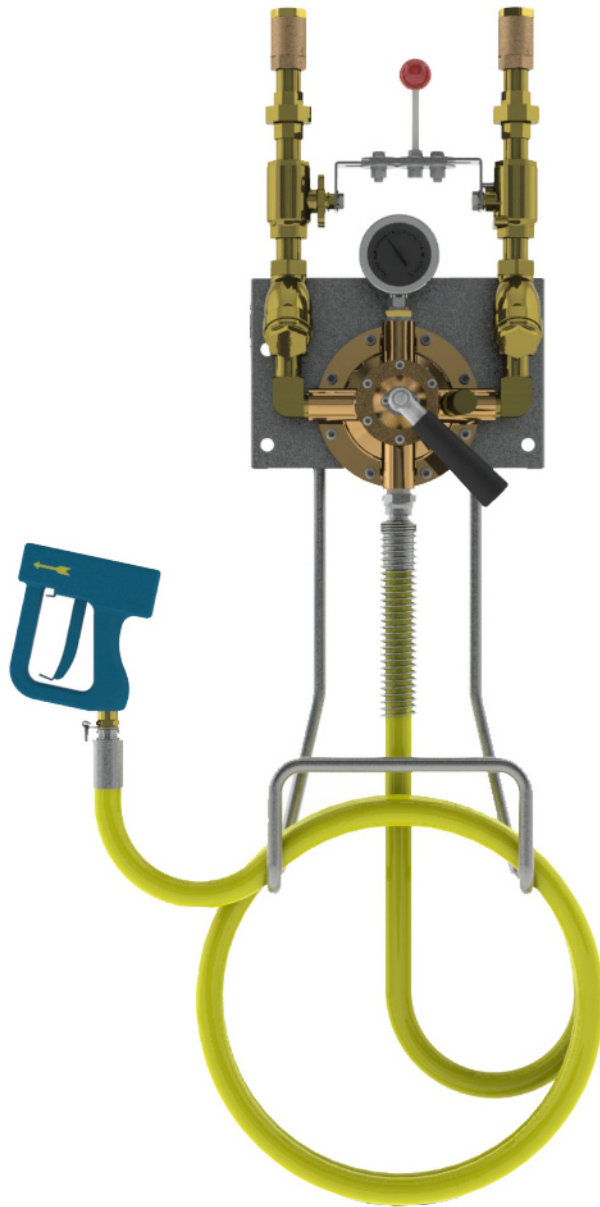




Armstrong®

STEAMIX™ Steam & Water Hose Station and Mixing Valve

Installation, Operation, and Maintenance Manual



Armstrong International
is ISO 9000 Certified



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**Retain this manual for
future reference.**

Armstrong

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Safety

Icon Legend

If instructions are not followed:



— injury or death and property damage are **imminent**



— injury or death and property damage are **possible**



— potential property damage, expensive repairs, and/or voiding the warranty may result



Failure to comply with safety warnings may result in serious injury, including severe burns from scalding water and flash steam.



Do not use this mixing valve with superheated steam.



Burn hazard:

- Avoid touching steam inlet and valve body.
- Avoid exposure to spray.



The STEAMIX Hose Station and Mixing Unit is not designed for and should never be used to deliver:

- Hot water for human showering, bathing, or hand washing
- Water at any temperature to emergency fixtures of any kind



Wear protective gloves, garments, and safety glasses when using this unit.



Never point nozzle at yourself or anyone else.



Do not use if damaged or not properly functioning.

General Description

STEAMIX units are designed to supply hot water in only industrial applications, such as vessel filling and hose down, by mixing steam and water at a single use point.

The mixing valve is a diaphragm-actuated, direct-steam-injection valve, typically installed on a hose rack, and equipped with isolation valves, a length of hose, and a nozzle.

STEAMIX mixes steam with cold water to produce water with a variable output temperature adjusted using the temperature control handle. (The temperature range varies from cold to boiling depending on the inlet pressures available.) A locked, pre-set temperature is possible by removing the control handle and installing an optional locking set.

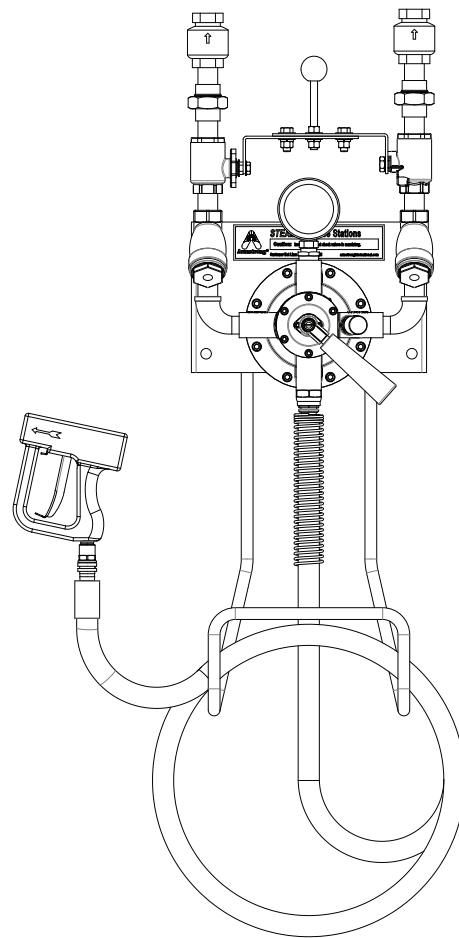
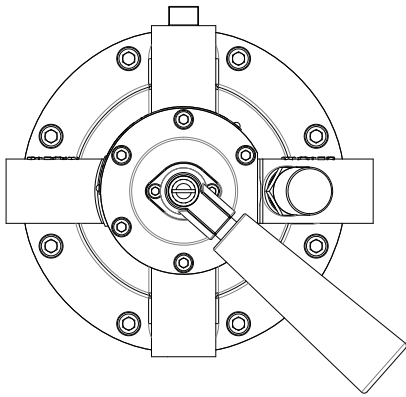


Note: STEAMIX's efficient use of steam makes it possible to deliver boiling water that may flash to steam upon reaching the atmosphere. This condition does not indicate valve failure or passage of live steam. Armstrong recommends installing optional locking set to avoid use of boiling water.

Among engineered safety features:

- Water pressure below 20 psi will not actuate poppet valve to allow steam entry.
- Diaphragm damage or failure will prohibit opening poppet valve and steam entry.

Models are available from a basic mixing valve only (shown below) to a complete hose station (shown at right).



Multiple options exist for materials of specific components, as well as hoses and nozzles shown on following page.

Consult Armstrong for advice regarding your specific application.

Armstrong reserves the right to make design or specification changes without notification.



Hose Options

Note: All hoses meet operating conditions. Color is based on preference or company-specific safety indication requirements.

Color	Pressure Rating psi (bar)	Temperature Rating °F (°C)
Safety yellow (standard)	400 (27.6)	212 (100)
Boston black	225 (15.5)	180 (82.2)
Boston red	225 (15.5)	180 (82.2)
White creamery	150 (10.3)	180 (82.2)
Generic white	Varies (consult Armstrong)	Varies (consult Armstrong)

Nozzle Options

Model*	Flow Rate gpm (L/min) @ 100 psi (bar)
D21115 (038-10) [standard]	10 (37.9)
D33767(038-16)	16 (60.6)
D33768 (038-22)	22 (83.3)
D11285 (TG) [premium]	6.5 (24.6)

* Old part number shown in parentheses.



Specifications

Parameter	psi(g)	Bar
Minimum inlet pressure (steam & water)	20	1.4
Maximum static pressure (steam & water)	150	10
Optimal pressure (steam & water)	50–75	3.5–5
Maximum pressure loss across mixing valve	60	4
Minimum pressure loss across mixing valve	7	0.4

Maximum pressure loss ratio in favor of either supply: 10:1

Typical flow rates at various temperatures and pressures shown below. Temperature categories indicate approximately:

- User safe temperature (ca. 120 °F/48 °C)
- Hot hose-down temperature (ca. 150–160 °F/65–71 °C)
- Common bacteria kill temperature (ca. 180 °F/82 °C; does not imply sterilization capability)

Steam and water pressures shown as psi (bar).

Flow rate shown as gal/min (L/min).

55 °F (31 °C) Temperature Rise				
Steam	20 (1.4)	45 (3)	75 (5)	100 (7)
Water				
22 (1.5)	9.6 (26.1)	10.2 (38.6)	10.2 (38.6)	10.2 (38.6)
45 (3)	9.6 (26.1)	13.2 (49.9)	13.2 (49.9)	13.2 (49.9)
60 (4)	9.6 (26.1)	13.8 (52.2)	15.7 (59.4)	15.7 (59.4)
100 °F (56 °C) Temperature Rise				
Steam	20 (1.4)	45 (3)	75 (5)	100 (7)
Water				
22 (1.5)	3.6 (13.6)	6.9 (26.1)	8.3 (31.4)	8.5 (32.1)
45 (3)	3.6 (13.6)	6.9 (26.1)	9.4 (35.5)	9.9 (37.4)
60 (4)	3.6 (13.6)	6.9 (26.1)	9.4 (35.5)	10.5 (39.7)
135 °F (73 °C) Temperature Rise				
Steam	20 (1.4)	45 (3)	75 (5)	100 (7)
Water				
22 (1.5)	2.5 (9.4)	5.0 (18.9)	6.6 (24.9)	7.2 (27.2)
45 (3)	2.5 (9.4)	5.0 (18.9)	7.2 (27.2)	8.0 (30.2)
60 (4)	2.5 (9.4)	5.0 (18.9)	7.2 (27.2)	8.0 (30.2)

Note: Low inlet pressures will significantly reduce outlet flow.




Installation

General

Note: STEAMIX units come pre-assembled—using anaerobic thread sealant—and pressure tested.

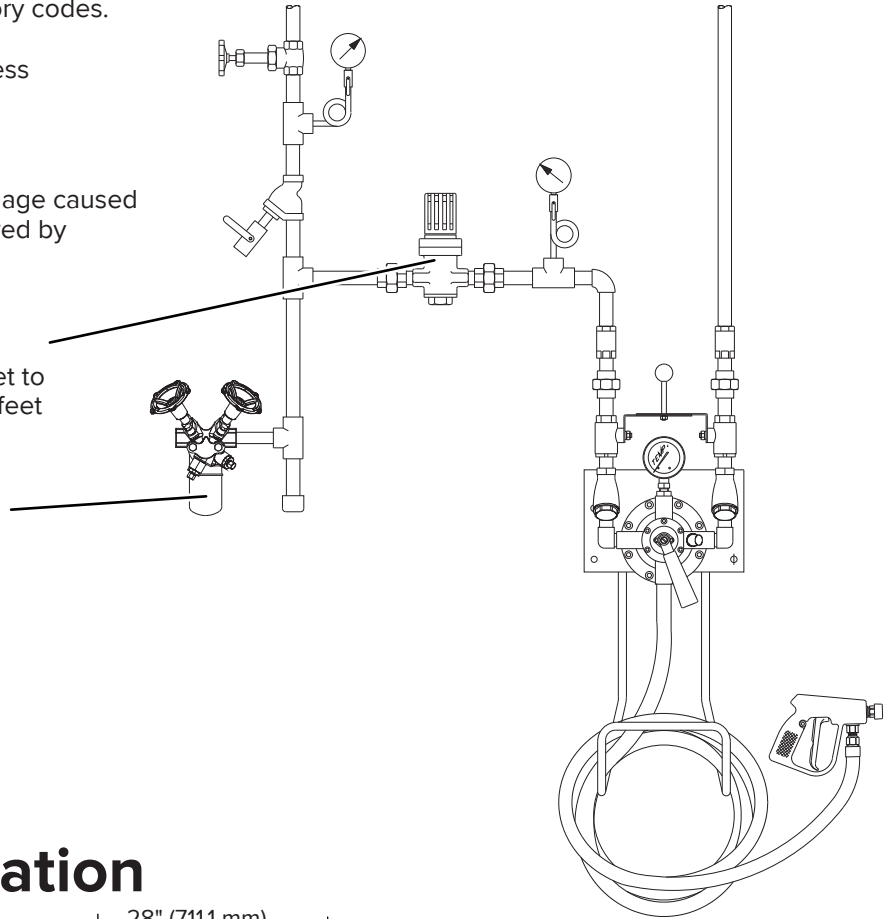
Note: Installation must comply with all applicable federal, state, and local sanitary, construction, plumbing and regulatory codes.

Install in a location that permits access for adjustment and servicing.

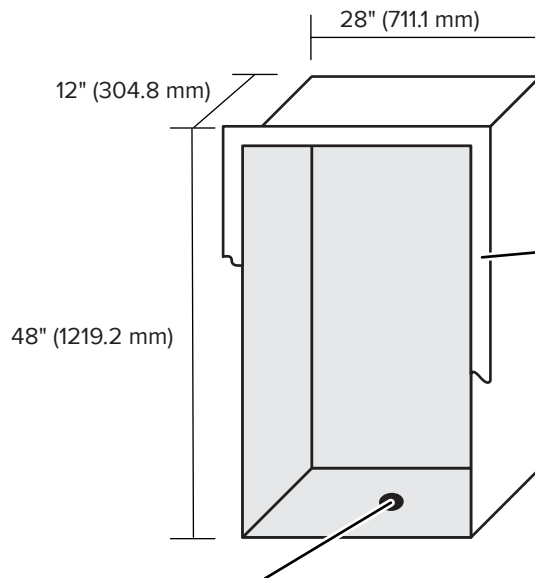
 Eliminate water hammer. Damage caused by water hammer is not covered by warranty.

Note:

- In systems with widely fluctuating steam pressure install regulator set to lowest known pressure at least 6 feet upstream from valve.
- Steam trap between 6 and 15 feet upstream of valve is recommended.



Cabinet Installation



On flush mount cabinets mounting flange typically extends 2" (50.8 mm) beyond cabinet wall.

Plumb drain out bottom of cabinet.

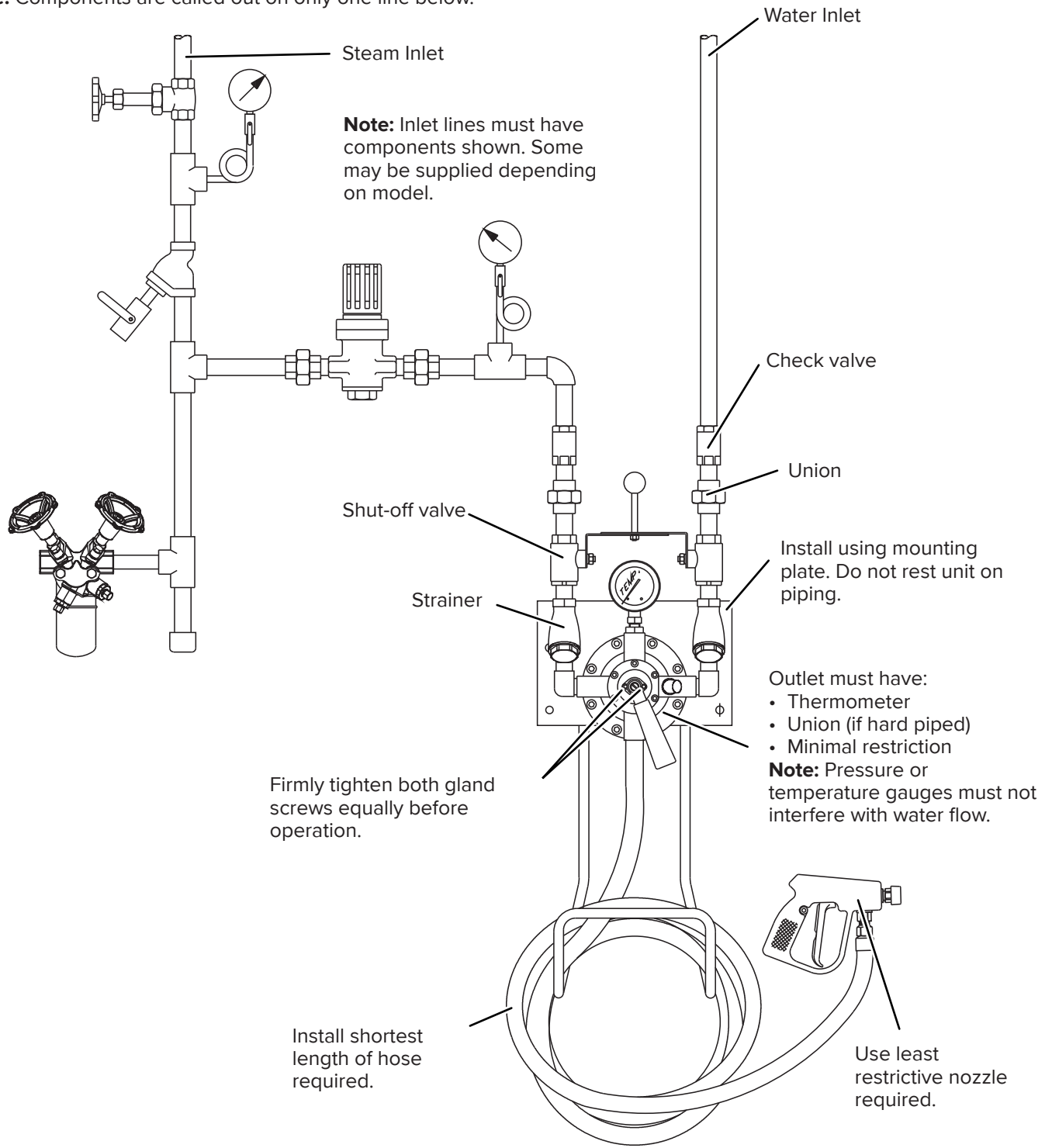


Typical Installation



Caution: Do not apply excessive torque on supplied fittings. Use two wrenches when assembling.

Note: Components are called out on only one line below.



Note: Inlet lines must have components shown. Some may be supplied depending on model.

Install using mounting plate. Do not rest unit on piping.

- Outlet must have:
- Thermometer
 - Union (if hard piped)
 - Minimal restriction

Note: Pressure or temperature gauges must not interfere with water flow.

Firmly tighten both gland screws equally before operation.

Install shortest length of hose required.

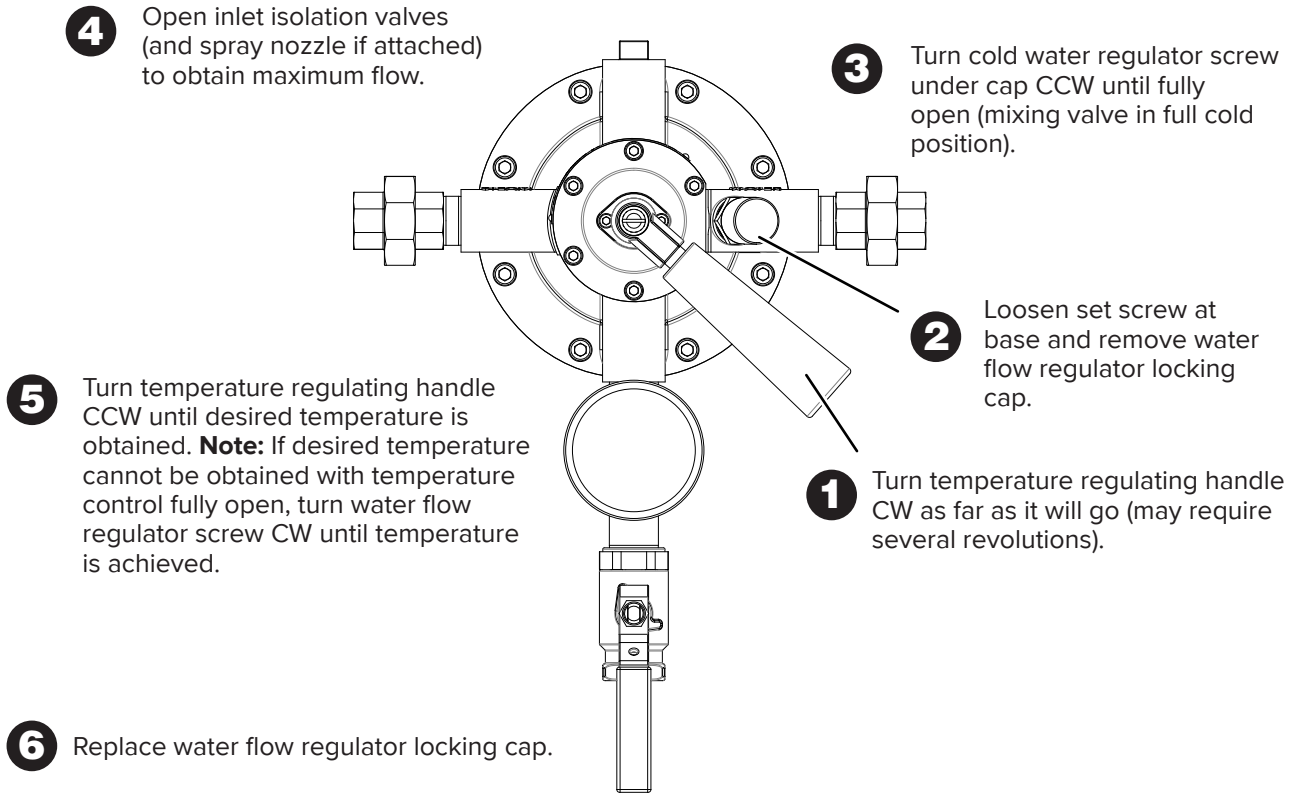
Use least restrictive nozzle required.


Note: Code or regulatory requirements may include back-flow preventers (single or double action) or vacuum breakers, which are not listed above.



Temperature Adjustment

Note: This adjustment is required only if output temperature is too low at maximum valve setting.



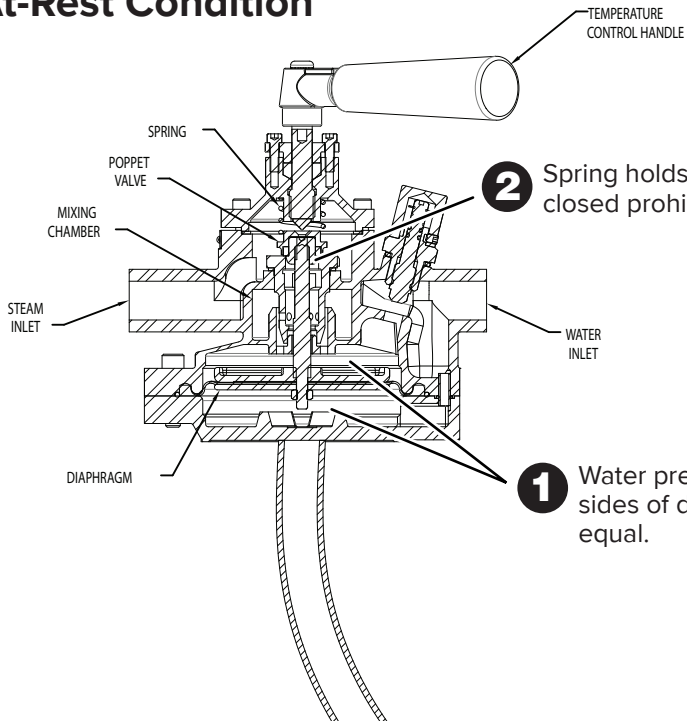
 **Caution:** Once temperature is set, operators should not attempt to adjust water flow restrictor.

Note: To lock temperature and prevent adjustment, remove temperature regulating handle and install tamper resistant locking set (P/N D14924).

Operation

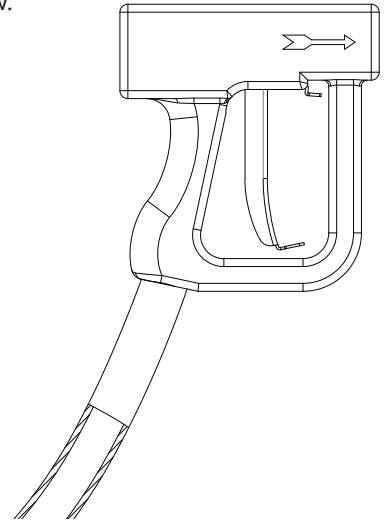
Description

At-Rest Condition

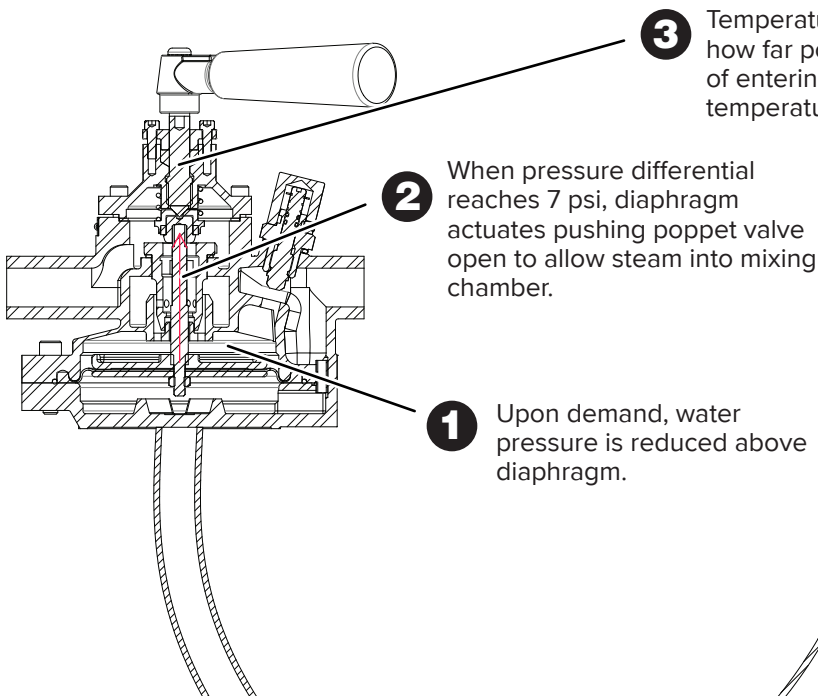


2 Spring holds poppet valve closed prohibiting steam flow.

1 Water pressure on both sides of diaphragm is equal.



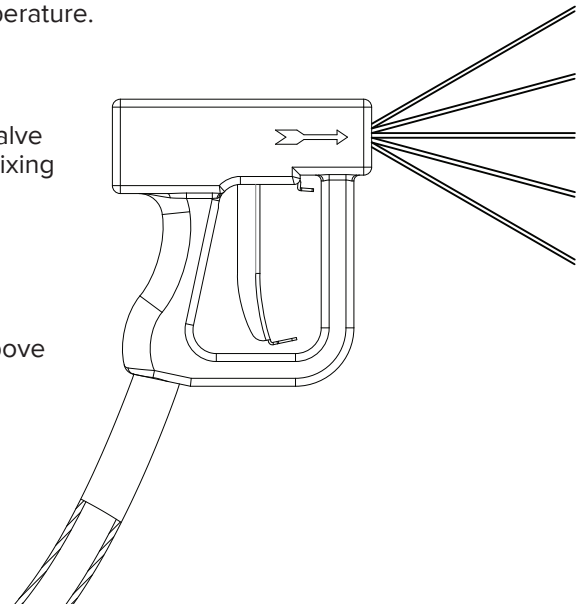
Operating Condition



3 Temperature control handle controls how far poppet valve opens. Volume of entering steam controls output temperature.

2 When pressure differential reaches 7 psi, diaphragm actuates pushing poppet valve open to allow steam into mixing chamber.

1 Upon demand, water pressure is reduced above diaphragm.



When demand ceases, equalizing water pressure reseats diaphragm in base of valve and spring closes poppet valve stopping steam flow.

Operator Instructions



Caution: Always check and be aware of last position of temperature control handle. Mixing valve will automatically rise to previous temperature setting. Armstrong recommends turning temperature control handle to low temp setting (fully CW) after each use.

- Use minimally required temperature for activity. Keep steam pressure at or below 100 psi. (Although units are rated for 150 psi, pressures above 100 psi have negligible effect.)

- Avoid kinks in hose.




Do not use valve if hose is ripped or damaged in any way.

- Close upstream steam and water valves after use. Do not use nozzle as long-term flow-control device.
- Bleed pressure from hose after closing valves. **Caution:** Leaving hose under pressure may lead to premature degradation or rupture.
- Return hose to holder after use.

Periodic Maintenance

Maintenance recommendations are based on typical usage. Frequency may need to be adjusted for your actual usage. The information below is intended only for Maintenance personnel or others with necessary expertise.

Interval	Task
Shift or Daily (frequent testing will not degrade unit)	Safety Check 1. Set mixing valve for normal operation. 2. Start outlet water flowing. 3. Shut off a remote water supply valve. 4. Confirm that outlet flow stops immediately and no live steam is passed from mixing valve.  If live steam is passed, do not use hose station!
As necessary	Evenly tighten both gland plate screws to prevent leakage through seal.
As necessary (based on water quality)	Disassemble mixing valve and clean internal parts with good quality, commercial, inhibited de-scaler.
6 months	Inspect all valve seats for wear.
	Inspect seals and gaskets for nicks and tears.
	Inspect diaphragm.
	Lubricate all moving parts. Use high quality silicone lubricant only. Do not use petroleum-based lubricants.
	Check supply shut-off valves.



Repair Procedures

Mixing Valve

Note: Always replace O-rings and gaskets. Use applicable parts kit.

1 Shut off steam and water supply lines.

2 Open outlet shut-off valve and spray nozzle, if equipped.

3 Remove retaining screw and washers from temperature regulating handle and remove handle.

6 Remove bonnet and spindle assembly.

9 Carefully remove spring and poppet valve from body.

10 Remove diffuser and gasket. De-scale diffuser using commercial, inhibited de-scalent.

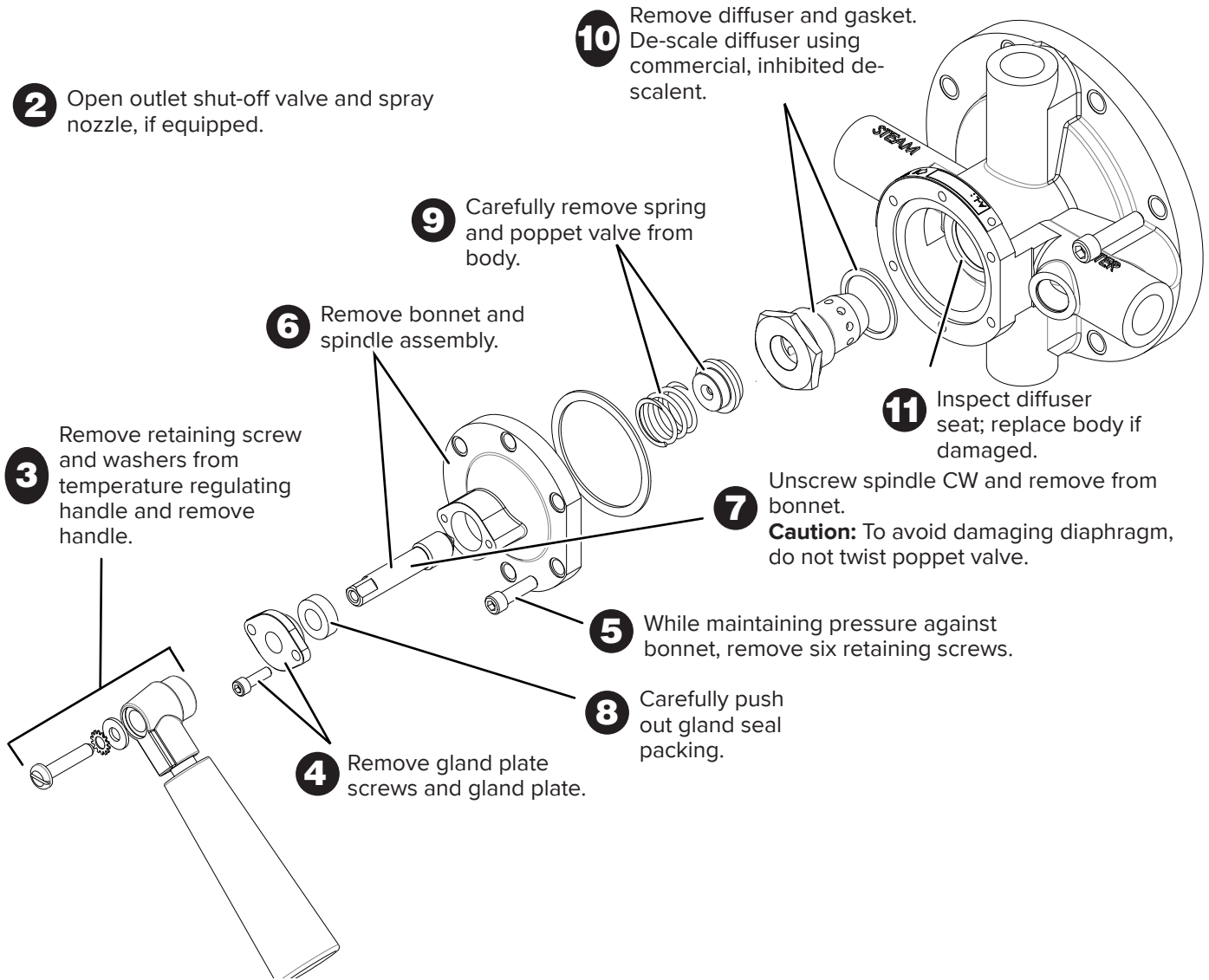
11 Inspect diffuser seat; replace body if damaged.

7 Unscrew spindle CW and remove from bonnet.
Caution: To avoid damaging diaphragm, do not twist poppet valve.

5 While maintaining pressure against bonnet, remove six retaining screws.

8 Carefully push out gland seal packing.

4 Remove gland plate screws and gland plate.



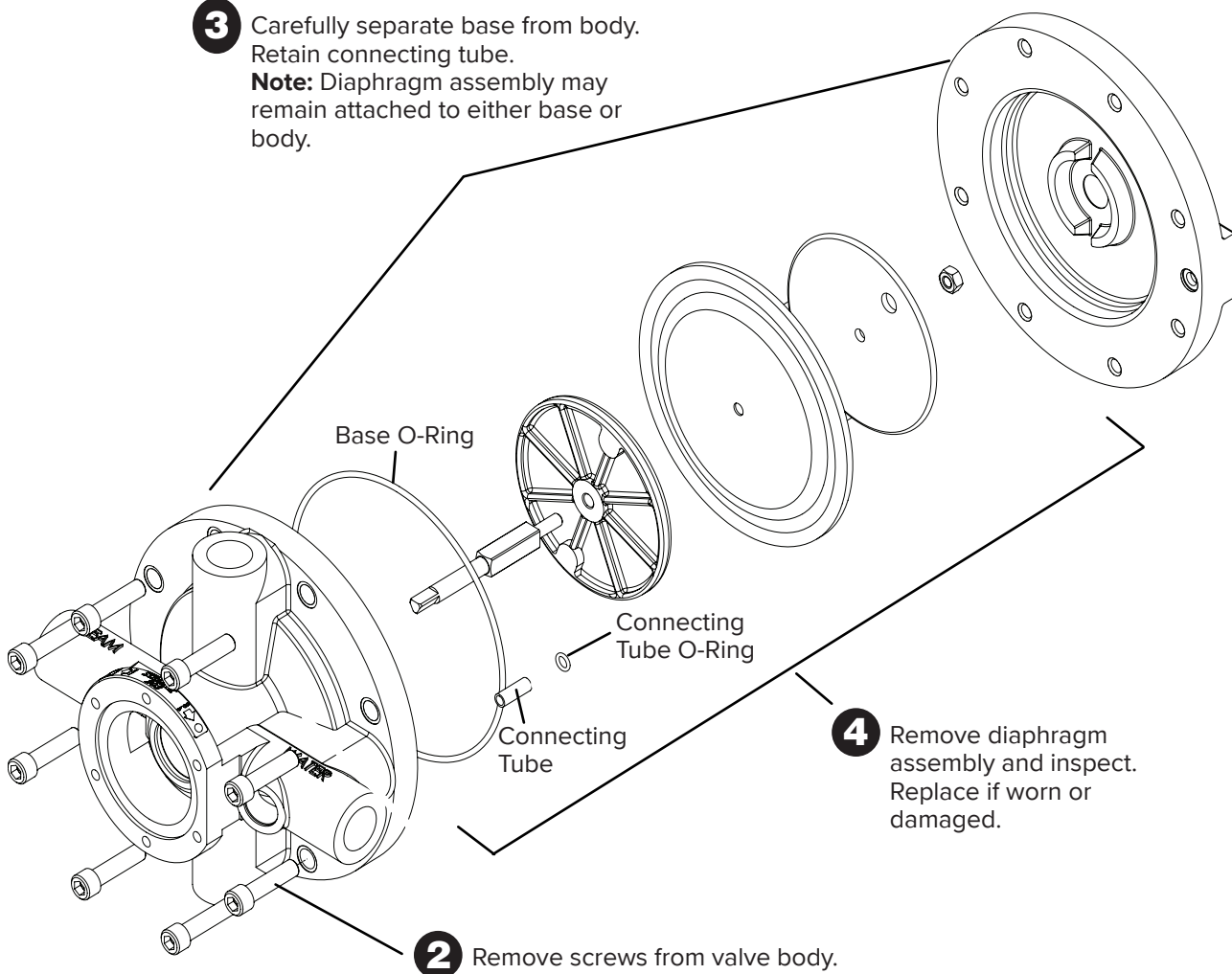
Diaphragm

Note:

- Recommended procedure is to check complete mixing valve when replacing diaphragm.
- Replace O-rings.

1 Disconnect mixing valve from piping.

3 Carefully separate base from body.
Retain connecting tube.
Note: Diaphragm assembly may remain attached to either base or body.



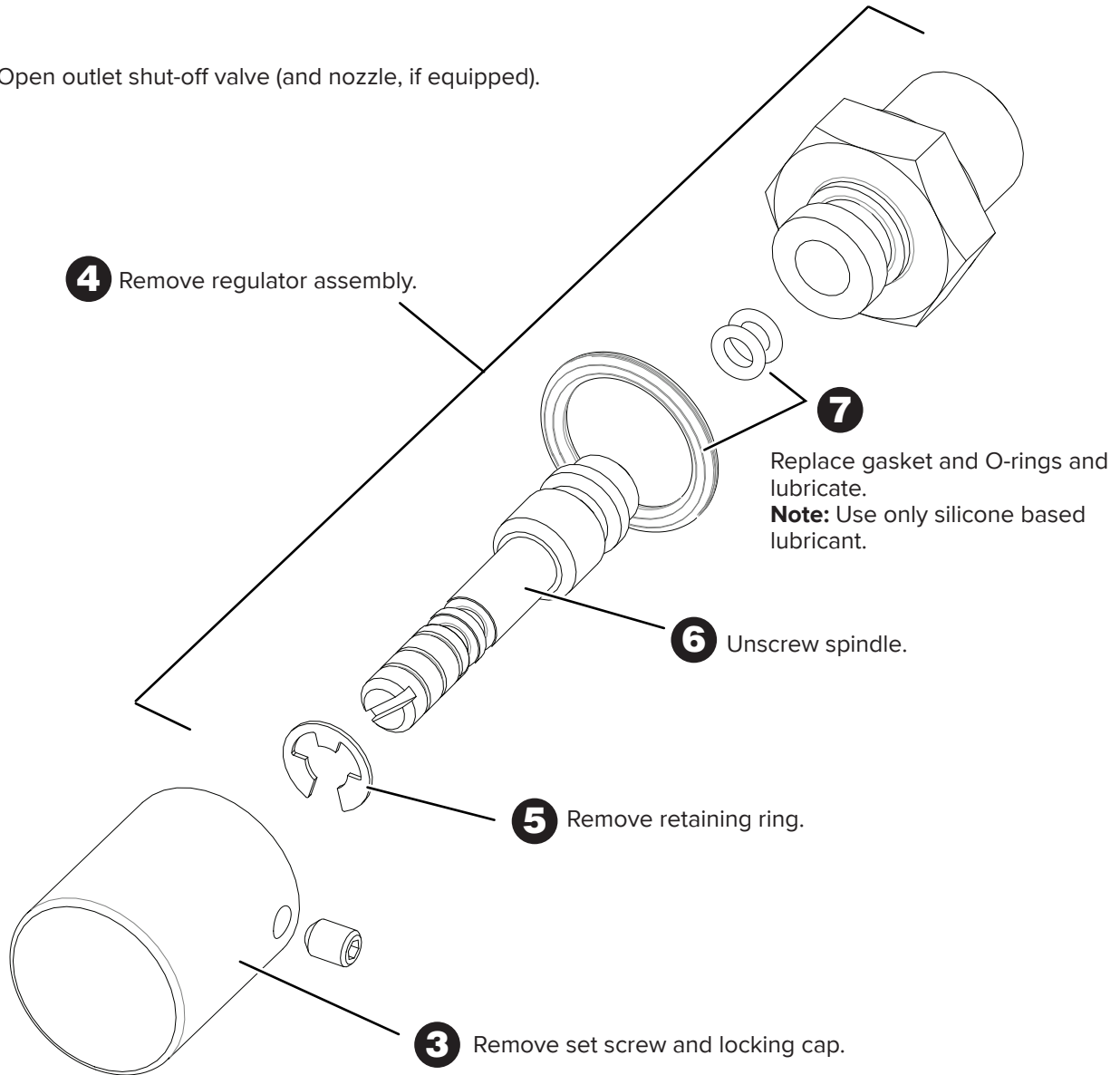
De-scaling valve body and actuating staff is recommended. **Do not** allow de-scaler to contact diaphragm if reusing it.

Reassemble in reverse order using silicone based lubricant:

- Ensure that base O-ring, connecting tube, and connecting tube O-ring seat properly.
- Tighten screws using diagonal pattern.
- Press triangular actuating staff visible in top of valve body (thermometer port) to confirm free and even movement of diaphragm assembly.

Water Flow Regulator

- 1 Shut off steam and water supply lines.
- 2 Open outlet shut-off valve (and nozzle, if equipped).



- 8 Reassemble in reverse order.
- 9 Check for leaks.
- 10 Set temperature parameters. Go to page 7. ➔ 7

Troubleshooting



Allow mixing valve to cool before beginning. Components and water may be hot.

Note: As indicated below, the great majority of performance problems are due to high pressure loss ratio (above 10:1). Pressure loss ratio (PLR) is the ratio of the two inlet pressures after subtracting the back pressure from each. In most cases a high PLR is the result of excessive back pressure, usually caused by a restrictive condition of some kind on the outlet side—too long a hose or too restrictive a nozzle, for example. Back pressure is difficult to measure precisely and it is not necessary to do so. The key is not the actual value, but the realization that it is the problem. High PLR may be corrected at either the inlet or outlet. Correcting it at the outlet side is both easier and cheaper and should be tried first. On the inlet side correction involves installing a pressure reducing valve on the line with the highest pressure.

To diagnose PLR:

1. Identify static inlet steam and water pressures at point of installation. Note a ratio in excess of 2:1.
2. Uncoil hose completely and ensure that it is not kinked or blocked. If unit operates correctly, excessive back pressure is being caused by hose.
3. Remove primary outlet restriction (e.g., nozzle). If unit operates correctly, nozzle is too restrictive.
4. If neither is problem and no other cause can be identified, operate hose station and note:
 - Flow rate
 - Output water temperature
5. Contact Armstrong for assistance. Have noted values at hand.

Troubleshooting		
Problem	Probable Cause	Correction
Inability to obtain hot water	Failed diaphragm	Replace
	Steam diffuser clogged (minerals)	Clean or replace
	Insufficient steam supply	Increase supply
	High pressure loss ratio	<ol style="list-style-type: none"> 1. Use shorter or less restrictive hose. 2. Use less restrictive nozzle. 3. Eliminate unnecessary flow restrictions such as hose reels or wands. 4. Install pressure regulators and reduce inlet pressure differential (but keep adequate supply pressures).
Inability to adjust outlet temperature accurately	High pressure loss ratio	<ol style="list-style-type: none"> 1. Use shorter or less restrictive hose. 2. Use less restrictive nozzle. 3. Eliminate unnecessary flow restrictions such as hose reels or wands. 4. Install pressure regulators and reduce inlet pressure differential (but keep adequate supply pressures).
Inability to stabilize outlet temperature	High pressure loss ratio	<ol style="list-style-type: none"> 1. Use shorter or less restrictive hose. 2. Use less restrictive nozzle. 3. Eliminate unnecessary flow restrictions such as hose reels or wands. 4. Install pressure regulators and reduce inlet pressure differential (but keep adequate supply pressures).



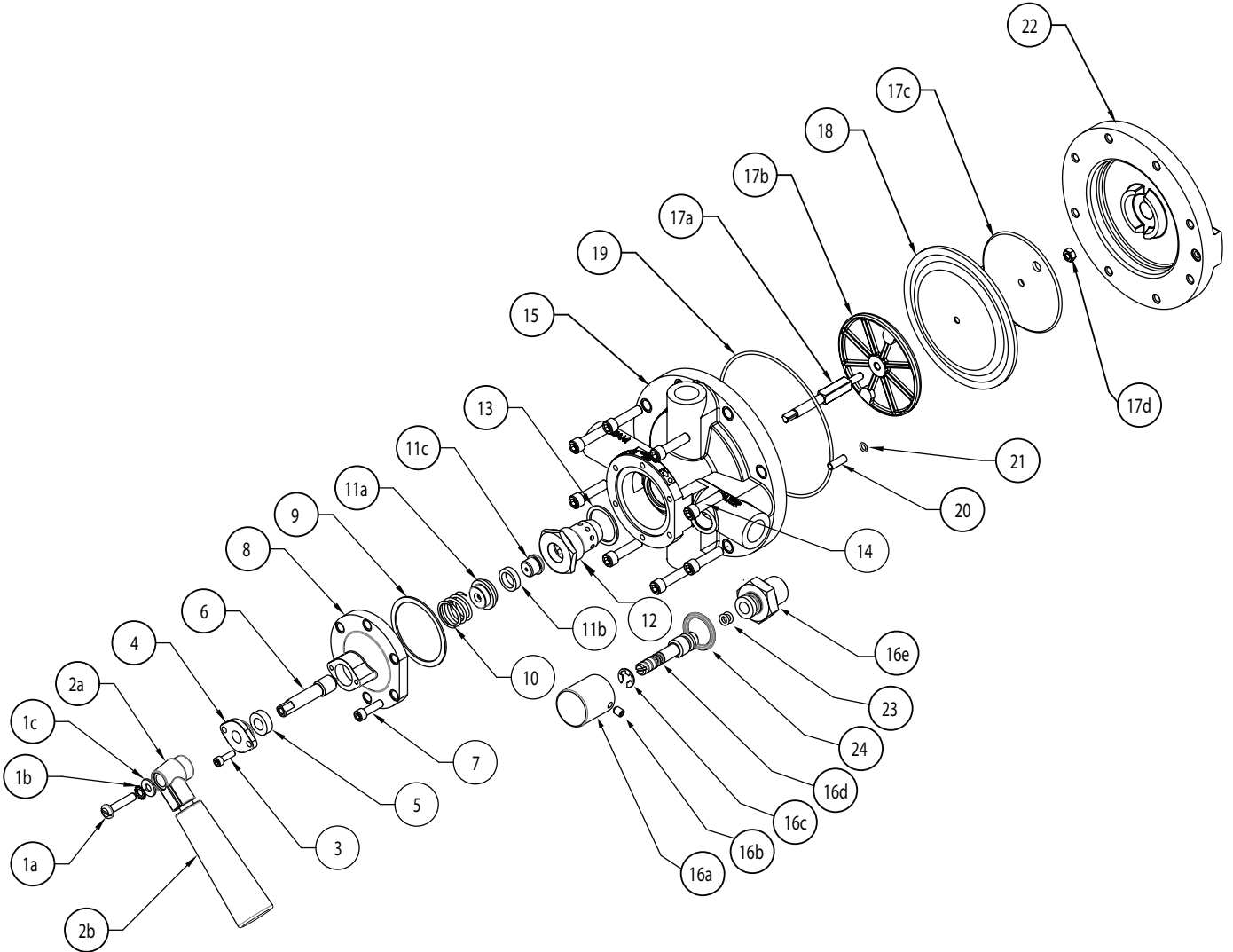
Troubleshooting		
Problem	Probable Cause	Correction
Noisy operation	High pressure loss ratio	<ol style="list-style-type: none"> 1. Use shorter or less restrictive hose. 2. Use less restrictive nozzle. 3. Eliminate unnecessary flow restrictions such as hose reels or wands. 4. Install pressure regulators and reduce inlet pressure differential (but keep adequate supply pressures).



Diagram

Use only performance-matched replacement parts from Armstrong. Do not substitute any components.

Note: Consult Armstrong for parts in units with serial number below 10000.



Kit List

Ref.	Description	Kit Reference (See Ledger)	Qty.
1a	Temperature Control Lever Retaining Screw	① ② ③	1
1b	Lock Washer	① ② ③	1
1c	Flat Washer	① ② ③	1
2a	Temperature Control Lever Boss	① ③	1
2b	Temperature Control Lever	① ③	1
3	Gland Plate Retaining Screw	② ③	2
4	Gland Plate	③	1
5	Gland Packing	③ ⑤ ⑦ ⑧	1
6	Temperature Control Spindle	B5373-1 ③	1
7	Bonnet Retaining Screw	②	6
8	Bonnet	D2904 ③	1
9	Upper Gasket	③ ④ ⑤ ⑦ ⑧	1
10	Return Spring	④	1
11a	Poppet Valve	④	1
11b	Facing	④	1
11c	Retainer	④	1
12	Steam Diffuser	④	1
13	Diffuser Copper Gasket	④ ⑤ ⑦ ⑧	1
14	Cover Screw	B5650 (Includes all 8 screws)	8
15	Body	D4354	1
16a	Locking Cap	⑥	1
16b	Set Screw	⑥	1
16c	Retaining Ring	⑥	1
16d	Spindle	⑥	1
16e	Water Flow Regulator Seat	⑥	1
17a	Actuating Spindle	⑦	1
17b	Diaphragm Top Plate	⑦	1
17c	Diaphragm Clamp Plate	⑦	1
17d	Nut	⑦	1
18	Diaphragm Only	⑦ ⑧	1
19	Base O-Ring	⑤ ⑦ ⑧	1
20	Connecting Tube	⑤ ⑦ ⑧	1
21	Connecting Tube O-Seal	⑤ ⑦ ⑧	1
22	Base	D3443	1
23	Water Flow Regulator Spindle O-Seals	⑤ ⑥ ⑦ ⑧	2
24	Water Flow Regulator Copper Gasket	⑤ ⑥ ⑦ ⑧	1
--	Locking Cap, Tamper Resistant (optional)	Not Shown	1

Kit Reference	Kit Part No.
①	D33834
②	B5649
③	D14923
④	D32602
⑤	B5648
⑥	B5651 (Brass) D40888 (Stainless)
⑦	D32600
⑧	D32601



Limited Warranty and Remedy

Armstrong Hot Water, Inc. ("Armstrong") warrants to the original user of those products supplied by it and used in the service and in the manner for which they are intended, that such products shall be free from defects in material and workmanship for a period of one (1) year from the date of installation, but not longer than 15 months from the date of shipment from the factory [unless a special warranty period applies, as listed below]. This warranty does not extend to any product that has been subject to misuse, neglect, or alteration after shipment from the Armstrong factory. Except as may be expressly provided in a written agreement between Armstrong and the user, which is signed by both parties, Armstrong DOES NOT MAKE ANY OTHER REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. The sole and exclusive remedy with respect to the above limited warranty or with respect to any other claim relating to the products or to defects or any condition or use of the products supplied by Armstrong, however caused, and whether such claim is based upon warranty, contract, negligence, strict liability, or any other basis or theory, is limited to Armstrong's repair or replacement of the part or product, excluding any labor or any other cost to remove or install said part or product, or, at Armstrong's option, to repayment of the purchase price. As a condition of enforcing any rights or remedies relating to Armstrong products, notice of any warranty or other claim relating to the products must be given in writing to Armstrong: (i) within 30 days of last day of the applicable warranty period, or (ii) within 30 days of the date of the manifestation of the condition or occurrence giving rise to the claim, whichever is earlier. IN NO EVENT SHALL ARMSTRONG BE LIABLE FOR SPECIAL, DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF USE OR PROFITS OR INTERRUPTION OF BUSINESS. The Limited Warranty and Remedy terms herein apply notwithstanding any contrary terms in any purchase order or form submitted or issued by any user, purchaser, or third party and all such contrary terms shall be deemed rejected by Armstrong.

Special Warranty Periods are as follows:

Armstrong Hot Water Group safety yellow washdown hose is a Goodyear® product, which is manufactured for industrial hot water washdown applications up to 190 °F.

The fittings at each end are installed by trained employees using specially calibrated crimping equipment, performance matched and sized ferrules with a stainless steel anti-kink spring guard at the hose inlet.

Industrial washdown can be a rigorous procedure and there is a fine relationship between weight and flexibility to reduce user fatigue and increased strength and durability which promotes user safety. As such, Armstrong supplied washdown hose should not be considered to be functionally infallible. However, provided that the hose is installed as supplied, users are correctly trained, the hose is commissioned, operated, routinely inspected and maintained, the risk of injury due to product failure, while never eliminated, may be reduced substantially.

The Armstrong Hot Water Group washdown hose has a variable service life depending upon factors such as the frequency of use, site/application conditions and operator care.

Washdown hoses, which are operated in harsh industrial environments, particularly those used with high temperature water, should be subject to regular inspection and replacement.

Armstrong Hot Water Group does not recommend and will not perform after-installation hose repair. Hose rupture or fatigue-related damage might be a sign that the hose has reached the end of its service life and a replacement hose is required. If the choice is made at the plant level to repair a washdown hose by installing new fittings, Armstrong Hot Water Group recommends that a professional hose distributor/supplier be contacted.

After-installation repair or secondary "re-fitting" of a Washdown Hose supplied by Armstrong Hot Water Group voids all warranties and frees Armstrong Hot Water Group from all liability.

Standard Warranty Policy

This is a fair wear and tear warranty and Armstrong Hot Water Group reserves the right to be final arbiter. This warranty is in lieu of all other warranties.

Armstrong Hot Water Group does not make any other representations or warranties, express or implied, including, but not limited to, any implied warranty of merchantability or any implied warranty of fitness for a particular purpose. In no event shall Armstrong Hot Water Group be liable for special, direct, indirect, incidental or consequential damages, including, but not limited to, loss of use, loss of profits or interruption of business.

General

Warranty Candidacy Period:

All washdown hoses supplied by Armstrong Hot Water Group are a candidate for warranty replacement for a period of one year as indicated by the date code stamped upon the fittings.

Warranty Replacement Program

Less than 3 months service—Full Replacement

More than 3 but less than 6 months service—Replace Hose at 25% of current price

More than 6 but less than 9 months—Replace Hose at 50% of current price

More than 9 but less than 12 months—Replace Hose at 75% of current price

For further information please call our technical department at 1-888-HOT HOSE.



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