

GURLEY SERIES R176H ROTARY INCREMENTAL ENCODERS

MOTION TYPE:

ROTARY

USAGE GRADE:

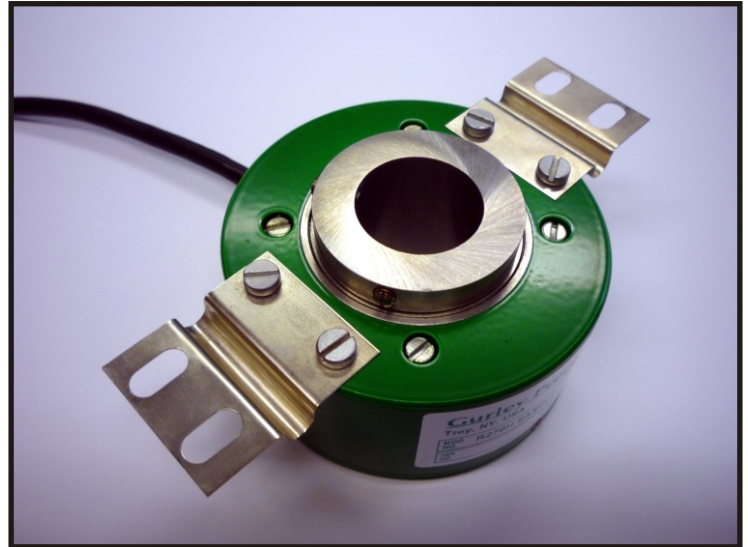
INDUSTRIAL

OUTPUT:

INCREMENTAL

MAX RESOLUTION:

1,000,000 COUNTS/REV.



STANDARD SIZE - HIGH PERFORMANCE

The Series **R176H** is a family of optical incremental encoders designed for industrial-grade applications that require thru-hollow shafts, high resolution and high accuracy. All R176Hs share these features:

- Resolutions up to 250,000 cycles/rev (1,000,000 counts/rev) at 0 to 70°C and 50,000 cycles/rev (200,000 counts/rev) at -40 to 100°C
- LED illumination for long life (>100,000 hours)
- Differential photo-detectors for signal stability
- Zero index signal
- IP64 sealing for harsh environments

The Series R176H is available in two basic models:

Model R176H base code A: Hollow shaft configuration without integral coupling

Model R176H base code B: Hollow shaft configuration with integral coupling

ingenuity[®]@work

ISO
9001
CERTIFIED

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R176 SPECIFICATIONS

	See Note	Model R176
Maximum line count on disc		5000
Maximum cycles/rev (quad sq waves)		250,000
Max counts/rev (after quad decode)		1,000,000
Internal square wave interpolation		1X, 2X, 5X, 10X, 25X, 50X
Encoder error, \pm arcsec	1	15, 30 for linecounts >2,500; 75,150 <2,500
Maximum output frequency, kHz		
1X square waves		200
2X square waves		400
5X square waves		1500
10X – 50X square waves		1500
Starting torque, Nm		0.07 – base code A; 0.05 – base code B
Moment of inertia, kgm^2		$4 \times 10^{-5} \text{ kgm}^2$
Maximum acceleration, rad/s^2		3×10^6
Operating temperature, $^{\circ}\text{C}$	2	0 to 70
Optional temperature, $^{\circ}\text{C}$	3	-40 to 100
Humidity, % rh, non-condensing		98
Shock		$<300 \text{ m/sec}^2$, 10 ms
Vibration		$<100 \text{ m/sec}^2$, 55-2000 Hz
Maximum weight, kg		.55 kg
Sealing		IP64
Bearings		Grease-lubricated and sealed
Maximum radial shaft load, N		20 with base A
Maximum axial shaft load, N		10 with base A
Maximum radial shaft misalignment, mm		+/- 0.1 with base code B
Maximum axial shaft misalignment, mm		+/- 1 with base code B

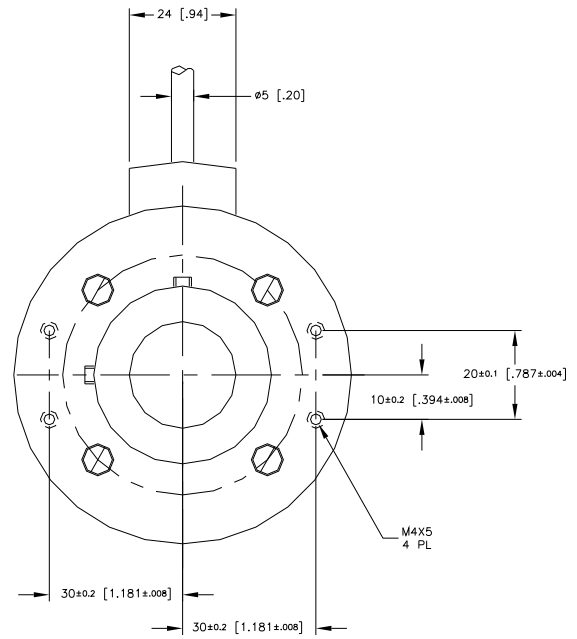
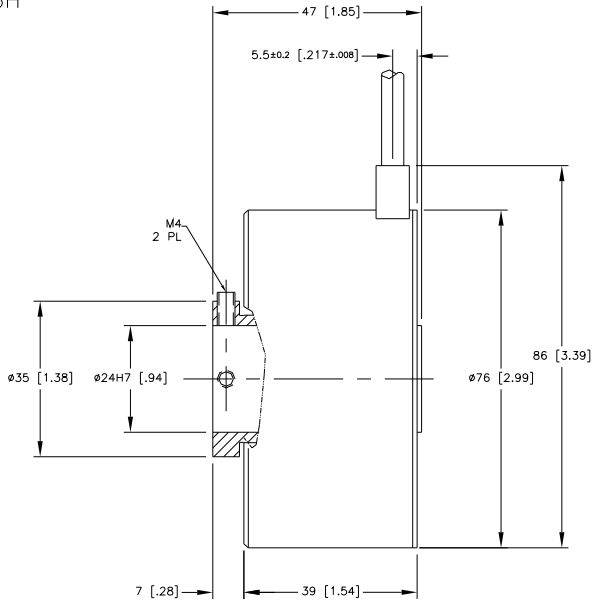
NOTES:

1. Total Optical Encoder Error is the algebraic sum of *Instrument Error* + *Quadrature Error* + *Interpolation Error*. Typically, these error sources sum to a value less than the theoretical maximum. Accuracy is guaranteed at 20°C.
2. For encoders with resolutions up to 250,000 cycles.
3. For encoders with resolutions to 50,000 cycles/rev.



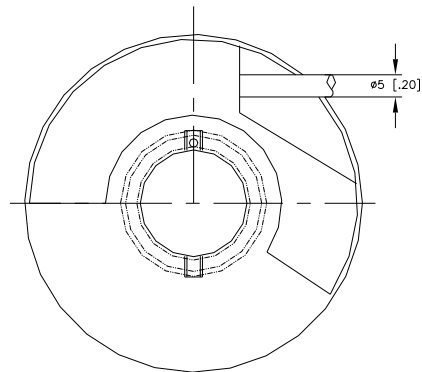
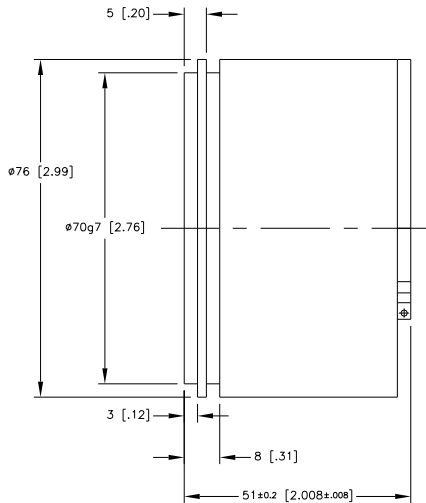
DIMENSIONS

R176H



BASE CODE A

DIMENSIONS ARE mm [INCHES]



BASE CODE B



INPUT POWER

Standard: +5 ±5% VDC @100 mA max.

Optional: +10-30 VDC

OUTPUTS

Output code L is an EIA/RS-422 balanced differential line driver. May be used single-ended for TTL-compatible inputs.

Output code M is buffered sinusoid differential signals (1 V p-p)

INDEX OPTIONS

Index is available in two formats:

Full cycle wide ±180° electrical (output code M) or quarter-cycle wide gated with high states of A and B (L)

	CONN. CODE	Q	R	S	P
	CONN. TYPE:	DA-15P	DE-15P	DE-9P	None
	FUNCTION:	PIN #	PIN #	PIN #	Color
Square Wave Output (output code L)	A	8	8	4	Yellow
	/A	7	7	8	Brown
	B	5	5	3	Green
	/B	4	4	7	Orange
	IND	2	2	2	Blue
	/IND	1	1	6	White
	+V	10	10	5	Red
	COMM	13	13	9	Black
	CASE	9	9	1	Shield
Sinusoid Output (output codes M and P)	SIN	9			Yellow
	COS	11			Green
	IND	5			Blue
	+V	4			Red
	COMM	15			Black
	CASE	8			Shield
	MATING CONN.	M01	M05	M06	—

ORDERING INFORMATION

MODEL	SHAFT	LINES	IND	V	OUT	INTERP	BASE	TEMP	CAB	EXIT	CONN	DIA	SPEC

MODEL

R176 standard

SHAFT - Shaft type

H Hollow shaft

LINES - Disc line count

**00250, 00500, 01000, 01024,
01250, 02000, 02048, 02500,
03600, 04096, 05000**

Consult factory for other line counts.

IND - Index format

F Full cycle (M output)
Q Quarter cycle gated (L output)
D Distance Coded Reference Mark

V - Input voltage

5 5 volts dc
R 10-30 volts dc (L = 1X to 10X only)

OUT - Output format

M buffered sinusoids differential
L RS-422 Differential line driver

INTERP - Interpolation factor

01 1X (OUT = M)
01, 02, 05, 10, 25, 50X (OUT = L)

Accessories (order separately)

M01 DA-15S (mates with CONN code **Q**)
M05 DE-15S (mates with CONN code **R**)
M06 DE-9S (mates with CONN code **S**)

BASE - Base

A Without integral coupling
B With integral coupling

TEMP - Temperature

N 0 to 70 Celsius
T -40 to 100 Celsius (limited to 50,000 cycles/rev)

CAB - Cable length, inches

18 Standard

EXIT - Cable exit or connector location

S Side

CONN - Connector

P Pigtails (no connector)
Q DA-15P
R DE-15P
S DE-9P

DIA - Shaft diameter

24M 24 mm

SPEC - Special features

X Issued at time of order to cover special customer requirements
N No special features

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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