

CONTROL SIGNAL

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It is Easy Being Green

There has been much discussion about the "Green Initiative". To many people, this means renewable energy. This includes technologies such as solar power, wind energy, biomass, biofuels, hydrogen, hydro power and geothermal. There is even a concept called "tree power". This technology, proven by MIT in 2009, utilized the pH difference between a tree's inner trunk and ground to get a voltage difference and therefore generate power.

Not too many of us are going to run out and erect a wind turbine in the near future, but there are many ways to utilize green concepts to conserve energy and therefore save money. In addition,



the US Department of Energy (www.eere.energy.gov) can provide tax incentives, both residential and commercial, for energy savings. They have *(Continued on page 3)*

Monitor the Health of Your HART Transmitter

Even the "smartest" transmitter is only as good as its ability to stay up and on the job. You paid extra for HART® capabilities. Now you can use the Moore Industries model HFA HART Fault Alarm to make sure you're getting a full return on that investment.



The HFA is like having a field technician watch the performance of your HART instrument 24-hours-a-day. Installed "transparently"

on to a point-to-point temperature, pressure, level, or flow HART (4-20mA) transmitter loop, the HFA continually "reads" the HART digital diagnostic messages that continuously ride on the 4-20mA loop.

It warns you of six different *(Continued on page 3)*

Hot New Products

Barcode Reader from Banner

The iVu series Barcode reader (BCR) from Banner Engineering offers packages consisting of sensor, lens, lighting and display.

The sensor is in a compact rugged housing which can have an integrated light or touch screen. The BCR is also available with a remote touch screen and intuitive interface to easily configure and quickly deploy without a PC or external controller (as pictured).

The iVue BCR reads the following barcode types:

- DataMatrix (ECC200) barcodes
- PDF 417 (in development)
- Linear barcodes: Code128
Code39
CODABAR
Interleaved 2 of 5,
EAN13



- EAN8
- UPCE
- Postnet
- IMB
- Pharmacode

The easy configuration allows you to install/connect to iVue, select sensor or bar code type, acquire image and set inspection parameters. The tools are menu-driven that guide you as you set up your inspection. The USB 2.0 compliant host is provided for easy updating and diagnostics, while an RS232 serial communications port is used to output barcode data to other applications.

Inside This Issue

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Employee Profile

We are pleased to introduce Gilson Engineering's newest Outside Sales Engineer, Ryan Dean. Ryan began his career with Gilson Engineering in May of 2009 as an Application's Engineer, after his graduation from the University of Florida in April 2009. He earned a degree in Mechanical Engineering and a minor in Business Administration.

During his year in Pittsburgh, Ryan was put through 10 to 12 hours a day in the "Gilson Boot Camp", during which time he gained his knowledge of controls instrumentation and the technical knowledge of the products that Gilson Engineering represents. Ryan worked with customers in all of our offices by providing technical support in product selection and configuration as well as setup and operation.

"Being with Gilson Engineering has taught me so much about instrumentation and how to handle different situations. It has given me a true recognition of dedication and hard work, and it has shown me that the more time and effort I put into my endeavors the more successful I will be. It is very uplifting to know that people rely on me to give them the best and most economical solutions for their problems."



Ryan is originally from Tampa, Florida and lived there until attending college at the University of Florida in Gainesville. He covers the South Florida territory from our Fort Lauderdale office. When not working, Ryan enjoys sports of all types, going to the beach, fishing, and traveling as much as possible.

New Explosion Proof Process Displays

Precision Digital has introduced a new explosion proof process display that can be used for the toughest of applications in hazardous areas. The ProtEX and ProtEX-RT are loop powered meters that take either a 4-20mA or pulse input to display your process measurement. Battery powered option are available as well.



ProtEX model 6800, displays value and engineering units

The ProtEX-RT has the capability to calculate rate and total of your process and would be ideal with the use of a flowmeter that has a 4-20mA or pulse output. The ease of programming allows customers to adjust configurations while still in a hazardous area. The meter has a SafeTouch™ feature, meaning that all of the programming can be done through the glass with the touch of your finger. Not only does the unit have a 0.7" display, but it also has a secondary, lower display 0.4" tall.



ProtEX model 6830 rate/totalizer

This lower display can be used to show engineering units or the totalized value. A backlight is available as an option. The enclosure is a smooth die cast aluminum rated explosion proof, IP68, and NEMA4X. There are flanges available for mounting it to a wall or a pipe.

Tech Tip: Improve the Life of your Electrochemical Sensors

Customers often ask what is the shelf life of an electrochemical gas sensor. E-chem sensors, which are used to monitor Oxygen, and a variety of toxic gases, are like batteries in that they will slowly degrade, even before they are put into use.

One tip is to store the sensors in a refrigerator. This will slow down the decay of the cell.

Catalytic bead and IR type gas detectors do not decay over time when not in use, so shelf life is not an issue.

General News, Schedule of Events

Charleston

September 13-14. West Virginia Rural Water Association (WVRWA), training and technical conference. Showshoe Resort and Conference Center.

www.gilsoneng.com

(Easy being green, Continued from p. 1) software available to calculate the total tax credits. They can also provide an energy assessment (free if you qualify) that “will focus on significantly increasing the implementation of identified savings opportunities”. An application form is available on their website.

Another buzz word you see is LEED Certification. LEED (Leadership in Energy and Environmental Design) was created in 1998 to encourage environmental awareness. The US Green Building Council issues certificates to those designs that qualify. In addition, an individual can become accredited for their knowledge of the LEED rating system.

Energy management and energy conservation starts with the ability to measure and monitor power and energy use. You need to get a base-line of your energy usage so that you can confirm if your policies are successful. A typical example that Gilson Engineering Sales Inc offers is our BTU measurement package for heating or cooling applications. We can provide a panel or wall mounted controller that calculates BTU based on flow and temperature inputs. The controller features include BTU rate, BTU total, water flow rate, inlet/outlet temperature and differential, analog and alarm outputs and optional communications and on-board memory.



Panel or wall mount BTU monitor

Utilizing green instrumentation practices, when choosing individual instruments, can have significant impact on overall costs. For example, traditional mechanical valve positioners have a significant air “bleed-rate”. In a modern process facility, the combined air loss due to positioner “bleed-rate” can be

significant. The Siemens PS2 Smart Positioner uses a piezoelectric valve. This means that once the valve has reached the required position, there is no air bleed. For many, the energy, service time and efficiency savings realized can pay for the positioner in the first year of use.



Siemens PS2 valve positioner with no-bleed piezoelectric valve

Thinking green can also influence your choice of flow meter. While the majority of flows are still measured using differential pressure, there are alternative methods that reduce the permanent pressure loss across the flow element. There are studies that show annual energy cost differentials for standard venturi meters (\$2,000/yr), a

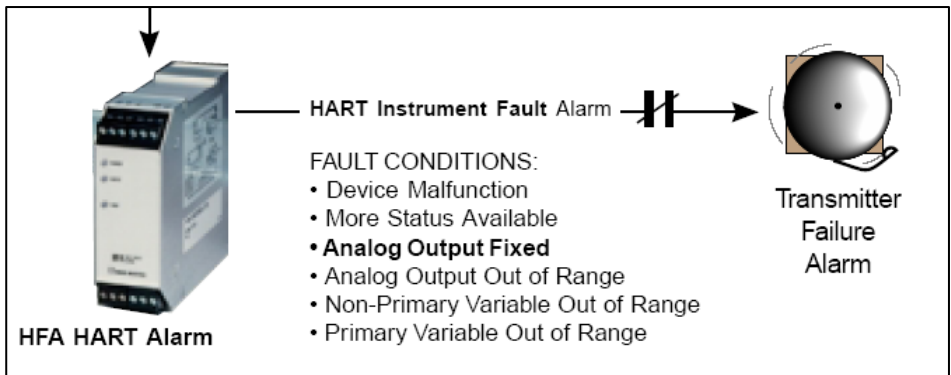
wedge meter (\$8,900/yr) and orifice plate meter (\$19,000/yr). Gilson offers a wide variety of low pressure drop flow meters for any application. They include electromagnetic flow tube and insertion meters, thermal dispersion, vortex, turbine and paddle wheel meters. We even have a clamp-on meter that works on both liquid and gas applications and imparts zero pressure drop.

Green design can also reduce the overall footprint. Rack mount remote transmitters mean you can locate more in the same panel or cabinet space. We also have power supplies that radiate significantly less heat than other manufacturer’s. This reduces the fan/cooling requirements for a cabinet and may also reduce the required size.

Lastly, any green design should monitor and utilize the predictive diagnostics available on today’s “Smart Instruments”. A well known Shell Global Solutions chart shows that over 60% of instrument maintenance labor results in no action taken. By utilizing the information available, this waste of resources would end. Gilson Engineering can help you wade through the many options we can provide to improve your energy efficiency and save you money.

(HART alarm, continued from p. 1) instrument problem/failure situations. The HFA will send an instrument fault (contact closure) alarm to let you know. It will help you identify a potential problem before a shut-down happens.

All parameters are configured via dip switches. On-board LED indicate communication, HFA proper operation, and if any alarm conditions, or transmitter problems exist.



HFA HART fault alarm monitors instrument continuously

Troubleshooting Siemens Magmeters

Siemens magnetic flowmeters are very user friendly for configuration as well as diagnostics and troubleshooting. When the unit is powered, it defaults into operator menu allowing the operator to page through up to 20 screens of information without a password. The screens allowed in operator menu are selected in the passcode protected configuration menu. Including a fault screen to display an error number and a verbal description of a given error is strongly suggested. If the fault screen is enabled, the transmitter will check a wide array of variables. If a fault is detected, a flashing square with a diagonal line will show on the right hand side of the display. This tells the operator to scroll through his display screens to display detected errors. With multiple errors, there will be a fault screen for each fault. Some of the most useful codes are as follows:

W21 – Pulse overflow The flowmeter has local display for rate and two local totalizers, with each capable of being set for forward only, reverse only, or net flow. Remote rate is represented by a 0/4-20mA sourced output. Remote total can be represented by a scaled pulse, a relay, or a frequency. If a totalizer output is on, and scaled beyond it's possible on/off duty, the W-21 error will show. Go back and review the configuration, setting the frequency of activation to a reasonable level in relationship to your expected full scale flow. It is a good practice to turn off any outputs not being used.

W30 – Overflow Q Max A given size magmeter will monitor velocity of a conductive fluid from 1 to 33ft/second, multiply by the cross sectional area of the inside diameter of the meter, and report the result in flow units over time (ie: GPM, MGD, etc.) The Q Max value is the flow value desired for full scale/20mA output. That Q Max value can be set anywhere from a flowrate corresponding to 1ft/second to 33ft/second. If the Q Max is set less than the actual flow, the local display will read accu-

rately, but the meter current output will be pegged. W30 is flagged, suggesting you reconsider the range of the meter to cover a flowrate that is possibly higher than originally anticipated.

P40 SENSORPROM ERROR Each Siemens magmeter is built then put on a wet stand for actual flow testing and calculating differences to a known NIST Traceable flow source. These calibration factors, along with meter size and other variables are generically referred to as FACTORY DATA that is read by any Siemens mag transmitter upon power-up. A second set of data is known as CUSTOMER DATA which includes customer field selections for configuration, and is stored on the SENSORPROM in a read-write fashion to accommodate changes in the field. This eliminates reconfiguration should a transmitter need replaced. The SENSORPROM is shipped in the junction box of the mag body and left there if the transmitter is to be integral. If a remote configuration, the SENSORPROM must be moved to follow the transmitter. Moving the SENSORPROM to the remote transmitter is often missed. The SENSORPROM also may not properly be seated to termination board. Check for the presence of the SENSORPROM, and if it is there, reseal the wiring termination board that sockets to the pins.



SensorProm for Siemens magmeters

P42 Current Output – Check Cables – The magmeter ships with the current output turned off. It must be turned on to be used. If there is no continuity to the loop, current is not possible, indicating an open in the loop, and will be flagged as P42. Check the wiring of all

loop devices to insure loop connectivity.

P61 SENSORPROM Error – Replace – While the mag transmitters have short circuit protection, connecting and disconnecting the transmitter with power applied should be avoided. Should you connect or disconnect the transmitter from the SENSORPROM at the same time data is being interchanged, there is a good chance that you can end up with corrupted data. Should this occur, P61 will be displayed. Record the serial number of your units and contact your local Gilson office to order a new SENSORPROM. With the serial number, a new chip can be burned at the factory to the original meter test data and shipped for field installation.

F70 coil current – Check Cables – Coil Excitation has failed when this error message appears. There are two plugs coming out of the molded mag body, one for the coils and one for the electrodes. In an integral transmitter configuration, these leads which are molded plugs with pins that land on a termination board with all other wiring. For a remote configuration, they land on a two sided terminal strip, with the opposing side for the cables to connect to the remote transmitter. All connections must be checked to insure they are positive firm connections, from the molded plugs all the way to the final transmitter connections for a remote transmitter. An easy and quick way to pinpoint the problem to the cables and clear the transmitter current source is shorting the coil drive terminals 85 to 86 at the transmitter. Shorting these two pins together will clear F70 if the transmitter's current source is healthy. Another source of this error could be an improper coil drive frequency. The coils of the magmeter are pulsed at an optimum frequency for a given size of meter. The correct frequency is part of the factory data written to the SENSORPROM, although unknowing finger wandering through the program changing this frequency can result in an F70. The correct frequencies are shown in the MAGFLO HANDBOOK available at www.gilsoneng.com.

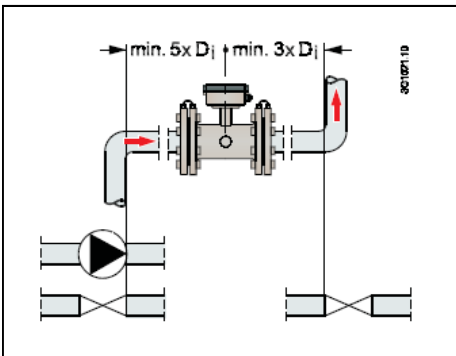
(Continued on page 5)

(Siemens magmeter, cont. from p. 4)

OTHER SYMPTOMS AND CHECKS

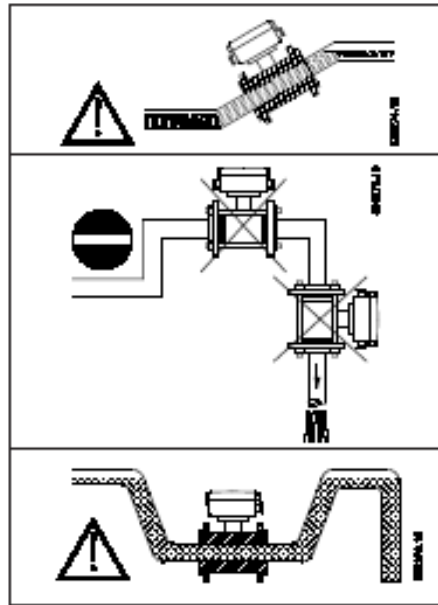
Noisy Flow readings:

1. Check to make sure low level signals like electrode cables are separated from AC wiring, and that the 4-20 leads are not in the same conduit with the 120VAC supply.
2. Make sure that the meter has been installed with the suggested 5 diameters upstream and 3 downstream of straight run after a simple 90 deg elbow. After a pump, try to get as far away as possible or mount in the suction side of the pump.



Minimum straight pipe run requirements

3. The magmeter must be kept full to read accurately. Mounting in Horizontal lines is fine as long as the line is full. A horizontal line feeding directly into an open tank should be placed at a lower elevation in the piping than the final discharge point. If vertical flow, the meter should be mounted with flow in an upward direction. A downward vertical flow can result in aeration unless pumping against a forced main, or a positive pressure. Aeration can show up as a noisy signal, but frequently can be verified utilizing the EMPTY PIPE DETECTION as long as a very short time-out value is set (time before an empty pipe error is flagged – too long a period and you will not see it).
4. Inadequate grounding can result in a noisy signal reflecting erroneous flow values and/or showing flow values positive or negative with verified no flow. Grounding electrodes are built-in to the 5100W series,



Sensor must be kept full of liquid for proper measurement

while the other model mag bodies do not have grounding electrodes. If mounting in non-metallic piping, the 5100 may not require grounding rings. The “Belt and Suspenders Approach” will utilize grounding rings, especially with the popularity of Variable Frequency Drives. The protective paints used on steel and iron pipe are far superior to those used in the past, and piping run through dirt should not be taken for granted as a definite ground. If induced electrical noise is suspected, the coil drive can be stopped in the menu. If the meter does not read zero with the coil drive off, there must be another source of a potential to the electrodes such as that induced from a nearby VFD. Grounding rings should be used on both sides of the meter, tied together as well as to the meter body grounding connection.

5. Check wiring of the magmeter, especially in a remote configuration, that the overall shields of both the coil and electrode cables are attached to grounding in the mags body, while **ONLY THE OVERALL BRAID OF THE COIL CABLE IS GROUNDED AT THE TRANSMITTER,**

LEAVING THE OVERALL SHIELD OF THE ELECTRODE CABLE UNGROUNDED AND TAPED OFF SO IT DOES NOT BECOME GROUNDED.

Meter Reading Lower Flows or No Flow

1. Open the mag body and look for moisture of any kind. Dry it out and inspect for any kind of corrosion.
2. Check the wiring in the mag body junction box in a remote transmitter configuration to insure the pins of the electrode lead plug have a conductor across the terminal strip and there is no wiring offset. Offsetting the wiring can leave one of the coils unpowered, and the body without enough energy to saturate the magnetic field, resulting in low induced voltage to the electrodes, and a low reported flow.
3. With power removed to the meter, check the resistance of the coils to make sure they are in tact with no loss of insulation between windings, Terminals 85-86. A table of resistance for each size is listed in the manual/MAGFLO HANDBOOK. Lightning can enter the mag body through the process fluid, and burn the insulation destroying the coils. A resistance check to ground will pick this up.
4. Electrode check to ground will detect a leak in the electrode to liner seal. With a body filled with process, the electrodes to ground, terminals 82-Grd and 83-Grd, would dictate a bad body.

The above pointers will be helpful in starting to diagnose Siemens Magmeters. Visit the Gilson website to download the MAGFLO Handbook. Siemens Tech Assist Department can be reached at 1-800-333-7421, or contact Gilson at 1-800-860-4499.

**3 Year Warranty on New
MSA Altair 4X Multigas
Detector**

Mesa's ALTAIR 4X Multigas Detector with new MSA XCell Sensor Technology offers many performance advantages: faster response time, four-year sensor life, increased stability, and less than 60-second calibration time. The ALTAIR 4X Multigas Detector operates with only MSA XCell Sensors for LEL, O2, two-toxic H2S/CO, or individual H2S and Carbon Monoxide sensors. The ALTAIR 4X Multigas De-



tor is compatible with the ALTAIR 4 Quick-Check® Station and the ALTAIR 4 Galaxy® Test Stand (Galaxy System software upgrade is required), and provides exclusive optional MotionAlert™ and InstantAlert™ features.

InstantAlert™ features.

Features include:

- Full three-year warranty
- Four-year sensor life, 60% longer

than the industry average

- MSA exclusive instrument end-of-sensor life warning
- Withstands 20-foot drop
- Fast, high-performing sensors
- MSA exclusive MotionAlert™ & InstantAlert™ Features
- 50% less calibration gas used per minute than the industry average
- Sensor response and clear times under 15 seconds, 38% faster than the industry average
- Span calibration time of 60 seconds
- The digital output of the sensors makes them much less susceptible to RF interference



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