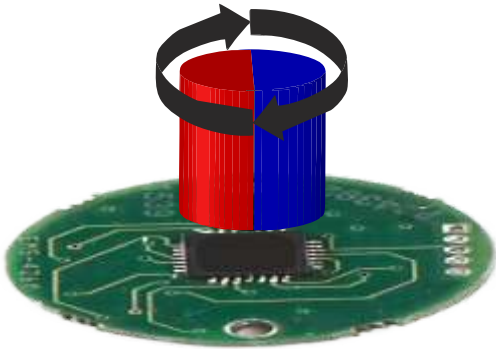


## WSE22 - Magnetic shaft encoder

Based on Dipole Magnet and Hall Sensors



WSE22 is a magnetic rotary enclosed encoder with a shaft. It has a precision sensor having an integrated Hall element for scanning a permanent Dipole magnet. The encoder can give Absolute as well as incremental outputs up to 14 bits per rotation.

**WSE22 enclosure is designed like a enclosed shaft encoders allowing for very easy installation in applications.**

**Its IP68 robust design makes it ideal for use in harsh environments.**

### Salient Features:

- ☞ 22mm Circular encoder with Ø4mm Shaft
- ☞ Operates on 5V power supply
- ☞ Variety of outputs supported like Analog Sin-Cos output, Incremental RS422, Absolute SSI and BiSS-C protocol
- ☞ Supports up to 14 bits (16384 positions) per rotation Absolute and Incremental outputs
- ☞ Accuracy +/- 0.35 deg
- ☞ High Speed operation up to 20000 rpm at finest resolution
- ☞ 3600 CPR also available to give angular resolutions easier for mathematical calculations
- ☞ Suitable for applications like motor control, Medical instrumentation, paper and textile industry, Industrial automation and many more



RATED TO  
**IP68**

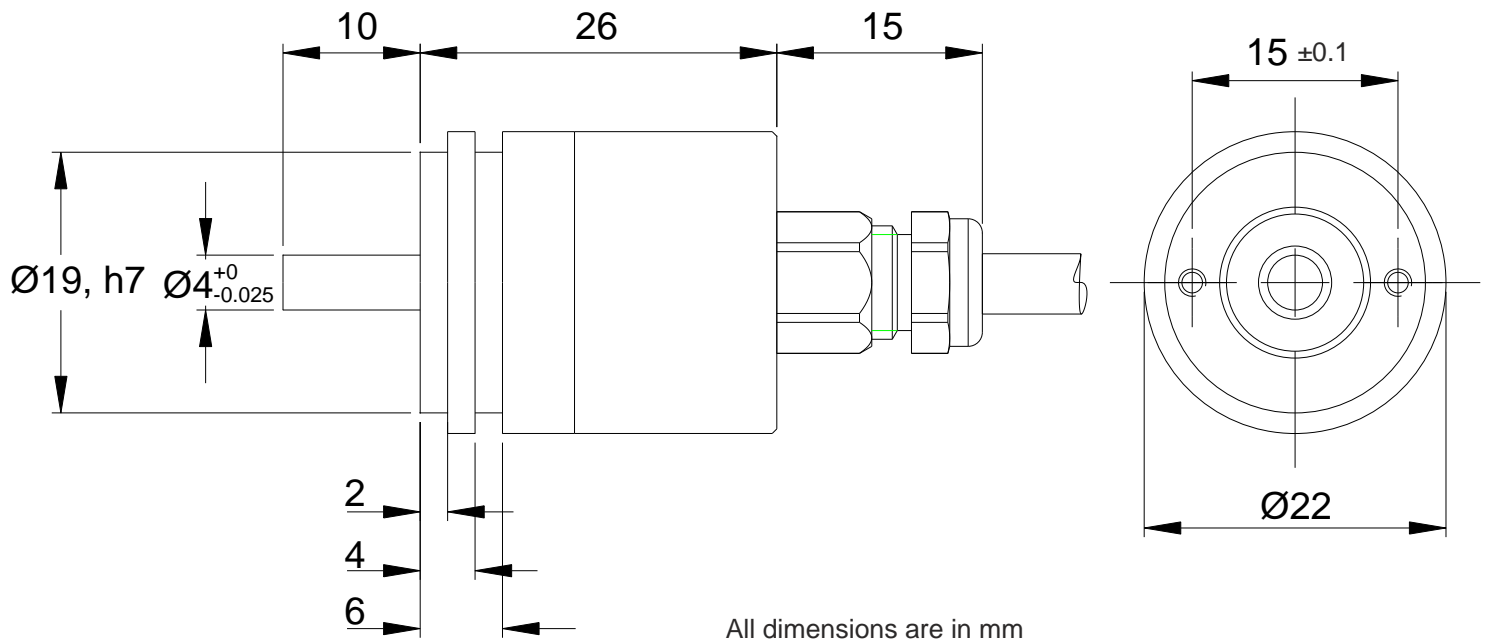


### Available models:

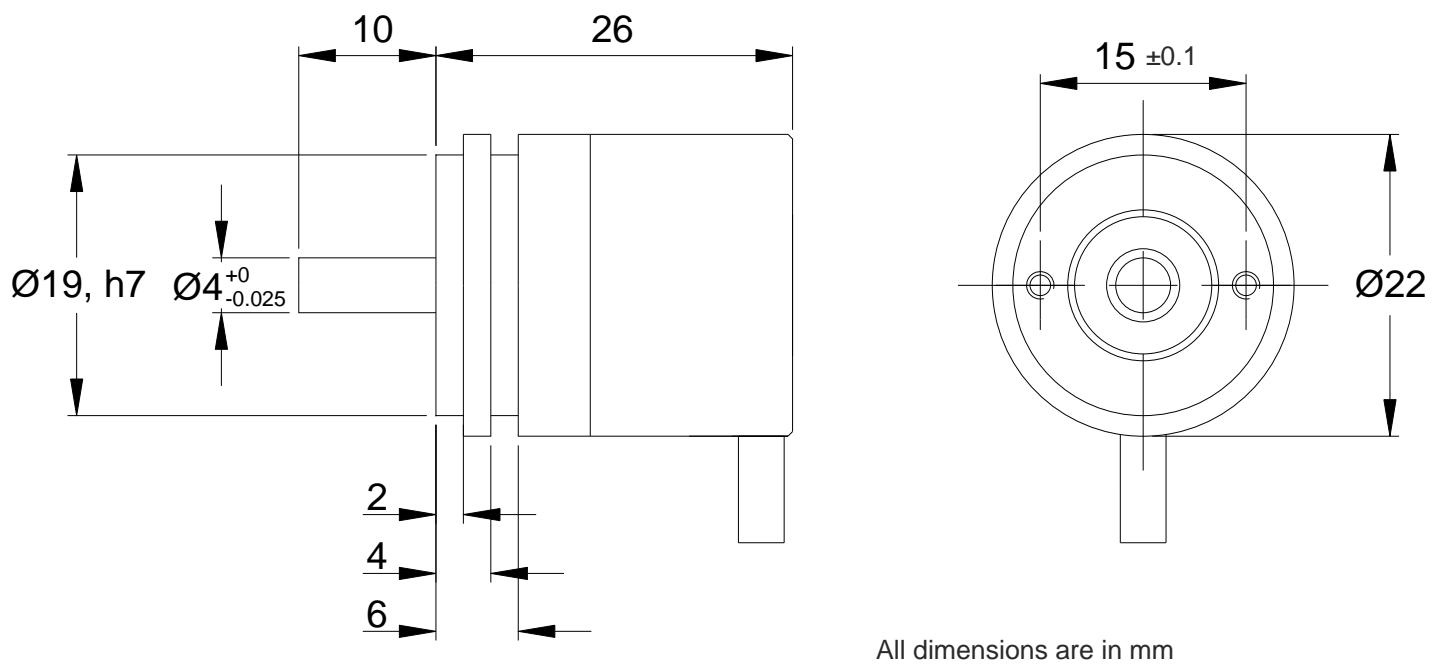
- ☞ **WSE22AS** - Analog single ended Sine Cosine output with a single sine-cosine cycle per rotation
- ☞ **WSE22AC** - Analog complementary Sine Cosine output with a single sine-cosine cycle per rotation
- ☞ **WSE22IR** - Incremental RS422 A, B and Z output with up to 16384 counts per rotation
- ☞ **WSE22SB** - Absolute output on Synchronous Serial interface (SSI) with Binary data up to 13 Bits per rotation
- ☞ **WSE22SG** - Absolute output on Synchronous Serial interface (SSI) with Grey coded data up to 13 Bits per rotation
- ☞ **WSE22BC** - Absolute output on BiSS-C data up to 14 Bits per rotation

## Installation drawings:

### Axial type



### Radial type



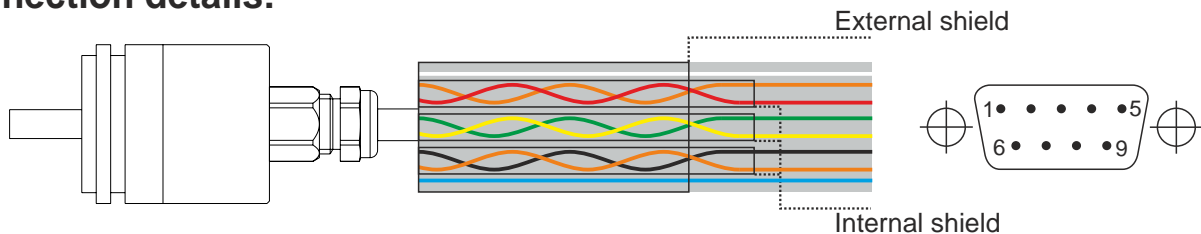
Note: The above drawings for IP53 model only. Please contact factory for installation drawings for IP64 / IP68 encoders

### Cable installation

## WSE22 Specifications:

	WSE22AS / AC	WSE22IR	WSE22SB / SG	WSE22BC
Power Supply ( $V_{dd}$ )	+5V DC ( $\pm 5\%$ )			
Current consumption	50mA maximum		90mA maximum	
Output	AS - 2Vpp each signal AC - 0.5Vpp each signal	RS422		
Maximum RPM	20000 RPM			
Operating Temperature	-40°C to +125°C			
Storage Temperature	-40°C to +125°C			
Storage Humidity	Max. 95% relative humidity (non-condensing)			
Operating Humidity	Max. 80% relative humidity (non-condensing)			
Accuracy	$\pm 0.35^\circ$			
Clock Frequency	Not Applicable		4MHz maximum	10MHz maximum
Output data format	Not Applicable		SB - Binary data SG - Grey coded data	BiSS-C
SSI Data time out	Not Applicable		16 $\mu$ S	12.5 $\mu$ S to 40 $\mu$ S
Standard Cable length	1 m			
Connector type	9 Pin D Connector Male (Plug), Flying leads			
Maximum Cable length	3 m	50 m		
Driving current	20mA max.			
Cable	$\varnothing 5.3$ mm, double shielded PUR cable, dragchain compatible			
Cable exit	Axial, Radial			
Shaft Size	$\varnothing 4$ X 10 mm			
Max. Shaft loads	Radial 20N, Axial 10N			
Protection class	IP53, IP64, IP68 (IEC 60529)			
EMI/EMC compliance	EN61326			

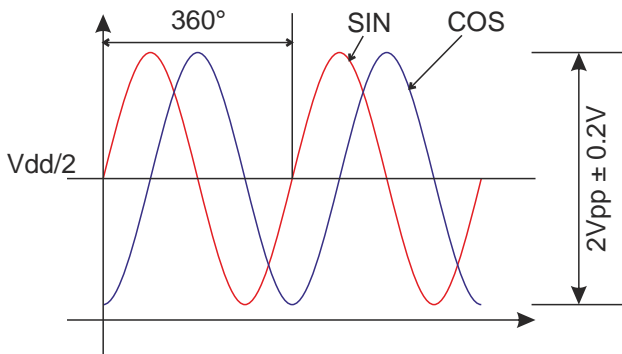
## Pin Connection details:



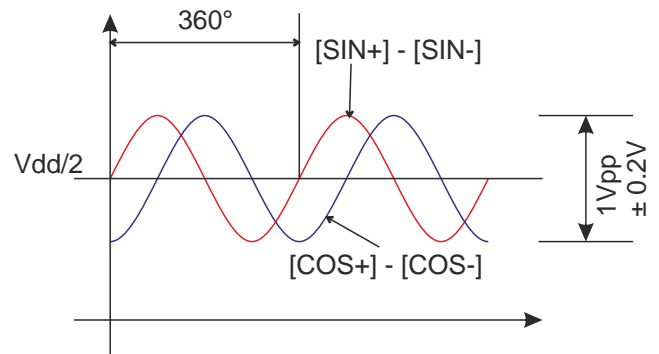
Pin numbers	WSE22AS		WSE22AC		WSE22IR		WSE22SB/SG/BC	
	Signal	Colour	Signal	Colour	Signal	Colour	Signal	Colour
1	Internal Shield		Internal Shield		Internal Shield		Internal Shield	
2	SIN	Red	SIN +	Red	Z +	Brown	CLK +	Red
3	COS	Yellow	COS +	Yellow	B +	Yellow	CLK -	Orange
4	NC	-	NC	-	A +	Red	NC	-
5	Vdd	White	Vdd	White	Vdd	White	Vdd	White
6	NC	-	SIN -	Orange	Z -	Black	Data +	Yellow
7	NC	-	COS -	Green	B -	Green	Data -	Green
8	NC	-	NC	-	A -	Orange	NC	-
9	GND	Blue	GND	Blue	GND	Blue	GND	Blue
Body	External Shield		External Shield		External Shield		External Shield	

## Output waveforms:

### WSE22AS

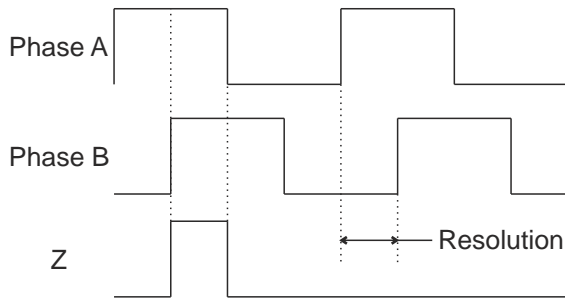


### WSE22AC



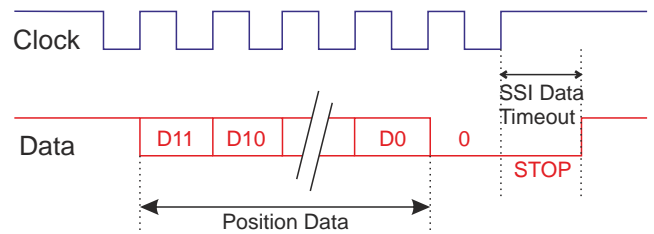
### WSE22IR

(Differential signals are not shown)

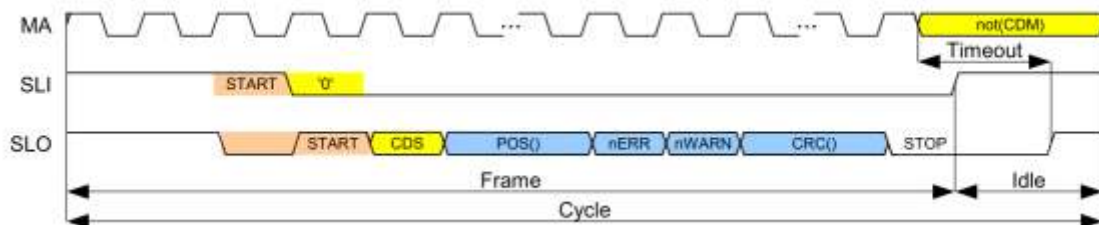


### WSE22SB / SG

(Differential signals are not shown)



### WSE22BC



## Output Resolutions:

### WSE22IR

CPR	Hysteresis	Max. RPM
4 to 256*	0.7°	20000
260 to 512*	0.35°	20000
516 to 4096*	0.17°	20000
8192	0.17°	20000
16384	0.17°	20000

### WSE22SB / WSE22SG

No of Bits	Hysteresis
9	0.35°
10 to 13	0.17°

### WSE22BC

No of Bits	Hysteresis
8	0.7°
9	0.35°
10 to 14	0.17°

\* - In increments of 4. Eg 4, 8, 12, till 256 etc

Note: Counts per Rotation (CPR) can be calculated as pulse per rotation (PPR) X 4

## Ordering Information:

WSE22

**Series name**  
22mm Circular  
rotary shaft encoder

**Model name**  
**AS** - Single ended SIN COS output  
**AC** - Complementary SIN COS output  
**IR** - Incremental RS422 output  
**SB** - SSI with binary data output  
**SG** - SSI with grey coded data output  
**BC** - BiSS-C with binary data output

**Resolution in PPR**  
For AS and AC  
**0000**  
For IR  
**0004 to 4096, 8192, 16384**  
For SB (no of bits)  
**0512(9), 1024(10), 2048(11), 4096(12), 8192(13)**  
For BC (no of bits)  
**0256(8), 0512(9), 1024(10), 2048(11),  
 4096(12), 8192(13), 16384(14)**

**Cable Length**  
**10** - 1m standard

**00** - Standard  
RoHS assembly  
**01** - Standard  
non-RoHS assembly

**IP Rating**  
**A** - IP53  
**B** - IP64  
**C** - IP68

**Shaft size**  
**04** - Ø4mm Std.  
**F4** - Ø4mm Flat

**Cable exit type**  
**A** - Axial  
**R** - Radial

**Connector type**  
**A** - Flying leads  
**B** - 9 pin male (plug)  
**D** connector