



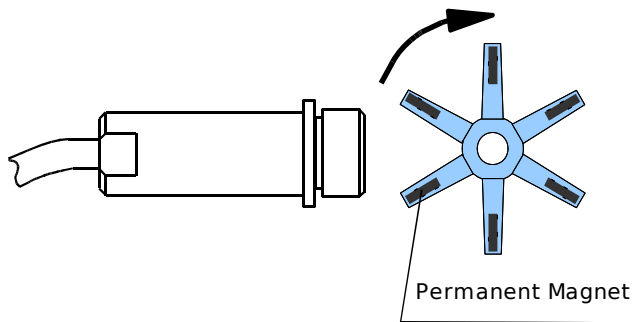
FEATURES

- **WIDE VOLTAGE RANGE:** 2 – 40 VDC
REVERSE POLARITY PROTECTION
SURGE PROTECTION
- **LOW CURRENT CONSUMPTION:** 0.5 mA
- **WIDE BANDWIDTH:** 10 kHz
- **WORKS WITH PULSES DOWN TO 50 us**
- **OPEN DRAIN SINKING, 100V / 100 mA OUTPUT**
REVERSE POLARITY PROTECTION
- **HIGH SENSITIVITY**
CUSTOM SENSITIVITY BY SPECIAL ORDER
- **HIGH HYSTERESIS**
CUSTOM HYSTERESIS BY SPECIAL ORDER
- **OMNIPOLAR:** WORKS WITH EITHER NORTH
OR SOUTH POLE OF THE MAGNET
- **SPECIAL VERSIONS WITH A PULSE DIVISION
FACTOR AVAILABLE**



APPLICATIONS

- **RPM MEASUREMENT**
- **PADDLE WHEEL, IMPELLER, PROPELLER,
TURBINE FLOW METERS**
- **POSITIONING**
- **OBJECTS COUNTING**
- **RAIN GAGES**
- **WIND SPEED METERS**
- **BATTERY POWER DEVICES**



1. DESCRIPTION

The GMS400 is a precision low power wide voltage range magnetic pick-up sensor with very high sensitivity and hysteresis, designed for harsh industrial environment. Its sensitivity and hysteresis can be easily changed at the factory and made by customer requirements.

The sensor works with either north or south pole of the magnet.

When the magnetic field exceeds its operate point the open drain output will turn on and sink current up to 100 mA DC. When the field decreases and reaches the release point the output will turn off and stand voltage up to 100 V DC. The high hysteresis between both trigger levels (operate and release) provides high noise immunity and reliability.

GMS400 is designed for use with low power flow meters or RPM meters. It can work with pulses of magnetic field as short as 50 us or frequencies as high as 10 kHz which is especially important for high RPM measurements or measurements of RPM with large diameters where the magnetic field pulse can be very short.



2. ABSOLUTE MAXIMUM RATINGS *

| | |
|---|------------------|
| Operating temperature | -40 °C to +85 °C |
| Higher temperature versions available by special order. | |
| Voltage on red wire with respect to black wire | +/- 42 VDC |
| Voltage on white wire with respect to black wire | 100 VDC |
| Maximum output current sunk (into white wire – out of black wire) | 100 mA DC |

* **NOTICE: Stresses above those ratings may cause permanent damage to the device.**

3. CHARACTERISTICS

| Parameter | Conditions | Typical | Units |
|--|---|---------------------------|-------|
| Power Supply Voltage RECOMMENDED | -40 to + 85 °C | 2 – 40 2.3 - 36 | VDC |
| Supply Current | 2.0 – 21.5 V DC, output open, Fig. 1 | 0.5 | mA |
| Sensitivity | Alnico 5, 0.305" x 0.060", 25 °C, 2.0 - 40V, Fig. 2, Fig. 3 | 98 - 100 | % |
| Input Frequency | Fig. 4, Fig. 5 | 0 – 10 | kHz |
| Materials | Body from Ertalyte ® PET-P. Epoxy potting. | | |
| Cable | 6' (1.80 m) PVC 3-wire, 22 AWG each. Black, red and white. | | |

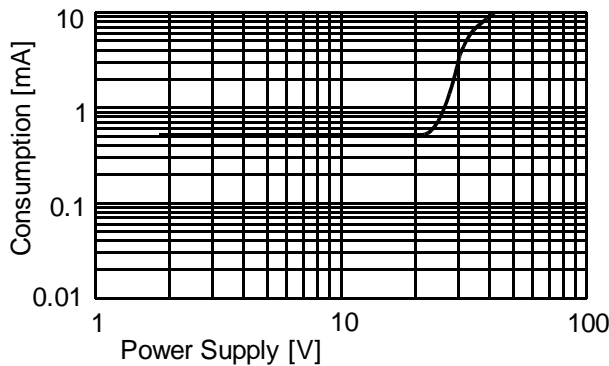


Fig. 1 Consumption vs. Power Supply

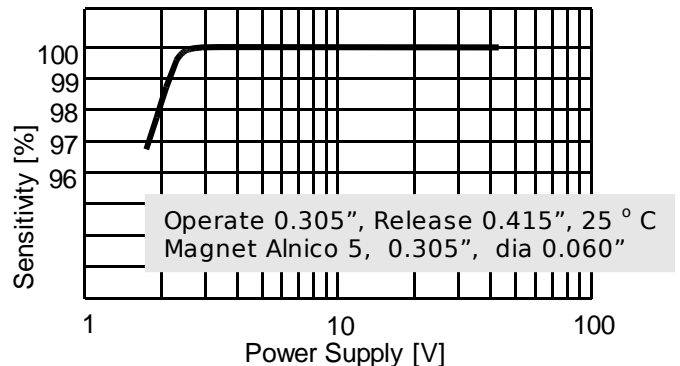


Fig. 2 Sensitivity vs. Power Supply



Fig. 3 Sensitivity vs. Distance

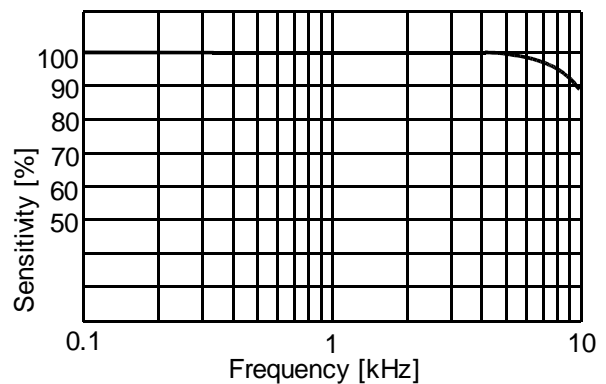


Fig. 4 Sensitivity vs. Frequency

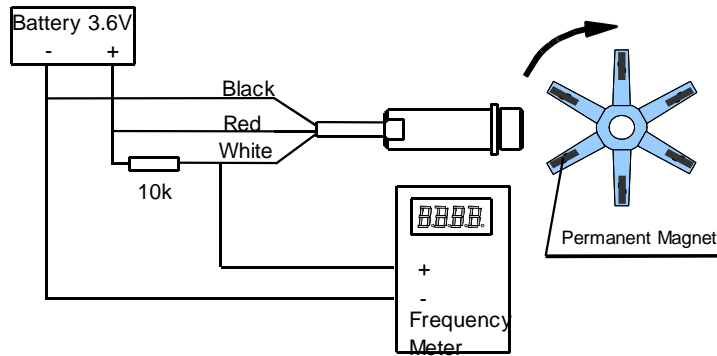


Fig. 5 Input Frequency Test

4. APPLICATION

4.1 MECHANICAL

GMS400 works by sensing magnetic field. It is important that it has to be provided a strong enough magnetic field for the operate point and weak enough or absent magnetic field for the release point.

The moving object that is to be sensed has to provide a constant (DC) magnetic field by having built-in small permanent magnet or a DC current coil. The direction of that field has to be axial to the GMS400 as shown on Fig. 6 .

The sensor has to be mounted on non-magnetic materials such as plastics, brass, stainless steel etc. Materials like cast iron can magnetize and affect the performance of GMS400. It also has to be mounted away from devices producing magnetic field (transformers, electric motors, breakers).

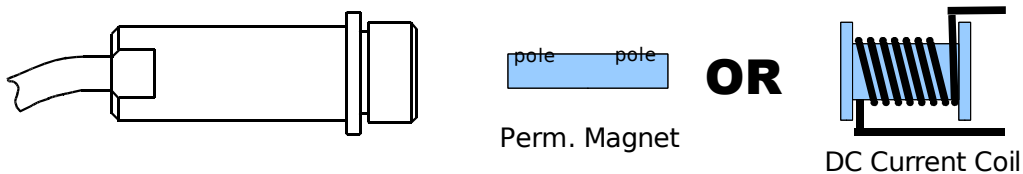


Fig. 6 GMS400 and magnetic field interaction

Figure 7 shows dimensions important for mounting the sensor.

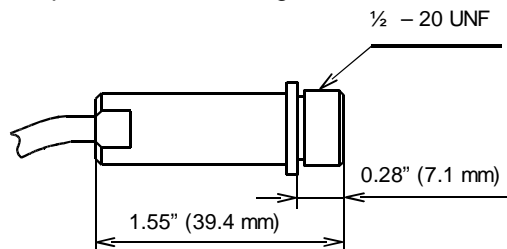


Fig. 7 Dimensions of GMS400

NOTE: DO NOT OVER TIGHTEN THE SENSOR.

Figure 8 shows a typical application of GMS400. The paddle wheel has molded small permanent magnets in its fins and it is rotated by the liquid flowing through the flow meter. GMS400 picks up the pulses of the magnetic field and provides a clear and reliable signal for a flow computer / totalizer.

The same principle of operation can be used to measure RPM of a rotating object.

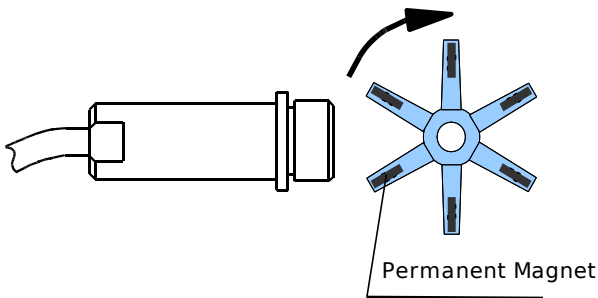


Fig. 8 RPM or flow measurement

There are many other applications such as positioning, counting objects, wind speed measurement, rain gage equipment, automatic door opening etc. where GMS400 can be an excellent solution.

4.2 ELECTRICAL

GMS400 is a 3-wire device. Black wire is the common, red wire is the power supply and white wire is the sinking open drain output. It requires a pull-up resistor to limit the current below 100 mA.

Many instrumentation devices, totalizers, displays, controllers, computers etc. have a built-in pull-up resistor. In such a case the external resistor is not needed. If the sensor is to be connected to a PLC a "current sourcing input" of the PLC has to be used.

Figure 9 shows connections of GMS400 to [GFC110](#) low power flow computer / RPM computer / totalizer which powers the sensor and displays accurate flow rate, total or RPM and provides many programmable features like for an instance an isolated 12 bit analog 4-20 mA output and isolated no polarity pulse output.

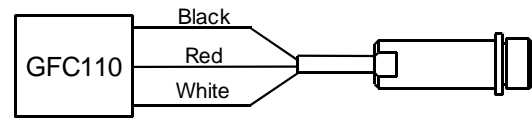


Fig. 9 [GFC110](#) powers GMS400

Figure 10 shows typical connections to displays, totalizers, process indicators, computers, regulators etc. using one power supply.

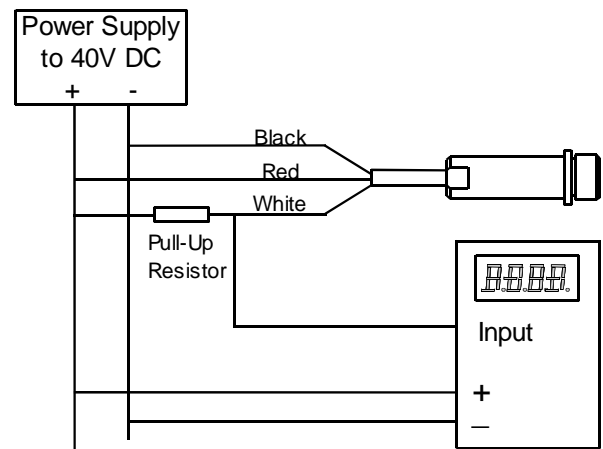


Fig. 10 Typical connections with one PS

Figure 11 shows typical connections using two power supplies and internal pull-up resistor.

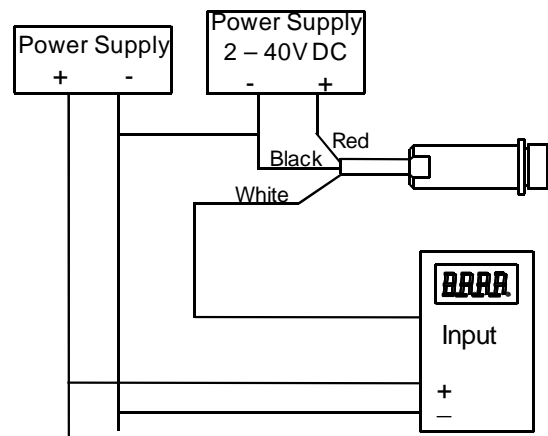


Fig. 11 Using two PS and an internal pull-up



NOTE: Special versions of GMS400 with a pulse division factor are available

5. ORDERING

For ordering please use G Instruments part number (PN) 30114.

For special versions (division factor, higher temperature range etc.) the part number will be different and will depend on the particular customer's application.



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