 2m) <b>G3:</b> PVC cable 8 wires R: radial cable (example: 020 = 2m)											
<b>Reduction Hub</b>											
<b>** :</b> No reduction hub <b>U2 :</b> Reduction hub											
<b>Anti-rotation</b>											
<b>DW** :</b> 9445/045 <b>**** :</b> No antirotation											



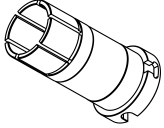
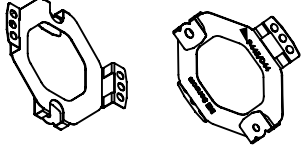
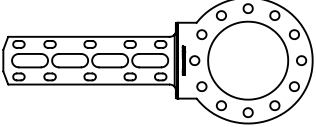
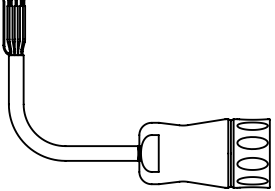
# AGENCY APPROVALS & CERTIFICATIONS



## GENERAL NOTES

**For a safe installation according to the required safety level needed in the application, refer to the user safety manual - during the installation on the equipment, a quick installation guide is provided with each encoder either in printed form in the shipping box or in digital form on the website.**

## ACCESORIES

<p><b>Reduction Hub</b> To create 20mm, 25mm and 25,4mm (1.00 in) ID bore on DSU9</p> 	<p>9418/S20 9418/S25 9418/S25,4</p>	<p>DSU9H DSU9X</p>
<p><b>Safety Rated Flexmount (hardware included)</b></p> 	<p>M9445/045</p>	<p>DSU9H DSU9X</p>
<p><b>Safety Encoder Tether Arm (hardware included)</b></p> 	<p>M9445/046</p>	<p>DSU9H DSU9X</p>
<p><b>Standard Mating Connector</b> 2m, 5m, 7m, 10m Mating Cable Assembly</p> 	<p>9416/076-8230/020-G6-020 = 2m 9416/076-8230/020-G6-050 = 5m 9416/076-8230/020-G6-070 = 7m 9416/076-8230/020-G6-100 = 10m</p> <p>For use with M23 connector type G6</p>	<p>DSU9H DSU9X</p>