

FRS

FREE-RUN SPEED SENSOR

FEATURES

KEYENCE™ DIGITAL FIBER OPTIC SENSOR

- LCD digital display for easy sensor programming and signal monitoring
- Simple, user friendly functions
- Select light-operate or dark-operate functions

FIBER OPTIC SENSOR CABLE

- Composed of a single sensor end that emits a sensing beam and receives reflected light
- Armored ToughFlex™ flexible stainless steel jacket protects fiber from daily wear and resists entanglement or shock
- More flexible than conventional spiral tubes with a tight bend radius of 2 mm and minimal optical attenuation

ARM AND BASE

- Flexible arm enables easy positioning of the sensor end to the motor shaft
- Base is supplied with 8 mm and 10 mm T-nuts for mounting to a PT Series T-slot Base Plate or TAB Series Dynamometer Table.

DESCRIPTION

Magtrol's FRS Free-Run Speed Sensor is used for accurate measurement of the free-run speed of any motor.

The FRS Sensor is composed of 3 primary components:

- Keyence™ Digital Fiber Sensor
- Fiber Optic Sensor Cable
- Flexible Arm with Base

APPLICATION

PROBLEM

When a motor is coupled to a dynamometer, or any device that has a shaft supported by ball bearings, there will be a small amount of drag load placed on the motor due to friction in the bearings. Ensuring optimal alignment of the motor and



Fig. 1: FRS Free-Run Speed Sensor

dynamometer shafts, as well as using higher-quality bearings and lubricants, can reduce this drag load. However, even when employing these tactics, drag load can never be completely eliminated. All motors will show a slightly greater current draw from the residual drag load, and some motors will show a reduction in free-run speed.

SOLUTION

Magtrol's FRS Free-Run Speed Sensor is designed for applications where it is necessary to acquire speed readings that are unaffected by drag load. Before connecting a motor to the dynamometer, the free-run speed can be obtained from the FRS Sensor. With its reflective sensor, the FRS does not need to be attached to the motor but only placed close to the motor shaft (as shown in the photo to the right). Note: For best contrast, the shaft should be marked with reflective tape.

The sensing end of the fiber optic assembly emits and receives light reflected from the shaft, and sends the speed signal to the digital fiber sensor. The raw speed data is then transmitted to either a Magtrol 3411 Torque Display or DSP7010 Dynamometer Controller where it is converted and displayed in rpm.

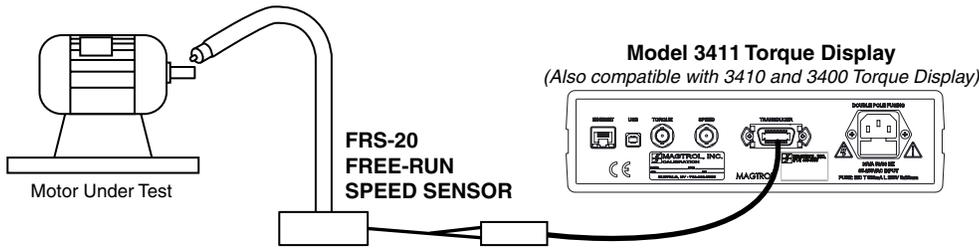


SPECIFICATIONS

| FLEXIBLE ARM | |
|---------------------|--------------------------|
| Construction | steel with chrome finish |
| Minimum Bend Radius | 35 mm / 1.5 in |
| Arm Length | 380 mm / 15 in |

| KEYENCE™ DIGITAL FIBER SENSOR | |
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| See the Keyence™ Digital Fiber Sensor Data Sheet | |

SYSTEM CONFIGURATION



NOTE: The FRS-20 can also be used with the DSP7000. The FRS-22 can be used with the DSP7010. The 3411/DSP also supplies power to the FRS Sensor.

ORDERING INFORMATION

| MODEL | DESCRIPTION |
|--------|---|
| FRS-20 | Free-Run Speed Sensor with Centronics 14M cable |
| FRS-21 | Free-Run Speed Sensor with pigtail wires |
| FRS-22 | Free-Run Speed Sensor with D-Sub 15M cable |