

# OVERVIEW

REVISIONS			
LTR	DESCRIPTION	DATE	APPR
A	ECO_597	1/7/06	
A1	ADD HS35	3/24/08	

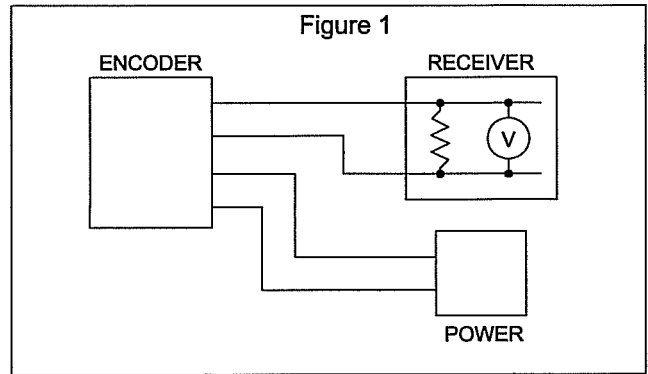
This is a standard analog interface commonly used in process control and is available on certain BEI absolute encoders (Model H25, HS35, H38 and H40 currently). This option used an internal digital-to-analog converter that reads the encoders shaft position as a 12-bit digital word and transmits it to a receiver via a controlled current level. (Figure 1). The 4-20mA option is designated A1 in the model number while the 0-10 VDC option is designated with an A2.

## Standard features:

- Four wire system reduces ground loop problems
- Isolation of power and signal to ground
- No contacts to wear out
- Cable lengths to 1000 feet
- Selectable count direction
- 12 bit resolution (4096 positions)

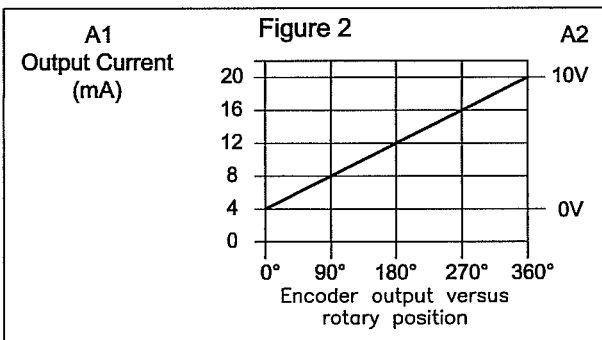
## Options:

- Nonvolatile reset
- 0-20 or 4-24 mA outputs
- 180° (2 cycle) or 90° (4 cycle)



# INTERFACE

Analog output is a four-wire system. Power for the encoder and the current loop is supplied externally at between 12 and 28 volts (Figure 1). The resistor in the receiving electronics determines the voltage drop across the loop. For example, a value of 250 ohms, results in a voltage range of 1 volt (4mA X 250 ohms) to 5 volts (20mA x 250 ohms) from zero to 360° shaft position (Figure 2). The maximum allowable loop impedance is 900 ohms. The total current requirement for the encoder is less than 125 milliamps.



## Operation (A1, 4-20 mA Output)

Within the encoder, a 12 bit word is converted to current through an on-board D/A converter. This current signal is supplied to the external sensing loop for transmission to a receiving circuit.

## Operation (A2, 0-10 VDC Output)

Internally, the encoder signal undergoes the same conversion process for a voltage output as it does for a current output. In the voltage output mode, the encoder provides a 0-10 V output over a single encoder revolution. (figure 2).

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
APPLY AFTER FINISH  
TOLERANCES ON

.XX ±.01	63 ✓
.XXX ±.005	
ANGLES ± 0° 30'	
REMOVE BURRS AND BREAK ALL SHARP EDGES .010 MAX	
ALL DIA. TO BE © WITHIN .010	

redrawn KRB DATE 2/17/06

APPROVED

**BEI INDUSTRIAL ENCODER DIVISION**  
**BEI TECHNOLOGIES, INC.**

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TITLE

SPECIFICATION  
ANALOG OUTPUT, 4-20mA or 0-10 VDC

SIZE

A

FSCM NO.

1RB90

DWG NO.

924-02088-001

REV

A1

SCALE: NONE

924-02088-001A1

1/2

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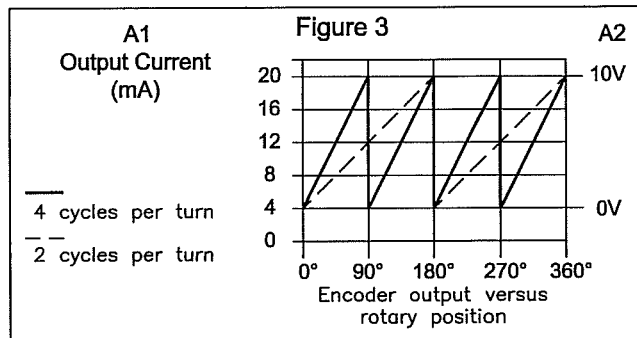
## OPTIONS:

### Reset:

With the optional RESET function, connecting the RESET pin momentarily to signal common sets that position as the 0° point. This position is stored in nonvolatile memory so that it is saved even if the power is cycled off and on. The encoder 0° point can be set to a new value by rotating the shaft to the new desired start position and activating the RESET pin again. The RESET function works with either the A1 or the A2 output. To designate this in the model number, add -S to the end of the model and include the term: -S = Reset.

### Two cycle and four cycle per turn:

These features are especially useful when the desired full signal output range occurs over 1/2 or 1/4 turn of the shaft (1/4 turn valves for example, refer to Figure 3). This feature can be used in conjunction with the Reset feature to designate the starting point for the first output cycle. This feature is available in either the A1 or A2 output. To designate this in the model number, add -S to the end of the model and include the term: -S = 2 cycle per turn or 4 cycle per turn, as appropriate for your application.



Sample Model Number: Encoder: H25D - SS - A1 - CW - SM18 - S

To specify  
A1 or A2 Output

To specify  
Special Feature

### Output Wiring:

FUNCTION	COLOR	CONNECTOR			TERM BOARD	
		M18	M16	M14/19	H38	H40
ANALOG+	YEL	A	A	A	4	1
ANALOG RETURN	WHT/YEL	H	C	B	7	7
+V (SUPPLY VOLTAGE)	RED	D	D	V	3	4
0V (CIRCUIT COMMON)	BLACK	F	F	T	2	5
RESET	BLUE	B	B	C	8	8
DIRECTION CONTROL	ORANGE	C	E	U	6	3
CASE GROUND	GREEN	G	G	S	1	6

**BEI** INDUSTRIAL ENCODER DIVISION  
BEI TECHNOLOGIES, INC.

SIZE  
A

FSCM NO.  
1RB90

DWG NO.

924-02088-001

REV  
A1

SCALE: NONE

2/2