

## 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<sup>1</sup>
- 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.



### Configuration Options:

Voltage	Resolution <sup>1</sup>	Commutation <sup>1</sup>	Output <sup>1</sup>	Bore Size	Mounting	Index Gating
05/05 = 5 VDC 05/26 = 5-26 VDC	500, 512, 1000, 1024, 2000, 2048, 2500, 4096, 5000, 8192 <sup>2</sup> , 10000 <sup>2</sup>	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 <sup>3</sup> 01 = 180° gated to A 02 = 90° gated to A & B

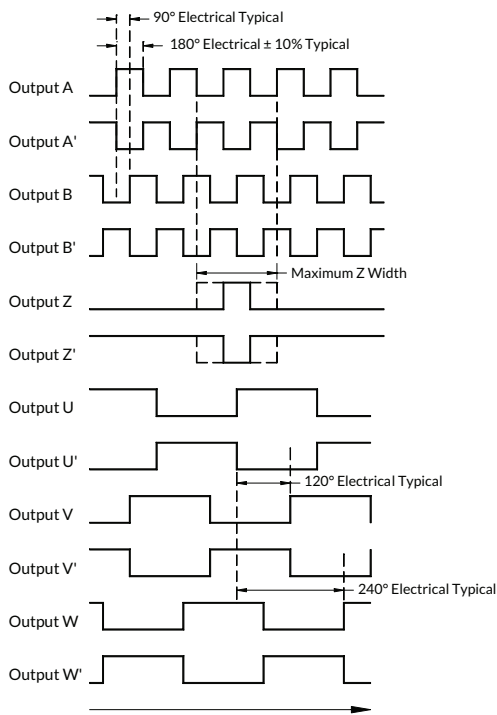
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### Note:

- 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

**ISO 9001**  
CERT. NO. FM 52711

## 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 $\pm$ 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 $\pm$ 10% typical
Minimum Edge Separation	54° electrical
Commutation Format	Three phase 4, 6 or 8 poles (other pole counts upon request)
Commutation Accuracy	$\pm$ 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	$\pm$ 0.030"
Housing	Carbon fiber composite (case ground via cable)
Housing Volume Resistivity	10 <sup>-2</sup> 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	$\varnothing$ 0.375 (6.5 x 10 <sup>-4</sup> oz-in-s <sup>2</sup> ), $\varnothing$ 0.500 (6.0 x 10 <sup>-4</sup> oz-in-s <sup>2</sup> ), $\varnothing$ 0.625 (5.1 x 10 <sup>-4</sup> oz-in-s <sup>2</sup> )
Acceleration	1 x 10 <sup>5</sup> radians/s <sup>2</sup>
Accuracy	$\pm$ 1.0 arc minute

\*\*Contact factory for more information

