



BiGa®

For milling, boring, lathe, grinding, EDM.....

-----100% independent intellectual property right

----Remarkable quality pursuit from excellence to perfect

DRO & Linear Scale Series

Accurate, yet Affordable, DRO System from BiGa

www.biga-dro.com



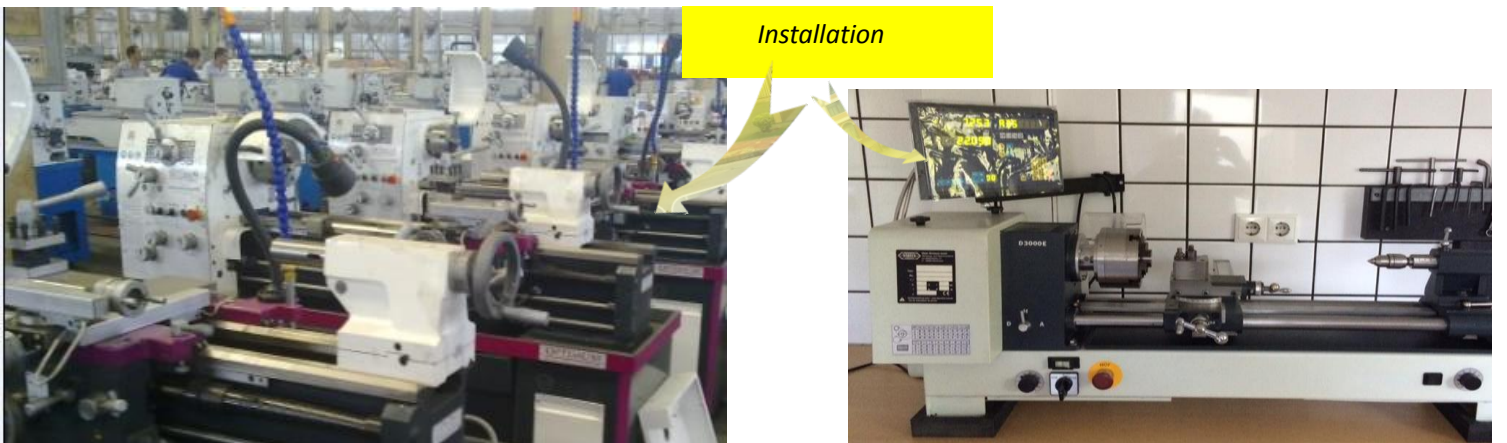
Dongguan City BiGa Grating Machinery Co., Ltd

Dongguan City BiGa Grating Machinery Co., Ltd. was established in 1996 with its corporate headquarters in Dongguan. It is one of early professional manufacturers engaged in research, development and production of digital readout and linear scales in China.

Research areas of the company include electronics, optics, machinery, digital display system, displacement controller, electronic magnetic grating digital system, etc. The company has its own professional technical staff and installation personnel, so that it can meet all the demand of linear scales, transformation of magnetic grid sensor and adequate and systematic service. At present, the company has various series of grating digital readout products which are widely applied to milling machine, grinding machine, lathe, EDM and so on. According to customers' need, the company can supply products such as gratings of special types and specifications, as well as magnescape, both assorted with other apparatus and special mechanical equipments. These products can, for example, be connected with PCL and widely used for automatic transformation of equipments. High-speed linear scale can be applied to chip mounters and injection molding machines. Extra-long grating, especially designed for gantry milling machine, can reach a maximum length of ten meters.

Our company holds the policy of band service and pursues from excellence to perfection. We have always been adhering to outstanding service coordinated with the advanced science and technology. In order to realize these aims, our company will make personalized service program according to each customer's demand, thus helping users reach their goals accurately.

Our business covers Hong Kong, Taiwan, Singapore, South Korea, Turkey, Southeast Asia, Middle East Asia, India, Europe, America, etc. And now we enjoy quite a perfect domestic service network. The main regions, with offices and departments of after-sale service, provide the first-class service for customers. We sincerely hope and promise that our efforts will make our customers satisfied.





Advanced glass vacuum coating workshop



Accuracy testing for short scales



High Precision Machining Equipment



Advanced grating glass testing workshop

Total Quality Assurance

BiGa is implementing the Total Quality Management (TQM) system to our plant in China since 1996. Strict control of production processes and quality records, continuous labor training and skill level assessments to ensure the quality assurance always be implemented throughout all production processes.

Our quality management system has been assessed and registered by National Quality Assurance Ltd. (NQA) against the provision of ISO9001:2000.



Advanced SMT equipment



Accuracy testing for long scale



Professional pre-delivery aging test room

TOP20 Series and BC20 Series Digital Readout

- TOP20-M plastic casing, general model, with functions more cater for milling.
- TOP20-L plastic casing, a specific model for lathe machine.
- DC-3000 Plastic casing, a specific model for optical profile projector.
- BC20-M metal casing, general model, with functions more cater for milling.
- BC20-L metal casing, a specific model for lathe machine.
- BC20-E metal casing, a specific model for electronic spark machine.
- BC20-V metal casing, multi-function DRO for milling, boring, lathe, grinding, EDM.



Milling DRO



EDM DRO



Lathe DRO

Casing:	ABS polymer casing box/die cast aluminum
Response Speed:	60m/min. (198.6feet/min)
Dimension:	265*182*48mm for TOP20; 290*190*105mm for BC20
Weight:	1.1KG for TOP20,,2.85KG for BC20
Quantizing error:	+/- 1count
Connection Type:	9 pin D-type
Encoder input:	5v TTL 90 °quadrature phase difference
Keypad type:	Membrane with PCB mounting tactile switch
Power Source:	AC 110 - 220V, 50 - 60 Hz
Power:	Universal power supply
Temperature :	Operating 0 ~ 40 deg C,
Display:	8-digits green color LED display

General Functions

Metric/Imperial Conversion. Zero Reset. Preset Dimension.
1/2 Distance Mode to aid Centre Finding. Recall Memorised Position.
Absolute and Incremental coordinate display modes.
Mechanical Zero & Workpiece Zero.
Shrink Function: Shrinkage allowance can be set to compensate for casting or moulding shrinkage.
Pitch Circle Diameter (PCD) Function: The console will output X and Y coordinates for each hole.

Calculator Functions

Maths Functions: Add, Subtract, Multiply, Divide.
Trig Functions: SIN, COS, TAN, SIN-1, COS-1, TAN-1, X2, $\sqrt{\quad}$, π (pi).
Axis position can be transferred to calculator as an operator.
Result can be transferred back to an axis

EDM Functions

EDM depth control function

Lathe Functions

Tool Compensation and Tool Number.
Diameter or Radius Reading.
Set tool compensation dimension

Profile Projector Functions

Basic functions

- 1)Automatic/Manual
- 2)Power-down memory
- 3)Points in the function
- 4)Inch / metric mode
- 5)INC/ABS mode
- 6)Storage function
- 7)Printing function

Processing functions

- 1)Point measuring function
- 2)Line measuring function
- 3)Circle measuring function
- 4)Distance measuring function
- 5)Angle measuring function
- 6)Coordinate translate
- 7)Coordinate adjust
- 8)RS232 function



OPP DRO



Multi-function DRO

Multi-function Functions (for milling, boring , lathe, grinding , EDM)

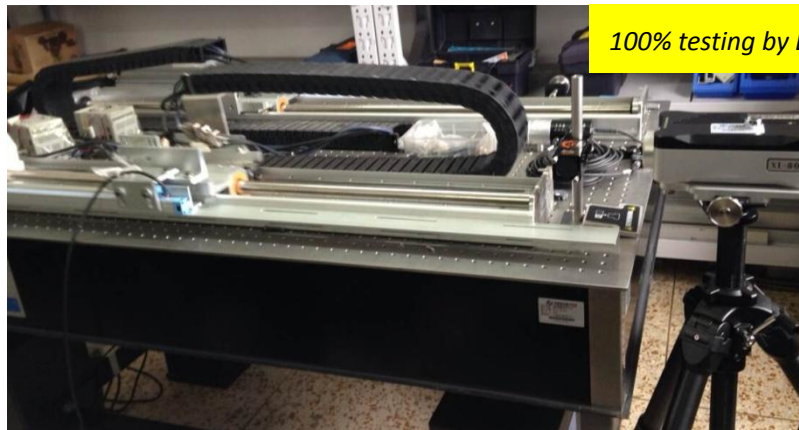
- 1)PCD circular sub-holes (for milling, EDM)
- 2)Slash punch (for milling machine)
- 3)Tool compensation function (for milling machine)
- 4)Taper measurement function (for lathe)
- 5)Slope processing (for milling machine)
- 6)R arc function (for milling machine)
- 7)200 tool magazine (for lathe)
- 8)EDM functions (for EDM, ordered separately)
- 9)RS-232 communication (ordered separately)

DRO fittings

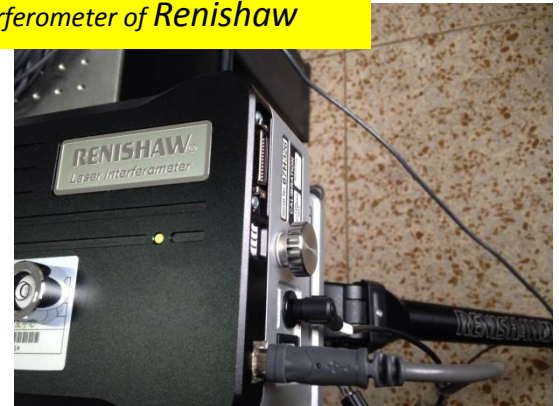
The Display console is supplied complete with a heavy duty mounting arm, c/w necessary mechanical & electrical fasteners. The mounting arm will allow the display console to swivel into a convenient and comfortable position for the user. You can choose a right angled or straight arm, via your option function. Normally, Lathe applications best suit the right angled arm, and Milling applications favour the straight arm.



ASD Series glass grating linear scales



100% testing by Laser interferometer of Renishaw



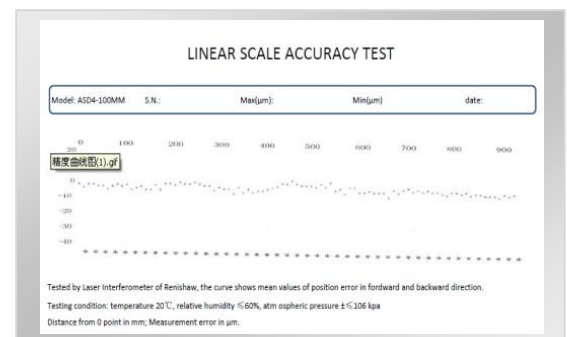
Linear scale main type

ASD4(50~1000mm) Universal Scales, scales are available in every 50mm.

ASD8(50~400mm) Slim Scales, feature small section design ,it's suitable for smaller lathes, especially on cross slide installation, and maximize cross slide travel on milling machines. Scales are available in every 100mm.

ASD2(100~3200mm)Long Scales - Used for Big machine with extended length. Heavy extrusion and 5mm thickness grate glass makes the better stability/shock-proof property. Scales are available in every 100mm

Accuracy report include



ASD series glass grating linear transducer technical specifications

Resolution	5um (other resolution is also available, pls contact us for details)
Maximum speed	60 meters per minutes
Accuracy	+/-10um/m
Cable	3m Armored for ASD4/ASD8 5m Armored for ASD2
Output Signals	5 volt TTL Quadrature (RS422 Line Driver, 1Vpp, 11uApp by special order)
Travel Lengths	<u>ASD8 Micro-scale</u> 50,100,150,200,250,300,350,400mm <u>ASD4 Standard scale</u> 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850,900,950,1000 <u>ASD2 long scale</u> 1100~3200mm
Operating Current	Maximum 40 mA per Channel
Grating period	20um
Operating	0° C to 40° C
Storage	-20 °C to 70°C

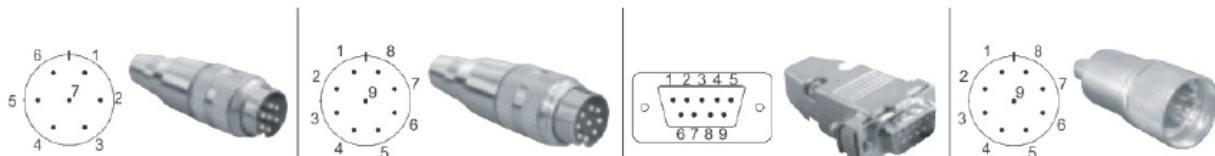


All mounting fitting include: dust cover, mounting bar(for size below 500mm), brackets , mounting hardware(screws, cables clip, cable tie, washer and spring washer) English Operation Manual. You get nothing to worry about.

Connection types and pinout configurations

The standard signal is TTL square wave, EIA422A, 1 volt peak to peak(1Vpp) and 11uA Sinusoidal for special order. Please feel free to contact our technical staff for assistance. Standard 9 pin DSUB9 and 7 pin DIN7 connectors are available for user's choice.

Model	Output Signals	No.	1	2	3	4	5	6	7	8	9
7	TTL, HTL	Signals	0V	/	A	B	Vcc/VDD	Z	Shield	/	/
		Color	Black		Blue	Green	Red	Yellow		/	/
9D	TTL, HTL	Signals	Vcc/VDD	0V	A	B	Z	/	Shield	Shield	/
		Color	Red	Black	Blue	Green	Yellow				
9, 9D	EIA-422-A	Signals	A	/B	Vcc	0V	/A	B	/Z	Z	Shield
		Color	Grey	Brown	Red	Black	Blue	Green	Yellow	White	
9D	TTL, connected with CDD Card	Signals	A	/	Vcc	0V	/	B	/	Z	Shield
		Color	Blue	/	Red	Black	/	Green	/	Yellow	
9, 9M, 9D	11uApp 1Vpp	Signals	0°	180°	Vcc	0V	90°	270°	Z	/	Shield
		Color	Grey	Brown	Red	Black	Blue	Green	Yellow	White	

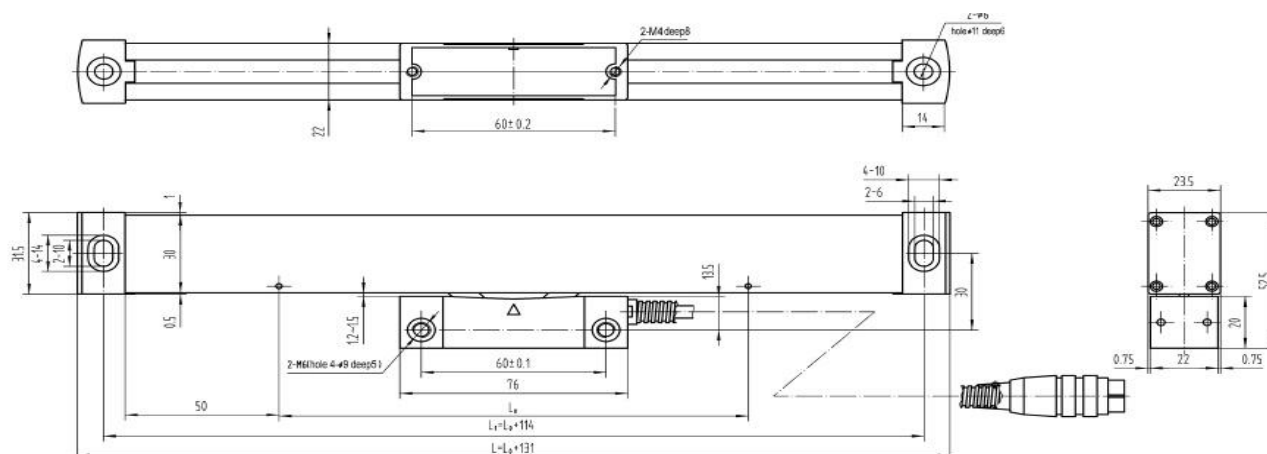


Installation Dimensions

>>ASD4 series

$L = \text{travel length} + 128\text{mm}$

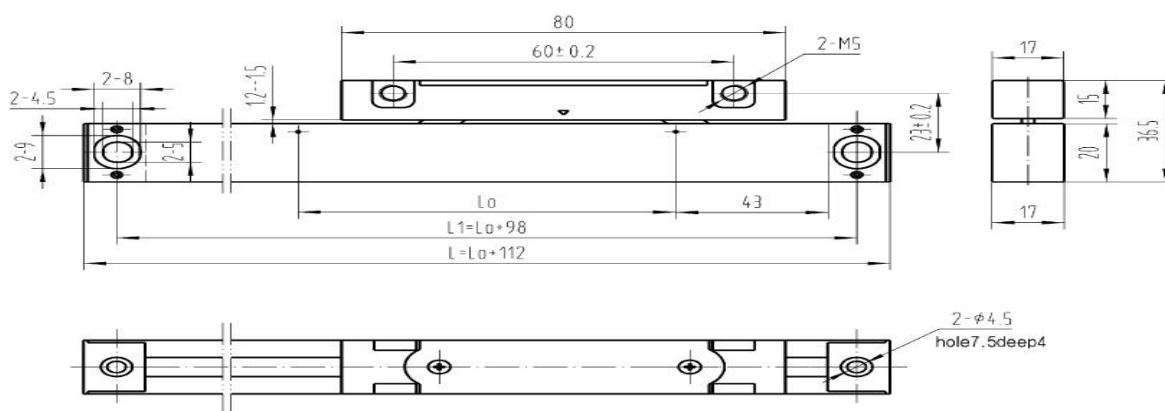
Measurement travel: 100mm to 1000mm



>> ASD8 series

$L = \text{travel length} + 112\text{mm}$

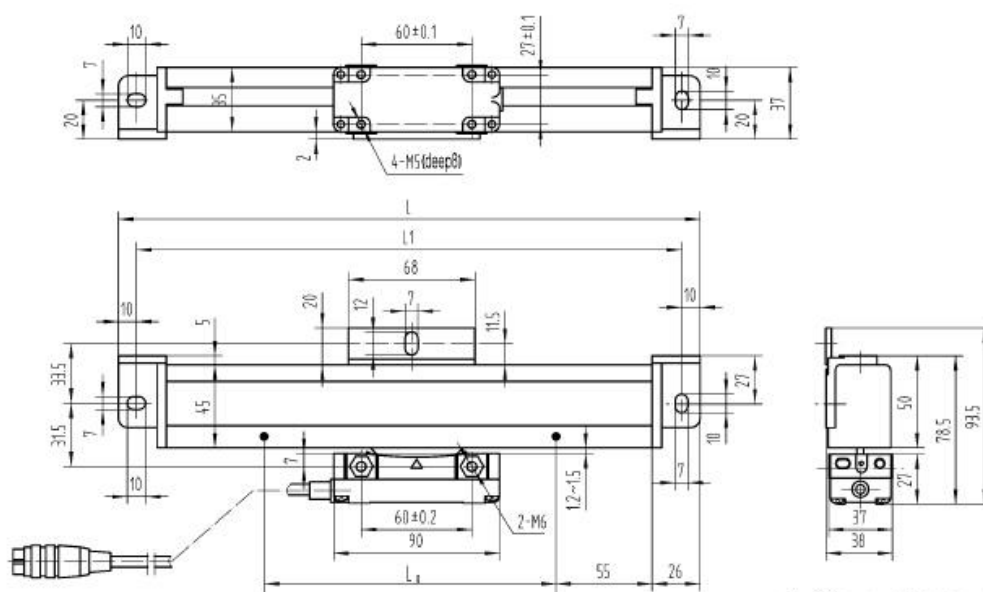
Measurement travel : 50mm to 400mm



>>ASD2 series

$L = \text{travel length} + 162\text{mm}$

Measurement travel : 1100mm to 3200mm



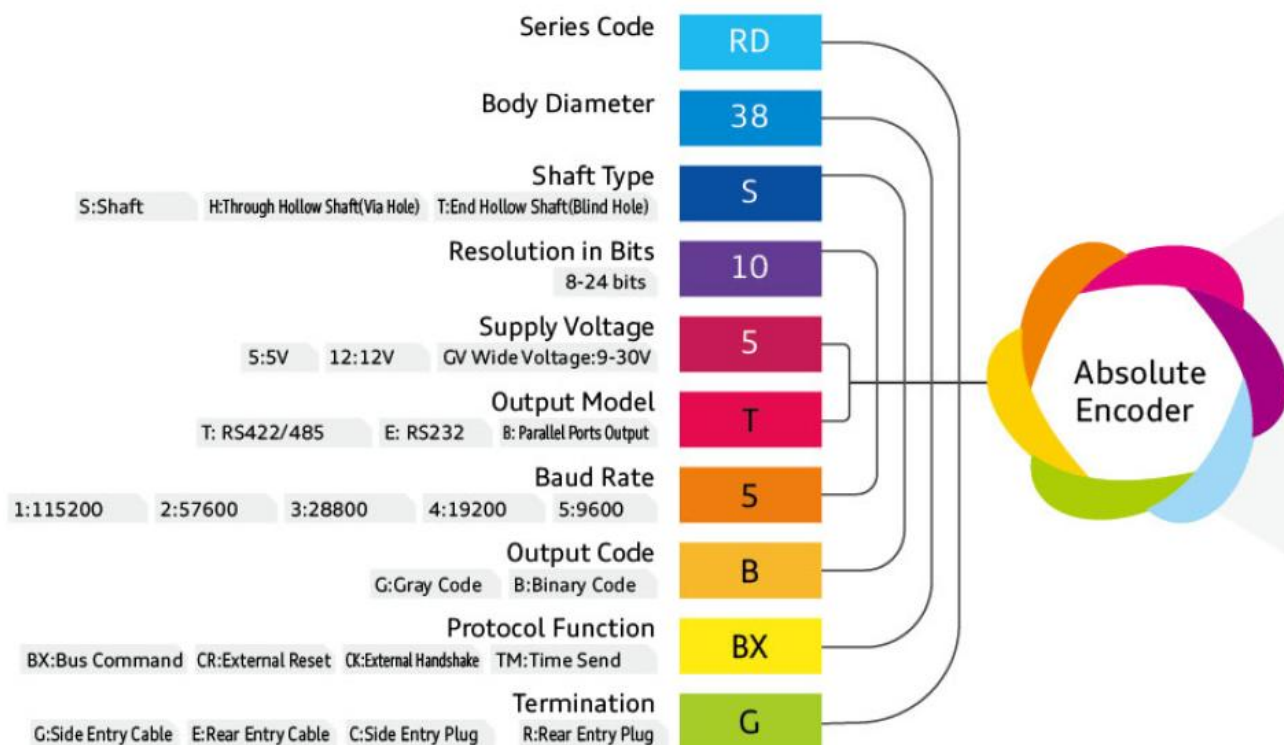
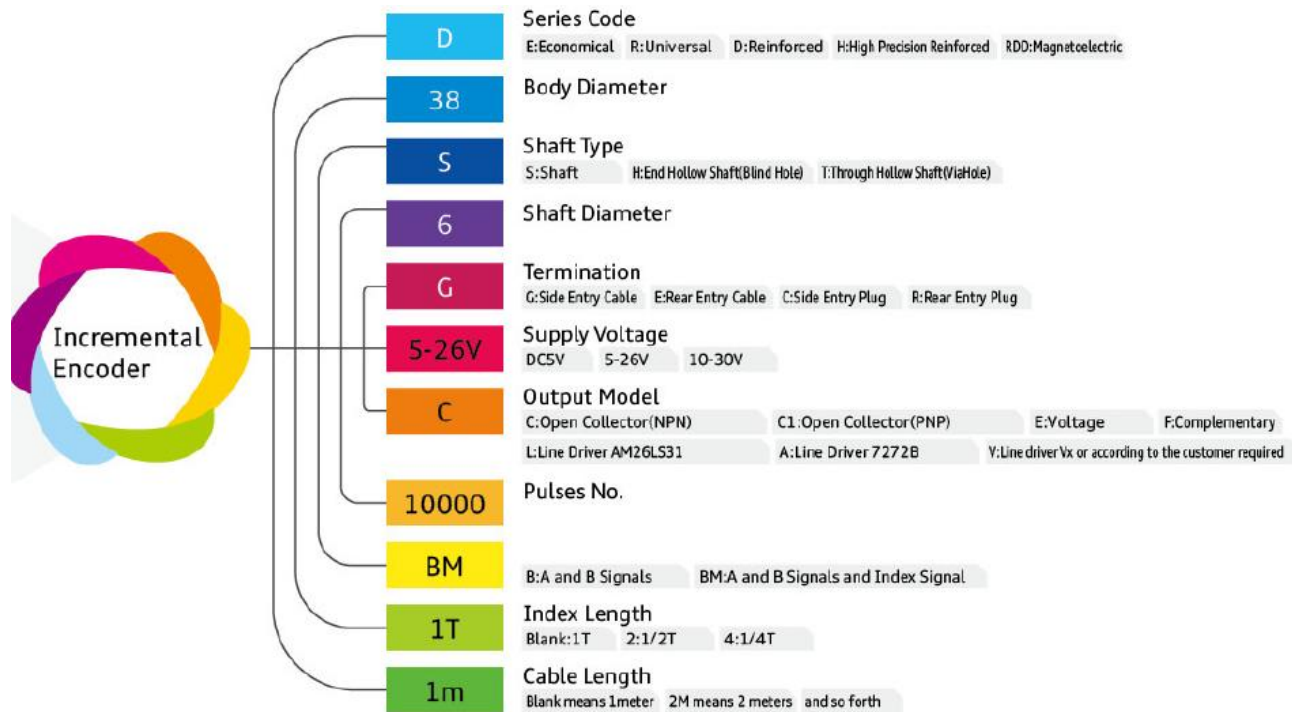
Auxiliary support may be added more than 1200mm length

Incremental and absolute Rotary Encoder

When ordering, please specify the product in detail ,model, pulses per revolution, supply voltage, termination, signal output model, function NO and so on.

Pulses per Revolution (P/r) = Displacement per Revolution /Design Resolution.

Partition No. = 360°/Design Resolution.



Specifications (various types available, please contact us for more information)



Small Single-turn Absolute Encoder[RD38S]



Small Single-turn Absolute Encoder[RD42S]



Standard Shaft Single-turn Absolute Encoder[RD50S]



Standard Shaft Single-turn Absolute Encoder[RD60S]

Mechanical Specifications

External Diameter	38mm	42mm	50mm	60mm
Shaft Diameter	6mm	6mm/8mm/10mm	8mm	10mm
Slew Speed	1000r/min	2000r/min	1000r/min	1000r/min
Shaft Load	≤20N	≤10N	≤10N	≤20N
Operating Temperature	-20 °C- +65°C/-40 °C- +65°C	-20 °C- +65°C/-40 °C- +65°C	-20 °C- +65°C/-40 °C- +65°C	-20 °C- +65°C/-40 °C- +65°C
Protection Class	IP 64	IP 50	IP 64	IP 64
Termination	G/E/C/R	G/E/C/R	G/E/C/R	G/E/C/R
Vibration Resistance	2.5g	2.5g	2.5g	2.5g

Electrical Specifications

Supply Voltage	DC5V±0.05%/DC10V-30V	DC5V±0.05%/DC10V-30V	DC5V±0.05%/DC10V-30V	DC5V±0.05%/DC10V-30V
Output Code	Binary Code/Gray Code	Binary Code/Gray Code	Binary Code/Gray Code	Binary Code/Gray Code
Output Model	T	T/E/B	T/E/B	T/E/B
Frequency Response	≤500HZ	≤500HZ	≤500HZ	≤500HZ
Current Requirement	≤180mA	≤180mA	≤180mA	≤180mA
Resolution in Bits	12-15	10-17	10	12-16
Resolution per rotation	4096-32768	1024-131072	1024	4096-65536
Measuring Range	0°-360°	0°-360°	0°-360°	0°-360°

Termination G=Side Entry Cable E=Rear Entry Cable C=Side Entry Plug R=Rear Entry Plug

Output Model T=RS422/485 E=RS232 B=Parallel output



Standard Shaft Single-turn Absolute Encoder[RD66S]



Standard Shaft Single-turn Absolute Encoder[RD100S]



Standard Shaft Sleeve Single-turn Absolute Encoder[RD60T]



Large Shaft Sleeve Single-turn Absolute Encoder[RD94T]

Mechanical Specifications

External Diameter	66mm	100mm	60mm	94mm
Shaft Diameter/Shaft Hollow Diameter	10mm	15mm	8mm/10mm/12mm/14mm	20mm/22mm/25mm/30mm
Slew Speed	1000r/min	1000r/min	1000r/min	500r/min
Shaft Load	≤20N	≤20N	≤20N	≤20N
Operating Temperature	-20 °C- +65°C/-40 °C- +65°C	-20 °C- +65°C/-40 °C- +65°C	-20 °C- +65°C/-40 °C- +65°C	-20 °C- +65°C/-40 °C- +65°C
Protection Class	IP 54	IP 54	IP 50	IP 50
Termination	G/E/C/R	G/E/C/R	G/C	G/C
Vibration Resistance	2.5g	2.5g	2.5g	2.5g

Electrical Specifications

Supply Voltage	DC5V±0.05%/DC10V-30V	DC5V±0.05%/DC10V-30V	DC5V±0.05%/DC10V-30V	DC5V±0.05%/DC10V-30V
Output Code	Binary Code/Gray Code	Binary Code/Gray Code	Binary Code/Gray Code	Binary Code/Gray Code
Output Model	T/E/B	T/E/B	T/E/B	T/E/B
Frequency Response	≤500HZ	≤500HZ	≤500HZ	≤500HZ
Current Requirement	≤180mA	≤180mA	≤180mA	≤180mA
Resolution in Bits	14-18	18-21	14-18	14-21
Resolution per rotation	16384-262144	262144-2097152	16384-262144	16384-2097152
Measuring Range	0°-360°	0°-360°	0°-360°	0°-360°

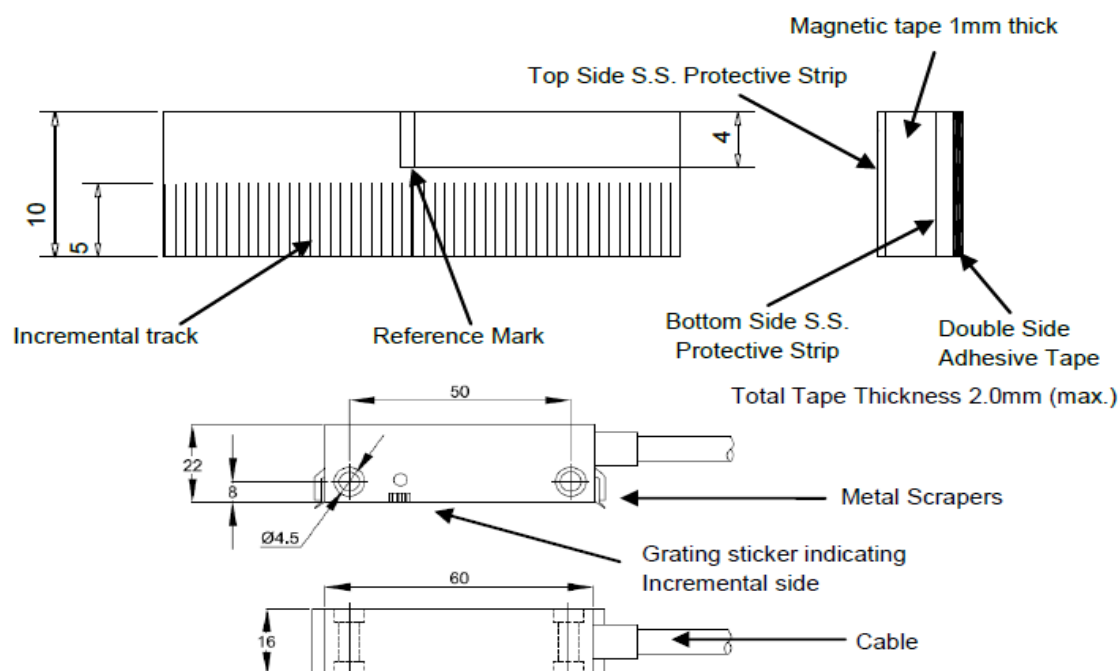
Termination G=Side Entry Cable E=Rear Entry Cable C=Side Entry Plug R=Rear Entry Plug

Output Model T=RS422/485 E=RS232 B=Parallel output

Magnetic Scale



Pole Pitch	1mm/2mm/5mm
Resolutions (X4 edge)	1μm , 5μm, 10μm, 20μm, 50μm, 100μm
Accuracy (μ/m)	±10μ, ±20μ, ±50μ, ±100μ
Repeat accuracy	± 1 count
Measuring Lengths	Up to 20m
Current consumption	Typ. 150mA (250mA max)
Power supply	+ 5 VDC (± 5%)
Output signal	Differential Line driver as per EIA RS422 standards. 1Vp-p Sine wave output. (0.6Vp-p – 1.2Vp-p)
Reference mark	Every 50mm
Operating Temperature	0° C to 50° C
Storage Temperature	-20° C to 70° C
Relative Humidity	20% to 80% Non-condensing
Standard Cable length	3 meters armoured/non-armoured cable
Max. cable length	20 meters
Measurement Speed	2MHz (10m/s @ 5μm) 1Vp-p – 10KHz
Protection class	IP-67 for Reader Head



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