



Advanced Flow Control Research Facility & IPH

Typically people consider using electric impedance pipe heating (IPH) for fluids and often times that is their first application. However, electric impedance pipe heating is not limited to fluids, it can be used effectively to heat gas and vapor phase products as well.

Recently, Banner-Day completed an installation of impedance pipe heating used to heat compressed air with a major producer of industrial control valves in their newly expanded state of the art valve testing facility. The control valve products developed and tested in this facility play a key role in managing material flow through process systems in such industries as power generation, refining, chemical, pharmaceutical and oil and gas production. Banner-Day's *TraceFREE™* impedance pipe heating system was just one part of a valve testing apparatus included in the new Fisher Technology Development Center, which will be the industry's largest and most advanced valve flow control research facility. This company is the world's leader in the manufacturer of control valve products. They have been fabricating the valves process oriented manufacturers have been relying on for well over 100 years. This expanded R&D capability will enable it to broaden its global reach to better meet the needs of its customers.

As stated in a press release issued by Emerson Process Management, Terry Buzbee, President of the Fisher Division of Emerson said "Process manufacturers have been relying on Fisher valves for well over 100 years, and this expansion of our R&D capabilities will enable us to broaden our global reach to better meet the needs of our global customers." Emerson is the world's largest manufacturer of control valves, with sales, manufacturing and service facilities located worldwide.

When designing the Development Center, the challenge was being able to test valves at temperatures exceeding 400° F with compressed air at pressures exceeding 400 PSI. Prior to implementing the impedance pipe heating solution electric resistance emersion type heaters were used. The emersion heaters were costly, cumbersome, proved unreliable and lacked the control needed to maintain the constant temperature requirements demanded by the valve testing protocol and specifications. Because the emersion heaters were installed in large air accumulator tanks space savings also was a consideration when evaluating alternate compressed air heating solutions.

After careful review, the design team decided to investigate a Banner-Day *TraceFREE™* impedance pipe heating solution to determine what features it might have available to meet their demanding test specifications and protocols. Their investigation revealed that IPH had the capability to increase and maintain the precise temperature control required for testing the valves at elevated pressures and temperatures while under variable flow rate conditions.

Other benefits of IPH considered by the design team included the limited space requirements for the IPH system. This feature saves not only on valuable floor space but helps reduce the overall cost of construction. The Banner-Day *TraceFREE™* system in its simplicity allows for rapid installation, reduced installation costs and minimal system start-up resources.

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As a result of the *TraceFREE™* system's controllability and additional beneficial attributes of minimal space requirements, rapid installation, and minimal installation and start-up costs, Banner-Day's impedance pipe heating solution was selected and implemented.

This pipe heating system was a component of the overall project to create the company's Technology Development Center, which will be the industry's largest and most advanced flow control research facility. The new facility will:

- Quadruple current air and water flow rate capabilities to permit testing of valves for larger and higher pressure applications
- Increase pressure and flow sub-systems to support noise abatement research and product development
- Provide new flow sciences research labs to support multi-phase, cavitation and real world fluid control problems
- Expand dynamic performance test loops to accommodate larger valves
- Support all new product development
- Improve customer demonstration and customer witness testing capability.

The *TraceFREE™* IPH system was carefully designed to heat and maintain compressed air at 400° F. This heated air is piped into and utilized in the Development Center's test floor. The following series of photos show the Banner-Day *TraceFREE™* impedance pipe heating system located below the test bed. Notice the clean compact design and position of the system as it is installed.

IPH Panel



IPH Transformers





Total System View (1)



Total System View (2)



IPH is not limited to only fluids, so don't forget to consider impedance pipe heating for your future gas and vapor phase product heating solutions. The simplicity and elegance of its design provide safe, cost effective and reliable performance.

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