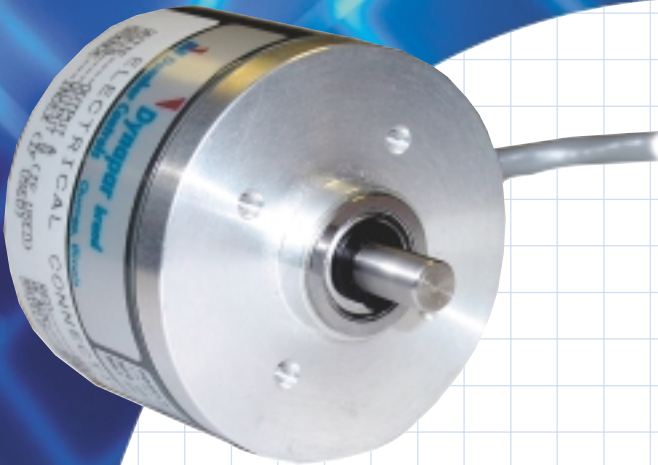


# Series E20

This product has been discontinued.  
Please contact Dynapar for a  
replacement. [www.dynapar.com](http://www.dynapar.com)



- **Face mount 2.0" diameter package**
- **Up to 2540 PPR with optional marker pulse**
- **Rugged all-metal housing**
- **Shielded cable standard**

The Series E20 is a totally enclosed, easy-to-install, incremental encoder designed for lighter-duty industrial and commercial applications with limited space. It is a 2" diameter, face-mount unit with a rugged, metal housing. The Series E20 includes precision bearings, and a 1/4" diameter stainless steel shaft.

Series E20 incorporates the latest in microelectronic packaging, LED light sources, and matched sensors. Outputs are designed to be compatible with most 5V TTL circuits with options for higher voltage 12 and 15 VDC. Shielded cable is standard. Line drivers with complementary outputs are available for longer cable runs and/or higher ambient electrical noise immunity.

## Typical Applications

- Industrial equipment
- Assembly machinery
- Phototypesetters and printers
- Robotics
- Medical diagnostic equipment
- Motor-mounted feedback
- Computer peripherals
- Instrumentation

## Mechanical and Environmental Features

- Durable metal housing
- Rugged 1/4" diameter stainless steel shafts
- Up to 5000 RPM

## Electrical Features

- Up to 2540 PPR with optional marker pulse
- Shielded cable and line drivers available for higher ambient electrical noise immunity
- Choice of 5, 12, or 15 VDC units

## SPECIFICATIONS

### Electrical

**Code:** Incremental

**Resolution:** 100 to 2540 PPR (pulses/revolution)

**Format:** Two channel quadrature (AB) with optional Index (Z) outputs

**Phase Sense:** A leads B for CW shaft rotation as viewed from the shaft end of the encoder

**Accuracy:**  $\pm 3 \times (360^\circ \div \text{PPR})$  or  $\pm 2.5$  arc-min worst case pulse to any other pulse, whichever is less

**Quadrature Phasing:**  $90^\circ \pm 36^\circ$  electrical

**Symmetry:**  $180^\circ \pm 18^\circ$  electrical

**Index:**  $360^\circ \pm 90^\circ$  electrical

**Waveforms:** Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pF

### Input Power:

TTL: 5 VDC  $\pm 5\%$  at 135 mA max.;

Line Driver: 5 VDC  $\pm 5\%$  at 210 mA max.;

CMOS: 12 or 15 VDC  $\pm 10\%$  at 100 mA max.; not including output loads

### Outputs:

5 VDC TTL:

Logic "1"  $V_{OH}$ : 2.5 V min. at 10 TTL gate load or 10 mA source;

Logic "0"  $V_{OL}$ : 0.4 V max. at 20 mA sink

5 VDC Line Driver: 88C30 or equivalent, 8 mA sink, 22 mA source

12 or 15 VDC CMOS:

Logic "1"  $V_{OH}$ :  $V_{CC} - 1.5V$  min. at 200  $\Omega$  load or 10 mA source;

Logic "0"  $V_{OL}$ : 0.4 V max. at 20 mA sink

**Frequency Response:** 100 kHz min. data channels; 50 kHz min. Index channel

### Mechanical

**Bearing Life:**  $(16 \times 10^6 \div \text{RPM})$  hours at max. load

**Shaft Loading:** 8 lb. radial, 5 lb. axial max.

**Shaft Speed:** 5,000 RPM max.

**Starting Torque:** 0.1 oz-in max. at 25  $^\circ\text{C}$

**Running Torque:** 0.09 oz-in max. at 25  $^\circ\text{C}$

**Moment of Inertia:**  $1.4 \times 10^{-4}$  oz-in-sec<sup>2</sup>

**Weight:** 9.0 oz. max.

### Environmental

**Operating Temperature:** 0 to +70  $^\circ\text{C}$

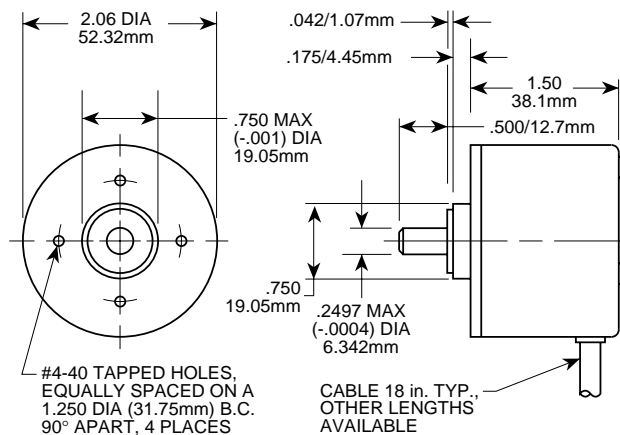
**Storage Temperature:** -25 to +70  $^\circ\text{C}$

**Humidity:** to 98% without condensation

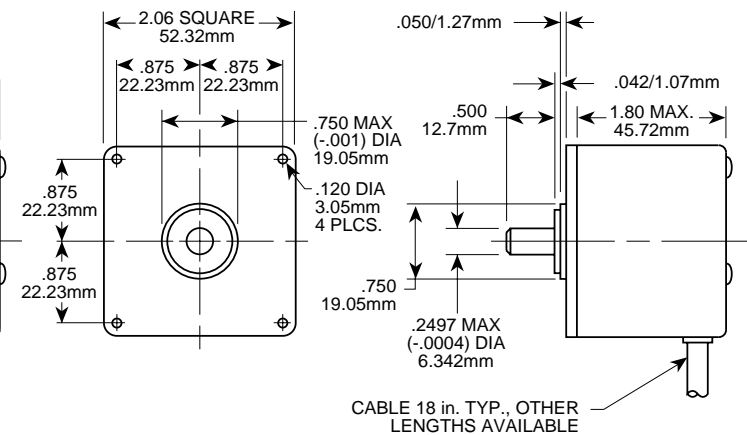
**Enclosure Rating:** NEMA12/IP54 (dirt tight, splashproof)

## Approximate Dimensions (inches/mm)

### Face Mount



### Flange Mount (Optional)



## Electrical Connections

| Wire<br>Color Code | Function                            |                        |                     |
|--------------------|-------------------------------------|------------------------|---------------------|
|                    | Standard Output<br>5, 12, or 15 VDC | w/ Line Driver Outputs |                     |
|                    |                                     | Unidirectional         | Bidirectional       |
| Red                | Power Source                        | Power Source           | Power Source        |
| Black              | Common                              | Common                 | Common              |
| White              | Signal A                            | Signal A               | Signal A            |
| Green              | Signal B (if used)                  | Signal A               | Signal B            |
| Orange             | Signal Z (if used)                  | No Connection          | Signal B̄           |
| Blue               | No Connection                       | No Connection          | Signal Ā           |
| Shield             | Floating                            | Floating               | Floating            |
| White/Black        | —                                   | —                      | Signal Z (if used)  |
| Red/Black          | —                                   | —                      | Signal Z̄ (if used) |

### Flange Mount Accessory

**Kit:** A kit is available for field conversion of a Series E20 face-mounted unit to a flange-mounted unit as shown in the dimension drawing above. Specify accessory kit part no. 106061.

## Ordering Information

To order, complete the model number with code numbers from the table below:

| Code 1: Model                    | Code 2: Pulses/Rev   | Code 3: Mechanical   | Code 4: Output   | Code 5: Electrical  | Code 6: Termination   |
|----------------------------------|--|--|--|---|---|
| <b>E20</b>                       | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/>  |
| E20 Size 20, Light Duty Enclosed | 0100 0800<br>0120 0900<br>0150 1000<br>0180 1024<br>0200 1200<br>0250 1250<br>0256 1270<br>0300 1500<br>0336 1800<br>0344 1951<br>0360 1968<br>0400 2000<br>0500 2048<br>0635 2400<br>0512 2500<br>0600 2540<br>0720 | 0 1/4" Shaft, Sealed Bearing<br>1 1/4" Shaft, Shielded Bearing<br>2 1/8" Shaft, Shielded Bearing | 0 Single Ended, Unidirectional<br>2 Single Ended, Bidirectional, no Index<br>3 Single Ended, Bidirectional, with Index<br>4 Differential, Unidirectional<br>6 Differential, Bidirectional, no Index<br>7 Differential, Bidirectional, with Index | available when Code 4 = 0, 2 or 3:<br>0 5 VDC<br>1 12 VDC<br>2 15 VDC<br><br>available when Code 4 = 4, 6 or 7:<br>3 5V Line Driver | 0 18" Cable<br>1 3' Cable<br>2 6' Cable<br>3 10' Cable<br>4 15' Cable |