

**QUANTUM DEVICES, INC.**

“Improving the Quality of Life through the Power in Light”

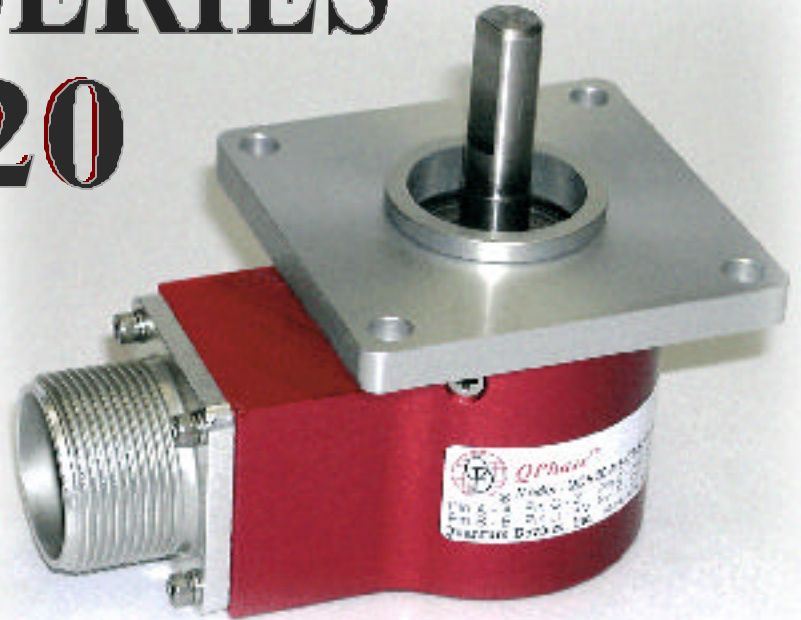
**QPhase™**

# SIZE 20 SERIES

# QDH20

## DESCRIPTION

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.

## TYPICAL APPLICATIONS

*Motion Control Feedback*  
*Machine Control*  
*Process Control*  
*Elevator Controls*  
*Agricultural Machinery*  
*Textile Equipment*  
*Robotics*  
*Food processing*  
*Conveyors*  
*Material Handling*

## 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 10mm
- ◆ Hollow shaft sizes up to 0.625" Diameter
- ◆ High Noise Immunity

**ISO 9001**

CERT. NO. FM 52711

**Quantum Devices, Inc. 112 Orbison St., P.O. Box 100, Barneveld, WI 53507**

Tel: (608) 924-3000

Fax: (608) 924-3007

URL: [www.quantumdev.com](http://www.quantumdev.com)

E-mail: [qdisales@quantumdev.com](mailto:qdisales@quantumdev.com)

# QDH20 Ordering Options

## QDH20-M1-C1-S2-N-5000-02-06-04-SS

<p><b>Mounting</b></p> <p><b>M1</b> (Flange w/ 1.181" Female Pilot)  <b>M2</b> (Flange w/ 1.250" Male Pilot)  <b>M3</b> (Servo w/ 1.181" Female Pilot)  <b>M4</b> (Servo w/ 1.250" Male Pilot)  <b>M5</b> (Size 25 Flange and Pilot)  <b>M6</b> (Size 25 Servo and Pilot)  <b>F1</b> (2.250" Bolt Circle Flex Mount)</p>	<p><b>Shaft</b></p> <p>S2 (0.375")  S3 (10 mm)  S4 (0.250")  <b>SOLID</b>  H5 (0.375")  H6 (0.500")  H7 (0.625")  <b>HOLLOW</b></p>	<p><b>Resolution</b></p> <p>200  250  256  500  512  600  1000  1024  1250  2000  2048  2500  3600  4096  5000</p>	<p><b>Output</b></p> <p>02 (OL7272)  04 (Open Coll.)</p>	<p><b>Output Waveform</b></p> <p>01  02  03  04  <b>SEE WAVEFORMS</b></p>	<p><b>Special Features</b></p> <p>SS  <b>CUSTOMER SPECIFIED FEATURES CONSULT FACTORY</b></p>
	<p><b>Housing</b></p> <p>C1 (Radial Exit 10 Pin)  C2 (Radial Exit 7 Pin)  C3 (Radial Exit 6 Pin)  C4 (Radial Exit Wire Gland)  C5 (Axial Exit 10 Pin)  C6 (Axial Exit 7 Pin)  C7 (Axial Exit 6 Pin)  C8 (Axial Exit Wire Gland)</p>	<p><b>Shaft Seal</b></p> <p>N (No)</p>		<p><b>Channels</b></p> <p>01 (Single Channel (A))  02 (Dual Quad Channel (AB))  03 (Dual w/Index (ABZ))  04 (Single Channel w/ Comp. (AA' BB'))  05 (Dual Quad Channel w/ Comp. (AA' BB' ZZ'))  06 (Dual w/ Index w/ Comp. (AA' BB' ZZ'))  <b>SEE OUTPUT TERMINATION CHART</b></p>	

### QDH20 SERIES Electrical Specifications

Input Voltage .....	4.75 to 26 VDC
Input Current Requirements .....	70mA Typical @ 5VDC Plus Interface Loads
Input Ripple .....	2% Peak to Peak @ 5VDC
Output Circuits .....	OL7272 High Voltage Line Driver: VOL = .5V Max @ 20mA Sink VOH = Vcc-.8V @ 20mA Source RS422 compatible @ 20mA Source
.....	Open Collector Output: Sink up to 100mA
Incremental Output Format .....	Quadrature outputs with index pulse. See waveform reference chart for timing and gating options
Accuracy .....	±1.0 arc minute
Frequency Response .....	500kHz
Symmetry .....	180° ± 10% Typical
Minimum Edge Separation .....	54 electrical degrees at 100 kHz
Code .....	Incremental
Rise Time .....	Less than 1 uS
Electrical Protection .....	Reverse protected to .6 A Cont. 4 amp for 1 uS. OL7272 outputs over voltage and short circuit protected

### QDH20 SERIES 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 @ 11mS Duration
Sealing Option .....	IP 66 Solid Shaft, IP 64 Hollow Shaft

**ISO 9001**  


---

  
**CERT. NO. FM 52711**

**Quantum Devices, Inc. 112 Orbison St., P.O. Box 100, Barneveld, WI 53507**

Tel: (608) 924-3000    Fax: (608) 924-3007    URL: www.quantumdev.com    E-mail: qdisales@quantumdev.com

## ODH20 SERIES Mechanical Specifications

Maximum Shaft Speed .....	8000 RPM (see factory for higher shaft speed)
Hollow Shaft Diameter Tolerance .....	0.375", 0.500", 0.625" (+.0006" to -.0000")
Solid Shaft Diameter Tolerance .....	0.250", 0.375", 10mm (+.0000" to -.0004")
Shaft Runout .....	.001 T.I.R. (Max)
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/ Sec <sup>2</sup>
Starting Torque .....	1.0 in-oz Max
Radial Shaft Loading .....	40 lbs, (80 lbs Max)
Axial Shaft Loading .....	40 lbs, (80 lbs Max)
Housing .....	Anodized Aluminum
Weight .....	13 oz. Typical
Termination .....	Radial Exit: 10, 7 & 6 pin MS, Wire Gland w 24" Cable
.....	Axial Exit: 10, 7 & 6 pin MS, Wire Gland w 24" Cable
Mounting.....	Flange w/ 1.181" Female Pilot
.....	Flange w/ 1.250" Male Pilot
.....	Servo w/ 1.181" Female Pilot
.....	Servo w/ 1.250" Male Pilot
.....	Size 25 Flange and Pilot
.....	Size 25 Servo and Pilot
.....	2.250" Bolt Circle Flex Mount

## ODH20 SERIES Incremental Output Terminations

Housing Option		No. of Channels in Model Number				
6 Pin	7 Pin	A	AB	ABZ	AA	AABB
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. A	Ch. A
B	D	+V	+V	+V	+V	+V
F	E					Ch. B
A	F	Ground	Ground	Ground	Ground	Ground
	G	Case Ground	Case Ground	Case Ground	Case Ground	Case Ground

10 Pin	Wire Gland	AABBZZ
A	Brown	Ch. A
B	Blue	Ch. B
C	Orange	Ch. Z
D	Red	+V
E		
F	Black	Ground
G	White/Black	Case Ground
H	White	Ch. A
I	Green	Ch. B
J	Yellow	Ch. Z
	Drain	Cable Shield

**NOTE:** The housing option and number of channels will determine output terminations.

**ISO 9001**

CERT. NO. FM 52711

**Quantum Devices, Inc. 112 Orbison St., P.O. Box 100, Barneveld, WI 53507**

Tel: (608) 924-3000

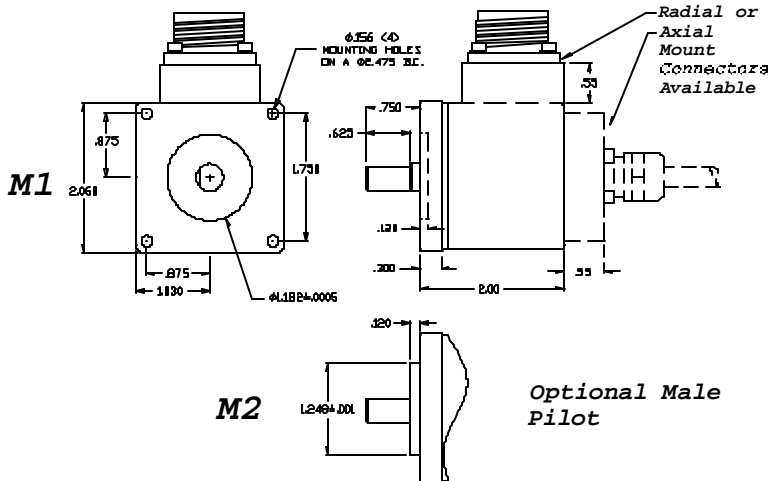
Fax: (608) 924-3007

URL: www.quantumdev.com

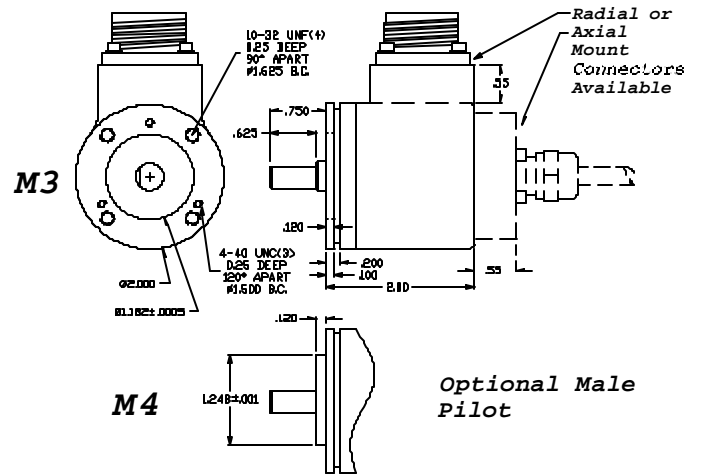
E-mail: qdisales@quantumdev.com

# ODH20 SERIES Mounting Dimensions

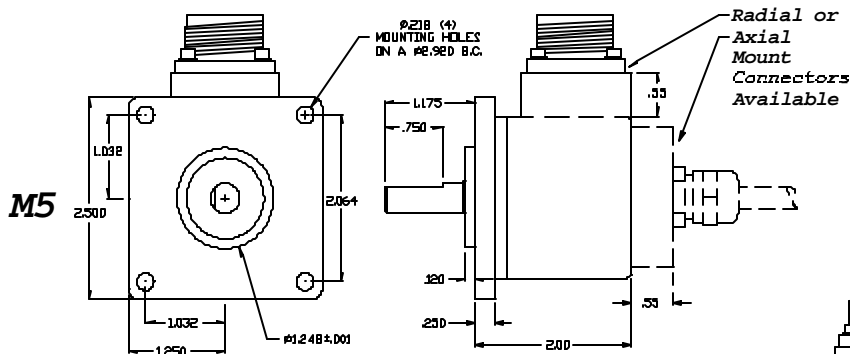
## Size 20 Flange



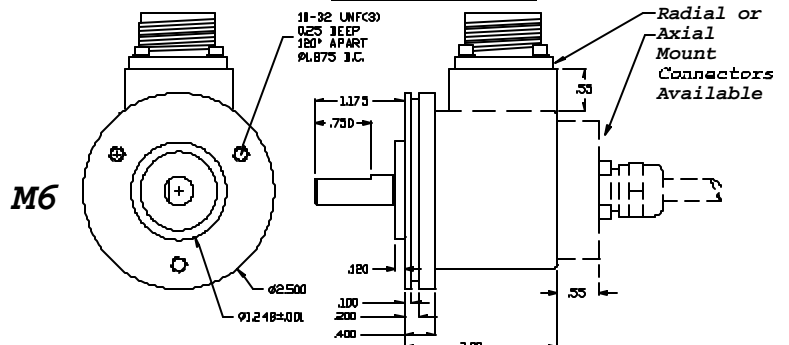
## Size 20 Servo



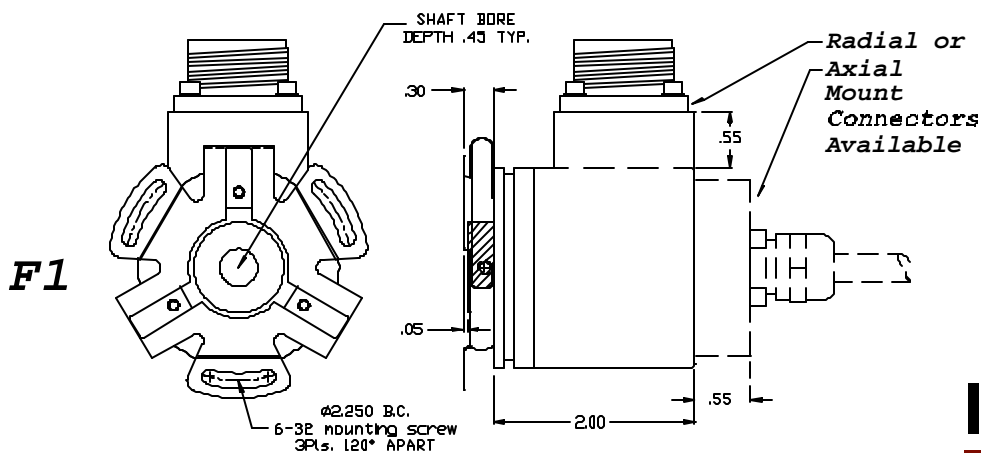
## Size 25 Flange



## Size 25 Servo



## Flex Mount Hollow Shaft



**ISO 9001**

CERT. NO. FM 52711

Quantum Devices, Inc. 112 Orbison St., P.O. Box 100, Barneveld, WI 53507

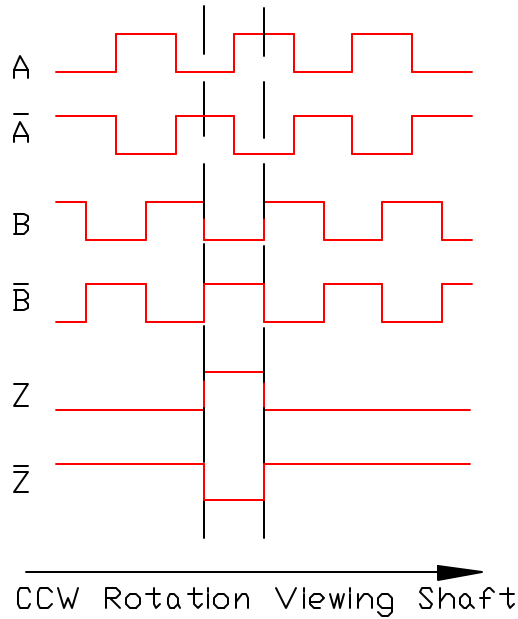
Tel: (608) 924-3000

Fax: (608) 924-3007

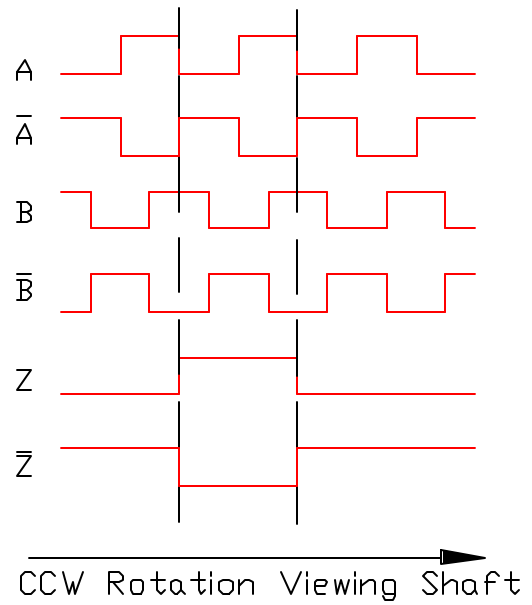
URL: [www.quantumdev.com](http://www.quantumdev.com)

E-mail: [qdisales@quantumdev.com](mailto:qdisales@quantumdev.com)

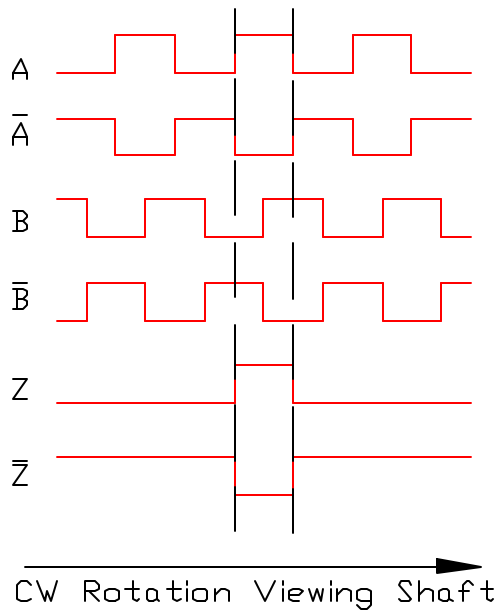
# QDH20 SERIES Output Waveforms



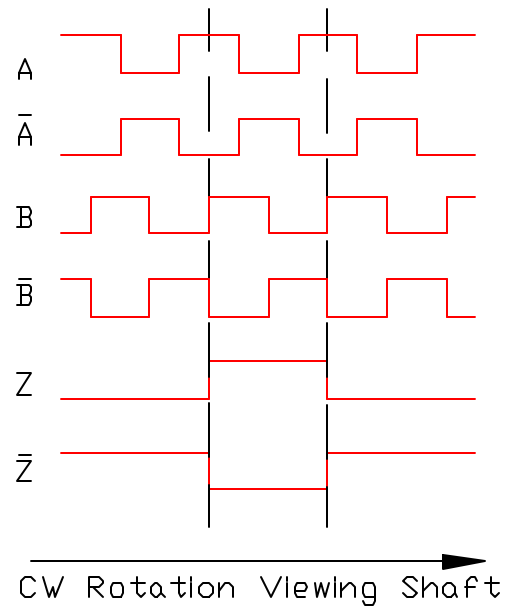
**01** (OL7272 Output with Z Gated to  $\bar{B}$ )  
See Waveform Above



**02** (Open Collector Output with Ungated Z Centered on  $\bar{B}$ ) 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

**ISO 9001**

CERT. NO. FM 52711

**Quantum Devices, Inc. 112 Orbison St., P.O. Box 100, Barneveld, WI 53507**

Tel: (608) 924-3000

Fax: (608) 924-3007

URL: [www.quantumdev.com](http://www.quantumdev.com)

E-mail: [qdisales@quantumdev.com](mailto:qdisales@quantumdev.com)

Rev. 071218