CUI INC

date 07/2008

PART NUMBER: NSO-S **DESCRIPTION:** incremental shaft type encoder

ELECTRICAL SPECIFICATIONS

output waveform		square wave
output signals		A, B, Z phase, inverse A, B, Z phase
current consumption		90 mA (voltage output, push-pull HV), ≤70 mA (open collector output, open collector HV output, line driver output), 100 mA (PNP push-pull), 60 mA (push-pull WV)
frequency response		200 kHz (voltage output, open collector HV output, open collector output), 50 kHz (PNP push-pull), 200 kHz (HV push-pull, line driver, 5000 PPR), 1 MHz (push-pull HV, line driver, 10000 PPR), 100 kHz (push-pull WV)
supply voltage		4.5 V ~ 13.2 V dc (voltage output, open collector output) 10.8 V ~ 26.4 V dc (open collector HV output, PNP push-pull, push-pull HV), 5 V dc ± 10% (line driver output), 4.75 ~ 30 V dc (push-pull WV)
output current		≤20 mA (voltage output, open collector output, PNP push-pull), 20 mA (line driver output), 40 mA (push-pull HV), 30 mA (push-pull WV)
output voltage	"H"	Vcc - 1 V (voltage output, PNP push-pull), Vcc - 3 V (push-pull HV), 2.5 V (line driver output), Vcc - 2.5 V (push-pull WV)
	"L"	0.5 V (voltage output, open collector output, open collector HV output, line driver), 3 V (push-pull HV), 0.4 V (push-pull WV)
output resolution (ppr)		10, 20, 30, 40, 50, 60, 100, 200, 250, 300, 360, 500, 600, 1000, 1024, 1250, 1800, 2000, 2048, 2500, 3600, 4096, 5000, 10000
waveform rise/fall time		1 μs (voltage output, open collector output, open collector HV output, push-pull, push-pull HV), 200 ns (line driver output), 3 μs (push-pull WV)

MECHANICAL SPECIFICATIONS

max shaft load,	radial:	8 kgf
	axial:	5 kgf
starting torque		100 gf·cm max.
max rotational speed		5000 RPM
shock resistance		980 m/s^2, 3 times each on XYZ
vibration proof		10 ~ 55 Hz, double amplitude 1.5 mm
weight		250g max.

ENVIRONMENTAL SPECIFICATIONS

operating temp	-10° to +70° C
storage temp	-30° to +85° C
humidity	RH 85% max, non-collecting
degree of protection	IP65

ELECTRICAL CONNECTIONS

2
2M
2C
2MC
2HC
2MHC
2HCP
2MHCP
2HT
2MHT

Color of Lead Wire	Description
Red	Power Source
Black	0V Common
Green or Blue	Signal A
White	Signal B
Yellow	Signal Z
Shielding Braid	NC

2MD

Color of Lead Wire	Description	Color of Lead Wire	Description
Red	Power Source	White	Signal $\overline{B}$
Black	0V Common	Gray	Signal B
Green	Signal A	Yellow	Signal $\overline{Z}$
Blue	Signal $\overline{A}$	Orange	Signal Z
Shielding Braid	NC		

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ORDERING INSTRUCTIONS

NSO-SXXXX-2XXX-X-XXX

Resolution (PPR):

10 = 10 PPR	600 = 600 PPR
20 = 20 PPR	1000 = 1000 PPR
30 = 30 PPR	1024 = 1024 PPR
40 = 40 PPR	1250 = 1250 PPR
50 = 50 PPR	1800 = 1800 PPR
60 = 60 PPR	2000 = 2000 PPR
100 = 100 PPR	2048 = 2048 PPR
200 = 200 PPR	2500 = 2500 PPR
250 = 250 PPR	3600 = 3600 PPR
300 = 300 PPR	4096 = 4096 PPR
360 = 360 PPR	5000 = 5000 PPR
500 = 500 PPR	10000 = 10000 PPR

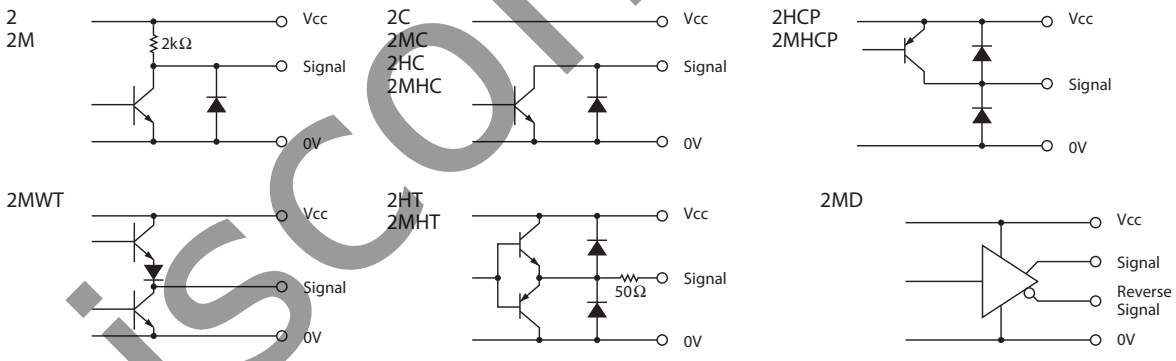
M = index channel

Output type:
"no entry" = Voltage output
C = Open collector output
HC = HV open collector output
HCP = PNP push-pull
HT = Push-pull / high voltage
WT = Push-pull / wide voltage
D = Line driver output

Cable length:
050 = 0.5 m*
100 = 1.0 m
300 = 3.0 m
*standard

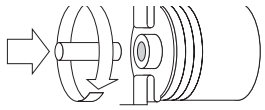
Shaft diameter:
8 = ø8 mm
9525 = ø9.525 mm
10 = ø10 mm
(custom sizes available)

CIRCUIT CONNECTIONS

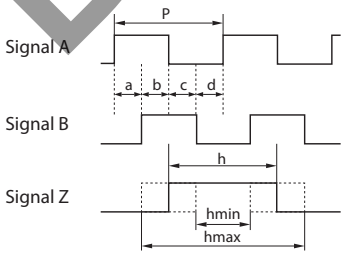


OUTPUT WAVEFORM

CW → Rotating Toward Clockwise Viewed from an Arrow



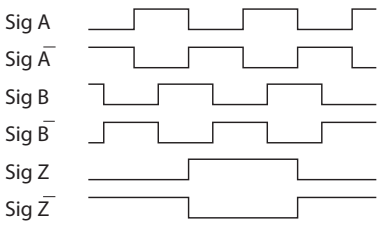
Rising point of A-Signal is always at one point while Z-Signal is at H-Level in CW.



$$P = \frac{1}{1\text{Resolution}}$$

$$a, b, c, d = \frac{P}{4} \pm \frac{P}{8} \quad \frac{P}{2} \leqq h \leqq \frac{3P}{2}$$

Wave Ratio (Duty); 50 ± 25 (%)



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MECHANICAL DRAWING

unless otherwise specified, dimensions are in mm