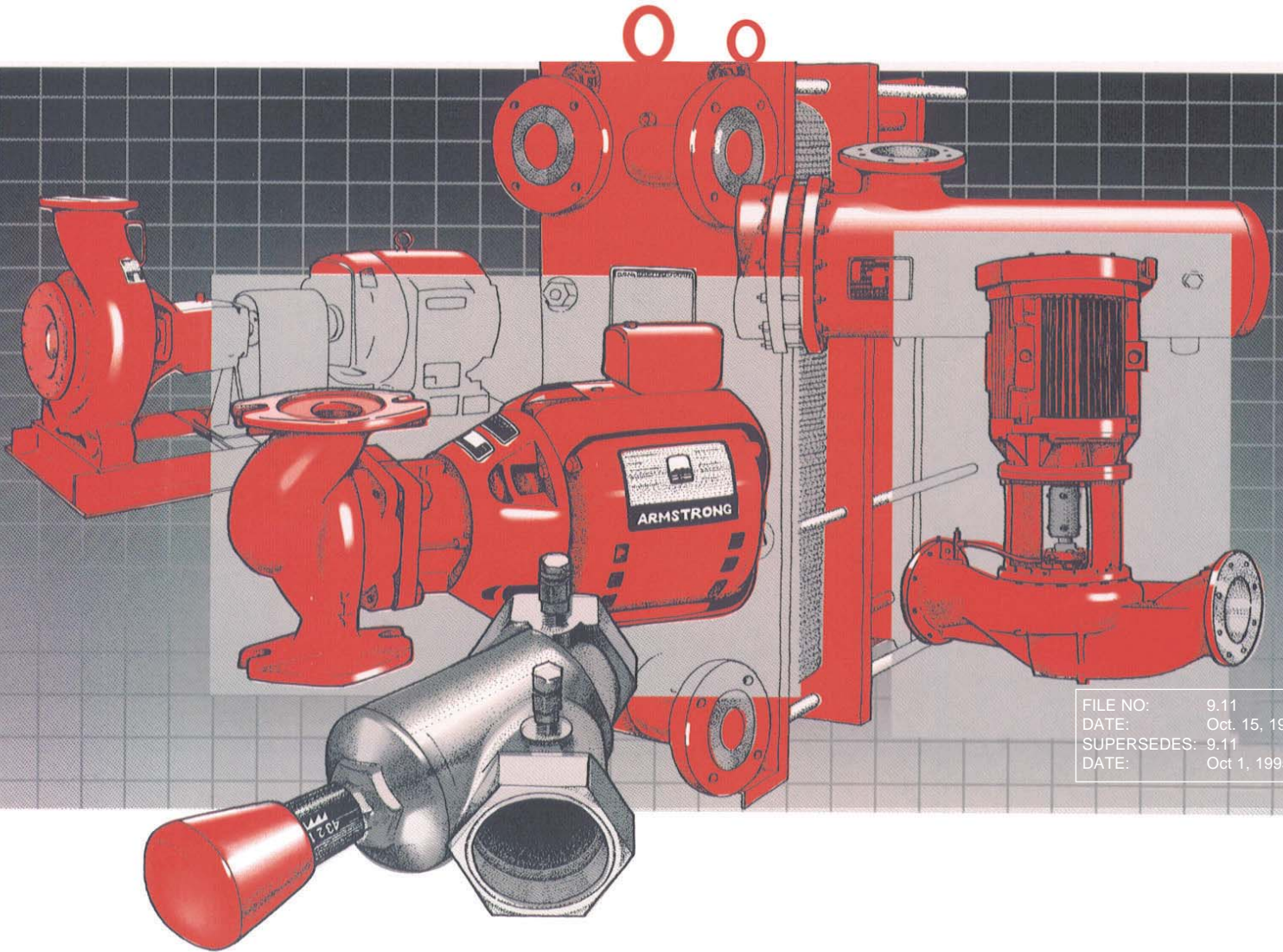


ARMSTRONG



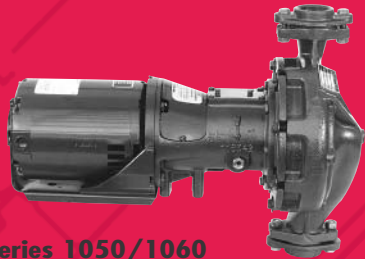
FILE NO:	9.11
DATE:	Oct. 15, 1998
SUPERSEDES:	9.11
DATE:	Oct 1, 1995

Fluid Dynamics

Circulators



S and H Series



Series 1050/1060



Astro Series

Circulators

Dependable Armstrong circulating pumps are engineered for dependability and serviceability. They feature a convenient radially split body that can be left in-line while servicing. Armstrong circulators are designed for efficient, trouble-free use in residential and commercial hot water heating recirculation systems, featuring quiet operating, vibration-free motors that meet NEMA specifications. All Armstrong circulators (except Astro series) feature ARMSEAL leak-proof construction.

'S' and 'H' SERIES

Both S and H Series circulators feature the unique Armstrong shaft and bearing module for ease of serviceability and maximum interchangeability. Oversized shafts of alloy steel machined to exact tolerances. Impellers are constructed from non-ferrous material and are designed for optimal water delivery. Available in bronze-fitted and all-bronze construction.

SERIES 1050/1060

These custom circulators feature the classic horizontal in-line design, engineered for durability and smooth operation. Designed for large flow applications. Impellers and motors are fine-tuned to meet the exact system requirements. Available in all-bronze and bronze-fitted construction.

ASTRO SERIES

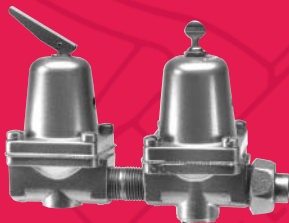
The ASTRO line of circulators offers breakthrough engineering in a compact, wet rotor circulator that features a replacement cartridge. Available with self-lubricated bearing, vent plug for initial

purging, and dynamically balanced stainless steel rotor assembly. These circulators eliminate the worry of mechanical seal or coupler alignment failure.

Hydronic



Flo-Control Valves



Combination Valves



Motorized Zone Valves

Specialties

Armstrong manufactures a comprehensive line of hydronic specialty products including Flo-Control valves, relief and reducing valves, tank fittings, air chargers and tank drainers, float type air vents, and air removal traps. They are specifically designed with maintenance and installation in mind, and constructed to provide years of service under the most demanding conditions.

FLO-CONTROL VALVES

Armstrong Flo-Control valves prevent gravity circulation in a hydronic system when the circulating pump is not running. When the pump starts, the Flo-Control valve opens automatically to permit circulation of water in the heating system. Available in 3/4" through 3" sizes.

COMBINATION VALVES

Armstrong's economical, C11 brass-construction relief and reducing valves feature built-in strainer and extra large diaphragm. Reducing valve is equipped with an anti-siphon check valve feature, and is easily adjusted to meet varying building heights. The special composition valve disc seats on brass ensuring quiet operation.

OTHER HYDRONIC SPECIALTY PRODUCTS

Armstrong's line of Hydronic Specialties include: Reducing Valves, Relief Valves, Motorized Zone Valves, TMA Tank Fittings,

TDV Air Charger & Tank Drainers, Float Type Air Vents, and Air Purgers.

Armstrong's Engineered Products offer savings in space and installation costs. Innovative design, combined with engineering knowledge, manufacturing excellence and full service capability, deliver an unbeatable range of products for the fluid flow marketplace.

CIRCUIT BALANCING VALVES

Armstrong's line of 1/2" to 12" CBV's feature multi-turn adjustment for detailed control, hidden memory to set balance point, and soft seats for positive shutoff. Our compact Mini Sweat CBV-MS is available in 1/2" and 3/4" sizes with solder type connections. All Armstrong CBV models feature precision flow measurement, pump throttling, and temperature measurement capabilities.

SUCTION GUIDES

Armstrong's Model SG suction guides are designed for direct mounting to the suction side of horizontal or vertical pumps. Space savings are achieved through elimination of long radius elbow, suction entrance pipe, and conventional 'Y' strainer. Available in sizes 2" to 17" and supplied with fine mesh brass start up strainer and permanent strainer. Cast iron body and cover.

FLO-TREX VALVES

Model FTV Flo-Trex combination valves combines the features of a check valve, throttling valve, and a shut-off valve, and are designed for installation on the discharge side of centrifugal pumps. The convertible body design permits the valve to be changed on site from the straight to the angle configuration. Available in 2 1/2" to 12" sizes. Ductile iron valve body with standard grooved end connections, or cast iron body with hard flanged connections.

VORTEX AIR SEPARATORS

Vortex air separators eliminate entrained air from heating and cooling systems, improving heat transfer efficiency. Armstrong's Models VA/VAS in cast iron are available in 2", 2 1/2" and 3" sizes, and fabricated steel in 4" to 24" sizes. Sizes larger than 24" are also available.

Series AX, AX-V, L EXPANSION TANKS

Armstrong's precharged diaphragm and bladder-type tanks separate air and water for space savings and improved system operation. Available in vertical and horizontal types, with sizes up to 80% smaller than conventional tanks. Both residential and ASME code vessels are offered.

COMPUFLO METERS

Armstrong's computerized CompuFlo Meter offers the ability to measure a wide range of differential and gauge pressures with precision. This multi-function instrument measures high and low range water flow/pressure, air flow/velocity/pressure, temperature and leak rate. Comes complete with high-temperature hoses, P.M.P. adapters, insertion-type thermocouple probe, and battery charger.

ARMEX

As a solution to storage of high-volume expansion, Armstrong offers the Armex expansion system for sealed heating and chilled water circuits. The Armex is now available in size up to 1,400 US gallons – equivalent in acceptance to 4 – 5,000 US gallons of bladder tank volume. The Armex transfer/control package has been streamlined and is provided with many more options – including microprocessor control – suitable for a much wider range of temperatures, pressures, transfer volumes and international variations in codes, regulations and installation practices.



Circuit Balancing Valves CBV-MS, CBV-10", CBV-1"T



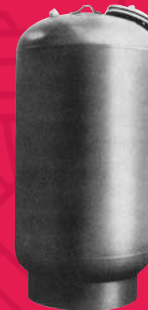
Suction Guides



Flo-Trex Valves



Vortex Air Separators



Series AX, AX-V, L Expansion Tanks



Armex



CompuFlo Meters



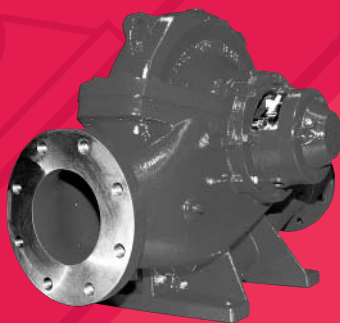
Series 4030



Series 4270



Series 4280



Series 4600

Armstrong's horizontal pumps are designed for dependable, continuous service in a wide range of heavy duty industrial and commercial applications including: HVAC, machinery cooling and product transfer, pollution control systems, and powerhouse auxiliary services.

BASE MOUNTED SERIES 4030

A comprehensive range of single stage, end suction, radially-split centrifugal pumps designed for a wide variety of applications. Features self-venting casing to prevent air binding, heavy duty bearings that are sealed and lubricated for life, back pull-out bearing frame for easy removal, and self-lubricating mechanical seal to prevent liquid seepage. Available in bronze fitted, all bronze and all iron construction.

MOTOR MOUNTED SERIES 4270

Close coupled, motor mounted pump is available in bronze-fitted and all-bronze construction. All models provide tapped openings for venting, draining, and gauge connections. Featuring heavy duty, permanently lubricated motor bearings, Viton seals as standard, non-ferrous engineered resin impeller, stainless steel faceplate and single spring inside mechanical seal.

MOTOR MOUNTED SERIES 4280

Motor mounted version of the horizontal end suction pump, with flanged connections. Radially-split volute with center-line discharge. Motor features heavy duty, grease-lubricated ball bearings. Supplied with self-lubricating mechanical seal and bronze balanced cast impeller designed for smooth performance and long life. Available in bronze fitted, all bronze and all iron construction.

HORIZONTAL SPLIT CASE SERIES 4600

The Series 4600 is the state of the art Horizontal Split Case pump – based on the “Tilted Parting” concept to minimize turbulence at the eye of the impeller by its straight laminar approach, thus maximizing efficiency. This also results in the lowest profile and minimum floor space of any HSC pump, lowering installation costs. Cartridge seals and bearing removal nuts ensure ease of maintenance.

Offering one of the most complete ranges of vertical in-lines available, Armstrong pumps serve a wide variety of applications including HVAC systems, automotive, transportation, municipal, glass and plastic, as well as general industrial and power plant. In addition to reduced maintenance and servicing costs, the design allows considerable savings in plant layout and installation.

VERTICAL IN-LINE SERIES 4360

Armstrong's economical, lower-range vertical in-line pump for HVAC, domestic water systems, and industrial applications requiring a compact pump. Positive sealing assured by proven inside-type mechanical seal. Radially split volute permits removal of the motor and pump rotating assembly without removing the pump volute from the line. Fewer maintenance and servicing problems due to bearing-free pump design. Available in bronze fitted, all bronze, or all iron construction, in a range of sizes.

VERTICAL IN-LINE SERIES 4300

Realizes 60% savings in space compared to base mounted pumps. Split-coupled design allows mechanical seal replacement without costly removal of the motor or pump from the piping. High-performance outside-type mechanical seal combines advantages of multiple-spring balanced seal with premium quality, while the inside-type mechanical seal provides an economical alternative. Double suction design available in sizes 12" and larger. Bronze fitted, all bronze, all iron, and ductile iron construction.

VERTICAL MULTISTAGE SERIES 4700

Series 4700, designed for temperatures ranging from 5° F to 250° F. (-15° C to 120° C), are well suited for boiler feed applications, condensate recovery and air conditioning systems. Easy to incorporate into industrial environmental engineering equipment, our stainless steel Vertical MultiStage pumps combine the advantages of compact design, quiet operation and ease of maintenance.

VERTICAL IN-LINE SERIES 4380

Armstrong's close-coupled vertical in-line pump features economical inside-type, single-spring mechanical seal, serviced by removing the rotating assembly while the pump casing remains in the line. Dynamically balanced impeller assures smooth, vibration-free operation. Radially split volute with equal suction and discharge flange sizes. Separate tapped openings for gauge, flush and drain connections. Available in bronze fitted, all bronze, all iron, and ductile iron construction.

VERTICAL IN-LINE SERIES 4302 and 4382

Armstrong's new *dualArm* vertical in-line pumps incorporate two Series 4300 or 4380 pumps in a single casing. Series 4302 is designed with split spacer type couplings, so that the mechanical seals may be serviced without disturbing the pump or motor connections, and is available with outside balanced or inside seals. Series 4382 is the economical close coupled design. Each type is supplied with a swing discharge port to hydraulically separate the casings to prevent recirculation when only one pump operates. Isolation valves enable one pump to be isolated for service or removal with the second pump still operating.



Vertical In-Line Series 4300



Vertical In-Line Series 4380



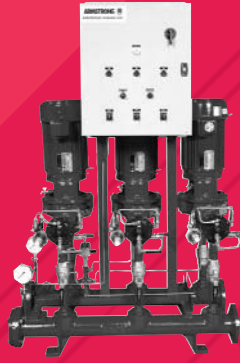
Vertical In-Line Series 4360



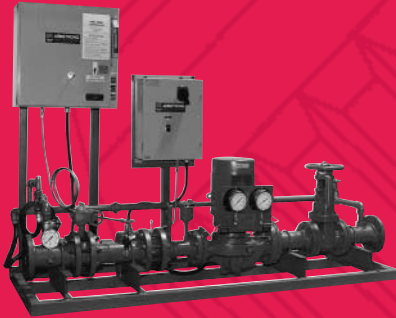
Vertical MultiStage Series 4700



Dualarm Series 4302 and 4382



**Pressure Booster Systems
Series 6000**



**Fire Pump
Packaged Systems**



**Vertical Turbine
Series 5100**



**Submersibles,
Series 5300**



**Sump & Sewage System
Series 5000**

Armstrong's expertise in total engineering brings unique benefits to everyone concerned with water pressure. Our engineered systems provide uniform water supply, reduce costs, and lower floor space requirements. The systems include sump and sewage, pressure booster, fire pump, heat transfer, and condensate. Many of our systems are available in standard and custom package configurations, with horizontal and vertical pump options.

PRESSURE BOOSTER SYSTEMS, SERIES 6000

Armstrong is one of the world's leading manufacturers of packaged pressure booster systems. Decades of experience in the design of custom packages ensure uniform water supply, reduce costs and floor space requirements. Systems are available in simplex, duplex and triplex, vertical and horizontal configurations, for continuous or intermittent operation. Also available, Armstrong DualPaks and QuickPaks.

FIRE PUMP PACKAGED SYSTEMS

Armstrong fire pump systems are constructed in accordance with the requirements of Underwriters Laboratories Inc. (UL), Underwriters Laboratories of Canada (ULC), and Factory Mutual Research Corporation (FM). Our products comply with recommendations of the National Fire Production Association (NFPA) Pamphlet 20, testimony to the high quality of 100 years design and manufacturing experience. System configurations available with either horizontal end suction, horizontal split case or vertical pumps, and electric or diesel drives.

VERTICAL TURBINE SERIES 5100

The versatile 5100 Series is easily serviced and covers a wide operating range. They are ideally suited to meet the requirements of commercial, municipal, and industrial markets. Vertical Turbine pumps are offered in product lubricated, and oil lubricated configurations, and are powered by either electric motors or diesel engines.

SUMP & SEWAGE SYSTEMS, SERIES 5000

Series 5200 and 5240 sump and 5400 sewage are available in simplex and duplex column-type arrangements. They are designed to meet a wide range of medium and heavy duty industrial and commercial applications such as: waste water removal, unscreened sewage, condensate transfer, bilge water, and drainage runoff. Cast iron volutes, iron or bronze impellers, steel and stainless steel shafts provide reliable and efficient operation. A variety of accessories and options are available.

CONDENSATE RETURN SYSTEMS

UNICON simplex and duplex systems offer improved designs. Our rugged vertical pump design does not utilize a mechanical shaft seal and eliminate the need for pump isolation valves. Available with all electrical controls and receivers.

SUBMERSIBLES, SERIES 5300

Armstrong electrical submersible pumps are built entirely in cast iron, and are reliable and highly efficient. This wide range which includes drainage models as well as those with Vortex type impellers, offers solutions in order to prevent any risk of clogging. Armstrong Series 5300 product line has been designed for the pumping of sewage water and other liquids, of civil and industrial origin.

Armstrong's line of shell and tube heat exchangers provide dependable, efficient performance for a broad range of commercial and light industrial applications where water and liquid must be quickly heated or cooled. Our products offer industry-wide compatibility and are available in several materials and working pressures to suit most requirements. The standard Armstrong design meets or exceeds Section VIII Division 1 of the ASME code.

TYPE W, WS, WR, U-TUBE

Economical, U-tube design heat exchanger of durable construction with removable bundle. Recommended where a low cost removable bundle design is needed for clean tube side fluids. The U-bend design provides a long service life for the exchanger by eliminating the effects of thermal expansion and contraction. Features carbon steel construction with 3/4" copper tubes and rugged cast iron head. Optional materials available.

TYPE WX, WSX, WRX DOUBLE WALL, U-TUBE

A double tube wall (tube-in-tube design) heat exchanger, designed for applications where it is critical that the shell and tube side fluids do not mix, i.e.: potable water heaters, etc. These units, in the event of a leak, allow the liquid to drain to atmosphere. The bundle from a WX heat exchanger will fit the shell of an existing W heat exchanger.

TYPE ABX, BRAZED PLATED HEAT EXCHANGERS

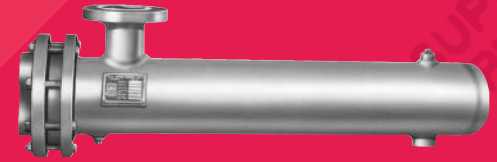
A compact Brazed Plate Heat Exchanger, the Model ABX is highly effective for heat recovery applications. It is designed for pressures up to 435 psi and temperatures up to 435° F. It is ASME Code designed, and is available from stock.

TANK HEATERS, U-TUBE

For immersion heating of water in storage tanks, these units feature 3/4" copper tubing, brass tube supports, carbon steel tubesheet and tank collar. Tubing is available in single or double wall copper and cupro-nickel. Tubesheets are also available in brass or stainless steel.

Type PFX, Plate Heat Exchangers

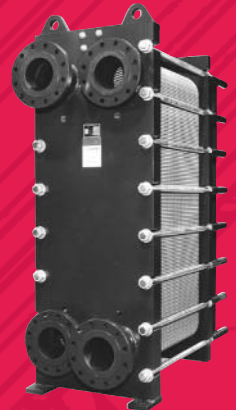
The Armstrong plate and frame heat exchanger consists of a number of specially corrugated stainless steel plates assembled in a frame and bolted between two pressure plates, one of which is fixed and the other adjustable. High turbulence is created in the liquid flow channels, giving very high heat transfer coefficients and resulting in a compact heat exchanger. Titanium plates are also available



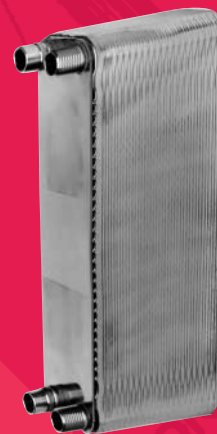
Type W, WS, WR U-Tube



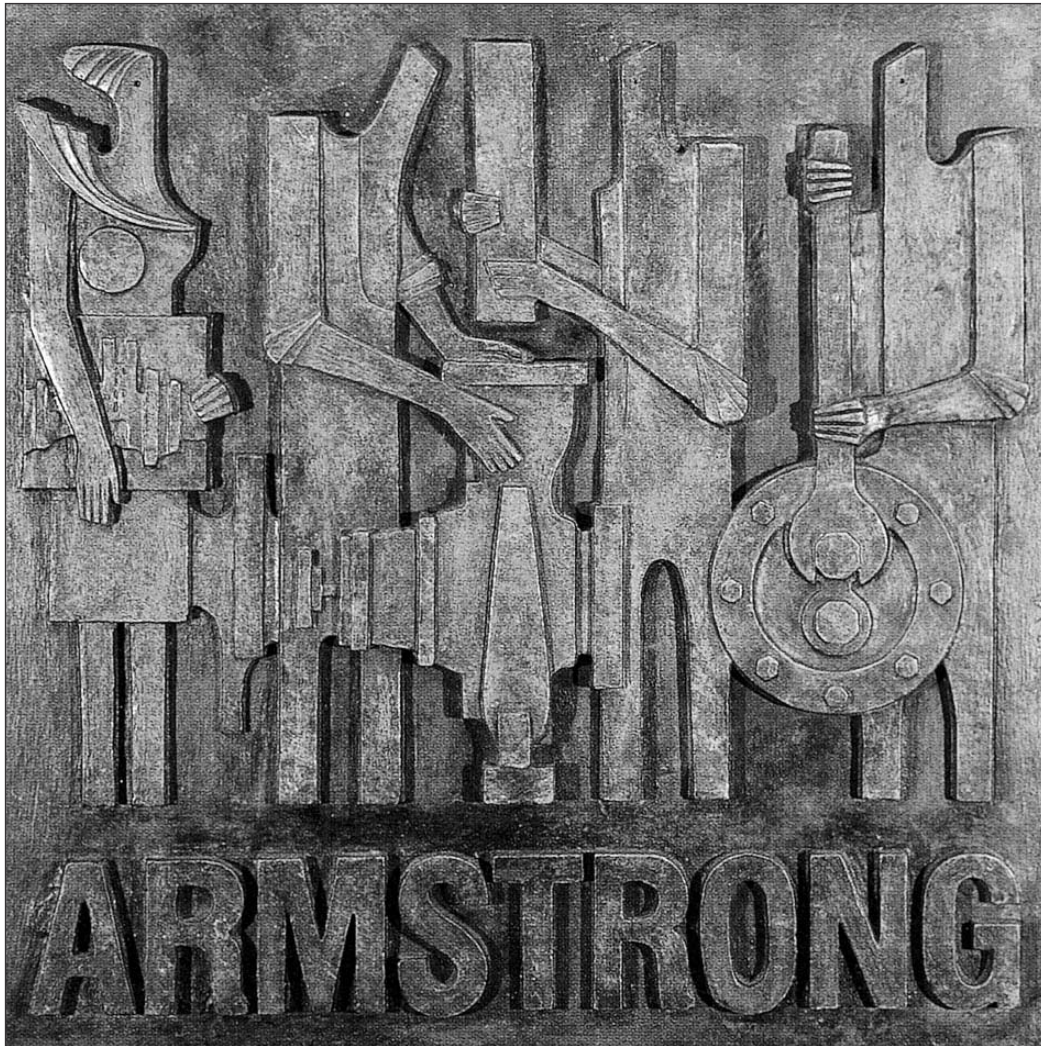
Tank Heaters U-Tube



Type PFX, Plate Heat Exchangers



Type ABX, Brazed Plate Heat Exchangers



Since our founding in 1934, our company has pioneered an uncompromising range of products for residential, commercial and industrial markets. From the very beginning, the Armstrong name has been a benchmark for quality in design, engineering, and manufacturing.

Today, as we market our products throughout the world, our original commitment to production of the highest quality is unchanged. We will not compromise this expectation of us, and we will never allow an inferior product to carry the Armstrong name. For us, identifying market needs, offering superior technology, and keeping our customers satisfied, are all part of the Armstrong family tradition.

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