# GURLEY MODEL A90 Absolute Encoder





## HIGH PERFORMANCE

The model **A90** encoder is a single-turn high resolution absolute rotary encoder with optoelectronic technology. This encoder is used in a wide variety of position-sensing applications for high resolution measuring of angles and distances. Mechanical features include a 90-mm aluminum housing, stainless steel shaft with a 10 mm diameter, and precision ball bearings. Extended operating temperature from -30 to +70C is optional.



ISO 9001 Certified Gurley Precision Instruments 514 Fulton Street Troy, NY 12180 U.S.A. (800) 759-1844, (518) 272-6300, fax (518) 274-0336, Online at www.gurley.com, e-mail: info@gurley.com



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### SPECIFICATIONS

	Units	Limiting Values		
Mechanical Specifications				
Moment of Inertia	in-oz-s <sup>2</sup> (g-cm <sup>2</sup> )	2.94 x 10 <sup>-3</sup> (20)		
Operating Torque	Nm (in-oz)	0.01 (1.416)		
Radial Shaft Load	lb (N)	2 (10)		
Axial Shaft Load	lb (N)	2 (10)		
Bearing Arrangement		2 pre-loaded bearings		
Bearings		Grease-lubricated and sealed		
Code Disc Type		Etched chrome on glass disc,		
Maximum Operating Speed	RPM	300		
Non-Operating Slew	RPM	4,000		
Shock 11 (ms)	g (m/s²)	30 (300)		
Vibration (55-2000Hz)	g (m/s²)	10 (100)		
Sealing		IP64	2	
Recommended Shaft Coupling	model	SCA		
Environmental Specifications				
Operating Temperature	°F (°C)	Standard is +32 to +158 (0 to +70)		
	°F (°C)	Extended is -40 to +185 (-30 to +70)		
Relative Humidity	%	98		
Electrical Specifications				
Supply Voltage	VDC	4.75 to 5.25, 5.00 nominal		
Current Consumption	mA	≤ 220		
LED Life	hours	≥ 100,000		
Output Code		Binary		
Output Format		18-24 bit SSI		
Output Device		RS Differential SP490		
Accuracy		+/-3.5 arc seconds		

#### Notes

1. Non-condensing

2. Per CEI / IEC 529 - Degrees of protection provided by enclosures (IP Code)

As part of our continuing product improvement program, all specifications are subject to change without notice.



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#### OUTPUT OPTIONS



Thanks to the serial data transmission, only four signal lines are required. The physical interface consists of two connections aside from power and ground. Data is transmitted in synchronism with a CLOCK signal from the subsequent electronics: one bit of position data is transmitted to the output per one CLOCK pulse received by the encoder.

In the beginning, when not transmitted, buses CLOCK and DATA are on Log "1". The transmission cycle begins with the first falling edge of the CLOCK, it means that the first negative front edge of signal CLOCK locks the output code into the internal register saving the measured values. So, the CLOCK initiates the communication- first falling edge latches the parallel data into an internal shift register.

Next positive edges of signal CLOCK provide bite-by-bite transfer of the fixed code starting from MSB. After the transfer of "n" bits (complete data word) the DATA line remains low and being held there for a period of time T3 until the encoder is ready for interrogation of a new value. At that time the code could be repeatedly read by putting the signal CLOCK into Log "0". Such transfer could be done not limited number of times. It means that if a falling CLOCK edge is received within T3, the same value will be output once again. After T3 DATA is being put into Log "1" and the encoder is ready to output the current code. If while reading the code the status of signal Clock is not changed in time higher than maximum value of T, the encoder automatically returns into starting state.





MODEL SHAFT RES	OF OC OD VOLT TE	MP BAS	<u>SE EXI</u>	I CAB CONN SHAFT SPEC	
MODEL		TEMP	– Tem	perature Range	
A90			S T	Standard (0 to 70°C)	
SHAFT - Sha	ift type		1		
S	Solid	BASE			
DEC Doool	ution		Α	Combination Synchro	
<b>RES</b> – Resolu 18	18 bit			flange/face mount base	
19	19 bit	EXIT-	Cable I	Exit	
20	20 bit		S	Side exit	
21	21 bit		т	Top exit	
22	22 bit				
23	23 DII 24 hit	CAR	Cable	longth inchos	
27			<b>39</b>	Standard 39" (1.0 m)	
<b>OF</b> – Output	Format		02-99	02" to 99"	
S	SSI				
	Cada	CONN	I – Coni	nector	
B	Binary		۲ ۹	Pigtali DE QD	
D	Dinary		3		
<b>OD</b> – Output Device		SHAFT – Diameter			
RS	RS Differential (SP 490)		10M	10mm	
			06E	3/8"	
<b>VOLT</b> – Volta	<b>VOLT</b> – Voltage		SPEC – Special features		
05	5 Vdc Power Supply	_	N	No Special Features	

#### **SPECIAL CAPABILITIES**

For special situations, we can optimize catalog encoders to provide higher frequency response, greater accuracy, wider temperature range, reduced torque, non-standard line counts, or other modified parameters. In addition, we regularly design and manufacture custom encoders for user-specific requirements. These range from high-volume, low-cost, limited-performance commercial applications to encoders for military, aerospace and similar high-performance, high-reliability conditions. We would welcome the opportunity to help you with your encoder needs.

#### WARRANTY

Gurley Precision Instruments offers a limited warranty against defects in material and workmanship for a period of one year from the date of shipment.



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