DEFENDER™

Made in U.S.A.

Optical Incremental Shaft Position Encoder

FEATURES

- NEMA 4X Stainless Steel Enclosure
- Two Independent Shaft Seals
- Heavy Duty Sealed Bearings
- Reverse Polarity Protection
- Short Circuit Protection
- Low Current Consumption
- Mating Connector Included
- Choice of Output Options
- Infrared LED and SMD Circuitry
- Weathertight Connector w/ gold plated contacts

APPLICATIONS

- Paper and Pulp Processing
- Chemical Plants
- Machine Tools
- Food Processing
- Heavy Equipment
- Textile Mills

SPECIFICATIONS

Input
Voltage: 5 or 12-28 VDC, others available
Current: 45 ma. @ 15 VDC typical

Output
Squarewave 50/50 duty cycle
0 - 20,000 pulses/sec.

Mechanical
Housing: 304 Stainless Steel
Shaft Rotation: Either direction
Shaft speed: 6000 RPM max. *
Bearings: Teflon® sealed heavy duty ABEC 3
Load: 30 lbs. radial *
10 lbs. axial *

Temperature Range: -30° to 165° F (-35° to 75°C)

* Please consult factory for details, technical bulletins, and see the safety and warranty sheet for additional information.

DESCRIPTION

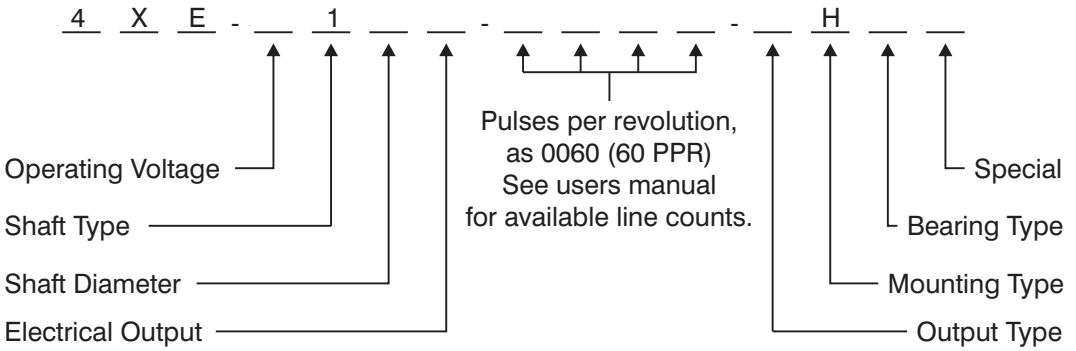
The *DefenderR* series is a NEMA 4X, rotary optical incremental shaft encoder designed with high precision mechanical and opto-electronic components. It is enclosed in a sealed rugged 304 stainless steel housing designed to operate in the most severe environments. Infrared LED and SMD circuitry provides high noise immunity. Two independent shaft seals prevent internal contamination due to moisture and dust. Teflon® sealed ABEC 3 with grease lube (standard) provide for heavier shaft loads. Single channel, index pulse, quadrature, and other special outputs are available with standard resolutions up to 1270 PPR. Over four decades of engineering and manufacturing experience is embodied in every FSI encoder. FSI is committed to manufacturing quality products and providing complete customer satisfaction!

FSI Encoders Controls Sensors™

FSI Technologies Inc.

668 Western Ave. • Lombard, IL 60148-2097 (630) 932-9380 • FAX: (630) 932-0016 www.fsinet.com

ORDERING INFORMATION FOR DefenderR SERIES ENCODERS



Operating Voltage

1	5 VDC
2	12 - 28 VDC
3	Customer specific special
4	12 - 28 VDC (In), 5 VDC (Out)
5	4.5 - 14 VDC
6	6 - 24 VDC
7	9 - 15 VDC use with elec. output type 6

Shaft Type

1	Single ended

Shaft Diameter

2	3/8"
6	3/8" Slotted shaft for screw jacks
7	1/2" Sleeve on 3/8" single ended shaft
8	5/8" Sleeve on 3/8" single ended shaft
9	3/4" Sleeve on 3/8" single ended shaft

Electrical Output

1	Pulse NPN
2	Open Collector NPN
3	Pulse PNP
4	Open Collector PNP
5	8830 TTL diff. line driver (5 VDC)
6	88C30 CMOS diff. line driv. (5, 9-15 VDC Max)
7	7272 CMOS diff. line driv. (30 VDC Max)
D	Dynapar, 1.5 KΩ P/U, 120 Ω SR
E	Encoder Products, 1.5 KΩ P/U, no SR
F	Encoder Products, open collector, no SR

Output Type

S	Single Channel
Q	Quadrature
P	Positive going index pulse
N	Negative going index pulse
D	Count / Direction
B	Up / Down count
G	Anti-Jitter, Quad. output - output type P/N not available with "G" option

Mounting Type

H	Blind holes front and foot flange

Bearing Type

T	Precision ABEC 3 Teflon® seal, oil lube
K	Precision ABEC 3 Teflon® seal, grease lube

Special Options

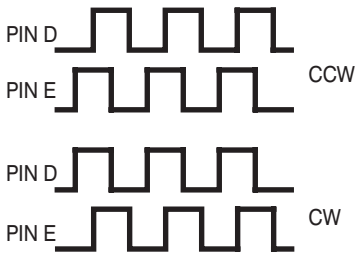
A	High speed output - 36 KHz (consult factory)
I	Delete 220 Ω (no short circuit protect)
J	Replace 220 Ω with 100 Ω
L	Low power (consult factory)
R-X	Strain relief & "X" length of cable - 3' std.
X	Customer specific special
2-XXX	Electronic 2X line count (XXX=ms.)
4-XXX	Electronic 4X line count (XXX=ms.)

Note: See Safety and Warranty data for additional information.

COMMON OUTPUT OPTIONS

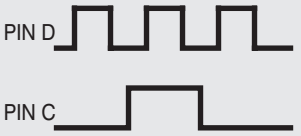
Option S Squarewave

A series of squarewaves corresponding to shaft rotation in either a clockwise (CW) of a counterclockwise (CCW) direction, will appear on Pin D.



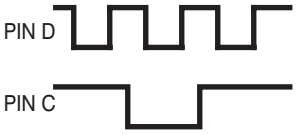
Option Q Quadrature

Quadrature Output on Pin E will lead the Pin D squarewave output for CCW shaft rotation and lag the Pin D squarewave output for CW shaft rotation.



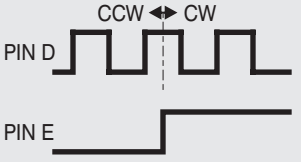
Option P Positive Index Pulse

In addition to the squarewaves, one positive going index pulse per revolution will be on Pin C.



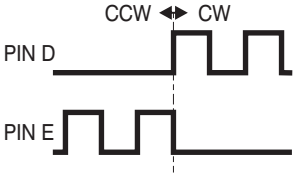
Option N Negative Index Pulse

In addition to the squarewaves, one negative going index pulse per revolution will be on Pin C.



Option D Count / Direction

Squarewave will appear on Pin D regardless of direction of shaft rotation. Pin E will be "high" for CW (Up Count) and "low" for CCW (Down Count).

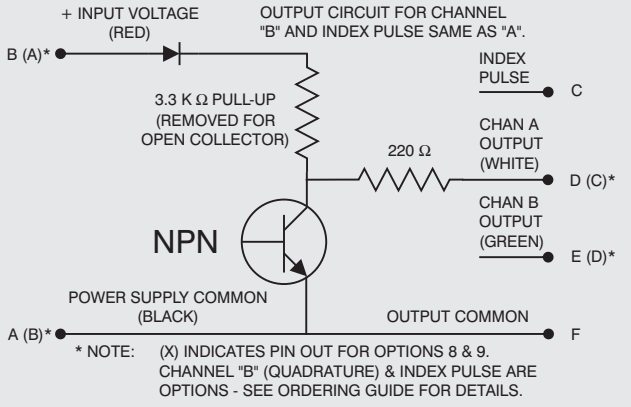


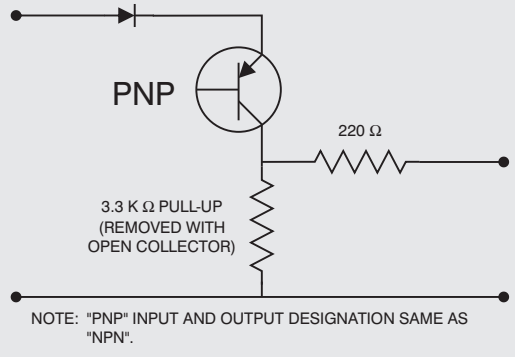
Option B Up / Down Count

A squarewave will appear on Pin D for CW shaft rotation and on Pin E for CCW shaft rotation.

WIRING INFORMATION

NOTE: Standard pin out shown - Additional output types are available.





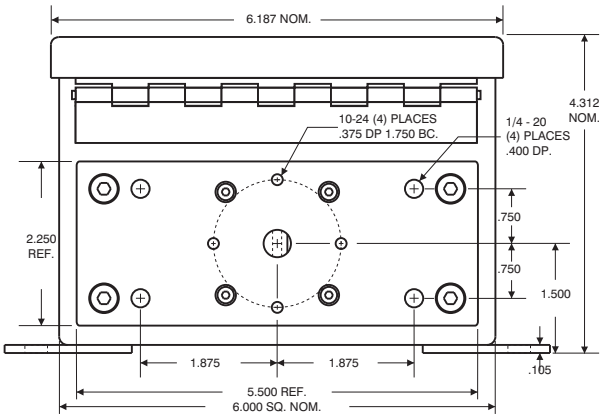
ACCESSORIES

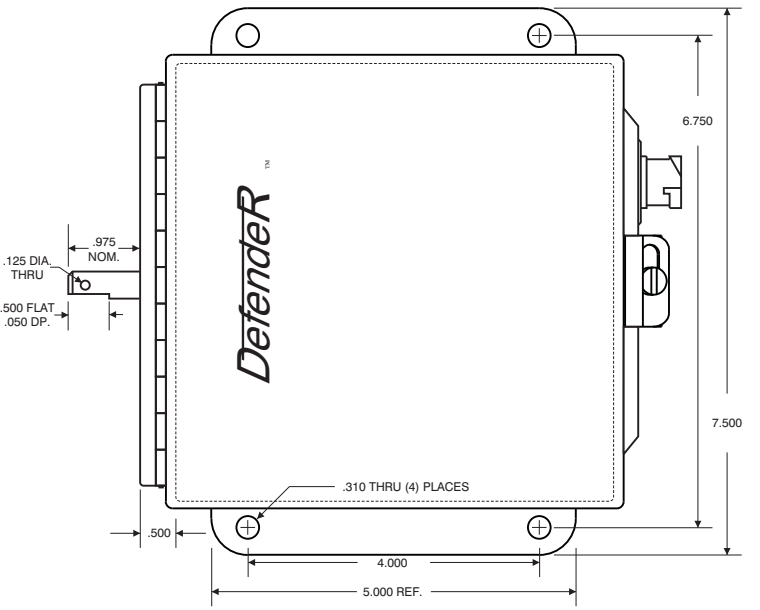
C-6	8 pin weathertight connector w/gold contacts - unassembled
C-6F-XX	C-6 (8 pin) and XX feet of cable - assembled
F-2	3/8" bore flexicoupling, 1.50" length, 1.00" dia.
F-4	1/4" - 5/16" - 3/8" Bore general purpose flexicoupling, 1.50" length, 1.00" dia.
F-5	1/4" Motor pilot to 1/4" - 5/16" - 3/8" bore flexicoupling, 1.25" body length, 1.00" dia.
F-6	3/8" Motor pilot to 1/4" - 5/16" - 3/8" bore flexicoupling, 1.25" body length, 1.00" dia.

NEMA 4X DESCRIPTION & APPLICATION - Ref: NEMA Standard 250

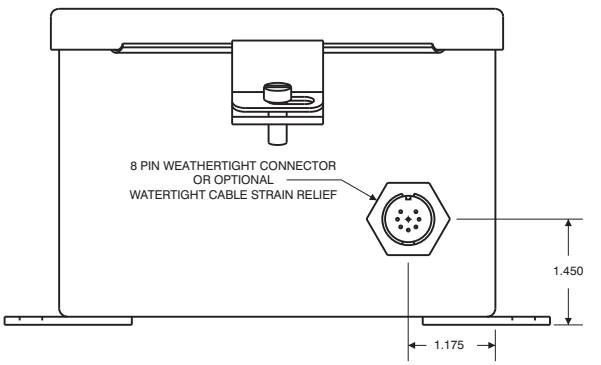
Type 4X enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water; and to be undamaged by the formation of ice on the enclosure. They shall meet hosedown, external icing, and corrosion-resistance design tests. They are not intended to provide protection against conditions such as internal condensation or internal icing.

DefendeR™ MECHANICAL





OVER 750 DISTRIBUTORS WITHIN NORTH AMERICA TO SERVE YOU



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