MODEL 770 - INCREMENTAL ENCODER

FEATURES

- Slim profile – only 1.00” deep
- Fits NEMA Size 56C thru 184C motor faces (4.5” AK)
- Incorporates Opto-ASIC technology
- Resolutions to 4096 CPR

The Model 770 C-Face encoder is a rugged, high resolution encoder designed to mount directly on NEMA C-Face motors. Both sides of the encoder are C-Face mounts, allowing additional C-Face devices to be mounted to this encoder. Unlike many C-Face kit type encoders, the Model 770 contains precision bearings and an internal flex mount, virtually eliminating encoder failures and inaccuracies induced by motor shaft runout or axial endplay. The advanced Opto-ASIC design provides the advanced noise immunity necessary for many industrial applications. This encoder is ideal for applications using induction motors and flux vector control. The Model 770 provides speed and position information for drive feedback in a slim profile – only 1.00” thick. The thru-bore design allows fast and simple mounting of the encoder directly to the accessory shaft or to the drive shaft of the motor, using the standard motor face (NEMA sizes 56C - 184C). The tough, all-metal housing resists the vibration and hazards of an industrial environment.

COMMON APPLICATIONS

Motor Feedback, Velocity & Position Control, Conveyors, Variable Speed Drives, Mixing & Blending Motors, Assembly & Specialty Machine

MODEL 770 ORDERING GUIDE

Blue type indicates price adder options. Not all configuration combinations may be available. Contact Customer Service for details.

<table>
<thead>
<tr>
<th>MODEL 770</th>
<th>H</th>
<th>1024</th>
<th>Q</th>
<th>OC</th>
<th>A</th>
<th>Y</th>
<th>N</th>
<th>N</th>
<th>CE</th>
</tr>
</thead>
</table>

**HOTEN STYLes**

A Completely encloses motor shaft, and eliminates access to motor shaft. IP65 rated. Includes C-Face Gasket Kit.

B Thru-bore housing version with IP50 dust seal.

**CYCLES PER REVOLUTION**

1 - 4096

See CPR Options below for available resolutions.

Price adder for CPR > 1024

**NUMBER OF CHANNELS**

Channel A leads B

Q Quadrature A & B

R Quadrature A & B with Index

Channel B leads A

K Reverse quadrature A & B

D Reverse quadrature A & B with Index

See Quadrature Phasing & Index Gating Options at encoder.com for additional options and waveforms

**OUTPUT TYPE**

S - 28V In / Out

OC Open Collector

PU Pull-Up Resistor

PP Push-Pull

HV Line Driver

**BORE SIZE**

A 5/8’, 0.625”

B 3/4’, 0.750”

C 7/8’, 0.875”

D 1”, 1.000”

H 14 mm

I 19 mm

K 24 mm

**C-FACE GASKET KIT OPTION**

"B" Housing Only

N None

Y Yes

**CERTIFICATION**

N None

CE CE Marked

**MATING CONNECTOR**

N No connector

Y Yes

**CONNECTOR TYPE**

P Gland nut with 24” cable

B Terminal strip in conduit box

X 10-pin MS on conduit box

Y 7-pin MS on conduit box

J 5-pin M12 on conduit box

K 8-pin M12 on conduit box

L 10-pin industrial clamp

**NOTES:**

1. Thru-Bore version may be IP65 sealed if mounted between two C-Face devices with optional gasket kit. Select ‘Yes’ under C-Face Gasket Kit Option.

2. Contact Customer Service for quadrature gating options.

3. Contact Customer Service for index gating options.

4. Contact Customer Service for index gating options.

5. Line Driver Outputs not available with 5-pin M12 connector. Available with 7-pin MS connector only without Index Z.

6. For mating connectors, cables, and cordsets see Accessories at encoder.com. For Connector Pin Configuration Diagrams, see Connector Pin Configuration Diagrams at encoder.com.

7. For non-standard cable lengths, add a forward slash (/) plus cable length expressed in feet. Example: P/6 = 6 feet of cable.


**MODEL 770 CPR OPTIONS**

- 0060 0100 0120 0240
- 0250 0256 0500 0512
- 1000 1024 2048 2500
- 4096

Contact Customer Service for other disk resolutions; not all disk resolutions available with all output types.
### MODEL 770 SPECIFICATIONS

#### Electrical

- **Input Voltage**: 4.75 to 28 VDC max for temperatures up to 70°C  
  4.75 to 24 VDC for temperatures between 70°C and 100°C
- **Input Current**: 100 mA max with no output load
- **Input Ripple**: 100 mV peak-to-peak at 0 to 100 kHz
- **Output Format**: Incremental – Two square waves in quadrature with channel A leading B for clockwise shaft rotation, as viewed from the mounting face. See Waveform Diagrams.
- **Output Types**:  
  - Open Collector – 100 mA max per channel  
  - Pull-Up – Open Collector with 2.2K ohm internal resistor, 100 mA max per channel  
  - Push-Pull – 20 mA max per channel  
  - Line Driver – 20 mA max per channel (Meets RS 422 at 5 VDC supply)
- **Index**: Once per revolution.  
  - 0001 to 0512 CPR: Ungated  
  - 0513 to 4096 CPR: Gated to output A  
  - See Waveform Diagrams.
- **Max Frequency**: 200 kHz
- **Electrical Protection**: Reverse voltage and output short circuit protected. NOTE: Sustained reverse voltage may result in permanent damage.
- **Noise Immunity**: Tested to BS EN61000-4-2; IEC801-3; BS EN61000-4-4; DDENV 50141; DDENV 50204; BS EN55022 (with European compliance option); BS EN61000-6-2; BS EN50081-2
- **Quadrature**: 67.5° electrical or better is typical,
- **Edge Separation**: 54° electrical minimum at temperatures > 99°C
- **Rise Time**: Less than 1 microsecond

#### Mechanical

- **Max Shaft Speed**: 6000 RPM. Higher shaft speeds may be achievable, contact Customer Service.
- **User Shaft Tolerances**:  
  - Radial Runout: 0.005”
  - Axial Endplay: ±0.050”
- **Moment of Inertia**: 3.3 x 10⁻³ oz-in-sec² typical
- **Housing**: All metal construction
- **Weight**: 2.60 lb with gland nut  
  - 3.00 lb with all other connector options
  - Note: All weights typical

#### Environmental

- **Storage Temp**: -25°C to 100°C
- **Humidity**: 98% RH non-condensing
- **Vibration**: 10 g @ 58 to 500 Hz
- **Shock**: 50 g @ 11 ms duration
- **Sealing**: IP65 for Option A housing style with gasket kit; IP50 for Option B housing style
MODEL 770 - INCREMENTAL ENCODER

MODEL 770 WITH GLAND NUT (P)

MODEL 770 WITH CONDUIT BOX (B, X, Y, J, K)

OPTIONAL HOUSING STYLE (A) PROTECTIVE COVER

Connector Type  Height
6- or 7-pin MS  0.67"
10-pin MS  0.90"
5- or 8-pin M12  0.50"

All dimensions are in inches with a tolerance of ±0.005" or ±0.01" unless otherwise specified.
WIRING TABLE
For EPC-supplied mating cables, refer to wiring table provided with cable. Trim back and insulate unused wires.

<table>
<thead>
<tr>
<th>Function</th>
<th>Gland Cable Wire Color</th>
<th>5-pin M12++ PU, PP, OC</th>
<th>8-pin M12++ PU, PP, OC</th>
<th>10-pin MS</th>
<th>7-pin MS HV</th>
<th>7-pin MS PU, PP, OC</th>
<th>Terminal Block</th>
<th>10-pin Industrial Clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Com</td>
<td>Black</td>
<td>3</td>
<td>7</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>2</td>
<td>1</td>
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<tr>
<td>+VDC</td>
<td>Red</td>
<td>1</td>
<td>2</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>1</td>
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<tr>
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<td>White</td>
<td>4</td>
<td>1</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>3</td>
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<tr>
<td>A'</td>
<td>Brown</td>
<td>--</td>
<td>3</td>
<td>H</td>
<td>C</td>
<td>--</td>
<td>4</td>
<td>8</td>
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<tr>
<td>B</td>
<td>Blue</td>
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<td>4</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>5</td>
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<tr>
<td>B'</td>
<td>Violet</td>
<td>--</td>
<td>5</td>
<td>I</td>
<td>E</td>
<td>--</td>
<td>6</td>
<td>7</td>
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<tr>
<td>Z</td>
<td>Orange</td>
<td>5</td>
<td>6</td>
<td>C</td>
<td>--</td>
<td>C</td>
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<tr>
<td>Z'</td>
<td>Yellow</td>
<td>--</td>
<td>8</td>
<td>J</td>
<td>--</td>
<td>--</td>
<td>8</td>
<td>9</td>
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<td>--</td>
<td>G++</td>
<td>G++</td>
<td>G++</td>
<td>--</td>
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<tr>
<td>Shield</td>
<td>Bare*</td>
<td>--</td>
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<td>--</td>
<td>--</td>
<td>--</td>
<td>9+</td>
<td>10+</td>
</tr>
</tbody>
</table>

*CE Option: Cable shield (bare wire) is connected to internal Case.
**CE Option: Pin G is connected to Case. Non-CE Option: Pin G has No Connection.
++CE Option: Pins 9 and 10 are connected to Case. Non CE Option: Pins 9 and 10 have No Connection.
†Standard cable is 24 AWG conductors with foil and braid shield.

WAVEFORM DIAGRAMS

Line Driver and Push-Pull

Open Collector and Pull-Up

Clockwise rotation as viewed from the mounting face.

NOTE: All degree references are electrical degrees. Index is positive going.