Series 600
Optical Rotary Encoder

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 Electrical Specifications

Series 600 Mechanical Specifications

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

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.

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

Series 600 Operational Specifications

Cable Style
1. “A” Cable length standard 7 1/2 in. +/- 1/2 in. (190.5mm +/- 12.7mm)
2. A AND B OUTPUTS ARE TTL COMPATIBLE ON ALL MODELS.

Cable Code

<table>
<thead>
<tr>
<th>COLOR</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td>5VDC +/-5% @ 30ma MAX.</td>
</tr>
<tr>
<td>ORANGE</td>
<td>B CHANNEL</td>
</tr>
<tr>
<td>YELLOW</td>
<td>A CHANNEL</td>
</tr>
<tr>
<td>GREEN</td>
<td>GROUND</td>
</tr>
</tbody>
</table>

PC Terminals Type B-66

<table>
<thead>
<tr>
<th>TERM #</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5VDC +/-5% @ 30ma MAX.</td>
</tr>
<tr>
<td>2</td>
<td>A CHANNEL</td>
</tr>
<tr>
<td>3</td>
<td>GROUND</td>
</tr>
<tr>
<td>4</td>
<td>B CHANNEL</td>
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</tbody>
</table>

“A” Dimension

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>SPECIAL</th>
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<tbody>
<tr>
<td>.160 (4.06mm)</td>
<td>.400 (10.16mm) MAX</td>
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</table>

PC Terminals Type c-24

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>SPECIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>.160 (4.06mm)</td>
<td>.475 (12.07mm) MAX</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>COLOR</th>
<th>PIN #</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td>1</td>
<td>5VDC +/-5% @ 30mg MAX.</td>
</tr>
<tr>
<td>ORANGE</td>
<td>3</td>
<td>B CHANNEL</td>
</tr>
<tr>
<td>YELLOW</td>
<td>4</td>
<td>A CHANNEL</td>
</tr>
<tr>
<td>GREEN</td>
<td>5</td>
<td>GROUND</td>
</tr>
</tbody>
</table>

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

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

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