



STEAM TRAP MONITORING



AIM[™]
ARMSTRONG INTELLIGENT MONITORING
WirelessHART[®]

Why Steam Trap Monitoring?

If the steam trap **fails open** (Leaking or Blow-Through):

- | Increased back pressure
 - Reduced flow for surrounding steam traps
- | Steam losses (monetary losses)
- | Safety issue
- | Environmental issue

If the steam trap **fails closed** (Cold):

- | Wet steam
 - Water hammering
 - Damaged turbine LP saturated steam stage
 - Piping corrosion
 - Erosion on valves, reducers
- | “Stalling” or flooded heat exchanger
 - Decrease in production
 - Reduced heat transfer
 - Batch process losses
 - Thermal stress

There are **3 challenges** for effective steam trap monitoring:

- | Identifying a failure – What, when, and where?
- | Evaluating the scope – How big of an impact?
- | Measuring the impact – Value the tangible and intangible losses.

AIM® enables you to tackle all three challenges with one system solution that combines a mix of methods including steam trap specific acoustic and temperature monitoring with integrated smart wireless solutions.

WirelessHART® Protocol

WirelessHART® is a highly reliable, easy to deploy wireless communications protocol for process automation applications. It adds wireless capabilities to HART technology while maintaining compatibility with existing HART devices, commands, and tools. WirelessHART uses mesh networking technology. Each device in a mesh network can serve as a router for messages from other devices. In other words, a device doesn't have to communicate directly to a gateway, but just forward its message to the next closest device. This extends the range of the network and provides redundant communication routes to increase reliability, particularly in the difficult radio environment found in process facilities. The Armstrong Intelligent Monitoring (AIM®) ST5700 series is the only steam traps monitoring device *WirelessHART®* registered by FieldComm Group.™

SIMPLE

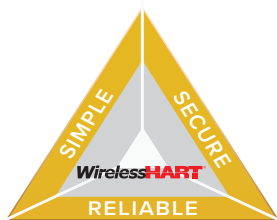
- | Easy set-up of network and HART devices
- | Self-organizing, adaptive mesh network
- | Seamless integration to existing hosts

RELIABLE

- | Robust, multi-tiered, always-on security
- | Device authentication and passwords
- | Industry standard data encryptions

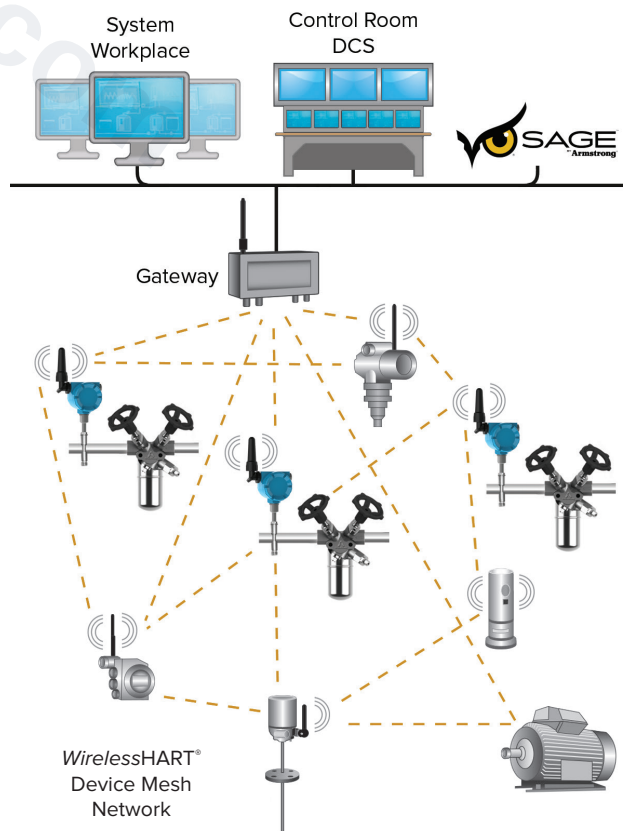
SECURE

- | Channel hopping to avoid interference
- | Time-synchronized communication
- | Redundant self-healing network



STEAM LOSS THRU AN ORIFICE • DRIP APPLICATION						
	10barg	150psig	17barg	250psig	28barg	400psig
Orifice	[kg/day]	[lb/day]	[kg/day]	[lb/day]	[kg/day]	[lb/day]
#38	495	1,091	796	1,754	1,246	2,747
7/64"	575	1,267	924	2,036	1,447	3,190
1/8"	751	1,655	1,207	2,660	1,890	4,167
5/32"	1,173	2,586	1,885	4,156	2,953	6,511
11/64"	1,419	3,129	2,281	5,029	3,573	7,878
3/16"	1,689	3,724	2,714	5,984	4,253	9,376
7/32"	2,299	5,068	3,695	8,145	5,788	12,761
1/4"	3,003	6,620	4,826	10,639	7,560	16,668
5/16"	4,692	10,343	7,540	16,623	11,813	26,043
3/8"	6,756	14,894	10,858	23,937	17,011	37,502
1/2"	12,011	26,479	19,303	42,556	30,241	66,671
9/16"	15,201	33,512	24,430	53,859	38,274	84,380
11/16"	22,707	50,061	36,495	80,457	57,175	126,050
3/4"	27,024	59,577	43,432	95,750	68,043	150,009

Blow-Through steam trap, Outlet Pressure < (Inlet Pressure/2) Source: AM0017 by UNFCCC



Armstrong International

AIM® ST5700 Series & WirelessHART®



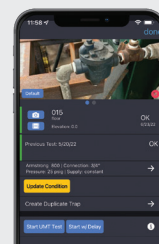
Simple. Smart. Sustainable.



- No steam trap set-up (operating pressure, trap details, rate).
- No integration to external software necessary.
- Transmitted Information to gateway:
 - Primary Variable (PV) → Steam Trap Condition: 1=OK, 2=COLD, 3=BLOW-THROUGH
 - Secondary Variable (SV) → Current Temperature (°C or °F)
 - Tertiary Variable (TV) → Temperature Set Point (°C or °F)
 - Quaternary Variable (QV) → Estimated Battery Life (Days)
- Acoustic range specifically calibrated for steam traps.
- Patented waveguide for proper acoustic filtration and vibration resistance.
- Non-intrusive installation, clamped directly on the pipe ahead of the steam trap.
- Waveguide hardware allows multiple transmitter installation orientations.
- 24/7 monitoring of the steam trap population.
- AIM® devices scattered on the steam system will strengthen the wireless network.

SAGE® keeps you fully informed, 24 hours a day by providing regular updates, precise documentation, custom-filtered reports, and real-time alerts to notify you immediately of any problems that arise.

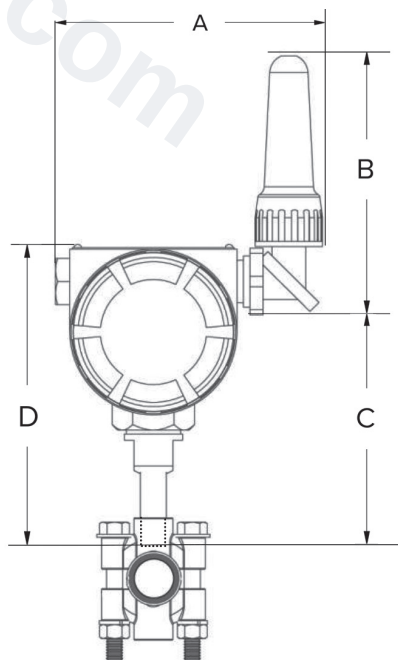
SAGE® calculates steam loss data and reports it using our proprietary steam system efficiency methodology approved by the United Nations Framework Convention on Climate Change (UNFCCC).



SPECIFICATIONS	
Housing Material	Epoxy coated aluminum
Waveguide Material	CF8M casting
Protection Rating	IP66
Hazardous Location	Class I, Division 1, ATEX Zone 0
Ambient Temperature	-40°F to 158°F (-40°C to 70°C)
Min. Operating Pressure	15psig (1barg)
Max. Process Temperature	824°F (440°C) *
Battery Type	Epoxy Lithium-metal battery pack
Pipe Diameter	½" to 12" (DN15 to DN300)
Weight (without waveguide)	4.1lbs (1.9kg)

* See IOM, not derated on ambient temperature using specific installation kit.

DIMENSIONS		
	[in]	[mm]
A	6.4	162
B	5.0	128
C	5.2	131
D	6.5	164



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