

Series 607

360° Precision Feedback and Display

The Model 0607-0002 Optical Encoder and Model 1005-0000 Counter Display system provides precision feedback and readout of shaft angular displacement over the full 360° revolution. From a fixed or user settable point, angular position is displayed in degrees over indefinite shaft revolutions at speeds up to 3000 RPM, with equivalent BCD output, USB output and analog output. In simplest mode, Encoder position is displayed in increments of 0.05° over the range 0.00° to 359.95°. Display and Encoder are sold separately and will deliver full accuracy without adjustment.



KEY FEATURES

Displays Full 360° Working Range	0.05° Accuracy and 0.05° Resolution
Speeds to 3,000 RPM	Binary-Coded-Decimal (BCD) Output
USB Output	Analog +/- 5 VDC Output

MODEL 0607-0002 OPTICAL ENCODER

Model 0607-0002 is a rotary, incremental Encoder that outputs 1800 cycles of quadrature TTL signal and one zero reference plus (Zr) per shaft revolution. Compact size, low weight, and servo and/or bolt-face mounting make it easy to install, even where space is limited.

The Encoder's precision pilot diameter provides a reference for mounting the unit concentric to the shaft to be monitored. Four tapped holes in the face, or the servo slot on its circumference, provide two means for securing the body to the user's reference surface. Installation of a flexible shaft coupling is highly recommended to protect the Encoder from excessive misalignment or motion of the monitored shaft. Encoder cable can be soldered directly to the Display connector or can be extended.

MODEL 1005-0000 COUNTER DISPLAY

Model 1005-0000 is a panel mount, 5-digit LED Display that excites the Encoder, decodes its output into 7200 counts/revolution, and displays the shaft angle position-in increments of 0.05°-from the last reset. It also provides latchable, strobed BCD output that matches the displayed value.

The compact 1/8 DIN case, rear-panel set-up and solder termination make it easy to install, even where space is limited. The Display installs directly through panels up to 0.25 inch (6.35 mm) thick, or can be used as a benchtop instrument. All necessary mating D-SUB connectors are included, to which Encoder leads, 12 VDC power and any other required connections can be soldered directly.

The meter also includes an analog output, providing +/-5.0 VDC over the range +/-359.95°, and a USB output that provides display data and remote reset operation.

OPERATION OF ENCODER/DISPLAY SYSTEM

When installed, the Encoder body is typically secured to the reference surface and its shaft is fixed (preferably by a flexible coupling) to the shaft being monitored. Its leads are connected to the Display, which requires a 12 VDC external power source that can provide at least 450 mA of current. The Display can be programmed, either locally or remotely, by electrically shorting the proper pins (ref. jumpers F1, F2, etc.) at its connector. The Display reads directly in degrees and resets to 000.00° at each of the following: 1) at power-up; 2) anytime it reaches 360.00° (regardless of sign); 3) when the front panel RESET button is

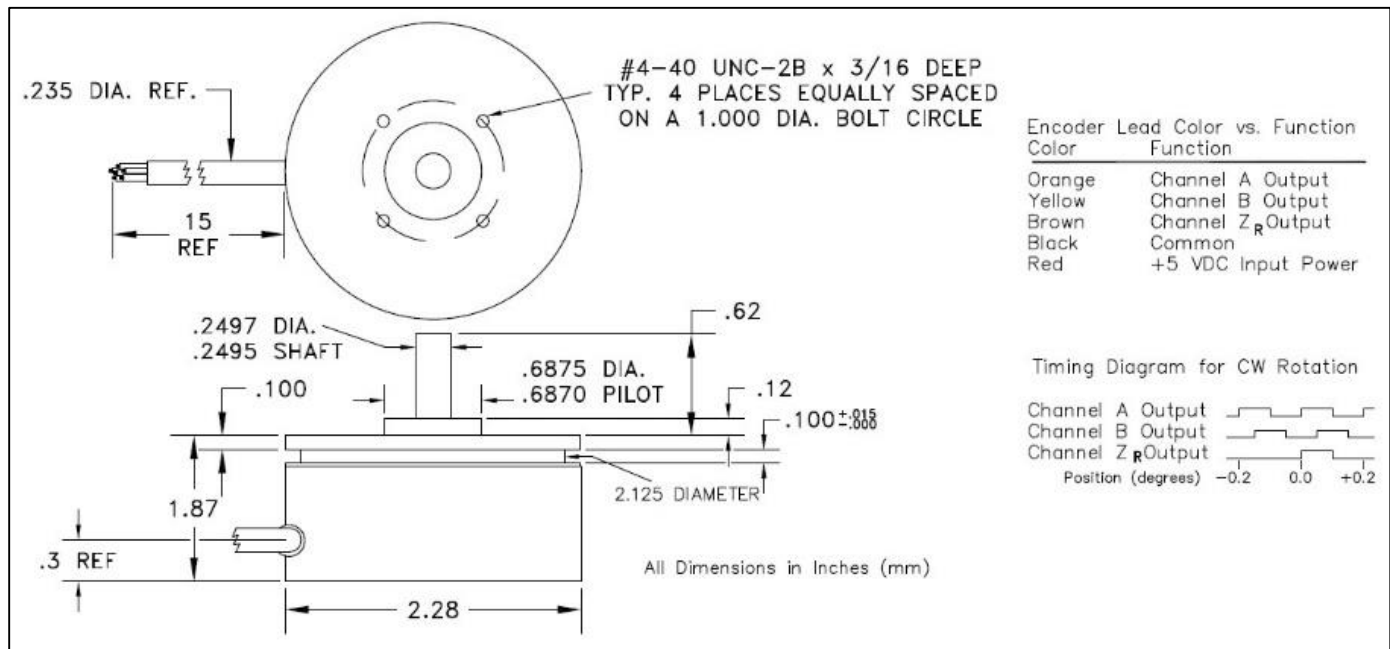
pressed; 4) when F1 is closed for at least 0.01 seconds; and 5) at ZR, only when F2 is closed. The Display is shipped with the following contacts open: F1, F2, F3 and F4. In this configuration, the display range is -359.95° to +359.95° and the displayed value increases while rotating the shaft in a clockwise direction (as viewed from the end of the shaft, looking towards the body). Closing F2 enables the reset at ZR. Closing F3 changes the sense of the display to counterclockwise. Closing F4 changes the display range to 000.00° to 359.95°.

ENCODER SPECIFICATIONS

ELECTRICAL	
Resolution Range	1800 cycles per revolution (7200 counts per revolution with external 4X counting when using A and B channel outputs)
Light Source	LED
Light Sensor	Photodiode
Excitation	5 VDC ±10%, 80 mA
Output Format	Two counts channel outputs (A and B) in phase quadrature, plus zero reference ZR; all are TTL single ended square waves with rise and fall time of one microsecond maximum into 1000 pF load
ZR Reference	Full cycle
Frequency Response	Up to 100 kHz, all channels
Phase Sense	Channel A leads B for CW rotation of shaft (as viewed from shaft end, looking towards body)
Termination	Shielded cable with #24 AWG lead wires (see diagram below for lead color vs. function)

MECHANICAL	
Shaft Loading	10 lb axially and radially, maximum; 100,000 radians/sec ² maximum angular acceleration
Shaft Radial Runout	0.001 inch (.025mm) T.I.R.
Bearing	R-4 shielded; 0.1 ounce-inch (7.2 gram-cm) maximum starting torque at 25°C
Operating Speed	3000 RPM maximum continuous
Materials	303 stainless steel shaft; aluminum pilot diameter and base; anodized aluminum cover
Weight	5 ounces (142 grams)
ENVIRONMENTAL	
Temperature	-23°F to 158°F (-10°C to 70°C) Operating -31°F to 176°F (-35°C to 80°C) Storage
Shock	30 G's for 11 milliseconds maximum
Vibration	50 Hz, 10 G's for 1 hour
Humidity	To 98% R.H. (non-condensing)

DIMENSIONAL DIAGRAM – ENCODER



DISPLAY COUNTER SPECIFICATIONS

ELECTRICAL	
Resolution Range	0.05 count over range -359.95 to +359.95
Display Type	0.5 inch (12.7 mm) high red LEDs; 5 digits plus \pm sign and decimal point
Excitation	12 VDC \pm 10%, 400 mA maximum
Signal Inputs	Accepts TTL level single-ended A, B, ZR inputs; with A and B input count is multiplied by four; the inputs pass through a single pole noise filter rolled off at 100 kHz
Output Signal	Latchable, TTL BCD outputs that correspond to the displayed value. Analog output \pm 5.0 VDC over \pm 359.95°. USB output providing display data.
Selectable Set-up Features	Closing F1 resets display to 000.00 Closing F2 enables reset at ZR Closing F3 changes sense to CCW Closing F4A/B selects range 000.00 – 359.95

MECHANICAL	
DIMENSIONS	INCHES (mm)
Case Size (H x W x L)	1.72 (44) x 3.56 (90) x 6.1 (156)
Front Panel (H x W x L)	1.91 (49) x 3.80 (97) x 0.1 (3)
Cut Out (H x W)	1.77 (45) x 3.62 (92)
Max. Panel Thickness	0.25 (6.35)
Termination	Two rear panel 15-pin D-SUB connectors with solder lugs and USB-A Port
ENVIRONMENTAL	
Temperature	32°F to 131°F (0°C to 55°C) Operating 14°F to 140°F (-10°C to 60°C) Storage

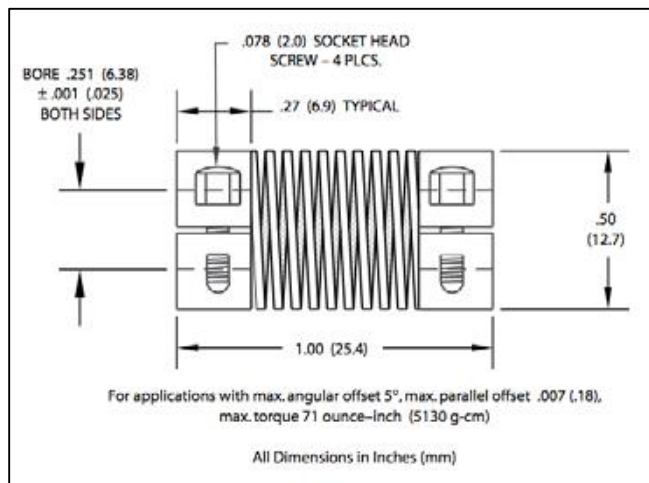
DISPLAY COUNTER CONNECTOR PINOUTS

Transducer Connector			
Pin #	Function	Pin #	Function
1	F3 Option	9	Ground
2	F2 Option	10	Analog Output
3	F1 Option	11	Ground
4	Ground	12	Ground
5	A Encoder	13	Ground
6	B Encoder	14	Display Latch (see note)
7	Zero Encoder	15	F4 Option
8	+5V		

Digital I/O Connector			
Pin #	Function	Pin #	Function
1	BCD0 Lower Nibble	9	D1 D2 Output Enable
2	BCD1 Lower Nibble	10	D3 D4 Output Enable
3	BCD2 Lower Nibble	11	D0 Pol Output Enable
4	BCD3 Lower Nibble	12	BCD Latch
5	BCD0 Upper Nibble	13	Display Latch
6	BCD1 Upper Nibble	14	Ground
7	BCD2 Upper Nibble	15	+5V
8	BCD3 Upper Nibble		

NOTE: Display latch is enabled with logic "1" and must be tied to ground (logic low "0") for normal operation.
 Lower Nibble holds D0, D1 and D3 BCD data. Upper Nibble holds D2 and D4 BCD data. Pol(+) stored in Upper Nibble.
 Output Enable and BCD Latch is enabled with logic "0".

DIMENSIONAL DIAGRAM - SHAFT COUPLER



ACCESSORIES (SOLD SEPARATELY)

F001-0019	Flexible Shaft Coupling - (see dimensional diagram above)
C003-0008	Connector - when ordered on Encoder, leads are terminated in type MS3106A-14S-5P connector (Red lead to Pin A; White to B; Black to C; Yellow to D; Green to E)
C000-0046	Cable - vinyl jacketed, 15 ft. long, terminated at one end in type MS3101A-14S-5S connector (mates with C003-0008) and leads at other end (Pin A to Red lead; B to Blue; C to Black; D to Brown; E to White; N/C to Green); operating temperature for Cable is -22°F to +176°F (-30°C to +80°C)
1100-0002	Line Powered Supply - 80-264 VAC input, 12 VDC output, 8W - 12.0 VDC ±5% at current up to 0.66 Ampere; 47-63 Hz input; operating temperature 32°F to 104°F (0°C to 40°C), storage temperature -4°F to 140°F (-20°C to 60°C); with 2-prong North American line plug, U.K style 3-prong plug or 2-prong E.U. style plug options; terminated in 5.5mm OD x 2.5 mm ID x 11.0mm Barrel Plug. Each 1005- meter comes with a power supply, for replacement reference this part number.