

# MR312

ZapFree™ ATEX FIBER OPTIC ROTARY ENCODER

# MICRONOR

automation components

## Products

The MR312 series ZapFree™ Fiber Optic Rotary Encoder is an entirely passive, intrinsically safe, fiber optic incremental rotary encoder – ideal for a wide range of harsh and hazardous environmental applications. There are no integral electronics within the encoder housing and the all-optical design requires just a single 62.5/125 MM optical fiber connection – the utmost in simplicity, reliability and ease of installation.

Downstream, an MR310 Remote Encoder Interface (REI) module converts the optical signals to an array of standard electrical outputs (both quadrature and analog) for interfacing to conventional counters, PLCs or computer interface boards. An RS232/RS422/RS485 serial interface is also provided for ease of interface to computers and PCs.



Intrinsically Safe  
Simple Apparatus  
CE Ex op is I/II ...Ga

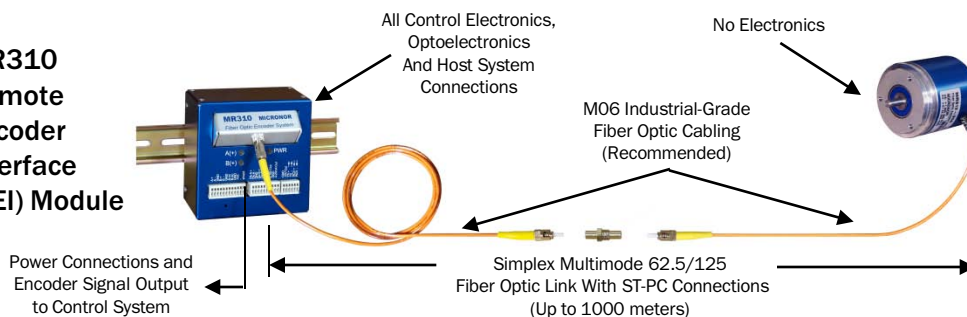
## Features

- 100% passive sensing design
- ATEX Classification “Simple Apparatus” and Intrinsically Safe. For use in all IEC Group I/II, U.S. Class I/II/III and Zones 0/1/2/20/21/22 hazardous and explosive atmospheres
- Insensitive to EMI and RFI for use in and around medical equipment and “noisy” industrial environments
- Immune to lightning and atmospheric static that “zaps” conventional encoders
- Outdistances copper, link lengths to 1000m
- Standard model operates -40° C to +80 ° C; Extended option covers -60° C to +150 ° C
- Special versions can be engineered for radiation and thermal-vac environments



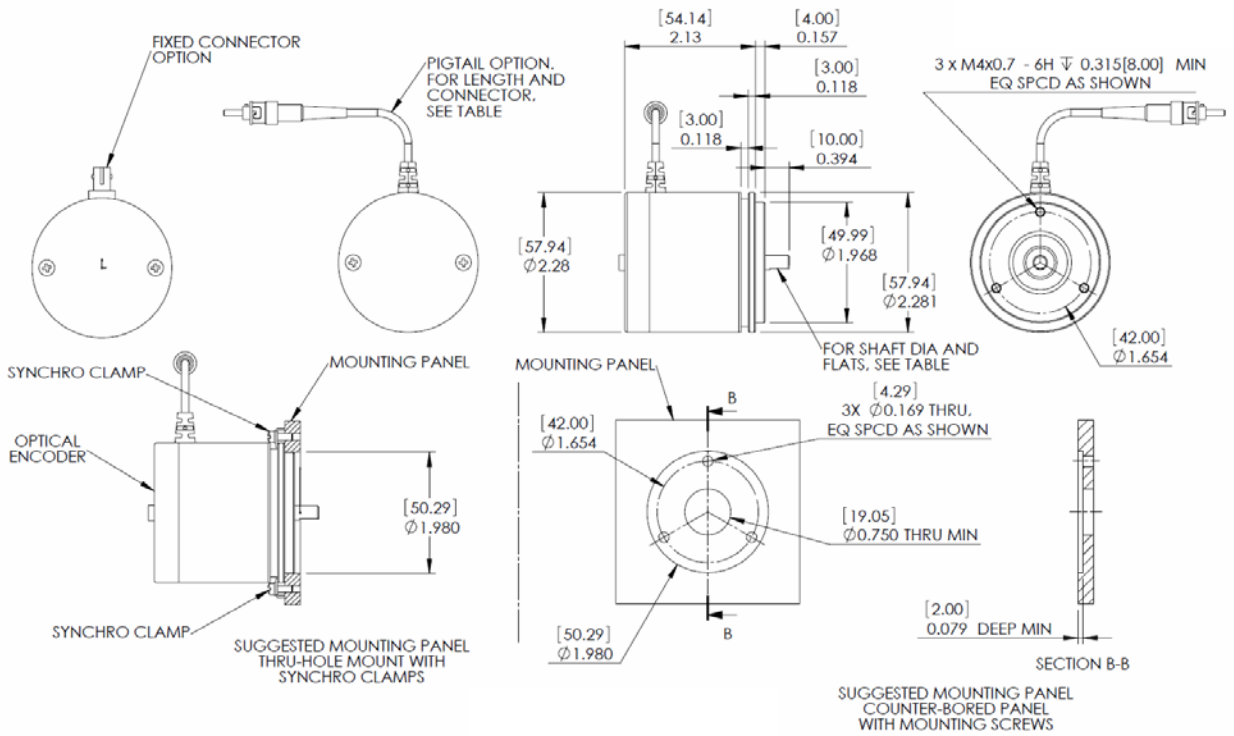
## Installation

**MR310 Remote Encoder Interface (REI) Module**

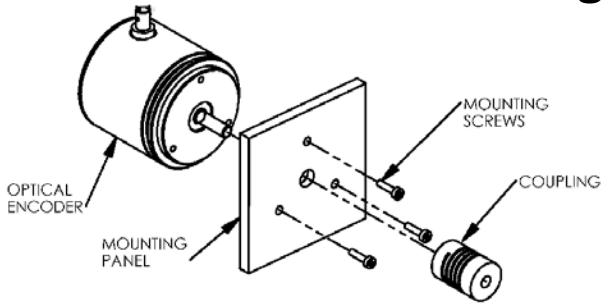


**MR312 ZapFREE™ Fiber Optic Rotary Encoder**

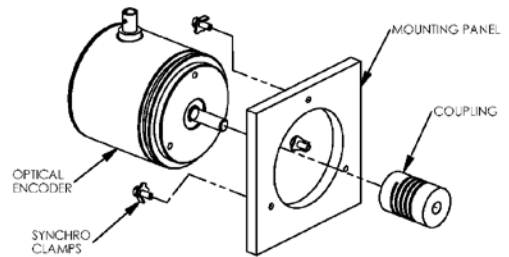
1. Connect the MR312 to the external equipment via a flexible shaft coupling and follow flange/panel mounting guidelines provided in the ZapFREE™ Encoder System User Guide.
2. Make MR310 electrical connections (power, ground, quadrature signals, serial interface, etc.) to the control system via WAGO Quick-Connect plugs (supplied with the MR310).
3. Connect ZapFREE™ Encoder to MR310 Module via MR320 series ST-PC to ST-PC FO cable assembly (or equivalent).
4. The ZapFREE™ Fiber Optic Encoder System is now ready to operate!



### Mounting Options

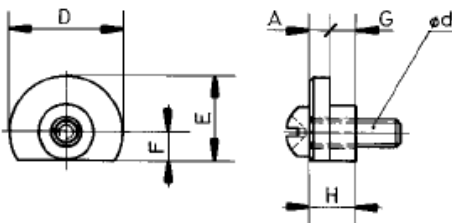


Face Mounting to Panel



Thru-Hole Flange Mounting With MR312A Hold-Down Clamps

### MR312A Mounting Kit



Kit consists of 3x BME clamps and 3x screws

Clamp Dimensions:  
 D=9.2 E=7.6 F=3 G=2.4 H=4.3mm

Screw ( $\varnothing$ d): M3 x 8

# Specifications

## Specifications Subject To Change Without Notice

<b>Resolutions</b>	100, 128, 256 and 360ppr (Other options available upon request)
<b>Max Speed</b>	<b>Continuous Operating Speed</b> ( <a href="#">Contact Micronor if higher speed requirements.</a> )
For MR310 Direct Quadrature Outputs	<b>8000 rpm</b> (Using standard MR310 and no Auxiliary Functions)
For MR310 Auxiliary Functions	<b>5000 rpm</b> (Speed limitation if all processor-controlled auxiliary functions are being used at same time; e.g. Programmable Divider, Programmable Analog Outputs, etc. Contact Micronor for more information about operational trade-offs versus speed.)
<b>Optical Interface</b>	ST-PC (for connection to MR310 REI Module)
<b>Fiber Type</b>	MM 62.5/125µm, Graded Index, 0.275NA
<b>Fiber Length (between MR310 and MR312)</b>	Up to 1000m (3280 ft)
<b>Temperature/Humidity Range and ATEX Ratings</b>	<b>ATEX Classification "Intrinsically/Inherently Safe Simple Apparatus"</b>
<b>STANDARD Option</b>	-40 °C to +80 °C / 0% to 95% RH (non-condensing) ☑☑ Ex op is I/II 80°C/T6 U.S.: Class I/II/II, AEx op is Group I/II/III 80°C/T6 , Zone 0/1/2/20/21/22, Division 1/2
<b>EXTENDED Option</b>	-60 °C to +150 °C / 0% to 95% RH (non-condensing) ☑☑ Ex op is I/II 150°C/T3 U.S.: Class I/II/II, AEx op is Group I/II/III 150°C/T3 , Zone 0/1/2/20/21/22, Division ½
<b>Max Shaft Loads</b>	Radial = 80N (18 lbf), Axial = 40N (9 lbf)
<b>Seal Rating</b>	IP64 (splash proof)
<b>Shaft OD</b>	Ø 6mm OD (Other options available upon request)
<b>Housing/Weight</b>	Ø 58mm x 58mm L; 210 g (7.25oz)
<b>System MTBF</b>	Bearing life calculated at 50% of max radial and axial load at 2500 rpm: 1.36 x 10 <sup>6</sup> hours (155.1 years)

# Ordering Info

## MR312 - C06T1R5

**Resolution Options**  
 A 100ppr  
 B 128ppr  
 C 256ppr  
 D 360ppr

**Termination Option**  
**T1R5** ST Pigtail, 1.5m  
**T00** ST Receptacle

**Shaft Size**  
**06** 6mm OD  
 Others on request

**Temperature Range**  
**Blank** Standard  
**E** Extended

## Optional Mounting Accessory:

**MR312A** Set of 3x BME Hold-Down Clamps and 3x Screws

### Related Items:

- MR310 Remote Encoder Interface (REI) Module
- MR320-M06Lxx Fiber Optic Cable Assembly
- MR320A ST-to-ST Mating/Bulkhead Adapter

### For additional technical information, contact Micronor and request:

- MR310 Remote Encoder Interface (REI) Module Data Sheet
- MR314 High Resolution Hollow Shaft Encoder Data Sheet
- MR316 Heavy Duty Shafted Encoder Data Sheet
- MR320-M06Lxx Ruggedized Fiber Optic Cable Assembly Data Sheet
- MR3XX ZapFREE™ Encoder System User Guide
- MR3XX ATEX Declaration of Conformity Report
- MR310, MR312, MR314 and MR320 Mechanical Reference Drawings

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