

ARMSTRONG



dualARM Vertical In-Line Pumps

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Smart pumps for the commercial HVAC market.

- ▶ Armstrong Vertical In-Line pump, the best design for HVAC systems, introduced in 1969.
- ▶ Armstrong **dualARM** Vertical In-Line pump, introduced in 1994.
- ▶ **dualARM** Series 4302 & 4382 contain all the features and advantages of two Armstrong time proven Vertical In-Line pumps, in one casing.



Series 4302, shown with one guard removed to reveal outside balanced seal, and a cutaway to show the isolation valve.

▶ Adding Value to Hydronic Systems

▶ Floor Space Value:

In a typical system, for example 1000 USgpm flow at 50 ft head (63.1 L/s at 15.2 m), the **dualARM** needs only one quarter of the space required for two end suction base mounted pumps and one eighth the space required for two split case horizontal pumps.

▶ Installation Value:

Vertical In-Line pumps become an integral component of the piping system. This configuration eliminates the need for flexible connectors, inertia bases, grouting and field alignment.

▶ Maintenance Value:

Mechanical seals require the greatest amount of maintenance in any pump. Service is performed on any Vertical In-Line pump without removing the casing from the piping. The Series 4302 split-spacer coupling design allows the mechanical seals to be serviced without disturbing the pump or motor connections.

▶ System Value:

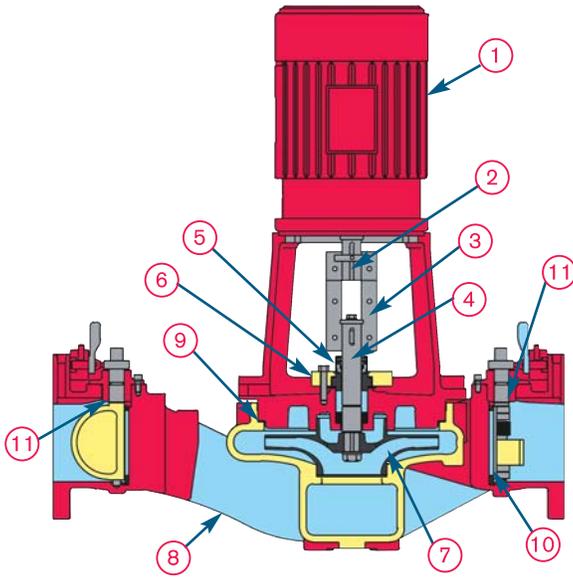
Standby and parallel pump systems may now be designed using only one pump piping set. Two pumps in a single large port casing allow both pumps to operate simultaneously, in true parallel fashion, with no loss in single pump efficiency.

▶ Design Value:

dualARM Vertical In-Line pumps, designed with a swing split-flapper valve in the discharge port, prevent liquid recirculating when only one pump is operating. Unique Armstrong isolation valves allow one pump to be isolated and removed for service while the second pump remains in operation.

► Series 4302

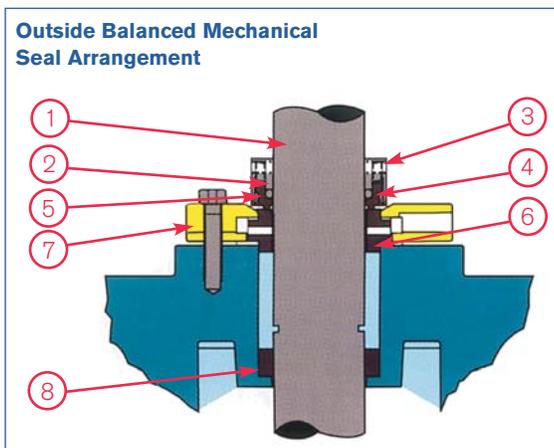
Designed to incorporate two Armstrong standard Series 4300 split coupled Vertical In-Line pumps in a single casing. All existing 4300 series catalogue information and performance curves may be used, or doubled in the case of parallel operation, for the Series 4302 Vertical In-Line pump.



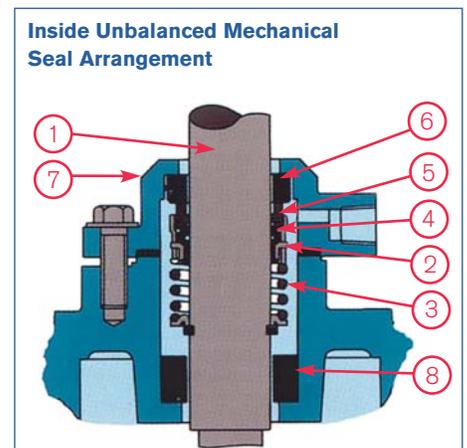
- ① **Motor** - Industry standard, designed for in-line service.
- ② **Motor shaft** - Run-out limited to 0.001" (0.03 mm) TIR (Total Indicated Reading).
- ③ **Coupling** - Axially split type spacer permits removal of seal without disturbing pump or motor.
- ④ **Shaft** - Stainless Steel with deflection at mechanical seal limited to 0.002" (0.05 mm) TIR.
- ⑤ **Mechanical seal** - Outside balanced or inside type, accessible and easily replaced.
- ⑥ **Seal plate** - Flush connection ensures lubrication at the seal faces and positive venting of seal chamber.
- ⑦ **Impeller** - Dynamically balanced to ensure smooth vibration-free operation.
- ⑧ **Volute** - Radially split, with equal suction and discharge flange sizes. Separate tapped openings for gauge, flush and drain connections.
- ⑨ **Gasket** - Confined casing gasket to meet stringent industrial temperature and pressure applications.
- ⑩ **Flapper valve** - Hydraulically isolates casings preventing recirculation when only one pump operates.
- ⑪ **Isolation valves** - Allow one unit to be isolated and removed for service with the second unit still operating.
- ⑫ **Coupling guards** - Fully enclose all access openings. (Not shown.)

► Sealing Arrangements

Armstrong Series 4302 split coupled Vertical In-Line pump is available with two normal mechanical seal arrangements. Each arrangement may be removed quickly and easily for servicing, without costly removal of the motor or rotating assembly from the pump casing. The high performance outside seal combines the advantages of a balanced seal with premium quality. The internal mechanical seal provides an economical alternative.



- ① Pump Shaft
- ② Rotating Hardware
- ③ Spring(s)
- ④ Secondary Seal
- ⑤ Rotating Face
- ⑥ Stationary Seat
- ⑦ Gland Plate
- ⑧ Throttle Bushing

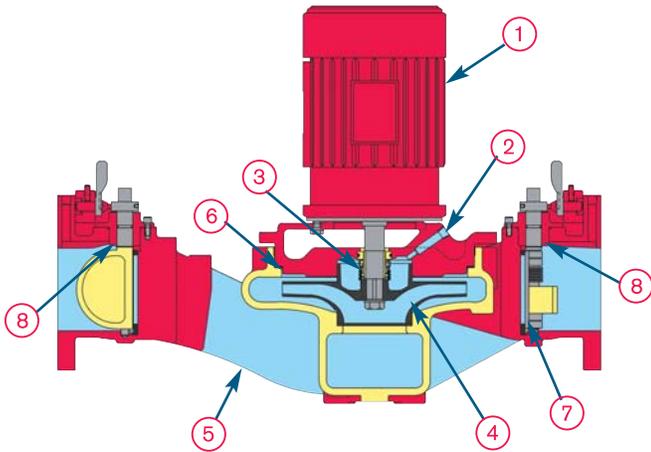


Inside Unbalanced Mechanical Seal Arrangement

dualARM Vertical In-Line Pumps

► Series 4382

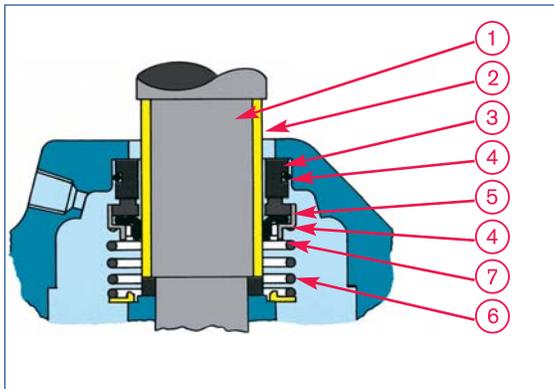
Designed to incorporate two Armstrong standard Series 4380 close coupled Vertical In-Line pumps in a single casing. All existing 4380 series catalogue information and performance curves may be used, or doubled in the case of parallel operation, for the Series 4382 Vertical In-Line pump.



- ① **Motor** - Industry standard, designed for in-line service.
- ② **Flush and vent connection** - Removes entrained air ensuring lubricating liquid is at the seal faces at all times. Piped to pump suction.
- ③ **Mechanical seal** - Inside type with Silicon Carbide seat, serviceable without disturbing the pipe connections.
- ④ **Impeller** - Dynamically balanced to ensure smooth vibration-free operation.
- ⑤ **Volute** - Radially split, with equal suction and discharge flange sizes. Separate tapped openings for gauge, flush and drain connections.
- ⑥ **Gasket** - Confined casing gasket to meet stringent industrial temperature and pressure applications.
- ⑦ **Flapper valve** - Hydraulically isolates casings preventing recirculation when only one pump operates.
- ⑧ **Isolation valves** - Allow one unit to be isolated and removed for service while the second unit remains in operation.

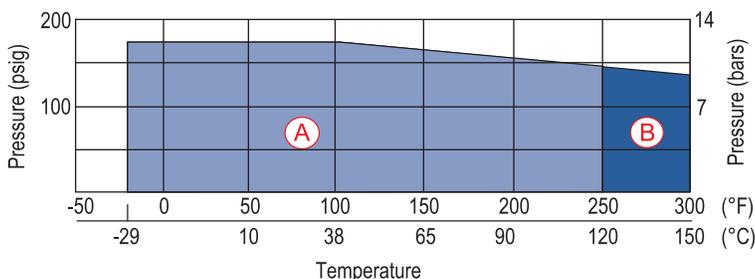
► Sealing Arrangements

Armstrong Series 4382 close coupled Vertical In-Line pump is supplied with an economical internal single spring unbalanced mechanical seal. The seal is serviced by removing the rotating element from the casing. The pump casing typically remains in the piping.



- ① Motor Shaft
- ② Shaft Sleeve
- ③ Stationary Seat
- ④ Secondary Seal
- ⑤ Rotating Face
- ⑦ Spring
- ⑥ Rotating Hardware

► dualARM Pressure/Temperature Parameters



Legend

- Ⓐ 4302 BF & DBF
4382 BF & DBF
- Ⓑ 4302 BF & DBF

All seals supplied with Silicon Carbide seats.

NOTES: For clean untreated water. For pumping temperatures above 200°F, longer mechanical seal life can be achieved on Series 4302 if flushing liquid is cooled by an external heat exchanger to maintain seal flush water below 200°F.

► Armstrongest System Value

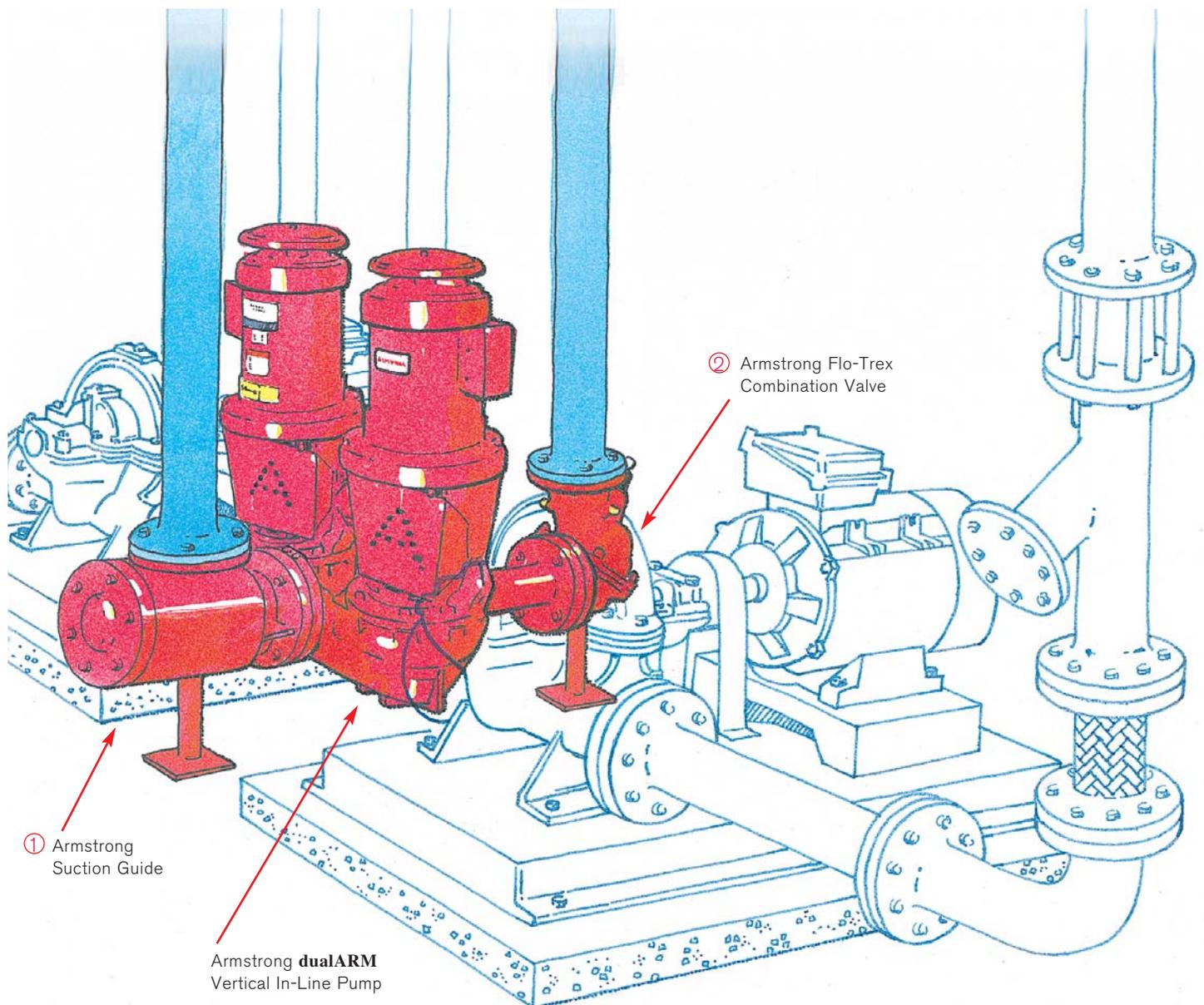
Armstrong **dualARM** Vertical In-Line pumps, when installed with Armstrong Suction Guides ① and Armstrong Flo-Trex combination valves, ② result in the greatest added value and lowest life cycle cost of any equipment that can be designed into today's commercial, industrial, HVAC and packaged systems.

- ① The Armstrong Suction Guide, designed with flow stabilizing plates in the outlet port, allows the guide to be bolted directly onto the pump suction flange, enabling the vertical piping to turn 90° into the pump. A disposable fine mesh start-up strainer and permanent perforated stainless steel strainer complete this valuable fitting.

The Suction Guide eliminates the need for a separate suction strainer, long radius elbow and minimum straight pipe run to the pump suction.

- ② The Armstrong Flo-Trex triple function combination valve is designed to operate equally as a non-slam check valve, drip tight isolation valve and properly designed throttling valve. The throttling feature enables a system head increase to operate the pump at design conditions. The Armstrong uniquely designed valve is field convertible from 90° angle type to 180° straight type.

The Flo-Trex combination valve eliminates the need for a discharge elbow, a separate check valve and a throttling type isolation valve.



► Typical Specifications

Series 4302 Split Coupled Vertical In-Line Pump

Supply and install as shown on the plans and specifications, Armstrong Series 4302 **dualARM** split coupled Vertical In-Line centrifugal pumping unit. The cast casing with equal size suction and discharge flanges, having separate tapped flush line and pressure gauge connections, shall incorporate two radially split, single stage centrifugal pumps. Each pump shall have a cast bronze dynamically balanced impeller, stainless steel shaft, lower seal flush throttle bushing, outside balanced mechanical seal with stainless steel parts, Viton secondary seal, carbon vs silicone carbide faces and stainless steel gland plate and hardware. Each pump shall be fitted with a factory furnished flush line to the mechanical seal. The flush line is to be fitted with a manual air vent.

Each driving motor shall be an industry standard vertical solid shaft, squirrel cage induction type, built to NEMA standards (motor efficiency levels may be specified). The motor shall have _____ enclosure and be suitable for a _____ Hz, _____ Phase, _____ Volt power supply and shall be connected to the pump by means of a rigid split type spacer coupling that permits removal of the mechanical seal without disturbing the pump or motor connections. The inlet and outlet ports on the casing shall be at least one size larger than the single pump size, so that both units may operate in parallel with no loss of single pump efficiency. Each port shall be fitted with an isolation valve that allows the units to operate in parallel or standby. It may also be used to isolate one pumping unit for servicing or removal, while the other pump remains operating.

Flush line option:

Supply in the flush line to the mechanical seal a 50 micron cartridge type filter (if the differential pressure exceeds 30 psig [2 bars], a Cyclone separator may be specified) and a sight flow indicator. The mechanical contractor shall change the filter cartridge after the system has been flushed and on a regular basis thereafter, until the building is turned over to the owner.

Series 4382 Close Coupled Vertical In-Line Pump

Supply and install as shown on the plans and specifications, Armstrong Series 4382 **dualARM** close coupled type Vertical In-Line centrifugal pumping unit. The cast casing with equal size suction and discharge flanges, having separate tapped flush line and pressure gauge connections, shall incorporate two radially split, single stage centrifugal pumps. Each pump shall have a cast bronze dynamically balanced impeller, bronze shaft sleeve and inside type single spring mechanical seal with carbon vs silicone carbide faces. Each pump shall be complete with a factory furnished flush and vent line.

Each driving motor shall be an industry standard vertical solid shaft, squirrel cage induction type, built to NEMA standards (motor efficiency levels may be specified). The motor shall have _____ enclosure and be suitable for a _____ Hz, _____ Phase, _____ Volt power supply. The inlet and outlet ports on the casing shall be at least one size larger than the single pump size, so that both units may operate in parallel with no loss of single pump efficiency. Each port shall be fitted with an isolation valve that allows the units to operate in parallel or standby. It may also be used to isolate one pumping unit for servicing or removal, while the other pump remains operating.

EXPERIENCE BUILDING...

S. A. Armstrong Limited
23 Bertrand Avenue
Toronto, Ontario
Canada, M1L 2P3
T: (416) 755-2291
F (Main): (416) 759-9101

Armstrong Pumps Inc.
93 East Avenue
North Tonawanda, New York
U.S.A., 14120-6594
T: (716) 693-8813
F: (716) 693-8970

Armstrong Holden Brooke Pullen
Wenlock Way
Manchester
United Kingdom, M12 5JL
T: +44 (0) 161 223 2223
F: +44 (0) 161 220 9660



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