

## CP-800/900 Series Size-25 Housed Rotary Optical Encoders

*Solid or hollow shaft, incremental, sine/cosine, or absolute format*

Allied Motion's CP800/900 series are size-25 (2.5 in. (63.5mm)) rotary optical encoders, available as solid or hollow shaft models with incremental, sine/cosine, and absolute encoding formats. These rugged units have their own bearing system and are fully enclosed in a metal housing sealed up to IP65.

CP-800 models have a solid shaft and are offered with either a square or servo flange. CP-900 models have a hollow shaft design with a hub-shaft accepting up to 0.5" (12.7mm) shafts. A face mounted spring absorbs installation misalignment.

CP-800/900 encoders offer exceptional resolution of up to 1 million counts per rev. or 17-bit absolute enabling their use in high precision positioning applications. Custom designs are available to suit special requirements.

### Features & Benefits

- Industry-standard size 25 fits / retrofits many applications easily
- Both solid and hollow-shaft models for application flexibility
- Incremental, sine/cosine, absolute output options
- Shielded ABEC-7 bearings for smooth, long life operation.
- Rugged aluminum housing with IP65-rated protection
- Choice of side or rear-exit connector or cable

### Options

- Special line counts and index
- Custom cable and/or connector
- Sealed bearings (IP65) and housing (IP65)
- RoHS compliancy available
- Extended temperature range: -25°C to +100°C



- Robust solid or hollow-shaft size-25 rotary optical encoders
- Up to 1 million counts/rev (max frequency response 2 MHz)
- Digital Incremental, sine/cosine or absolute encoding formats
- Absolute single turn resolution up to 17-bit

## SPECIFICATIONS - INCREMENTAL ENCODER

Model	CP-800/900	CP-850/950	CP-870/970	CP-850-950-HHC
<b>Type</b>	Incremental, sin/cos	Incremental, digital	Incremental, digital, line-driver	Incremental, digital, high-count
<b>Format</b>	A quad B, index	A quad B, index inverses	A quad B, index inverses	A quad B, index inverses
<b>Resolution (cycles/ rev; 1 cycle/rev = 4 quad counts/rev)</b>	1000, 1024, 2048, 3600, 4096	360, 512, 720, 1000, 1024, 1440, 1800, 2000, 2048, 2880, 3000, 3600, 4000, 4096, 5000, 5120, 6000, 7200, 8000, 8192, 9000, 10000	360, 512, 720, 1000, 1024, 1440, 1800, 2000, 2048, 2880, 3000, 3600, 4000, 4096, 5000, 5120, 6000, 7200, 8000, 8192, 9000, 10000	11.25k, 12k, 12.5k, 15k, 16384, 20k, 22.5k, , 24k, 25k, 26k, 28.8k, 30k, 32k, 32.5k, 32768, 36k, , 40k, 45k, 50k, 52k, 57.6k, 60k, 62.5k, 64k, 65k, 65536, 72k, 75k, 80k, 90k, 92160, 100k, 120k, 150k, 180k, 200k, 225k, 250k, 262144, 325k, 360k, 400k, 512k, 524288, 625k, 720k, 900k, 1000k, 1024k, 1048576, 1250k
<b>Frequency Response</b>	40 kHz	250 kHz	250 kHz	2 MHz
<b>Accuracy</b>	±12 arcsec (typ.)			± 1 count
<b>Repeatability</b>	1 arc sec	± 1 count		
<b>Power Supply (VDC)</b>	+5, +12 (50 mA max ea.)	+5 (100 mA max)	+8 to +30 (150 mA max)	+5 (250 mA max)
<b>Output</b>	Op amp (TIL084)	TTL/ 74LS04	Line-driver	Line-driver

Incremental Encoder Connections (Connector: MS3102R-18-1P)									
<b>Connection</b>	A	A inv	B	B inv	Index	Index inv	+5 VDC	Common	Shield
<b>Connector Pin</b>	A	G	B	H	C	I	E	F	J

# Optical Encoders

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### SPECIFICATIONS—ABSOLUTE ENCODERS

Model	CP-850/950-12GC	CP-850/950-14GC	CP-850/950-17SGC	CP-850/950-12NB	CP-850/950-12ANX
<b>Type</b>	Absolute, 12-bit	Absolute, 14-bit	Absolute, 17-bit	Absolute, 12-bit	Absolute, Analog
<b>Format</b>	Parallel Gray code	Parallel Gray code	SSI Gray Code	Parallel Natural Binary	12 bits (4096 steps)
<b>Freq. Response</b>	100 kHz min word rate		5 MHz clock	100 kHz min word rate	50µs latency
<b>Output</b>	TTL Compatible		TTL or RS485	TTL Compatible	0 - 10V (std) 4 - 20 mA (opt)
<b>Power Supply</b>	+5 VDC ±10% (100 mA max)		+5 ± .5 VDC	+5 VDC ±10% (100 mA max)	+12.6 to + 16.6, (100 mA max)

### Absolute Encoder Connections

Connector	KPT00A-14-19P				MS3102R18-1P		KPT00A-14-19P		MS3102R-16S-1P	
	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin
	G0	A	G0	P	CLOCK POS	A	B0	A	Iout	A
	G1	B	G1	S	DATA POS	B	B1	B	Iout (rtn)	B
	G2	C	G2	A	NSL POS	C	B2	C	Vout	C
	G3	D	G3	B	N/C	D	B3	D	Vout (rtn)	D
	G4	E	G4	C	+5 VDC	E	B4	E	Direction	E
	G5	F	G5	D	GROUND	F	B5	F	+15 VDC	F
	G6	G	G6	E	CLOCK NEG	G	B6	G	Common	G
	G7	H	G7	F	DATA NEG	H	B7	H	GND	H
	G8	J	G8	G	NSL NEG	I	B8	I		
	G9	K	G9	H	GROUND	J	B9	K		
	G10	M	G10	J			B10	M		
	G11	N	G11	K			B11	N		
	+ 5 VDC	V	G12	M			Direction	L		
	Common	T	G13	N			+ 5 VDC	V		
	GND	S	+ 5 VDC	V			Common	T		
			Common	T			GND	S		
			GND	shield						

## CP-800/900 Series Size-25 Housed Rotary Encoders

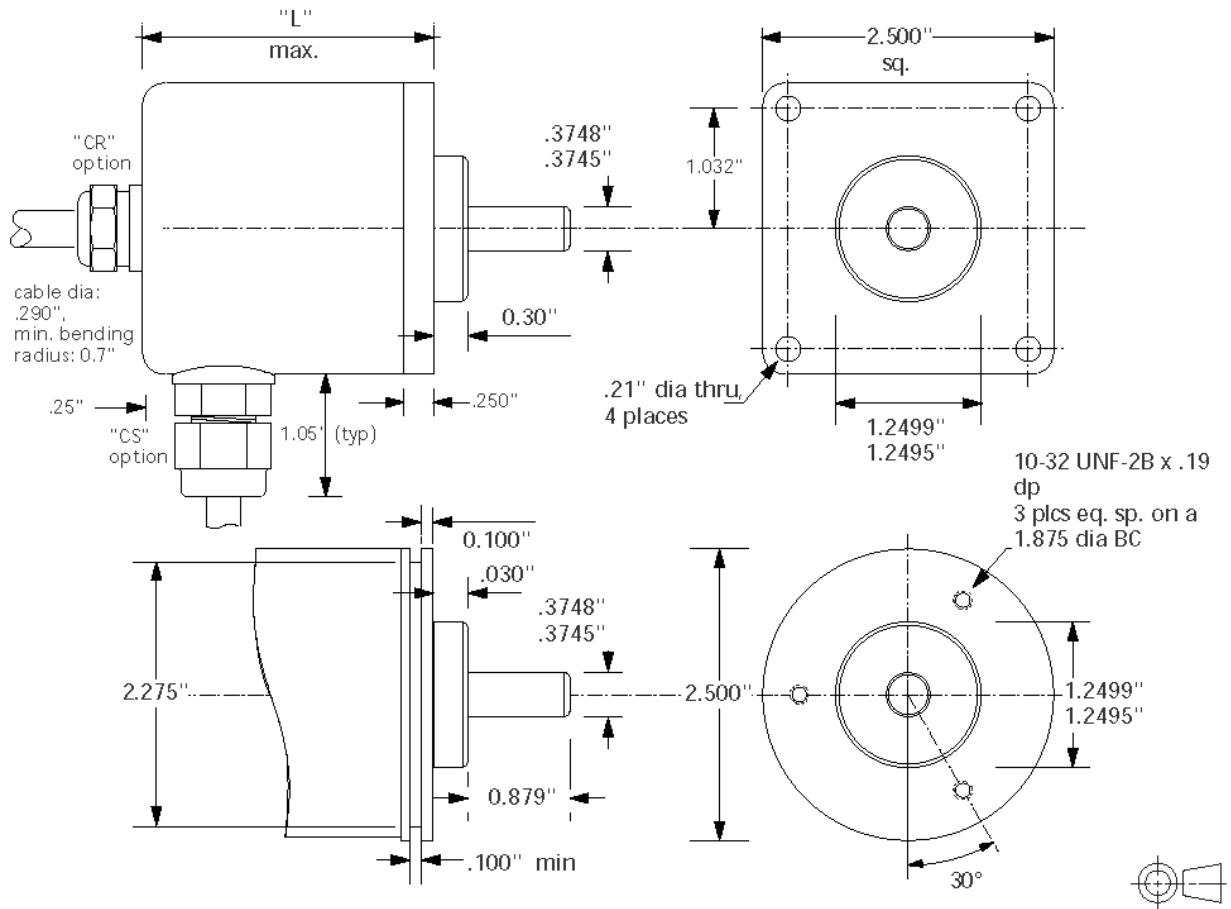
### SPECIFICATIONS—MECHANICAL

Model	CP-800 Series	CP-900 Series
Shaft Diameter, in (mm)	0.3745/ 0.3748 (9.512/ 9.520)	0.5 (12.7) max
Shaft Play, in (mm)	0.05 (1.27) axial; 0.005 (0.127) radial	
Shaft Loading, lb (N)	40 (178) axial; 35 (156) radial	
Shaft Runout, T.I.R, in (mm)	0.0005 (0.0127)	
Shaft Material	416 stainless steel	
Shaft Rotation	Continuous, reversible	
Bearing Type	ABEC-7	
Starting Torque, oz-in (mNm)	1.5 (10.6) max. at 20C	
Inertia, oz-in-s <sup>2</sup> (kgm <sup>2</sup> )	4.1E-4(2.9E-6)	
Slew Speed, RPM	10000	
Shock, g	50 at 11ms	
Vibration, Hz	5 - 2000 Hz at 20g	
Operating Temp, °C	-20 to +90	
Humidity	98% without condensation	
Protection Rating	Without shaft seal: IP54 (with shaft seal: IP65)	
Housing Material	Aluminum (flange and cover)	
Weight, lb (kg)	13 (0.369)	

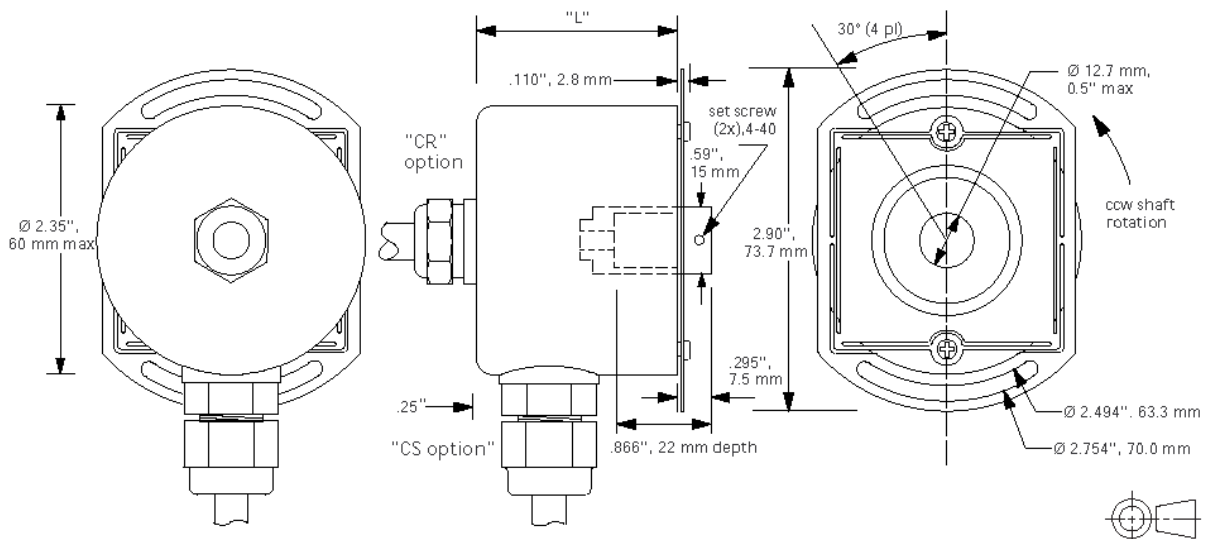
# Optical Encoders

## CP-800/ 900 Series Size-25 Housed Rotary Encoders

### DIMENSIONS—CP-800 Solid Shaft



### DIMENSIONS—CP-900 Hollow Shaft

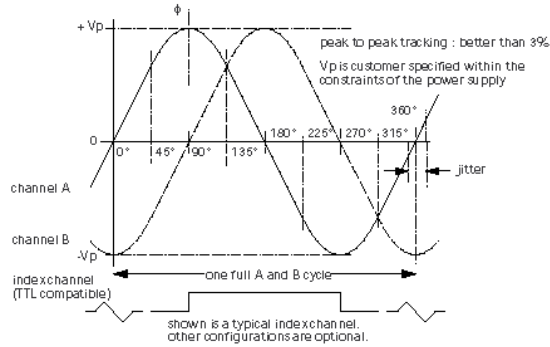


## CP-800/ 900 Series Size-25 Housed Rotary Encoders

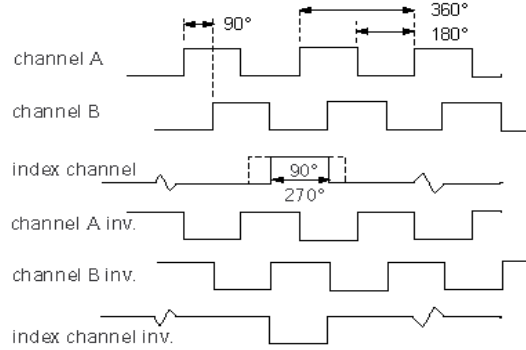
### OUTPUT WAVEFORMS

**Note:** All waveforms shown are for CW rotation viewed from encoder shaft end

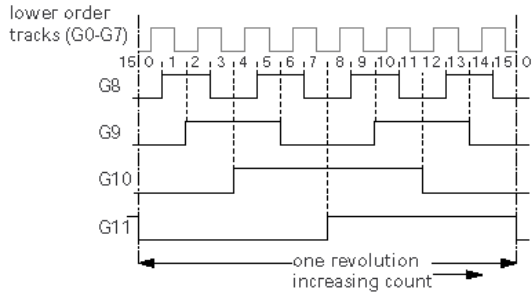
#### CP-800/900



#### CP-850/950, CP-850/950-HHC, CP-870/970

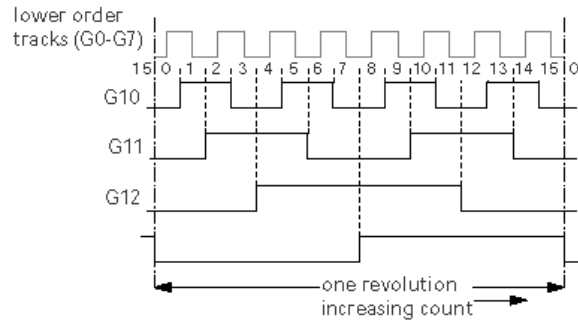


#### CP-850/950-12GC

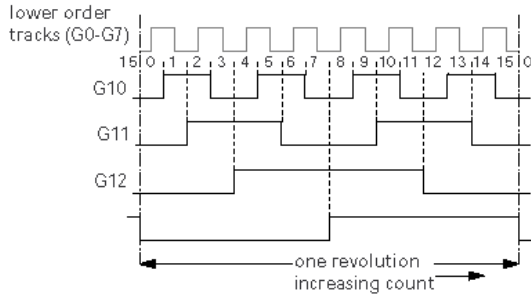


For -12GC/3600: 0.1°/step: 0-1799, then 2296 to 4095

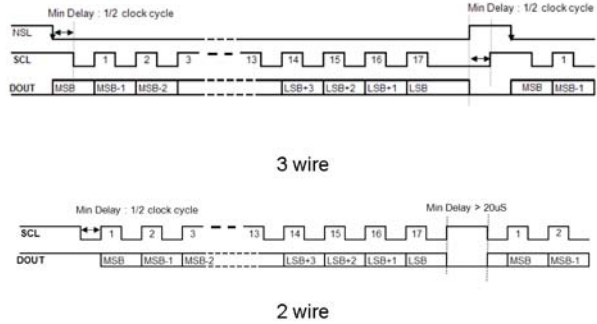
#### CP-850/950-14GC



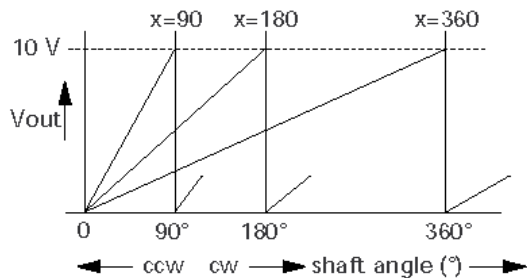
#### CP-850/950-12NB



#### CP-850/950-17SGC



#### CP-850/950-12AN

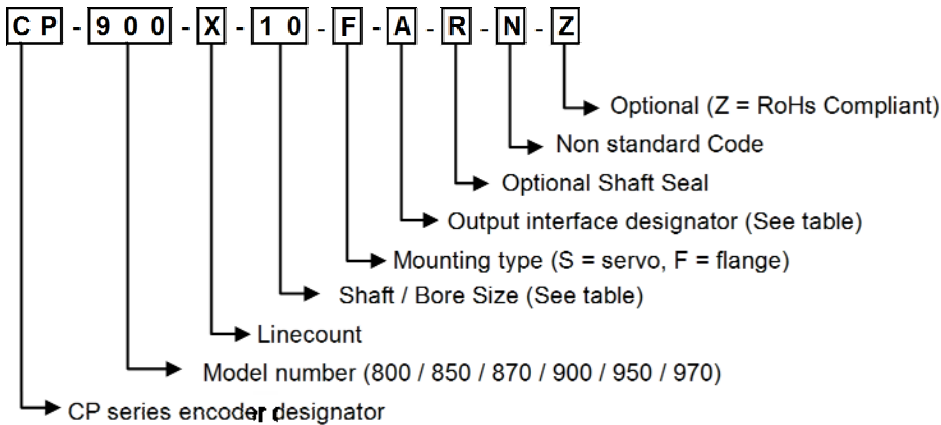


Options	X = 90	X = 180	X = 360
Rotation	90	180	360
Resolution	5.27 arc min.		
mV/ step	9.77 mV	4.88 mV	2.44 mV

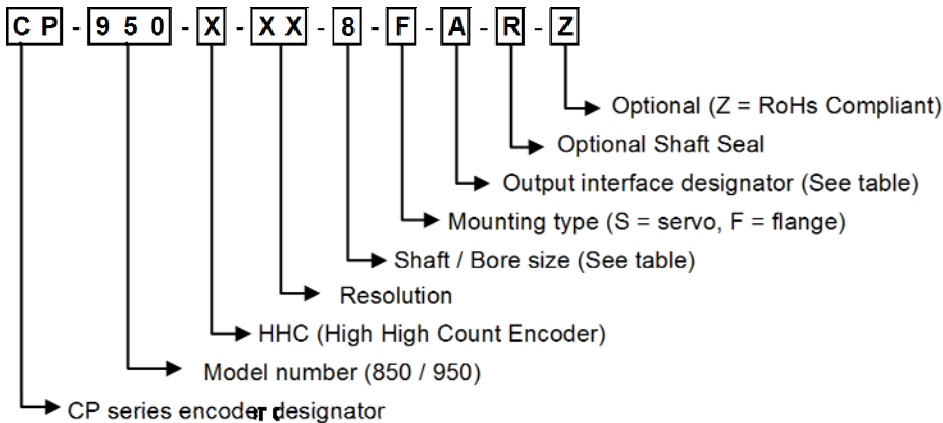
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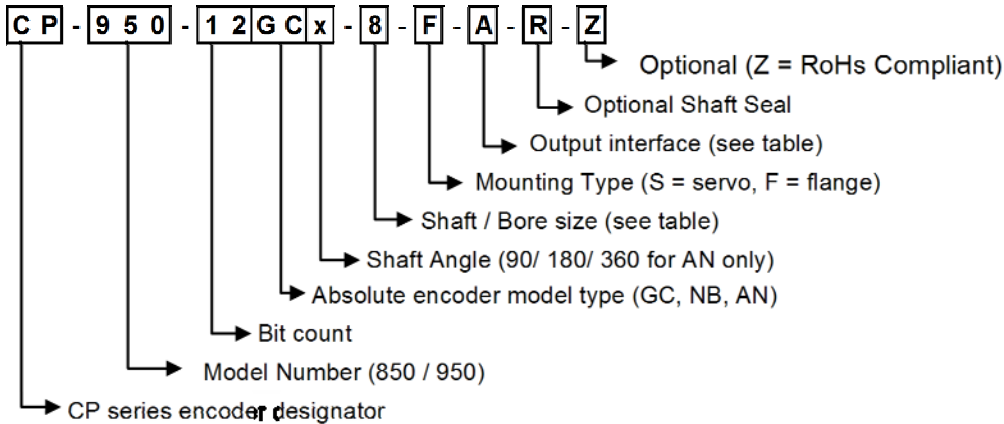
### MODEL NUMBERING – INCREMENTAL ENCODERS



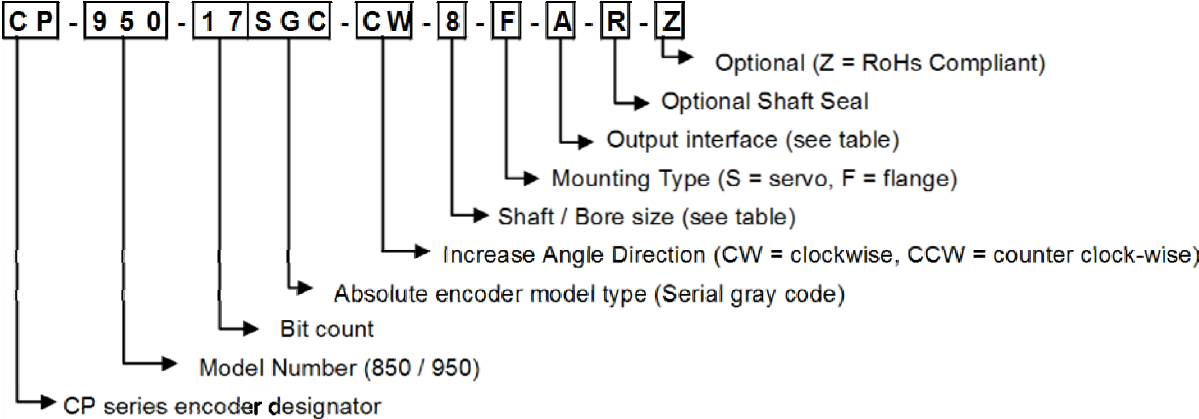
### MODEL NUMBERING – HIGH-COUNT ENCODERS



### MODEL NUMBERING – ABSOLUTE ENCODERS



## CP-800/ 900 Series Size-25 Housed Rotary Encoders



Output Interface
A = rear cable
B = side cable
C = rear connector
D = side connector

Series	Shaft and Bore Size	
	CP-800	CP-900
<b>Inch</b>	1/4, 3/8	3/32, 3/16, 1/4, 5/16, 3/8, 1/2
<b>Metric</b>	6.350, 9.525 (mm)	4, 5, 6, 8, 10, 12.7 (mm)
Enter Shaft/Bore size as inch fraction or whole number for metric		

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