



Engineering Specifications -SITRANS Magflo MAG 3100 Electromagnetic Flowmeter (Magmeter)

General

Scope

This section describes the requirements for an electromagnetic flow meter and microprocessor based converter/transmitter. Under this item, the contractor shall furnish and install the magmeter equipment and accessories as indicated on the plans and as here in specified.

Submittals

The following information shall be included in the submittal for this section:














- Data sheets and catalog literature for the magmeter and the microprocessor based converter/transmitter.
- Connection diagrams for equipment wiring.
- List of spare parts and optional equipment.

Products







ELECTROMAGNETIC FLOWMETER (MAGMETER)

The electromagnetic flow meter shall consist of a flow sensor based on Faraday's law of electromagnetic induction and microprocessor based signal converter/transmitter, type 5000 or 6000.

Sensor:



-  Operating principle: Utilizing Faraday's law, the sensor converts the liquid flow through the sensor into electrical voltage proportional to the velocity of the flow.
-  Construction: The sensor is built up of 304 stainless steel pipe, 2 coils, 2-316 stainless steel electrodes, Neoprene, EPDM and Teflon isolating liners and carbon steel connecting flanges.
-  Installation: A minimum of 5 pipe diameters up stream and 3 pipe diameters down stream are recommended. (Consult the factory for any variations.)
-  Operating Temp: -40 to 350 degrees F. (Dependent on liner selected)
-  Size: 1/2" to 80" diameter (see instrument schedule)
-  Submergence: The sensor shall be submersible to 10 feet for 72 hours standard and to 30 feet indefinitely when the terminal box is backfilled with a non-setting transparent potting material provided by the manufacturer.
-  Converter/Transmitter: Type 5000 and 6000
-  Enclosure: NEMA 4X enclosure
-  Display: Background illuminated alphanumeric 3 line, 20 character display to indicate flowrate, totalized values, settings and faults and 6-key keypad. (A blind transmitter version of the 5000 is available)
-  Power supply: 115/230 VAC or 11-24VDC.
-  Operating temp: -5 to 120 degrees F.
-  Output: 0-20mA or 4-20mA into 800 ohms max. 1 relay rated at 42VAC/2A, 24DC/1A.
-  Communications: Optional HART module available.

Performance:

-  Flow Range: 1.5 fps to 33 fps for accuracies stated below.
-  Accuracy: 0.25% of actual with Model 6000 converter and 0.50% of actual with model 5000 converter.
-  Separation: Maximum distance of 900 feet between converter and sensor without the use of any additional equipment.
-  Bi-directional flow capabilities shall be standard
-  Totalizer: Two eight digit counters for forward, net or reverse flow
-  The electromagnetic flow meter shall be a Siemens Model 3100 flow sensor with a Siemens Model MAGFLO 5000 or 6000 converter. Insertion type flow meters will not be accepted



Spare Parts

Spare parts for the equipment shall include the following, unless noted otherwise:

-  One set of manufacturers recommended spare parts.
-  Extra operation manuals as required.








OPERATOR FUNCTIONS

Calibration

-  Each flow sensor shall be wet calibrated and all of the calibration information and factory settings matching the sensor shall be stored in an integral mounted SENSORPROM® memory unit. The SENSORPROM® shall store sensor calibration data and signal converter settings for the lifetime of the product. At initial commissioning, the flowmeter commences measurement without any initial programming. Any customer specified settings are downloaded to the SENSORPROM®. Should the signal converter need to be replaced, the new converter will upload all previous settings and resume measurement without any need for reprogramming or rewiring.
-  A certificate of calibration shall accompany each flow sensor.

Converter/Transmitter Function Details

The following functions shall be provided:

-  All programming shall accomplished through an integral key pad and all programming shall be protected by a user-defined password.
-  The converter/transmitter shall be integrally mounted or remotely mounted using a remount mount kit provided by the manufacturer.
-  The converter/transmitter shall provide a 0-20 or 4-20 mADC signal proportional to flow into 850 ohms max. Output selectable as unidirectional or bi-directional.
-  The relay shall be programmable as error indicator, limit alarm or pulsed output.
-  The converter system shall be equipped with an error and status log with 4 groups of information.
 - A. Information without a functional error involved.
 - B. Warnings which may cause malfunction in the application
 - C. Permanent errors, which may cause malfunction in the application.
 - D. Fatal error, which is essential for the operation of the flowmeter.
-  A system error shall be indicated by a flashing Icon on the display or activation of the relay when set as an error alarm.
-  The first nine standing errors shall be stored in the error pending log. A corrected error is removed from the error pending log. A status log shall be provided to store the last 9 error messages received for 180 days regardless of correction.

REVERIFICATION

Verification Procedure

- ✎ Verification using a stand-alone Siemens MAGFLO Vericator to measure a number of selected parameters in the flow sensor and signal converter, which affects the integrity of the flow measurement, shall be available through a factory reverification service.

Parameters

Verification of the Flowmeter shall consist of the following test routines:

- ✎ Insulation test of the entire flowmeter system and cables.
- ✎ Test of sensor magnetic properties.
- ✎ Signal converter gain, linearity and zero point tests.
- ✎ Digital output test.
- ✎ Analog output test.

Certificate

- ✎ A certificate of verification shall be issued if the flowmeter passes all of the tests with-in 1% of the original factory test parameters.

EXECUTION

Installation

- ✎ Follow manufacturer's recommendation for the minimum upstream and downstream installation requirements for the flow sensor.
- ✎ Wiring between flow sensors and remote mounted converters shall use cable type and procedures as per the manufacturers' recommendations.

MANUFACTURER'S ASSISTANCE

Warranty

- ✎ The manufacturer of the electromagnetic flow meter shall guarantee for one year of operation that the equipment shall be free from defects in design, workmanship, or materials.
- ✎ In the event a component fails to perform as specified or is proven defective in service during the guarantee period, the manufacturer shall promptly replace the defective part at no cost to the owner.