



MODEL HS35 DRAWWORKS OPTICAL ENCODER

Product Description

This specially configured DrawWorks Model HS35 encoder combines rugged, heavy-duty features into a unique through-shaft style for use as a winch-turns counter in the DrawWorks system of oil rigs. It incorporates dual bearings and shaft seals for NEMA 4 and 13 (IP65) ratings, a hard-anodized metal housing and a sealed connector. It comes with a standard 1"-14 diameter threaded connection and a convertible adapter that allows its use in systems with a 5/8"-18 threaded connection. This encoder has an UL, cUL, and ATEX/CENELEC intrinsically safe rating when installed with the proper barriers (refer to BEI P/N 924-60004-XXX series on the back of this specification sheet). This barrier is high performance, galvanically isolated and carries US and European agency approvals. It is suitable for ALL Hazardous locations, regardless of gas and dust types.



SPECIFICATIONS

Electrical Specifications

Code	Incremental
Output Format	2 channels (A and B) in quadrature $\pm 27^\circ$ electrical, with index and complements (see Figure 1)
Cycles per Shaft Turn	Up to 5,000 (see Table A)
Supply Voltage	5 or 9V
Current Requirements	120mA (typical)
Output Device	5V/OC, 9V/OC, 5V/OCR, 40mA max current sink; 5 or 5V/V line driver 100mA source/sink; 5V only
Frequency Response	150 KHz
Output Termination Pinouts	See Table 1

Mechanical Specifications

Shaft Bore	0.375" diameter through with convertible adapter for 1" or 5/8" air coupler.
Starting Torque at 25°C	7in-oz
Shaft Material	416 stainless steel
Bearings	52100 bearing steel
Bearing Housing	Die cast aluminum
Bearing Life	7.5 X 10 ⁹ revs at rated load (50,000 hrs at 2500 RPM)
Maximum RPM	6,000 RPM (see frequency response, below)
Moment of Inertia	0.019 oz-in-sec ²
Weight	Approximately 18 oz.

Environmental Specifications

Enclosure Rating	NEMA 4/13 (IP65)
Temperature	-40° to +80°C standard
Shock	50 G/s at 11msec duration
Vibration	5 to 2000 Hz @ 20 G's
Humidity	98% RH without consideration

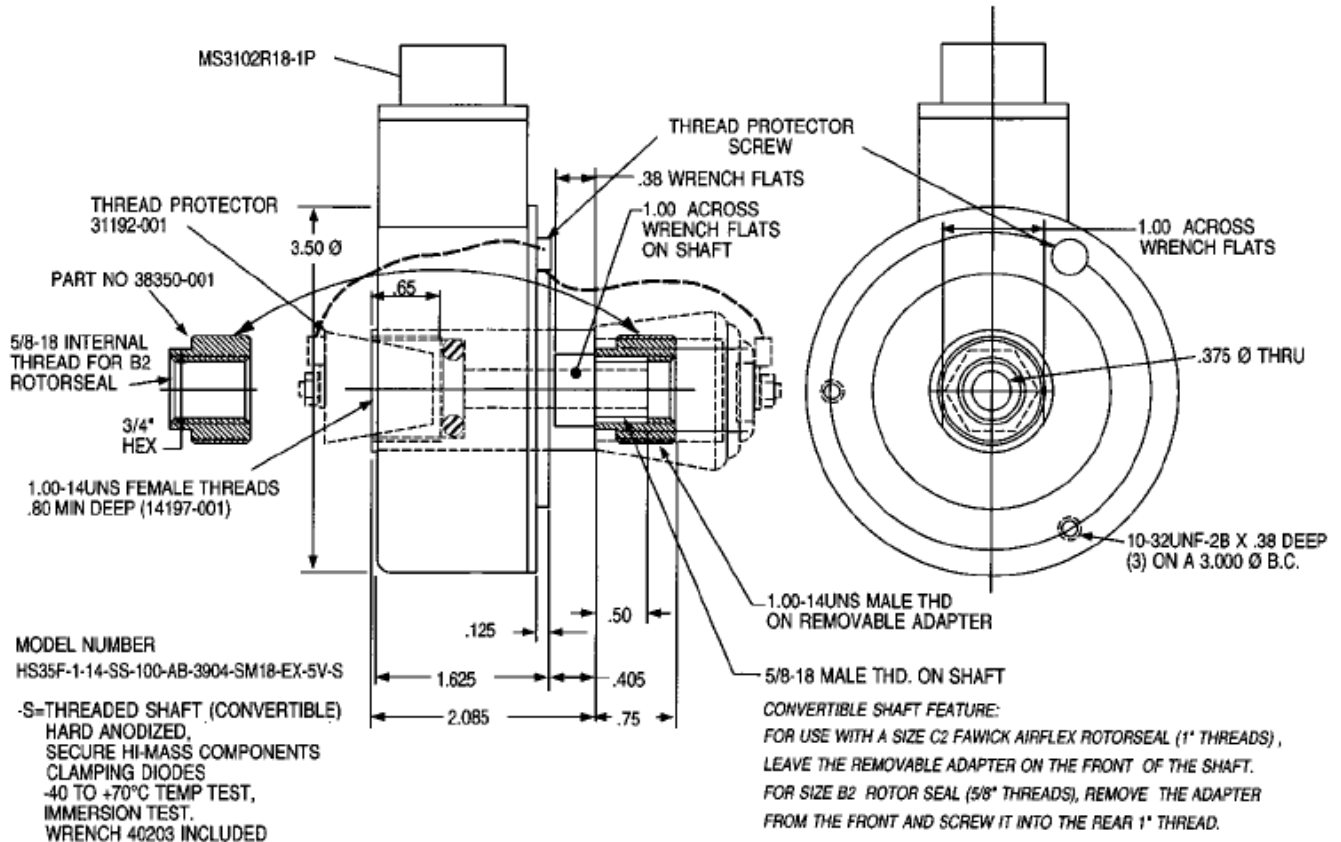


DIMENSIONS

Dimensions in mm

MS Connector Termination

TOLERANCES: .XX = ±0.01, .XXX = ±0.005



INTRINSICALLY SAFE WHEN INSTALLED PER
INSTALLATION DRAWING 924-08064-001

TABLES

Table 1 —
Output Terminations

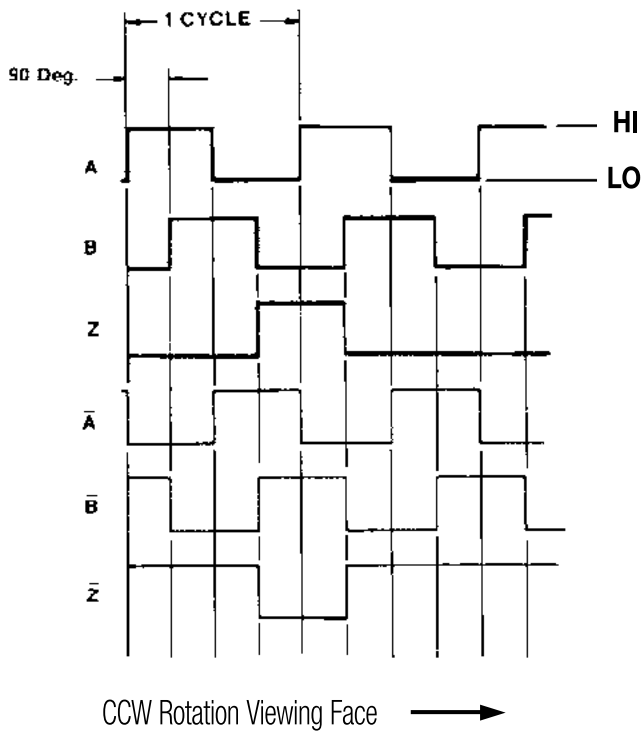
PIN	ABZ	ABZC
A	CH A	CH A
B	CH B	CH B
C	INDEX, Z	INDEX, Z
D	+V (Supply Voltage)	
E	—	
F	0V (Circuit Common)	
G	Case Ground	
H	N/C	\bar{A}
I	N/C	CH B
J	N/C	CH Z

Table A —
Disc Resolutions (Cycles Per Turn)

32, 100, 250, 360, 500, 512, 600, 1000, 1024, 1200, 1650, 1800, 2000, 2048, 2100, 2500, 2881, 2884, 3600, 3710, 4096, 5000
--

FIGURE 1

Output Waveforms





ORDERING OPTIONS

HS35F - **1-14** - **SS** - **200** - **ABZC** - **C** - **5V/OC** - **SM18** - **EX** - **S**

Type
Hollow Shaft 3.5" Diameter

Threading
1-14: 1" Threaded Bore
1-14L: 1" Threaded Bore
100-S: 1" Straight Bore

Shaft Seal
SS: Shaft Seal

Cycles Per Turn
(Enter Cycles)
(See Table A)

No. of Channels
A: Single Channel
AB: Dual Channel in Quadrature.
ABZ: Dual Channel with Index
AZ: Single Channel with Index

Compliments
C: Complimentary Outputs (5V/V)

Output IC
5V/OC: (Open Collector)
9V/OC: (Open Collector)
5V/OCR: (Open Collector with Internal Pull-Up Resistor)
5V/V: (Line Driver)

Connector
SM18: MS3102F18S-1P, 10 Pin Connector

Intrinsic Safety
EX: Intrinsically Safe Rated Encoder. Must be installed with proper IS barriers.

Special Features
For shaft insert assembly, add -S to model number and specify one of the following P/N on your Purchase Order:
31386-001: 1"-14 threads on both ends
31386-002: 1"-14 threads on female end, 5/8"-18 threads on male end
31386-003: 1"-14 threads on female end, 5/8"-18 threads on male end and adapter nut

Additional Components

BEI Intrinsic Safety Barrier

Supply Voltage to Barrier	Output Type from Barrier	Barrier Part Number
12-24 VDC	V _{out} = 5VDC	924-60004-002
12-24 VDC	V _{out} = V _{in}	924-60004-003
12-24 VDC	V _{out} = Open Collector	924-60004-004

M18 Cable Assembly

Part #	Cable Length
924-31186-1810	10 Feet
924-31186-1820	20 Feet
924-31186-1830	30 Feet
924-31186-1850	50 Feet



AGENCY APPROVALS & CERTIFICATIONS



Agency	File Number
CE	EN 55011 and EN 61000-6-2
UL	U.S. Standards Class I, Group A,B,C, & D, Class II Group E, F, & G
cUL	Canadian Standards Class I, Zone 0, Group IIC
EX	GENELEC EEX ia IIC T4

Consult factory for more details.

Revised 02/01/18

Sensata Technologies, Inc. ("Sensata") data sheets are solely intended to assist designers ("Buyers") who are developing systems that incorporate Sensata products (also referred to herein as "components"). Buyer understands and agrees that Buyer remains responsible for using its independent analysis, evaluation and judgment in designing Buyer's systems and products. Sensata data sheets have been created using standard laboratory conditions and engineering practices. Sensata has not conducted any testing other than that specifically described in the published documentation for a particular data sheet. Sensata may make corrections, enhancements, improvements and other changes to its data sheets or components without notice.

Buyers are authorized to use Sensata data sheets with the Sensata component(s) identified in each particular data sheet. HOWEVER, NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE TO ANY OTHER SENSATA INTELLECTUAL PROPERTY RIGHT, AND NO LICENSE TO ANY THIRD PARTY TECHNOLOGY OR INTELLECTUAL PROPERTY RIGHT, IS GRANTED HEREIN. SENSATA DATA SHEETS ARE PROVIDED "AS IS". SENSATA MAKES NO WARRANTIES OR REPRESENTATIONS WITH REGARD TO THE DATA SHEETS OR USE OF THE DATA SHEETS, EXPRESS, IMPLIED OR STATUTORY, INCLUDING ACCURACY OR COMPLETENESS. SENSATA DISCLAIMS ANY WARRANTY OF TITLE AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUIET ENJOYMENT, QUIET POSSESSION, AND NON-INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY RIGHTS WITH REGARD TO SENSATA DATA SHEETS OR USE THEREOF.

All products are sold subject to Sensata's terms and conditions of sale supplied at www.sensata.com SENSATA ASSUMES NO LIABILITY FOR APPLICATIONS ASSISTANCE OR THE DESIGN OF BUYERS' PRODUCTS. BUYER ACKNOWLEDGES AND AGREES THAT IT IS SOLELY RESPONSIBLE FOR COMPLIANCE WITH ALL LEGAL, REGULATORY AND SAFETY-RELATED REQUIREMENTS CONCERNING ITS PRODUCTS, AND ANY USE OF SENSATA COMPONENTS IN ITS APPLICATIONS, NOTWITHSTANDING ANY APPLICATIONS-RELATED INFORMATION OR SUPPORT THAT MAY BE PROVIDED BY SENSATA.

Mailing Address: Sensata Technologies, Inc., 529 Pleasant Street, Attleboro, MA 02703, USA.

CONTACT US

Americas

+1 (800) 350 2727 – Option 1
sales.beisensors@sensata.com
Europe, Middle East & Africa
+33 (3) 88 20 8080
position-info.eu@sensata.com

Asia Pacific

sales.isasia@list.sensata.com
China +86 (21) 2306 1500
Japan +81 (45) 277 7117
Korea +82 (31) 601 2004
India +91 (80) 67920890
Rest of Asia +886 (2) 27602006
ext 2808