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Find the *Novanta Inc. / Dynamics Research C153/421-1000-120CBV* at our website: *Click HERE*

Model C150/152/153
Incremental Optical Rotary Encoder with Integral Shaft Coupling



- **Integral shaft coupling design (10 I.D.扭 available)**
- **Single LED light source**
- **Up to 8,000 counts per shaft revolution**
- **Sealed bearings standard for maximum reliability**
- **Optional differential line driver output stage**
- **Centering tools available (sets concentricity of flange to shaft)**

The Model C150/152/153 is a compact incremental, optical rotary encoder for light industrial and/or motor mounted applications. The Model C150/152/153 is available with discs providing up to 2,000 cycles per shaft revolution to provide a maximum of 8,000 counts per revolution utilizing external 4X circuitry. This encoder is available with either differential sinewave or TTL compatible complementary squarewave outputs. Custom electronics can be provided to maximize encoder performance to best suit your application. This unit's small diameter (1.625") is appropriate for many limited size applications. In its standard configuration the unit can be used in applications where a low cost, easy to install, totally enclosed optical encoder is required. Typical applications include machine tools, assembly machinery, phototypesetters, robotics, and X-Y stage encoding.

SPECIFICATIONS

ELECTRICAL

Resolution range:
- To 2,000 cycles per shaft revolution (to 8,000 counts per revolution with 4X counting circuitry).

Light source:
- Gallium aluminum arsenide LED rated for 100,000 hours MTBF (manufacturer扭 specification).

Light sensors:
- Photovoltaic cells for count channels, phototransistor for zero reference.

Excitation voltages:
- 150/152: +5Vdc (�) at 125ma (maximum). 153: +5Vdc (�) at 175ma (maximum).

Output format:
- One or two count channel outputs (A and/or B) in phase quadrature with an optional zero reference (ZR) output.

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Quadrature specification:
- 90° ± 30° (at 10KHz output frequency).

Symmetry specification:
- 180° ± 10° (at 10KHz output frequency).

Rise and fall times:
- 1 µ sec (maximum) into 1,000pf load capacitance. (Applies to squarewave outputs only.)

Frequency response:
- 50KHz for count channels, 10KHz for zero reference.

Zero reference angular width:
- C150/152: 1 ± ° count channel cycle. C153: ° cycle is standard and is designated as GZ.

Zero reference alignment:
- C150/152: There is no specified alignment between the ZR and count channels. C153: GZ aligns with output quadrant AB.

Phase sense:
- Channel A leads Channel B for clockwise rotation of the coupling as viewed from the coupling end of the unit.

Pin connections:
- See Table 1. Units can be supplied with up to 60" of shielded cable or unshielded wires.

Output specifications:

Waveform: **Signal levels:**

Sinewave
(See Figure 1)
- Count channels: Sinewave outputs with amplitudes of 20mv p-p (minimum) into a (user-supplied) 2KW load at 50KHz output frequency or 3,000 RPM whichever occurs first. DC offset is ±% of p-p signal output (maximum).
- Zero reference: 100mv (minimum) usable signal level into a 5K load resistor to ground (user-supplied) at 10KHz count channel output frequency.

Squarewave
(See Figure 2)
- 152: TTL compatible complementary outputs from a 74LS04* output stage providing 8ma sink current.
- 153: TTL compatible differential line driver outputs with 40ma sink and ±ma source current from a 75158* output stage.

Output options:
- Reversed phase sense栈hannel B leads Channel A for clockwise rotation.
- 7406* open collector output stage with 40ma/30V capability.
- Custom electronics can be provided for non-recurring charge.

MECHANICAL

Outline dimensions:
- See Figure 3.

Starting torque at 25° C:
- 5 oz.-in. (maximum).

Shaft angular acceleration:	• 10^5 radians/sec^2 (maximum).
Moment of inertia:	• 5.8 • 10^{-4}oz.-in.-sec^2 (maximum).
Bearing type:	• ABEC class 5 (sealed).
Bearing life:	• 2 • 10^9 revolutions at maximum coupling misalignment.
Coupling characteristics:	• Wind-up: 30 arcseconds/oz.-in. • Maximum angular misalignment between encoder and drive shaft: 5• . • Maximum parallel misalignment .010" . • Maximum axial play: •.010" .
Slew speed:	• 5,000 RPM.
Maximum operating speed:	• 3,000 RPM or 50KHz count channel output frequency, whichever occurs first.
Weight:	• 10 oz. (maximum).
Error:	• See pg. 6.
Connector:	• Not supplied on standard units.
Cover material:	• Aluminum or plastic (Valox).*

ENVIRONMENTAL

Operating temperature range:	• 0• to +70• C
Storage temperature range:	• -25• to +90• C.
Shock:	• 10 G扭 for 11 milliseconds duration.
Vibration:	• 20Hz to 2,000Hz at 5G扭.
Humidity:	• To 98% R.H. (non-condensing).

***or performance equivalent.**

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

The diagrams, tables, and how to order information are published as .pdf files. You will need the Adobe Acrobat Reader Software to display and print this information. It can be downloaded for free by clicking on the Adobe icon.

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Model C150/152/153 Diagram and How To Order Information in .pdf file format.

Model C150/152/153 Outline Dimensions in .pdf file format.



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