Quantum Devices

QPhase™ Encoders

QR145

DESIGN FEATURES

- 500 kHz fundamental frequency response
- Low profile, 0.87" assembled height
- Bearing design simplifies encoder attachment
- Resolutions up to 5000 lines per revolution direct read
- 4, 6 or 8 pole commutation[1]
- Conductive carbon fiber housing
- 1.575", 1.812" bolt circle or size 15 resolver mounting
- Optional IP66 housing
- Through bore sizes up to 0.375" (10 mm) diameter
- High noise immunity
- Cost competitive with modular encoders

APPLICATIONS

- Servo Motors
- Robotics
- Medical
- Packaging
- XY Gantry

Quantum Devices, Inc. Model QR145 provides an improved feedback solution in applications typically using modular encoders. With an overall height of only 0.87" and the stability of a bearing encoder design, the model QR145 can provide significant performance upgrades in applications limited by traditional modular encoder solutions. Outputs consist of a quadrature with reference pulse and three-phase commutation, which can be configured with either the industrial standard 5 volt RS-422 line driver or the 5 to 26 volt OL7272 line driver. A flexible spring mount allows for much greater tail shaft run out than can be tolerated by modular encoder designs, plus it provides 30 degrees of rotation for commutation timing. A housing constructed of conductive carbon fiber composite provides the EMI shielding of an all metal housing and the performance of a lightweight robust assembly.

QR145	-	05/05	-	1000	-	6	-	01	-	T3	-	01	-	02
		Voltage		Resolution		Commutation		Output		Bore Size		Mounting		Index Gating

Configuration Options:

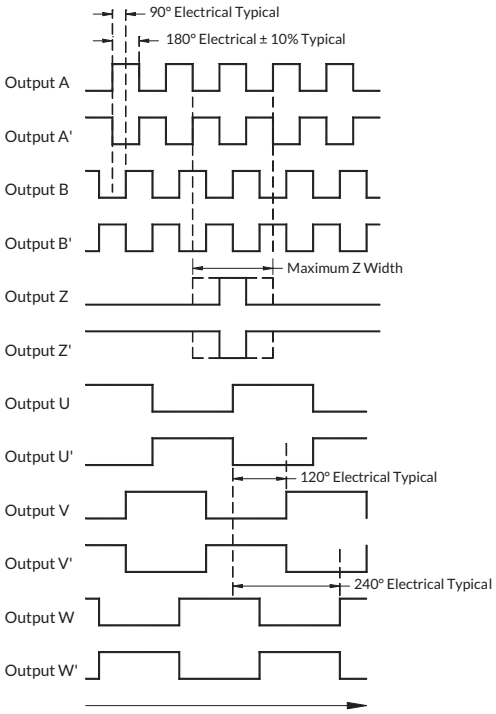
Voltage	Resolution[1]	Commutation[1]	Output[1]	Bore Size	Mounting	Index Gating
05/05 = 5 VDC 05/26 = 5-26 VDC	120, 200, 250, 256, 360, 500, 512, 600, 635, 800, 1000, 1024, 1250, 2000, 2048, 2500, 3000, 3600, 4096, 5000	0 = No Comm 4 = 4 Pole 6 = 6 Pole 8 = 8 Pole	01 = Line Driver 02 = 5-26V DC Line Driver 03 = TTL 04 = Line Driver ABZ / Open Collector UVW	T1 = 0.250" T2 = 0.3125" T3 = 0.375" T4 = 6 mm T5 = 8 mm T6 = 10 mm T11 = 5 mm T12 = 4 mm T18 = 0.1875"	01 = 1.812" 02 = Size 15 Resolver 03 = 1.812" IP66 Sealed Housing 04 = 1.575" 06 = Inverted 1.575" 07 = Inverted 1.812"	00 = Ungated 01 = 180° gated to A 02 = 90° gated to A & B

ISO 9001
CERT. NO. FM 52711

Note:
1.) Consult factory for configuration options not shown (e.g. resolution, commutation, output, etc.)

Quantum Devices, Inc.
112 Orbison St., P.O. Box 100
Barneveld, WI 53507
(608) 924-3000
qdisales@quantumdev.com

OUTPUT WAVEFORMS



Clockwise Shaft Rotation as Viewed Looking at the Encoder Face *(see figure below)*

QR145 WIRING DIAGRAM

Red – Vcc	Violet – Output U
Black – Common	Gray – Output U´
Brown – Output A	Brown/White – Output V
White – Output A´	Red/White – Output V´
Blue – Output B	Orange/White – Output W
Green – Output B´	Yellow/White – Output W´
Orange – Output Z	Black/White – Case Ground
Yellow – Output Z´	Drain Wire – Cable Shield

Note: *TTL output (Output option 03) consists of Vcc, Common, Case Ground, Cable Shield and Outputs A, B, Z, U, V & W wires only*

ELECTRICAL SPECIFICATIONS

Input Voltage	5 VDC ± 5% or 5-26 VDC
Input Current Requirements	125 mA typical @ 5 VDC plus interface loads
Input Ripple	2% peak to peak @ 5 VDC
Output Circuits	01 = 26C31 line driver (RS-422) 02 = OL7272 high voltage line driver 03 = TTL output (single-ended) 04 = ABZ 26C31 line driver, UVW open collector
Incremental Output Format	Quadrature with A leading B for CW rotation Index pulse centered over A for 2500 line count and below Index pulse true over A and B high for 2500 line count and above
Max Operating Frequency	500 kHz
Symmetry	180° electrical ± 10% typical
Minimum Edge Separation	54° electrical
Commutation Format	Three phase 4, 6 or 8 poles (other pole counts upon request)
Commutation Accuracy	± 1° mechanical

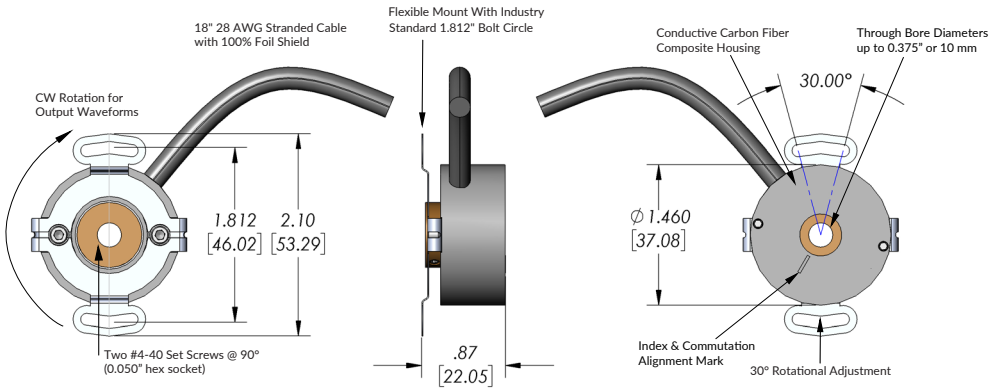
ENVIRONMENTAL SPECIFICATIONS

Storage Temperature	-40 to 125°C
Operating Temperature	-20 to 100°C typical -20 to 120°C optional**
Humidity	98% non-condensing
Vibration	20 g's @ 50 to 500 CPS
Shock	50 g's @ 11 ms duration

MECHANICAL SPECIFICATIONS

Maximum Shaft Speed	8000 RPM
Bore Diameter (Tolerance)	0.1875", 0.250", 0.3125", 0.375", 4 mm, 5 mm, 6 mm, 8 mm, 10 mm (+0.0005/-0.0000")
Allowable Shaft Runout	0.007" TIR
Axial Shaft Movement	± 0.030"
Housing	Carbon fiber composite (case ground via cable)
Housing Volume Resistivity	10^{-2} ohm·cm
Termination	15 conductor cable, 28 AWG 18" long 9 conductor cable for non-commutated and TTL outputs
Mounting	1.575", 1.812" bolt circle or size 15 resolver
Moment of Inertia	1.5 x 10^{-4} oz·in·s²
Acceleration	1 x 10^{5} radians/s²
Accuracy	± 1.0 arc minute

***Contact factory for more information*



**Quantum Devices, Inc. reserves the right to make changes in design, specifications and other information at any time without prior notice.*

REV. 200520

ISO 9001
CERT. NO. FM 52711

Quantum Devices
112 Orbison St., P.O. Box 100
Barneveld, WI 53507
(608) 924-3000
qdisales@quantumdev.com
www.quantumdev.com