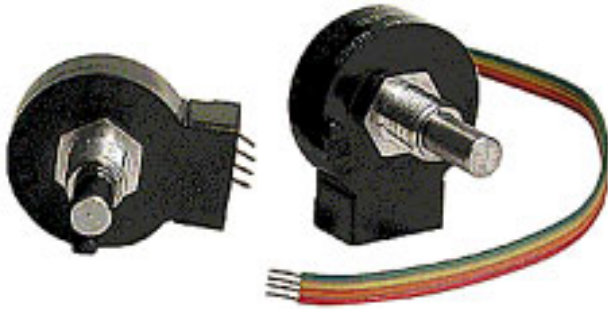


## Series 600 Optical Rotary Encoder



### Description

The series 600 controls are manually-operated, rotary, optical encoders that output two square waves in quadrature at a rate of 128 pulses per channel per revolution as a standard, with other resolutions down to 10 pulses available.

The outputs are TTL compatible. The variation by construction is the terminal configuration, with one model having 4 cable leads, and the other model having 4 pin leads and internal resistors

### Features

- **Long Life** - 10 million revolutions minimum (contactless)
- **Cost effective** - Elimination of A/D converters
- **Rugged** - Stainless-steel shafts and nickel-plated bushings in various lengths
- **Stability** - -40°C to +65°C operating temperature.
- **Variability** - Cable and printed circuit terminations available

## Series 600 Electrical Specifications

### Input Power

5 volts DC +/-5% @ 30ma maximum plus external requirements.

### Output Rate

128 pulses/revolution per channel, standard. Other pulses/revolution between 10 and 180 are available

### Channels

Two separate output channels in quadrature, 90° +/-45°

### Output Voltage

High level voltage - 2.4 volts minimum with 10Kohms load to ground.

Low level voltage - .4 volt maximum

## Series 600 Mechanical Specifications

### Shaft Rotation

Continuous in either direction

### Body Size

(Single module) .5 in (12.70 mm) square  
+/- .031 in. (.790 mm), except at standoffs

### Operating Speed

300 rpm maximum

### Rotational Life

10 million revolution minimum

### Rotational Torque

1.5 oz. in. minimum.

Other torque ranges available.

### Shaft

1/4 in.(6.35 mm) diameter, standard

1/8 in.(3.175 mm) diameter available, stainless steel

### Bushing

3/8 in.(9.53 mm) diameter, standard

1/4 in.(6.35 mm) diameter available, brass, nickel-plated

### Shaft End Play

.005 in. (.127 mm) maximum

### Shaft Radial Play

.010 in. (.254 mm) maximum @ 1 in. (25.4 mm) FMS  
with 3/8 in. (9.53mm) long bushing

### Axial Force

15 lb. minimum push or pull force applied to shaft end.

### Terminals

PC Type: .025 in. (0.635mm) by .012 in. (0.305mm)  
thick brass, gold plated to facilitate soldering.

Cable Type: Four lead ribbon cable, color-coded, with  
.050 in. (1.27mm) spacing, 28 AWG. Strength:

Terminals withstand 2 lb. push or pull and a 90° bend.

*Mechanical Specifications continued on next page*

### Mounting Hardware

For 3/8 in. (9.53mm) bushing,  
hex mounting nut 3/8 in. (9.53mm) x 32 thread,  
1/2 in. (12.7mm) across flats,  
3/32 in. (2.38mm) thick internal tooth lockwasher  
11/16 in (17.46mm) O.D. by .022 in. (0.56mm) thick.

### Seals

Mounting seal and shaft seal available.  
Controls are not sealed for board washing.  
Consult Factory for specifications.

### Marking

Consists of customer or Clarostat part number and EIA source and date code. Ink stamped on periphery of the control meets EIA RS230 & RS327 specifications

### Weight

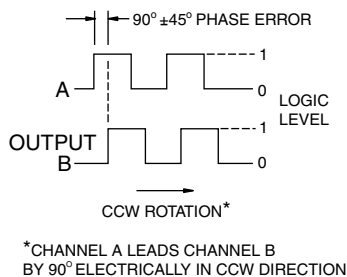
PC type or cable type  
1 in. (25.4mm) FMS shaft and 3/8 in. (9.53mm)  
bushing, .046 lb. (21 gm.)

### Locating Pin

Single pin located 17/32 in. (13.49mm) from center can be supplied. Pin withstands 5 in. lb. torque.

Figure 1

### Output Waveform



### Block Diagram One Output Channel

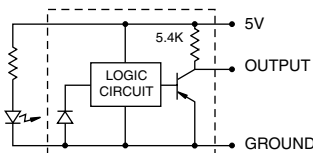
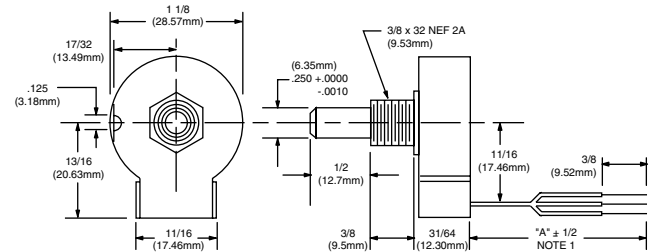


Figure 2  
Cable Style



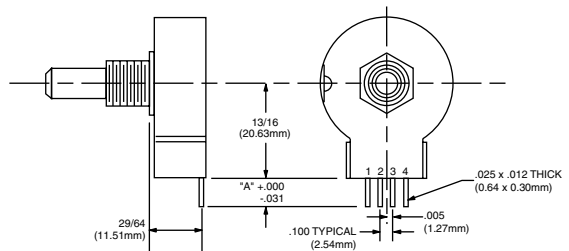
1. "A" Cable length standard 7 1/2 in. +/- 1/2 in. (190.5mm +/- 12.70mm)
2. A AND B OUTPUTS ARE TTL COMPATIBLE ON ALL MODELS.

### CABLE CODE

COLOR	FUNCTION
RED	5VDC +/-5% @ 30ma MAX.
ORANGE	B CHANNEL
YELLOW	A CHANNEL
GREEN	GROUND

Figure 3

### PC Terminals Type B-66



TERM #	FUNCTION
1	5VDC +/-5% @ 30ma MAX.
2	A CHANNEL
3	GROUND
4	B CHANNEL

### "A" DIMENSION

STANDARD	.160 (4.06mm)
SPECIAL	.400 (10.16mm) MAX

## Series 600 Operational Specifications

### Storage Temperature

-55°C to +110°C.

### Operating Temperature

-40°C to +65°C.

### Humidity

85% RH @ 40°C, 240 hours

### Vibration

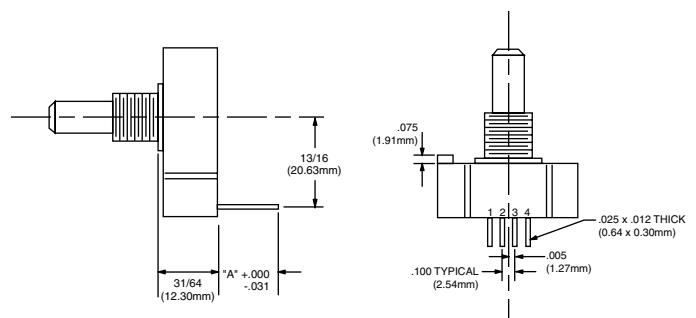
10 to 2000 Hz., 15G peak MIL-STD-202; method 204, test C

### Shock

100G @ 6 MS per MIL-STD-202; method 213, condition I

Figure 4

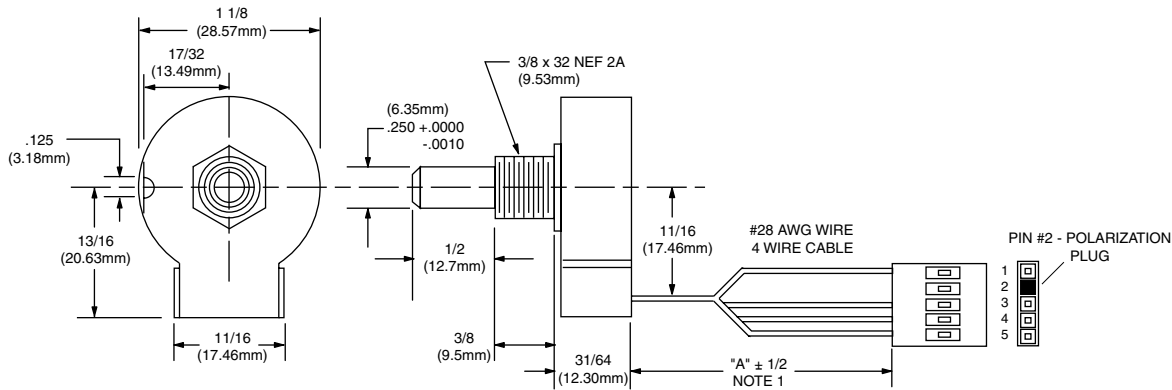
### PC Terminals Type c-24



### "A" DIMENSION

STANDARD	.160 (4.06mm)
SPECIAL	.475 (12.07mm) MAX

Figure 4  
**Cable Style with Connector**



**NOTE:**

1. "A" Cable length standard 7 1/2 in. +/- 1/2 in. (190.5mm +/- 12.70mm)
2. A AND B OUTPUTS ARE TTL COMPATIBLE ON ALL MODELS.

CABLE CODE		
COLOR	PIN #	FUNCTION
RED	1	5VDC +/-5% @ 30mg MAX.
ORANGE	3	B CHANNEL
YELLOW	4	A CHANNEL
GREEN	5	GROUND

**Series 600 Standard Stock Options**

**Stocked Part Numbers**

- 600EN-128-B66: PC Terminals Type B-66  
 600EN-128-C24: PC Terminals Type C-24  
 600EN-128-CBL: 7.5 in. (190.5mm) Long cable/lead  
 600EN-128-CNI: 7.5 in. (190.5mm) Long cable/connector

**Series 600 How to Order**

Example: **388-E-N-128-B66**

600	E	N	128	B66
Series	Encoder	Shaft & Bushing	Pulses	Terminal Configuration
		Shaft: 1/4" dia. x 7/8" FMS long (6.35mm x 22.23mm)	Number of pulses per Revolution	B66 = PC Pins, horizontal
		Bushing: 3/8" dia. x 3/8" long (9.53mm x 9.53mm)		C24 = PC Pins, vertical
				CN1 = Cable with connector
				CBL = 7.5 in. cable (190.5mm)



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