FIGURE 1

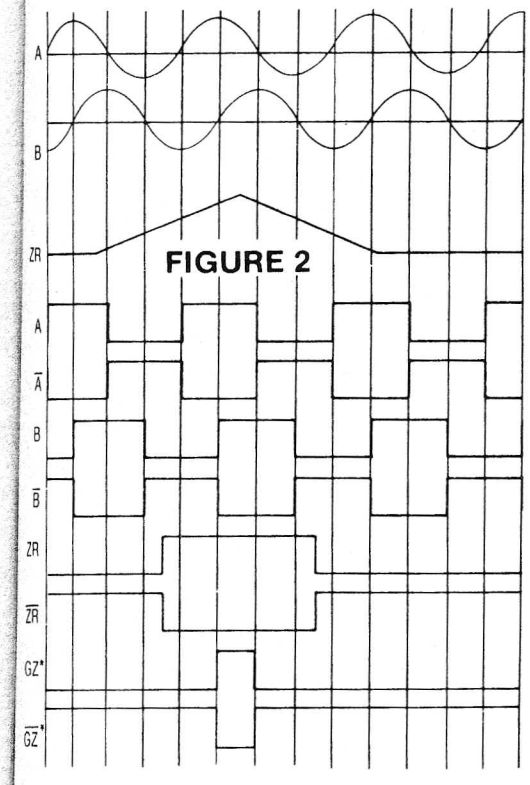

FIGURE 2

CW ROTATION ⟶

*Line driver (Model 153) output units only

TABLE 1

WIRE DESIGNATIONS FOR MODELS 150/152/153

Function	Model 150 Sinewave Output	Model 152 Squarewave Output	Model 153 Line Driver Output
Channel A	Orange	Brown	Orange
Channel $\overline{A}$	Green	Brown/White	Green
Channel B	Yellow	Green	Yellow
Channel $\overline{B}$	Blue	Green/White	Blue
Channel ZR	Gray	Orange	Brown
Channel $\overline{ZR}$	—	Orange/White	Grey
+5 Vdc	Red	Red	Red
Common	Black	Black	Black

HOW TO ORDER

15 ○ — ○ ○ ○ — ○ — ○ ○ ○

OUTPUT TYPE
0 = Differential sinewave
2 = Complementary squarewave
3 = Line driver outputs

BEARING TYPE
0 = Shielded
1 = Sealed

NUMBER OF COUNT CHANNELS
1 = Single channel
2 = Dual channel

ZERO REFERENCE
0 = Without zero reference
1 = With zero reference

CYCLES PER SHAFT REVOLUTION
(See disc resolution listing pg. 105)

WIRE LENGTH
18" or 36" standard. Can be specified to 60" maximum.

SPECIAL REQUIREMENTS
DRC will assign a modifier code to denote special requirements at time of order.

WIRE/COVER TYPE
C = Shielded wires, plastic cover
W = Unshielded wires, plastic cover

SPECIFICATIONS

ELECTRICAL

Resolution range: • To 1,250 cycles per shaft revolution (to 5,000 counts per revolution with external 4X counting circuitry).

Light source: • Gallium aluminum arsenide LED rated for 100,000 hours MTBF (manufacturer's specification).

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

Excitation voltages: • 150/152: 5Vdc (±5%) at 125ma (maximum). 153: 5Vdc (±5%) at 175ma (maximum).

Output format: • Two count channel outputs (A and B) in phase quadrature with an optional zero reference (ZR) output.

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

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

Rise and fall times: • 1 μsec (maximum) into 1,000pf load capacitance.

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

Zero reference angular width: • 150/152: 1 ± ½ count channel cycle. 153: ¼, (¼ cycle is standard and is designated as GZ).

Zero reference alignment: • 150/152: There is no specified alignment between the ZR and count channels. 153: GZ aligns with output quadrant AB.

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

Pin connections: • See Table 1.

Output specifications:

Waveform: **Signal levels:**

Sinewave (See Figure 1)
- Count channels: Sinewave outputs with amplitudes of 30mv p-p (minimum) into a (user-supplied) 2KΩ load at 50KHz output frequency or 3,000 RPM whichever occurs first. DC offset is ±10% of p-p signal output (maximum).
- Zero reference: 100mv (minimum) usable signal level into a 5KΩ load resistor to ground (user-supplied) at 10KHz count channel output frequency.

Squarewave (See Figure 2)
- TTL compatible complementary outputs from a 7404* output stage providing 16ma sink current.
- TTL compatible differential line driver outputs with 40ma sink and -40ma source current from a 75158* output stage.

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

MECHANICAL

Outline dimensions: • See Figure 3.

Shaft loading: • 5 lbs. axially and radially (maximum).

Shaft radial runout: • .001" T.I.R.

Starting torque at 25° C:
- Models with shielded bearings: .1 oz.-in. (maximum).
- Models with sealed bearings: .5 oz.-in. (maximum).

Shaft angular acceleration: • 10^5 radians/sec^2 (maximum).

Moment of inertia: • 1.0 x 10^{-4} oz.-in.-sec^2 (maximum).

Bearing type: • ABEC class 5 (sealed or shielded).

Bearing life: • 1 x 10^9 revolutions at full load (manufacturer's specifications).

Shaft material: • 303 series stainless steel.

Cover material: • Aluminum or plastic (Valox)*.

Slew speed: • 5,000 RPM.

Maximum operating speed: • 3,000 RPM or 50KHz output frequency, whichever occurs first.

Weight: • 6 oz. (maximum).

Error: • See pg. 6.

Connector: • Not supplied on standard units.

ENVIRONMENTAL

Operating temperature range: • 0° to +70° C.

Storage temperature range: • -25° to +90° C.

Shock: • 10G's for 11 milliseconds duration.

Vibration: • 20Hz to 2,000Hz at 5G's.

Humidity: • To 98% R.H. (non-condensing).

***or performance equivalent.**

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.