

## QDH20

### DESIGN FEATURES

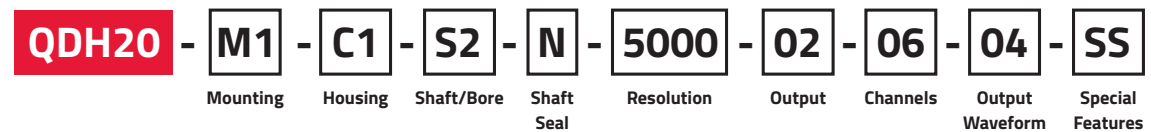
- 500 kHz fundamental frequency response
- High operating temperature (100°C)
- Resolutions up to 5000 lines per revolution direct read
- Flange and servo mount options
- Solid shaft sizes up to 10 mm diameter
- Blind bore sizes up to 0.625" diameter
- High noise immunity

### APPLICATIONS

- Motion control feedback
- Machine control
- Process control
- Elevator controls
- Agricultural machinery
- Textile equipment
- Robotics
- Food processing
- Conveyors
- Material handling



Quantum Devices, Inc. Model QDH20 provides an improved feedback solution in applications typically using a standard size 20 package. The QDH20 provides encoder feedback in standard industrial mounting configurations with superb mechanical and environmental protection. Outputs consist of a quadrature A & B with reference pulse Z as a standard feature. The output can be configured with either the 5 to 26 volt OL7272 line driver or open collector outputs. The QDH20 features two heavy-duty bearings holding the output shaft, and two more bearings along with an integral flexible spring mount to isolate the working pieces of the encoder from mechanical stresses.



#### Configuration Options:

Mounting	Housing	Solid Shaft	Resolution <sup>1</sup>	Output <sup>1</sup>	Channels <sup>1</sup>	Output Waveform <sup>1</sup>
M1 = Size 20 Flng w/ 1.181" F Pilot M2 = Size 20 Flng w/ 1.250" M Pilot M3 = Size 20 Servo w/ 1.181" F Pilot M4 = Size 20 Servo w/ 1.250" M Pilot M5 = Size 25 Flng w/ M Pilot M6 = Size 25 Servo w/ M Pilot F1 = Blind Bore 2.25" Flex Mount	C1 = Radial 10 Pin C2 = Radial 7 Pin C3 = Radial 6 Pin C4 = Radial Wire Gland C5 = Axial 10 Pin C6 = Axial 7 Pin C7 = Axial 6 pin C8 = Axial Wire Gland	S2 = 0.375" S3 = 10 mm S4 = 0.250"  <b>Blind Bore</b> H5 = 0.375" H6 = 0.500" H7 = 0.625"	120, 200, 250, 256, 360, 500, 512, 600, 635, 800, 1000, 1024, 1250, 2000, 2048, 2500, 3000, 3600, 4096, 5000	02 = Line Driver 04 = Open Collector	01 = Single A 02 = Dual AB 03 = Dual AB w/Z 04 = Single A w/ A' 05 = Dual AB w/ Comp. A'B' 06 = Full Comp. AA' BB' ZZ'	01 = LD Out, Z gated to B' 02 = OC Out, Ungated Z 03 = LD Out, Z gated to A 04 = OC Out, Ungated Z

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

**ELECTRICAL SPECIFICATIONS**

Input Voltage	4.75 to 26 VDC
Input Current Requirements	70 mA typical @ 5 VDC plus interface loads
Input Ripple	2% peak to peak @ 5 VDC
Line Driver Output Circuits	OL7272 high voltage line driver: VOL = 0.5 V max @ 20 mA sink VOH = Vcc-0.8 V @ 20 mA source RS-422 compatible @ 20 mA source
Open Collector Output Circuits	Sink up to 100 mA
Incremental Output Format	Quadrature outputs with index pulse See waveform reference chart for timing and gating options
Accuracy	±1.0 arc minute
Max Operating Frequency	500 kHz
Symmetry	180° electrical ± 10% typical
Minimum Edge Separation	67° electrical at 100 kHz
Code	Incremental
Rise Time	Less than 1 μs
Electrical Protection	Reverse protected to 0.6 A cont., 4 A for 1μs OL7272 outputs over voltage and short circuit protected

**ENVIRONMENTAL SPECIFICATIONS**

Storage Temperature	-40 to 125°C
Operating Temperature	-20 to 100°C typical
Humidity	98% non-condensing
Vibration	20 g's @ 50 to 500 CPS
Shock	50 g's @ 11 ms duration
IP Rating	IP66 solid shaft, IP64 blind bore

**MECHANICAL SPECIFICATIONS**

Maximum Shaft Speed	8000 RPM
Blind Bore Diameter (Tolerance)	0.375", 0.500", 0.625" (+0.0006/-0.0000")
Solid Shaft Diameter (Tolerance)	0.250", 0.375", 10 mm (+0.0000/-0.0004")
Allowable Shaft Runout	0.001" TIR
Bearings	Precision ABEC double shielded
Shaft Material	303 stainless steel
Bearing Life	1.5 x 10 <sup>9</sup> at rated load
Moment of Inertia	3.4 x 10 <sup>-4</sup> oz·in·s <sup>2</sup>
Acceleration	1 x 10 <sup>5</sup> radians/s <sup>2</sup>
Starting Torque	1.0 in·oz max
Radial Shaft Loading	40 lb for rated bearing life, 80 lb max
Axial Shaft Loading	40 lb for rated bearing life, 80 lb max
Housing	Anodized aluminum
Weight	13 oz typical
Termination	Radial Exit: 10, 7 & 6 pin MS, wire gland with 24" cable Axial Exit: 10, 7 & 6 pin MS, wire gland with 24" cable
Mounting	Size 20 Flange w/1.181" Female Pilot Size 20 Flange w/1.250" Male Pilot Size 20 Servo w/1.181" Female Pilot Size 20 Servo w/1.250" Male Pilot Size 25 Flange and Pilot Size 25 Servo and Pilot 2.250" bolt circle flex mount

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## INCREMENTAL OUTPUT TERMINATIONS

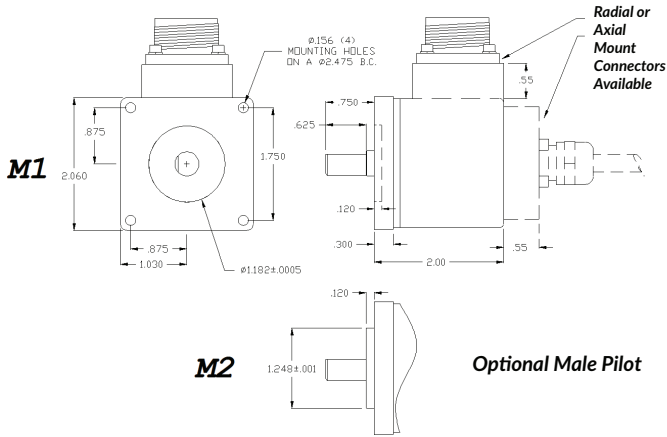
HOUSING OPTION		NO. OF CHANNELS IN MODEL NUMBER				
6 Pin	7 Pin	A	AB	ABZ	A $\bar{A}$	A $\bar{A}$ B $\bar{B}$
E	A	Ch. A	Ch. A	Ch. A	Ch. A	Ch. A
D	B		Ch. B	Ch. B		Ch. B
C	C			Ch. Z	Ch. $\bar{A}$	Ch. $\bar{A}$
B	D	Vcc	Vcc	Vcc	Vcc	Vcc
F	E					Ch. $\bar{B}$
A	F	Ground	Ground	Ground	Ground	Ground
	G	Case Ground	Case Ground	Case Ground	Case Ground	Case Ground

10 Pin	Wire Gland	A $\bar{A}$ B $\bar{B}$ Z $\bar{Z}$
A	Brown	Ch. A
B	Blue	Ch. B
C	Orange	Ch. Z
D	Red	Vcc
E		
F	Black	Ground
G	White/Black	Case Ground
H	White	Ch. $\bar{A}$
I	Green	Ch. $\bar{B}$
J	Yellow	Ch. $\bar{Z}$
	Drain	Cable Shield

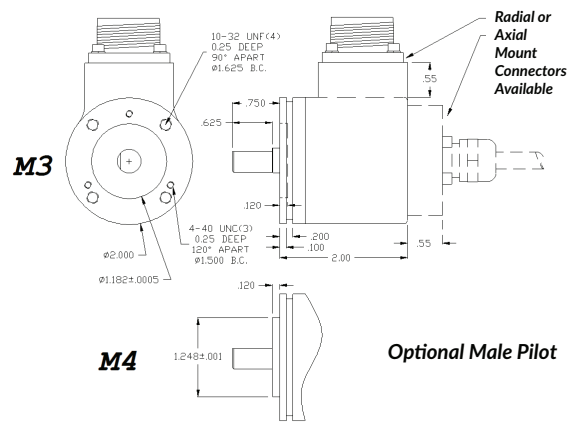
**Note:** The Housing option and Channels option will determine output terminations

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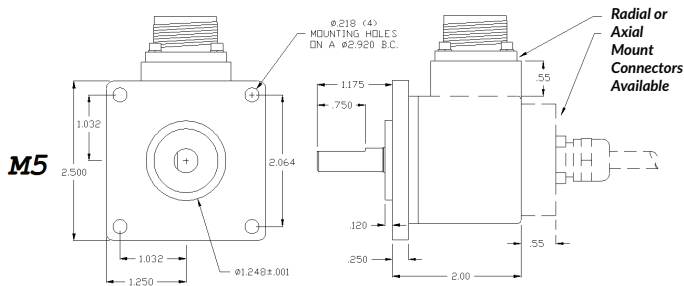
**Size 20 Flange**



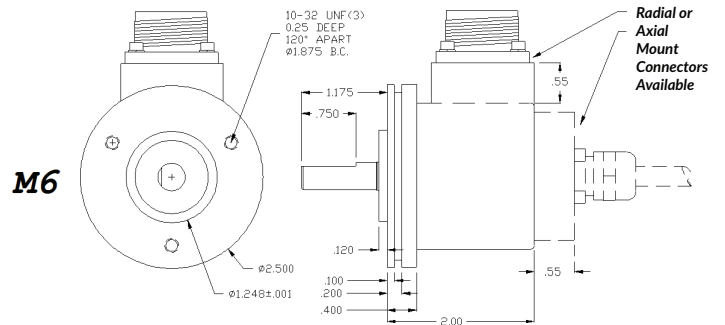
**Size 20 Servo**



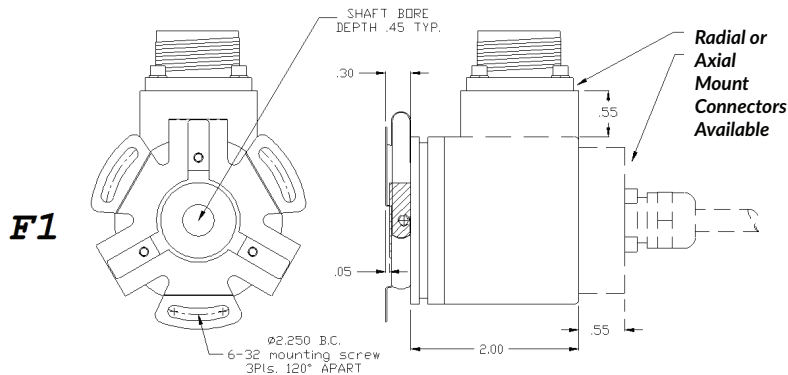
**Size 25 Flange**



**Size 25 Servo**

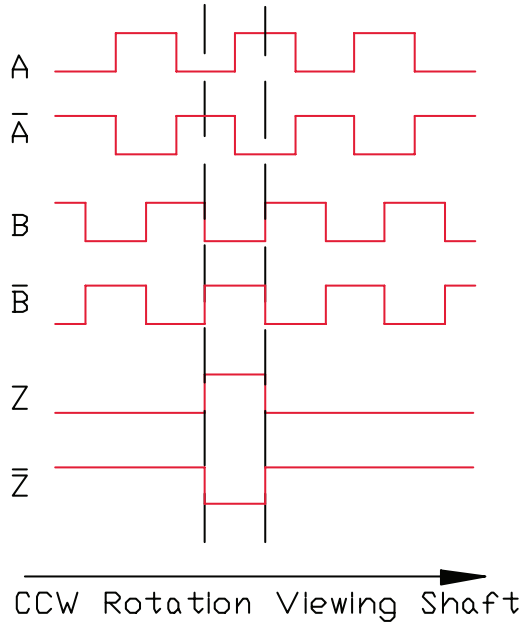


**Flex Mount Blind Bore**

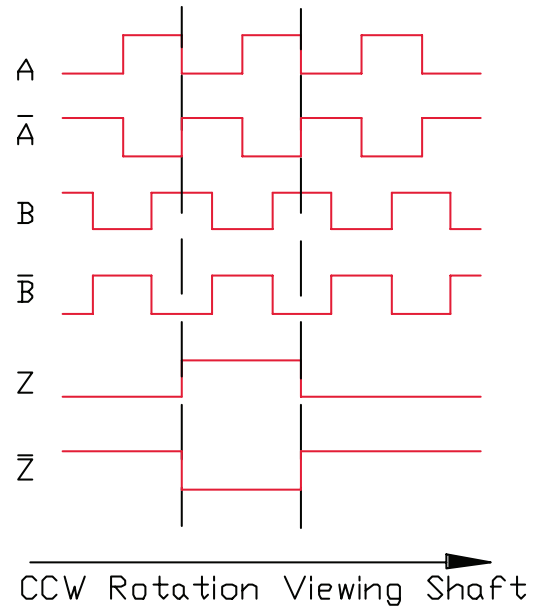


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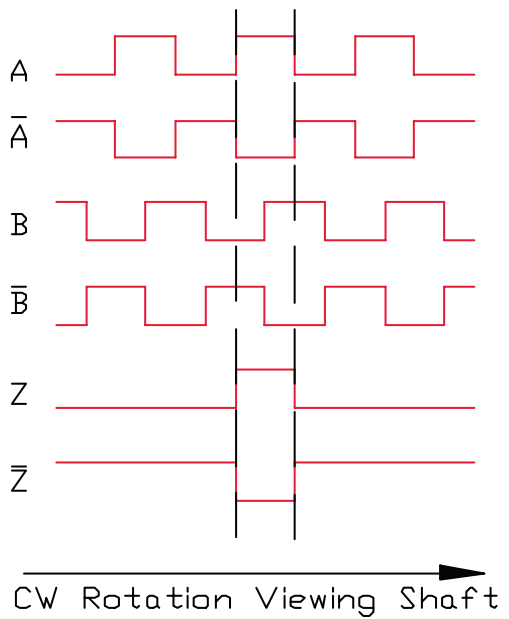
**OUTPUT WAVEFORMS**



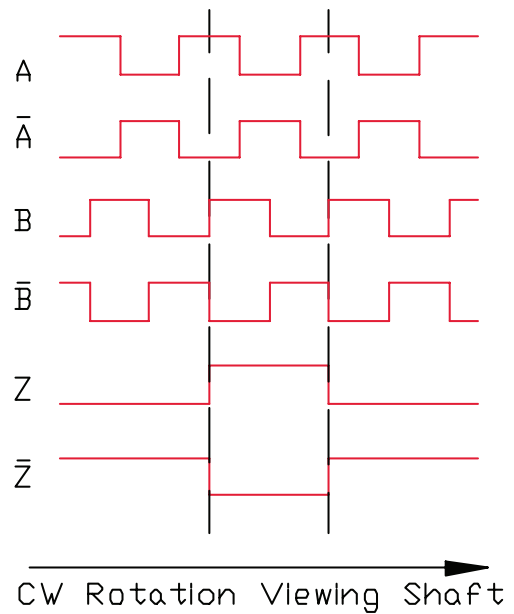
**01** (OL7272 Output with Z Gated to B')  
See Waveform Above



**02** (Open Collector Output with Ungated Z Centered on B') See Waveform Above



**03** (OL7272 Output with Z Gated Z to A)  
See Waveform Above



**04** (Open Collector Output with Ungated Z Centered on A') See Waveform Above