

Solutions for improved process reliability and energy efficiency on heat transfer equipment



Condensate Removal – Process Steam Traps



Steam Trap Failures Initiate Major Business Consequences

Steam Traps have a difficult job. They are expected to work rain or shine, 24 hours a day in dirty conditions. They keep many critical industries functioning, delivering the products which improve the world's standard of living. However, no one notices as they gradually get worn out, plugged with debris, or damaged and eventually fail.

Steam Trap Failure Consequences

When steam traps fail, they often fail in an open position, allowing the heat transfer process to continue uninterrupted. The steam trap will continue to blow live steam, causing a surprising amount of energy an emissions waste.

While steam traps normally fail in an open position, some steam trap technologies are prone to closed or semi-closed position. The consequences of condensate backing up through the system ranges from slower heat transfer to ruptured steam lines with even higher financial impacts than failed open steam traps.



The financial impact of neglected steam traps snowballs over time, growing each month. Improvement requires measurement plus establishing a goal and strategy for improvement.

"A study of 38 sites including 4834 steam traps found 18% of traps leaking with an average leak rate of 128,000 lb/yr."
- The Enbridge Consumers Gas Steam Saver Program – Steam Digest



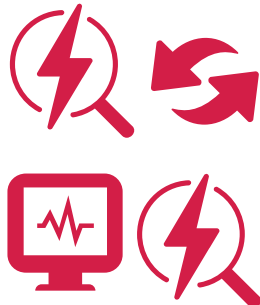
"In steam systems that have not been maintained for 3 to 5 years, between 15% to 30% of the installed steam traps may have failed."
- U.S. Department of Energy



"In steam systems with a regularly scheduled maintenance program, leaking steam traps should account for less than 5% of the trap population."
- US Department of Energy



"Trap repairs are an attractive investment with an average simple payback of 0.4 years."
- The Enbridge Consumers Gas Steam Saver Program – Steam Digest (based off audits of 38 sites including 4834 steam traps)

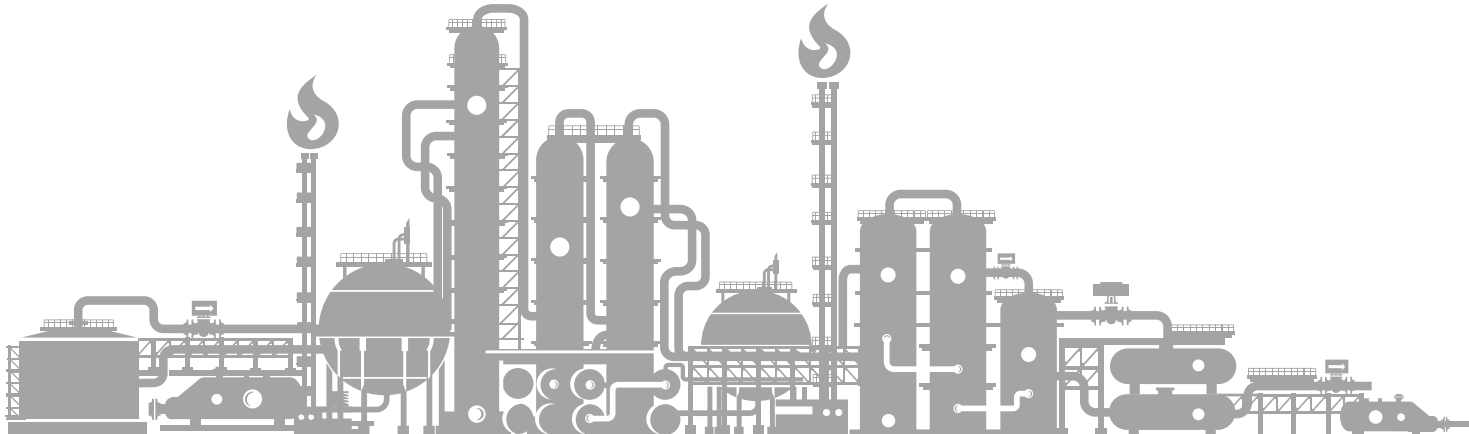


Frequent Surveys that investigate the root cause of failure

Or continuous monitoring and less frequent surveys



Steam trap repair and addressing the root cause of failure



Improve Process Reliability and Energy Efficiency on Heat Transfer Equipment

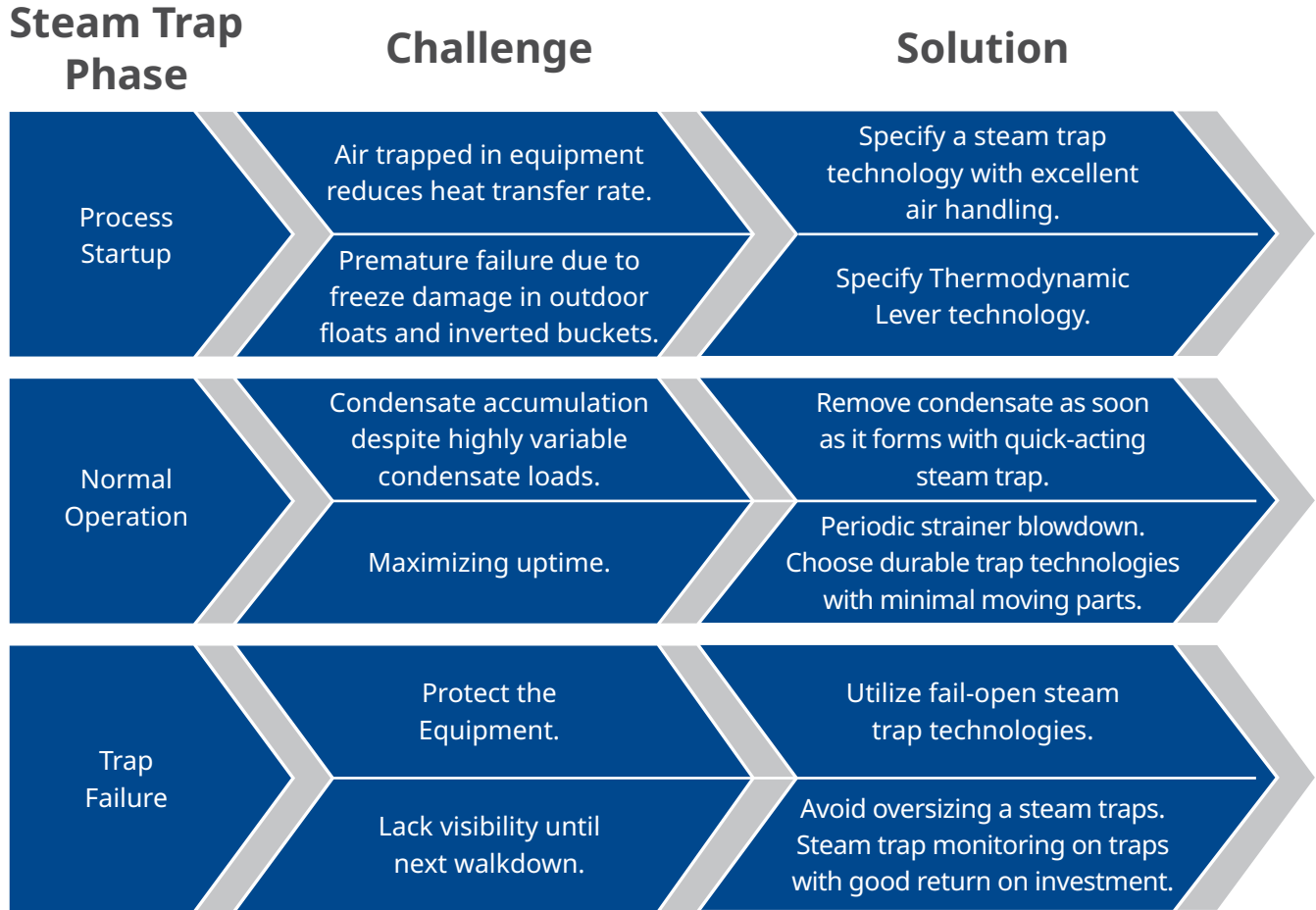
Since steam traps aren't the only asset you operate, how can you manage steam traps in addition to everything else on your plate?

We are here to help.







Due to Emerson's broad steam and condensate portfolio and industry knowledge we are uniquely qualified to deliver more than just a steam trap verification. We can assess your steam and condensate system starting with the combustion setup at the boiler and covering the entire steam and condensate system. We also evaluate whether the steam trap failure is a symptom of a larger problem such as an issue with the piping layout or condensate return setup.



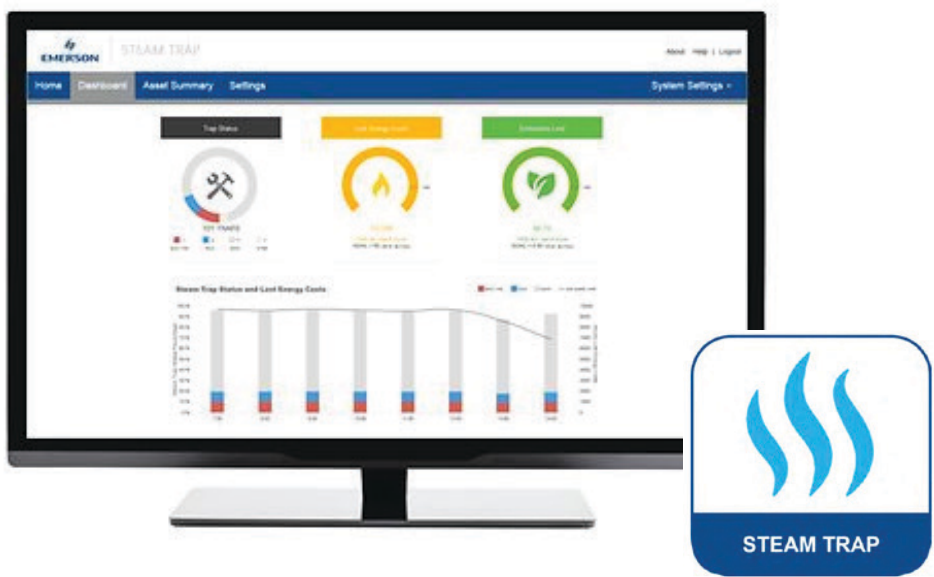
By combining industry-leading technical expertise with innovative predictive diagnostic technology, Emerson can partner with you to create and implement maintenance strategies to streamline turnarounds, minimize costs, improve availability, and reduce the risk of process upsets impacting your bottom line.



Working Together to Solve Steam and Condensate Challenges

Emerson Steam Trap Solutions	Emerson Trap Management Solutions
 <p>Portfolio full of inline repairable steam traps.</p>	 <p>For critical traps, Rosemount Wireless steam trap monitoring.</p>
 <p>Offering both levered and leverless F&T trap technology to match your preference.</p>	 <p>Local support and walkdowns for less critical traps so you can focus your resources on more pressing needs.</p>
 <p>Unique thermodynamic levered traps withstand water hammer and freezing during shutdowns and have an open failure mode.</p>	 <p>Guidance when choosing the right trap technology per application.</p>

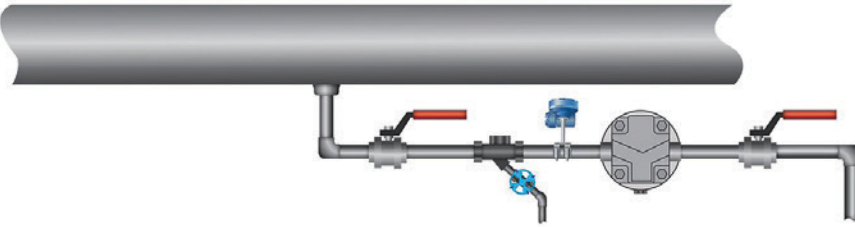
Continuous Steam Trap Monitoring



Plantweb Insight™ brings it all together by managing your facility data and providing data interpretation that enables you to make the critical decisions necessary to improve operational performance and safety.

How It Works

The Plantweb Insight™ Steam Trap application determines the online health status of your steam traps by verifying if a trap is in failure mode. This is calculated using a status algorithm established by years of industry experience and analytics. With this application, you can view trending of past health, emissions, and energy loss on a per trap basis, and track impact set against key performance objectives.



Cut Energy Costs



Real-time monitoring clearly displays economic and environmental impact in terms of excess energy costs and emissions loss.

Improve Efficiency

Quickly identify any steam traps that require attention: Blow through, plugged, and flooded failure modes are immediately displayed.

The application utilizes data from the Rosemount™ 708 Wireless Acoustic Transmitters to continuously determine steam trap status. This includes identifying steam trap failures (blow through, flooded, plugged) and inactivity.

Working Together to Solve Steam and Condensate Challenges

<p>Steam Trap Failures Have a Major Business Impact</p>  <p>Continuous steam trap monitoring helps identify failures in real-time for quick repair and replacement.</p>	<p>Avoid Costly Damage with Greater Visibility</p>  <p>Wireless provides a cost effective, reliable solution and non-intrusive transmitters make installation quick and easy.</p>
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Process Steam Traps

Levered Float and Thermostatic Yarway FIT100 Series



- Technology: Mechanical – Float (Levered) and Thermostatic
- Size: NPS 1/2, 3/4, 1 / DN 15, 20, 25
- Max Temperature: 850°F / 454°C
- Max Pressure: 465 psi / 32 bar
- Capacity: Up to 2750 lb/hr / 1250 kg/hr
- Connections: NPT, SWE, BSPT, 150RF, 300RF, 600RF, PN16, PN40
- Materials: Ductile Iron, Carbon Steel, or Stainless Steel

Levered Float and Thermostatic Yarway FIT200 Series



- Technology: Mechanical – Float (Levered) and Thermostatic
- Size: NPS 1, 1-1/2, 2 / DN 25, 40, 50
- Max Temperature: 800°F / 425°C
- Max Pressure: 465 psi / 32 bar
- Capacity: Up to 50,000 lb/hr / 23,000 kg/hr
- Connections: NPT, SWE, BSPT, 150RF, 300RF, 600RF, PN16, PN40
- Materials: Ductile Iron, Carbon Steel, or Stainless Steel

Leverless Float and Thermostatic Yarway FXT Series



- Technology: Mechanical – Float (Leverless) and Thermostatic
- Size: NPS 1/2, 3/4, 1, 1-1/2, 2 / DN 15, 20, 25, 40, 50
- Max Temperature: 750°F / 400°C
- Max Pressure: 650 psi / 44.8 bar
- Capacity: Up to 22,450 lb/hr / 10,183 kg/hr
- Connections: NPT, SWE, BSPT, 250RF, 300RF, 600RF
- Materials: Cast Iron or Carbon Steel

Thermodynamic (Lever) Yarway 40 Series



- Technology: Thermodynamic (Lever)
- Size: NPS 1/2, 3/4, 1, 1-1/2, 2, 3 / DN 15, 20, 25, 40, 50, 80
- Max Temperature: 750°F / 400°C
- Back pressure: Up to 40% of inlet pressure (absolute pressure)
- Capacity: up to 80,000 lb/hr / 36,000 kg/hr
- Connections: NPT, SWE, 150RF, 300RF, 600RF
- Materials: F11 Chrome Moly

Thermostatic (Bellows) Yarway 151 Series



- Technology: Thermostatic (Filled Thermal Element)
- Size: NPS 3/4, 1 / DN 20, 25
- Maximum Temperature: 750°F / 400°C
- Maximum Pressure: 300 psi / 20.7 bar
- Capacity: Up to 11,023 lb/hr / 5000 kg/hr
- Connections: NPT, SWE, 150RF, 300RF
- Materials: Low carbon Chrome Moly

Features and Benefits

Excellent Choice for a Wide Variety of Process Applications

- Responds quickly to sudden pressure and condensate load changes
- Excellent air handling
- Condensate discharge temperature closely follows the saturation curve

Excellent Choice for a Wide Variety of Process Applications

- No mechanical linkages to repair or replace
- One moving part
- Infinite number of contact surfaces with the orifice, ensuring little wear and long reliable life

Rugged Trap for Outdoor Applications which have a Risk of Freezing

- Withstands both freezing and water hammer unlike many process traps
- Excellent air handling and condensate capacity, replacing traps of larger physical size
- Fail-open failure mode protects equipment from water hammer

Suitable for outdoor applications with risk of freezing

Steam Traps

Inverted Bucket Yarway INB100 Series



- Technology: Inverted Bucket
- Size: NPS 1/2, 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2 / DN 15, 20, 25, 32, 40, 50, 65
- Max Temperature: 662°F / 350°C
- Max Pressure: 465 psig (32 bar)
- Capacity: Up to 20,000 lb/hr / 9070 kg/hr
- Connections: NPT, SWE, BSPT
- Materials: Cast Iron, Carbon Steel

Thermodynamic Piston Yarway 741 Series



- Technology: Thermodynamic (Piston)
- Size: NPS 1/2, 3/4, and 1 / DN 15, 20, and 25
- Max Temperature: 750°F / 400°C
- Max Pressure: 600 psig (41 bar)
- Back Pressure: Up to 40% of inlet pressure, psia/bar
- Capacity: Up to 3900 lb/hr / 1772 kg/hr
- Connections: NPT, SWE
- Materials: F11 Chrome Moly

Thermodynamic Disk Yarway 721 Series



- Technology: Mechanical – Float (Leverless) and Thermostatic
- Size: NPS 1/2, 3/4, 1, 1-1/2, 2 / DN 15, 20, 25, 40, 50
- Max Temperature: 750°F / 400°C
- Max Pressure: 650 psi / 44.8 bar
- Capacity: Up to 22,450 lb/hr / 10,183 kg/hr
- Connections: NPT, SWE, BSPT, 250RF, 300RF, 600RF
- Materials: Cast Iron or Carbon Steel

Sanitary Thermostatic Yarway ST600 Series



- Technology: Thermostatic
- Size: NPS 1/2, 3/4, 1, 1-1/2 / DN 15, 20, 25, 40
- Max Temperature: 338°F / 170°C
- Max Pressure: 100 psig (6.9 bar)
- Capacity: Up to 575 lb/hr / 1622 kg/hr
- Connections: Tri-clamp
- Electropolish Surface Finish (optional): 13 μ in. Ra internal, 20 μ in. Ra external
- Gasket Approvals: FDA, USDA, USP Class VI, 3A Sanitary Standard, and NSF

Features and Benefits

Simple and Reliable General-Purpose Trap

- Suitable for wide variety of loads and applications
- Resists Dirt and Scale – the valve and orifice are positioned at top of traps
- Top-entry, In-line repairable

Ideal for Syphon Applications used in Pulp & Paper and Food and Beverage

Prevents Steam Lock in applications where condensate is lifted with a syphon such as rotating cylinders, submerged coils, and jacketed kettles

Ideal for Platen and Vulcanizing Press Applications

Fast, in-line trap renewal. Changing the capsule only takes a couple minutes and results in a brand new steam trap

Excellent in Hygienic Applications

Only requires 3°F subcooling, minimizing pipe length

Continuous Monitoring

Wireless Acoustic Transmitter Rosemount™ 708



- Acoustic Level: 0-255 Counts
- Operating Temp: -40 to 260 °C / -40 to 500 °F
- Update Rate: 1 second to 60 minutes, user selectable
- Power Supply: Replaceable, non-rechargeable, intrinsically safe Lithium-Thionyl Chloride Power Module pack with PBT/PC enclosure
- Housing Material: Engineered Polymer (PBT/PC)
- Antenna Type: Internal antenna: Maximum of 10mW (10 dBm) EIRP
- Warranty: 12/18 months standard, 3 or 5 year optional
- FM and CSA Class 1 Div 1 approvals

Application Plantweb Insight™ Steam Trap



- Operating System: VMware Virtual Hardware Version 16 or higher or Microsoft® Hyper-V Configuration Version 8.0 or higher
- 4 dedicated processors minimum
- 8GB RAM minimum
- 512GB of free hard drive space
- Communication Protocol: HART®-IP client, OPC-UA client/server, Modbus TCP/IP server, REST API

Application Plantweb Insight Heat Exchanger



Features and Benefits

- Intrinsically safe power module with 10+ year battery life
- Directly mounts to process piping without cutting or changing pipe configurations for flexible, simple installation
- WirelessHART® technology is secure, cost-effective and delivers >99% data reliability
- WirelessHART® network easily integrates into host systems, data historians or energy management software

- Steam trap status algorithm, developed from decades of experience and analytics
- “Inactive”, “blow through”, “plugged” and “flooded” failure modes are immediately displayed for increased efficiency

- Easy-to-use visual dashboard provides real-time heat exchanger status and alerts, including fouling and heat duty
- Predictive diagnostics and alert weights enable prioritization of heat exchanger maintenance

Application Plantweb Insight Valve Health



Prevent Unplanned Downtime—
The Valve Health application sends predictive alerts on critical valves and repair urgency. This allows you to intelligently manage and schedule needed maintenance

Accessories

Air Vent Yarway Type AV-5



- Technology: Thermostatic Air Vent
- Size: NPS 1/2, 3/4 / DN 15 / 20
- Maximum Temperature: 650°F / 343°C
- Max Pressure: 600 psi / 41 bar
- Capacity: 1.25 cu ft/min

Strainer Yarway 900 Series



- Body Size: NPS 3/8, 1/2, 3/4, 1, 1-1/2 and 2 / DN 10, 15, 20, 25, 40, and 50
- Body Material: Cast iron or WCB steel

Isolation Globe Valve Yarway 5500 Series



- Certifications: PED, CE, ASME B31.1
- End Connection: Threaded, Socket Weld
- Material: Steel, Stainless Steel
- Shutoff Class: Class V (FCI 70-2)
- Standards: ASME B16.34
- Valve Size: NPS 2 / DN 50, NPS 1-1/4 / DN 32, NPS 1-1/2 / DN 40, NPS 1/2 / DN 15
- Pressure Rating: ASME 800 LTD Class

Isolation Ball Valve KTM™ K-Ball Series 182



- Body Design: Three-Piece
- Material: Carbon Steel or Stainless Steel
- End Connection: Butt weld, socket weld and threaded
- Pressure Rating: ASME 300 / 600
- Valve Size: DN 8 - 100 (NPS ¼ - 4)

Features and Benefits

Supplemental air vent which removes air and non-condensable gases which otherwise would reduce efficiency of heat transfer during start-up and upset conditions

Meets ASME B31.1

Contains a fixed, repairable seat overlaid with Stellite hardfacing

1. Double shaft seal design
2. Heavy duty, three-piece ball valve

Steam distribution solutions for optimizing fuel usage and maximizing uptime



ROSEMOUNT™ YARWAY KTM™ FISHER™
CROSBY™ KEYSTONE™ BAUMANN™

Emerson can help you accomplish your stretch goals for reliability and efficiency improvements in your steam and condensate system. By combining industry-leading technical expertise with innovative predictive diagnostic technology, Emerson can partner with you to create and implement maintenance strategies to streamline turnarounds, minimize costs, improve availability, and reduce the risk of process upsets impacting your bottom line.

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