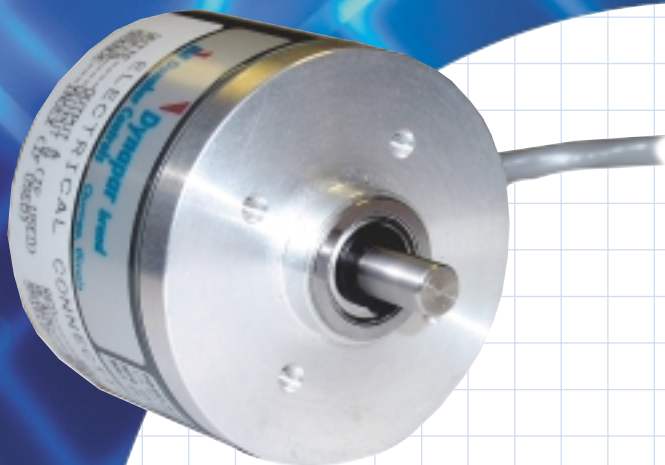


Series E20



- **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 ± 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 Ω 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 °C

Running Torque: 0.09 oz-in max. at 25 °C

Moment of Inertia: 1.4×10^{-4} oz-in-sec²

Weight: 9.0 oz. max.

Environmental

Operating Temperature: 0 to +70 °C

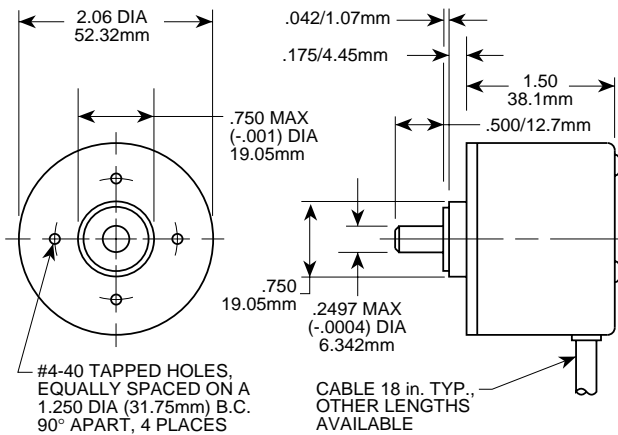
Storage Temperature: -25 to +70 °C

Humidity: to 98% without condensation

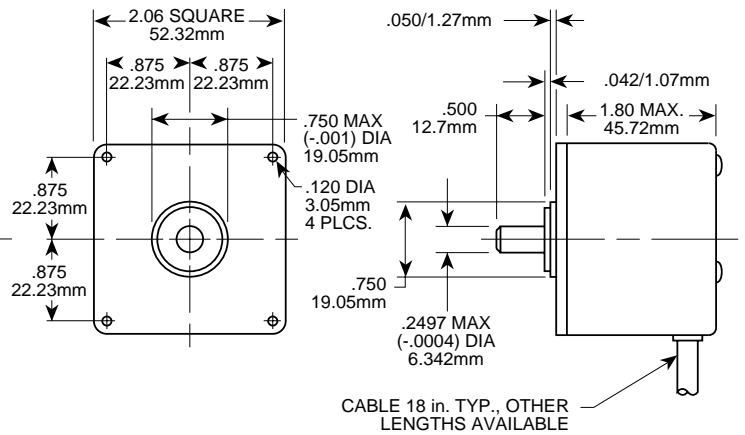
Enclosure Rating: NEMA12/IP54 (dirt tight, splashproof)

Approximate Dimensions (inches/mm)

Face Mount



Flange Mount (Optional)



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.

Electrical Connections

Wire Color Code	Function		
	Standard Output 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)

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