



PCATM

Issue No.8 - November 2010

ROTARY SHAFT ENCODERS INCREMENTAL AND PARALLEL OUTPUT ABSOLUTE

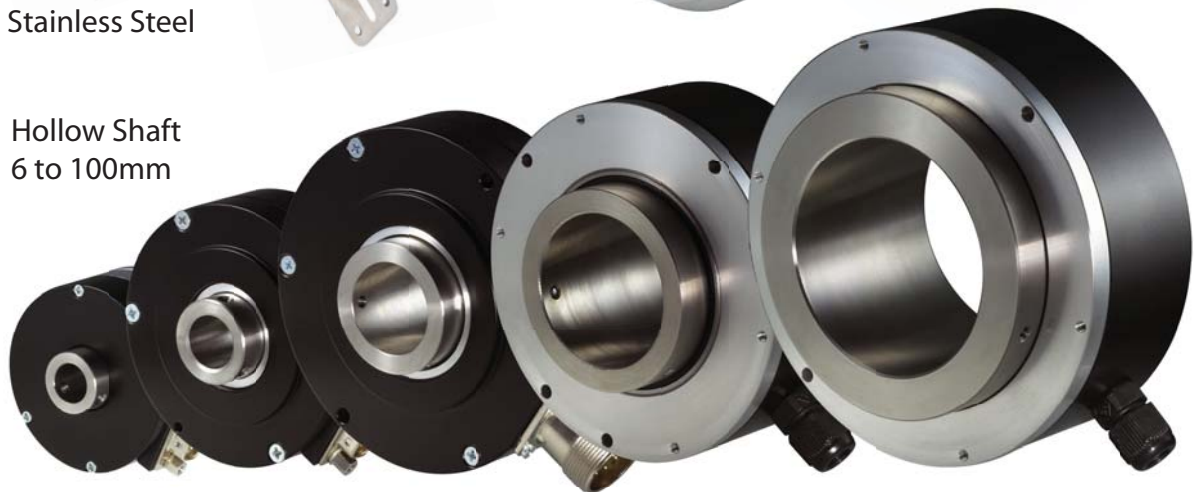


Stainless Steel



Solid Shaft 6 to 12mm

Hollow Shaft
6 to 100mm



For more encoder and control products visit www.pca-us.com.au



Absolute Multi-Turn



Mini Absolute Magnetic



Linear Incremental and Analogue



Linear - Optical



Interface & Processing

Standard Incremental and Absolute Parallel Output Shaft Encoders



PLANT CONTROL AND AUTOMATION PTY LTD
ABN 51 000 671 830

PO Box 121
Hornsby NSW 2077
Australia

95 Hunter Street
Hornsby NSW 2077
Australia

+61 (02) 9482 3733

+61 (02) 9476 6822

sales@pca-us.com.au

www.pca-us.com.au

NOTE: All products with **PCA** shown as the builder are assembled in Australia and can be built within 24 hours if required.

Trade marks of our suppliers



Other product catalogues

- ☐ Absolute serial output encoders
- ☐ Linear encoder systems
- ☐ Motion and interface modules
- ☐ Inclometers
- ☐ Explosion protected Ex encoders
- ☐ Minature magnetic multi-turn

Release Date: November 2010

Page Series
1 **Page Index** Detailed Page Index for the 2010 Catalogue Issue 8

General Encoder Information

2	Information	General Information
5	Install HELP	Installation Precautions
6	Hollow FIT	Hollow Shaft fitting Instructions
7	AROD-M3	Hollow Shaft Mounting guide with torsion arm

Accessories

8	AWD	Retractable Wire Drum - Rotary to Linear Converter
9	AF58-BELL-P	Bell housing mounting flange
10	CUP-BRAK-WHEL	Couplings, Brackets and Wheels
11	Flanges - Plugs	Standard Flanges
12	Flanges - Special	Special Flanges
13	ENC-SIM01	Encoder simulator PCA
14	ENC-IET04	Encoder tester PCA

Absolute, Single-Turn, Ex-Rated, Parallel Output

		Shaft	Body Dia.	Shaft Size	Max. PPR	Builder
15	AESH	Solid	70mm	10, 12mm	4,096	W+S
16	AESL	Solid	90mm	11, 12mm	4,096	W+S

Absolute, Single-Turn, Parallel Output

17	ANHF	Hollow	58mm	6, 10 or 12mm	4,096	W+S
18	ANHJ	Hollow	74mm	6 to 18mm	8,192	W+S
19	ANHM	Hollow	95mm	12 to 26mm	8,192	W+S
20	ANSF	Solid	58mm	6 or 10mm	8,192	W+S
21	ANSF	Solid	58mm	6 or 10mm	8,192	W+S
22	ANSH	Solid	70mm	10 or 12mm	8,192	W+S
23	ANSL	Solid	90mm	10, 11 or 12mm	8,192	W+S

Absolute, Single-Turn, Heavy Duty, Parallel Output

24	APSG	Solid	58mm	6, 10 or 12mm	8,192	IED
25	APSH	Solid	70mm	10 or 12mm	8,192	W+S
26	APSL	Solid	90mm	11 or 12mm	8,192	IED
27	APSW	Solid	70mm	10 or 12mm	8,192	IED

Incremental, Ex Rated

28	IESH	Solid	70mm	10 or 12mm	5,000	W+S
29	IESL	Solid	90mm	10 or 12mm	5,000	W+S

Incremental, Hollow Shaft

30	INBF	Blind Hole	58mm	6 to 18mm	30,000	IED
31	INHD	Hollow	49mm	6mm	3,600	W+S
32	INHG	Hollow	58mm	6,10 or 12mm	10,000	W+S
33	INHJ	Hollow	74mm	6 to 18mm	25,000	W+S
34	INHK	Hollow	95mm	12 to 30mm	25,000	W+S
35	INHM	Hollow	95mm	12 to 26mm	25,000	W+S
36	INHJ	Hollow	103mm	26 to 44mm	50,000	W+S
37	INHP	Hollow	120mm	44 to 65mm	50,000	W+S
38	INHJ	Hollow	120mm	44 to 65mm	50,000	W+S

Incremental, Solid Shaft

39	INSA	Solid	24mm	4 or 6mm	1,024	W+S
40	INSB	Solid	28mm	4 or 6mm	1,024	W+S
41	INSC	Solid	41mm	6mm	10,000	W+S
42	INSE	Solid	58mm	6, 10 or 12mm	25,000	PCA
43	INSF	Solid	58mm	6, 10 or 12mm	25,000	PCA
44	INSG	Solid	58mm	6, 10 or 12mm	25,000	PCA
45	INSH	Solid	70mm	10 or 12mm	25,000	W+S
46	INSL	Solid	90mm	10, 11 or 12mm	25,000	PCA

Incremental, Heavy Duty, Solid & Hollow Shaft

47	IPHJ	Hollow	75mm	10 to 20mm	5,000	IED
48	IPSE	Solid	58mm	6, 10 or 12mm	30,000	IED
49	IPSG	Solid	58mm	6, 10 or 12mm	30,000	IED
50	IPSH	Solid	70mm	10 or 12mm	5,000	PCA
51	IPSL	Solid	90mm	11 or 12mm	30,000	IED
52	IPSW	Solid	70mm	6, 10 or 12mm	30,000	IED

Absolute, Multi-Turn, Parallel Output

53	MzBG	Blind Hole	58mm	6 to 15mm	65,536 X 16,384	Fraba
54	MzSE	Solid	58mm	6 or 10mm	65,536 X 16,384	Fraba
55	MzSG	Solid	58mm	6 or 10mm	65,536 X 16,384	Fraba

Encoder Interface Modules

56	Motrona	Expansion and conversion modules, and universal panel meters
----	----------------	--

Encoder Information

WHAT IS A SHAFT ENCODER

A Shaft Encoder is an electromechanical transducer, which converts a rotary position into an electronic signal suitable for providing input data to a vast range of electronic control devices. Shaft Encoders are being used for an ever-increasing variety of mechanical applications. Following are just a few examples:

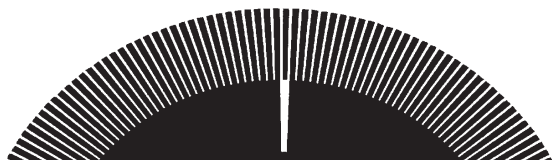
- ☐ Measuring the length of raw material during a winding process, then again when the material is cut to size for final use.
- ☐ Determining angular positions when synchronising machine movements, such as those found in packaging machines.
- ☐ Monitoring the position of products on a conveyor.
- ☐ Positioning of indexing tables, stacker cranes, etc.
- ☐ Tracking the position of automated robots, and their arm movements.
- ☐ Some of the more unusual applications include satellite tracking, road surface analysis and automobile suspension studies.

In 1981 PCA commenced assembly of incremental encoders in Australia with one body style, that had only two output options. Currently we assemble five body styles. Each of these is available with a range of shaft sizes, output options, and connecting methods, providing over 3500 different model possibilities. In addition, we have a large library of incremental disks, with increments ranging from 1 to 100,000 per revolution.

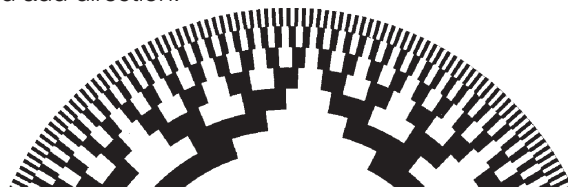
When we receive an order, the optical disc and output circuit board are assembled into the bearing housing. The completed encoder is normally shipped to the customer within seven days of placing an order. A 24/48 hour build service is also available for those unforeseen emergencies.

WHICH ONE ? INCREMENTAL OR ABSOLUTE

Incremental encoders provide a serial output train of square wave signals as the shaft rotates. To determine the angular position or direction of rotation, external electronic circuitry is required. The number of signals per revolution of the shaft is determined by the customer's selection when placing an order.



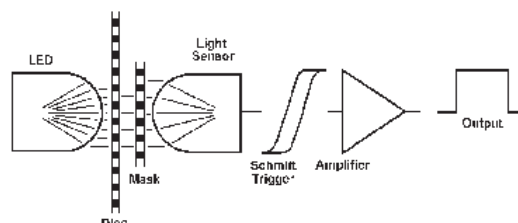
Absolute encoders provide a parallel output structure, the code of which gives a direct reading of the shaft's angular position, there is an optical reading device for each of the tracks. All disks are formatted with a Gray code; to ensure there are no reading errors, this code has only one bit change between divisions. E-PROMs inside the encoder are used to program the individual output code and add direction.



INCREMENTAL READING PRINCIPLE

Most of our encoders are fitted with unique laminated plastic disks produced with very specialised equipment. These disks have a low mass, excellent shock resistance and can be reproduced economically, making our encoders better suited to harsh environments than those normally using glass or fine metal disks.

As the disk rotates, it interrupts an inferred light path sending signals to a Schmitt Trigger and then to the final output amplifier. Except for very low increment models the light path has a stationary mask or grid with the same increment pattern as the disk. This is known as the Moiré Fringe principle. The grid is divided into two halves with a 90° offset between the two, providing the quadrature function essential for direction control.



INCREMENTAL ENCODERS

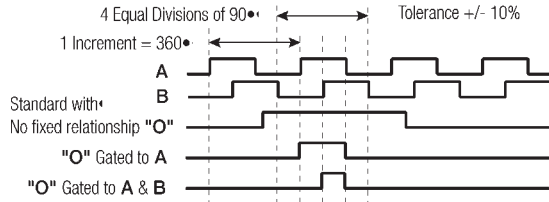
Incremental encoders are the most common type. They have only one graduated track around the disk perimeter and a serial output pulse train, making them much simpler internally than Absolute encoders, and are therefore a little more economical.

The main point to consider is that the actual shaft position is an assumed relationship between the shaft and associated external counting equipment. If the power is removed it is normally necessary to provide a means of resetting the associated circuitry to a known reference point.

Up to three independent optical channels are available in each encoder. In addition the complement of each channel is available, making a total of six output signal lines.

Encoder Information

The output signals are referred to as 'A', 'B' & 'O'. The 'A' & 'B' outputs are setup with a 90° offset, commonly referred to as quadrature. Associated counting equipment monitors this relationship and determines the shaft direction. This feature provides up/down information for counters and with the right circuitry prevents incorrect counting in applications where vibration causes problems.



The quadrature relationship in association with external circuitry can also provide the ability to multiply the output signals by four. Thus a 5000 increment model can provide 20,000 increments per revolution.

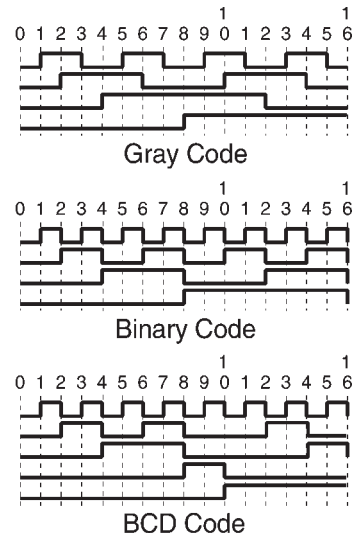
The 'O' output provides one signal for each revolution of the shaft. The signal is used as an exact reference point to coordinate the serial pulse train with a known mechanical location. To use this effectively, it is necessary to install the encoder with a clamp mounting bracket, or some other means that will allow the body of the encoder to be turned.

The state (high or low) of the 'O' or output pulse can be selected. However, it is important to note that there is not necessarily any fixed relationship between the edges of the 'O' output and the incremental channels. A known relationship can be provided if specified in the part number selected. NOTE: this option is not available for some high increment models.

ABSOLUTE ENCODERS

These encoders have a multiple track gray coded optical disk that has one track for each 'Bit' of its stated resolution. This code has the advantage that only one 'Bit' changes for each change in output code. The final output code, Gray, Binary or BCD, and the direction of shaft rotation to increment the output value in most models is programmed into E-PROMs.

Each individual increment forms its own unique code on a parallel output bus. Therefore, even if the power fails, once restored, the position of the shaft is immediately known without any resetting routine, as is required with Incremental encoders.



The main consideration is that standard Absolute encoders only provide this feature for one shaft revolution. Therefore their use is restricted to synchronising machinery based on a 360° cycle. If more turns are required it is necessary to use some form of mechanical reduction, or select one of our Multi-Turn Absolute encoders. This type has an internal mechanical arrangement that drives multiple absolute code disks.

Multi-turn absolute encoders are available with resolutions up to 30 bits. This is achieved with a mechanical build that has 14 bit (16,384) turns of the shaft and 16 bits (65,536) for each shaft revolution. Encoders are available with both parallel and serial outputs; the serial protocols are the preferred option today, this approach considerably reduces the field wiring and the I/O ports of the control devices.

Encoders are available with the most common industrial interfaces; DeviceNET, Ethernet in a number of formats, CanOPEN, InterBUS, ProfiBUS-DP and SSI which is the simplest of all the protocols. Refer to our web site for full technical details for each interface.

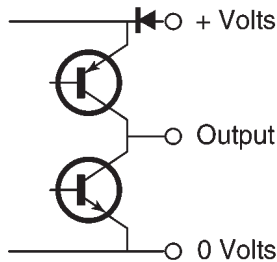
OUTPUT CIRCUITS

In the past there was a range of five different output options, available for some of the series, providing for all types of input structures to which encoders may be connected. Today most of our encoders have the same output driver regardless of the rated voltage. Encoders rated for 5 Volt operation simply have the reverse voltage protection diode removed to ensure that the logic "1" is as close as possible to the + 5 Volt rail.

The maximum output frequency is typically 300kHz, but depends upon the length of the connecting cable, as the line capacitance increases, the rise and fall time of the square waves also increases.

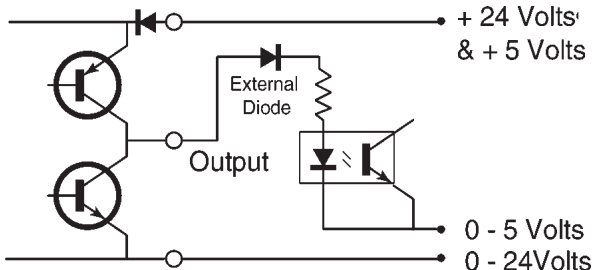
Encoder Information

Push Pull: This is now the most widely used output configuration, and will normally operate at any voltage from 11 to 30 Volts. The main feature of this structure is that it can be used to switch either NPN or PNP input circuits, thus reducing spares inventory if both types are required on the one site.

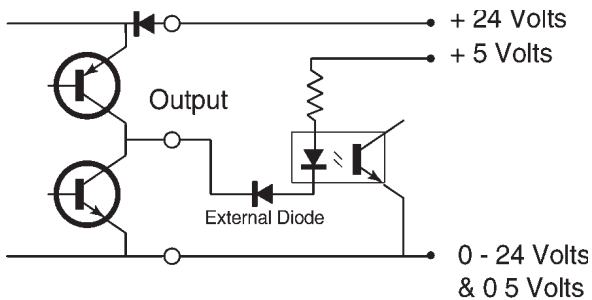


Connection for normal Push Pull output

Most of our encoders today are only made with Push Pull output, if a true open collector is required or the output is required to switch a different voltage than the encoder power supply, this can be achieved with one external diode.

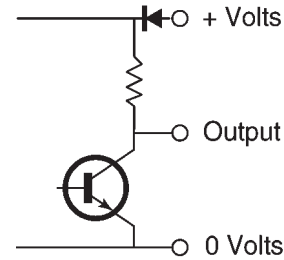


Connection for PNP using Push Pull output
NOTE: Common + Volt Supply

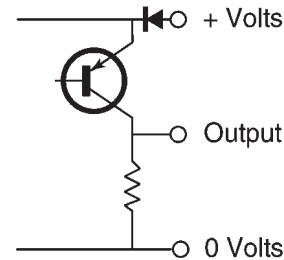


Connection for NPN using Push Pull output
NOTE: Common 0 Volt Supply

NPN or current sink: Has a 40mA switching action between the output signal and the 0 Volt supply. Pull up resistors are fitted between the output and the + Volt power supply line.



PNP or current source: Has a 40mA switching action between the + Volt supply and the output. Pull down resistors are fitted between the output and the 0 Volt power supply line.



Line Driver: Uses a push pull line driver output circuit which provides a 5 to 15 Volt 40mA output signal capable of driving cable runs up to 100 metres.

This type has the highest frequency response capability and the best noise immunity, provided the installation is equipped with a differential line receiver. To utilise this function output signal options must be selected to provide both the true and compliment signals.

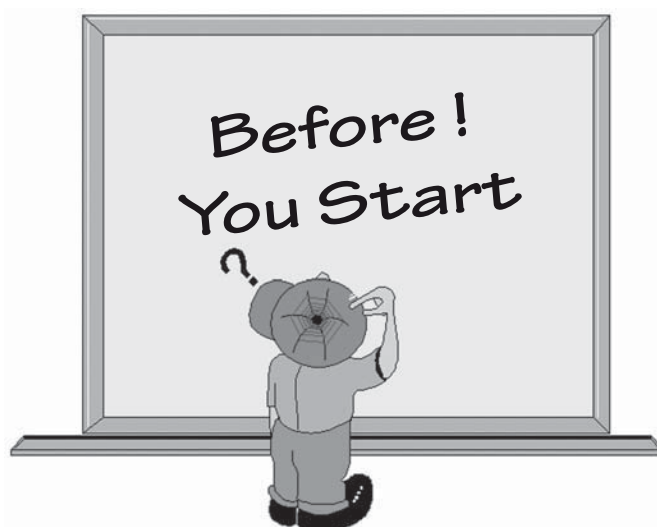
5 Volt Only: The output circuit is essentially the same as the Push Pull circuit shown above, but it has the reverse voltage protection diode removed for 5 Volt TTL operation.

NOTE: The output and voltage information is typical, refer to the individual Series data sheets for specific details about the model you have selected.

PLEASE NOTE

Every effort has been made to ensure the information contained within this catalogue is correct at the time of production, however we have an ongoing development program and upgrades are made. Normally these will have no effect to applications however, current information is always available upon request. Neither PCA nor our prime suppliers accept any responsibility for incorrect use of the product or liability for any damage it may cause to any other part of your equipment.

Installation Precautions!



PCA encoders are designed for a wide range of installations, from general industry to very heavy duty sites as found in food processing and on the decks of ships at sea. To ensure you receive optimal life from our encoders, there are a number of precautions that must be followed.

MECHANICAL HANDLING PRECAUTIONS

- 1** Do not drop the encoder because if it falls on the shaft, internal damage can occur.
- 2** Do not apply excessive force on the shaft when fitting your driving system. All driving devices must slide freely on the shaft and be anchored by grub screws and/or the key-way where provided.
- 3** Do not expose the encoder to environments greater than its nominated protection class. IP54, IP65, IP66, IP67
- 4** Do not expose to direct sun light - direct exposure can easily cause the internal temperature to exceed the encoder maximum temperature rating.
- 5** Do not exceed the maximum shaft loading as bearing damage will result.
- 6** Do not rigidly mount a solid shaft encoder to a drive shaft - always use a flexible coupling.
- 7** Do not rigidly mount the body of a hollow shaft encoder to the surrounding frame. Mount the encoder directly onto the shaft and attach a flexible arm to stop the body rotating.
- 8** Mount the encoder firmly and avoid locations of excessive vibration.

PLEASE NOTE: Any encoder mounted outdoors must be adequately covered to prevent sun or driving rain from directly hitting the body. Although the IP66/67 models can operate under one metre of water, direct sunlight will cause over heating inside the body.

ELECTRICAL PRECAUTIONS

PCA encoders meet the requirements of EN50081-2 and EN50082-2. It is important to maintain this protection throughout the installation, following is a number of points to consider.

- 1** Do not leave any unused output wires unprotected, they should all be insulated or terminated in a terminal strip
- 2** Always insure the wiring to the encoder is electrically and mechanically isolated from any other high current or high voltage conductors.
- 3** Do not leave excess cable in a coil.
- 4** Always connect the cable screening at the final end point of the wiring termination.
- 5** Do not short output wires to either of the power supply lines or another output.
- 6** Do not exceed the maximum voltage or output current requirements.
- 7** Do not leave the logic control cables for Absolute encoders floating or longer than necessary.
- 8** Any cable runs longer than 100 metres signal conditioning logic modules should be considered.

OPERATION CONSIDERATIONS

Please consider the following points before making your selection.

- 1** Check the input specification of your control equipment. Make sure that the maximum output frequency produced by the encoder at maximum RPM does not exceed the upper limit of the input to the control equipment.
- 2** Use a clamp type-mounting bracket with all absolute encoders and incremental encoders fitted with a marker or zero output signal. This type of bracket provides a means to synchronise the electrical and mechanical zero locations.

Hollow Shaft Encoder Installation Precautions

All hollow shaft type encoders are designed to fully support their own weight on the driving shaft.

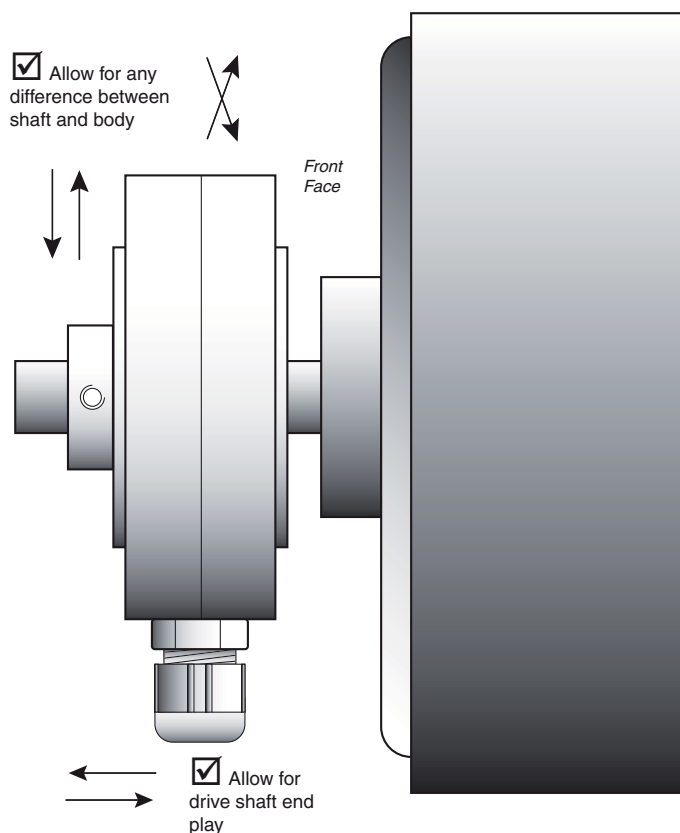
A simple torsion arm is required to prevent the encoder housing from turning. This arm must only stop rotational movement of the body, in all other directions, a degree of flexibility must be maintained to provide for any run out between the shaft, equipment frame and the encoder housing.

The arm is fixed between a hole provided in the outer edge of the encoder housing and a stationary section of the equipment frame.

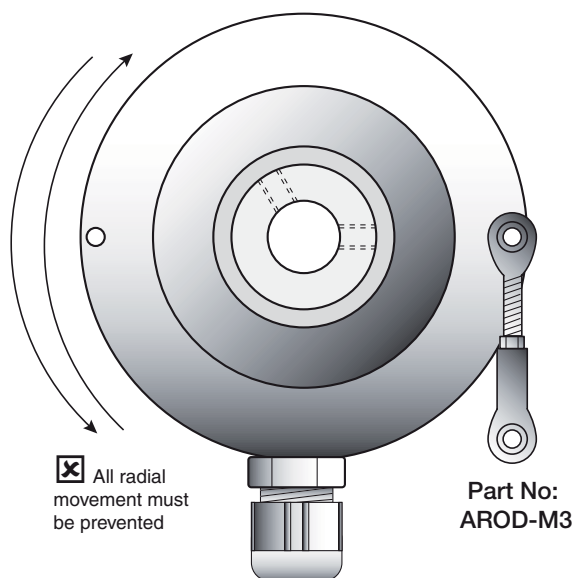
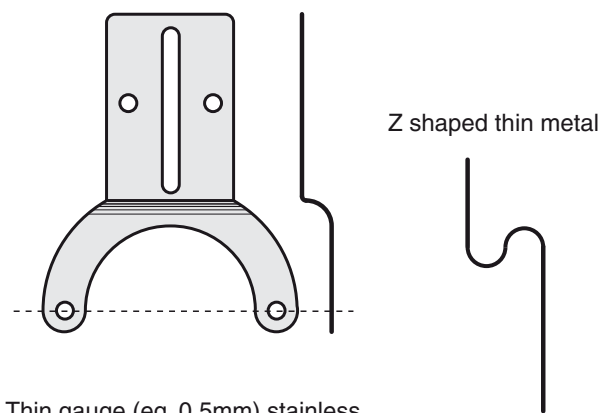
Some hollow encoders are provided with a groove in the front face, this is to accommodate a pin fastened to the equipment frame, and this pin is free to move around in the groove on the face of the encoder.

Absolute encoders and incremental encoders fitted with a zero pulse will require additional mounting considerations. Torsion arms for both these types require the ability to rotate the body of the encoder to allow the electrical zero and the mechanical zero to be mechanically aligned.

Over stress on the bearings will seriously reduce the working life of the encoder.

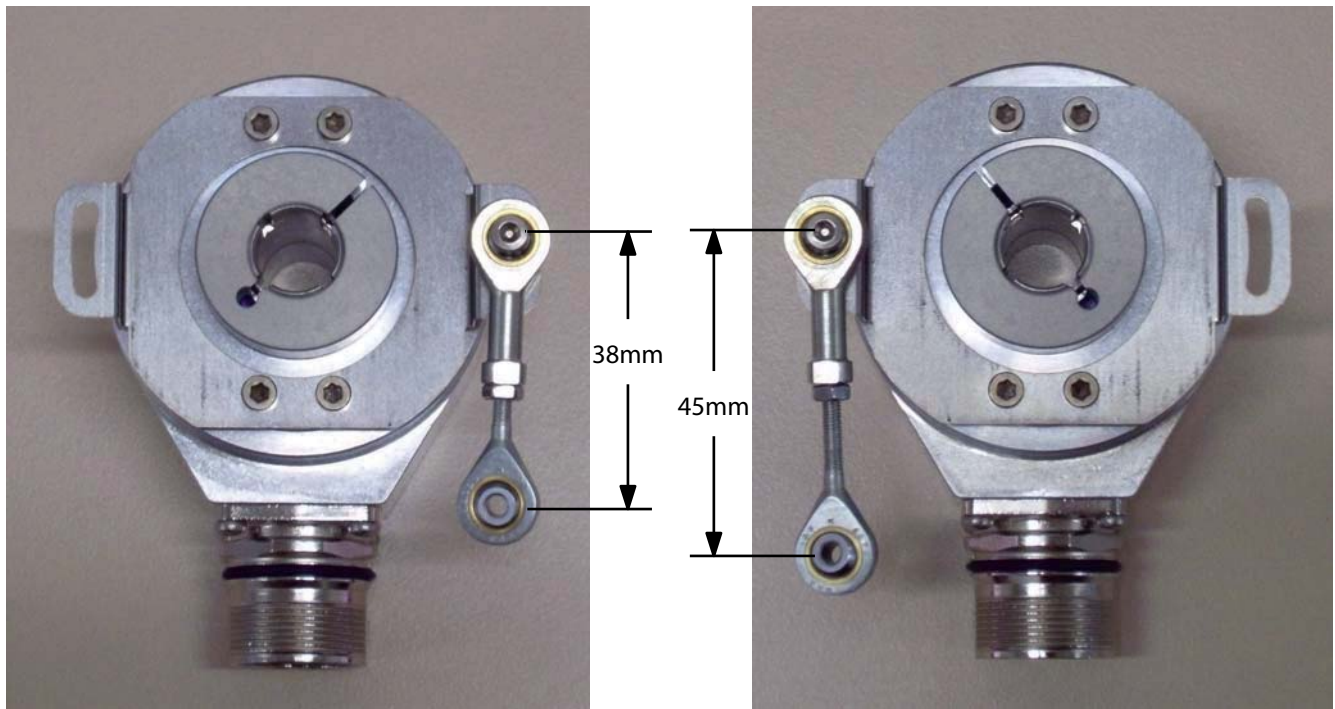


Some Torsion Arm Design Ideas



Rod ends with ball fixing eyes mounted in this manner provide an excellent torsion arm. A feature of this approach is the inherent vernier adjustment it provides for aligning the mechanical and electrical zero positions.

AROD-M3 Hollow shaft torsion arm



Ball joint holes are 3mm Dia. the dimensions are the same for AROD-2.5, the AROD-M4 distance between the two mounting holes is 40mm to 48mm. The rod should be as close as practical to parallel with the centre axis



MECHANICAL SPECIFICATIONS

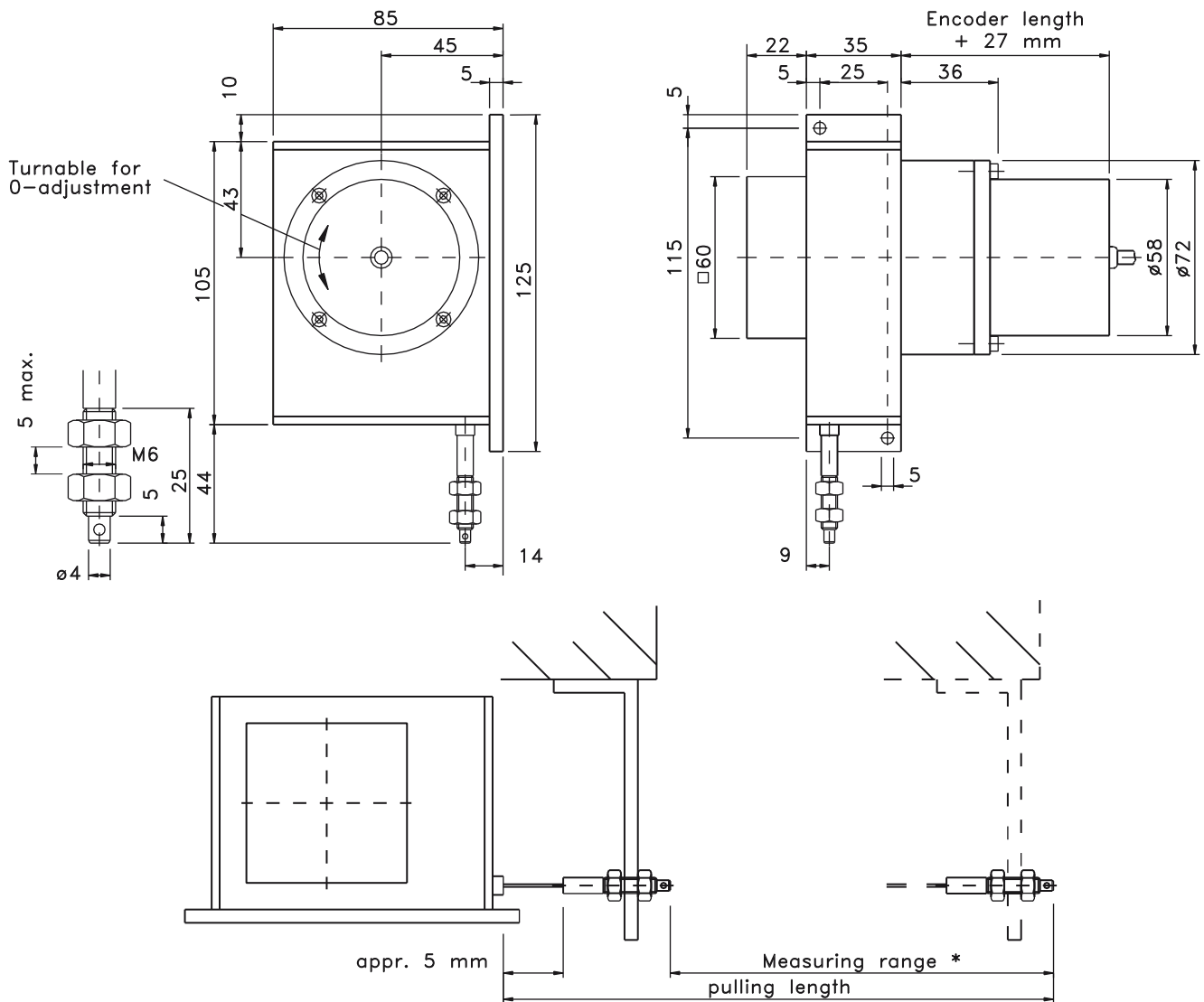
Maximum velocity 3000mm/Sec
Spring return power 4 - 10Nm
Weight 550g
Temperature -20°C to +70°C
Measuring resolution 0.05% of full scale
Drum circumference 200mm
Housing material Aluminium
Wire material AWD-3000 .. Plastic coated steel
Wire material AWD-5000 Stainless steel

FEATURES

The AWD series provides an economical means of measuring linear motion. A standard 58mm diameter incremental or absolute rotary shaft encoder is coupled to a spring loaded drum which has a wire coiled around it. As the wire is extended and retracted the encoder is turned.

The drum circumference is 200mm. Therefore an encoder with 200 increments per revolution will provide one pulse for each millimetre of linear motion.

The drum is fitted with dual heavy duty bearings and the wire is made of non corrosive twisted steel particularly selected to resist environmental pollution.

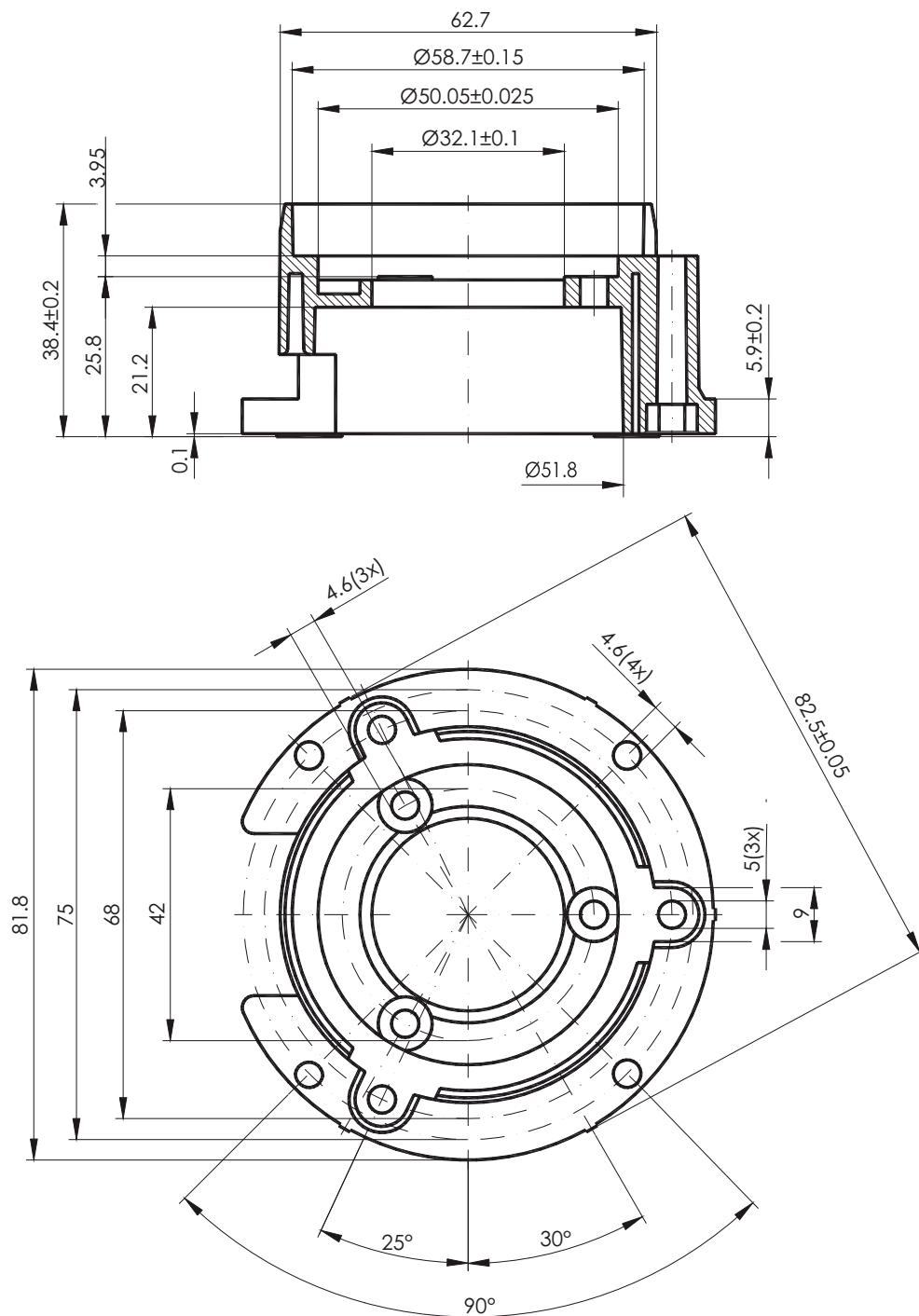


NOTE. There is a step in the 200mm/turn measuring increment once the measuring length exceeds 5 metres, refer to additional application note when using the 10 Metre product.

Part Number Selection Guide

3 Metre Measuring Range AWD-3000
5 Metre Measuring Range AWD-5000
10 Metre Measuring Range AWD-10000

AF58-BELL-P



Note: Used with 58mm Diameter Encoder Housings

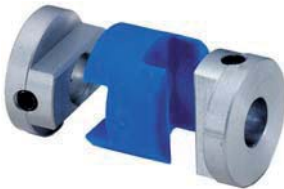
Couplings - Brackets - Wheels

Couplings



Hub - Zinc. Coupling - Polyurethane

Part Number	Hub Hole IN - mm	Hub Hole OUT - mm	Outside Diameter - mm	Length - mm	Torque - N.m	Weight - g	Static Torsional Stiffness - N.m/rad	Maximum Eccentricity - mm	Maximum Angularity - °	Maximum End Play - mm
Standard Type										
CST16-06x06	6	6	16	27	0.5	22	3	0.2	2	Nil
CST20-10x10	10	10	20	34	1.0	43	9	0.2	2	Nil
CST25-12x12	12	12	25	41	1.5	84	12	0.2	2	Nil



Hub - Aluminium. Coupling - Polyacetal

Oldham Type										
COL16-06x03	6	3	16	18	0.7	7	31	1.0	3	Nil
COL16-06x06	6	6	16	18	0.7	7	31	1.0	3	Nil
COL25-10x05	10	5	25	28	2.0	28	140	2.0	3	Nil
COL25-10x10	10	10	25	28	2.0	28	140	2.0	3	Nil
COL32-12x08	12	8	32	33	4.5	55	280	2.5	3	Nil
COL32-12x12	12	12	32	33	4.5	55	280	2.5	3	Nil



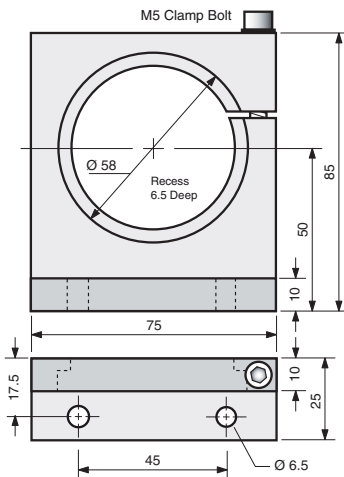
Hub - Aluminium. Bellows - Bronze
Hub and Bellows - Stainless Steel

No Backlash Bronze										
CBR16-06x06	6	6	16	26.5	0.5	10	110	0.10	1.5	+0.4/-1.2
CBR20-10x10	10	10	20	32	0.8	20	180	0.15	2	+0.6/-1.8
CBR25-12x12	12	12	25	36.5	1.3	35	240	0.15	2	+0.6/-1.8
No Backlash Stainless										
CSS16-06x06	6	6	16	26.5	1.0	25	150	0.10	1.5	+0.4/-1.2
CSS20-10x10	10	10	20	32	1.5	45	220	0.15	2	+0.6/-1.8
CSS25-12x12	12	12	25	36.5	2.0	85	330	0.15	2	+0.6/-1.8

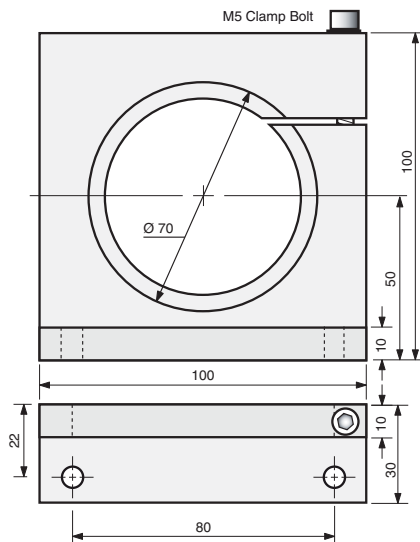
Clamp Brackets

Material - anodised aluminium

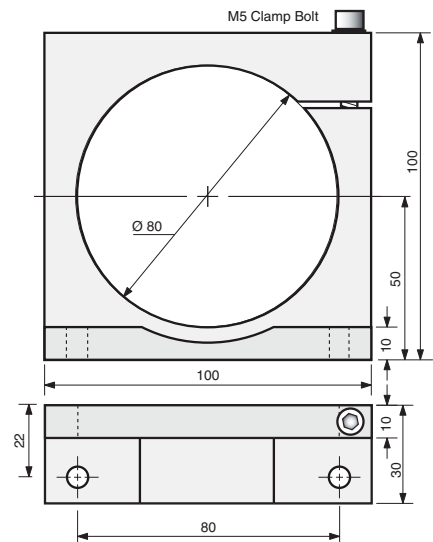
Part Number **AB58-CL-AL**
For all 58mm Diameter Encoders



Part Number **AB70-CL-AL**
For all 70mm Diameter Encoders

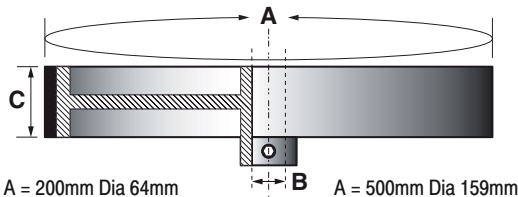


Part Number **AB90-CL-AL**
For all 90mm Diameter Encoders



NOTE: Reffer to additional data sheets for our range of adaptor flanges.

Measuring Wheels



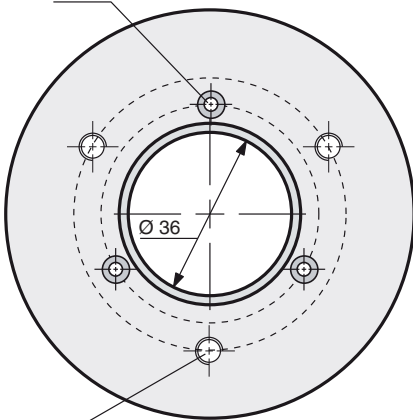
Rolling Surface	A Circumference	B Shaft Hole	C Width	Part Number
Knurled Aluminium	200mm	6mm	12mm	AWM-200-06
Flat Plastic	200mm	6mm	12mm	AWP-200-06
Textured Plastic	200mm	6mm	12mm	AWR-200-06
Knurled Aluminium	500mm	12mm	25mm	AWM-500-12
Flat Plastic	500mm	12mm	25mm	AWP-500-12
Textured Plastic	500mm	12mm	25mm	AWR-500-12

Flanges and Plugs

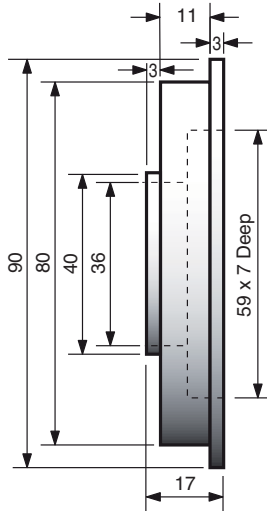
58mm to 90mm Adaptor Flange

Part Number: **AF58-90-AL**

3 x 3mm holes at 48 PCD
Countersink to 6mm Dia.



3 x M6 at 60 PCD 6mm Deep

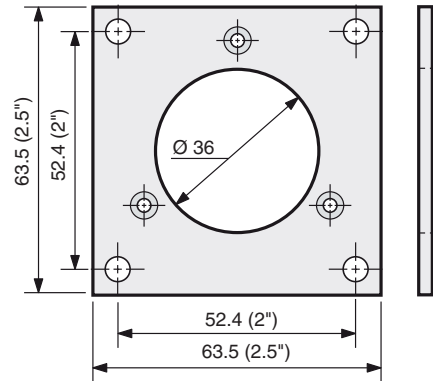


58mm to 2.5" Square (USA Type) Flange

Part Number: **AF58-63x63**

Mounting Holes
4 x 5.5 Dia

Aluminium Plate
3mm Thick

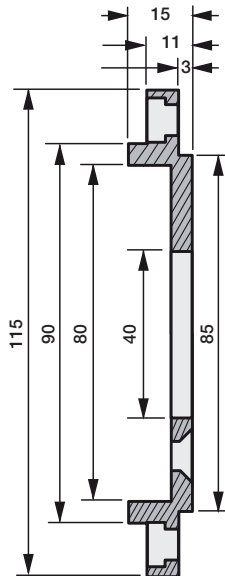
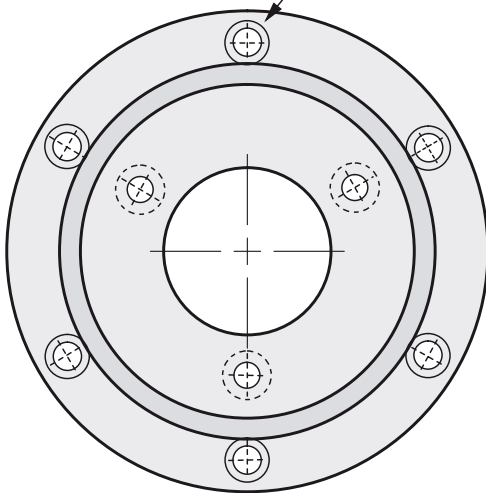


Adaptor Flanges

REO Flange

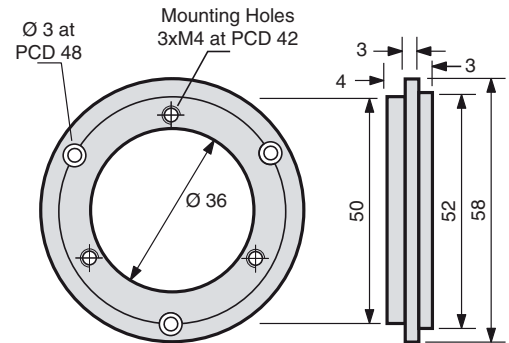
Part Number: **AF90-REO**

Mounting holes
6.5mm Dia at 100mm PCD



58mm to Servo Ring Adaptor

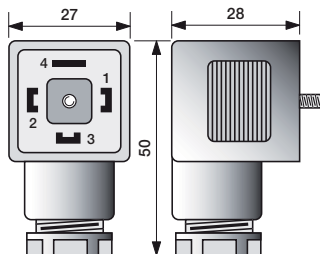
Part Number: **AF58-E**



These flanges provide a mounting adaptation to allow our 58mm and 90mm diameter encoders to replace a wide range of other encoder housings.

4 Pin Plastic Plug

Part Number: **AP04-CS-PS**

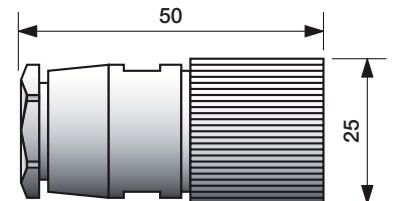


Wiring termination
is made with
screw terminals

Plugs & Wiring

?Metal Plugs

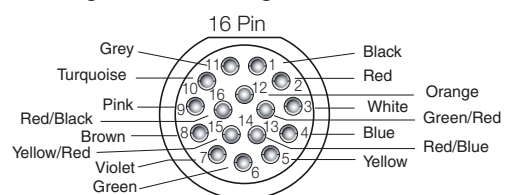
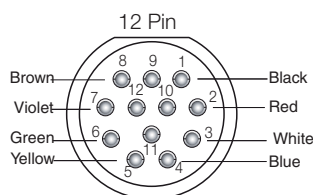
Pins	Part Number
12 Pin:	AP12-CS-MA
16 Pin:	AP16-CS-MA
17 Pin:	AP17-CS-MA
21 Pin:	AP21-CS-MA
26 Pin:	AP26-CS-MA



Wiring termination is made with solder terminals

NOTE: This plug can be used ONLY if A & B output channels are required. To maintain environmental protection standards the gasket supplied MUST be fitted between the plug mating faces. To select this four pin plug, place an "A" in the 9th digit and a "2" in the 10th digit of the part number.

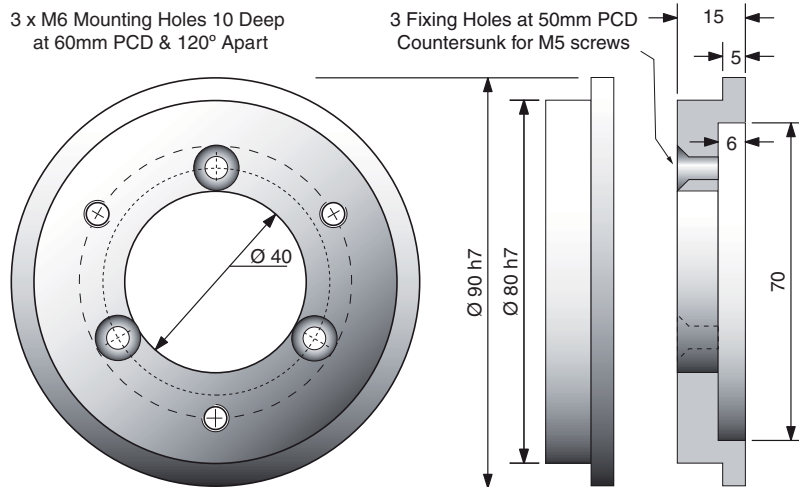
Australian assembled Plug Lead Wiring Termination



Flanges Special

3 x M6 Mounting Holes 10 Deep
at 60mm PCD & 120° Apart

3 Fixing Holes at 50mm PCD
Countersunk for M5 screws



PART No: **AF70-90**

Optional types:

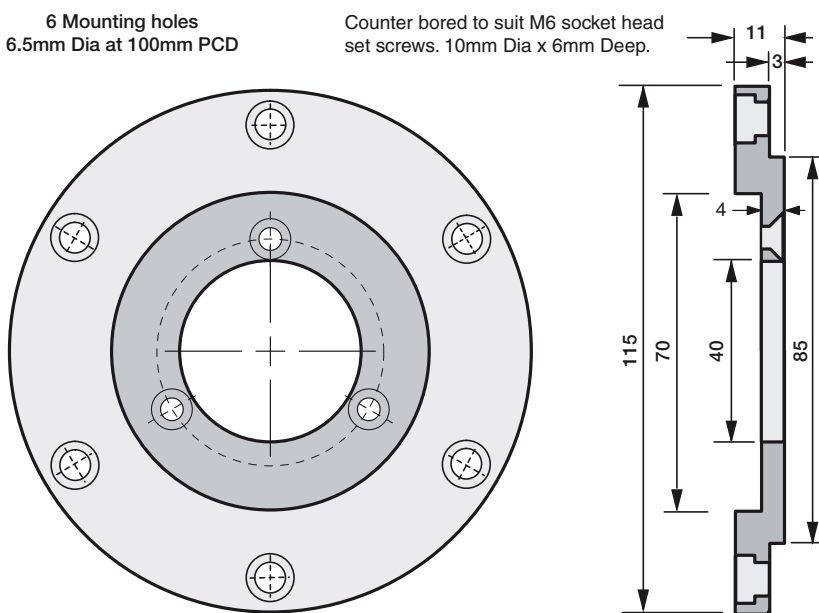
AF70-90-AL = Anodized aluminium

AF70-90-SS = Stainless Steel

This flange is used in conjunction with the 70mm diameter INSH or IPSH Series encoders, to make an INSL or IPSL 90mm diameter series encoder.

6 Mounting holes
6.5mm Dia at 100mm PCD

Counter bored to suit M6 socket head
set screws. 10mm Dia x 6mm Deep.



PART No: **AF70-REO**

Optional types:

AF70-REO-AL = Anodized aluminium

AF70-REO-SS = Stainless Steel

REO Adaptor Flange for 70mm Dia
Series encoders

*NOTE: Reffer to drawing
"Flange-Plug" file for the
more comon range of
flanges.*

Encoder mounting holes
3 x M5 at 50mm PCD 120° apart

ENC-SIM01

Incremental Encoder Simulator Instrument

Increment range min 2 to max 99999

Output Frequency Manual or Auto 50 to 500,000



This instrument is designed to simulate the function of most types of incremental encoders; it allows the engineer to fully test a control system that uses a rotary or linear shaft encoder, without the need for any mechanical movement. In addition the user can control the exact number of square wave signals applied to the output, this allows the engineer to control the input pulses generated down to just one pulse, so the user can monitor in slow motion the operation of a control system.

Access to the instrument is through a standard nine pin D type plug, the user simply connects the simulator to the terminals or plug of their control system. The power for the instrument is taken from the control system, it will operate on any voltage from 5 to 30 volts 100mA DC

PLUG WIRING	3 = A Output	6 = /A Output
1 = 0 Volts	4 = B Output	7 = /B Output
2 = + 5 to 30 Volts	5 = 0 Output	8 = /O Output

EXPLANATION OF CONTOL PANEL

LCD Display Panel 2 X 16 Character 5.5mm x 3mm

RPM: Displays the speed of the output encoder, this is determined by the time taken for each "shaft" rotation. The maximum value for the RPM display is 15,000, if the simulation parameters drive the display faster, the value will display as arrow heads.

MODE: This states the current mode of operation for the programming switches in the panel below

PPR: Displays the number of pulses for one rotation of the simulated shaft encoder that has been programmed into the instrument or it displays the number of increment pulses between each zero pulse.

Count Progress: This is used when in MAN mode so that the user can see the number of signals that have been transmitted to the output.

Frequency: Displays the frequency of the output signals, the minimum value is 10 Hertz

OPERATOR PROGRAMMING BUTTONS

Mode Selection: The red LED at the top of each column shows the function which will be applied to the four programming buttons on the left side of the operator control panel. The two Select buttons below change the selection from one mode to the next.

PPR Mode: To setup the pulses of the encoder to be simulated, the results of the following setting process are shown in the PPR display.

Start: Resets the PPR display to 2, and allows the new selection process to begin.

Select: Increments the right digit under the PPR display by one, each time the button is pressed.

Move: Moves the digit just entered one space to the left, then the Select input is used again to increment the next digit in the number as described above.

Save & Run: Once the desired value is entered, press this button and the "Count Progress" number is reset to zero and the system is ready to run in either "man" or continuously in the "Rate" modes of operation

NOTE 1: The output signal pulse width is determined by the Hertz selected under the RATE mode setup.

NOTE 2: This button will also reset the counter at any time when the RPM selection is operational.

MAN Mode: This mode provides the facility to manually control the number of output signals sent. The progress of this entry is displayed on the "Count Progress" display.

"1": Indexes the output by 1 pulse with each press of the button.

"10" Indexes the output by 10 pulses with each press of the button.

"100" Indexes the output by 100 pulses with each press of the button.

"1000" Indexes the output by 1000 pulses with each press of the button.

NOTE: If there is no output selected (a green LED illuminated) and a pulse train button pressed, the last value selected will output immediately the output is turned on.

RATE: The results of this range setting are displayed on the "Frequency" display, for speeds between the ranges rotate the "Hertz Fine Adjust" knob.

50 - 500: Fifty to five hundred hertz.

500 - 5k: Five hundred to five thousand hertz.

5k - 50k: Five thousand to fifty thousand hertz.

50k - 500k: Fifty to five hundred thousand hertz.

Direction Control: Selects the output wave relationship, this function in an encoder determines the direction of rotation as seen by the control system. The top button produces an output phase with A rising before B, the lower button selection will make B rise before A.

NOTE: No output signals are transmitted until a phase direction is selected, a green LED must be illuminated.

Housing Size: 95mm wide, 150mm long, 30mm high for the button section, and 40mm high at the display end.

ENC-IET05

Incremental Encoder Testing Instrument

Maximum Count Capacity 99999 PPR at 600kHz

Measuring Parameters Voltage, Current, Phase



Function Outline

As an assembler and repairer of encoders since 1981, we have found that it is almost impossible for customers to FULLY test an incremental encoder with products normally available from electrical assembly suppliers. An oscilloscope can only read the phase angle between the A and B outputs. A counter capable of operating at the maximum frequency of encoders, with latch and store functions, is not available off the shelf.

As a result we have developed the PCA Encoder Tester to provide a simple means for service personnel and encoder assemblers to test all types of incremental encoders. Once the encoder is attached to the tester, all important parameters are displayed simultaneously on a large back lit LCD screen. Data available at one glance is;

1. The count per turn of all three output channels: either true or complimentary at once Max 600kHz.
2. Current draw of the encoder 10 to 150mA.
3. A/B Phase relationship of the two output signals.
4. RPM of the shaft
5. Kilohertz of the output signal.
6. The applied voltage 5, 12 or 24.
7. The one revolution reference method for the test.

There are two methods of wiring termination for the encoder under test: spring loaded wiring terminals for quick cable termination, or a nine pin D type plug for connecting adaptor leads to standard plugs or other input methods. Adaptor leads for any type of encoder plug can be made to allow quick and simple testing of a wide range of products.

When testing an encoder it is essential to have one pulse per turn reference point for each rotation of the shaft. This is normally achieved by either using the zero or marker pulse in the encoder under test, or by connecting an external signal from the mechanical rig driving the encoder. This information is used to determine the PPR (pulses per revolution) of the encoder, however in some instances it may be impossible to obtain such a pulse. The tester provides the user with a mode where a count value can be loaded into the tester and used to compare the count values from each encoder channel.

Specification Summary

Power supply input . . .	12 Volts AC 500mA
Power Connection . . .	Circular 2.5 ID X 5.5 OD
Case Size	Height at the back 150mm
	Width 187mm
	Height at terminals 23mm
Weight	850g
Output Voltage	5, 12 or 24 DC
Output Current	150mA short / open circuit protected
Signal Counters	Maximum frequency 600 kHz
	Output A: 0 to 99,999
	Output B: 0 to 99,999
	Output O: 0 to 9
Character Size	5 x 7 Dot matrix - 5x8mm
Signal input load	4.7K Fitted in plug in socket
Test Supply Current . . .	10 to 150mA Auto turn off below 10mA or above 150mA
Frequency Meter	600 to 10,000



MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque >0.4Nm
Loading Axial 60N, Radial 50N
Weight 1300g
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 100mA
Maximum output signal frequency 50kHz

NOTE: Short circuit protection on all wires

FEATURES

The AESH encoders are designed for installation in General Hazardous Areas, with certification to the following European and International standards.

Certification Number Demko 02 ATEX 133213XEX I/II G D

EN50014 1197 E incl. A1+A2

EN50018 2000E

EEx d IIC T6 +60 Centigrade

EEx d IIC T4 +100 Centigrade

EEx d I

PCA AUS

Function Wire

0 Volts =	1
+ Volts =	2
Bit 1 - 2 ⁰ =	3
Bit 2 - 2 ¹ =	4
Bit 3 - 2 ² =	5
Bit 4 - 2 ³ =	6
Bit 5 - 2 ⁴ =	7
Bit 6 - 2 ⁵ =	8
Bit 7 - 2 ⁶ =	9
Bit 8 - 2 ⁷ =	10
Bit 9 - 2 ⁸ =	11
Bit 10 - 2 ⁹ =	12
Bit 11 - 2 ¹⁰ =	13
Bit 12 - 2 ¹¹ =	14
CW/CCW	15
Select	16

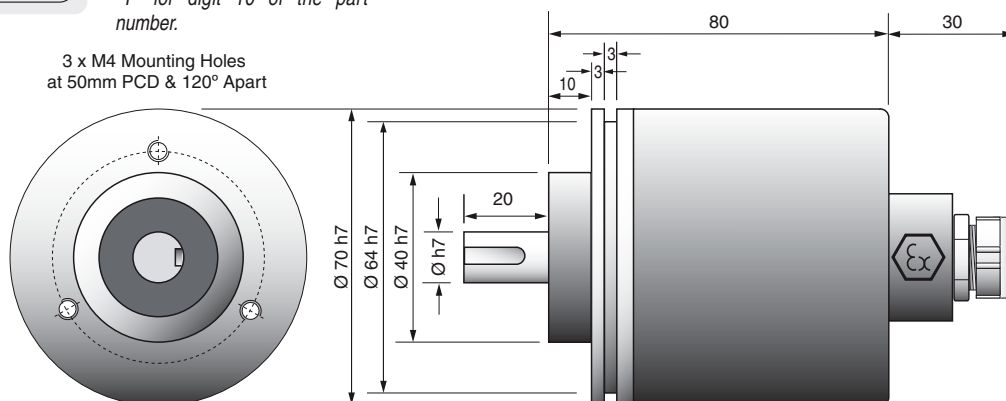
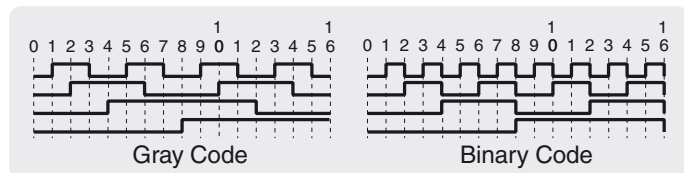
NOTE 1: Gray code encoders with a non cyclic output code (360, 720 etc) have a zero off-set applied. This ensures that only one bit changes between the highest value and the home or zero positions.

e.g. An encoder with 360 divisions for each rotation of the shaft, will read between 76 and 435 only.

If a non cyclic code is required and at 0° shaft position, the output is to read all zeros, select "T" for digit 10 of the part number.

Each encoder has a control wire to change the count direction (up or down), with the control wire connected to the + and the encoder shaft turning clockwise, (CW) the output value will increase. Connecting the control wire to the 0 Volt supply the output value will decrement as the shaft turns clockwise.

A range of mounting accessories are also available, refer to the Accessories and Couplings data sheets for full details. NOTE: A flexible coupling must always be used to attach the encoder to the drive shaft.



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Bit Range			
1	2	3	4	5	6	7	8	9	10	11	12	9-12 Bits 00512-04096			
A	E	S	H			P	R					/			
Stainless Shaft Shaft 10 or 12mm								Voltage & Output Type 5 Volt TTL 1 8-30 Volt Push Pull M							
Housing Material IP66/67 Stainless Steel P								Output Options None Fitted A							
Wiring Method Cable 2 Meters 2 Cable 5 Meters 3 Cable - Custom Length .. 4								Output Code Standard Gray A Binary B #Gray with NO excess T # see Note 1							
Wiring Entry Rear or Axial R															

A product of the world wide GESgroup made by W+S UK. Sold and serviced in Australia by PCA

NOTE: The encoder products outlined in this data sheet have been certified by a nominated European Test Authority, and are identified on all International and European certificates as the AX700 Series.

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque > 0.4Nm
Loading Axial 60N, Radial 50Nm
Weight 1300g
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 100mA
Maximum output signal frequency 50kHz
NOTE: Short circuit protection on all wires

FEATURES

The AESH encoders are designed for installation in General Hazardous Areas, with certification to the following European and International standards.

Certification Number Demko 02 ATEX 133213X EX I/II G D
EN50014 1197 E incl. A1+A2
EN50018 2000E
EEx d IIC T6 +60 Centigrade
EEx d IIC T4 +100 Centigrade
EEx d I

PCA AUS

Function	Wire
0 Volts	= 1
+ Volts	= 2
Bit 1 - 2 ⁰	= 3
Bit 2 - 2 ¹	= 4
Bit 3 - 2 ²	= 5
Bit 4 - 2 ³	= 6
Bit 5 - 2 ⁴	= 7
Bit 6 - 2 ⁵	= 8
Bit 7 - 2 ⁶	= 9
Bit 8 - 2 ⁷	= 10
Bit 9 - 2 ⁸	= 11
Bit 10 - 2 ⁹	= 12
Bit 11 - 2 ¹⁰	= 13
Bit 12 - 2 ¹¹	= 14
CW/CCW	= 15
Select	= 16

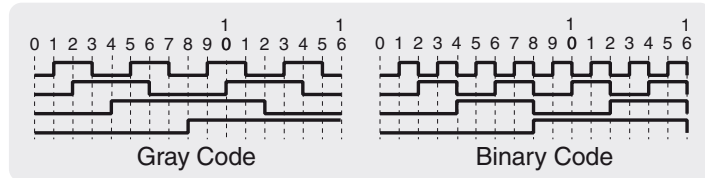
NOTE 1: Gray code encoders with a non cyclic output code (360, 720 etc) have a zero off-set applied. This ensures that only one bit changes between the highest value and the home or zero positions.

e.g. An encoder with 360 divisions for each rotation of the shaft, will read between 76 and 435 only.

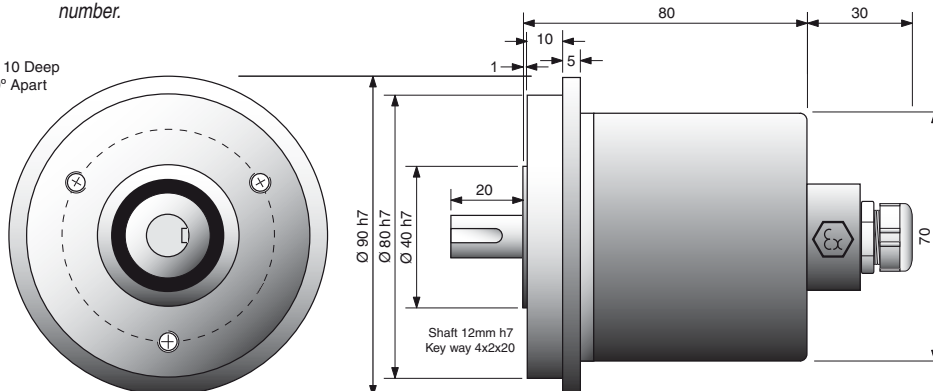
If a non cyclic code is required and at 0° shaft position, the output is to read all zeros, select "T" for digit 10 of the part number.

Each encoder has a control wire to change the count direction (up or down), with the control wire connected to the + and the encoder shaft turning clockwise, (CW) the output value will increase. Connecting the control wire to the 0 Volt supply the output value will decrement as the shaft turns clockwise.

A range of mounting accessories are also available, refer to the Accessories and Couplings data sheets for full details. **NOTE:** A flexible coupling must always be used to attach the encoder to the drive shaft.



3 x M6 Mounting Holes 10 Deep at 60mm PCD & 120° Apart



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Bit Range			
1	2	3	4	5	6	7	8	9	10	11	12	9-12 Bits 00512-04096			
A	E	S	L												
Stainless Shaft				Housing Material				Wiring Entry				Voltage & Output Type			
Shaft 12mm				IP66/67 Stainless Steel P				Rear or Axial R				5 Volt TTL 1			
Wiring Method												8-30 Volt Push Pull M			
Cable 2 Meters 2												Output Options			
Cable 5 Meters 3												None Fitted A			
Cable - Custom Length .. 4												Output Code			
												Standard Gray A			
												Binary B			
												#Gray with NO excess T			
												# see Note 1			

A product of the world wide GESgroup made by W+S UK. Sold and serviced in Australia by PCA

NOTE: The encoder products outlined in this data sheet have been certified by a nominated European Test Authority, and are identified on all International and European certificates as the AX700 Series.

ANHFSeries

Absolute Hollow Shaft Encoder

Maximum Resolution 12 Bit = 4,096

Shaft Hole Diameters 6, 10 or 12 mm

MECHANICAL SPECIFICATIONS

RPM Max. 6000
Torque > 4Ncm
Loading Axial 40N, Radial 30N
Weight Aluminium 200g
Temperature -20°C to +70°C

ELECTRICAL

Current consumption 100mA
Signal frequency for the LSB 50kHz
Switching load 40mA

NOTE: Short circuit protection on all wires.

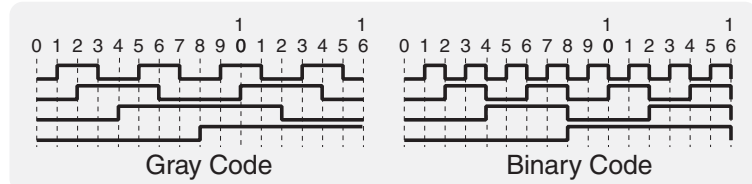
NOTE: Gray code encoders with a non cyclic output code (360, 720 etc) have a zero off-set applied. This ensures that only one bit changes between the highest value and the home or zero positions.

E.G. An encoder with 360 divisions for each rotation of the shaft, will read between 76 and 435 only. It will never read "0" even when the reset is applied, the lowest value will be 76.

FEATURES

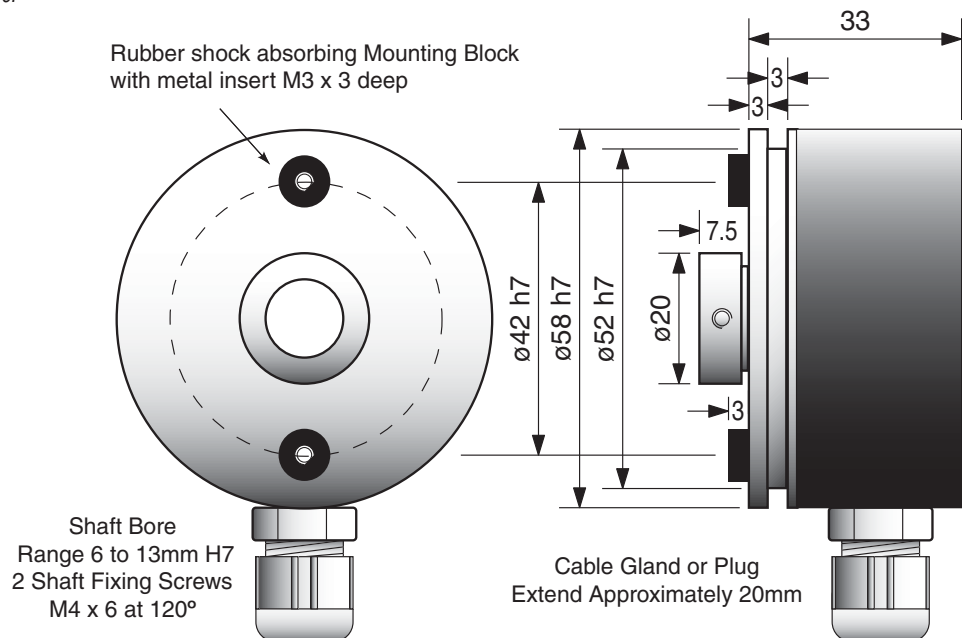
The ANHF encoders are suitable for most industrial applications. This series provides a high resolution option for a small body, up to 12 Bits. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

Each encoder has a direction control wire for connection to either the + or 0 Volt supply. This control wire provides the facility to change the relationship between the up/down count of the output data and the shaft rotation direction.



Function	Plug Pin	Wire
0 Volts	1	White
+ Volts	2	Brown
Bit 1 - 2 ⁰	3	Green
Bit 2 - 2 ¹	4	Yellow
Bit 3 - 2 ²	5	Grey
Bit 4 - 2 ³	6	Pink
Bit 5 - 2 ⁴	7	Blue
Bit 6 - 2 ⁵	8	Red
Bit 7 - 2 ⁶	9	Black
Bit 8 - 2 ⁷	10	Violet
Bit 9 - 2 ⁸	11	Grey/Pink
Bit 10 - 2 ⁹	12	Red/Blue
Bit 11 - 2 ¹⁰	13	White/Green
Bit 12 - 2 ¹¹	14	Brown/Green
	15	
CW/CCW Select	16	Yellow/Brown

NOTE: For other wiring and plug combinations refer to data sheet "Plug & Wiring Variations"



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Bit Range			
1	2	3	4	5	6	7	8	9	10	11	12	9-13 Bits 00512-04096			
A	N	H	F			H	S			A					
Stainless Steel Shaft Hole Hole 06, 10 or 12mm Standard .. 06, 08, 10, or 12								Voltage & Output Type 5 Volt Line Driver 1 8-30 Volt Push Pull M							
Housing Material IP65 Aluminium H								Wiring Entry Side or Radial S							
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length 4 16 Pin Metal Plug M								Output Options None Fitted A							
								Output Code Standard Gray A Binary B							

A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA

ANHMSeries

Absolute Hollow Shaft Encoder

Maximum Resolution13 Bit = 8,192

Shaft Diameters 12 to 26mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque >0.04Nm
Loading Axial 40N, Radial30Nm
Weight 570g
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 100mA
Maximum output signal frequency 50kHz

NOTE: Short circuit protection on all wires

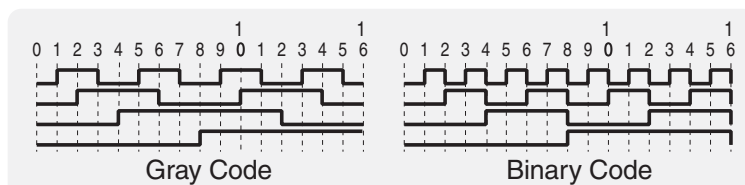
NOTE: Gray code encoders with a non cyclic output code (360, 720 etc) have a zero off-set applied. This ensures that only one bit changes between the highest value and the home or zero positions.

E.G. An encoder with 360 divisions for each rotation of the shaft, will read between 76 and 435 only. It will never read "0" even when the reset is applied, the lowest value will be 76.

FEATURES

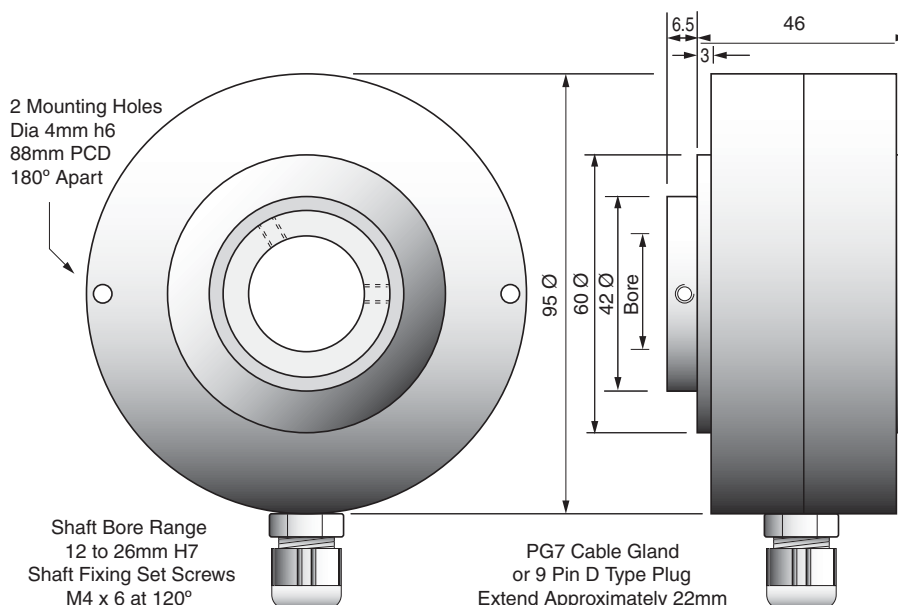
The ANHM encoders are suitable for most industrial applications. This series provides a high resolution option for a small body, up to 13 Bits. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

All absolute encoders have a control wire to change the count direction (up or down), with the control wire left open and the encoder shaft turning clockwise, (CW) the output value will increase. Connecting the control wire to the 0 Volt supply the output value with decrement as the shaft turns clockwise.



Function	Plug Pin	Wire
0 Volts	1	White
+ Volts	2	Brown
Bit 1 - 2 ⁰	3	Green
Bit 2 - 2 ¹	4	Yellow
Bit 3 - 2 ²	5	Grey
Bit 4 - 2 ³	6	Pink
Bit 5 - 2 ⁴	7	Blue
Bit 6 - 2 ⁵	8	Red
Bit 7 - 2 ⁶	9	Black
Bit 8 - 2 ⁷	10	Violet
Bit 9 - 2 ⁸	11	Grey/Pink
Bit 10 - 2 ⁹	12	Red/Blue
Bit 11 - 2 ¹⁰	13	White/Green
Bit 12 - 2 ¹¹	14	Brown/Green
CW/CCW Select	15	Yellow/Brown

NOTE: For other wiring and plug combinations refer to data sheet "Plug & Wiring Variations"



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Bit Range			
1	2	3	4	5	6	7	8	9	10	11	12	9-13 Bits 00512-08192			
A	N	H	M				S			A					
Stainless Shaft Shaft 12 to 26mm								Voltage & Output Type 5 Volt TTL - Line Driver ... 1 8 to 30V - Push/Pull M							
Housing Material IP65 Aluminium H IP65 Stainless Steel R								Output Options None Fitted A							
Wiring Method Cable 2 Meters 2 Cable 5 Meters 3 Cable - Custom Length .. 4 Plug 16 Pin Metal M								Output Code Gray A Binary B							
Wiring Entry Side or Radial S															

A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA

ANHJ Series

Absolute Hollow Shaft Encoder

Maximum Resolution 13 Bit = 8,192

Shaft Hole Diameters 6 to 18mm

MECHANICAL SPECIFICATIONS

RPM Max. 6000
Torque > 4Ncm
Loading Axial 40N, Radial 30N
Weight Aluminium 250g
Temperature -20°C to +70°C

ELECTRICAL

Current consumption 100mA
Signal frequency for the LSB 50kHz
Switching load 40mA

NOTE: Short circuit protection on all wires.

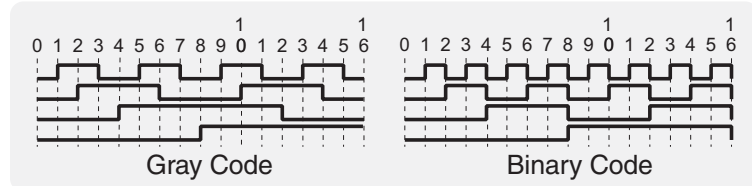
NOTE: Gray code encoders with a non cyclic output code (360, 720 etc) have a zero off-set applied. This ensures that only one bit changes between the highest value and the home or zero positions.

E.G. An encoder with 360 divisions for each rotation of the shaft, will read between 76 and 435 only. It will never read "0" even when the reset is applied, the lowest value will be 76.

FEATURES

The ANHJ encoders are suitable for most industrial applications. This series provides a high resolution option for a small body, up to 13 Bits. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

Each encoder has a direction control wire for connection to either the + or 0 volt supply. This control wire provides the facility to change the relationship between the up/down count of the output data and the shaft rotation direction.



PCA AUS		plug Pin	Wire
Function			
0 Volts	1	White	
+ Volts	2	Brown	
Bit 1 - 2 ⁰	3	Green	
Bit 2 - 2 ¹	4	Yellow	
Bit 3 - 2 ²	5	Grey	
Bit 4 - 2 ³	6	Pink	
Bit 5 - 2 ⁴	7	Blue	
Bit 6 - 2 ⁵	8	Red	
Bit 7 - 2 ⁶	9	Black	
Bit 8 - 2 ⁷	10	Violet	
Bit 9 - 2 ⁸	11	Grey/Pink	
Bit 10 - 2 ⁹	12	Red/Blue	
Bit 11 - 2 ¹⁰	13	White/Green	
Bit 12 - 2 ¹¹	14	Brown/Green	
Bit 13 - 2 ¹²	15	White/Yellow	
Direction CW/CCW	16	White/Grey	

NOTE: For other wiring and plug combinations refer to data sheet "Plug & Wiring Variations"

2 Mounting Holes
Dia 3mm H6
69mm PCD
180° Apart

PG7 Cable Gland
or 9 Pin D Type Plug
Extend Approximately 20mm

Shaft Bore Range 6 to 18mm H7
2 Shaft Fixing Set Screws
M4 x 6 at 120°

Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Bit Range				
1	2	3	4	5	6	7	8	9	10	11	12	9-13 Bits 00512-08192				
A	N	H	J			H	S			A		/				
Stainless Steel Shaft Hole Hole 06 to 18mm Standard .. 06, 10, or 12								Voltage & Output Type 5 Volt Line Driver 1 8-30 Volt Push Pull M								
Housing Material IP65 Aluminium H								Wiring Entry Side or Radial S								
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length 4 16 Pin Metal Plug M								Output Options None Fitted A								
								Output Code Standard Gray A Binary B								

A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA

ANSF Series

Absolute Shaft Encoder

Maximum Resolution 13 Bit = 8,192

Shaft Diameters 6 or 10mm

MECHANICAL SPECIFICATIONS

RPM Max. 6000
Torque > 5Ncm
Loading Axial 40N, Radial 30N
Weight Stainless 630g - Aluminium 320g
Temperature -20°C to +70°C

ELECTRICAL

Current consumption 100mA
Signal frequency for the LSB Max. 50kHz
Switching load 40mA

NOTE: Short circuit protection on all wires

NOTE 1: Gray code encoders with a non cyclic output code (360, 720 etc) have a zero off-set applied. This ensures that only one bit changes between the highest value and the home or zero positions.

e.g. An encoder with 360 divisions for each rotation of the shaft, will read between 76 and 435 only.

FEATURES

The ANSF encoders are suitable for most industrial applications. The series provides a high resolution for a small body size, up to 13 Bits.

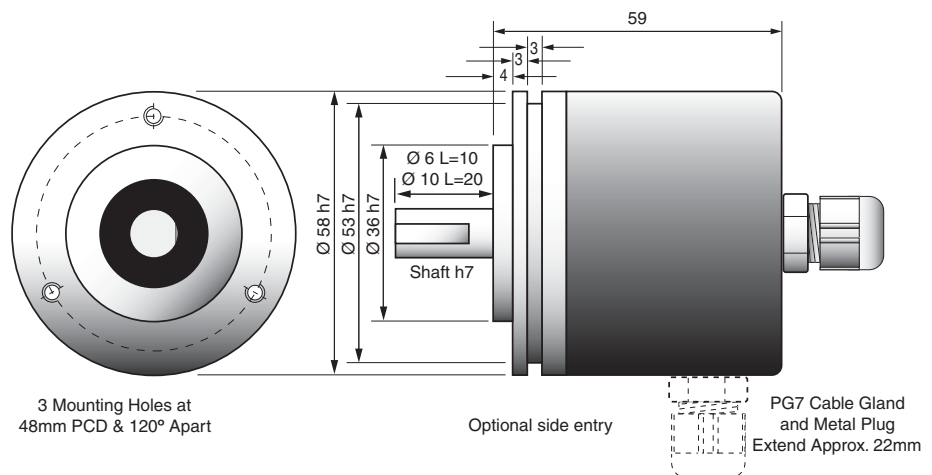
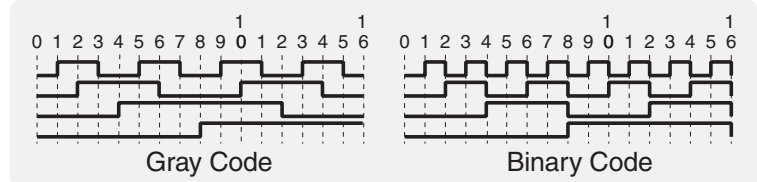
The direction select control wire determines the relationship between the rotation of the shaft and the count direction of the output. With the wire tied to the + the output value will increase as the shaft turns clockwise (CW), when the wire is connected to the 0 Volt supply the output will increase as the shaft turns counter clockwise (CCW).

Switching the optional "zero reset" input, from the positive to the negative supply for a minimum of .5 Seconds, will force the output code to reset to zero regardless of the shaft position. This provides a simple way to synchronise the encoder output to the machine physical zero position.

To ensure long-term reliability, each encoder must be mounted in accordance with the installation instructions. Refer to the Accessories section for a range of couplings and mounting hardware.

Function	Plug Pin	Wire
0 Volts	1	White
+ Volts	2	Brown
Bit 1 - 2 ⁰	3	Green
Bit 2 - 2 ¹	4	Yellow
Bit 3 - 2 ²	5	Grey
Bit 4 - 2 ³	6	Pink
Bit 5 - 2 ⁴	7	Blue
Bit 6 - 2 ⁵	8	Red
Bit 7 - 2 ⁶	9	Black
Bit 8 - 2 ⁷	10	Violet
Bit 9 - 2 ⁸	11	Grey/Pink
Bit 10 - 2 ⁹	12	Red/Blue
Bit 11 - 2 ¹⁰	13	White/Green
Bit 12 - 2 ¹¹	14	Brown/Green
	15	
CW/CCW Select	16	Yellow/Brown

NOTE: For other wiring and plug combinations refer to data sheet "Plug & Wiring Variations"



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Bit Range			
1	2	3	4	5	6	7	8	9	10	11	12	9-13 Bits 00512-08192			
A	N	S	F			H						/			
Stainless Shaft Shaft 06 or 10mm								Voltage & Output Type 5 Volt Line Driver 1 8-30 Volt Push Pull M							
Housing Material IP65 Aluminium H								Output Options None Fitted A Remote Zero Reset 7							
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4 Plug 16 Pin Metal M Plug 17 Pin Metal S								Output Code Standard Gray A Binary B							
Wiring Entry Rear or Axial R Side or Radial S															

A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA

ANSG Series

Absolute Shaft Encoder

Maximum Resolution ..13 Bit = 8,192

Shaft Diameters 6 or 10mm

MECHANICAL SPECIFICATIONS

RPM Max. 6000
Torque > 5Ncm
Loading Axial 40N, Radial 30N
Weight Stainless 630g - Aluminium 320g
Temperature -20°C to +70°C

ELECTRICAL

Current consumption 100mA
Signal frequency for the LSB Max. 50kHz
Switching load 40mA

NOTE: Short circuit protection on all wires

NOTE 1: Gray code encoders with a non cyclic output code (360, 720 etc) have a zero off-set applied. This ensures that only one bit changes between the highest value and the home or zero positions.

e.g. An encoder with 360 divisions for each rotation of the shaft, will read between 76 and 435 only.

FEATURES

The ANSG encoders are suitable for most industrial applications. The series provides a high resolution for a small body size, up to 13 Bits.

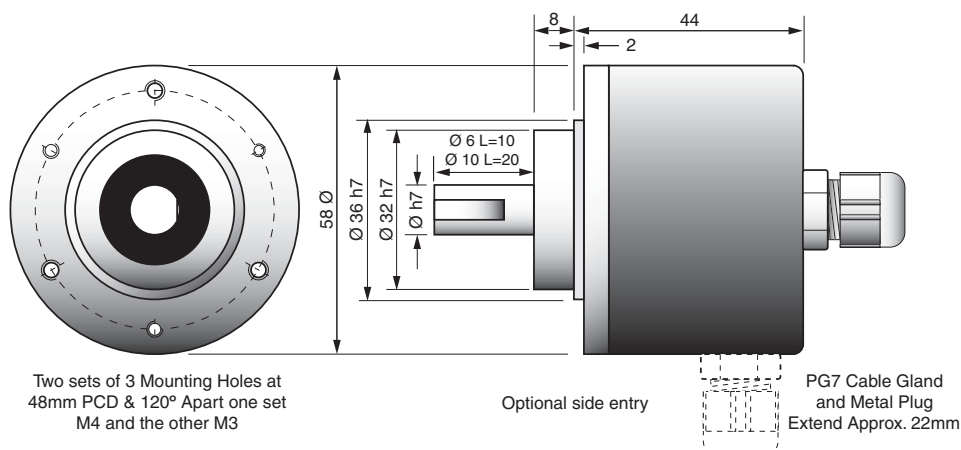
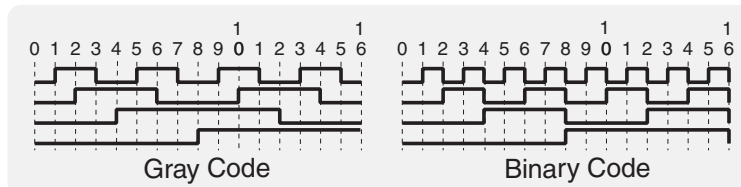
The direction select control wire determines the relationship between the rotation of the shaft and the count direction of the output. With the wire tied to the + the output value will increase as the shaft turns clockwise (CW), when the wire is connected to the 0 Volt supply the output will increase as the shaft turns counter clockwise (CCW).

Switching the optional "zero reset" input, from the positive to the negative supply for a minimum of .5 Seconds, will force the output code to reset to zero regardless of the shaft position. This provides a simple way to synchronise the encoder output to the machine physical zero position.

To ensure long-term reliability, each encoder must be mounted in accordance with the installation instructions. Refer to the Accessories section for a range of couplings and mounting hardware.

Function	Plug Pin	Wire
0 Volts	1	White
+ Volts	2	Brown
Bit 1 - 2 ⁰	3	Green
Bit 2 - 2 ¹	4	Yellow
Bit 3 - 2 ²	5	Grey
Bit 4 - 2 ³	6	Pink
Bit 5 - 2 ⁴	7	Blue
Bit 6 - 2 ⁵	8	Red
Bit 7 - 2 ⁶	9	Black
Bit 8 - 2 ⁷	10	Violet
Bit 9 - 2 ⁸	11	Grey/Pink
Bit 10 - 2 ⁹	12	Red/Blue
Bit 11 - 2 ¹⁰	13	White/Green
Bit 12 - 2 ¹¹	14	Brown/Green
	15	
CW/CCW Select	16	Yellow/Brown

NOTE: For other wiring and plug combinations refer to data sheet "Plug & Wiring Variations"



Two sets of 3 Mounting Holes at 48mm PCD & 120° Apart one set M4 and the other M3

Optional side entry

PG7 Cable Gland and Metal Plug Extend Approx. 22mm

Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Bit Range			
1	2	3	4	5	6	7	8	9	10	11	12	9-13 Bits 00512-08192			
A	N	S	G			H									
Stainless Shaft				Housing Material				Wiring Entry				Voltage & Output Type			
Shaft 06 or 10mm				IP65 Aluminium H				Rear or Axial R Side or Radial S				5 Volt Line Driver 1 8-30 Volt Push Pull M			
Wiring Method												Output Options			
Cable 2 Metres 2												None Fitted A			
Cable 5 Metres 3												Remote Zero Reset 7			
Cable - Custom Length .. 4												Output Code			
Plug 16 Pin Metal M												Standard Gray A			
Plug 17 Pin Metal S												Binary B			

A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA

ANSH Series

Absolute Shaft Encoder

Maximum Resolution....13 Bit = 8,192

Shaft Diameters 10 or 12mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque >0.5Nm
Loading Axial 60N, Radial 50N
Weight 450g
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 50mA
Maximum output signal frequency 200kHz
NOTE: Short circuit protection on all wires

NOTE 1: Gray code encoders with a non cyclic output code (360, 720 etc) have a zero off-set applied. This ensures that only one bit changes between the highest value and the home or zero positions.

e.g. An encoder with 360 divisions for each rotation of the shaft, will read between 76 and 435 only.

FEATURES

The ANSH encoders are suitable for most industrial applications. The series provides a high resolution for a medium body size, up to 13 Bits.

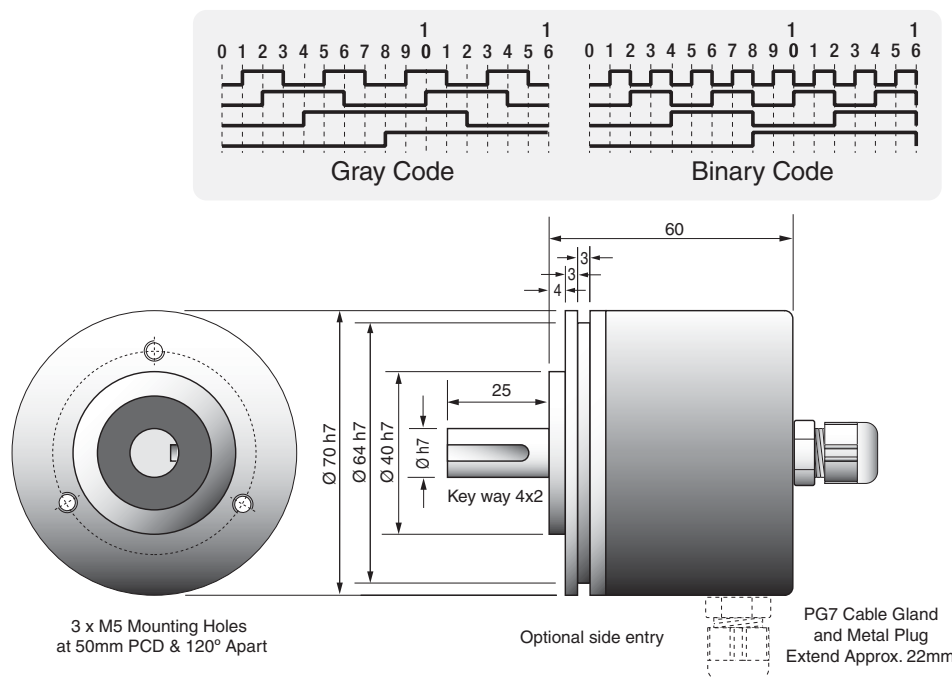
The direction select control wire determines the relationship between the rotation of the shaft and the count direction of the output. With the wire tied to the + the output value will increase as the shaft turns clockwise (CW), when the wire is connected to the 0 Volt supply the output will increase as the shaft turns counter clockwise (CCW).

Switching the optional "zero reset" input, from the positive to the negative supply for a minimum of .5 Seconds, will force the output code to reset to zero regardless of the shaft position. This provides a simple way to synchronise the encoder output to the machine physical zero position.

To ensure long-term reliability, each encoder must be mounted in accordance with the installation instructions. Refer to the Accessories section for a range of couplings and mounting hardware.

Function	Plug Pin	Wire
0 Volts	1	White
+ Volts	2	Brown
Bit 1 - 2 ⁰	3	Green
Bit 2 - 2 ¹	4	Yellow
Bit 3 - 2 ²	5	Grey
Bit 4 - 2 ³	6	Pink
Bit 5 - 2 ⁴	7	Blue
Bit 6 - 2 ⁵	8	Red
Bit 7 - 2 ⁶	9	Black
Bit 8 - 2 ⁷	10	Violet
Bit 9 - 2 ⁸	11	Grey/Pink
Bit 10 - 2 ⁹	12	Red/Blue
Bit 11 - 2 ¹⁰	13	White/Green
Bit 12 - 2 ¹¹	14	Brown/Green
	15	
CW/CCW Select	16	Yellow/Brown

NOTE: For other wiring and plug combinations refer to data sheet "Plug & Wiring Variations"



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Bit Range			
1	2	3	4	5	6	7	8	9	10	11	12	9 to 13 Bits 00512-08192			
A	N	S	H			H									
Stainless Shaft Shaft 10 or 12mm								Voltage & Output Type 5 Volt TTL - Line Driver ... 1 8 to 30V - Push/Pull M							
Housing Material IP65 Aluminium H								Output Options None Fitted A Remote Zero Reset 7							
Wiring Method Cable 2 Meters 2 Cable 5 Meters 3 Cable - Custom Length .. 4 Plug 16 Pin Metal M Plug 17 Pin Metal S								Output Code Gray A Binary B							
Wiring Entry Rear or Axial R Side or Radial S															

A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA

ANSLSeries

Absolute Shaft Encoder

Maximum Resolution...13 Bit = 8,192

Shaft Diameters 10, 11 or 12mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque >0.05Nm
Loading Axial 60N, Radial 50N
Weight 850g
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 50mA
Max. output frequency of LSB 50kHz

NOTE: Short circuit protection on all wires

NOTE 1: Gray code encoders with a non cyclic output code (360, 720 etc) have a zero off-set applied. This ensures that only one bit changes between the highest value and the home or zero positions.

e.g. An encoder with 360 divisions for each rotation of the shaft, will read between 76 and 435 only.

FEATURES

The ANSL encoders are suitable for most industrial applications. The series provides a heavy duty body and up to 13 Bits resolution.

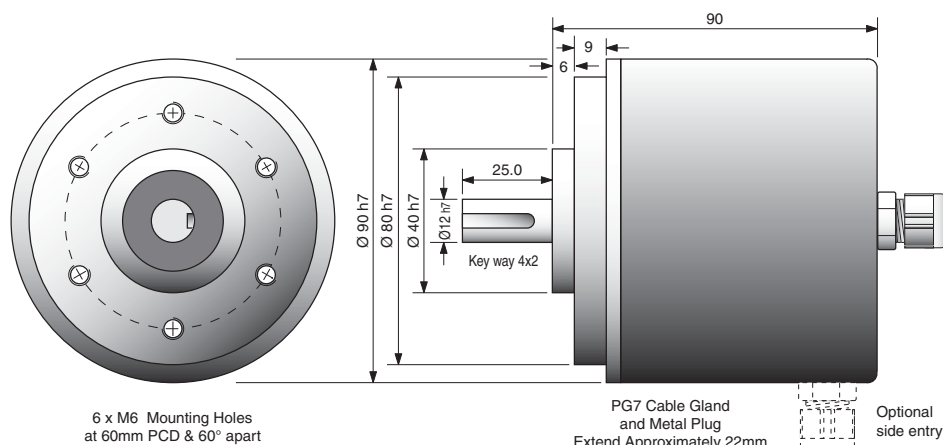
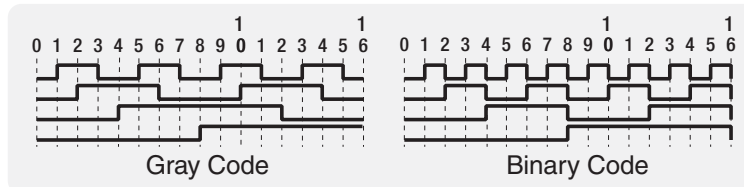
The direction select control wire determines the relationship between the rotation of the shaft and the count direction of the output. With the wire tied to the + the output value will increase as the shaft turns clockwise (CW), when the wire is connected to the 0 Volt supply the output will increase as the shaft turns counter clockwise (CCW).

Switching the optional "zero reset" input, from the positive to the negative supply for a minimum of .5 Seconds, will force the output code to reset to zero regardless of the shaft position. This provides a simple way to synchronise the encoder output to the machine physical zero position.

To ensure long-term reliability, each encoder must be mounted in accordance with the installation instructions. Refer to the Accessories section for our range of couplings and mounting hardware.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	White
+ Volts	2	Brown
Bit 1 - 2 ⁰	3	Green
Bit 2 - 2 ¹	4	Yellow
Bit 3 - 2 ²	5	Grey
Bit 4 - 2 ³	6	Pink
Bit 5 - 2 ⁴	7	Blue
Bit 6 - 2 ⁵	8	Red
Bit 7 - 2 ⁶	9	Black
Bit 8 - 2 ⁷	10	Violet
Bit 9 - 2 ⁸	11	Grey/Pink
Bit 10 - 2 ⁹	12	Red/Blue
Bit 11 - 2 ¹⁰	13	White/Green
Bit 12 - 2 ¹¹	14	Brown/Green
	15	
CW/CCW Select	16	Yellow/Brown

NOTE: For other wiring and plug combinations refer to data sheet "Plug & Wiring Variations"



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Bit Range			
1	2	3	4	5	6	7	8	9	10	11	12	9-13 Bits 00512-08192			
A	N	S	L												
Stainless Shaft Shaft 10 to 12mm								Voltage & Output Type 5 Volt TTL - Line Driver ... 1 8 to 30V - Push/Pull M							
Housing Material IP65 Aluminium / Steel .. B								Output Options None Fitted A Remote Zero Reset 7							
Wiring Method Cable 2 Meters 2 Cable 5 Meters 3 Cable - Custom Length .. 4 Plug 16 Pin Metal M Plug 17 Pin Metal S								Output Code Gray A Binary B							
Wiring Entry Rear or Axial R Side or Radial S															

A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA

APSG Series

Absolute Shaft Encoder IP66/67

Maximum Increments 8192

Shaft Diameter Range 6, 10 or 12mm

MECHANICAL SPECIFICATIONS

RPM Max. 3000
Torque > 3Ncm
Loading Axial 10N, Radial 10N
Weight Aluminium 300g Stainless 600g
Temperature -20°C to +85°C

ELECTRICAL

Current consumption Max. 100mA
Signal frequency 100kHz
Switching load 40mA

FEATURES

The APSG encoders are suitable for most industrial applications. The series provides a high resolution for a small body size, up to 13 Bits.

The direction select control wire determines the relationship between the rotation of the shaft and the count direction of the output. With the wire tied to the + the output value will increase as the shaft turns clockwise (CW), when the wire is connected to the 0 Volt supply the output will increase as the shaft turns counter clockwise (CCW)

These encoders are machined from either aluminium or stainless steel, both with a range of double lip shaft seals filled with grease to suit most environments.

Shaft Sealing Options

Nitrile = General Industrial Use

Food = Approved in USA & UK use with food

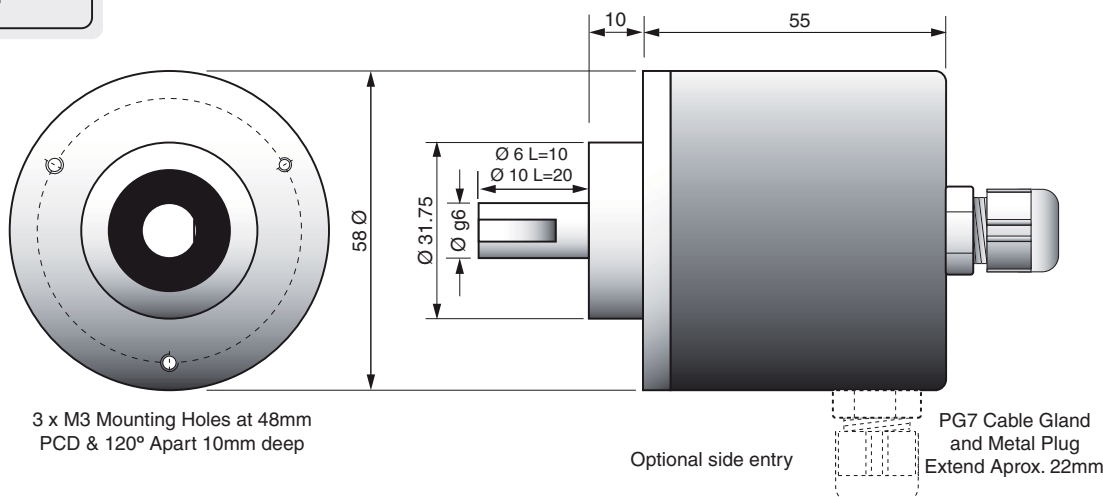
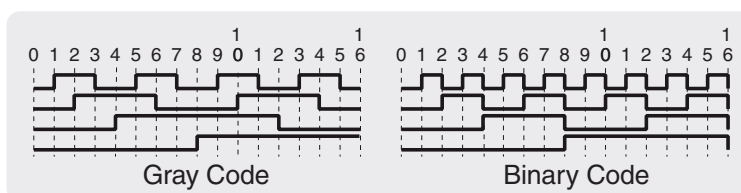
PTFE = High Speed Low Torque

Viton Peroxide = Chemical & Acid resistant

EPDM = Thurban material for outdoor use - resistant to UV and ozone damage

Function	Wire
0 Volts	1 Black
+ Volts	2 Red
Bit 1 - 2 ⁰	3 White
Bit 2 - 2 ¹	4 Blue
Bit 3 - 2 ²	5 Yellow
Bit 4 - 2 ³	6 Green
Bit 5 - 2 ⁴	7 Violet
Bit 6 - 2 ⁵	8 Brown
Bit 7 - 2 ⁶	9 Pink
Bit 8 - 2 ⁷	10 Turquoise
Bit 9 - 2 ⁸	11 Grey
Bit 10 - 2 ⁹	12 Orange
Bit 11 - 2 ¹⁰	13 Green/Red
Bit 12 - 2 ¹¹	14 Red/Blue
Bit 13 - 2 ¹²	15 Yellow/Red
? Select CW/CCW	16 Red/Black

NOTE: Refer to
COUPLING data sheet for
our range of Stainless
Steel zero backlash shaft
couplings



3 x M3 Mounting Holes at 48mm
PCD & 120° Apart 10mm deep

Optional side entry

PG7 Cable Gland
and Metal Plug
Extend Approx. 22mm

Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range				
1	2	3	4	5	6	7	8	9	10	11	12	00256 to 08192				
A	P	S	G									/				
Stainless Steel Shaft Shaft 6, 10 or 12mm Standard ... 10mm								Voltage & Output Type 5 Volt - Line driver 1 8 - 30 Volt Push Pull M								
Housing Material IP66/67 Aluminium + Nitrile Seal J Aluminium + PTFE Seal K Aluminium + Food Seal L Aluminium + Viton Seal M 316 Stainless + Nitrile Seal S 316 Stainless + PTFE Seal T 316 Stainless + Food Seal U 316 Stainless + Viton Seal V 316 Stainless + EPDM Seal 6								Wiring Entry Rear or Axial R Side or Radial S								
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length ... 4								Output Channels Standard Gray A Binary B BCD C								

Manufactured in UK by IED
Sold and serviced in Australia by **PCA**

APSH Series

Single Turn Absolute Shaft Encoder IP66/67

Maximum Increments 13 Bit = 8,192

Shaft Diameter Range 10 or 12mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque >0.4Nm
Loading Axial 60N, Radial 50N
Weight 1300g
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 100mA
Maximum output signal frequency 50kHz

NOTE: Short circuit protection on all wires

FEATURES

The APSH encoders are designed for installation in very harsh areas, with certification to the following European and International standards.
EN 60529 & IEC 144 CENELEC to IP66/67 - M/S Dynamic & Static
EN50.081-2 & EN50.082-2 ... CENELEC Generic EMC Standards

Each encoder has a control wire to change the count direction (up or down), with the control wire connected to the + and the encoder shaft turning clockwise, (CW) the output value will increase. Connecting the control wire to the 0 Volt supply the output value will decrement as the shaft turns clockwise.

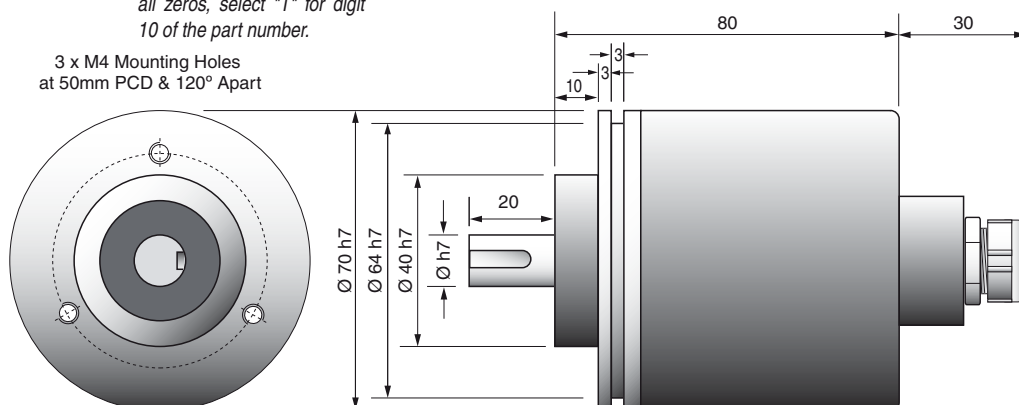
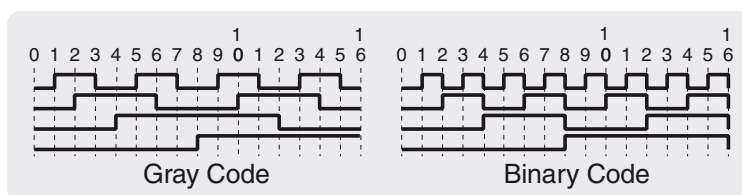
A range of mounting accessories are also available, refer to the Accessories and Couplings data sheets for full details. NOTE: A flexible coupling must always be used to attach the encoder to the drive shaft.

Function	Plug Pin	Wire
0 Volts	1	White
+ Volts	2	Brown
Bit 1 - 2 ⁰	3	Green
Bit 2 - 2 ¹	4	Yellow
Bit 3 - 2 ²	5	Grey
Bit 4 - 2 ³	6	Pink
Bit 5 - 2 ⁴	7	Blue
Bit 6 - 2 ⁵	8	Red
Bit 7 - 2 ⁶	9	Black
Bit 8 - 2 ⁷	10	Violet
Bit 9 - 2 ⁸	11	Grey/Pink
Bit 10 - 2 ⁹	12	Red/Blue
Bit 11 - 2 ¹⁰	13	White/Green
Bit 12 - 2 ¹¹	14	Brown/Green
	15	
CW/CCW Select	16	Yellow/Brown

NOTE 1: Gray code encoders with a non cyclic output code (360, 720 etc) have a zero off-set applied. This ensures that only one bit changes between the highest value and the home or zero positions.

e.g. An encoder with 360 divisions for each rotation of the shaft, will read between 76 and 435 only.

If a non cyclic code is required and at 0° shaft position, the output is to read all zeros, select "T" for digit 10 of the part number.



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Bit Range			
1	2	3	4	5	6	7	8	9	10	11	12	9-13 Bits 00512 - 08192			
A	P	S	H												
Stainless Shaft												Voltage & Output Type			
Shaft 10 or 12mm												5 Volt TTL 1			
												8-30 Volt Push Pull M			
Housing Material												Output Options			
IP66/67 Stainless Steel S												None Fitted A			
				Wiring Entry								Output Code			
				Rear or Axial R								Standard Gray A			
Wiring Method												Binary B			
Cable 2 Meters 2												#Gray with NO excess T			
Cable 5 Meters 3												# see Note 1			
Cable - Custom Length .. 4															

A product of the world wide GESgroup made by W+S UK. Sold and serviced in Australia by PCA

NOTE: The encoder products outlined in this data sheet have been certified by a nominated European Test Authority, and are identified on all International and European certificates as the AP700 Series.

APSL Series

IP66/67 Single Turn Absolute Shaft Encoder

Maximum Increments 4096

Shaft Diameter Range 12mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000

Torque >0.4Nm

Loading Axial 60N, Radial 50Nm

Weight 1300g

Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 100mA

Maximum output signal frequency 50kHz

NOTE: Short circuit protection on all wires

FEATURES

The APSL encoders are designed for installation in very harsh areas, with certification to the following European and International standards.

EN 60529 & IEC 144 CENELEC to IP66/67 - M/S Dynamic & Static
EN50.081-2 & EN50.082-2 ... CENELEC Generic EMC Standards

Each encoder has a control wire to change the count direction (up or down), with the control wire connected to the + and the encoder shaft turning clockwise, (CW) the output value will increase. Connecting the control wire to the 0 Volt supply the output value will decrement as the shaft turns clockwise.

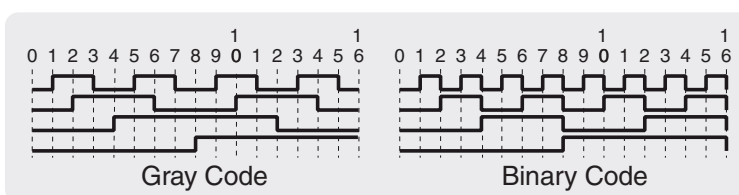
Function	Plug Pin	Wire
0 Volts	1	White
+ Volts	2	Brown
Bit 1 - 2 ⁰	3	Green
Bit 2 - 2 ¹	4	Yellow
Bit 3 - 2 ²	5	Grey
Bit 4 - 2 ³	6	Pink
Bit 5 - 2 ⁴	7	Blue
Bit 6 - 2 ⁵	8	Red
Bit 7 - 2 ⁶	9	Black
Bit 8 - 2 ⁷	10	Violet
Bit 9 - 2 ⁸	11	Grey/Pink
Bit 10 - 2 ⁹	12	Red/Blue
Bit 11 - 2 ¹⁰	13	White/Green
Bit 12 - 2 ¹¹	14	Brown/Green
?	15	
Direction	16	Yellow/Brown
CW/CCW		

NOTE 1: Gray code encoders with a non cyclic output code (360, 720 etc) have a zero off-set applied. This ensures that only one bit changes between the highest value and the home or zero positions.

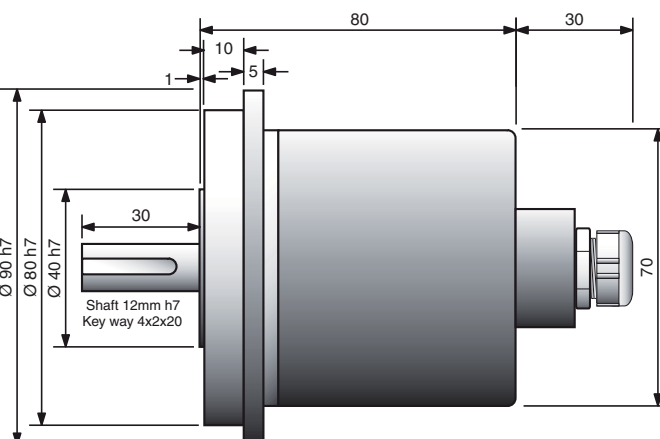
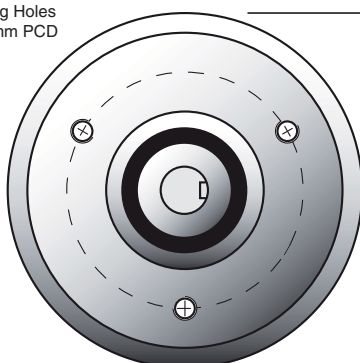
e.g. An encoder with 360 divisions for each rotation of the shaft, will read between 76 and 435 only.

If a non cyclic code is required and at 0° shaft position, the output is to read all zeros, select "T" for digit

A range of mounting accessories are also available, refer to the Accessories and Couplings data sheets for full details. NOTE: A flexible coupling must always be used to attach the encoder to the drive shaft.



3 x M6 Mounting Holes
10 Deep at 60mm PCD
& 120° Apart



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Bit Range			
1	2	3	4	5	6	7	8	9	10	11	12	12 Bits 4096			
A	P	S	L			S	R					/			
Stainless Shaft				Housing Material				Wiring Entry				Voltage & Output Type			
Shaft 10 or 12mm				IP66/67 Stainless Steel S				Rear or Axial R				5 Volt TTL 1 8-30 Volt Push Pull M			
Wiring Method												Output Options			
Cable 2 Meters 2												None Fitted A			
Cable 5 Meters 3												Output Code			
Cable - Custom Length .. 4												Standard Gray A Binary B #Gray with NO excess T # see Note 1			

A product of the world wide GESgroup made by WJ+S UK. Sold and serviced in Australia by PCA

NOTE: The encoder products outlined in this data sheet have been certified by a nominated European Test Authority, and are identified on all International and European certificates as the AP700 Series.

APSW Series

Absolute Shaft Encoder IP66/67

Maximum Increments 8192

Shaft Diameter Range 10 or 12mm

MECHANICAL SPECIFICATIONS

RPM Max. 3000
Torque > 3Ncm
Loading Axial 10N, Radial 10N
Weight Aluminium 460g Stainless 1080g
Temperature -20°C to +85°C

ELECTRICAL

Current consumption Max. 100mA
Signal frequency 100kHz
Switching load 40mA

FEATURES

The APSW encoders are suitable for most industrial applications. The series provides a high resolution for a small body size, up to 13 Bits.

The direction select control wire determines the relationship between the rotation of the shaft and the count direction of the output. With the wire tied to the + the output value will increase as the shaft turns clockwise (CW), when the wire is connected to the 0 Volt supply the output will increase as the shaft turns counter clockwise (CCW)

These encoders are machined from either aluminium or stainless steel, both with a range of double lip shaft seals filled with grease to suit most environments.

Shaft Sealing Options

Nitrile = General Industrial Use

Food = Approved in USA & UK use with food

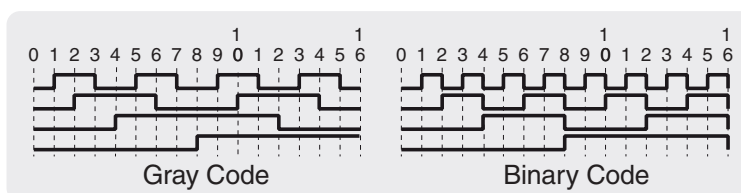
PTFE = High Speed Low Torque

Viton Peroxide = Chemical & Acid resistant

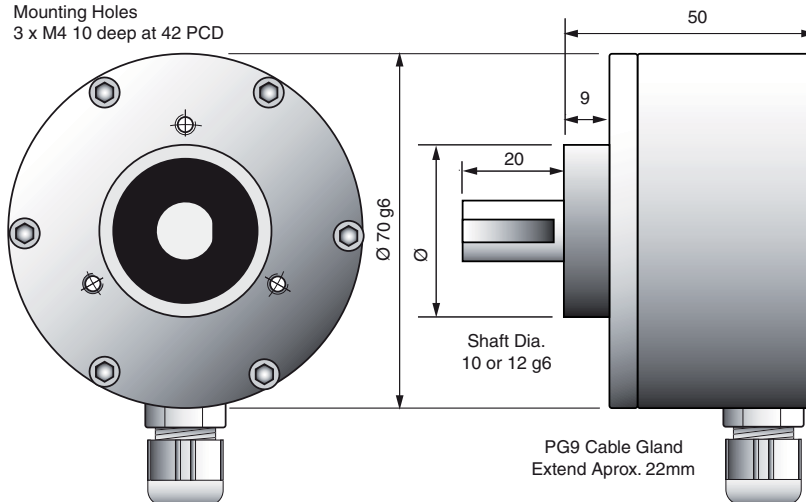
EPDM = Thurban material for outdoor use - resistant to UV and ozone damage

Function	Wire
0 Volts	1 Black
+ Volts	2 Red
Bit 1 - 2 ⁰	3 White
Bit 2 - 2 ¹	4 Blue
Bit 3 - 2 ²	5 Yellow
Bit 4 - 2 ³	6 Green
Bit 5 - 2 ⁴	7 Violet
Bit 6 - 2 ⁵	8 Brown
Bit 7 - 2 ⁶	9 Pink
Bit 8 - 2 ⁷	10 Turquoise
Bit 9 - 2 ⁸	11 Grey
Bit 10 - 2 ⁹	12 Orange
Bit 11 - 2 ¹⁰	13 Green/Red
Bit 12 - 2 ¹¹	14 Red/Blue
Bit 13 - 2 ¹²	15 Yellow/Red
? Select CW/CCW	16 Red/Black

NOTE: Refer to
COUPLING data sheet for
our range of Stainless
Steel zero backlash shaft
couplings



Mounting Holes
3 x M4 10 deep at 42 PCD



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range			
1	2	3	4	5	6	7	8	9	10	11	12	00256 to 08192			
A	P	S	W												
Stainless Steel Shaft Shaft 10 or 12mm Standard ... 12mm								Voltage & Output Type 5 Volt - Line driver 1 8 - 30 Volt Push Pull M							
Housing Material IP66/67 Aluminium + Nitrile Seal J Aluminium + PTFE Seal K Aluminium + Food Seal L Aluminium + Viton Seal M 316 Stainless + Nitrile Seal S 316 Stainless + PTFE Seal T 316 Stainless + Food Seal U 316 Stainless + Viton Seal V 316 Stainless + EPDM Seal 6								Wiring Entry Rear or Axial R Side or Radial S							
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length ... 4								Output Channels Standard Gray A Binary B BCD C							

Manufactured in UK by IED
Sold and serviced in Australia by **PCA**

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
 Torque >0.4Nm
 Loading Axial 60N, Radial 50N
 Weight 1300g
 Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 40mA
 Maximum output signal frequency 300kHz
 NOTE: Short circuit protection on all wires

FEATURES

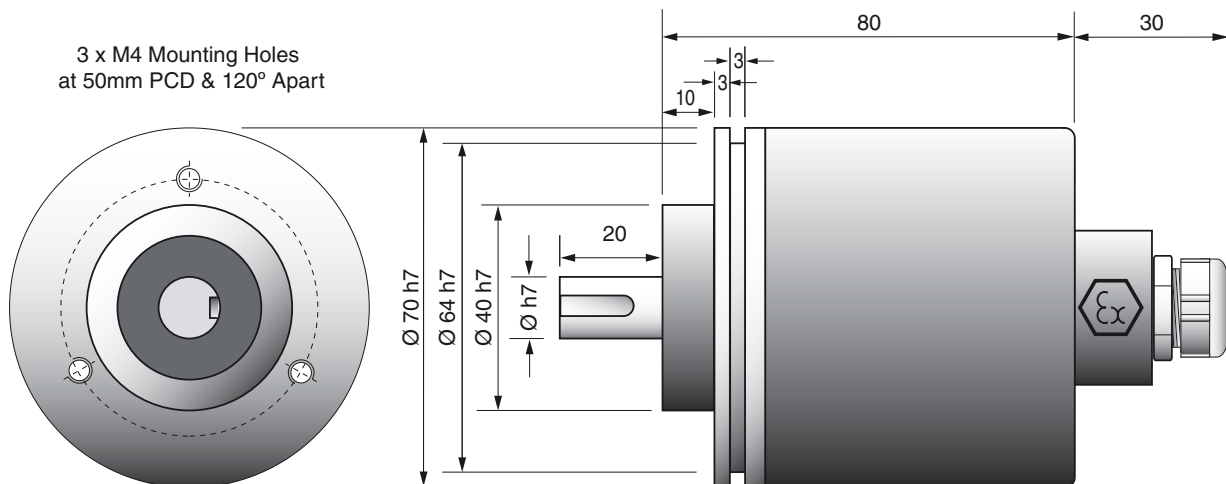
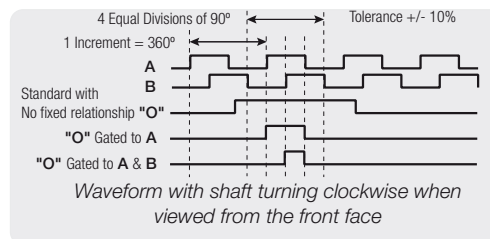
The IESH encoders are designed for installation in General Hazardous Areas, with certification to the following European and International standards.

Certification Number Demko 02 ATEX 133213X EX I/II G D
 EN50014 1197 E incl. A1+A2
 EN50018 2000E
 EEx d IIC T6 +60 Centigrade
 EEx d IIC T4 +100 Centigrade
 EEx d I

A range of mounting accessories are also available, refer to the Accessories and Couplings data sheets for full details. NOTE: A flexible coupling must always be used to attach the encoder to the drive shaft.

PCA AUS	
Function	Wire Number
0 Volts	1
+ Volts	2
A	3
B	4
O	5
A	6
B	7
O	8

W+S	
Wire	Plug Pin
White	1 0 Volts
Brown	2 + Volts
Green	3 A
Yellow	4 B
Gray	5 O
Pink	6 A
Blue	7 B
Red	8 O



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range			
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 05000			
I	E	S	H			P	R					/			
Stainless Shaft Shaft 10 or 12mm								Voltage & Output Type 5 Volt TTL - Line Driver ... 1 8 to 30V - Push/Pull M							
Housing Material IP66/67 Stainless Steel P								Output Options Standard A							
Wiring Entry Rear or Axial R								Output Channels A, B, O 3 A, B, O, A, B, O 7							
Wiring Method Cable 2 Meters 2 Cable 5 Meters 3 Cable - Custom Length .. 4															

A product of the world wide GESgroup made by W+S UK. Sold and serviced in Australia by PCA

NOTE: The encoder products outlined in this data sheet have been certified by a nominated European Test Authority, and are identified on all International and European certificates as the IX700 Series.



MECHANICAL SPECIFICATIONS

Maximum RPM 6000
 Torque >0.4Nm
 Loading Axial 60N, Radial 50Nm
 Weight 1300g
 Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 40mA
 Maximum output signal frequency 300kHz

NOTE: Short circuit protection on all wires

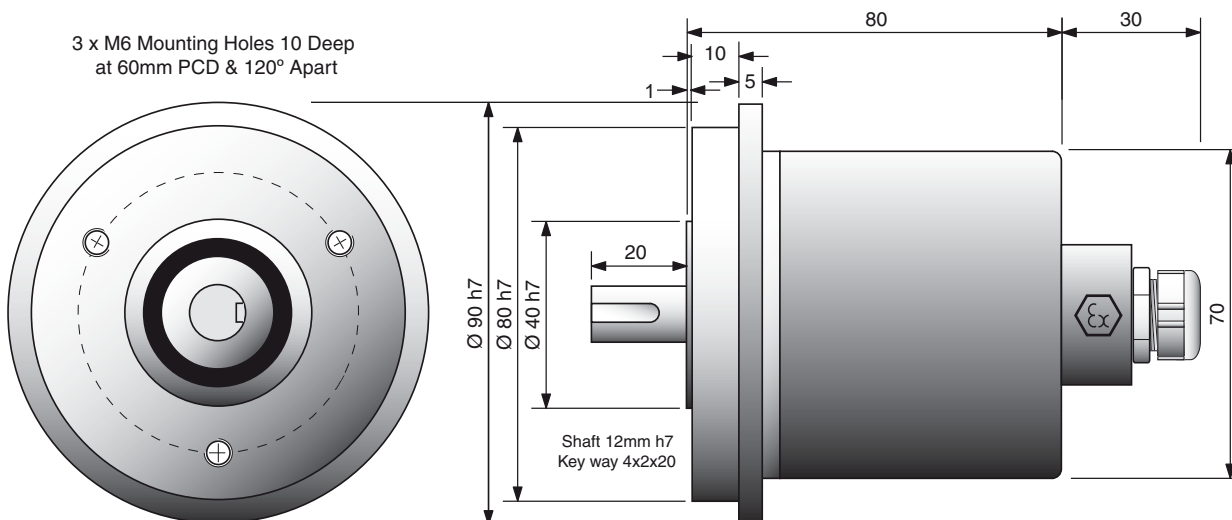
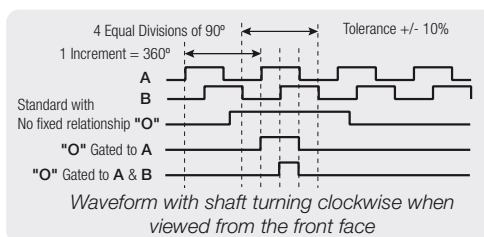
FEATURES

The IESH encoders are designed for installation in General Hazardous Areas, with certification to the following European and International standards.

Certification Number Demko 02 ATEX 133213XEX I/II G D
 EN50014 1197 E incl. A1+A2
 EN50018 2000E
 EEx d IIC T6 +60 Centigrade
 EEx d IIC T4 +100 Centigrade
 EEx d I

A range of mounting accessories are also available, refer to the Accessories and Couplings data sheets for full details. NOTE: A flexible coupling must always be used to attach the encoder to the drive shaft.

PCA AUS	
Function	Wire Number
0 Volts	1
+ Volts	2
A	3
B	4
O	5
A/B	6
O	7
O	8



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range 00001 to 05000			
1	2	3	4	5	6	7	8	9	10	11	12				
I	E	S	L			P	R					/			
Stainless Shaft Shaft 12mm								Voltage & Output Type 5 Volt TTL - Line Driver ... 1 8 to 30V - Push/Pull M							
Housing Material IP66/67 Stainless Steel ... P								Output Options Standard A							
Wiring Method Cable 2 Meters 2 Cable 5 Meters 3 Cable - Custom Length .. 4								Output Channels A, B, O 3 A, B, O, A, B, O 7							
Wiring Entry Rear or Axial R															

A product of the world wide GESgroup made by W+S UK. Sold and serviced in Australia by PCA

NOTE: The encoder products outlined in this data sheet have been certified by a nominated European Test Authority, and are identified on all International and European certificates as the IX700 Series.

INHB Series

Incremental Hollow Shaft Encoder

Maximum Increments 3,600

Hole Diameter Range 06, 08, 10mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000

Torque >0.04Nm

Loading Axial 20N, Radial 15N

Weight 130g

Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 40mA

Maximum output signal frequency 100kHz

FEATURES

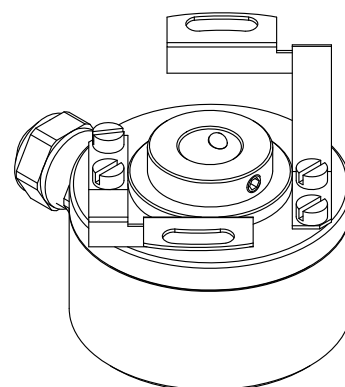
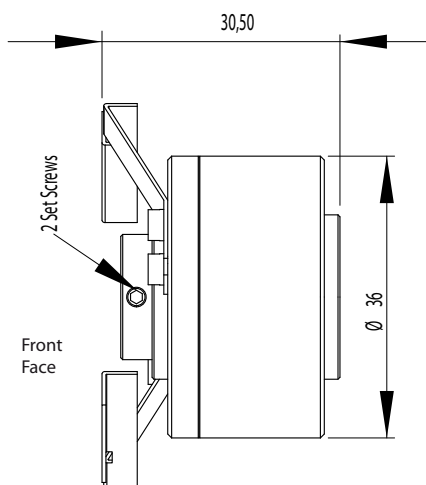
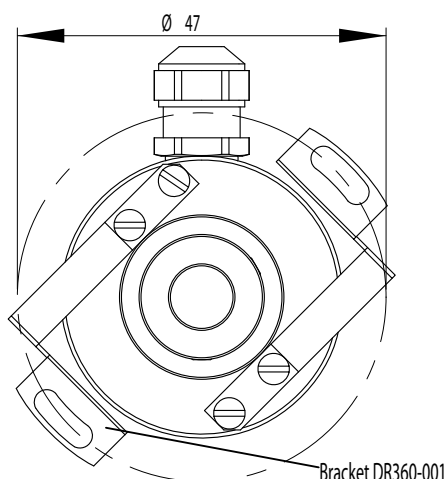
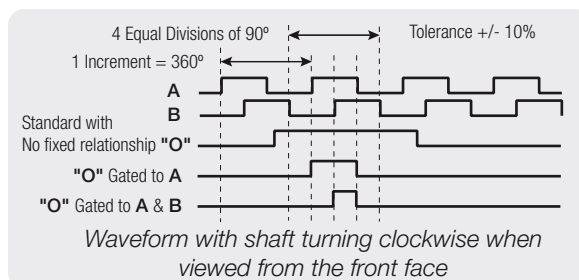
The INHB industrial encoders are designed for mounting directly onto the drive shaft of motors and other rotary shafts. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

To mount a hollow shaft encoder simply slide the encoder onto the drive shaft, tighten the set screws and attach a simple torsion arm to prevent the encoder body from rotating.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A	6	Green
B	7	Violet
O	8	Brown

W+S		
Wire	Plug Pin	Output Signals
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A
Blue	7	B
Red	8	O

Alternate German Wiring for some encoders not made in Australia



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range					
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 03600					
I	N	H	B			H	S			A		/					
Stainless Steel Shaft Hole Hole 06, 08, 10mm								Voltage & Output Type 5 Volt Line Driver 1 8 to 30 - Push Pull M									
Housing Material IP65 Aluminium H								Output Options Standard NO gating..... A									
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4								Output Channels A, B, O 3 A, B, O, A, B, O 7									
Wiring Entry Side or Radial S																	

A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA

INHD Series

Incremental Hollow Shaft Encoder

Maximum Increments 3,600

Hole Diameter Range 6mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
 Torque >0.4Nm
 Loading Axial 20N, Radial 15N
 Weight 130g
 Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 40mA
 Maximum output signal frequency 100kHz

FEATURES

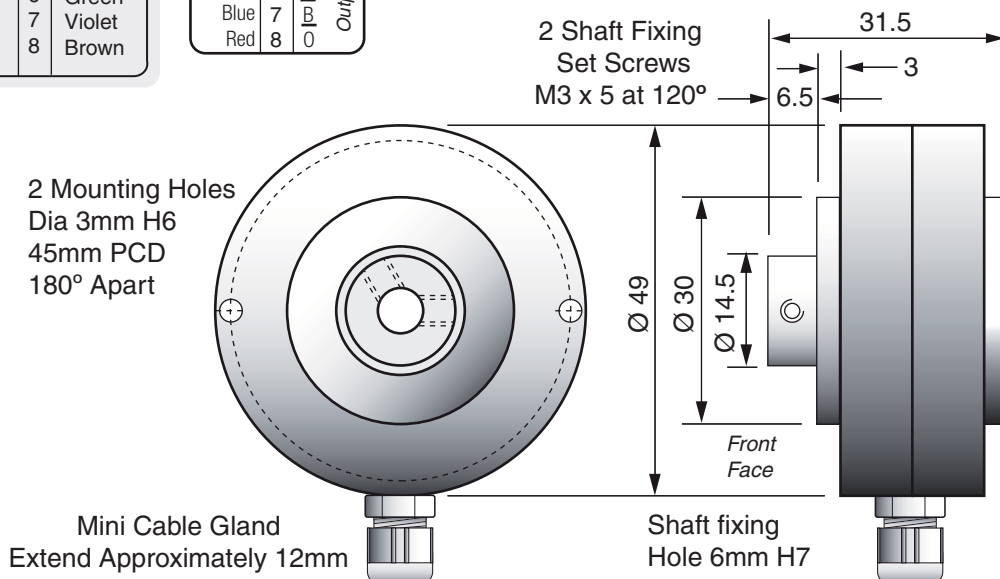
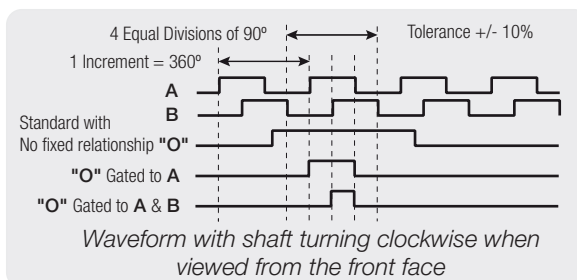
The INHD industrial encoders are designed for mounting directly onto the drive shaft of motors and other rotary shafts. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

To mount a hollow shaft encoder simply slide the encoder onto the drive shaft, tighten the set screws and attach a simple torsion arm to prevent the encoder body from rotating.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
Output Signals	3	White
A	4	Blue
B	5	Yellow
O	6	Green
A	7	Violet
B	8	Brown
O		

W+S		
Wire	Plug Pin	Output Signals
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A
Blue	7	B
Red	8	O

Alternate German Wiring for some encoders not made in Australia



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range			
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 03600			
I	N	H	D			H	S			A		/			
Stainless Steel Shaft Hole				Housing Material				Voltage & Output Type				Output Options			
Hole 06mm				IP65 Aluminium H				5 Volt Line Driver 1				Standard NO gating..... A			
				Wiring Entry				Output Channels							
				Side or Radial S				A, B, O 3							
Wiring Method								A, B, O, A, B, O 7							
Cable 2 Metres 2															
Cable 5 Metres 3															
Cable - Custom Length .. 4															

A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA

INHG Series

Incremental Hollow Shaft Encoder

Maximum Increments 10,000

Hole Diameter Range 6, 10 or 12mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque >0.4Nm
Loading Axial 20N, Radial 15N
Weight 250g
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 40mA
Maximum output signal frequency 200kHz

FEATURES

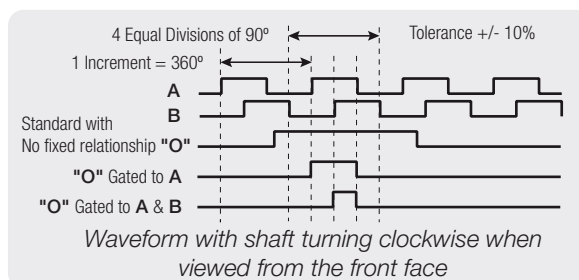
The INHG industrial encoders are designed for mounting directly onto the drive shaft of motors and other rotary shafts. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

To mount a hollow shaft encoder simply slide the encoder onto the drive shaft, tighten the set screws and attach a simple torsion arm to prevent the encoder body from rotating.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
Output Signals	3	White
A	4	Blue
B	5	Yellow
O	6	Green
A	7	Violet
B	8	Brown

W+S		
Wire	Plug Pin	Output Signals
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A
Blue	7	B
Red	8	O

Alternate German Wiring for some encoders not made in Australia



2 Mounting Holes
Dia 2.5mm H6
53mm PCD
180° Apart

PG7 Cable Gland
or 9 Pin D Type Plug
Extend Approximately 20mm

Shaft Bore Range 6 to 12mm H7
2 Shaft Fixing Set Screws
M4 x 6 at 120°

Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range					
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 10000					
I	N	H	G			H	S			A		/					
Stainless Steel Shaft Hole Hole 6, 10 or 12mm								Voltage & Output Type 5 Volt Line Driver 1 8 to 30 - Push Pull M									
Housing Material IP65 Aluminium H								Output Options Standard NO gating..... A									
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4 Plug 8 Pin Metal G								Output Channels A, B, O 3 A, B, O, A, B, O 7									
Wiring Entry Side or Radial S																	

A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA

INHJ Series

Incremental Hollow Shaft Encoder

Maximum Increments 25,000

Hole Diameter Range 6 to 18mm

MECHANICAL SPECIFICATIONS

RPM Max. 6000
Torque > 4Ncm
Loading Axial 40N, Radial 30N
Weight ... Plastic 200g, Al 380g, Stainless 730g
Temperature -20°C to +70°C

ELECTRICAL

Current consumption Max. 40mA
Signal frequency 300kHz
Switching load - Short circuit protected 40mA

FEATURES

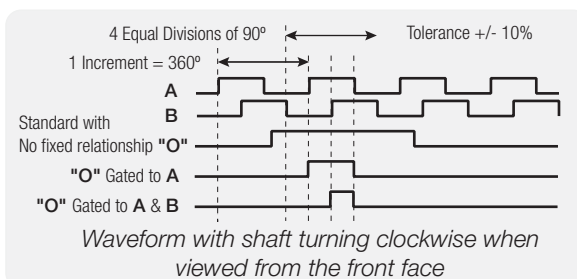
The INHJ industrial encoders are designed for mounting directly onto the drive shaft of motors and other rotary shafts. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

To mount a hollow shaft encoder simply slide the encoder onto the drive shaft, tighten the set screws and attach a simple torsion arm to prevent the encoder body from rotating.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
Output Signals	A	3 White
	B	4 Blue
	O	5 Yellow
	A	6 Green
	B	7 Violet
	O	8 Brown

W+S		
Wire	Plug Pin	Output Signals
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A
Blue	7	B
Red	8	O

Alternate German Wiring for some encoders not made in Australia



2 Mounting Holes
Dia 3mm H6
69mm PCD
180° Apart

PG7 Cable Gland
or 9 Pin D Type Plug
Extend Approximately 20mm

Shaft Bore Range 6 to 18mm H7
2 Shaft Fixing Set Screws
M4 x 6 at 120°

Part Number Selection Guide

Series	Mechanical Options	Electrical Options	Increment Range
1 2 3 4	5 6 7 8	9 10 11 12	00001 to 25000
I N H J	S	/	/
Stainless Steel Shaft Hole Hole 06 to 18mm Standard .. 10, 12,			
Housing Material IP65 Aluminium H IP65 Stainless Steel R IP54 Plastic 2			
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4 # Plug 9 Pin D Type H Plug 12 Pin Metal L			
Wiring Entry Side or Radial S			
Voltage & Output Type 5 Volt Line Driver 1 8-30 Volt - Push Pull M			
Output Options Standard NO gating..... A			
Output Channels A, B, O 3 A, B, O, A, B, O 7			

INHK Series

Incremental Hollow Shaft Encoder

Maximum Increments 25,000

Hole Diameter Range 12 to 30mm

MECHANICAL SPECIFICATIONS

RPM Max. 6000
Torque >.04Ncm
Loading Axial 50N, Radial 30N
Weight Aluminium 570g - Stainless 1070g
Temperature -20°C to +70°C

ELECTRICAL

Current consumption Max. 40mA
Signal frequency 300kHz
Switching load - Short circuit protected 40mA

FEATURES

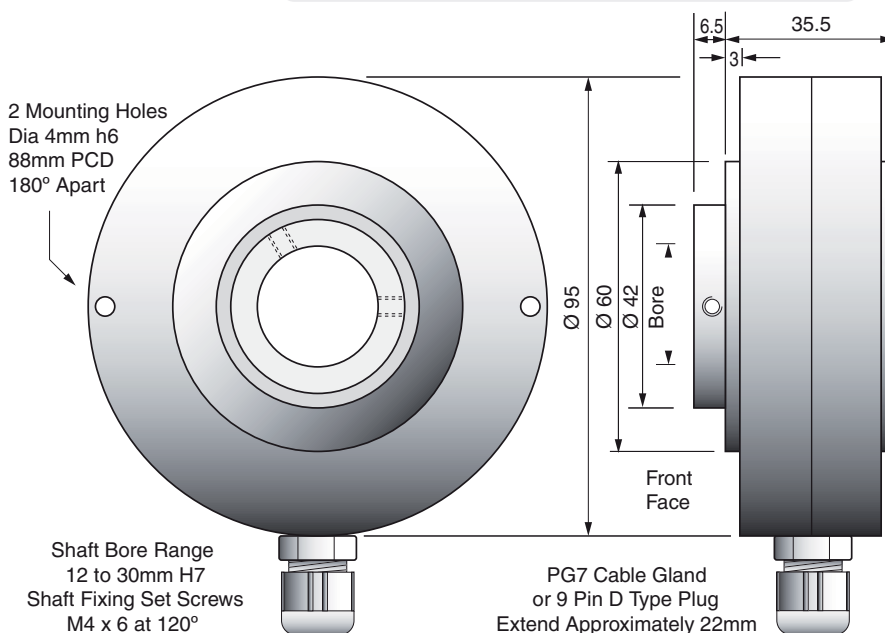
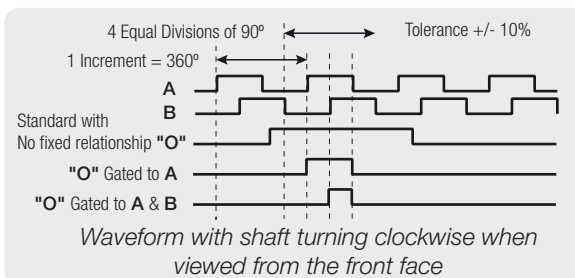
The INHK industrial encoders are designed for mounting directly onto the drive shaft of motors and other rotary shafts. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

To mount a hollow shaft encoder simply slide the encoder onto the drive shaft, tighten the set screws and attach a simple torsion arm to prevent the encoder body from rotating.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A	6	Green
B	7	Violet
O	8	Brown

W+S		
Wire	Plug Pin	Output Signals
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A
Blue	7	B
Red	8	O

Alternate German Wiring for some encoders not made in Australia



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range					
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 25000					
I	N	H	K									/					
Stainless Steel Shaft Hole Hole 12 to 30mm Standard .. 15, 18, 20, or 26								Voltage & Output Type 5 Volt Line Driver 1 8-30 Volt - Push Pull M									
Housing Material IP65 Aluminium H IP65 Stainless Steel R								Wiring Entry Side or Radial S									
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4 # Plug 9 Pin D Type H Plug 12 Pin Metal L #IP54 Only								Output Options Standard NO gating A									
A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA								Output Channels A, B, O 3 A, B, O, A̅, B̅, O̅ 7									

INHM Series

Incremental Hollow Shaft Encoder

Maximum Increments 25,000

Hole Diameter Range 12 to 30mm

MECHANICAL SPECIFICATIONS

RPM Max. 6000
Torque > 4Ncm
Loading Axial 50N, Radial 30N
Weight Aluminium 570g - Stainless 1070g
Temperature -20°C to +70°C

ELECTRICAL

Current consumption Max. 40mA
Signal frequency 300kHz
Switching load - Short circuit protected 40mA

FEATURES

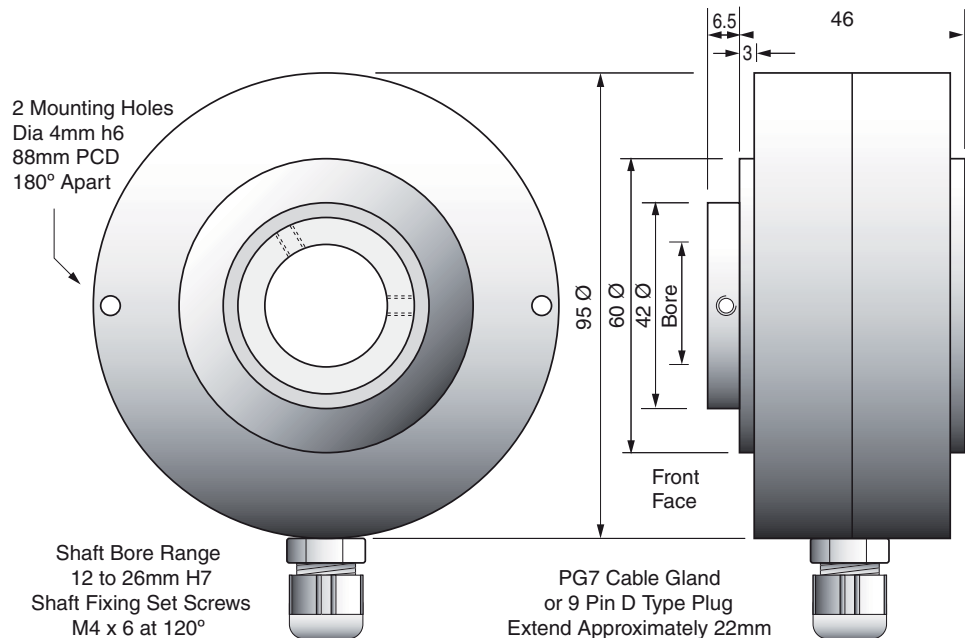
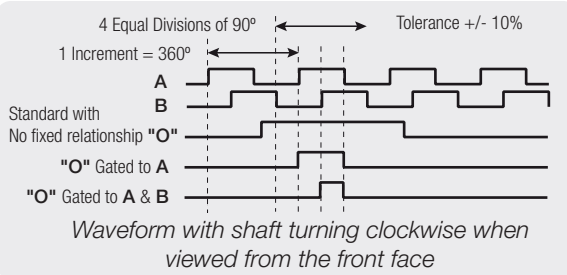
The INHM industrial encoders are designed for mounting directly onto the drive shaft of motors and other rotary shafts. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

To mount a hollow shaft encoder simply slide the encoder onto the drive shaft, tighten the set screws and attach a simple torsion arm to prevent the encoder body from rotating.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A	6	Green
B	7	Violet
O	8	Brown

W+S		
Wire	Plug Pin	Output Signals
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A
Blue	7	B
Red	8	O

Alternate German Wiring for some encoders not made in Australia



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range							
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 25000							
I	N	H	M									/							
Stainless Steel Shaft Hole Hole 12 to 30mm Standard .. 15, 18, 20, or 26								Voltage & Output Type 5 Volt Line Driver 1 8-30 Volt - Push Pull M											
Housing Material IP65 Aluminium H IP65 Stainless Steel R								Wiring Entry Side or Radial S											
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4 # Plug 9 Pin D Type H Plug 12 Pin Metal L								Output Options Standard NO gating..... A											
Output Channels A, B, O 3 A, B, O, A, B, O 7								#IP54 Only A product of the world wide GESgroup made by W+S Germany Sold and serviced in Australia by PCA											

INHNSeries

Incremental Hollow Shaft Encoder

Maximum Increments 50,000

Hole Diameter Range 26 to 44mm

MECHANICAL SPECIFICATIONS

RPM Max. 5000
Torque > 2Ncm
Loading Axial 60N, Radial 80N
Weight Stainless 1350g - Aluminium 720g
Temperature -20°C to +70°C

ELECTRICAL

Current consumption Max. 40mA
Signal frequency 300kHz
Switching load - Short circuit protected 40mA

FEATURES

The INHN industrial encoders are designed for mounting directly onto the drive shaft of motors and other rotary shafts. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

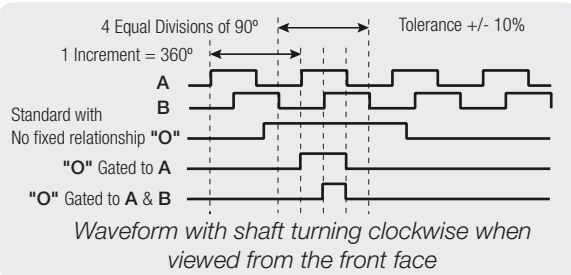
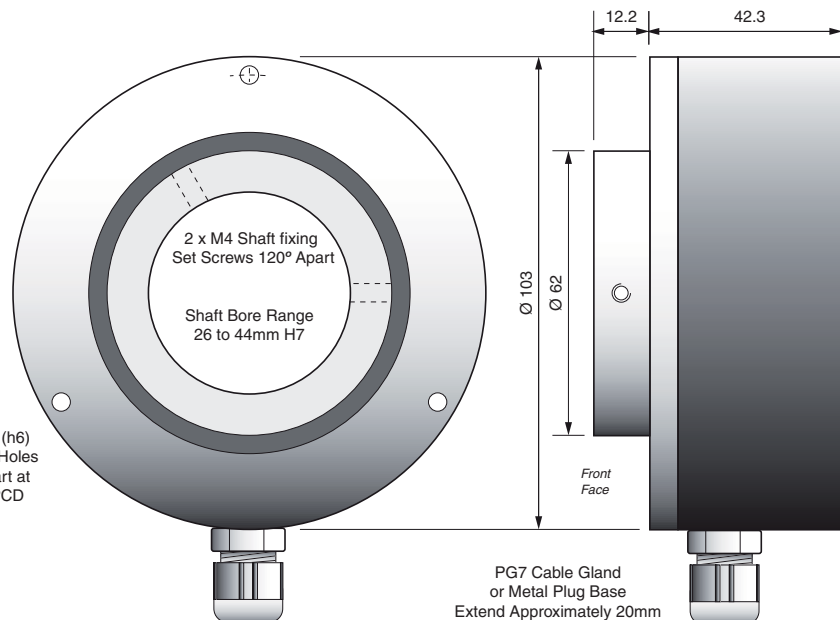
To mount a hollow shaft encoder simply slide the encoder onto the drive shaft, tighten the set screws and attach a simple torsion arm to prevent the encoder body from rotating.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A/B	6	Green
B/O	7	Violet
O	8	Brown

W+S		
Wire	Plug Pin	Output Signals
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A/B
Blue	7	B/O
Red	8	O

Alternate German Wiring for some encoders not made in Australia

3 x 4mm (h6) Mounting Holes 120° Apart at 94mm PCD



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range					
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 50000					
I	N	H	N				S					/					
Stainless Steel Shaft Hole Hole 26 to 44mm								Voltage & Output Type 5 Volt Line Driver 1 8-30 Volt - Push Pull M									
Housing Material IP65 Aluminium H IP65 Stainless Steel R								Output Options Standard NO gating A									
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4 # Plug 9 Pin D Type H Plug 12 Pin Metal L #IP54 Only								Output Channels A, B, O 3 A, B, O, A, B, O 7									
Wiring Entry Side or Radial S																	

A product of the world wide GESgroup
made by W+S Germany
Sold and serviced in Australia by PCA

INHP Series

Incremental Hollow Shaft Encoder

Maximum Increments 50,000

Hole Diameter Range 45 to 65mm

MECHANICAL SPECIFICATIONS

RPM Max. 5000
Torque > 2Ncm
Loading Axial 60N, Radial 80N
Weight Aluminium 720g
Temperature -20°C to +70°C

ELECTRICAL

Current consumption Max. 40mA
Signal frequency 300kHz
Switching load - Short circuit protected 40mA

FEATURES

The INHP industrial encoders are designed for mounting directly onto the drive shaft of motors and other rotary shafts. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

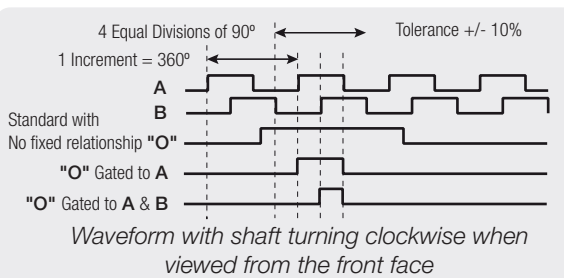
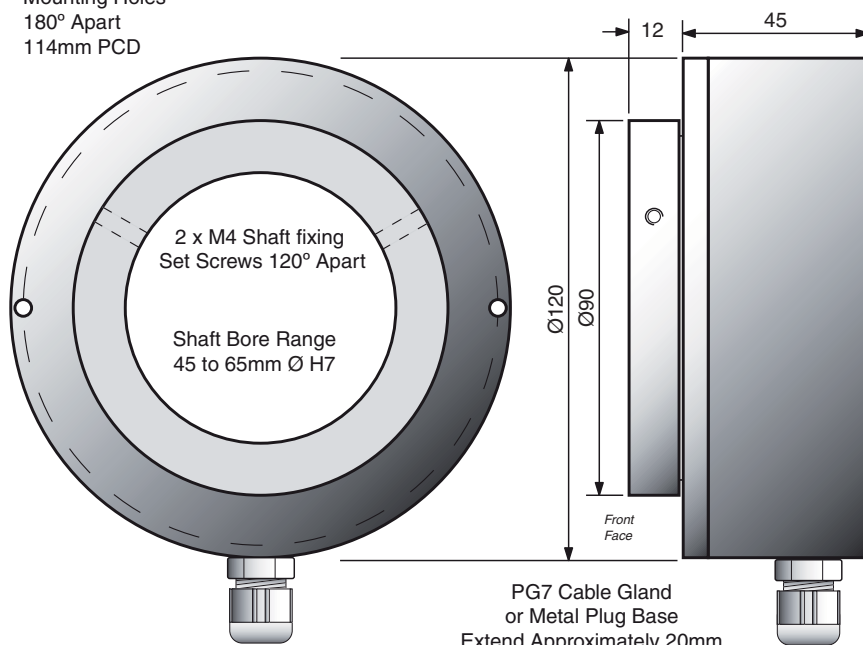
To mount a hollow shaft encoder simply slide the encoder onto the drive shaft, tighten the set screws and attach a simple torsion arm to prevent the encoder body from rotating.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A	6	Green
B	7	Violet
O	8	Brown

W+S		
Wire	Plug Pin	Output Signals
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A
Blue	7	B
Red	8	O

Alternate German Wiring for some encoders not made in Australia

2 x 4mm Ø (h6)
Mounting Holes
180° Apart
114mm PCD



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range					
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 50000					
I	N	H	P			H	S					/					
Aluminium Shaft Hole Hole 45 to 65mm								Voltage & Output Type 5 Volt Line Driver 1 8-30 Volt - Push Pull M									
Housing Material IP65 Aluminium H								Output Options Standard NO gating..... A									
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4 # Plug 9 Pin D Type H Plug 12 Pin Metal L #IP54 Only								Output Channels A, B, O 3 A, B, O, A, B, O 7									
Wiring Entry Side or Radial S																	

A product of the world wide GESgroup
made by W+S Germany
Sold and serviced in Australia by PCA

INHQSeries

Incremental Hollow Shaft Encoder

Maximum Increments 50,000

Hole Diameter Range 65 to 100mm

MECHANICAL SPECIFICATIONS

RPM Max. 4000
Torque > .2 Nm
Loading Axial 60N, Radial 80N
Weight Aluminium 980g
Temperature -20°C to +70°C

ELECTRICAL

Current consumption Max. 40mA
Signal frequency 300kHz
Switching load - Short circuit protected 40mA

FEATURES

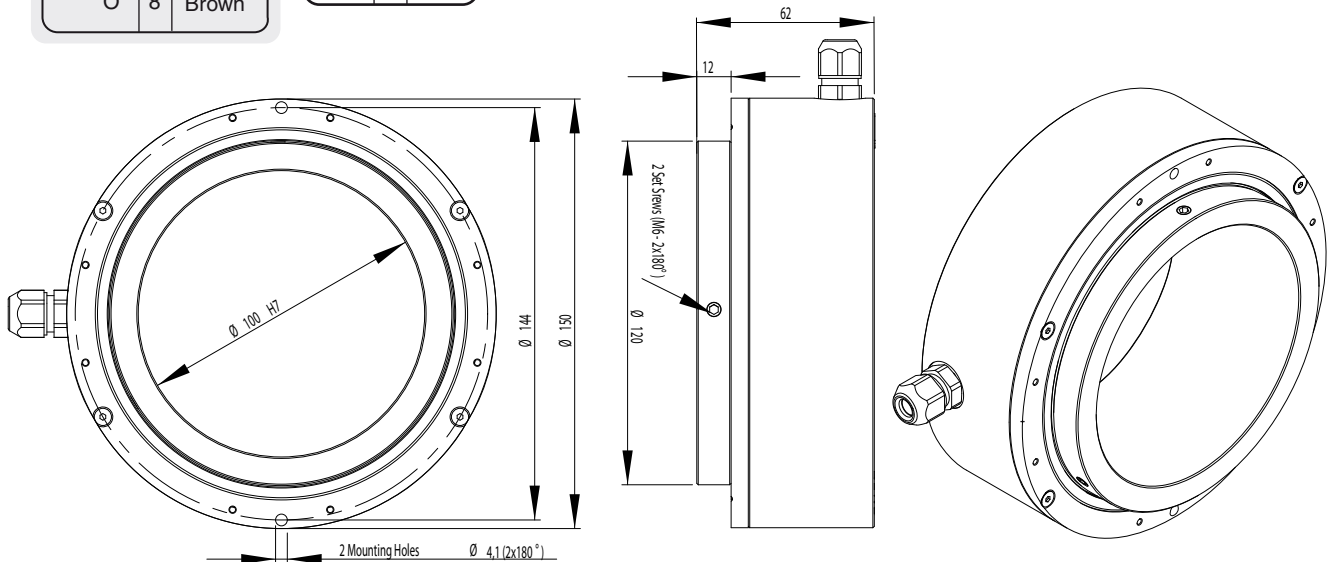
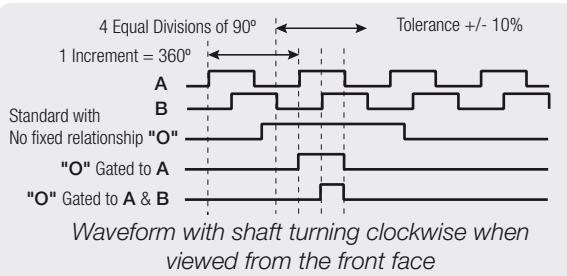
The INHQ industrial encoders are designed for mounting directly onto the drive shaft of motors and other rotary shafts. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

To mount a hollow shaft encoder simply slide the encoder onto the drive shaft, tighten the set screws and attach a simple torsion arm to prevent the encoder body from rotating.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A	6	Green
B	7	Violet
O	8	Brown

W+S		
Wire	Plug Pin	Function
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A
Blue	7	B
Red	8	O

Alternate German Wiring for some encoders not made in Australia



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range					
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 50000					
I	N	H	P			H	S					/					
Aluminium Shaft Hole Hole 65 to 100mm								Voltage & Output Type 5 Volt Line Driver 1 8-30 Volt - Push Pull M									
Housing Material IP65 Aluminium H								Output Options Standard NO gating..... A									
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4 # Plug 9 Pin D Type H Plug 12 Pin Metal L #IP54 Only								Output Channels A, B, O 3 A, B, O, A, B, O 7									
Wiring Entry Side or Radial S																	

A product of the world wide GESgroup
made by W+S Germany
Sold and serviced in Australia by PCA

INSA Series

Incremental Shaft Encoder

Maximum Increments1,024

Shaft Diameters 4 or 6mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque >0.04Nm
Loading Axial 30N, Radial 20N
Weight 110g
Temperature -20°C to +70°C

ELECTRICAL

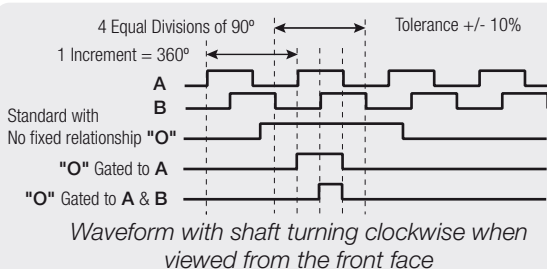
Current Consumption 40mA
Maximum output signal frequency 100kHz
NOTE: Short circuit protection on all wires

FEATURES

The INSA encoders are one from our miniature range, despite their small size they are suitable for most industrial applications. This series provides up to 1024 A B phase signals.

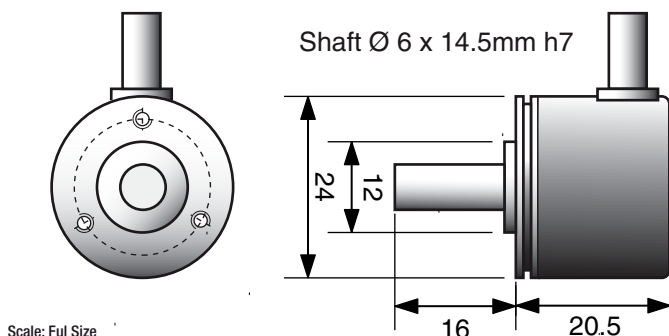
A range of couplings are available, refer to the couplings data sheets for full details. **NOTE:** A flexible coupling must always be used to attach the encoder to the drive shaft.

PCA AUS		Plug Pin	Wire
Function			
0 Volts	1		White
+ Volts	2		Brown
A	3		Green
B	4		Yellow
O	5		Grey
A	6		Pink
B	7		Blue
O	8		Red



3 x M3 Mounting Holes at
18mm PCD & 120° Apart

Mini Cable Gland
Extend Aprox.12mm



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range			
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 01024			
I	N	S	A	O		H				A	L	/			
Stainless Shaft Shaft 04 or 06mm								Voltage & Output Type 4.75 to 30 - Push Pull L							
Housing Material IP65 Aluminium H								Output Options Standard A							
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4								Output Channels A, B, O 3 A, B, O, A, B, O 7							
Wiring Entry Rear or Axial R Side or Radial S															

A product of the world wide GESgroup
made by W+S Germany
Sold and serviced in Australia by PCA

INSB Series

Incremental Shaft Encoder

Maximum Increments1,024

Shaft Diameters 4 or 6mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000

Torque >0.4Nm

Loading Axial 30N, Radial 20N

Weight 120g

Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 40mA

Maximum output signal frequency 100kHz

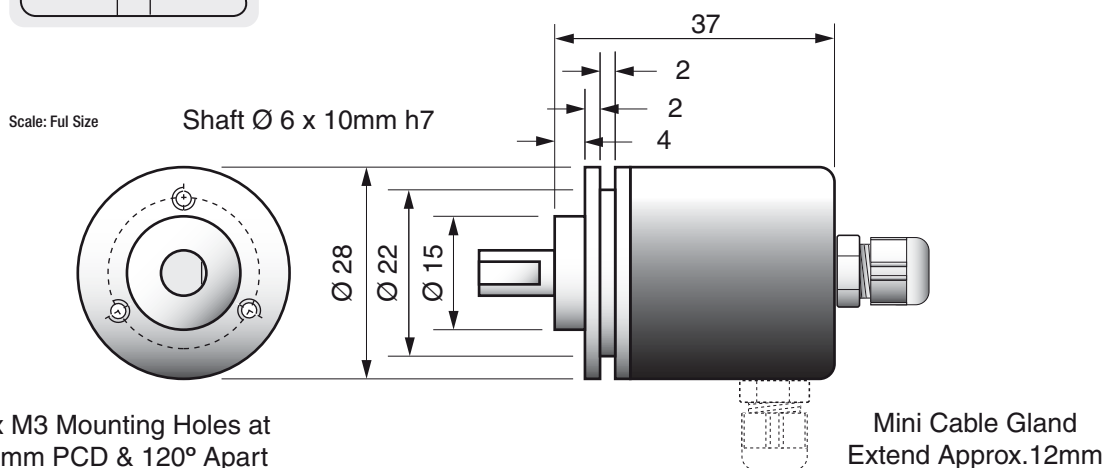
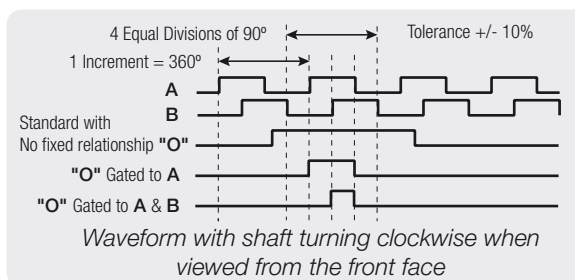
NOTE: Short circuit protection on all wires

FEATURES

The INSB encoders are one from our miniature range, despite their small size they are suitable for most industrial applications. This series provides up to 1024 A B phase signals.

A range of couplings are available, refer to the couplings data sheets for full details. NOTE: A flexible coupling must always be used to attach the encoder to the drive shaft.

Function	Plug Pin	Wire
0 Volts	1	White
+ Volts	2	Brown
A	3	Green
B	4	Yellow
O	5	Grey
A	6	Pink
B	7	Blue
O	8	Red



Part Number Selection Guide

Series	Mechanical Options	Electrical Options	Increment Range
1 2 3 4	5 6 7 8	9 10 11 12	00001 to 01024
I N S B	O H	A L	/
Stainless Shaft Shaft 04 or 06mm			
Housing Material IP65 Aluminium H			
Wiring Entry Rear or Axial R Side or Radial S			
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4			
Voltage & Output Type 4.75 to 30 - Push Pull L			
Output Options Standard A			
Output Channels A, B, O 3 A, B, O, A, B, O 7			

A product of the world wide GESgroup
made by W+S Germany
Sold and serviced in Australia by PCA

INSC Series

Incremental Shaft Encoder

Maximum Increments 10,000

Shaft Diameters 6 mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque >0.04Nm
Loading Axial 30N, Radial 20N
Weight 140g
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 40mA
Maximum output signal frequency 100kHz

NOTE: Short circuit protection on all wires

FEATURES

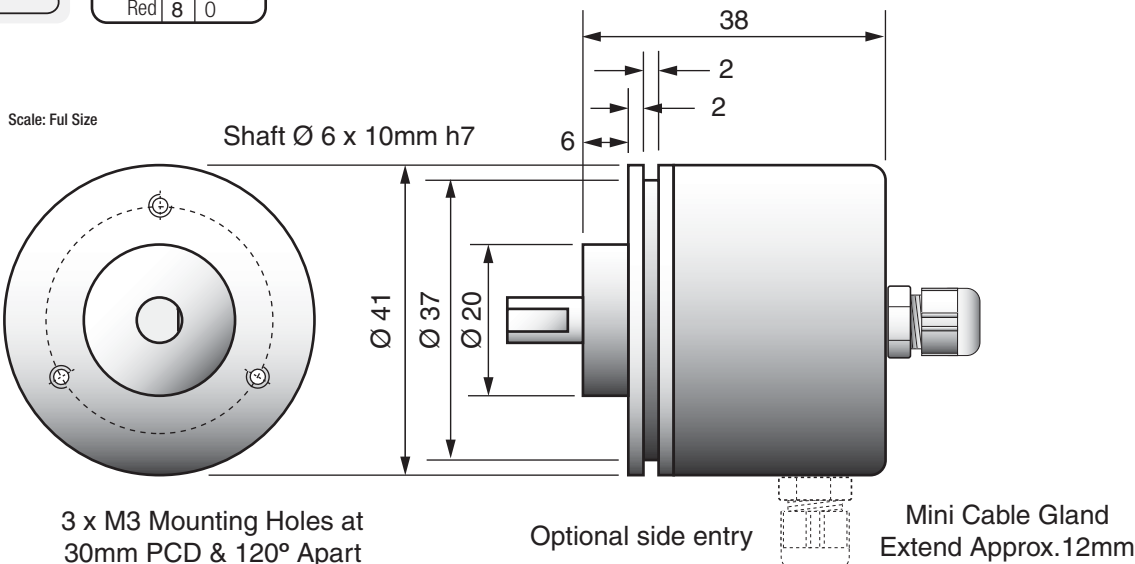
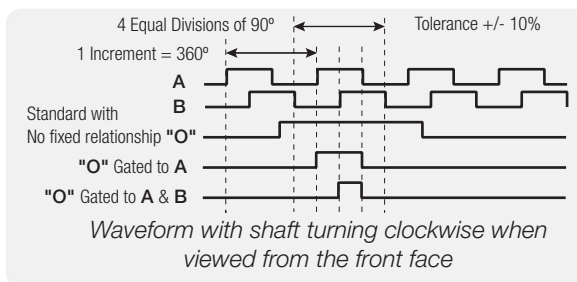
The INSC encoders are a very small lightweight encoder, but their solid construction ensures they remain well suited for most industrial applications. The series provides up to 10,000 A B phase increments per revolution.

There are two methods for attaching an encoder to a drive shaft. A flexible coupling must be used to turn the shaft when the encoder housing is rigidly mounted. Secondly the encoder may be fixed with a rigid coupling to the drive shaft and a flexible arm attached to the encoder mounting holes to prevent any radial movement.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A/B	6	Green
B/O	7	Violet
O/A	8	Brown

W+S		
Wire	Plug Pin	Output Signals
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A/B
Blue	7	B/O
Red	8	O/A

Alternate German Wiring for some encoders not made in Australia



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range			
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 10000			
I	N	S	C	0	6	H				A	L	/			
Stainless Shaft Shaft 6 mm								Voltage & Output Type 4.75 to 30 - Push Pull... L							
Housing Material IP65 Aluminum H								Output Options Standard NO gating..... A							
Wiring Method Cable 2 Meters 2 Cable 5 Meters 3 Cable - Custom Length .. 4								Output Channels A, B, O 3 A, B, O, A, B, O 7							
Wiring Entry Rear or Axial R Side or Radial S															

A product of the world wide GESgroup
made by W+S Germany
Sold and serviced in Australia by PCA

INSE Series

Incremental Shaft Encoder

Maximum Increments 25,000

Shaft Diameters 6, 10 or 12mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque >0.05Nm
Loading Axial 40N, Radial 30Nm
Weight 320g
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 40mA
Maximum output signal frequency 300kHz

NOTE: Short circuit protection on all wires

FEATURES

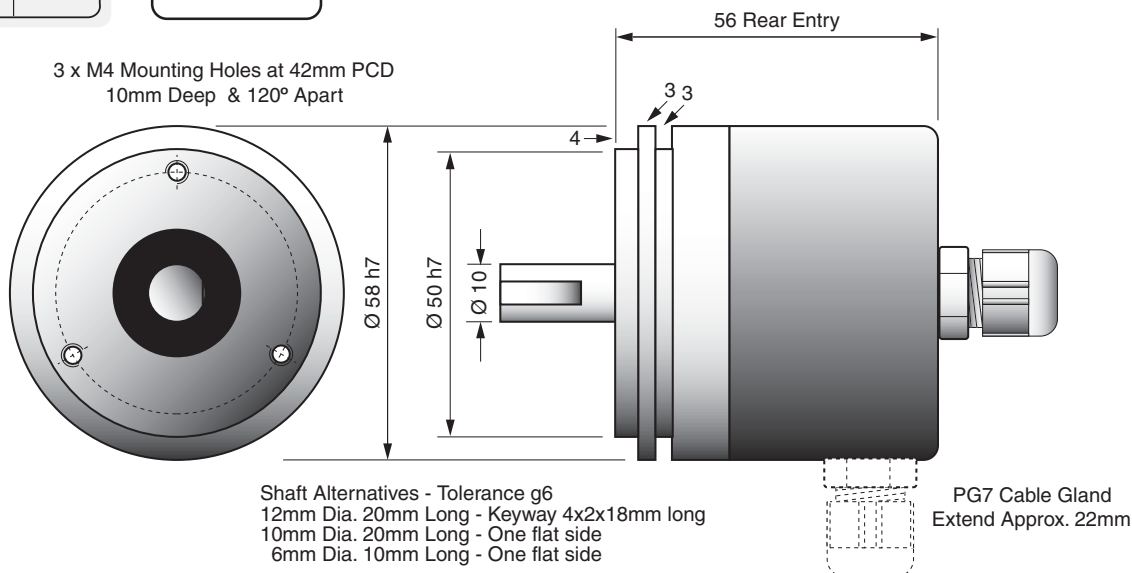
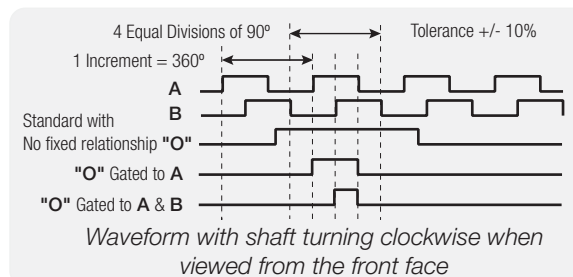
The INSE encoders are suitable for most industrial applications. This series can be built with up to 25,000 A B phase signals. When used with appropriate circuitry, 25,000 can deliver 100,000 processed signals per revolution.

A range of mounting accessories are also available, refer to the Accessories and Couplings data sheets for full details. **NOTE:** A flexible coupling must always be used to attach the encoder to the drive shaft.

Function	plug pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A/B	6	Green
O	7	Violet
O	8	Brown

Wire	Function
Black	0 Volts
Brown	+ Volts
Green	A
Grey	B

Special Wiring for Build No.A020
made in Australia
Housing length 66mm
Cable gland PG11
22mm long
Steel armoured cable



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range			
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 25000			
I	N	S	E			H									
Stainless Shaft Metric 06 10 or 12mm Imperial 1/4" AA Imperial 3/8" AB								Voltage & Output Type 5 Volt Line Driver 1 8 to 30 - Push Pull M 5 Volt Line Driver 100° N 8 to 30 Push Pull 100° ... Q							
Housing Material IP65 Aluminium H				Wiring Entry Rear or Axial R Side or Radial S				Output Options Standard NO gating..... A "O" Gated with A B "O" Gated with B C "O" Gated with A & B D							
Wiring Method Cable 2 Meters 2 Cable 5 Meters 3 Cable - Custom Length .. 4 Plug 4 Pin Plastic A Plug 12 Pin Metal L				Output Channels A, B, O 3 A, B, O, A, B, O 7											

A product of the world wide **GESgroup**
made by W+S Germany
ASSEMBLED and serviced in Australia by **PCA**

INSF Series

Incremental Shaft Encoder

Maximum Increments 25,000

Shaft Diameters 6, 10 or 12mm

MECHANICAL SPECIFICATIONS

Maximum RPM 8000
 Torque >0.05Nm
 Loading Axial 40N, Radial 30N
 Weight 320g
 Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 40mA
 Maximum output signal frequency 300kHz

NOTE: Short circuit protection on all wires

FEATURES

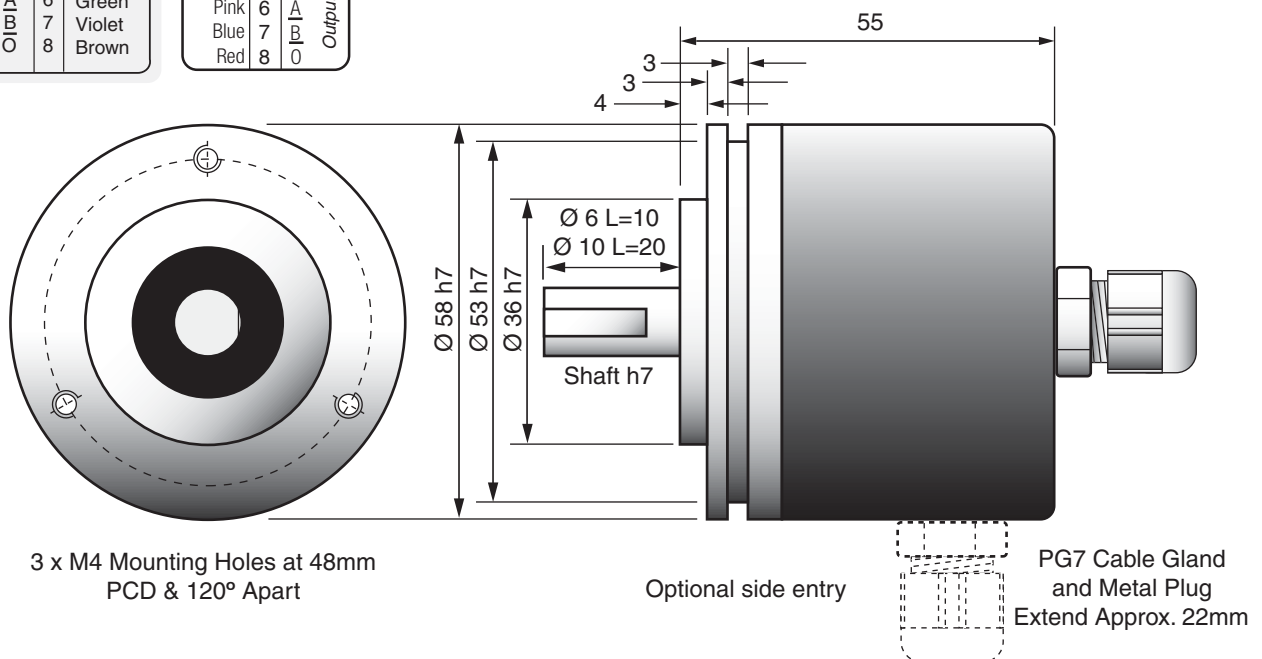
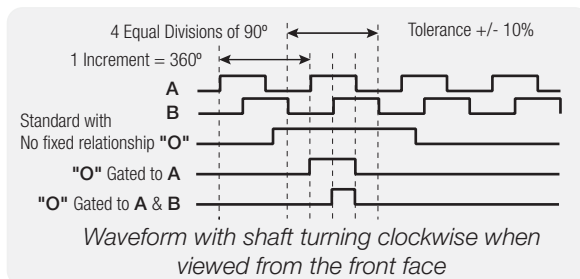
The INSF encoders are suitable for most industrial applications. This series can be built with up to 25,000 A B phase signals. When used with appropriate circuitry, 25,000 can deliver 100,000 processed signals per revolution.

A range of mounting accessories are also available, refer to the Accessories and Couplings data sheets for full details. **NOTE:** A flexible coupling must always be used to attach the encoder to the drive shaft.

PCA ^{AUS}		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A	6	Green
B	7	Violet
O	8	Brown

W+S		
Wire	Plug Pin	Function
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A
Blue	7	B
Red	8	O

Alternate German Wiring for some encoders not made in Australia



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range					
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 25000					
I	N	S	F			H				A		/					
Stainless Shaft Shaft 06, 10 or 12mm								Voltage & Output Type 5 Volt Line Driver 1 8 to 30 - Push Pull M									
Housing Material IP65 Aluminium H								Output Options Standard NO gating..... A									
Wiring Entry Rear or Axial R Side or Radial S								Output Channels A, B (4 Pin Plug only) 2 A, B, O 3 A, B, O, A̅, B̅, O̅ 7									
Wiring Method Cable 2 Meters 2 Cable 5 Meters 3 Cable - Custom Length .. 4 Plug 4 Pin Plastic A Plug 12 Pin Metal L								A product of the world wide GESgroup made by W+S Germany ASSEMBLED and serviced in Australia by PCA									

INSG Series

Incremental Shaft Encoder

Maximum Increments 25,000

Shaft Diameters 6, 10 or 12mm

MECHANICAL SPECIFICATIONS

Maximum RPM 8000
Torque >0.05Nm
Loading Axial 40N, Radial 30N
Weight 320g
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 40mA
Maximum output signal frequency 300kHz

NOTE: Short circuit protection on all wires

FEATURES

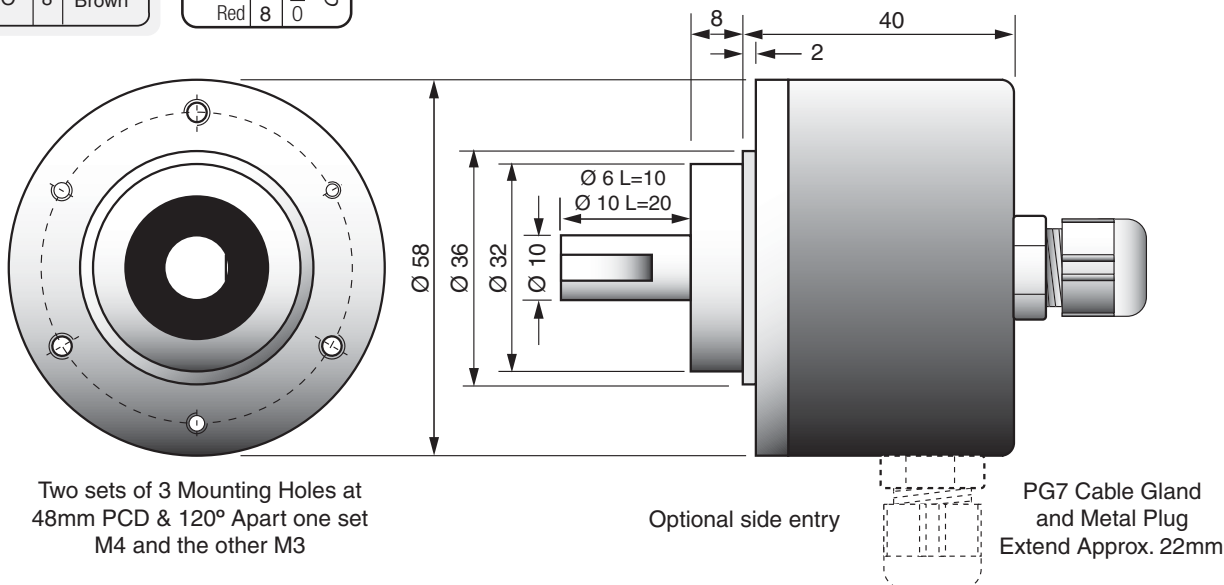
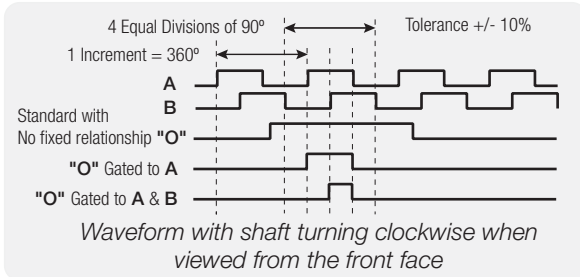
The INSG encoders are suitable for most industrial applications. This series can be built with up to 25,000 A B phase signals. When used with appropriate circuitry, 25,000 can deliver 100,000 processed signals per revolution.

A range of mounting accessories are also available, refer to the Accessories and Couplings data sheets for full details. **NOTE:** A flexible coupling must always be used to attach the encoder to the drive shaft.

PCA AUS		
Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A	6	Green
B	7	Violet
O	8	Brown

W+S		
Wire	Plug Pin	Output Signals
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A
Blue	7	B
Red	8	O

Alternate German Wiring for some encoders not made in Australia



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range			
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 25000			
I	N	S	G			H				A					
Stainless Shaft Metric 06 10 or 12mm Imperial 1/4" AA Imperial 3/8" AB								Voltage & Output Type 5 Volt Line Driver 1 8 to 30 - Push Pull M							
Housing Material IP65 Aluminium H				Wiring Entry Rear or Axial R Side or Radial S				Output Options Standard NO gating..... A							
Wiring Method Cable 2 Meters 2 Cable 5 Meters 3 Cable - Custom Length .. 4 Plug 4 Pin Plastic A Plug 12 Pin Metal L				Output Channels A, B (4 Pin Plug only) 2 A, B, O 3 A, B, O, A̅, B̅, O̅ 7											

A product of the world wide **GESgroup**
made by W+S Germany
ASSEMBLED and serviced in Australia by **PCA**

INSH Series

Incremental Shaft Encoder

Maximum Increments 25,000

Shaft Diameter Range 10 to 12mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque >0.1Nm
Loading Axial 60N, Radial 50N
Weight 450g
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption 40mA
Maximum output signal frequency 300kHz

NOTE: Short circuit protection on all wires

FEATURES

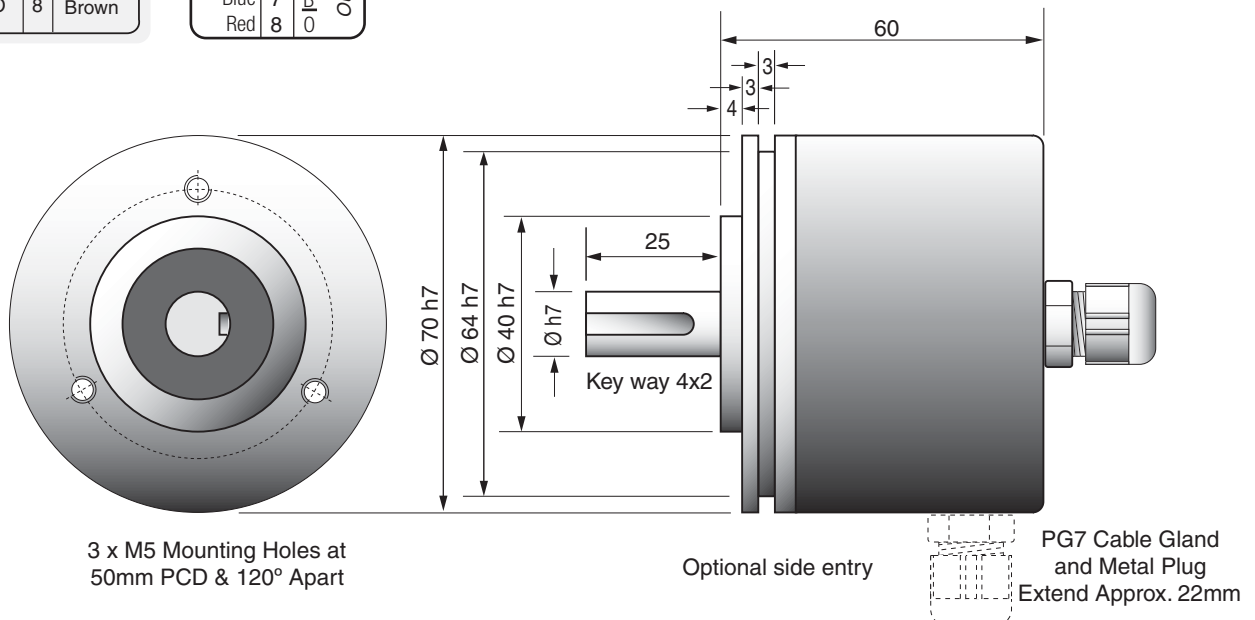
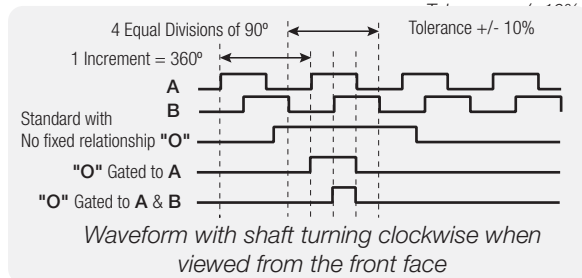
The INSH encoders are suitable for most industrial applications. This series can be built with up to 25,000 A B phase signals. When used with appropriate circuitry, 25,000 can deliver 100,000 processed signals per revolution.

A range of mounting accessories are also available, refer to the Accessories and Couplings data sheets for full details. NOTE: A flexible coupling must always be used to attach the encoder to the drive shaft.

Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A	6	Green
B	7	Violet
O	8	Brown

Wire	Plug Pin	Output Signals
White	1	0 Volts
Brown	2	+ Volts
Green	3	A
Yellow	4	B
Gray	5	O
Pink	6	A
Blue	7	B
Red	8	O

Alternate German Wiring for some encoders not made in Australia



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range 00001 to 25000			
1	2	3	4	5	6	7	8	9	10	11	12				
I	N	S	H	-			H	-			A	/			
Stainless Shaft Shaft 10 or 12mm								Voltage & Output Type 5 Volt Line Driver 1 8-30 Volt - Push Pull M							
Housing Material IP65 Aluminium H								Output Options Standard NO gating..... A							
Wiring Method Cable 2 Meters 2 Cable 5 Meters 3 Cable - Custom Length .. 4 Plug 4 Pin Plastic A Plug 12 Pin Metal L								Output Channels A, B (4 Pin Plug only) 2 A, B, O 3 A, B, O, A, B, O 7							
Wiring Entry Rear or Axial R Side or Radial S															

A product of the world wide GESgroup made by W+S Germany
Sold and serviced in Australia by PCA

INSL Series

Incremental Shaft Encoder

Maximum Increments 25,000

Shaft Diameter 10, 11 or 12mm

MECHANICAL SPECIFICATIONS

Maximum RPM 6000
Torque >0.1Nm
Loading Axial 60N, Radial 50N
Weight Aluminium 1.2kg Stainless 2kg
Temperature -20°C to +70°C

ELECTRICAL

Current Consumption Nominal 40mA
Maximum output signal frequency 300kHz

NOTE: Short circuit protection on all wires

FEATURES

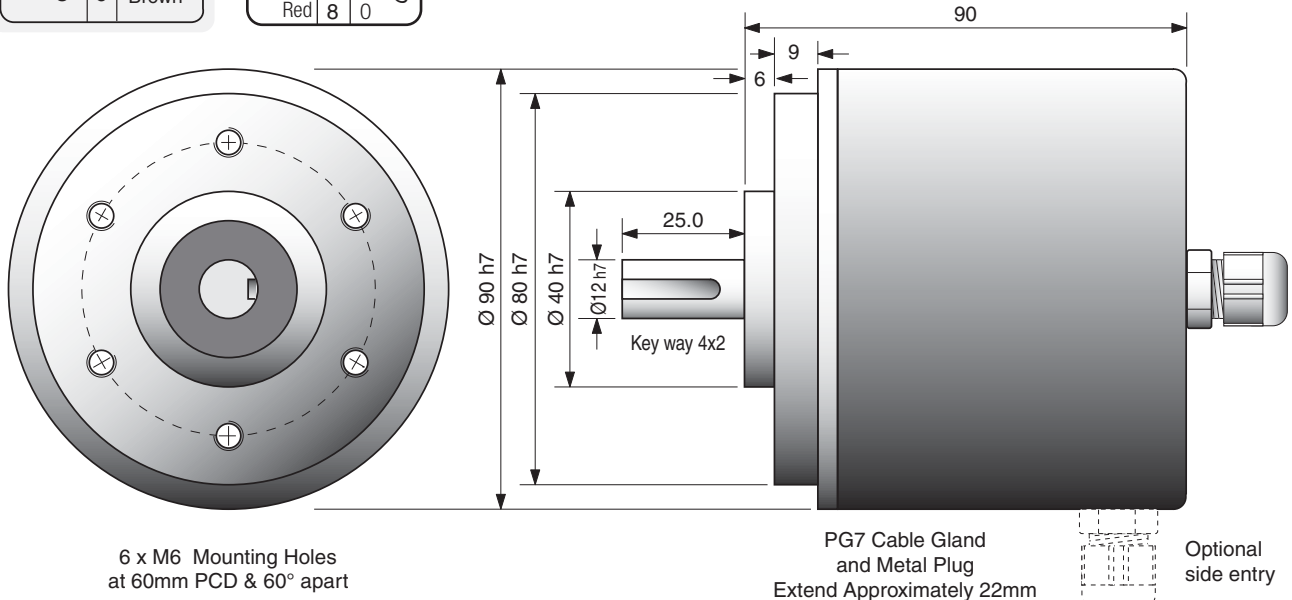
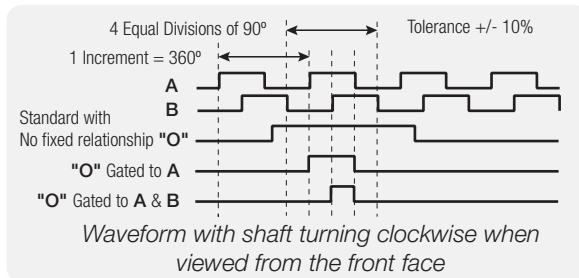
The INSL encoders are suitable for most industrial applications. This series can be built with up to 25,000 A B phase signals. When used with appropriate circuitry, 25,000 can deliver 100,000 processed signals per revolution.

A range of mounting accessories are also available, refer to the Accessories and Couplings data sheets for full details. **NOTE:** A flexible coupling must always be used to attach the encoder to the drive shaft.

PCA AUS	Function	Plug Pin	Wire
0 Volts	1	Black	
+ Volts	2	Red	
A	3	White	
B	4	Blue	
O	5	Yellow	
A	6	Green	
B	7	Violet	
O	8	Brown	

W+S	Wire	Plug Pin	Output Signals
White	1	0 Volts	
Brown	2	+ Volts	
Green	3	A	
Yellow	4	B	
Gray	5	O	
Pink	6	A	
Blue	7	B	
Red	8	O	

Alternate German Wiring for some encoders not made in Australia



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range			
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 25000			
I	N	S	L	-			B	-			A	/			
Stainless Shaft Shaft 10, 11 or 12mm								Voltage & Output Type 5 Volt Line Driver 1 8 to 30 - Push Pull M							
Housing Material IP65 Aluminium / Steel B								Output Options Standard NO gating..... A							
Wiring Entry Rear or Axial R Side or Radial S								Output Channels A, B (4 Pin Plug only) 2 A, B, O 3 A, B, O, A, B, O 7							
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4 Plug 4 Pin Plastic A Plug 12 Pin Metal L								A product of the world wide GESgroup made by W+S Germany ASSEMBLED and serviced in Australia by PCA							

NOTE:
10,000
4 Character
code = 010K

IPHJ Series

Incremental Hollow Shaft Encoder IP66/67

Maximum Increments 5,000

Hole Diameter Range 10 to 20mm

MECHANICAL SPECIFICATIONS

RPM Max. 3000
Torque > 4.0Ncm
Loading ... Designed to support its own weight
Weight Aluminium 600g, Stainless 1200g
Temperature -20°C to +60°C

ELECTRICAL

Current consumption Max. 60mA
Signal frequency 200kHz
Switching load - Short circuit protected 40mA

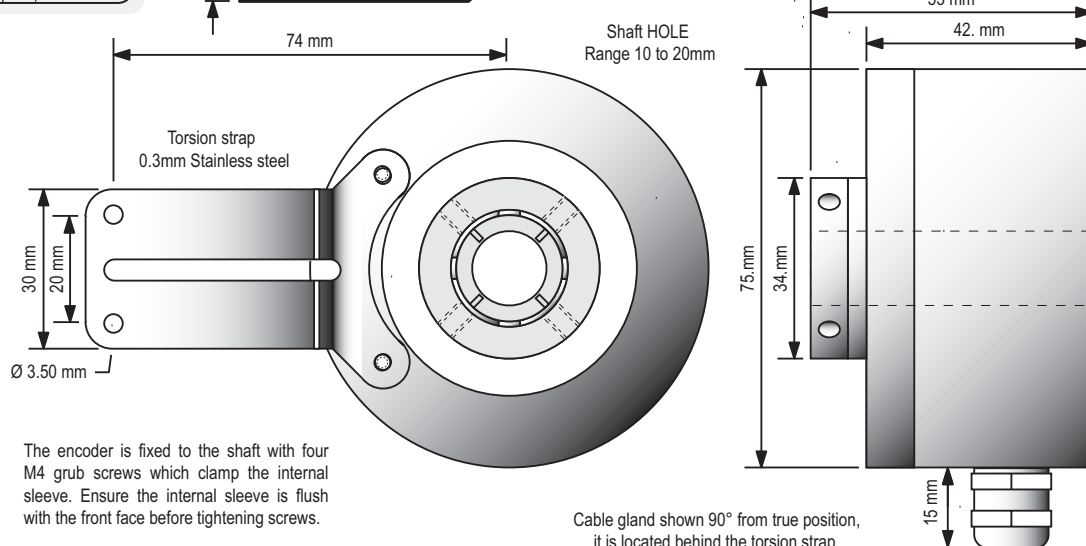
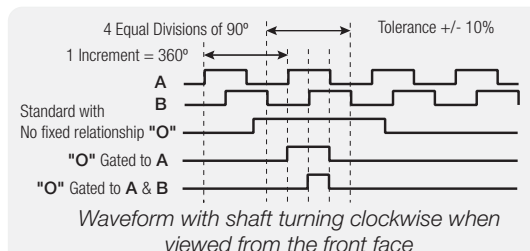
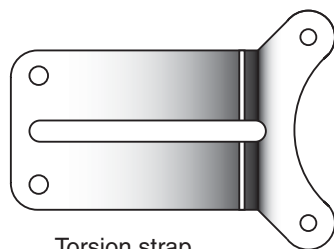
FEATURES

The IPHJ industrial encoders are designed for mounting directly onto the drive shaft of motors and other rotary shafts. The hollow shaft system eliminates the necessity for most additional fixing hardware, such as flexible couplings, drive belts and mounting plates or brackets.

To mount a hollow shaft encoder simply slide the encoder onto the drive shaft, tighten the set screws and attach a simple torsion arm to prevent the encoder body from rotating.

NOTE: To ensure the correct heat transfer, make sure the shaft penetrates the encoder by no less than 35mm

Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
Output Signals	3	White
A	4	Blue
B	5	Yellow
O	6	Green
A/B	7	Violet
O	8	Brown



The encoder is fixed to the shaft with four M4 grub screws which clamp the internal sleeve. Ensure the internal sleeve is flush with the front face before tightening screws.

Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range 00001 to 05000			
1	2	3	4	5	6	7	8	9	10	11	12				
I	P	H	J				S					/			
Stainless Steel Shaft Hole Hole 10 to 20mm Standard 10, 12, 14, 16, 18, 20								Voltage & Output Type 5 Volt Line Driver 1 8-30 Volt - Push Pull M							
Housing Material IP66/67 Aluminium J IP66/67 Stainless Steel .. T								Output Options Standard NO gating..... A							
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length .. 4								Output Channels A, B, O 3 A, B, O, A̅, B̅, O̅ 7							

made by IED in the UK
Sold and serviced in Australia by **PCA**

IPSE Series

Incremental Shaft Encoder IP66/67

Maximum Increments 30,000

Shaft Diameter Range 6, 10 or 12mm

MECHANICAL SPECIFICATIONS

RPM Max. 3000
Torque > 3Ncm
Loading Axial 10N, Radial 10N
Weight Aluminium 300g Stainless 600g
Temperature -20°C to +85°C

ELECTRICAL

Current consumption Max. 60mA
Signal frequency 200kHz
Switching load 40mA

FEATURES

The IPSE heavy duty industrial encoder is designed for mounting in harsh environments. This grade of encoder has been installed in numerous aggressive locations, from the decks of sea going ships to dairy machinery that receives daily washings of pressurised water and detergents.

These encoders are machined from either aluminium or stainless steel, both with a range of double lip shaft seals filled with grease to suit most environments.

Shaft Sealing Options

Nitrile = General Industrial Use

Food = Approved in USA & UK use with food

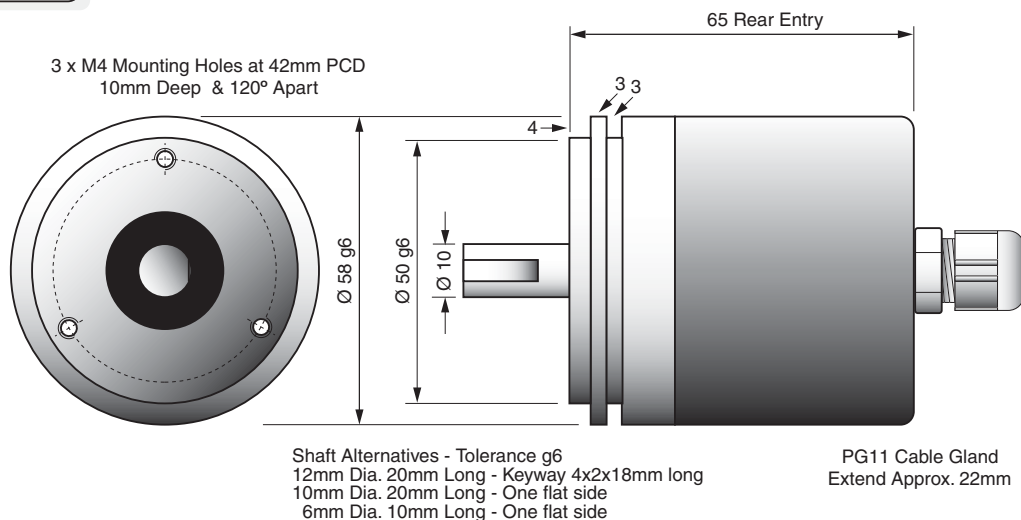
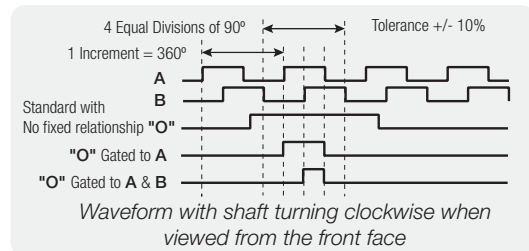
PTFE = High Speed Low Torque

Viton Peroxide = Chemical & Acid resistant

EPDM = Thurban material for outdoor use - resistant to UV and ozone damage

PCA AUS	Function	Plug Pin	Wire
0 Volts	1	Black	
+ Volts	2	Red	
A	3	White	
B	4	Blue	
O	5	Yellow	
A	6	Green	
B	7	Violet	
O	8	Brown	

NOTE: Refer to
COUPLING data sheet for
our range of Stainless
Steel zero backlash shaft
couplings



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range					
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 30000					
I	P	S	E									/					
Stainless Steel Shaft Shaft 6, 10 or 12mm Standard ... 10mm								Voltage & Output Type 5 Volt - Line driver 1 8 - 30 Volt Push Pull M									
Housing Material IP66/67 Aluminium + Nitrile Seal J Aluminium + PTFE Seal K Aluminium + Food Seal L Aluminium + Viton Seal M 316 Stainless + Nitrile Seal S 316 Stainless + PTFE Seal T 316 Stainless + Food Seal U 316 Stainless + Viton Seal V 316 Stainless + EPDM Seal 6								Wiring Entry Rear or Axial R Side or Radial S									
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length ... 4								Output Channels A, B, O 3 A, B, O, A̅, B̅, O̅ 7									

Manufactured in UK by IED
Sold and serviced in Australia by **PCA**

IPSG Series

Incremental Shaft Encoder IP66/67

Maximum Increments 30,000

Shaft Diameter Range 6, 10 or 12mm

MECHANICAL SPECIFICATIONS

RPM Max. 3000
Torque > 3Ncm
Loading Axial 10N, Radial 10N
Weight Aluminium 300g Stainless 600g
Temperature -20°C to +85°C

ELECTRICAL

Current consumption Max. 60mA
Signal frequency 200kHz
Switching load 40mA

FEATURES

The IPSG heavy duty industrial encoder is designed for mounting in harsh environments. This grade of encoder has been installed in numerous aggressive locations, from the decks of sea going ships to dairy machinery that receives daily washings of pressurised water and detergents.

These encoders are machined from either aluminium or stainless steel, both with a range of double lip shaft seals filled with grease to suit most environments.

Shaft Sealing Options

Nitrile = General Industrial Use

Food = Approved in USA & UK use with food

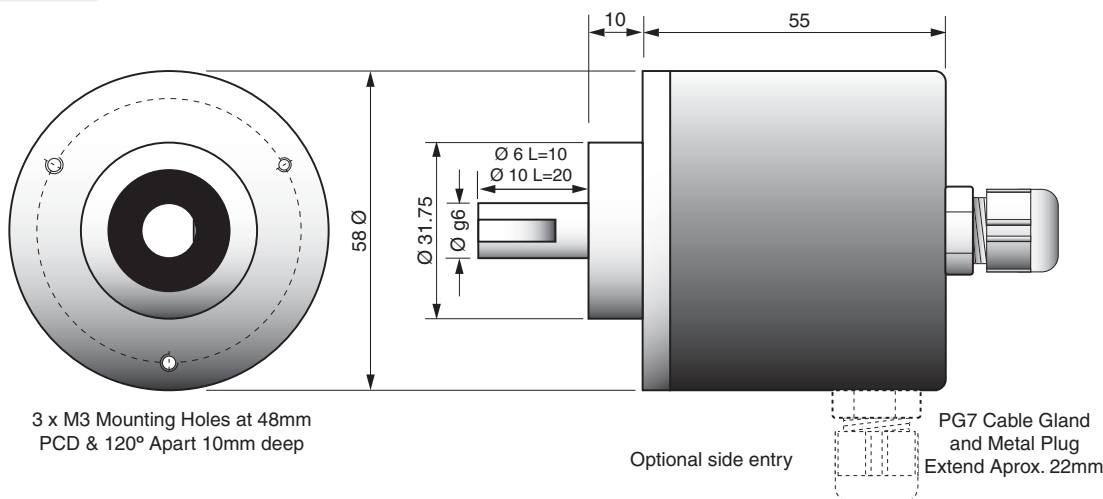
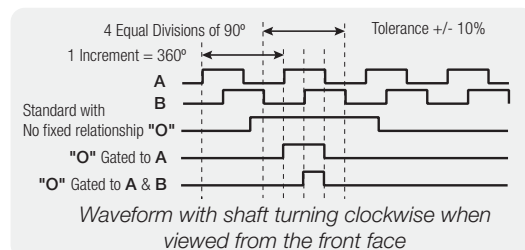
PTFE = High Speed Low Torque

Viton Peroxide = Chemical & Acid resistant

EPDM = Thurban material for outdoor use - resistant to UV and ozone damage

PCA AUS	Function	Plug Pin	Wire
0 Volts	1	Black	
+ Volts	2	Red	
A	3	White	
B	4	Blue	
O	5	Yellow	
A	6	Green	
B	7	Violet	
O	8	Brown	

NOTE: Refer to
COUPLING data sheet for
our range of Stainless
Steel zero backlash shaft
couplings



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range			
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 30000			
I	P	S	G												
Stainless Steel Shaft Shaft 6, 10 or 12mm Standard ... 10mm								Voltage & Output Type 5 Volt - Line driver 1 8 - 30 Volt Push Pull M							
Housing Material IP66/67 Aluminium + Nitrile Seal J Aluminium + PTFE Seal K Aluminium + Food Seal L Aluminium + Viton Seal M 316 Stainless + Nitrile Seal S 316 Stainless + PTFE Seal T 316 Stainless + Food Seal U 316 Stainless + Viton Seal V 316 Stainless + EPDM Seal 6								Output Options Standard NO gating..... A							
Wiring Entry Rear or Axial R Side or Radial S								Output Channels A, B, O 3 A, B, O, A̅, B̅, O̅ 7							
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length ... 4								Manufactured in UK by IED Sold and serviced in Australia by PCA							

IPSL Series

Incremental Shaft Encoder IP66/67

Maximum Increments 30,000

Shaft Diameter Range 12mm

MECHANICAL SPECIFICATIONS

RPM Max. 3000
Torque > 3Ncm
Loading Axial 10N, Radial 10N
Weight Aluminium 1000g Stainless 2700g
Temperature -20°C to +85°C

ELECTRICAL

Current consumption Max. 60mA
Signal frequency 200kHz
Switching load 40mA

FEATURES

The IPSL heavy duty industrial encoder is designed for mounting in harsh environments. This grade of encoder has been installed in numerous aggressive locations, from the decks of sea going ships to dairy machinery that receives daily washings of pressurised water and detergents.

These encoders are machined from either aluminium or stainless steel, both with a range of double lip shaft seals filled with grease to suit most environments.

Shaft Sealing Options

Nitrile = General Industrial Use

Food = Approved in USA & UK use with food

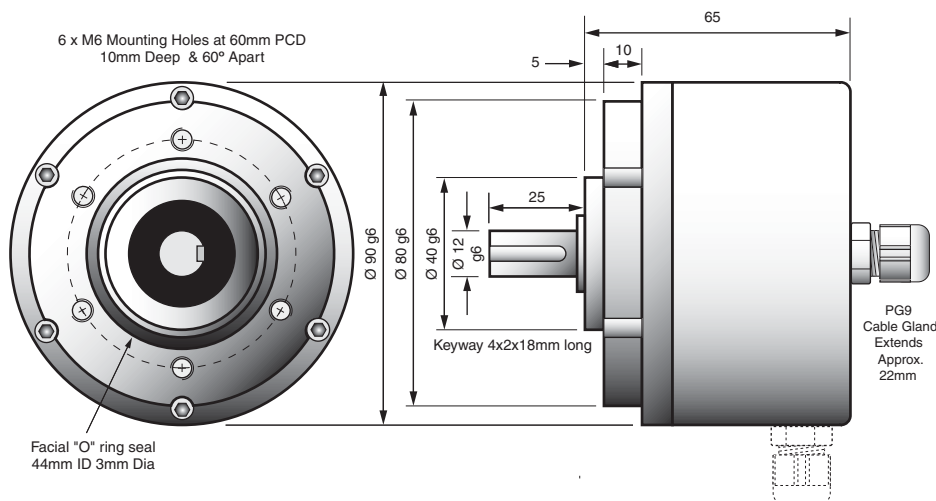
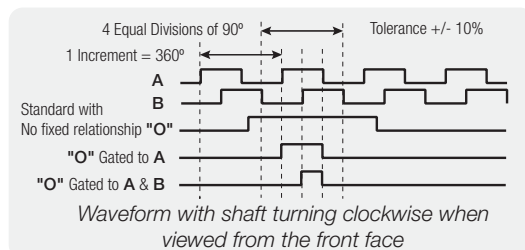
PTFE = High Speed Low Torque

Viton Peroxide = Chemical & Acid resistant

EPDM = Thurban material for outdoor use - resistant to UV and ozone damage

PCA AUS	Function	Plug Pin	Wire
0 Volts	1	Black	
+ Volts	2	Red	
A	3	White	
B	4	Blue	
O	5	Yellow	
A	6	Green	
B	7	Violet	
O	8	Brown	

NOTE: Refer to
COUPLING data sheet for
our range of Stainless
Steel zero backlash shaft
couplings



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range			
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 30000			
I	P	S	L	1	2										
Stainless Steel Shaft Shaft 12mm								Voltage & Output Type 5 Volt - Line driver 1 8 - 30 Volt Push Pull M							
Housing Material IP66/67 Aluminium + Nitrile Seal J Aluminium + PTFE Seal K Aluminium + Food Seal L Aluminium + Viton Seal M 316 Stainless + Nitrile Seal S 316 Stainless + PTFE Seal T 316 Stainless + Food Seal U 316 Stainless + Viton Seal V 316 Stainless + EPDM Seal 6								Output Options Standard NO gating..... A							
Wiring Entry Rear or Axial R Side or Radial S								Output Channels A, B, O 3 A, B, O, A̅, B̅, O̅ 7							
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length ... 4								Manufactured in UK by IED Sold and serviced in Australia by PCA							

IPSW Series

Incremental Shaft Encoder IP66/67

Maximum Increments 30,000

Shaft Diameter Range 6 10 or 12mm

MECHANICAL SPECIFICATIONS

RPM Max. 3000
Torque > 3Ncm
Loading Axial 10N, Radial 10N
Weight Aluminium 460g Stainless 1080g
Temperature -20°C to +85°C

ELECTRICAL

Current consumption Max. 60mA
Signal frequency 200kHz
Switching load 40mA

FEATURES

The IPSW heavy duty industrial encoder is designed for mounting in harsh environments. This grade of encoder has been installed in numerous aggressive locations, from the decks of sea going ships to dairy machinery that receives daily washings of pressurised water and detergents.

These encoders are machined from either aluminium or stainless steel, both with a range of double lip shaft seals filled with grease to suit most environments.

Shaft Sealing Options

Nitrile = General Industrial Use

Food = Approved in USA & UK use with food

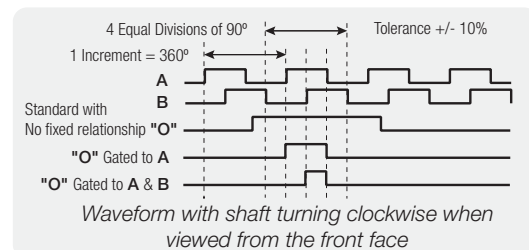
PTFE = High Speed Low Torque

Viton Peroxide = Chemical & Acid resistant

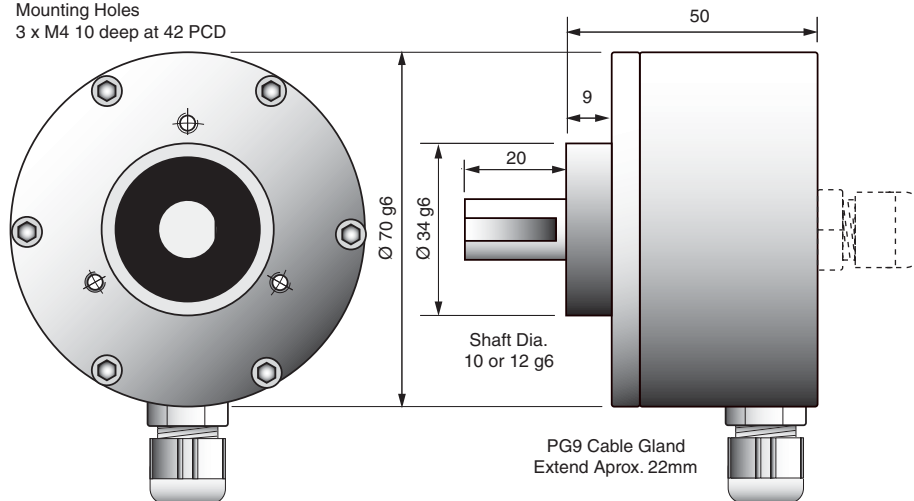
EPDM = Thurban material for outdoor use - resistant to UV and ozone damage

Function	Plug Pin	Wire
0 Volts	1	Black
+ Volts	2	Red
A	3	White
B	4	Blue
O	5	Yellow
A/B	6	Green
O	7	Violet
O	8	Brown

NOTE: Refer to
COUPLING data sheet for
our range of Stainless
Steel zero backlash shaft
couplings



Mounting Holes
3 x M4 10 deep at 42 PCD



Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Increment Range			
1	2	3	4	5	6	7	8	9	10	11	12	00001 to 30000			
I	P	S	W												
Stainless Steel Shaft Shaft 6, 10 or 12mm Standard ... 12mm								Voltage & Output Type 5 Volt - Line driver 1 8 - 30 Volt Push Pull M							
Housing Material IP66/67 Aluminium + Nitrile Seal J Aluminium + PTFE Seal K Aluminium + Food Seal L Aluminium + Viton Seal M 316 Stainless + Nitrile Seal S 316 Stainless + PTFE Seal T 316 Stainless + Food Seal U 316 Stainless + Viton Seal V 316 Stainless + EPDM Seal 6								Wiring Entry Rear or Axial R Side or Radial S							
Wiring Method Cable 2 Metres 2 Cable 5 Metres 3 Cable - Custom Length ... 4								Output Channels A, B, O 3 A, B, O, A̅, B̅, O̅ 7							

Manufactured in UK by IED
Sold and serviced in Australia by **PCA**

MzBG Series

Multi-Turn Absolute Blind Hollow Shaft Encoder

Maximum Resolution 30 bits

Hole Diameter 6 to 15mm

MECHANICAL SPECIFICATIONS

RPM Max.
6000 Torque IP65, 7Ncm
Loading Axial 40N, Radial 110N
Weight 200g
Temperature -20°C to + 70°C

ELECTRICAL

Current 400mA @ 10V - 180mA @ 24V
Signal frequency for the LSB 100kHz
Max Switching load 20mA

FEATURES

The MzHG Series is an IP65 protected industrial encoder designed for normal industrial environments. The output data is a true parallel code; suitable for reading direct into a panel meter or standard PLC input card.

NOTE: All output signals are short circuit protected. The input control wire is protected against open circuit or connection to the positive supply.

Refer to COUPLING data sheet for our range of zero backlash shaft couplings, which must be used to drive these encoders.

NOTE

Three control inputs are provided to customise the encoder to suit different applications while retaining a single stock item.

1. **PRESET** Connect to the + supply for greater than 100ms to reset the output bits to all read zero. This feature eliminates the necessity to co-ordinate the mechanical and electrical zero positions.

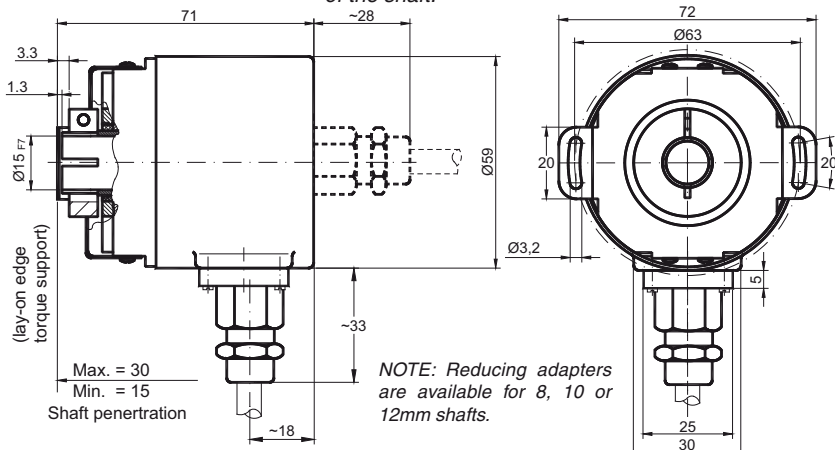
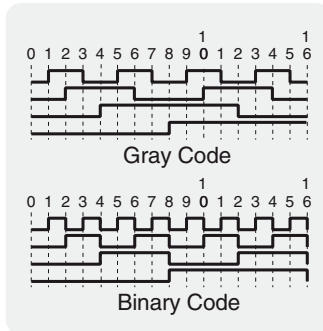
2. **LATCH** Connect to the + supply to hold the output data from changing, updates immediately the signal returns to logic 0.

3. **COUNT DIRECTION** When at logic 0 the output will count UP with clock wise (CW) rotation, when connected to + supply the output will count UP with counter clockwise rotation (CCW) of the shaft.

MzHG Series Multi-turn Absolute

Signal	Plug Pin	Cable
Bit 1	1	White
Bit 2	2	Brown
Bit 3	3	Green
Bit 4	4	Yellow
Bit 5	5	Grey
Bit 6	6	Pink
Bit 7	7	Blue
Bit 8	8	Red
Bit 9	9	Black
Bit 10	10	Violet
Bit 11	11	Grey-Pink
Bit 12	12	Red-Blue
Bit 13	13	White-Green
Bit 14	14	Brown-Green
Bit 15	15	White-Yellow
Bit 16	16	Yellow-Brown
Bit 17	17	White-Grey
Bit 18	18	Grey-Brown
Bit 19	19	White-Pink
Bit 20	20	Pink-Brown
Bit 21	21	White-Blue
Bit 22	-	Brown-Blue
Bit 23	-	White-Red
Bit 24	-	Brown-Red
Bit 25	-	White-Black
Preset	22	Brown-Black
Latch	23	Grey-Green
CW/CCW	24	Yellow-Grey
+10-30 V	25	Pink-Green
0 Volts	26	Yellow-Pink

NOTE: Wiring code can vary, refer to product label for final details.



Part Number Selection Guide

Series	Mechanical Options	Electrical Options	Reading Range
1 2 3 4	5 6 7 8	9 10 11 12	12,13 or 16 Bits
M B G		A M	
<p>Number Of Shaft Turns</p> <p>4 Bit = 16 V</p> <p>8 Bit = 256 C</p> <p>12 Bit = 4,096 J</p> <p>14 Bit = 16,348 L</p> <p>Stainless Steel Hole</p> <p>Metric 6 to 15mm</p> <p>Shaft hole reducers are fitted for 8, 10, or 12mm shaft selections</p> <p>Housing Material</p> <p>IP65 Aluminium H</p> <p>IP66 Aluminium J</p> <p>IP66 Stainless Steel S</p> <p>Wiring Entry</p> <p>Rear or Axial R</p> <p>*Side or Radial S</p> <p>* Only available for aluminium housing</p> <p>Wiring Method</p> <p>Cable 2 Metres 2</p> <p>Cable 5 Metres 3</p> <p>Cable - Custom Length ... 4</p> <p>Plug 26 Pin P</p> <p>Voltage & Output Type</p> <p>10-30V Push Pull M</p> <p>Options</p> <p>None available A</p> <p>Parallel Output Code</p> <p>Gray A</p> <p>Binary B</p> <p>NOTE: Refer to NzbG Series for serial Buss encoders.</p>			

NOTE: When determining the resolution of the encoder, remember to consider that the number of pins in the plug, or cores in the cable will ultimately determine the number of bits you can select. The sum of the bits limit for a 26 Pin plug = 21 Bits and Cable = 25 Bits.

MzSE Series

Multi-Turn Absolute Shaft Encoder

Maximum Resolution 30 bits

Shaft Diameter 6 or 10mm

MECHANICAL SPECIFICATIONS

RPM Max.
6000 Torque IP65, 7Ncm
Loading Axial 40N, Radial 110N
Weight 200g
Temperature -20°C to + 70°C

ELECTRICAL

Current 400mA @ 10V - 180mA @ 24V
Signal frequency for the LSB 100kHz
Max Switching load 20mA

FEATURES

The MzSE Series is an IP65 protected industrial encoder designed for normal industrial environments. The output data is a true parallel code; suitable for reading direct into a panel meter or standard PLC input card.

NOTE: All output signals are short circuit protected. The input control wire is protected against open circuit or connection to the positive supply.

Refer to COUPLING data sheet for our range of zero backlash shaft couplings, which must be used to drive these encoders.

NOTE

Three control inputs are provided to customise the encoder to suit different applications while retaining a single stock item.

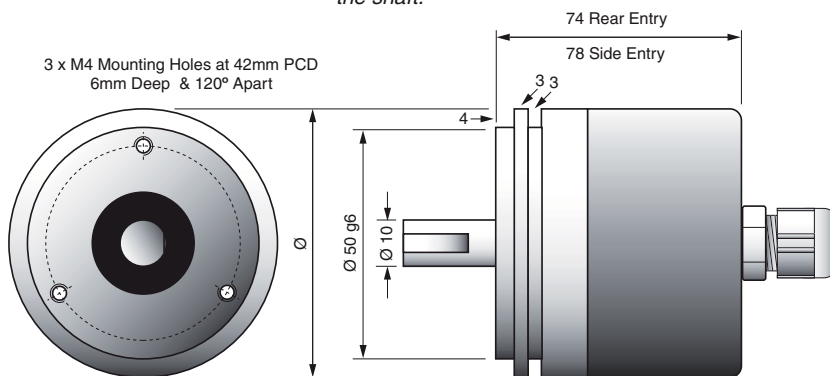
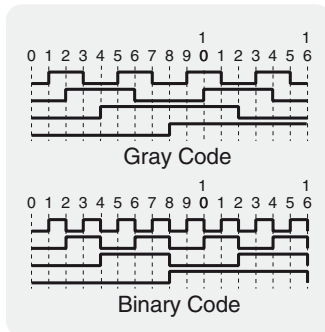
1. **PRESET** Connect to the + supply for greater than 100ms to reset the output bits to all read zero. This feature eliminates the necessity to co-ordinate the mechanical and electrical zero positions.

2. **LATCH** Connect to the + supply to hold the output data from changing, updates immediately the signal returns to logic 0.

3. **COUNT DIRECTION** When at logic 0 the output will count UP with clock wise (CW) rotation, when connected to + supply the output will count up with counter clockwise rotation (CCW) of the shaft.

MzSE Series Multi-turn Absolute

Signal	Plug Pin	Cable
Bit 1	1	White
Bit 2	2	Brown
Bit 3	3	Green
Bit 4	4	Yellow
Bit 5	5	Grey
Bit 6	6	Pink
Bit 7	7	Blue
Bit 8	8	Red
Bit 9	9	Black
Bit 10	10	Violet
Bit 11	11	Grey-Pink
Bit 12	12	Red-Blue
Bit 13	13	White-Green
Bit 14	14	Brown-Green
Bit 15	15	White-Yellow
Bit 16	16	Yellow-Brown
Bit 17	17	White-Grey
Bit 18	18	Grey-Brown
Bit 19	19	White-Pink
Bit 20	20	Pink-Brown
Bit 21	21	White-Blue
Bit 22	-	Brown-Blue
Bit 23	-	White-Red
Bit 24	-	Brown-Red
Bit 25	-	White-Black
Preset	22	Brown-Black
Latch	23	Grey-Green
CW/CCW	24	Yellow-Grey
+10-30 V	25	Pink-Green
0 Volts	26	Yellow-Pink



Shaft Alternatives - Tolerance g6
10mm Dia. 20mm Long - One flat side
6mm Dia. 10mm Long - One flat side

PG11 Cable Gland
Extend Approx. 22mm

NOTE: Wiring code can vary, refer to product label for final details.

Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Reading Range				
1	2	3	4	5	6	7	8	9	10	11	12	12, 13 or 16 Bits				
M		S	E							A	M	/				
Number Of Shaft Turns				Wiring Entry				Wiring Method				Voltage & Output Type				
4 Bit = 16 V				Rear or Axial R				Cable 2 Metres 2				12 Bit = 04,096				
8 Bit = 256 C				*Side or Radial S				Cable 5 Metres 3				13 Bit = 08,192				
12 Bit = 4,096 J				* Only available for aluminium housing				Cable - Custom Length ... 4				16 Bit = 65,536				
14 Bit = 16,348 L								Plug 26 Pin P				10-30V Push Pull M				
Stainless Steel Shaft				Wiring Method								Options				
Metric 06 or 10mm				Cable 2 Metres 2								None available A				
Housing Material				Cable 5 Metres 3								Parallel Output Code				
IP65 Aluminium H				Cable - Custom Length ... 4								Gray A				
IP66 Aluminium J				Plug 26 Pin P								Binary B				
IP66 Stainless Steel S												NOTE: Refer to NzSG Series for serial Buss encoders.				

NOTE: When determining the resolution of the encoder, remember to consider that the number of pins in the plug, or cores in the cable will ultimately determine the number of bits you can select. The sum of the bits limit for a 26 Pin plug = 21 Bits and Cable = 25 Bits.

MzSG Series

Multi-Turn Absolute Shaft Encoder

Maximum Resolution 30 bits

Shaft Diameter 6 or 10mm

MECHANICAL SPECIFICATIONS

RPM Max.
6000 Torque IP65, 7Ncm
Loading Axial 40N, Radial 110N
Weight 200g
Temperature -20°C to + 70°C

ELECTRICAL

Current 400mA @ 10V - 180mA @ 24V
Signal frequency for the LSB 100kHz
Max Switching load 20mA

FEATURES

The MzSG Series is an IP65 protected industrial encoder designed for normal industrial environments. The output data is a true parallel code; suitable for reading direct into a panel meter or standard PLC input card.

NOTE: All output signals are short circuit protected. The input control wire is protected against open circuit or connection to the positive supply.

Refer to COUPLING data sheet for our range of zero backlash shaft couplings, which must be used to drive these encoders.

NOTE

Three control inputs are provided to customise the encoder to suit different applications while retaining a single stock item.

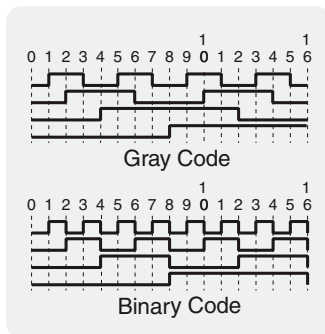
1. **PRESET** Connect to the + supply for greater than 100ms to reset the output bits to all read zero. This feature eliminates the necessity to co-ordinate the mechanical and electrical zero positions.

2. **LATCH** Connect to the + supply to hold the output data from changing, updates immediately the signal returns to logic 0.

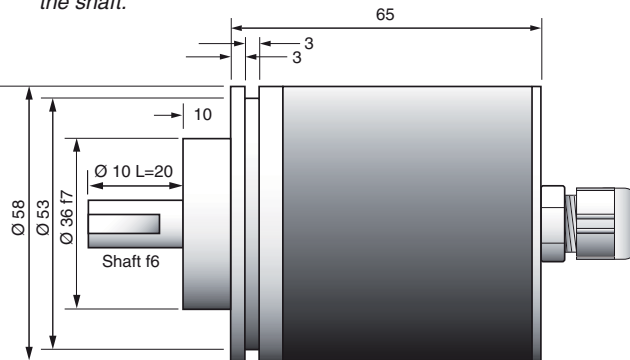
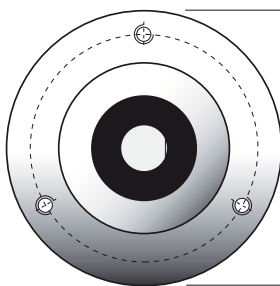
3. **COUNT DIRECTION** When at logic 0 the output will count UP with clock wise (CW) rotation, when connected to + supply the output will count up with counter clockwise rotation (CCW) of the shaft.

MzSG Series Multi-turn Absolute

Signal	Plug Pin	Cable
Bit 1	1	White
Bit 2	2	Brown
Bit 3	3	Green
Bit 4	4	Yellow
Bit 5	5	Grey
Bit 6	6	Pink
Bit 7	7	Blue
Bit 8	8	Red
Bit 9	9	Black
Bit 10	10	Violet
Bit 11	11	Grey-Pink
Bit 12	12	Red-Blue
Bit 13	13	White-Green
Bit 14	14	Brown-Green
Bit 15	15	White-Yellow
Bit 16	16	Yellow-Brown
Bit 17	17	White-Grey
Bit 18	18	Grey-Brown
Bit 19	19	White-Pink
Bit 20	20	Pink-Brown
Bit 21	21	White-Blue
Bit 22	-	Brown-Blue
Bit 23	-	White-Red
Bit 24	-	Brown-Red
Bit 25	-	White-Black
Preset	22	Brown-Black
Latch	23	Grey-Green
CW/CCW	24	Yellow-Grey
+10-30 V	25	Pink-Green
0 Volts	26	Yellow-Pink



3 x M4 Mounting Holes at 48mm
PCD & 120° Apart



PG7 Cable gland and metal
plug base, extends
approximately 22mm

Optional side entry

NOTE: Wiring code can vary, refer to
product label for final details.

Part Number Selection Guide

Series				Mechanical Options				Electrical Options				Reading Range 12,13 or 16 Bits			
1	2	3	4	5	6	7	8	9	10	11	12				
M		S	G							A	M	/			
Number Of Shaft Turns				Wiring Entry				Options				Voltage & Output Type			
4 Bit = 16 V				Rear or Axial R				None available A				10-30V Push Pull M			
8 Bit = 256 C				*Side or Radial S											
12 Bit = 4,096 J				* Only available for aluminium housing											
14 Bit = 16,348 L															
Stainless Steel Shaft				Wiring Method				Parallel Output Code							
Metric 06 or 10mm				Cable 2 Metres 2				Gray A							
				Cable 5 Metres 3				Binary B							
				Cable - Custom Length ... 4											
				Plug 26 Pin P											
Housing Material															
IP65 Aluminium H															
IP66 Aluminium J															
IP66 Stainless Steel S															

Made by Fraba of Germany
serviced in Australia by **PCA**

NOTE: Refer to **NzSG** Series for serial Buss encoders.

NOTE: When determining the resolution of the encoder, remember to consider that the number of pins in the plug, or cores in the cable will ultimately determine the number of bits you can select. The sum of the bits limit for a 26 Pin plug = 21 Bits and Cable = 25 Bits.

Signal Converters

Part No	Function	In / Output
DZ266	Multi function Under/Over speed	1 Incremental to Analogue and Relay
FU252	Frequency to analogue converter	1 Incremental to Analogue & RS232
ZU252	Count value to Analogue conversion	Voltage 0-10 Current 4 to 20mA

Incremental Encoder Signal expanders

FM260	Level converter & Impulse or Frequency multiplier	1 in 1 Incremental Encoder
GV204	Level converter TTL/HTL to TTL/HTL No isolation 9 Pin D Plug wiring	1 in 2 Incremental Encoder
GV210	Level converter TTL/HTL to TTL/HTL No isolation - Screw terminal wiring	2 in 2 x Incremental Encoder
GV210	Level converter & Expander 2 out	1 in 2 x Incremental Encoder
GV470	Level converter, Isolator & Expander 8 out	1 in 8 Encoder Outputs
GV471	Level converter, Isolator & Expander 4 out	1 in 4 Encoder Outputs
GV480	Level converter, Isolator & Expander 8 Isolated out	1 in 8 Isolated Encoder Outputs
GV481	Level converter, Isolator & Expander 4 Isolated out	1 in 4 Isolated Encoder Outputs
IT251	Level converter Divider & Expander 2 Out	1 in 2 x Incremental Encoder
PU210	Level converter - with Opto Isolation	1 in 1 Incremental Encoder

Multi function panel meter with 15mm LED display

- Universal input power supply 110 to 240 AC - Optional DC available
- High Speed Position and Event Counter (100 kHz)
- Tachometer, Frequency Meter
- Baking Time and Processing Time Indicator (reciprocal speed)
- Timer, Stopwatch
- Speed Display from Transition Time between Start and Stop Impulse
- Additional Functions: Linearization, Brightness Control, Digital Filter etc.

DX342	Display with two presetable mechanical relay outputs	2 Mechanical relay + RS232/485
DX345	Display only	No output function
DX346	Display with analogue output	Voltage 0-10 Current 4 to 20mA
DX347	Display with two presetable opto isolated outputs	2 Transistor switches
DX348	Display with RS232 / 485	Serial RS232 / 485

NOTE: This is a small selection of products from the Motrona range, these are the ones most commonly used with incremental encoders. For the full product range, and installation manuals for these products, visit the web site. www.motrona.com



DX345



FU251

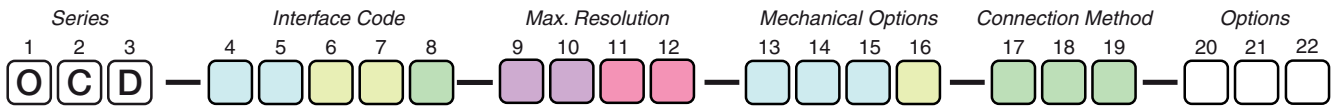


GV470

Posital Absolute Optical Encoder Selection Guide

NOTE: Not all options are available for each encoder in a series, be sure to refer to the individual data sheet to determine the selections available for each protocol.

<http://www.posital.com/>



Protocol - 4 & 5

CA - Can Open
D2 - DeviceNET
EE - Ethernet IP
EM - Ethernet Modbus
E2 - Ethernet Powerlink V2
ET - Ethernet TCP/IP
IB - InterBUS
P1 - Parallel + Zero reset
PP - Parallel Push/Pull
DP - ProfiBUS
EI - ProfiNET RT
S4 - SSI + Zero reset button
S1 - SSI + Zero reset input
SL - SSI Standard

Firmware 6 & 7

?? - Version

Code - 8

G - Gray
B - Binary

Bit turns - 9 & 10

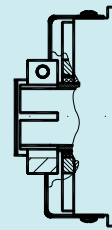
00 - Single turn
12 - 4,096
13 - 8,192
14 - 16,384

Bits each turn - 11 & 12

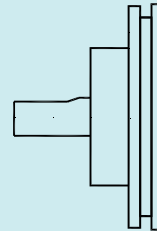
12 - 4,096
13 - 8,192
16 - 65,536

Flange & Shaft 13 - 14 - 15

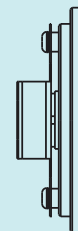
Blind Hollow
B10 - 10mm Hole
B12 - 12mm Hole
B15 - 15mm Hole



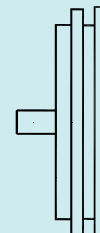
Clamp Flange
C10 - 10 x 20mm



Through Hole
T12 - 12mm Hole



Synchro Flange
S06 - 06 x 10mm
S10 - 10 x 20mm



NOTE

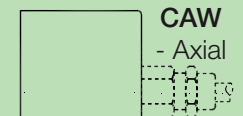
All housings are 58mm diameter

Housing - 16

0 - Standard
S - Shaft Seal
V - Stainless + Steel
H - Heavy duty
C - Custom type

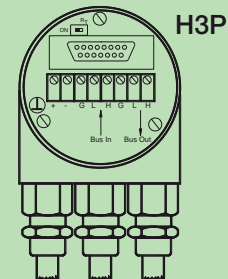
Connection 17 - 18 - 19

Cable Wiring Entry

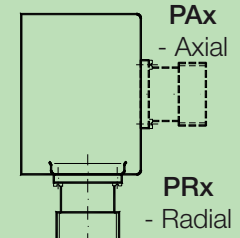


CRW
- Radial

Protocol Cap



Plug Wiring



x = Plug type

M - 5 Pin Plug
9 - 9 Pin D Sub
L - 12 Pin Plug
P - 16 Pin Plug
T - 26 Pin Plug



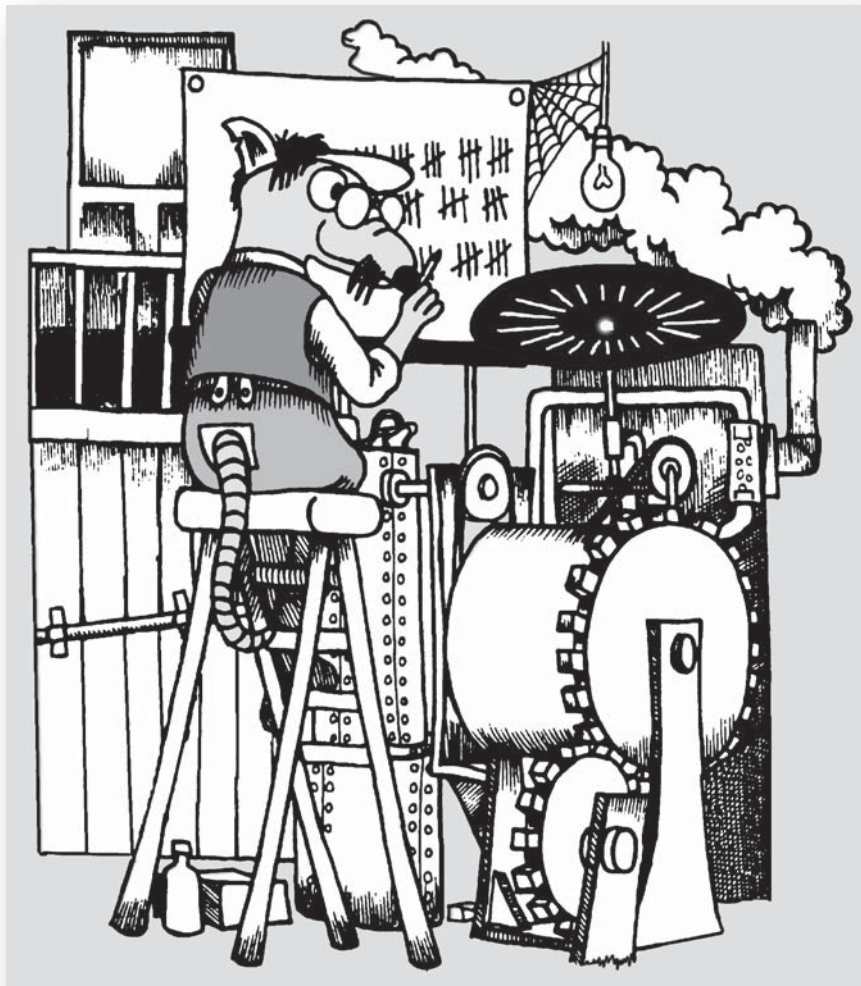
Other Posital Measuring Products

MCD - Minature magnetic absolute encoders 36mm Dia
OPT - Optipact non contact linear measuring systems
ANS - Rectangular inclinometers - DeviceNET and ProfiBUS protocol
AGS - Round inclinometers with CanBUS and a range of analogue outputs
Ex - Encoders for installation in hazardous areas



PCATM

Encoders for Australian Industry
Since 1981



When you're caught in the manufacturing rat race
you can count on PCA encoders



On Line Information

www.pca-aus.com.au