![BEI PRECISION]

ENCODER DATA SHEET

INC35 & BIC35 INCREMENTAL ENCODERS

FEATURES

- Optical incremental encoder with long life LED light source
- INC35 is intended for rotation in one direction.
- BIC35 is intended for bidirectional rotation.
- Standard models with or without an index pulse
- BIC35 models output square waves in quadrature, or optionally pulse trains
- Several choices of output line drivers are optional.
- Standard units operate from +5 VDC. Other supply voltage ranges are optional.
- Internal count multiplication and direction sensing logic.
- Shaft seal, alternate output connector, low torque bearings are optional.
- Extended temperature range optional.

PHYSICAL CHARACTERISTICS

FIGURE 1
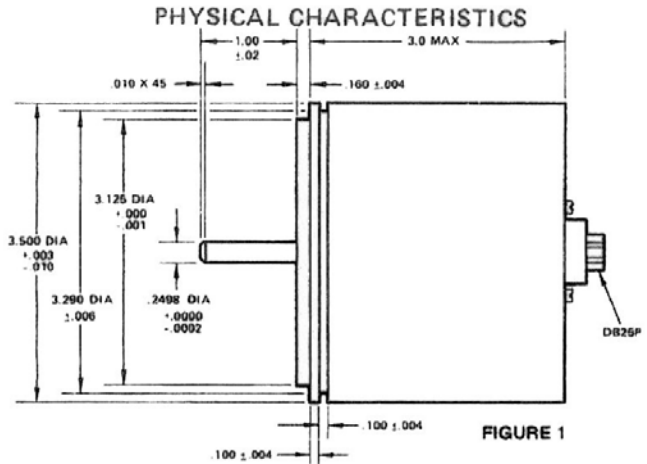
APPLICATIONS

- Radar Antennas
- Calibration, Test, and Other Ground Support Equipment
- Automatic Weight Logging
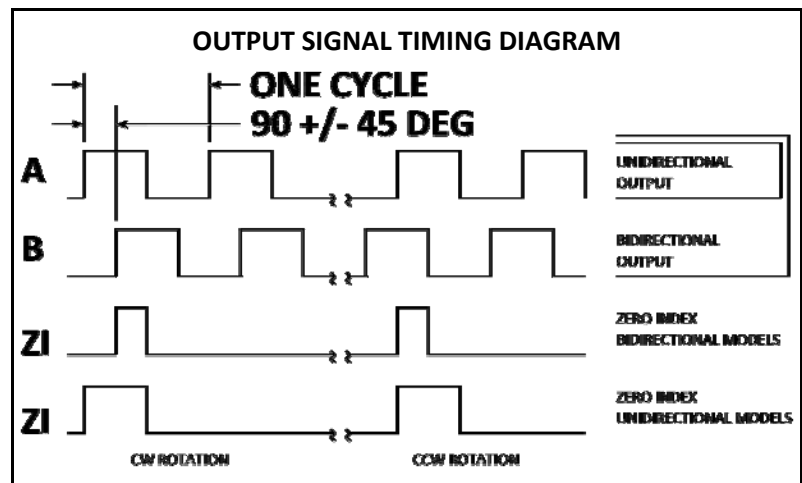- Liquid Level Measurements

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USE THIS BLOCK DIAGRAM
TO ORDER

CODE FORMAT:
INC – UNIDIRECTIONAL INCREMENTAL
BIC – BIDIRECTIONAL INCREMENTAL

CYCLES PER 360°:
UP TO 5000 –
USE DESIGNATION FROM TABLE 1

[ ] 35- [ ] G [ ]

CONFIGURATION:
1A – STANDARD
2A – STANDARD W/ZERO INDEX
OTHER DESIGNATIONS ARE ASSIGNED BY FACTORY

TABLE 1	
CYCLES PER 360°	DESIGNATION
1024	10
1800	182
2048	11
3600	362
4096	12
5000	502

OUTPUT SIGNAL TIMING DIAGRAM

ONE CYCLE 90 +/- 45 DEG

A — UNIDIRECTIONAL OUTPUT
B — BIDIRECTIONAL OUTPUT
ZI — ZERO INDEX BIDIRECTIONAL MODELS
ZI — ZERO INDEX UNIDIRECTIONAL MODELS

CW ROTATION   CCW ROTATION

Approved for general release.

MECHANICAL CHARACTERISTICS

- Dimensions   per Figure 1

- Weight   48.0 oz maximum

- Starting Torque   0.5 oz-in maximum
  @ 25°C

- Moment of Inertia   0.6 oz-in^2 maximum

- Slewing Speed   3000 RPM maximum
  (See note 1)

- Operating Speed (See Note 1)
  ‣ Models without Zero
    index $= \left(\dfrac{50KHz}{cycles\,/\,360°} \right) \times 60$

  ‣ Models with Zero
    index $= \left(\dfrac{15KHz}{cycles\,/\,360°} \right) \times 60$

- Shaft rotation   Continuous & Reversible
- Mechanical Life 10^9 Revolutions min
- Shaft loading   5.0 lbs max

ELECTRICAL CHARACTERISTICS

- Code Format   Optional – Unidirectional
                                     or Bidirectional with or
                                     without Zero Index

- Input Power   5.0 VDC ± 5%
                                     @ 225 mA

- Output Circuitry   DTL-TTL compatible. Fan
                                     out: 10 unit loads (UL)
                                     (1 UL = 1 DTL gate)

- Output Logic Levels
  ‣ Logic '1'   Vcc with 1K ±10% ohm
                                     source impedance.
  ‣ Logic '0'   0.0 to 0.5 VDC max with
                                     12 mA sink current max

- Illumination Source
  ‣ Type   Solid State (GaAs)
  ‣ Useful Life   100,000 Hrs min.

ENVIRONMENTAL

- Temperature
  ‣ Operating   0°C to 71°C
  ‣ Storage   -40°C to 85°C
- Vibration   5 to 500 Hz @ 20 g's
- Shock   30 g's for 11 ms duration

NOTES:
1. Slewing Speed is the maximum mechanical speed to which the coder may be subjected without permanent degradation of performance. Operating Speed is the maximum mechanical speed at which the encoder may be read while maintaining full accuracy. In cases where Operating Speed calculates toa higher value than Slewing Speed, the latter is the limiting factor. Higher operating Speeds up to 150 kHz are permissible, particularly with one channel models where quadrature alignment is not a applicable, and with two channel models where a broader quadrature quadrature alignment tolerance is permitted. quadrature tolerance specified (+45 Elect Deg) is Worst Case and considers maximum operating speed, input voltage tolerance and full temperature range.
2. Other input voltages (up to 15 volts) can be facilitated; Logical '1' level will be equal to VCC with a 1K ±10% ohm source impedance. Additionally, higher sink currents (up to 45 mA) can be facilitated; Logical '0' level will be 1 volt typical and 1.75 volt maximum when sinking 45 mA. Specify input voltage (Vcc) and tolerance, and sink current requirement on purchase order (if other than standard).
3. Special configurations, such as the following, are available on special order:
   - Low Torque Bearings
   - Line Driver Output Circuitry
   - Internal Count Multiplication and Direction Sensing Logic
   - Other Resolutions
   - Shaft Seals
   - Extended Operating Temperature Range

Specifications Subject to Change Without Notice