MR330 SERIES

ZapFREE™ FIBER OPTIC SINGLE TURN POSITION SENSOR

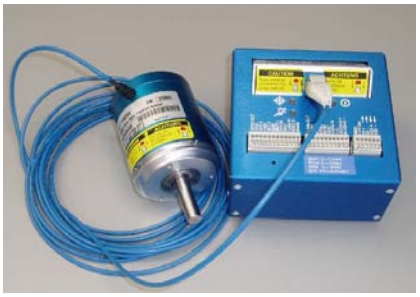
MICRONOR
automation components

Products

The MR330 Series ZapFREE™ Fiber Optic Absolute Position Sensor measures absolute angular position from 0° to 360° with 13-bit (8192 count) resolution.

The system consists of an optical sensor (MR332) and a controller (MR330) linked via industry standard Duplex LC optical connectors and 62.5/125 multimode fiber. This novel sensor system outdistances conventional absolute encoders and resolvers – providing interference-free sensing and transmission up to 300m.

The MR330 Controller is the "active" part of the fiber optic sensor system and offers industry-standard interfaces such as SSI, Modbus (RTU), USB and Analog Outputs (±10V and 4-20mA). The MR330 system integrates seamlessly into any control system as any conventional absolute encoder would.



Sensor ATEX Rating:
Simple Apparatus
CE Ex op is I/II 80°C/T6 Ga

Features

- Absolute 0-360° position sensor with 13-bit resolution
- 100% passive sensing design – requires no power
- Immune to electrical interference
- Immune to lightning
- Long distance sensing without interference – up to 300m
- ATEX Classification "Simple Apparatus". 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
- MR330 Controller is DIN rail mount able and provides wide array of interfaces; including SSI, Modbus, USB, two Digital Set Points and Analog Outputs (±10V, 4-20mA)

Installation

MR332
Passive Position Sensor

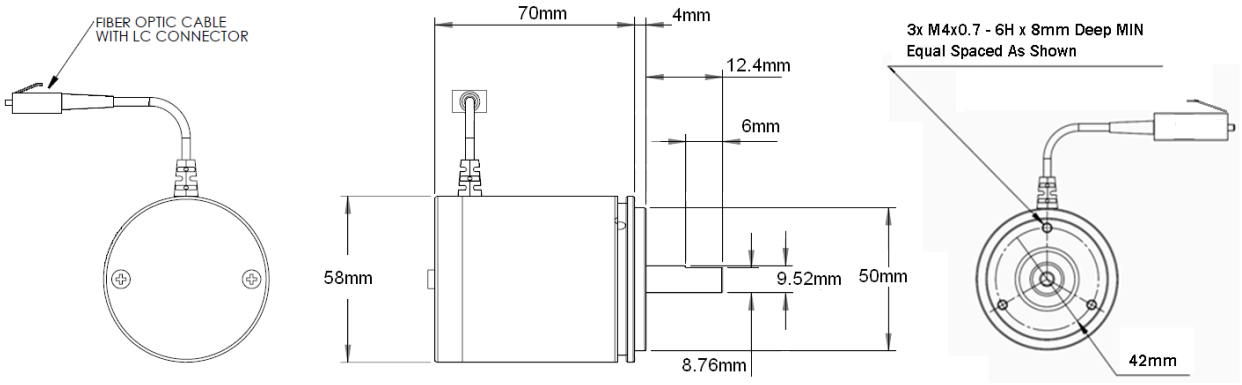
MR330
Sensor Controller

Electrical Connections To Control System
- Power • SSI • USB
- Modbus/RTU
- Analog (4-20mA, ±10V)
- Digital Set Points

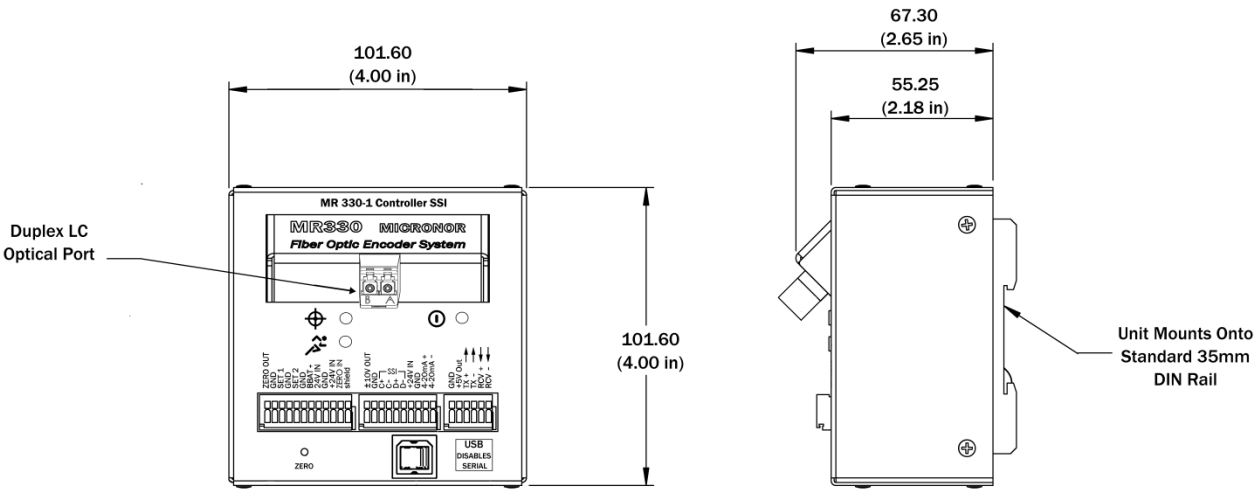
1. Connect the MR332 sensor to the external equipment with a precision shaft coupling and follow flange/panel mounting guidelines provided in the MR330 Series User Guide.
2. Make MR330 electrical connections (power, ground, interfaces etc.) to the control system via supplied WAGO Quick-Connect plugs and/or USB receptacle.
3. Connect sensor to module via Duplex LC optical link (Micronor MR320 series or equivalent).
4. The ZapFREE ™ Fiber Optic Absolute Encoder System is now ready to operate!

Reference Drawings

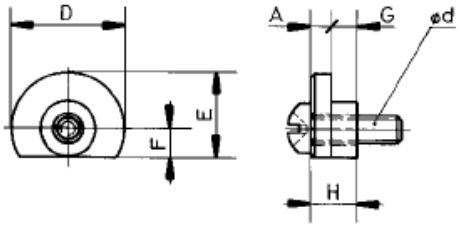
MR332 Sensor



MR330 Controller



Synchro Mount Clamp Kit



Micronor P/N 6099.20.651

Kit consists of 3x Aluminum Clamps and 3x SS screws

- Clamp Dimensions:
  D=9.2 E=7.6 F=3 G=2.4 H=4.3mm
- Screw (∅d): M3 x 8

MR332 Sensor Specifications

Measurement Parameters	
Measurement Range	0° to 360° (continuous)
Resolution	13-bits (8192 counts)
Maximum RPM	6,500 rpm (mechanical maximum)
Mechanical Performance	
Materials	Body: Anodized Aluminum, Shaft and Bearings: Stainless Steel
Moments of Inertia	TBD
Max Shaft Loads	Axial TBD , Radial TBD
System MTBF	Bearing life calculated at 50% of max radial and axial load at 2500 rpm: 1.36×10^6 hours (155.1 years)
Physical Attributes	
Housing Dimensions	Ø 58mm x 73mm L (Industry standard 58mm servo mount housing)
Unit Weight	50 0g (18 oz)
Environmental Performance	
Temperature	Operating:: 40°C to +80°C, Storage: -40°C to +80°C
Humidity	0% to 95% RH (non-condensing)
Ingress Protection	IP64 (dust proof and splash resistant)
ATEX Classification	**Simple Apparatus,** CE Ex op is I/II 80°C/T6 Ga **USA** Class I/II/II, AEx op is Group I/II/III 80°C/T6 , Zone 0/1/2/20/21/22, Division 1/2

Specifications Subject To Change Without Notice

MR330-1 Controller Specifications

The following is a summary of MR330—1 performance specifications when used to operate the MR332 Sensor. Consult separate MR330 Data Sheet and MR330 Instruction Manual for detailed performance and interface information.

Position Output Interfaces	
SSI	Up to 25 bits, Programmable baudrate 25 kHz - 250 kHz
Modbus	Modbus (RTU) compatible RS422/RS485 interface
USB	USB, Disables Modbus interface when used
Current Output	Isolated 4-20 mA (270V isolation maximum), Output scalable by user
Voltage Output	-10V to +10V, Non-Isolated, Output scalable by user
Position Set Point Outputs	0-24V maximum 10mA Load
Power Supply	+12 VDC to +32 VDC, 65mA (typical) / 75mA (max) at 24VDC During Power Up, external power supply should be capable of 100mA momentary output
Interface Update Rate	
Angular Speed (ω)	Max 250 radians/sec (equivalent to 2,400 rpm) for accurate position reporting
Update Rate	1.71 kHz (850 µs)
Reporting Delay	SSI: Maximum 800 µs (time from actual position to SSI output) Analog Output: Maximum 1.0 ms
Fiber Optic Interface	
Connector Type	Duplex LC plug with Super PC Polish Performance Requirements: IL<0.5dB, RL>24dB, Telcordia GR-326 Endface Geometry
Fiber Type	2 x Multimode 62.5/125µm, Graded Index, 0.275NA
Maximum Optical Link Length	Maximum of 300m (1000 ft) *or* TBD dB (measured at 850nm)
Physical Attributes	
Housing Dimensions	102mm W x 102mm D x 68mm H, Includes 35mm DIN rail mount
Unit Weight	600g (22 oz)
Environmental Performance	
Temperature	Operating : 0°C to +45°C, Storage: -15°C to +65°C
Humidity	25% to 95% RH (non-condensing)
Ingress Protection	IP640 (Non-Protected)
ATEX Classification	**Inherently Safe Optical Radiation** CE [Ex op is I/II 45C/T6 Ga]

Specifications Subject To Change Without Notice

How To Order A Fiber Optic Encoder System

A fully functional absolute encoder system requires ordering the following items:

- MR33X series Sensor
- MR330 series Controller
- MR320-D06-DXX Duplex LC Optical Cable Assemblies where XX=length in meters (for extended links)
- MR320D Duplex LC Bulkhead/Mating Adapters (for interconnecting MR320 assemblies)
- Synchro Mount Clamp Kit P/N 6099.25.671 (if required)

MR332 - 10 D 03 _

SENSOR Options

Shaft Diameter

06 = 6 mm
95 = 3/8" or 0.375" (9.52 mm)
10 = 10 mm

Optical Connector Type

D = Duplex LC

Optical Pigtail Length

03 = 3 m (9.8 ft)
05 = 5 m (16.4 ft)
10 = 10 m (32.8 ft)

Temperature Range

(Bank) = Standard Range, -40°C to +80°C

Above Example: MR332-10D03 denotes standard MR332 Absolute Encoder with 10mm OD shaft and 3m Duplex LC optical pigtail .

MR330 - 1

CONTROLLER Options

Interfaces

1 = SSI + Modbus (RTU) + USB

Above Example: MR330-1 denotes standard MR330 Controller with the following built-in interfaces: SSI, Modbus/RTU and USB.

We are constantly updating the interface options available for our Fiber Optic Absolute Encoder systems. Please contact Micronor with your specific needs.

Other Accessories:

- **SSI LED Display, Order P/N 0.570.011.E00**

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