Quantum Devices

QPhase™ Encoders

QR200

DESIGN FEATURES

- 500 kHz fundamental frequency response
- Low profile, 0.93" 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
- 1.812", 2.375" bolt circle or size 21 resolver mounting
- Through bore sizes up to 0.625" diameter
- High noise immunity
- RoHS Construction

Quantum Devices, Inc. Model QR200 provides an improved feedback solution in applications typically using modular encoders. With an overall height of 0.93" and the stability of a bearing encoder design, the model QR200 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.

QR200	-	05/26	-	1000	-	6	-	02	-	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	500, 512, 1000, 1024, 2000, 2048, 2500, 4096, 5000, 8192[2], 10000[2]	0 = No Comm 4 = 4 Pole 6 = 6 Pole 8 = 8 Pole	01 = Line Driver 02 = 5-26 VDC Line Driver 03 = TTL 04 = Line Driver ABZ / Open Collector UVW	T3 = 0.375" T5 = 8 mm T7 = 0.4375" T8 = 0.500" T9 = 0.625" T10 = 12 mm T14 = 14 mm	01 = 2.375" 02 = Size 21 Resolver 03 = 1.812"	00 = Ungated[3] 01 = 180° gated to A 02 = 90° gated to A & B

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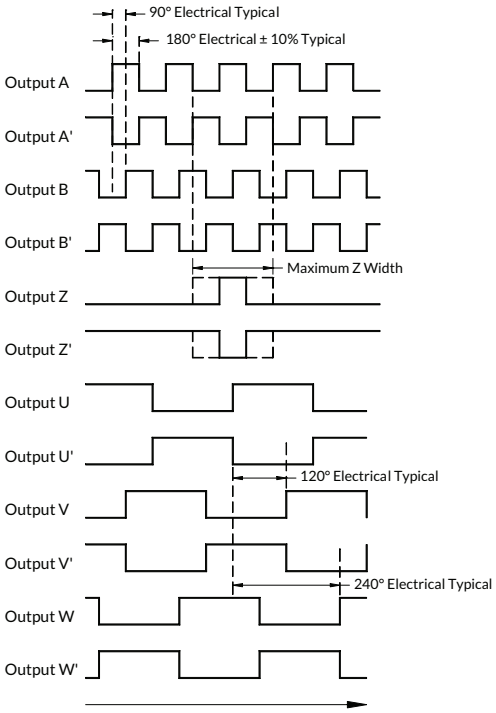
Note:
1.) Consult factory for configuration options not shown (e.g. resolution, commutation, output, etc.)
2.) 2x interpolated resolution
3.) Index gating option 00 not available with 2x interpolated resolution

OUTPUT WAVEFORMS



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

QR200 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

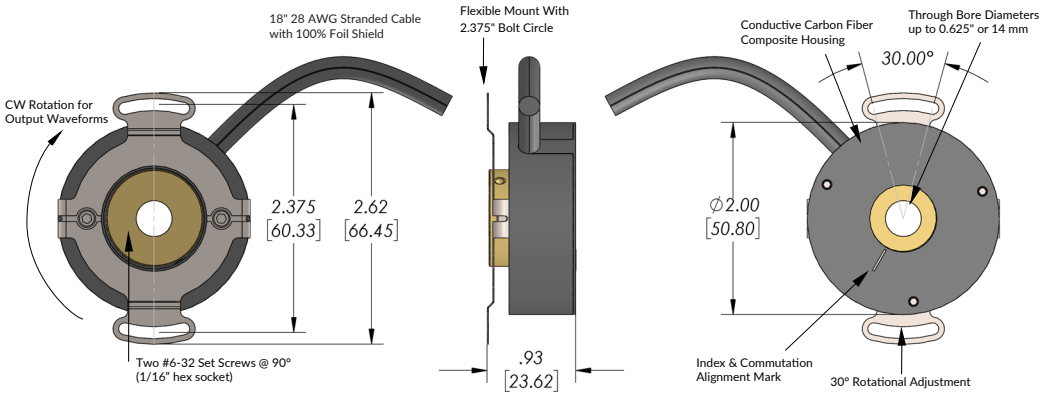
ENVIRONMENTAL SPECIFICATIONS

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)	0.375", 0.4375", 0.500", 0.625", 8 mm, 12 mm, 14 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	1.812", 2.375" bolt circle or size 21 resolver
Moment of Inertia vs. Bore Diameter	Ø0.375 (6.5 x 10^{-4} oz·in·s²), Ø0.500 (6.0 x 10^{-4}oz·in·s²), Ø0.625 (5.1 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.*

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