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Bulletin No. ZDH/ZNH-C
Drawing No. LP0732
Released 10/09

MODEL ZDH - 2" FLANGE MOUNT ROTARY PULSE GENERATOR
MODEL ZNH - 2.5" FLANGE MOUNT ROTARY PULSE GENERATOR
(REPLACES THE MODEL RPGD AND RPGN RESPECTIVELY)

GENERAL DESCRIPTION

The ZDH and ZNH series of sensors are heavy duty, extremely rugged, reliable, yet compact encoders designed for harsh factory and plant floor environments. Both models are flange mount and conform to NEMA 4, 13 and IP66 standards. Typical applications include motion control feedback, machine control, process control, elevator controls, conveyors, textile equipment, robotics and food processing.

Open Collector Output Wiring

The ZDH and ZNH series of sensors have open collector outputs. An open collector output brings the uncommitted collector of the encoder switching device to the external world. Because the collector element is not associated with the sensor supply voltage, the sensor output collector may be "pulled up" to external voltages different than the encoder supply voltage (40 VDC maximum). NPN open collector outputs are current sinking devices. An output signal will not be generated unless a pull-up resistor is connected from the open-collector to the positive side of an external supply. The same supply can be used for powering the unit and for the pull-up resistor.

REPLACEMENT

Note: The RPGD connections are made by a 24 inch cable. The ZDH uses a 7-Pin MS connector.

SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

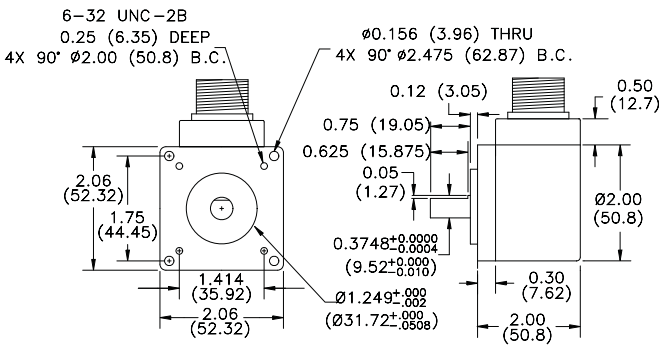
1. **SUPPLY VOLTAGE**: 4.75 to 28 VDC, 100 mA max. with no output load
2. **OUTPUTS**: NPN Open Collector Transistor, V_{OH} = 40 VDC max.; 100 mA max. current. incremental - two square waves in quadrature with A leading B for clockwise shaft rotation.
3. **MAX. FREQUENCY**: Up to 1 MHz
4. **INDEX**: NPN Open Collector Transistor, V_{OH} = 40 VDC max.; 100 mA max. current. Once per revolution centered over Output Channel A. Index is a positive pulse.
5. **INPUT RIPPLE**: 100 mV peak to peak at 0 to 100 KHz.
6. **NOISE IMMUNITY**: Tested to BS EN61000-4-2; IEC801-3; BS EN61000-4-4; DDENV 50141; DDENV 50204; BS EN55022; BS EN61000-6-2; BS EN50081-2
7. **SYMMETRY**:
   1 to 6000 CPR: 180° (±18°) electrical at 100 KHz output
   6001 to 20,480 CPR: 180° (±36°) electrical
8. **QUAD PHASING**:
   1 to 6000 CPR: 90° (±22.5°) electrical
   6001 to 20,480 CPR: 90° (±36°) electrical
9. **MIN EDGE SEP**:
   1 to 6000 CPR: 67.5° electrical at 100 KHz output
   6001 to 20,480 CPR: 54° electrical
   >20,480 CPR: 50° electrical
10. **RISE TIME**: Less than 1 microsecond
11. **ACCURACY**:
    Instrument and Quadrature Error: From one cycle to any other cycle.
    200 to 1999 CPR: 0.017° mechanical (1.0 arc minutes)
    2000 to 3000 CPR: 0.01° mechanical (0.6 arc minutes)
    Interpolation error (units >3000 CPR only) within 0.005° mechanical.
    (Total Optical Encoder Error = Instrument + Quadrature + Interpolation)

MECHANICAL SPECIFICATIONS

1. **MAXIMUM MECHANICAL SPEED**: 8000 RPM
2. **SHAFT DIAMETER**:
   ZDH: 0.375" (9.5 mm)
   ZNH: 0.375" (9.5 mm)
3. **RADIAL SHAFT LOAD**: 80 lbs. max. Rated load of 20 to 40 lbs. for bearing life of 1.5 X 10^9 revolutions.
4. **AXIAL SHAFT LOAD**: 80 lbs. max. Rated load of 20 to 40 lbs. for bearing life of 1.5 X 10^9 revolutions.
5. **STARTING TORQUE**: 3.0 oz-in. (21.18 N-mm)

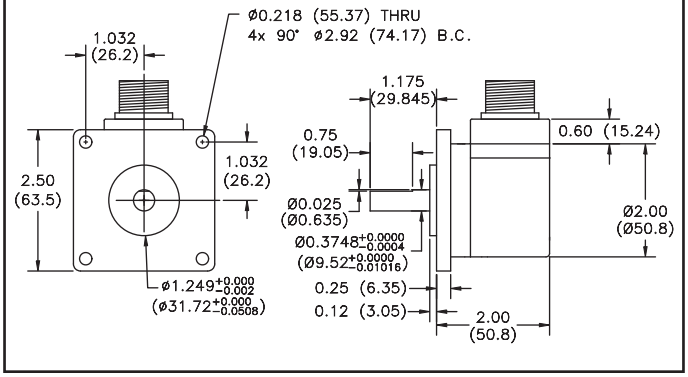
DIMENSIONS In inches (mm)

ZDH



DIMENSIONS In inches (mm)

ZNH



6. **MOMENT OF INERTIA**: 5.2 x 10^{-4} oz-in-sec^2 (3.66 x 10^{-3} N-mm-sec^2)
7. **CONNECTOR TYPE**: 7-Pin MS type connector

FUNCTION	PIN	WIRE COLOR
+VDC	A	RED
COMMON	B	BLACK
DATA A	C	WHITE
DATA B	D	GREEN
INDEX Z	E	ORANGE
CASE GROUND	F	BARE WIRE

8. **HOUSING**: Black non-corrosive finish
9. **MOUNTING**:
   ZDH: 2.0" Flange Mount
   ZNH: 2.5" Flange Mount
10. **WEIGHT**: 11 oz. (311.8 g)

ENVIRONMENTAL CONDITIONS

1. **OPERATING TEMPERATURE**: 0 to +70 °C
2. **STORAGE TEMPERATURE**: -25 to +85 °C
3. **HUMIDITY**: 98% RH non-condensing
4. **SHOCK**: 75 g @ 11 msec duration
5. **SEALING**: NEMA 4, 13 and IP66 with shaft seal

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PPR	PART NUMBER	
			2" Flange Mount	2.5" Flange Mount
ZDH & ZNH	Rotary Pulse Generators	60	ZDH0060H	ZNH0060H
		100	ZDH0100H	ZNH0100H
		500	ZDH0500H	ZNH0500H
		600	ZDH0600H	ZNH0600H
		1000	ZDH1000H	ZNH1000H
		1200	ZDH1200H	ZNH1200H
		2000	ZDH2000H	ZNH2000H
		2500	ZDH2500H	ZNH2500H

ACCESSORIES

MODEL NO.	DESCRIPTION	PART NUMBER
CCBRPG	7-Pin MS Connector	CCBRPG00
	7-Pin MS Connector w/10 ft 24 AWG 5 Conductor w/drain	CCBRPG02
	7-Pin MS Connector w/20 ft 24 AWG 5 Conductor w/drain	CCBRPG03
RPGFC	Flexible Coupling (1" Length) 0.25" - 0.375"	RPGFC002
	Flexible Coupling (1" Length) 0.375" - 0.375"	RPGFC003
	Flexible Coupling (1.5" Length) 0.375" - 0.5"	RPGFC004
	Flexible Coupling (1" Length) 0.375" - 6 mm	RPGFC006

Note: Only Factory Stocked part numbers are listed. Consult Factory for part number and availability of other PPR and Output Configurations.

LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

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