connected to any analog input port used on a distributed control system (DCS) or programmable logic controller (PLC). Since it is HART enabled, critical data from CorrTran MV can be monitored with a standard hand-held communicator by field personnel at a plant, accessed directly by a "smart" analog input port used on a DCS or PLC and installed according to the National Electrical Code (NEC). An intrinsically safe, Division 2, and general-purpose version are suitable for ambient temperatures as low as -58 ºF (-50 ºC). The intrinsically safe, Division 2, and general-purpose versions are available to the process engineer so decisions can be made in real-time and according to current process conditions. CorrTran MV-Innovations in Corrosion Monitoring by Pepperl+Fuchs.

Specifications
The standard probes used for corrosion detection on CorrTran MV consist of 3 electrodes: 2 for measurement and 1 for reference. In order to get an accurate measurement, the electrodes must be made of the same material as the pipe or tank being monitored. The sacrificial electrodes are induced with a small signal and are placed directly in the flow of corrosive media. These signals are monitored and analyzed by the transmitter over a period of 21 minutes in order to get an accurate representation of the general and localized corrosion rate as well as conductance. This can be reduced to 16 minutes if you only measure localized corrosion with conductance or 4.5 minutes if you only measure general corrosion and conductance. The following is a small sampling of electrode materials available for pipeline detection:

1018 carbon steel
304 stainless steel
316 stainless steel
Hastelloy
400 monel
1100 aluminum
2024 aluminum
GR2 titanium

Also available are various types of mechanical probes for direct or remote mounting in fixed or adjustable lengths. The basic probe comes with a standard 3/4" NPT fitting with pressure ratings up to 3000 psi (102 bar). The process media temperature can be as high as 500 °F (260 °C) while the transmitter can operate in an ambient temperature range of -40 °F to +158 °F (-40 °C to +70 °C). The only requirement necessary to get an accurate corrosion reading is that the material inside the tank or pipe must maintain a small amount of conductance.

Given its rugged design and industrialized housing, CorrTran MV is ready to be installed in any industrial application from wastewater management to chemical processing to oil refining. If the area is considered nonhazardous (nonexplosive), this transmitter can simply be connected to an analog input on a DCS or PLC and installed according to local, state, and national regulations. For Division 2 applications, its low-power design allows it to be mounted directly within a Division 2 hazardous location regardless of the classification within the pipe. In this configuration, the control signal (4-20 mA circuit) must be connected in accordance with the National Electrical Code according to Division 2 wiring methods. For clarification, a Division 2 location is considered to be hazardous only under abnormal conditions (i.e., faulty valve, unexpected release, aging seal, etc). As a matter of fact, significant portions of a process facility can be designated Division 2; therefore, CorrTran MV can be easily installed in these areas. Division 1 applications require the use of our specially designed CorrTran MV. Our intrinsically safe (IS) unit requires the use of an isolation barrier mounted between the I/O card and the transmitter. This IS barrier (i.e., KFD2-STC4-Ex1 from P+F) limits the energy into the Division 1 area and works in concert with CorrTran MV to eliminate the potential of high energy causing ignition of the hazardous location. An explosion-proof version is available for Division 1 applications.

Configuration
For configuration purposes, CorrTran MV can be connected to any HART-enabled tool once the specific Device Driver (DD) has been loaded into the tool's library. This allows quick modification of a wide range of application-specific values such as range, alarm points, B-value, and damping. Large portions of today's HART transmitters are actually programmed with a hand-held communicator. If HART communication is impossible or unwarranted, our transmitter can also be configured using P+F's own PACTware tool. This configuration takes corrosion monitoring to a new level—one that makes corrosion data readily available to the process engineer so decisions can be made in real-time and according to current process conditions.

Advantages of CorrTran MV
- Takes corrosion out of the laboratory and into the control room
- Lowers the risk of equipment failures
- Minimizes unplanned downtime
- Reduces ownership cost
- Easy to integrate into existing systems
- Optimizes equipment utilization
- Simple to connect, install, and operate
- Suitable for new or existing installations
- CSA certified for the United States and Canada
- ATEX certified
- Suitable for aqueous solutions and vapor applications
- Available in standard, nonincendive (Div 2), explosion proof, and intrinsically safe versions
- Easily configured via HART or PACTware

Industries
CorrTran MV is suitable for a wide range of industries including:
- Gas & oil refining
- Oil exploration & transportation
- Chemical & petrochemical
- Pharmaceutical
- Water and wastewater
- Power generation
- Pulp & paper

CorrTran MV: Innovations In Corrosion Monitoring

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INNOVATIONS IN CORROSION MONITORING

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CorrTran MV: Innovations In Corrosion Monitoring

Corrosion History
Corrosion is a problem that has been a part of the process industry for as long as there have been metal components involved in the process. Corrosion is a chemical reaction that occurs at the interface between the metal and its environment, resulting in the loss of metal and the formation of rust, scale, or other corrosion products. This reaction can be accelerated by factors such as temperature, pressure, and the presence of certain chemicals in the environment.

Corrosion Future
Pepperl+Fuchs was one of the first companies to recognize the need for real-time corrosion monitoring in the process industry. They developed CorrTran MV, a revolutionary transmitter housing that can be used to monitor general and localized corrosion in real-time. This transmitter is capable of detecting both types of corrosion, and it is designed to be easily installed into a standard control room architecture.

Corrosion Technology
The CorrTran MV transmitter is based on the principle that when a metal/alloy is immersed in an electrolytic solution, an anodic site is formed when metal from the surface of the metal is oxidized, and a cathodic site is formed when the dissolved metal ions (Fe2+) are reduced in the environment. This process is known as localized corrosion, and it can be accelerated by factors such as temperature, pressure, and the presence of certain chemicals in the environment.

Real-Time Corrosion Monitoring
Real-time corrosion monitoring is essential for ensuring the safe and efficient operation of process facilities. Corrosion monitoring is based on the measurement of the corrosion current (Icorr), which is the rate at which metal is lost due to corrosion. The CorrTran MV transmitter is designed to measure Icorr in real-time, allowing operators to quickly and accurately determine the corrosion rate and the type of corrosion that is occurring.

ECN (Electrochemical Corrosion Number) is a parameter that is used to determine the corrosion rate of a metal. ECN is determined from the measurement of the corrosion current (Icorr) and the polarization resistance of the metal. The polarization resistance is determined from the measurement of the potential difference between the anodic and cathodic sites.

The CorrTran MV transmitter is designed to measure Icorr and the polarization resistance in real-time, allowing operators to quickly and accurately determine the corrosion rate and the type of corrosion that is occurring. This information can be used to make decisions about maintenance and repair, and to ensure the safe and efficient operation of process facilities.

Figure 1
Figure 2

The CorrTran MV transmitter is designed to measure Icorr and the polarization resistance in real-time, allowing operators to quickly and accurately determine the corrosion rate and the type of corrosion that is occurring. This information can be used to make decisions about maintenance and repair, and to ensure the safe and efficient operation of process facilities.