



Armstrong®

**GLOBAL EXPERTISE FOR
HIGHER EDUCATION**

INTELLIGENT PRODUCTS, PROGRAMS AND SERVICES FOR COLLEGES AND UNIVERSITIES OF ALL SIZES, WORLDWIDE

As global leaders in energy management, conservation and sustainability, Armstrong understands the complex issues you face every day. Our experts can help you lower your overall utility expenses and achieve your objectives for increasing efficiency and sustainability, while providing a safe, comfortable learning environment for students.

Armstrong offers solutions to satisfy your industry's most unique requirements for: steam and condensate, hot water, air quality and humidification, Legionella and scalding risk reduction, electricity generation, wastewater treatment, reverse osmosis for incoming water, on-site utility system management, and more.

KNOWLEDGE APPLIED IS ENERGY SAVED.

Armstrong consistently saves time, money and energy for some of the most respected universities in the world, even during campus expansion. We can optimize your current thermal utility infrastructure, as well as design and implement complete, optimal systems for your new or existing facilities. Our on-site specialists will work with you on day-to-day maintenance, repair, and overhaul activities to keep everything running smoothly and efficiently.

For more information, or to find an Armstrong representative near you, visit armstronginternational.com/higher-education.

ABOUT ARMSTRONG INTERNATIONAL

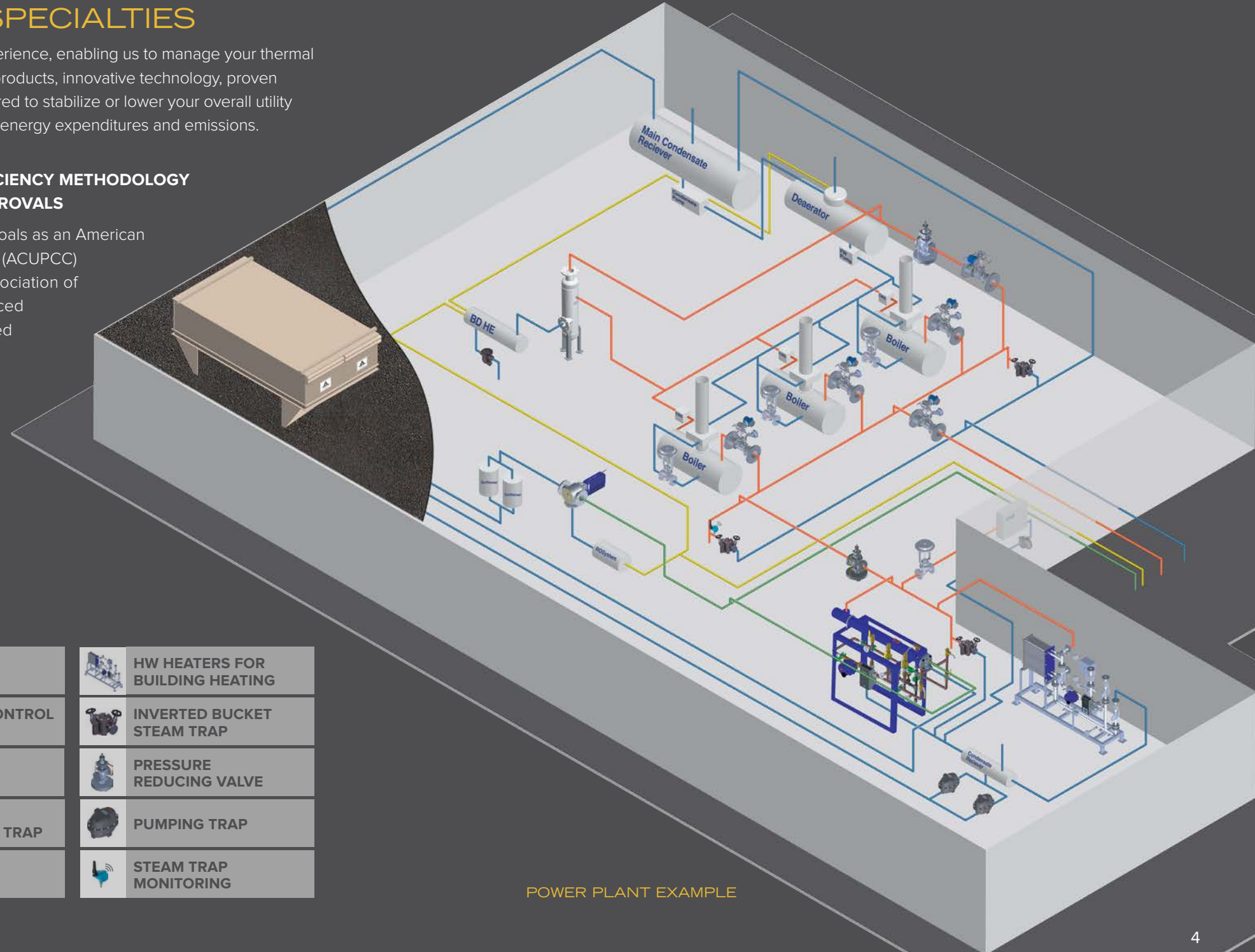
Founded in 1900, Armstrong International is a privately held, fifth-generation, family-owned company. We have a unique heritage of knowledge, experience and insight that reaches back more than a century, enabling us to serve the higher education industry in ways no one else can.
















MAXIMIZING PERFORMANCE, EFFICIENCY AND SAFETY FOR INSTITUTIONS LIKE YOURS IS ONE OF OUR SPECIALTIES

Armstrong has more than 118 years of knowledge and experience, enabling us to manage your thermal utilities better than anyone in the world. The hardworking products, innovative technology, proven programs and custom services we provide are all engineered to stabilize or lower your overall utility expenses while helping you reach your goals for reducing energy expenditures and emissions.

ARMSTRONG'S PROPRIETARY STEAM SYSTEM EFFICIENCY METHODOLOGY HAS UNITED NATIONS AND KYOTO PROTOCOL APPROVALS

Our specialists can help you achieve your performance goals as an American College and University Presidents' Climate Commitment (ACUPCC) signatory, and as a Strategic Business Partner of the Association of Physical Plant Administrators (APPA). Armstrong's advanced steam system efficiency methodology has been approved by the United Nations Framework Convention on Climate Change (UNFCCC), and ours is the first efficiency methodology to be approved for international trading of resultant carbon dioxide (CO2) emissions under the Kyoto Protocol.



	AIR COOLED HEAT EXCHANGERS		DOMESTIC HOT WATER HEATER		HW HEATERS FOR BUILDING HEATING
	AIR HEATING COILS		FEED WATER CONTROL VALVE		INVERTED BUCKET STEAM TRAP
	BACK-PRESSURE CONTROL VALVE		FLASH TANK		PRESSURE REDUCING VALVE
	DIGITAL WATER TEMPERATURE CONTROL VALVE		FLOAT AND THERMOSTATIC TRAP		PUMPING TRAP
	DIGITAL RECIRCULATING VALVE		FLOW METER		STEAM TRAP MONITORING

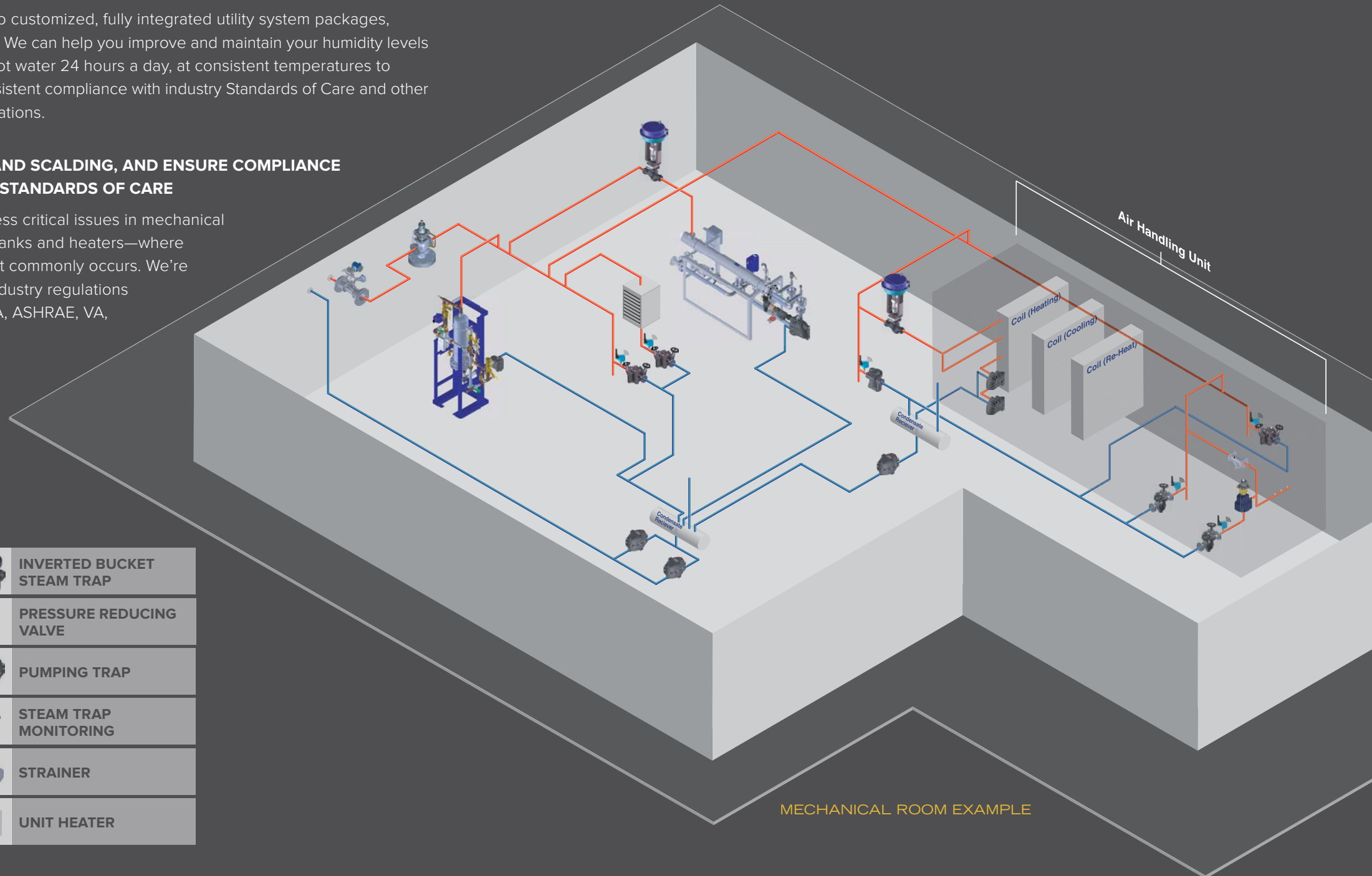
POWER PLANT EXAMPLE













STATE-OF-THE-ART SOLUTIONS TO HELP YOU MAINTAIN A SAFE, COMFORTABLE ENVIRONMENT FOR LEARNING

From rugged, dependable products to customized, fully integrated utility system packages, Armstrong has exactly what you need. We can help you improve and maintain your humidity levels and air quality, and provide reliable hot water 24 hours a day, at consistent temperatures to prevent scalding—while ensuring consistent compliance with industry Standards of Care and other hot water safety guidelines and regulations.

REDUCE RISKS FOR LEGIONELLA AND SCALDING, AND ENSURE COMPLIANCE WITH ASHRAE, OSHA AND OTHER STANDARDS OF CARE

Armstrong will work with you to address critical issues in mechanical rooms, plumbing systems, hot water tanks and heaters—where incubation of Legionella bacteria most commonly occurs. We're experts in helping you comply with industry regulations and Standards of Care, such as OSHA, ASHRAE, VA, World Health Organization and more.



	BUILDING HEATING WATER HEATER		INVERTED BUCKET STEAM TRAP
	DOMESTIC WATER HEATER		PRESSURE REDUCING VALVE
	CONTROL VALVE		PUMPING TRAP
	FLOAT AND THERMOSTATIC TRAP		STEAM TRAP MONITORING
	FLOW METER		STRAINER
	HUMIDIFIER		UNIT HEATER

MECHANICAL ROOM EXAMPLE

ASHRAE Guideline 12-2000

4.1.6 RECOMMENDED TREATMENT

Hot water stored above 140°F (60°C), minimum recirculated return 124°F (51°C).

ASHRAE Standard 188-2015 Legionellosis: Risk Management for Building Water Systems

6.1.7 DOCUMENTATION & RECORDKEEPING

Establish documentation and maintain records.

STANDARDS OF CARE TO REDUCE RISKS OF LEGIONELLA AND SCALDING

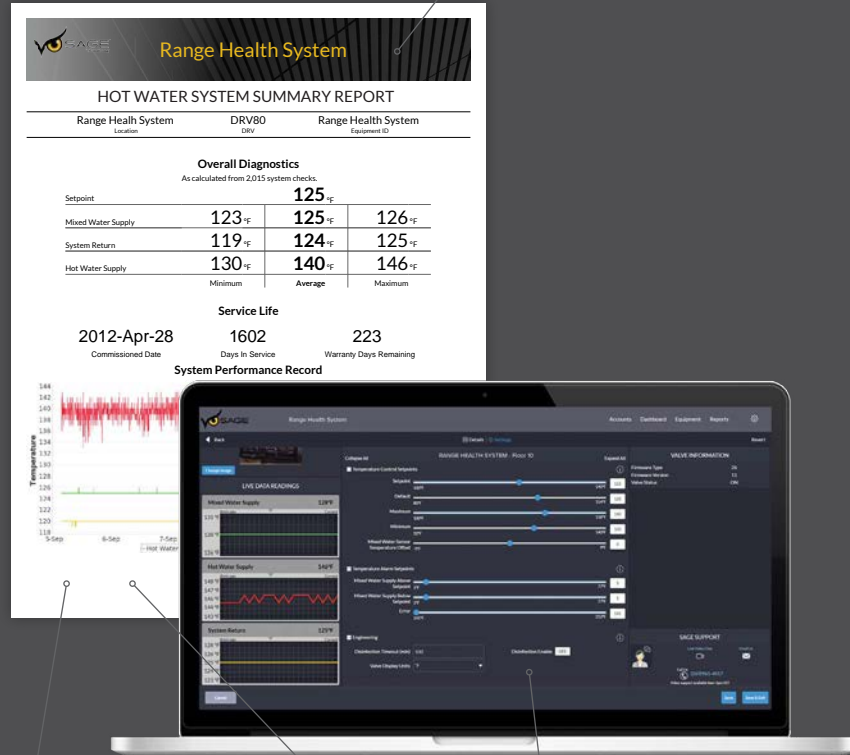
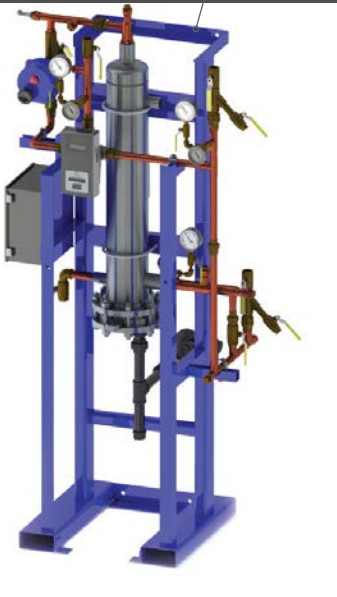
A Standard of Care is defined as acknowledged applicable laws, standards and guidelines. Following the appropriate Standard of Care can minimize the risk of Legionella-related illness and scalding injuries.

OSHA (1998), Joint Commission Environment of Care (2001), ASHRAE Guideline 12-2000, ASHRAE Standard 188-2015 and VA Directive 1061 (2014) are Standards of Care which include critical recommendations for establishing and monitoring hot water system temperature control limits.

LEGIONELLA AND LEGIONNAIRES' DISEASE

Legionella is a type of bacteria that can cause a severe, often lethal form of pneumonia known as Legionnaires' disease in persons at risk. Within the last decade, Legionnaires' disease has been reported throughout the world. Outbreaks have been linked to buildings with large or complex water systems that are improperly maintained. It is most often found in hot water tanks and heaters, large plumbing systems, faucets and showers, decorative fountains and cooling towers (air conditioning units).

The potable water systems in student housing, gymnasiums, stadiums, ice arenas, student recreation buildings, facilities buildings, research centers, ag research buildings, performing arts centers, dining halls and kitchens, aquatic centers, campus laundry, campus inns and hotels, fire houses, police stations, and other facilities are major sources of Legionella.



ASHRAE Standard 188-2015 Legionellosis: Risk Management for Building Water Systems

6.1.3 CONTROL LIMITS

Establish limits within which a chemical or physical parameter must be monitored and maintained.

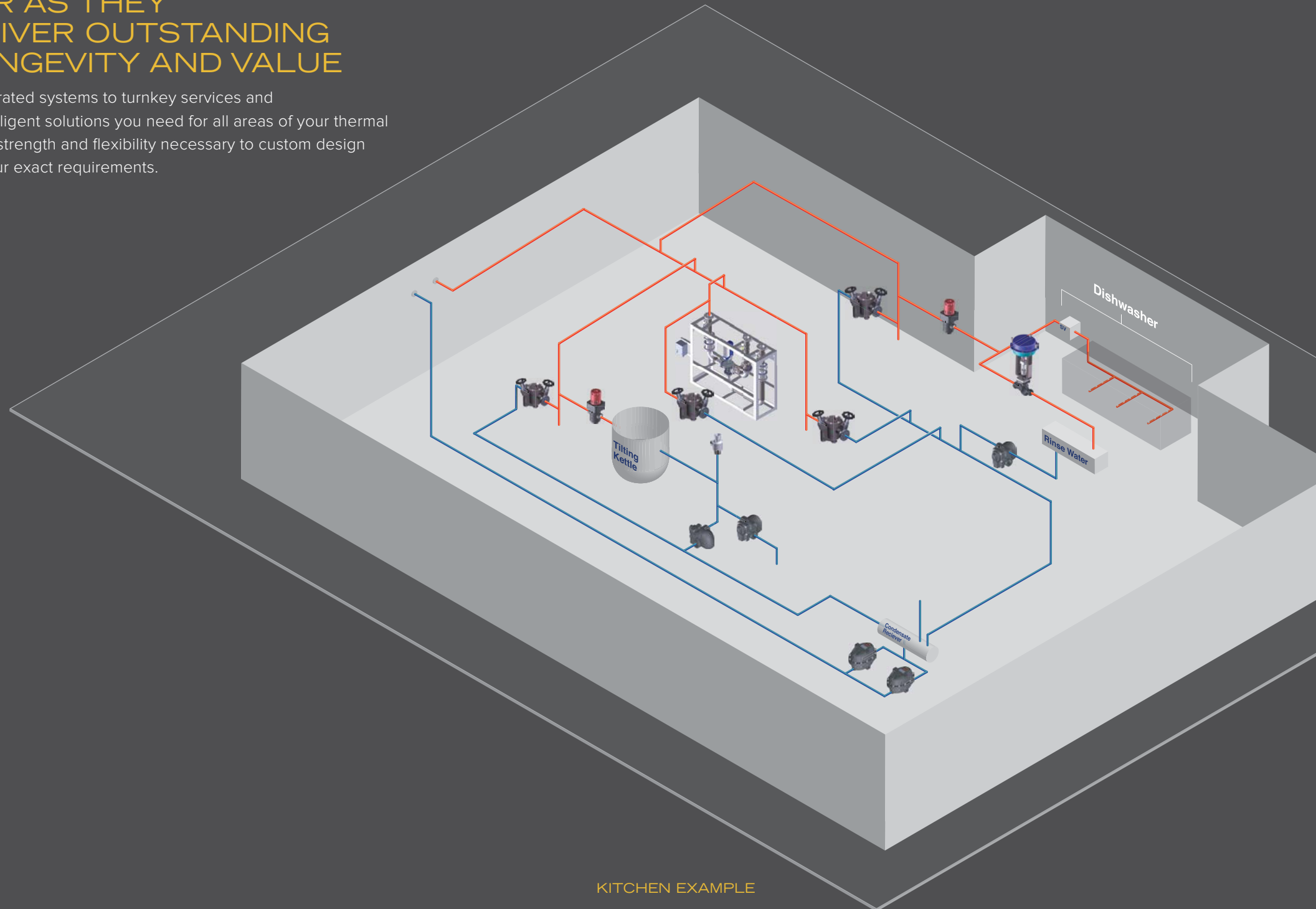
ASHRAE Standard 188-2015 Legionellosis: Risk Management for Building Water Systems

6.1.4 MONITORING

Establish a system for monitoring the parameters associated with the control limits established in 6.1.3.

ARMSTRONG PRODUCTS ARE DESIGNED TO WORK TOGETHER AS THEY CONSISTENTLY DELIVER OUTSTANDING PERFORMANCE, LONGEVITY AND VALUE

From cutting-edge equipment and fully integrated systems to turnkey services and implementation, Armstrong provides the intelligent solutions you need for all areas of your thermal utility. We have the extensive manufacturing strength and flexibility necessary to custom design and build long-lasting equipment to meet your exact requirements.



	AIR VENT / VACUUM BREAKER
	FLOAT AND THERMOSTATIC TRAP
	INVERTED BUCKET STEAM TRAP
	MIXING VALVE
	PRESSURE REGULATOR
	PUMPING TRAP
	TEMPERATURE CONTROL VALVE

KITCHEN EXAMPLE

BEST-IN-CLASS QUALITY

The unwavering reliability, safety and efficiency of Armstrong products is ensured by our stringent quality control and the rigorous support of our quality assurance and supply chain, as well as our manufacturing, engineering and maintenance teams. Our products are backed by Armstrong's distinctive technical support, and our digital monitoring technology enables us to perform real-time evaluations on many products.

CUTTING-EDGE SOLUTIONS YOU CAN COUNT ON FOR ACCURACY, 24 HOURS A DAY, WINTER OR SUMMER

Armstrong offers a complete array of state-of-the-art tools, technology and software for monitoring, metering, submetering, auditing and documentation, all designed to provide exceptional efficiency, accuracy and dependability in every application, throughout the year.

OUR INDUSTRY-LEADING SOLUTIONS FOR THE HIGHER EDUCATION INDUSTRY INCLUDE:

- | Wireless steam trap monitoring in real time
- | Advanced flow measurement technology for steam, water or gas
- | Smart steam and hot water system management software to help you comply with industry regulations, guidelines and standards of care



NO STRAIGHT RUN OF PIPE?

No problem for Armstrong's patented flow meter, VERIS Accelabar®.

OUR INDUSTRY-LEADING FLOW METERS DELIVER OUTSTANDING ACCURACY AND RELIABILITY FOR GAS, LIQUID OR STEAM

Armstrong offers a full line of differential pressure flow elements and vortex meters, including VERIS Accelabar®—our proprietary meter that doesn't require any straight pipe lengths for installation. Other flow measurement solutions include the Armstrong ASME Flow Nozzle and Armstrong Orifice Plate.

VERIS ACCELABAR®

VERIS Accelabar® delivers reliable accuracy in utility metering and submetering, season to season, all year long, for improved billing and budget allocation—without strict installation requirements. In a class of its own, this highly accurate flow measurement device has a patented no-straight-pipe installation requirement. VERIS Accelabar® provides exceptional versatility, with turndown capabilities over a large range of flow rates.



VERIS VERABAR®

VERIS Verabar® is the most accurate, reliable and advanced averaging pitot tube on the market today. It has a bullet shape and aerospace design principles that produce a stable flow signal with less propensity to clogging in the presence of dirt or debris.



ARMSTRONG VORTEX METER

Reliable, well-known vortex technology in a package that is easy to install and simple to operate. Armstrong inline and insertion vortex meters are capable of HART, Modbus, BacNet, or analog outputs with integral pressure and temperature compensation.



ONLY ARMSTRONG CONQUERS SEASONAL TURNDOWN WITH YEAR-ROUND ACCURACY, SO YOU CAN CHARGE BACK FOR ACTUAL STEAM USAGE

Armstrong's patented flow meter, VERIS Accelabar®, delivers reliable accuracy in utility metering and submetering, season to season, all year long—for improved billing and budget allocation, without strict installation requirements.

ARMSTRONG BRINGS YOU INNOVATIONS IN HOT WATER GENERATION, DIGITAL WATER TEMPERATURE CONTROL, AND SMART HOT WATER SYSTEM MONITORING AND DOCUMENTATION

Our hot water solutions are designed to reduce risks for the growth and spread of Legionella and other opportunistic pathogens in building water systems, while preventing injuries from scalding. We can help you meet ASHRAE and other industry standards with hardware to guide your compliance, and software that enables you to prove it through accurate monitoring and documentation. The Brain® and SAGE® are the first barriers to Legionella and essential to the prevention of Legionnaires' disease.

EMECH® DIGITAL WATER CONTROL VALVES

Emech® is engineered to ensure that your research facilities, campus pilot plants, and other non-domestic applications have access to a consistent supply of water at the precision temperatures they require. Emech® digital control valves deliver and maintain water at the desired temperature ($\pm 1^\circ\text{F}$, $\pm 0.5^\circ\text{C}$)—hot or chilled—immediately on demand. Compared to traditional systems, Emech® offers a superior performance for speed, precision and reduced mechanical wear.



THE BRAIN® DIGITAL RECIRCULATING VALVE (DRV)

As a stand-alone DRV or a pre-piped digital mixing center, The Brain® simplifies your hot water system to deliver unparalleled accuracy, stability and safety. Designed to improve the performance of hot water systems using all types of water heating technologies, The Brain® provides programmable temperature alerts and a platform to promote compliance with recommended Legionella guidelines.

PERFORMANCE

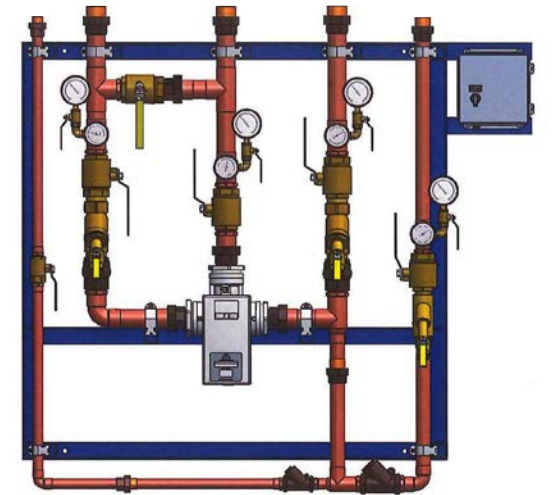
- | $\pm 2^\circ\text{F} / 1^\circ\text{C}$ control
- | $1^\circ\text{F} / 1^\circ\text{C}$ minimum system temperature loss

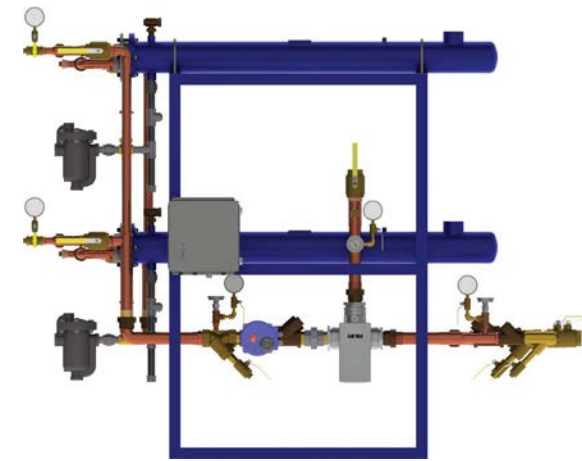
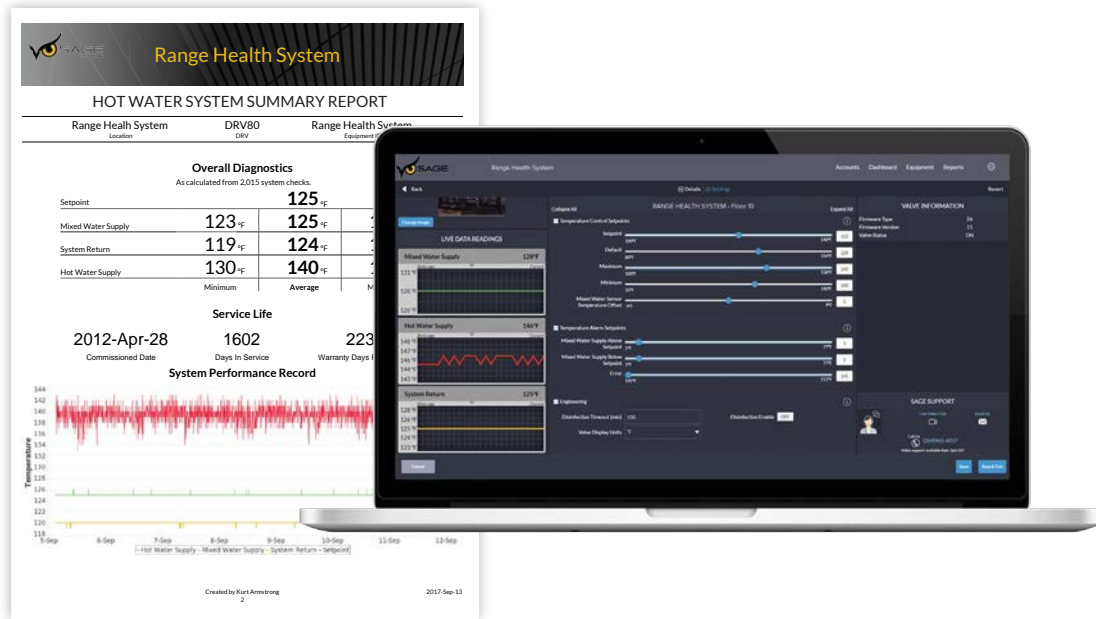
FEATURES

- | Component self-diagnostics
- | Programmable set point and alerts
- | Programmable thermal disinfection

SAFETY

- | Over temperature shutoff
- | Power failure shutoff
- | Emergency mode





DIGITAL-FLO® INSTANTANEOUS AND SEMI-INSTANTANEOUS WATER HEATERS

Armstrong’s industry-changing series of water heaters achieves a level of hot water system temperature control accuracy previously considered unattainable. All Digital-Flo® Water Heaters come SAGE®-enabled and feature our revolutionary digital water temperature control technology, The Brain®.

Digital-Flo® is available in Steam to Water, Steam to Water Vertical, and Boiler Water to Water solutions. Digital-Flo® boiler water semi-storage, steam PHE, boiler water PHE models available in Europe, the Middle East and Africa only.

SAGE® SMART HOT WATER SYSTEM MONITORING AND DOCUMENTATION

This fully integrated software tool brings you the next level in smart hot water system monitoring and reporting. SAGE® works seamlessly with all our real-time monitoring products, including The Brain®, as it analyzes data to track behavior and measure performance—ensuring a consistent supply of hot water at precision-controlled temperatures, as well as full compliance with ASHRAE, OSHA, VA and World Health Organization hot water system safety guidelines and requirements. By providing regular updates and real-time alerts, SAGE® keeps you informed, 24 hours a day. Armstrong’s digital hot water solutions are all available SAGE®-enabled.

SAGE® offers simple, effective monitoring, logging and remote alerting of key temperature control components of a hot water system safety risk management plan, for a modest monthly fee.

FEATURES

- | Dashboard monitoring in real time
- | Secure remote programming you control
- | Multi-location view of all properties, simultaneously or filtered
- | Temperature and system diagnostic alerts in real time
- | Digital documentation and recordkeeping, retain as needed

CONNECTIVITY

- | Integral Modbus RTU interface (The Brain®)
- | SAGE® building system interface module
- | Web-enabled
- | Modbus, BACnet™ and LonWorks

THE BRAIN® AND SAGE®

The Brain® and SAGE® are integral components of a hot water system operation protocol that complies with VA, ASHRAE, OSHA, World Health Organization and other hot water system safety guidelines and requirements that minimize risks for scalding, Legionella-related illness, and associated litigation. Regular updates and real-time alerts keep you fully informed, 24 hours a day. Armstrong’s digital hot water solutions are all available SAGE®-enabled.

DIGITAL-FLO® AND THE BRAIN®, WITH SAGE®

Combining our tankless hot water generation (Digital-Flo®) and our temperature control hardware (The Brain®) with our cloud-based, smart monitoring and documentation software tool (SAGE®) results in a complete, factory-integrated hot water system solution that can only be found only at Armstrong.

ARMSTRONG IS THE INDUSTRY LEADER IN SUSTAINABLE, PROACTIVE TRAP MANAGEMENT SERVICES

More than a century of in-depth knowledge and experience enables us to provide the most comprehensive, state-of-the-art products and services for steam and condensate system management available anywhere. Our hardworking products, proven programs, and groundbreaking technology are all engineered to deliver unparalleled efficiency, accuracy and reliability in every application.

OUR PROVEN STEAM TRAP MANAGEMENT PROGRAM

Armstrong uses a holistic approach that considers your entire system, as well as the unique requirements of your facilities and industry. Our specialists will work with you to implement a custom trap management program that's modeled after our empirical success with Notre Dame, WMU, U of M, MSU, and nearly 40 other universities and educational institutions.

EFFECTIVE STEAM TRAPPING

Armstrong steam traps are designed for energy efficiency, minimal steam loss, corrosion resistance, CO2 venting, operation against back pressure, freedom from dirt problems, and long, dependable service.

STEAM TRAPS FOR EVERY APPLICATION

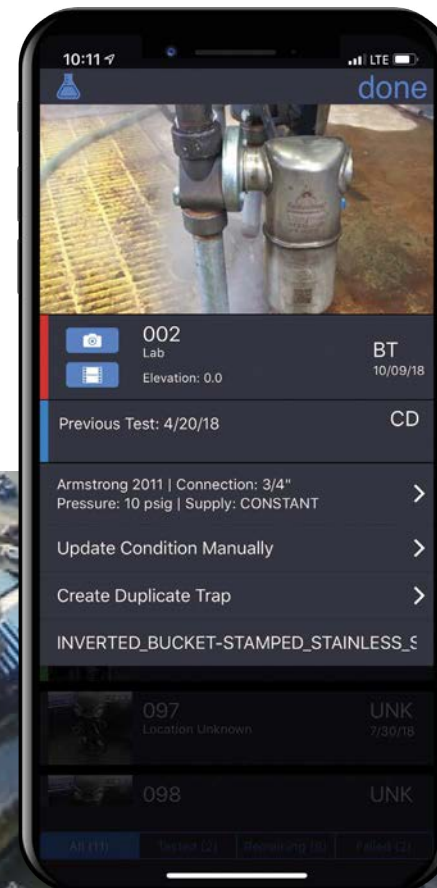
- | Bimetallic superheat steam traps
- | Clean steam thermostatic steam traps
- | Disc steam traps
- | Dual orifice steam traps
- | Float and thermostatic steam traps
- | Inverted bucket steam traps
- | Steam trap options and connectors
- | Thermostatic steam traps
- | Thermostatic wafer steam trap
- | Trap valve stations

SAGE® SMART UTILITY SYSTEM MANAGEMENT

SAGE® keeps you fully informed, 24 hours a day with regular updates, precise documentation, custom-filtered reports, and real-time alerts notifying you of any problems. This powerful software calculates steam loss data and reports it using Armstrong's proprietary, UNFCCC-approved, steam system efficiency methodology. SAGE® is engineered to be a fully integrated part of your steam system. It works seamlessly with our real-time monitoring products (SteamEye® and AIM®), ensuring that it always has access to the most current data.

SAGE® WORKS HARDER TO MAKE YOUR LIFE EASIER

- | Survey steam traps quickly and accurately with SAGE UMT™ and SAGE® Mobile
- | Customers own their own data
- | Available reports include defective traps and associated monetary and CO2 emissions loss
- | Maximize your equipment's reliability, efficiency and safety
- | Customizable user experience
- | Accessible on tablets, laptops and PCs
- | Real-time dashboard monitoring
- | Multi-location views



SAGE UMT™—WIRELESS, HANDHELD TRAP TESTER

Testing steam traps is as simple as pressing a button with Armstrong's SAGE UMT™. Our state-of-the-art, automated testing device eliminates human error and requires no technical knowledge, making it easy to survey your steam trap population quickly and accurately, on a regular basis.

Armstrong's SAGE UMT™ syncs wirelessly to the SAGE® Mobile app on your smartphone or tablet. SAGE® Mobile then delivers your steam trap information directly to SAGE® Smart Utility System Management platform, eliminating the need to manually enter survey information or decipher illegible field notes.

SAGE UMT™ GIVES YOU THE ADVANTAGE

- | Detects traps in good, cold and blow-through condition
- | Piezoelectric acoustic sensor, developed and tuned specifically for the unique conditions found in steam traps
- | Non-contact infrared temperature sensor
- | RFID technology significantly reduces the time required to locate and identify traps
- | SAGE UMT™ works seamlessly with SAGE® Mobile and SAGE® Smart Utility System Management platform
- | Data is uploaded to the cloud by SAGE® for secure storage and automated backups
- | Customers own their own data
- | Lifetime upgrades for SAGE UMT™ firmware at no charge



CONDENSATE MANAGEMENT

Armstrong offers a full range of condensate recovery and management products and solutions, including pumps. We can help you reduce costs for: fuel and energy, boiler water makeup and sewage treatment, and boiler water chemical treatment.

WIRELESS STEAM SYSTEM MONITORING

Our superior, groundbreaking solutions provide real-time monitoring of your critical steam trap population. You receive notifications of any problems instantly, so you can repair or replace failed traps before they create serious steam quality issues.

Both SteamEye® and AIM® can communicate with SAGE®, allowing the user to continuously monitor critical traps and survey the entire trap population, all in the same database.



AIM® (Armstrong Intelligent Monitoring)—AIM® is a wireless monitoring technology built on the WirelessHART and ISA-100 communications protocols, which continuously monitors and evaluates the operating condition of steam traps and other critical equipment in your system. AIM® provides instantaneous notification in the event of steam trap or critical equipment failure.

SteamEye®—SteamEye® uses a proprietary wireless transmitter mounted at the inlet of any type of steam trap to detect temperature and ultrasonic fluctuations in steam flow. In the event of steam trap failure, a signal is sent to a central receiver, alerting system operators that maintenance is required.

PRESSURE REDUCING VALVES (PRVS)

Armstrong can help you manage your steam, air and liquid systems safely and efficiently with pressure reducing valves (PRVs) and temperature regulators to maintain constant pressure or temperature for process control, for uninterrupted productivity. Armstrong offers several types of PRVs to match your requirements.

CONTROL VALVES

Armstrong offers control valves in a range of materials, sizes, and features to provide safe, reliable, accurate control for your application.

ON THE FOREFRONT OF TECHNOLOGY AND INNOVATION

Often the first to market, Armstrong holds more than 70 patents on exceptional products and software. Armstrong invented the Inverted Bucket Steam Trap. We introduced digital water temperature control to the world with The Brain®, then we made it smarter, easier and even more connected with The Brain® DRV25. We brought you SAGE®, the most advanced monitoring and documentation software available, and our proprietary efficiency methodology was the first to be approved for international trading of resultant carbon dioxide (CO2) under the Kyoto Protocol. These are just a few of the many state-of-the-art tools and solutions found only at Armstrong.

STATE-OF-THE-ART DESIGN, MANUFACTURING AND APPLICATION OF HUMIDIFICATION AND CONDITIONED STEAM EQUIPMENT FOR UNIVERSITIES OF ALL SIZES

The energy-efficient, cost-effective solutions we provide consistently deliver the clean, reliable, precisely controlled humidification necessary for reducing static discharge and achieving a pleasant, comfortable environment for students and staff.

HUMIDICLEAN™ HUMIDIFIERS

HumidiClean™ electric and gas-fired humidifiers feature replaceable, ionic bed inserts. This remarkable technology provides more efficient and safe operation, increased energy savings, and close to maximum output throughout their service life.



HUMIDIPACK® STEAM DISPERSION PANELS

This prefabricated steam humidifier system is ready for insertion in the duct. Armstrong HumidiPack® offers simplified installation, corrosion-resistant stainless steel, reduced heat gain to duct air, and compatibility with many steam sources. The HumidiPack® Family includes a variety of sizes and configurations to meet new installation or retrofit needs.



SERIES 1000 STAINLESS STEEL DIRECT STEAM HUMIDIFIERS

Armstrong offers Series 1000 steam-separator humidifiers for use in sensitive environments where pure demineralized, deionized or distilled water is used to generate clean steam. Wetted parts of the humidifier package are stainless steel, minimizing the carryover of impurities created by this highly corrosive water.



CUSTOM DESIGN AND MANUFACTURING OF EXTENDED HEAT TRANSFER (COILS) EQUIPMENT FOR AIR AND GAS TREATMENT

Armstrong's exceptional flexibility and expertise enables us to design and build heat transfer equipment for all forms of air and gas treatment, according to your exact needs. We manufacture unit heaters, door heaters, air cooled heat exchangers, tank heaters and more—in a wide variety of metals and alloys, including steel, stainless steel, copper and aluminum. Armstrong consistently maintains tight quality control measures, ensuring the long life of our dependable, hardworking products.

AIR COOLED HEAT EXCHANGERS (ACHE)

Armstrong offers customized air cooled heat exchangers (ACHE) to meet your unique requirements. Armstrong's ACHE can be fabricated with either heavy-duty industrial pressure parts (as used in the Series 6000) or with a light-duty core design (primarily used in institutional markets). Choose from direct drive or belt drive fans with fan diameters ranging from 10 inches to 48 inches (25cm to 122cm). Multiple direct drive fans are typically used at 870 or 1,150 RPM.

UNIT HEATERS

Built for long-lasting performance, corrosion resistance, and a trouble-free service life, Armstrong unit heaters deliver high efficiency and output, even in harsh operating environments.



THE BENEFITS ARE MEASURABLE.

Reliable, well-known vortex technology in a package that is easy to install and simple to operate. Armstrong inline and insertion vortex meters are capable of HART, Modbus, BacNet, or analog outputs with integral pressure and temperature compensation.

- | Heavy-duty enclosures
- | Corrosion-resistant heating cores are fabricated in a full range of materials; compatible with steam or liquid
- | Standard NEMA frame TEFC ball bearing motors; enclosed to lock out dirt
- | Thick fins and tubs, constructed of high-strength, corrosion-resistant materials
- | Cost-effective solutions, customized to your needs

LARGE SPACE HEATING

Armstrong's Rotabreath high-mounted, heavy-duty heaters are strong enough to effectively combat high ceilings and large doors that contribute to lack of heating.



FEATURES

- | Less piping, wiring and controls
- | Ideal in a low temp heat recovery loop (single point)
- | Ease of maintenance
- | Reduced installation/shutdown time
- | Simple installation, fewer units to install
- | One unit averages 300 feet diameter of coverage
- | Reduced temperature stratification

ARMSTRONG MAKES YOUR LIFE EASIER WITH SPECIALIZED SERVICES TO KEEP YOUR THERMAL UTILITIES RUNNING SMOOTHLY AND EFFICIENTLY, DAY AFTER DAY

As your thermal utility partner, Armstrong can handle it all. We offer everything from short-term supervision to ongoing, on-site management of your entire thermal utility system infrastructure. Armstrong will also provide training to help you manage your utility system yourself, more efficiently and safely.

WE HAVE MORE FLEXIBILITY TO CUSTOMIZE OUR SERVICES FOR YOUR NEEDS

Armstrong offers custom engineering, long-term or short-term solutions, and turnkey services. We can supply you with one operator tech as well as a complete operations and maintenance staff. Whether it's system design for new construction, or implementing complete system solutions at existing facilities worldwide, our experts can tailor our services to meet your unique objectives.

ASSESSMENTS

This is a preliminary system assessment, or walkthrough, of your facility that allows us to gather important information about your utility system's infrastructure. Once we have identified any immediate opportunities for improvements, such as reducing energy use or correcting safety issues, Armstrong's experts will offer initial recommendations.

AUDITS, STUDIES AND CONSULTING

We conduct a comprehensive, on-site evaluation of your utility system to reveal inefficiencies, identify opportunities for improvement, and uncover the cause of current or potential problems. After analyzing the results, our specialists determine the intelligent solutions that will be most effective in achieving your objectives. Your detailed report will include recommended Energy Conservation Measures (ECMs), schematics, drawings, estimated savings (thermal, water and financial), emissions reductions, and more.



OPERATIONS AND MAINTENANCE

Armstrong's complete range of O&M services can be customized for the distinctive needs of your institution. Our specialists will provide everything from short-term supervision to ongoing management of your entire thermal utility system infrastructure. We also offer expert training to help you manage it yourself, more efficiently and safely.

ENGINEERING SERVICES AND TURNKEY PROJECT SOLUTIONS

Armstrong's custom engineering and turnkey services are designed to address your institution's most difficult challenges. We offer site-specific solutions for every area of your utility system, including: steam generation, distribution and utilization; condensate return; flash steam and heat recovery; hot water generation, distribution, and temperature control; water utilization; water and wastewater treatment; electricity utilization; and more.

ON-SITE UTILITY SYSTEM AND ASSET MANAGEMENT, OPERATIONS AND MAINTENANCE

- | On-site leadership and/or management of daily O&M activities
- | Integrated on-site services for handling O&M function, which may include providing a complete staff or employment of current plant staff
- | Short-term O&M labor support
- | Audit and analysis of complete O&M function or specified areas
- | Development and implementation of site-specific, best practices and procedures
- | Safe, efficient utility system startups and/or shutdowns
- | Customized technical and safety training for all utility systems
- | Utilities oversight, engineering support, and ongoing expert support
- | Project financing and management
- | Asset ownership and financing

ARMSTRONG UNIVERSITY GIVES YOU EASY ACCESS TO MORE THAN A CENTURY OF IN-DEPTH KNOWLEDGE AND EXPERIENCE

We offer online courses, training, seminars, on-demand webinars, and educational packages that provide industry-specific content and learning opportunities to help you address tough, everyday issues.

Courses cover topics such as: increasing student safety and comfort, operating your thermal utility systems more efficiently, upholding your commitment to carbon neutrality, and learning how monitoring, metering/submetering and auditing your systems can save time, money and energy for your institution, and more.

INTRODUCTORY, INTERMEDIATE AND ADVANCED COURSES—AVAILABLE ON YOUR COMPUTER, TABLET OR SMARTPHONE

Armstrong University coursework was developed by energy and thermal utility system specialists and leading technical experts with over 2,000 years of collective, practical experience. Our extensive curriculum that spans multiple colleges of learning and more than 150 online courses of study in steam and condensate, humidification, hot water, Legionella prevention, water treatment, refrigeration, flow measurement, environmental health and safety, and more. Courses that qualify for Continuing Education Units (CEUs) are also available.

CUSTOMIZED ONLINE COURSES

Armstrong University can tailor an online curriculum for the needs of your organization—to be delivered at your site or one of our global learning centers, whichever is most convenient.

GLOBAL LEARNING CENTERS

Armstrong has Learning Centers in: Three Rivers, Michigan (USA); Liege, Belgium; Beijing, China; Nagoya, Japan; and soon in Guadalajara, Mexico. Many of Armstrong's representatives throughout the world operate their own learning centers. Armstrong locations in India, Korea and other parts of the world have portable demonstration capabilities that allow us to bring the seminar to you.

KNOWLEDGE NOT SHARED IS ENERGY WASTED®

One of Armstrong International's greatest strengths is our wealth of knowledge, experience and insight, derived from more than a century of providing thermal utility solutions for customers all over the world. As a true, sage brand and we're fully committed to sharing all that we've learned to help you make the smartest possible decisions for your institution.

RECOMMENDED COURSES FOR THE HIGHER EDUCATION INDUSTRY



Legionella—Learn how Legionella develops in hot water systems, the dangers of Legionella if left untreated and how it can be killed, and how to design a hot water system that discourages Legionella growth.

Higher Education Package—Included are 14 online courses to help you increase student safety and comfort, improve accuracy in metering and submetering, and uphold your commitment to carbon neutrality. Armstrong University Online offers a wide variety of courses designed to address issues faced by your industry each day.

Safety Training 101 Package—Includes 21 courses that address environmental health and safety issues to help you provide a safe working environment. Each course can typically be completed in 30 minutes or less.

CONTACT ARMSTRONG INTERNATIONAL

For case studies, additional information on product models, sizes and custom solutions, or to find an Armstrong representative near you, visit armstronginternational.com/higher-education.



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