

# GURLEY MODEL A36

## ABSOLUTE ENCODER WITH SSI OUTPUT

### MOTION TYPE:

ROTARY

### USAGE GRADE:

INDUSTRIAL

### OUTPUT:

ABSOLUTE

### MAX RESOLUTION:

SINGLE-TURN:  $2^{12}$

MULTI-TURN:  $2^{25}$



## INDUSTRIAL RUGGEDNESS, SINGLE OR MULTI-TURN

### Major Features and Advantages:

- 12 x 13 resolution standard; higher turns counts available
- Shaft or blind hollow-shaft options
- 36 mm diameter; 41 mm length
- Standard synchro flange
- SSI interface standard @ 100 kHz - 2 MHz clock frequency; CAN bus optional
- Data update rate <1usec
- Accuracy +/- .35 degrees

The Model A36S with SSI output is a heavy-duty absolute rotary encoder with robust magnetic technology and standard SSI (RS422) interface. It is available as a single-turn encoder with up to 12 bits of resolution (4096 steps per revolution), or as a standard multi-turn with a range of  $2^{25}$  (12-bit (4096) words/turn + 13-bit (8192) turns). These encoders are used in a wide variety of position sensing applications for the measuring of angles and distances. Mechanical features include a 36 mm aluminum housing, a 6 mm stainless steel shaft, and precision ball bearings.

Complimentary quadrature square waves are available at 1024 steps per revolution and at 100 RPM (2 ms cycle time required). Call factory for details.

ISO  
9001  
CERTIFIED

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# SPECIFICATIONS

## ELECTRICAL

|                           |   |
|---------------------------|---|
| Clock input               | Via opto-coupler                                  |
| Clock frequency           | 100 kHz to 2 MHz                                  |
| Data update rate          | <100µsec  |
| Data output               | Line-driver according to RS 422                   |
| LSB step frequency        | Max. 100 kHz                                      |
| Transition accuracy @20°C | ± .35 degrees                                     |
| EMC                       | Certified according to EN 61000-6-2, EN 61000-6-4 |
| Supply voltage            | +5 VDC ±0.25 V or 10-30 VDC                       |
| Current consumption       | 100mA   |
| Output code format        | Gray code or Natural Binary                       |

## MECHANICAL

|                        |   |
|------------------------|---|
| Housing                | Stainless steel   |
| Bearing life           | 6 x 10 <sup>9</sup> revolutions (with 26 N radial or 13 N axial load)           |
| Moment of inertia      | £ 30 g-cm <sup>2</sup> (4.2 x 10 <sup>-4</sup> in-oz-s <sup>2</sup> )           |
| RPM                    | Max. 12,000 (continuous)  |
| Shock (IEC 68-2-27)    | £ 100g (half sine, 6 ms)  |
| Vibration (IEC 68-2-6) | £ 10g (10 Hz to 1,000 Hz)   |
| Max shaft loading      | Axial 40 N (4 lb), radial 110 N (25 lb)   |
| Friction torque        | £ 3 Ncm (4.2 in-oz) without shaft seals<br>£ 10 Ncm (14 in-oz) with shaft seals |
| Maximum weight, oz (g) | 5.3 (150)   |

## ENVIRONMENTAL

|                       |                                   |
|-----------------------|-----------------------------------|
| Operating temperature | - 30°C to + 85°C (-22°F to 185°F) |
| Storage temperature   | - 30°C to + 85°C (-22°F to 185°F) |
| Humidity              | 98 % (non-condensing)             |
| Casing side           | IP 54 Protection class (EN 60529) |
| Shaft side            | IP 64 Protection class (EN 60529) |

*As part of our continuous product improvement program these specifications are subject to change without notice.*

# SYNCHRONOUS SERIAL INTERFACE (SSI)

## DRIVER:

## TRANSFER:

## TRANSMISSION:

## PAIR LINES:

## INTERFACE:

Driver meets EIA standard RS 422: transmission rates up to 10 MBit/s

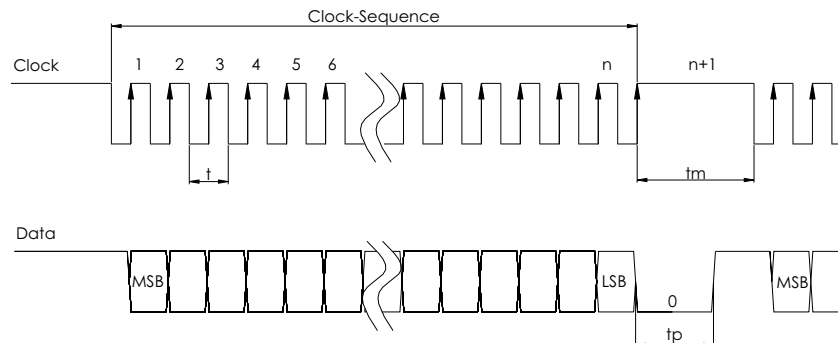
Transfer distance up to 1,200m

Balanced transmission provides high noise immunity

Shielded and twisted pair lines are essential to attain extremely high noise immunity

For a detailed description of the Synchronous-Serial Interface (SSI), refer to *Introduction to SSI*

### SINGLE SHIFT



$$tp < 20 \mu s; tm > 20 \mu s; t < tm$$

## ELECTRICAL INTERFACE

| Function            |     | DE-9P (CONN = S) | Wire color (CONN = P) |
|---------------------|-----|------------------|-----------------------|
| Clock -             | INP | 3                | Yellow                |
| Clock +             | INP | 2                | Green                 |
| Data +              | OUT | 6                | Grey                  |
| Data -              | OUT | 7                | Pink                  |
| Direction           | INP | 4                | Red                   |
| V = +5 V or 10-30 V | PWR | 5                | Brown                 |
| GND                 | PWR | 9                | White                 |
| Shield              |     | 1                | Shielding             |
| Preset              |     | 8                | Blue or Black         |

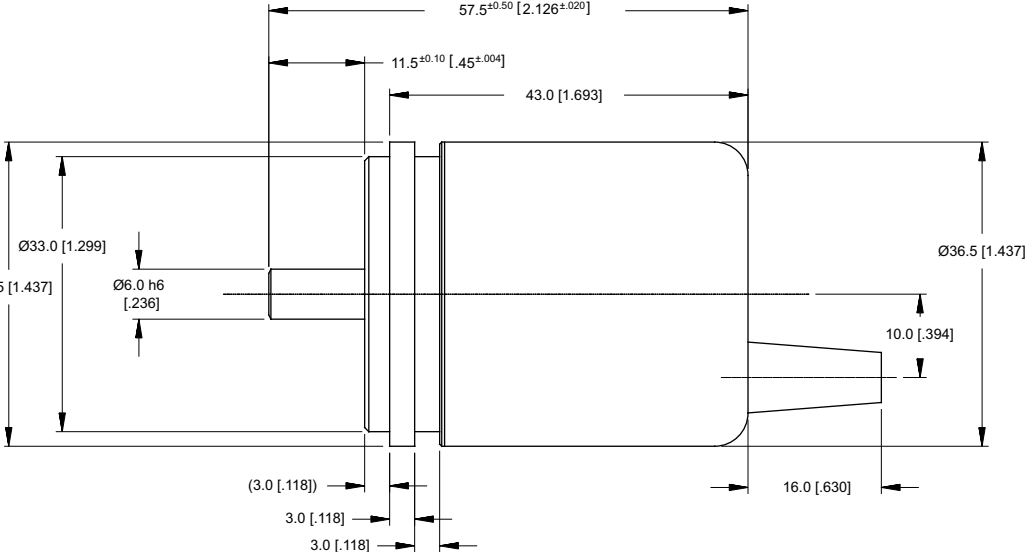
### PRESET FUNCTION

| Voltage Level                           | Function                                |
|---|---|
| 0 (Input = N.C. or GND)                 | Inactive                                |
| 1 (Input $\geq 10V$ / Input $\leq UB$ ) | Encoder value will set to 0 after 1 sec |
| Input Resistance                        | 10kOhm                                  |

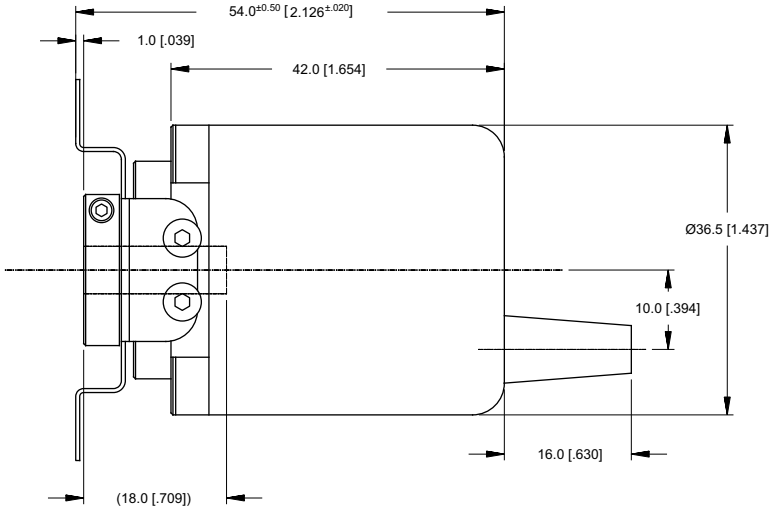
### COMPLIMENT FUNCTION (CW SHAFT END)

| Voltage Level                           | Function |
|---|----------|
| 0 (Input = N.C. or GND)                 | Up       |
| 1 (Input $\geq 10V$ / Input $\leq UB$ ) | Down     |
| Input Resistance                        | 10kOhm   |

## A36S BASE A



## A36S BASE B



# ORDERING INFORMATION

A36

|       |    |      |     |        |        |      |       |      |      |     |    |
|-------|----|------|-----|--------|--------|------|-------|------|------|-----|----|
|       |    |      |     |        |        |      |       |      |      |     |    |
| SHAFT | IN | CODE | RES | FORMAT | #TURNS | BASE | CABLE | EXIT | CONN | DIA | SF |

## SHAFT

**S** Solid shaft  
**B** Blind hollow-shaft

## BASE

**A** Clamp flange (SHAFT = S)  
**B** Blind hollow shaft (SHAFT = B)

## IN

**5** +5 VDC input voltage  
**R** 10-30 VDC

## CABLE

**##** Cable length, inches (02 to 99)  
**40** 40" Standard

## CODE

**B** Natural Binary  
**G** Gray code

## EXIT

**T** Top exit  
**S** Side exit

## RES

**12** 4096 words/turn

## CONN

**P** Pigtails (no connector)  
**S** DE-9P

## FORMAT

**S** SSI

## DIA

**06M** 6 mm shaft diameter

## #TURNS

**00** Single-turn  
**12** 4096  
**13** 8192

## SF

**#** Issued at time of order to cover special customer requirements  
**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.

