

GURLEY MODELS A19 & A20 ABSOLUTE ENCODERS

MOTION TYPE:

ROTARY

USAGE GRADE:

INDUSTRIAL

OUTPUT:

ABSOLUTE

MAX RESOLUTION:

20 BITS



MINIATURE HIGH-RESOLUTION ABSOLUTE ENCODER

The series **A19 & A20** are miniature single-turn absolute rotary encoders with optical reflective technology. This encoder is used in a wide variety of position-sensing applications for the measuring of angles and distances in very small envelopes, where high resolution is required.

In addition, the encoder features:

- Faster and more accurate than any resolver-based system
- Up to 20-bit resolution, SSI or BiSS outputs
- -40C to +85C extended operating temperature available
- Optical reflective technology
- 19-20mm diameter housing
- 3-4mm (0.125") diameter steel solid or blind hollow shaft

A19: ϕ 19-mm body; ribbon cable

A20: ϕ 20-mm body; round cable with shielded twisted pairs

ingenuity[®]@work

ISO
9001
CERTIFIED

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SPECIFICATIONS

	Units	Limiting Values	See Note
Mechanical Specifications			
Moment of Inertia	in-oz-s ² (g-cm ²)	5.7 x 10 ⁻⁶ (0.4)	
Starting Torque	in-oz (N x m)	0.07 (5 x 10 ⁻⁴)	
Radial Shaft Load	lb (N)	.067 (3)	
Axial Shaft Load	lb (N)	.067 (3)	
Bearing Arrangement		2 pre-loaded bearings	
Bearings		Grease lubricated and sealed	
Measuring Rotational Element		Etched chrome on glass disc	
Non-Operating Slew	RPM	10,000	
Shock 11 (ms)	g (m/s ²)	30 (300)	
Vibration (55-2000Hz)	g (m/s ²)	10 (100)	
Sealing		IP50	2
Acceleration	rad/s ²	3 x 10 ⁶	
Max. Operational Speed	RPM	10000	
Recommended Coupling	SCD		
Environmental Specifications			
Operating Temperature	°F (°C) °F (°C)	Standard is +32 to +158 (0 to +70) Extended is -40 to +185 (-40 to +85)	
Relative Humidity	%	90	1
Electrical Specifications			
Supply Voltage	VDC	4.7 to 5.3, 5.00 nominal	
Current Consumption	mA	≤ 120	
Output Code		Gray or binary	
Output Format		Up to 20-bit, SSI or BiSS-C	
Output Device		RS422	
Accuracy		+/-75 arc seconds	

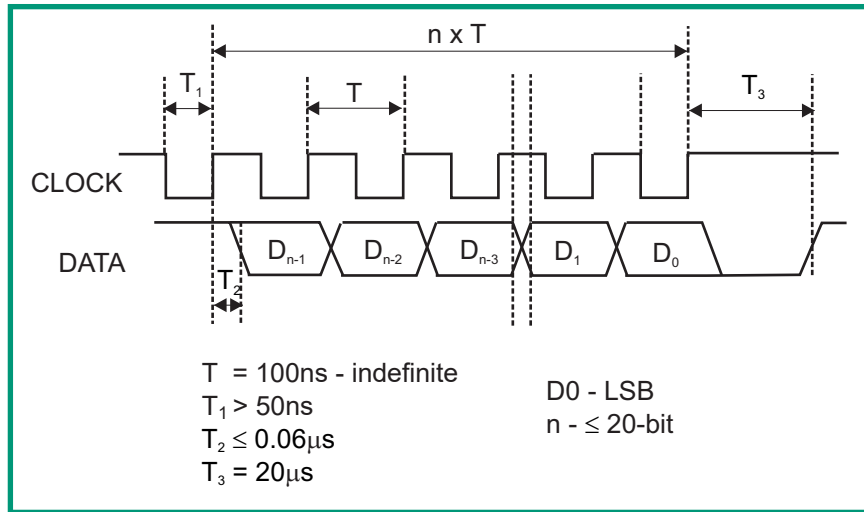
Notes

1. Non-condensing
2. IP level could be improved using o-rings & sealants as a custom feature

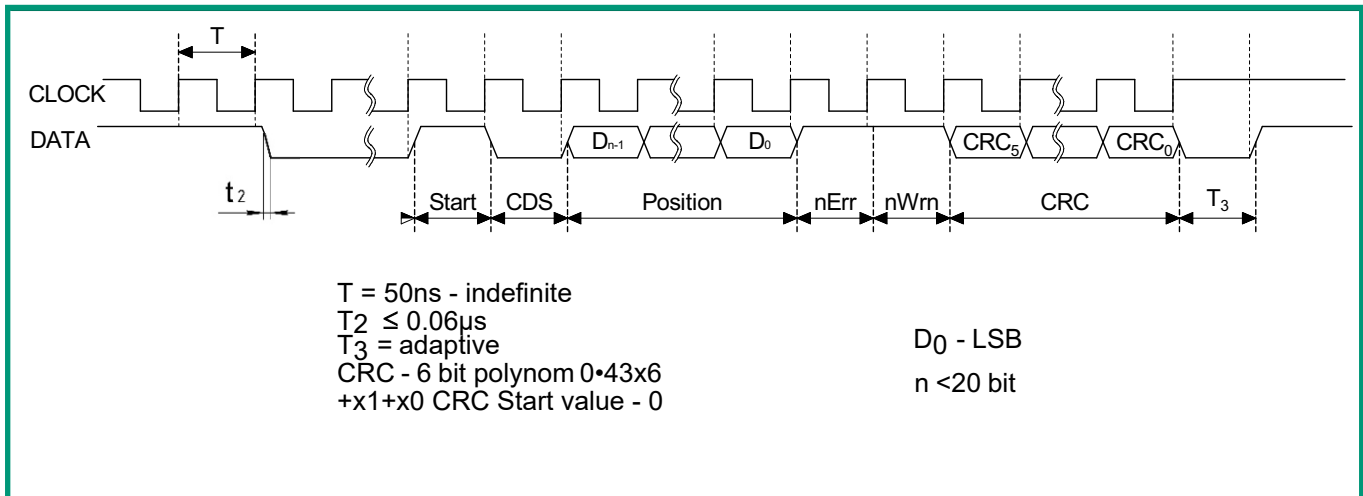
As part of our continuing product improvement program, all specifications are subject to change without notice.



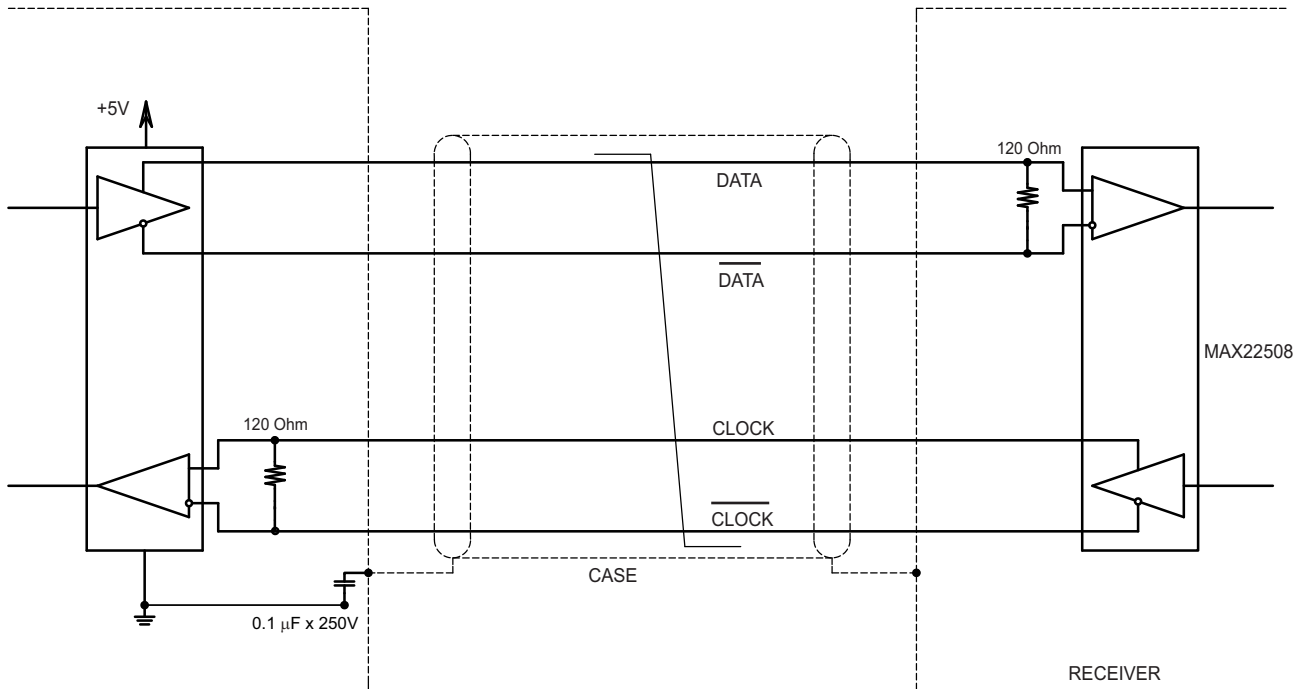
SSI Output



BiSS Output



SSI & BiSS CHANNEL



A19 - SSI Output Gray code or Binary - Ribbon Cable

Electrical Signal	Pin	Color
CASE	7	Gray
Clock	2	Gray
/ Clock	3	Gray
Data	4	Gray
/ Data	5	Gray
0V	8	Blue
+5V	1	Gray
n/a	6	Gray

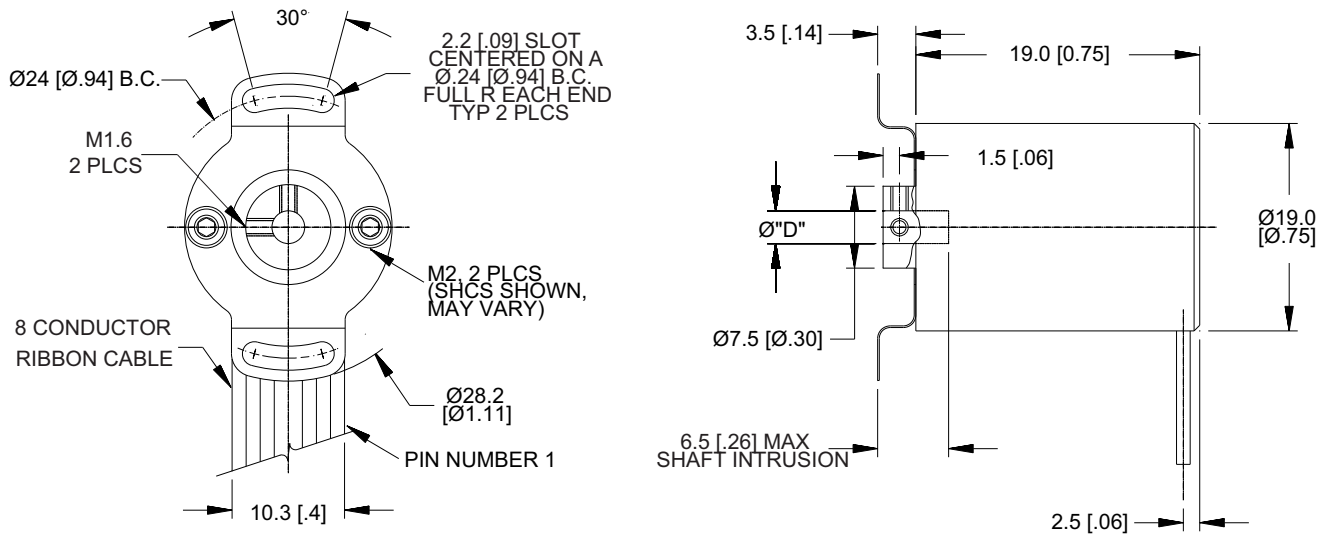
A20 - SSI or BiSS Outputs Binary code only - Round Cable

Electrical Signal	Pin	Color
CASE	1	Shield
Clock	2	Yellow
/ Clock	3	Brown
Data	6	Green
/ Data	7	Orange
0V	9	Black
+5V	5	Red



OUTLINE DIMENSIONS

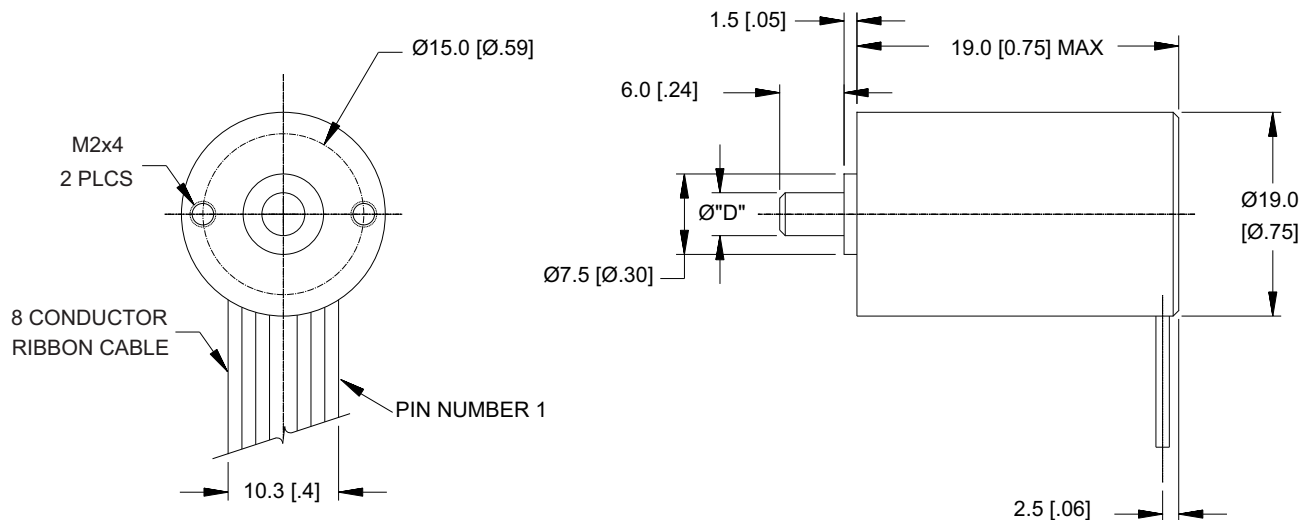
A19B (BASE CODE A)



Ø"D" TABLE		
"DIA" CODE	A19S/A20S	A19B
03M	Ø3mm h6	Ø3mm H7
04M	Ø4mm h6	N/A
02E	Ø0.125" ^{+0.000} / _{-.0003}	Ø0.125" ^{+0.005} / _{-.0000}

ALL DIMENSIONS IN MM [INCHES]

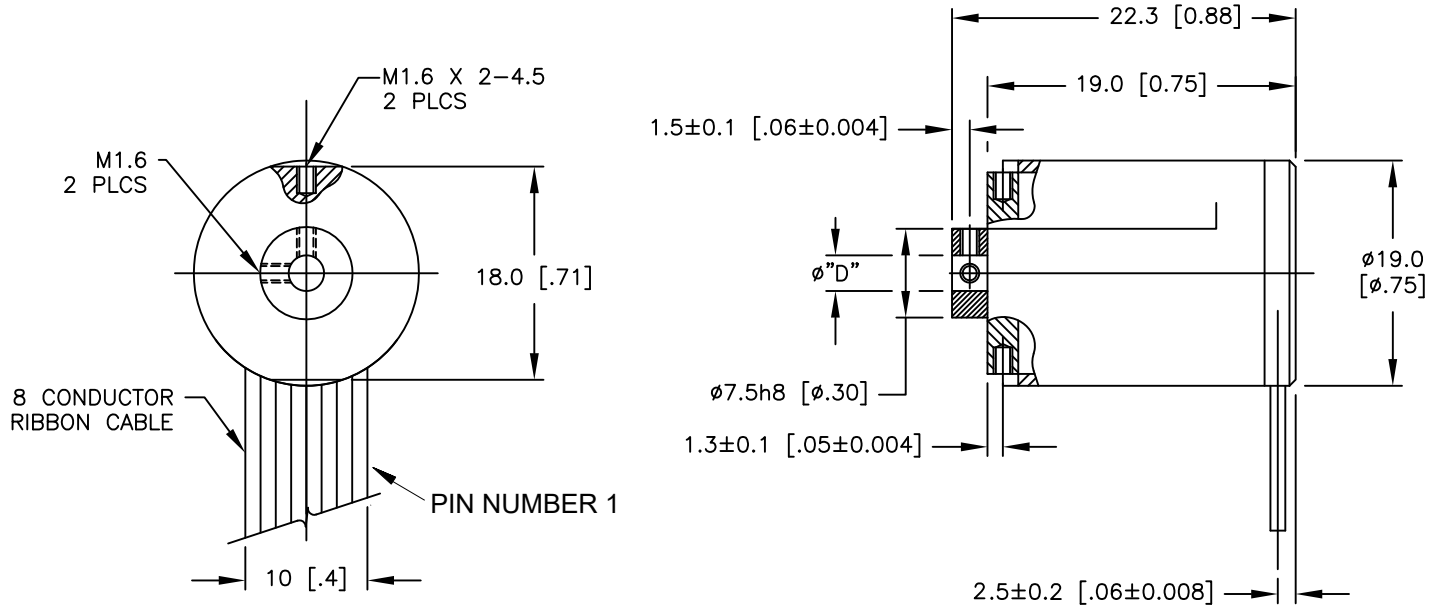
A19S (BASE CODE B)



Ø"D" TABLE		
"DIA" CODE	A19S/A20S	A19B
03M	Ø3mm h6	Ø3mm H7
04M	Ø4mm h6	N/A
02E	Ø0.125" ^{+0.000} / _{-.0003}	Ø0.125" ^{+0.005} / _{-.0000}

OUTLINE DIMENSIONS

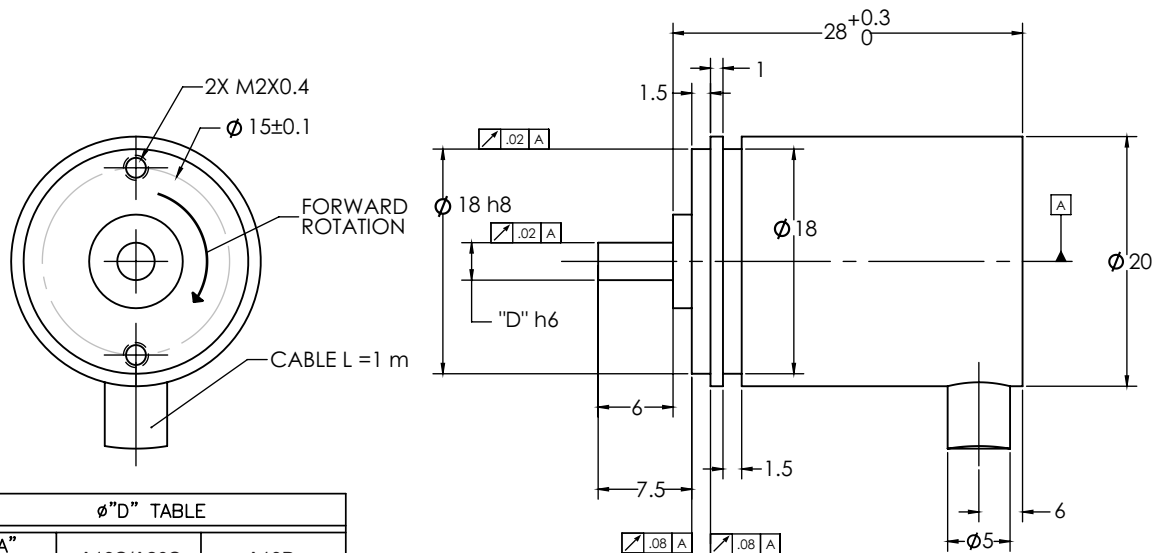
A19B (BASE CODE D)



"DIA" TABLE		
"DIA" CODE	A19S/A20S	A19B
03M	$\phi 3$ mm h6	$\phi 3$ mm H7
04M	$\phi 4$ mm h6	N/A
02E	$\phi 0.125$ " $\begin{smallmatrix} +.0009 \\ -.0003 \end{smallmatrix}$	$\phi 0.125$ " $\begin{smallmatrix} +.0005 \\ -.0000 \end{smallmatrix}$

ALL DIMENSIONS IN mm [INCHES]

A20S (BASE CODE C)



"DIA" TABLE		
"DIA" CODE	A19S/A20S	A19B
03M	$\phi 3$ mm h6	$\phi 3$ mm H7
04M	$\phi 4$ mm h6	N/A
02E	$\phi 0.125$ " $\begin{smallmatrix} +.0000 \\ -.0003 \end{smallmatrix}$	$\phi 0.125$ " $\begin{smallmatrix} +.0005 \\ -.0000 \end{smallmatrix}$

ORDERING INFORMATION

MODEL	SHAFT	RES	OF	OC	OD	V	TEMP	BASE	EXIT	CAB	CONN	DIA	SF

MODEL

- A19** ϕ 19-mm body, ribbon cable
- A20** ϕ 20-mm body, round, shielded cable

SHAFT - Shaft Type

- B** Blind hollow shaft (A19 only)
- S** Solid shaft

RES - Resolution

- | | |
|------------------|------------------|
| 08 8-bit | 15 15-bit |
| 09 9-bit | 16 16-bit |
| 10 10-bit | 17 17-bit |
| 11 11-bit | 18 18-bit |
| 12 12-bit | 19 19-bit |
| 13 13-bit | 20 20-bit |
| 14 14-bit | |

OF - Output format

- B** BiSS
- S** SSI

OC - Output code

- B** Binary (OF = **B** or **S**)
- G** Gray code (OF = **S** ONLY)

OD - Output device

- RS** RS Differential (RS422)

V - Input voltage

- 05** +5 Vdc

TEMP - Operating temperature

- S** 0C to +70C
- T** -40C to +85C

BASE - Base code

- A** Blind hollow, ext. face mount (A19)
- B** Face mount base (A19)
- C** Solid Shaft (A20)
- D** Blind hollow, ext. tether mount (A19)

EXIT - Cable exit

- S** Side-exit cable

CAB - Cable length, inches

- 18** Standard

CONN - Connector

- P** Pigtails (no connector)
- R** DE-15P
- S** DE-9P
- Y** 8-pos ribbon cable socket connector (FCI71600-100LF or equal)

DIA - Shaft diameter

- 02E** 1/8" (SHAFT = **S** or **B**)
- 03M** 3 mm (SHAFT = **S** or **B**)
- 04M** 4 mm (SHAFT = **S** ONLY)

SPEC - Special features

- #** Issued at time of order to cover special customer requirements
- N** No special features

ACCESSORIES (order separately)

- SCD-xxx-xxx** Shaft coupling (see separate data sheet)

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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