

# CP-300 Series Housed Encoders

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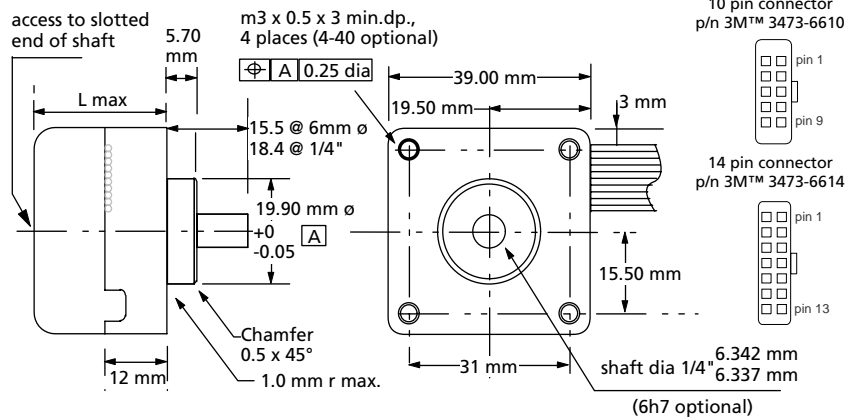


## Description:

The CP-300 series encoder is a small, rugged device, with a package form factor identical to that of a 39 mm stepper motor. The light source is a single light emitting diode, the sensor a monolithic silicon array. Up to 4,096 counts per revolution (16,384 measuring steps) are available for the incremental models and up to 10 bits for the absolute units.

## Options:

- custom linecounts and index configurations
- through shaft
- custom shaft and cable configurations
- extended temperature range (-30 °C to +100 °C)
- integral brushless DC motor version (CM-320-x)
- shaft seal

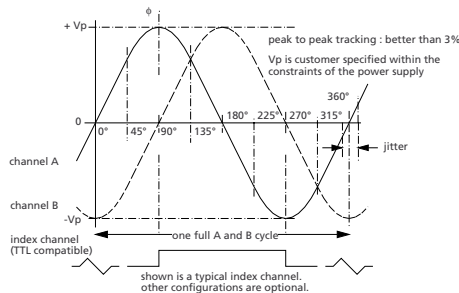


shaft diameter: 1/4", 6.342 / 6.337 mm  
 shaft options: 6 mm  
 shaft loading: 10 N axial, 20 N radial (2 lbs and 4 lbs resp.)  
 shaft runout: 0.0125 mm T.I.R.  
 starting torque: 0.1 Ncm @20°C max  
 shaft rotation: continuous, reversible  
 slew speed: 160 rev/sec<sup>2</sup>  
 bearings: ABEC 5  
 shaft material: 416 stainless

housing material: diecast aluminum  
 cover: 1.5 mm wall, Ryton 4  
 bearing life: manufacturer's specs  
 moment of inertia: 1.7 gcm<sup>2</sup>  
 weight: approx. 0.120 kg  
 temperature: operating: -20°C to +85°C  
 shock: 50 G's @ 11 ms  
 vibration: 5-2,000 Hz @ 20 G's  
 humidity: 98% without condensation  
 protection: IP 64 (w/o shaft extension)

## CP-300, Incremental, Sine/Cosine

all waveforms shown for cw rotation, as seen from load end-degrees are in electrical degrees unless otherwise designated.



## Electrical Data:

power supply: ± 12 Vdc @ 50 mA max.  
 code: incremental  
 cycles per revolution: up to 2048  
 output format: A and B channel in quadrature, Index  
 output: TIL 084 op-amp  
 frequency response: flat up to 75 kHz  
 absolute accuracy  
 of zero-crossings: ± 25 acseconds typ.

## Pin Assignments:

- 1 ground
- 2 channel A
- 3 n/c
- 4 - 12 Vdc
- 5 n/c
- 6 channel B
- 7 n/c
- 8 + 12 Vdc
- 9 V reference input (servo ground)
- 10 index

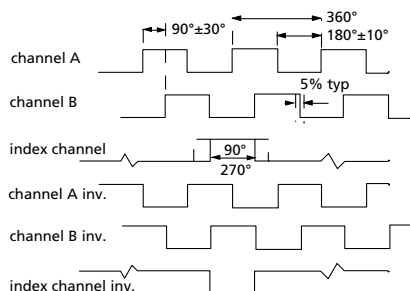
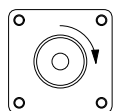
## Mechanical Data:

dimensions: L<sub>max</sub> = 26 mm

## Ordering Information:

Please contact factory

## CP-350, Incremental, Digital



## Electrical Data:

power supply: + 5Vdc ± 10% @ 50 mA max (no load)  
 output format: incremental  
 cycles/revolution: 100, 200, 256, 360, 500, 600, 1000, 1024, 1728, 2048, 2500 and 4096 std.  
 frequency response: 150 kHz min. @ 85 °C  
 linedriver output: 26LS31, EIA std. RS 422 and DIN 66259 compatible  
 TTL output: 74LS04  
 open collector  
 output: LM 339, 6 mA max. sink  
 overall length: L<sub>max</sub> = 26 mm

## pinout linedrivers:

- 1 + 5Vdc
- 2 + 5Vdc
- 3 channel A inv.
- 4 channel A
- 5 channel B inv.
- 6 channel B
- 7 index channel
- 8 ground
- 9 index channel inv.
- 10 ground

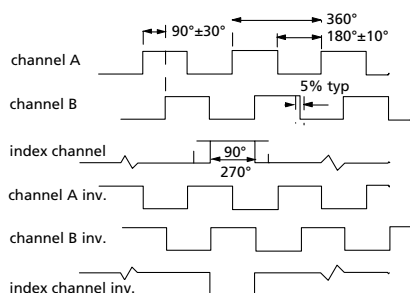
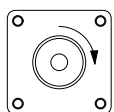
## pinout TTL:

- 1 channel A
- 2 + Vcc
- 3 ground
- 4 ground
- 5 ground
- 6 ground
- 7 + Vcc
- 8 channel B
- 9 n/c
- 10 index channel

## Ordering Information:

CP-350-(linecount)-(1)-(2)-(3)  
 (1): linedriver=L, TTL=T, open collector=O  
 (2): Vcc=5V, 12V or 24V, "O" version only  
 (3): optional through-shaft extension in mm

## CP-360, Incremental, Linedriver 5V to 30V



## Electrical Data:

power supply: V<sub>in</sub> = + 4.75 Vdc to 30 Vdc @ 50 mA max (no load)  
 output format: incremental  
 cycles/revolution: 100, 200, 256, 360, 500, 600, 1000, 1024, 1728, 2048, 2500 and 4096 std.  
 frequency response: 150 kHz min. @ 85 °C  
 output: EIA std. RS 422 and DIN 66259 (part 3) compatible  
 output @ V<sub>in</sub>=4.75V: V<sub>lo</sub> 0.5 V@20 mA sink  
 V<sub>hi</sub> 2.5V@20 mA source  
 output @ V<sub>in</sub>=30V: V<sub>lo</sub> 0.5 V@20 mA sink  
 V<sub>hi</sub> 27 V@20 mA source  
 overall length: L<sub>max</sub> = 26 mm

## pinout

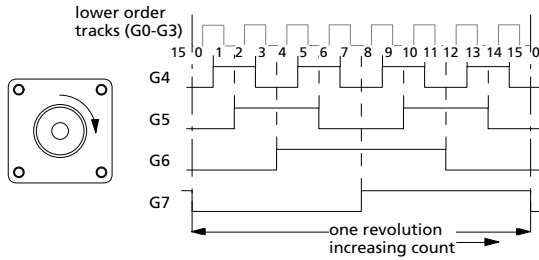
- 1 + V<sub>in</sub>
- 2 channel A
- 3 channel A inv.
- 4 channel B
- 5 channel B inv.
- 6 index channel/ground
- 7 index channel inv.
- 8 ground
- 9 n/c
- 10 n/c

## Ordering Information:

CP-360-(linecount)-(1)  
 (1): optional through-shaft extension in mm

# CP-300 Series Housed Encoders

## CP-350-08GC, Absolute, 8 bit Gray Code



### Electrical Data:

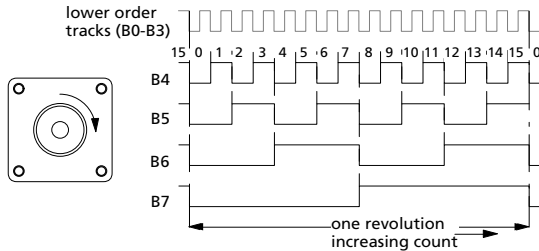
power supply: + 5Vdc  $\pm$  10% @ 50 mA max (no load)  
 + 24 Vdc  $\pm$  10% @ 70 mA max (option)  
 output format: 8 bit parallel, Gray code  
 frequency response: 100 kHz min. wordrate  
 output: LM 339, with pullup resistor,  
 6 mA max. sink  
 overall length:  $L_{max}$  = 26 mm

pinout :  
 1 G4  
 2 G6  
 3 G0 (lsb)  
 4 G3  
 5 ground  
 6 G2  
 7 +5Vdc  
 8 G5  
 9 G7 (msb)  
 10 G1

### Ordering Information:

CP-350-08GC-(1)-(2)-(3)  
 (1): R= with pull-ups, blank if no pullups  
 (2): 5 = 5 Vdc, 12 = 12 Vdc, 24 = 24 Vdc power supply  
 (3): optional through-shaft extension in mm

## CP-350-08NB, Absolute, 8 bit Binary



### Electrical Data:

power supply: + 5Vdc  $\pm$  10% @ 50 mA max (no load)  
 max (no load)  
 output format: 8 bit parallel, binary  
 frequency response: 100 kHz min. wordrate  
 output: standard TTL/CMOS

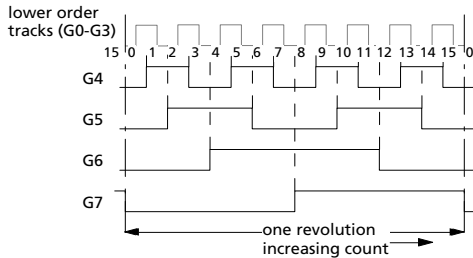
pinout:  
 1 B4  
 2 B6  
 3 B0 (lsb)  
 4 B3  
 5 ground  
 6 B2  
 7 +5Vdc  
 8 B5  
 9 B7 (msb)  
 10 B1

overall length:  $L_{max}$  = 36 mm

### Ordering Information:

CP-350-08NB

## CP-350-08GC180, Absolute, 1° Position



### Electrical Data:

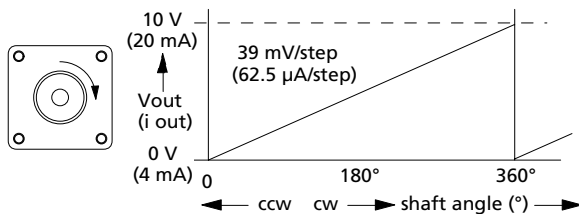
power supply: + 5Vdc  $\pm$  10% @ 50 mA max (no load)  
 + 24 Vdc  $\pm$  10% @ 70 mA max (option)  
 output format: 8 bit parallel, Gray code,  
 1°/position, repeated twice per revolution.  
 frequency response: 100 kHz min. wordrate  
 output: LM 339, with pullup resistor, 6 mA max. sink  
 overall length:  $L_{max}$  = 26 mm

pinout :  
 1 G4  
 2 G6  
 3 G0 (lsb)  
 4 G3  
 5 ground  
 6 G2  
 7 +5Vdc  
 8 G5  
 9 G7 (msb)  
 10 G1

### Ordering Information:

CP-350-08GC180-(1)-(2)-(3)  
 (1): R= with pull-ups, blank if no pullups  
 (2): 5 = 5 Vdc, 12 = 12 Vdc, 24 = 24 Vdc power supply  
 (3): optional through-shaft extension in mm

## CP-350-08AN, Absolute, Analog



### Electrical Data:

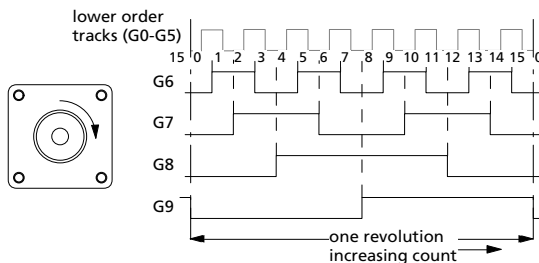
power supply  $V_{in}$ : 12.6 Vdc to 16.6 Vdc @ 100 mA max  
 voltage output  $V_{out}$ : 0 - 10 V standard,  
 current output  $I_{out}$ : 4 - 20 mA (optional)  
 resolution: 8 bits (256 steps)  
 stability:  $\pm$  0.2 %  
 direction control  
 input: TTL/CMOS (5 V)  
 overall length:  $L_{max}$  = 36 mm

pinout:  
 1 n/c  
 2 +  $V_{in}$   
 3 n/c  
 4 n/c  
 5 direction control  
 6 power ground  
 7  $I_{out}$   
 8 n/c  
 9  $V_{out}$   
 10  $I_{out}$  or  $V_{out}$  return

### Ordering Information:

CP-350-08AN-(1)  
 (1) : blank or V =  $V_{out}$ , I =  $I_{out}$  (Select one only)  
 (2) : Shaft Size : 1/4 or 6mm

## CP-350-10GC, Absolute, 10 bit Gray Code



### Electrical Data:

power supply: + 5Vdc  $\pm$  10% @ 100 mA max (no load)  
 max (no load)  
 output format: 10 bit parallel, Gray code,  
 frequency response: 50 kHz min. wordrate  
 output: standard TTL/CMOS

pinout :  
 1 G1  
 2 G8  
 3 G6  
 4 G7  
 5 ground  
 6 G5  
 7 +5Vdc  
 8 G0 (lsb)  
 9 G9 (msb)  
 10 G3  
 11 G4  
 12 G2  
 13 n/c  
 14 G9 inverted

overall length:  $L_{max}$  = 36 mm

### Ordering Information:

CP-350-10GC