



# Rada Z358-40 Thermostatic Mixing Valve Installation and Maintenance

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## Water Temperature Controls Emergency Fixtures Thermostatic

This Rada Z358-40 Valve has been supplied for this application based upon information provided to Armstrong at the time the order was placed.

This Rada Z358-40 Valve is configured for use in a “dead-leg” piping configuration as indicated in the drawing on Page 6.

This Rada Z358-40 Valve has **not** been configured for use in a centrally pumped re-circulation system.

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

**Model No.**  Rada Z358-40

**Serial No.** \_\_\_\_\_

**Ship Date** \_\_\_\_\_

# Water Temperature Control - Emergency Fixtures

## Thermostatic

Rada Z358 series has been designed specifically to provide temperature controlled water to emergency fixtures as detailed in ANSI Z358.1-2009.

Tepid Water (Sections 4.5.6, 5.4.6, 6.4.6, 7.4.5, 8.1.1.2, 8.2.3.4)

Tepid flushing fluid is considered necessary in all types of emergency equipment applications. Tepid is defined in the standard, as "A flushing fluid temperature conducive to promoting a minimum 15-minute irrigation period. A suitable range is 60-100°F (16-38°C)" (Definitions p. 8). Generally, temperatures higher than 100°F may cause chemical interactions with the skin and result in further damage. At 60°F and below hypothermia becomes a concern. Consulting a safety/health advisor will be a helpful aid in the determination of the best temperature parameters. Not two hazards are exactly the same and each should be evaluated on a case-by-case basis.

## Point of Use

Rada Z358-20 and Z358-40 Thermostatic Mixing Valves are suitable for installation at or near a point of use for direct tepid water supply to an emergency fixture or grouping of fixtures. Groups of fixtures must meet the valve's flow capacity requirements if there is a potential for simultaneous operation.

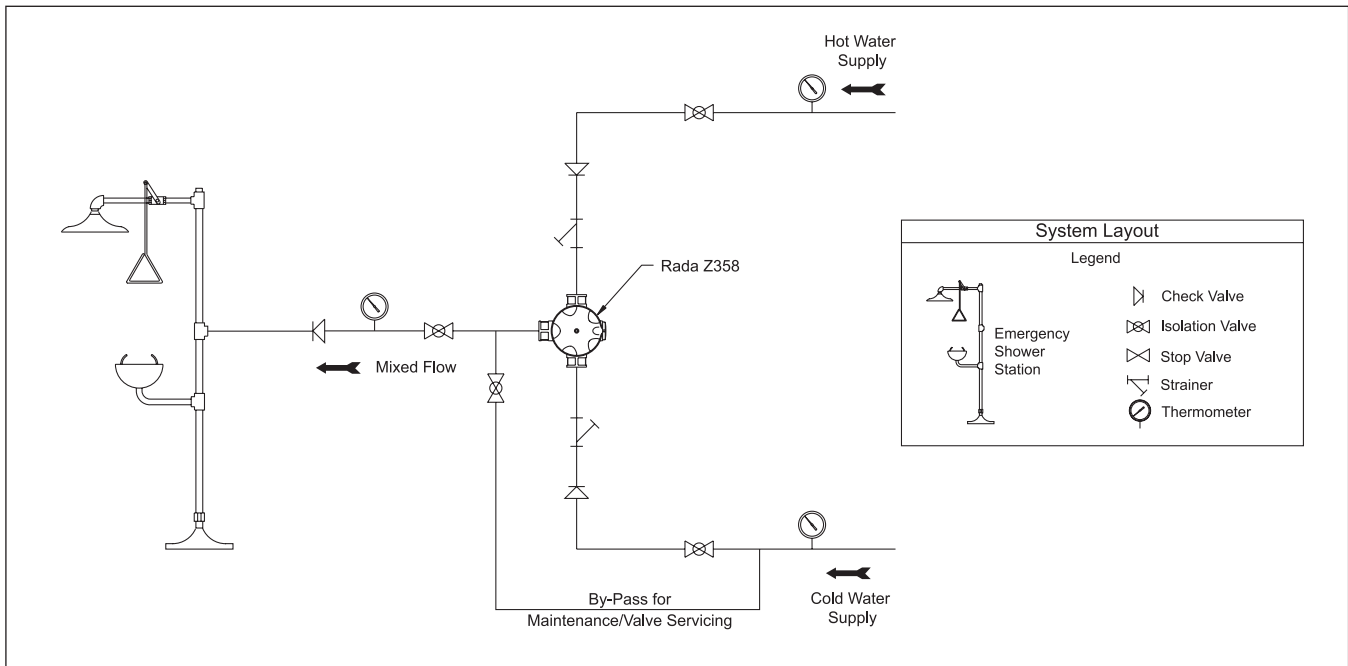
## Central Recirculation System Control

Recirculated, tepid loops serving emergency fixtures are fundamentally different in application from standard institutional hot water recirculating systems. The limited system draw-off requirement of the emergency fixture circuit portends limited system audit capability and a subsequent underlying system management concern.

In other words, institutional loops with frequent draw-offs at diverse flow rates for hand washing, showering and bathing communicate with building management on a regular basis (the lavatory is too hot, the shower is too cold, etc.). The capacity exists to make adjustments and corrections.

Closed loops for emergency fixtures, on the other hand, require infrequent but often a large and sudden volume of water that must be in the correct temperature range every time. Without some level of manual or automated system monitoring and correction, along with an aggressive system maintenance protocol, tepid loops present a challenge.

**For recirculated tepid loops serving emergency fixtures, Armstrong suggests that ONLY Digital Recirculating Valves should be considered. Please consult your Armstrong representative or Armstrong directly.**



# Water Temperature Control - Emergency Fixtures

## Thermostatic

### Rada Z358-40

Rada Z358-40 has been designed specifically to provide temperature controlled water to emergency fixtures as detailed in ANSI Z358.1-2009.

Z358-40 is a Thermostatic Mixing Valve designed specifically to deliver tepid water to emergency fixtures. Compact design and top or bottom blended water outlet makes Z358-40 ideal for OEM, new construction and upgrade/retrofit installations.

For Emergency Drench Showers. Rada Z358-40 will pass ANSI specified minimum of 20 gpm (75.7 lpm)—actual 46 gpm (147 lpm)—and will flow a minimum of 15 gpm (57 lpm) from direct cold water supply in hot failure mode at 45 psi (3 bar) pressure drop.

For Emergency Eye Wash Stations. For single or multiple fixture installation, Rada Z358-40 will control accurately at flow rates from 40 gpm (151 lpm) to below 2 gpm (7 lpm)—actual 46 gpm @ 45 psi pressure drop.

In 40 gpm (151 lpm) flow applications, Z358-40 will pass approximately 40% of original flow setting in hot failure mode.

In 30 gpm (114 lpm) flow applications, Z358-40 will pass approximately 50% of original flow setting in hot failure mode.

In 15 gpm (57 lpm) flow applications, Z358-40 will pass approximately 75% of original flow setting in hot failure mode.

## Operational Specifications

1. Site Adjustable—Mechanical maximum temperature limit stop and single temperature locking features as functions of the temperature control handle design.
2. Thermal shutdown feature is designed to protect user from unsafe water temperatures or hot water/chemical reaction should cold supply be interrupted during use.
3. Unique constant cold water flow design ensures that in the event of a hot supply failure the Rada Z358-40 will allow cold water to flow to fixture.
4. Unique constant cold water flow feature allows the inlet hot water supply to be set within a prescribed range, thus limiting the potential outlet temperature to a safe maximum in the event of misadjustment, unauthorized tampering or thermostat failure. This feature presumes that the correct initial commissioning was performed and that the cold water supply has not been interrupted.

## Technical Specifications

- 1-1/4" (32 mm) NPT inlets and 1-1/4" (32 mm) NPT outlet(s)
- Chrome-plated DZR brass/polymer construction with bright
- "Safety Yellow" control handle.
- Operating pressures must be nominally equal
  - Maximum: 100 psi (6.9 bar)\*
  - Minimum: 40 psi (2.7 bar) drench showers
  - 20 psi (1.4 bar) eye wash
- Maximum recommended pressure drop 75 psi (5 bar)
- Maximum recommended outlet flow 53 gpm (200 lpm)
- Integral thermometer
- Integral replaceable cartridge-type inlet check valves
- Integral replaceable inlet strainers
- Dual thermostatic elements
- 15 gpm (57 lpm) constant cold water flow in hot failure mode to open outlet at 45 psi (3 bar) pressure drop
- Shipping weight 18 lb (8 kg)

\*High water pressures may deliver a volume and spray force that are injurious to the user. Check with fixture manufacturer or regulate water pressures within acceptable range.

**Table 1.**

Safe Maximum Inlet Hot Water Supply Temperature  
Refer to Table 1 below to correlate inlet hot water supply temperature with anticipated seasonal ground water temperatures (use best case/warmest scenario). For details, reference Safety benefit Bullet #4 at left. **NOTE:** Shaded area indicates potential user risk.

**Table 1**

Inlet Hot Water Temp. °F	Cold Water Temperature °F				
	33	40	50	60	70
120	80	84	88	93	97
130	86	89	94	98	103
140	91	95	99	104	108
150	96	100	105	109	114
160	102	106	110	115	119
175	110	114	118	123	127
185	116	119	124	128	133

**Table 2.**

Minimum Inlet Hot Water Supply Temperature  
Rada Z358-40 will require a minimum inlet hot water supply temperature, which must be correlated with the anticipated seasonal inlet cold water supply temperature (use worst case/coldest scenario) as per Table 2 below. **NOTE:** Shaded area represents Armstrong's interpretation of "tepid" water. Expanded chart shown on page 12 of this manual.

**Table 2**

Blend Temp °F	Cold Water Temperature °F				
	33	40	50	60	70
80	120	113	105	97	88
85	129	122	114	106	97
90	138	132	123	115	107
95	147	141	132	124	116

For expanded versions of Tables 1 and 2, consult factory or product installation and maintenance manual.

## Safety Warnings

The function of a Thermostatic Mixing Valve is to deliver water consistently at a pre-designated temperature.

Rada Thermostatic Mixing Valves are precision engineered to give continued superior and safe performance provided:

1. They are installed, commissioned, operated and maintained in accordance with the recommendations provided and accepted plumbing practices.
2. Periodic attention is given, as necessary, to maintain the product, the accessory fittings and the plumbing system in good functional order.

In keeping with every other mechanical product, Rada Mixing Valves should not be considered as functionally infallible and, as such will never totally replace the vigilance and attention of maintenance, supervisory and safety staff.

Provided that they are installed, commissioned, operated and maintained, the risk of product failure and its associated consequences, if not eliminated, are reduced to the minimum achievable.

## Rada Z358-40 Operating Specifications

Maximum Recommended Hot Water Supply Temperature	130°F (54°C)
Minimum Cold Water Supply Temperature	33°F (1°C)
Optimum Inlet to Outlet Temperature Differential	Refer to Table 3-2
Minimum Flow Rate	2 gpm (7.5 lpm)
Maximum Inlet Supply Pressure (supplies must be nominally equal)	100 psi (6.9 bar)*
Maximum Inlet to Outlet Pressure Drop	75 psi (5 bar)
Maximum Outlet Flow Rate	53 gpm 200 lpm)
Minimum Inlet Supply Pressure	40 psi (2.7 bar) Drench Shower 20 psi (1.4 bar) Eye Wash

\*High water pressures may deliver a volume and spray force which is injurious to the user. Check with fixture manufacturer or regulate water pressures within acceptable range.

**Danger:** Correct on site commissioning of Rada Z358-40 is critical. If you have any questions call us Toll Free at 1-888-HOT-HOSE.

**Warning:** The constant cold water flow design ensures that in the event of a hot water supply failure the Rada Z358-40 will allow cold water to flow to the fixture.

In addition, Rada Z358-40 is designed to shutdown the hot water supply in the event of a cold water supply failure.

**These features will only function if:**

1. There is a minimum of 20°F differential between the Hot Supply and the Blend set point (85°F (29°C) suggested).
2. The Rada Z358-40 has been pre-set or commissioned **On-Site** correctly. It is critical to note that under certain inlet temperature supply conditions, the constant cold water supply feature **may give the false impression** that a blend set point has been correctly established. However, the blend temperature may just be a function of the combination of inlet hot water temperature and the constant cold water flow. The valve may actually be inadvertently set to deliver temperatures well in excess of the set point but it is unable to do so due to the constant cold water flow. **In this situation the cold water failure safety shutdown has been compromised.**

Refer to Page 7 "Commissioning the Rada Z358-40" or call Armstrong toll free at 1-888-HOT-HOSE for details or assistance in correctly setting the Rada Z358-40 on site.

## Rada Z358-40 Installation Tips

The Rada Z358-40 Thermostatic Mixing Valve must be installed as per the piping schematic provided on Page 2. Failure to follow this directive will compromise valve/system performance, void all warranties and may create a user comfort issue and safety concern.

Armstrong has technical support personnel available from 8:00 a.m. to 5:00 p.m. EST. Call Toll Free 1-888-HOT-HOSE.

### Notes:

1. Rada Z358-40 should be installed in a horizontal position and ease of service access should be considered.
2. Rada Z358-40 must be installed in a standard **HOT-LEFT/COLD-RIGHT** inlet supply configuration. There are red (hot) and blue (cold) markings on each valve. Rada Z358-40 is provided as standard with a piped bottom outlet with thermostat and tee and a plugged top outlet. This configuration can be reversed by simply switching the outlet plug and fittings. The inlet supplies must always match the corresponding inlet ports on the valve.
3. Be sure to thoroughly flush the pipework before fitting the Rada Z358-40.
4. Be sure to “make up” all “sweat” or “soldered” fittings ahead of time. Do not expose Rada Z358-40 or any of its fittings to extreme temperatures (such as an acetylene or propane torch).
5. Rada Z358-40 is serviced from the front of the valve as you face it. A minimum 18” clearance in front of the Temperature Control Handle is suggested for internal parts access.
6. Rada Z358-40 is pre-set at the factory to a “full cold” outlet temperature. As such:

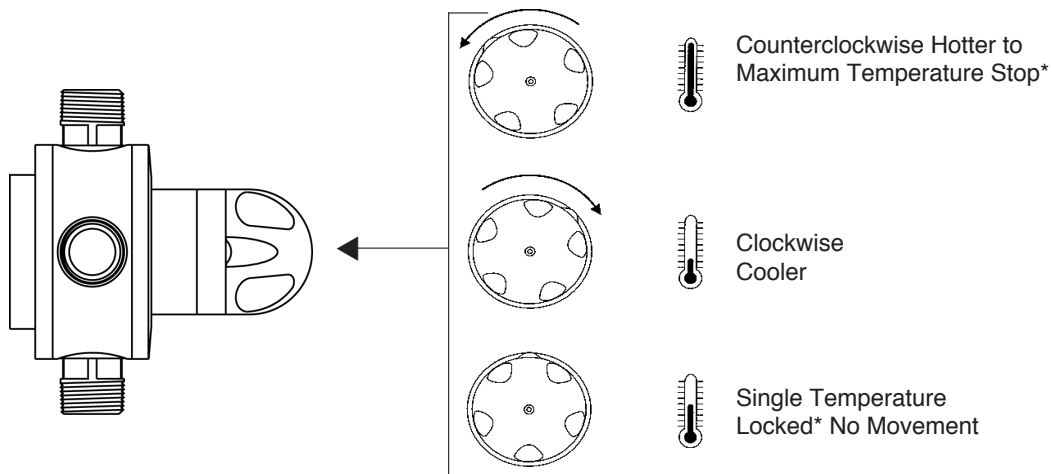
### **RADA Z358-40 MUST BE RE-SET ON SITE BY QUALIFIED PERSONNEL.**

Rada Z358-40 set up (**Commissioning the Rada Z358-40**) protocol is included on Page 7.

7. Rada Z358-40 is designed to control up to two drench showers or combination drench shower/eye wash stations which have a potential for multiple simultaneous demand.
8. Rada Z358-40 is designed to control multiple eye wash stations as long as the potential multiple simultaneous demand does not exceed valve capacity and the individual eye wash fixtures have a flow rate greater than 2 gpm (7.5 lpm). Refer to flow chart on page 3 and maintain a “residual pressure” of at least 20 psi to operate fixtures at a satisfactory flow rate.
9. Ensure that the inlet supply pressures are nominally equal.

## Operation

For models with a standard temperature knob fitted, adjustment of the blend temperature from preset maximum to cold is achieved by clockwise rotation of the knob.



\*Maximum temperature stop or single temperature locking feature is established during the on-site commissioning protocol referenced on page 7.

## Commissioning the Rada Z358-40

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**Commissioning must be carried out in accordance with these instructions, and must be conducted by designated, qualified and competent personnel.**

### Exercising the Thermostat

Thermostatic mixing valves with thermostats are inclined to lose their responsiveness if not used. Valves which have been in storage, installed but not commissioned, or simply not used for some time should be exercised before setting the maximum temperature or carrying out any tests. A simple way to provide this exercise is:

1. Ensure that the hot and cold water are available at the valve inlets, and the outlet is open.
2. Move the temperature control rapidly from cold to hot and hot back to cold several times, pausing at each extreme.

### Temperature Setting

The blend temperature obtainable through the mixing valve should be limited to prevent selection of a flushing temperature that is too hot.

Rada Z358-40 is fully performance tested and then pre-set at the factory to a “full cold” outlet temperature. As such **Rada Z358-40 must be re-set on site by qualified personnel.** During the temperature re-setting process, a manual maximum temperature selection limit stop or single temperature locked position should be established.

### Maximum Temperature Setting

Check that an adequate supply of **hot** water is available at the hot inlet of the mixing valve (Refer to Table 2 on Page 3 of this IOM).

For optimum performance the minimum temperature of the hot water must be at least 20°F (12°C) above the desired blend, however during resetting this should be close to the typical supply maximum to reduce the possibility of any blend shift due to fluctuating supply temperatures. The downstream fixture(s) must be turned on to full flow.

Temperatures should always be recorded using a thermometer with proven accuracy.

1. Remove the temperature knob using a 3 mm hexagonal wrench (supplied).
2. Refer to Figure 7-1 and remove the brass hub assembly.
3. Ensure that the spindle is rotated fully clockwise so that you deliver the coldest supply temperature water available from the Rada Z358-40. Invert the hub 180° to assist spindle rotation.
4. Gradually rotate the spindle counterclockwise until the temperature begins to rise. Continue rotation until the Armstrong recommended 85°F (29°C) or your desired temperature is achieved. Allow water temperature to stabilize. Rotate the spindle further counterclockwise and allow the temperature to rise an additional 5°F. Allow water temperature to stabilize. Rotate the spindle back (clockwise) to initial set point and proceed to step 5.

**Warning:** It is critical to note that under certain inlet temperature supply conditions, the constant cold water supply feature **may give the false impression** that a blend set point has been correctly established. However, the blend temperature may just be a function of the combination of inlet hot water temperature and the constant cold water flow. The valve may actually be inadvertently set to deliver temperatures well in excess of the set point but it is unable to do so due to the constant cold water flow. **In this situation the cold water failure safety shutdown has been compromised. As such correct adjustment as detailed in points 3 and 4 is extremely important.**

## Commissioning the Rada Z358-40

5. Once the desired maximum blend temperature is achieved, gently remove the inverted hub without disturbing the spindle, re-invert 180° to operational position and re-fit so that:
  - A. the left stop lug on the hub rests against the right side of the stop on the valve thus preventing any further counterclockwise rotation for a **Maximum Temperature Limit Stop Figure 7-1 on Page 7.**
  - B. the two stop lugs on the hub “straddle” the stop on the valve body thus preventing any further rotation in either direction for a maximum temperature lock, see Figure 7-1 on Page 7.

Check that the blend temperature has not changed and re-fit the yellow temperature knob.

## Validate The Commissioning

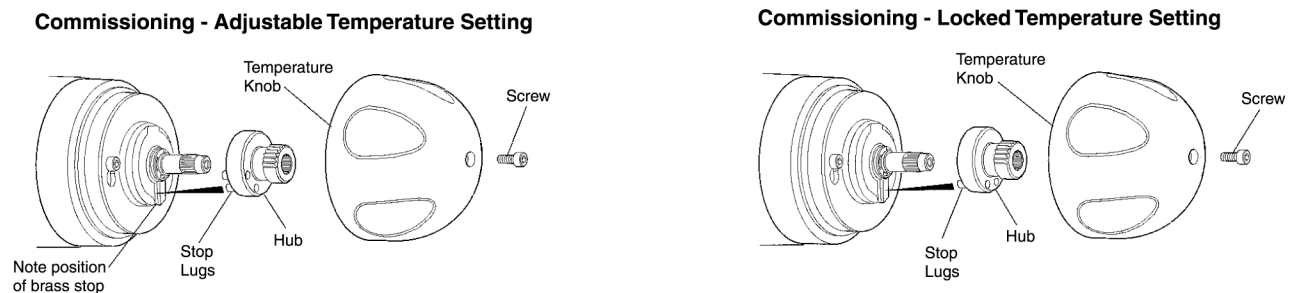
After completing items 1-5 in the previous section “Commissioning the Rada Z358-40” it is important that the commissioning is validated.

Proceed as follows:

1. Operate the fixture(s) at full flow and take a temperature reading. Water temperature should not fluctuate more than 4°F. If water temperature control is unsatisfactory, refer to Page 13 item 4 “Fault Diagnosis” or call Armstrong Toll Free at 1-888-HOT-HOSE.
2. Operate the fixture(s) at full flow and intentionally “fail” the hot water supply to the Rada Z358-40. Cold water should continue at a reduced flow rate. Confirm that the cold water flow rates meet the specifications detailed on page 2. If cold water does not flow, refer to Page 13 item 8 “Fault Diagnosis” or call Armstrong Toll Free at 1-888-HOT-HOSE.
3. Operate the fixture(s) at full flow and intentionally “fail” the cold water supply to the Rada Z358-40. All flow through the fixture should shut off completely within 2 seconds. If flow does not shut off to specification, repeat steps 1-5 under “Commissioning the Rada Z358-40” and repeat test. If the results do not improve to specification refer to Page 13 “Fault Diagnosis” item 9 or call Armstrong Toll Free at 1-888-HOT-HOSE.

**For optimum performance and safety repeat steps 1-3 as a part of a regularly scheduled test and validation program. Record and report any variations to Plant Management, Plant Safety Officer and Armstrong.**

**Figure 7-1.**



## Rada Z358-40 Servicing and Maintenance (Refer to Figures 10-1 and 10-2 on Page 10)

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Rada Z358-40 Thermostatic Mixing Valves should be inspected and tested on a regular schedule. Acknowledged site conditions such as high mineral content water may dictate an increased frequency.

**Note:** All seals are pre-lubricated. If further lubrication is required, use only silicone based lubricants on this product. Do not use petroleum based lubricants.

**Warning:** Rada Z358-40 has a specially designed replacement port sleeve assembly. Ensure that the marking Z358-40 appears on the retaining flange on the port sleeve assembly.

**Important:** Do not install a replacement port sleeve assembly which does not have the Rada Z358-40 identifier. Call us immediately Toll Free 1-888-HOT-HOSE.

Rada Z358-40 can be completely serviced from the front/top and all of the internal components are replaceable. To access the valves internal components for inspection, cleaning or replacement proceed as follows.

Maintenance must be carried out in accordance with these instructions, and must be conducted by designated, qualified and competent personnel. This mixing valve is designed for minimal maintenance under conditions of normal use. External surfaces may be wiped clean with a soft cloth, and if necessary, a mild detergent or soap solution can be used.

Warning! Many household and industrial cleaning products contain mild abrasives and chemical concentrates, and should not be used on polished, chromed or plastic surfaces.

Components are precision-made, so care must be taken while servicing to avoid damage.

### Lubricant

**Important!** All seals are pre-lubricated. If you need to further lubricate the seals, use only a small amount of silicone-only based lubricants on this product. Do not use oil-based or other lubricant types as these may cause rapid deterioration of seals.

### Maintenance Procedure

1. Isolate the water supplies to the mixing valve. Open the outlet fixture(s) to release pressure and to assist the draining of residual water.
2. Use the 3 mm hexagonal wrench (supplied) to remove the temperature knob screw. Remove the temperature knob.
3. Loosen the two screws holding the cover shroud in position, turn clockwise and remove the cover shroud.
4. Remove the hub, the circlip and the pressure washer.
5. Remove the eight screws and remove the cover. Note the position of the stop on the cover, so that it can be re-assembled in the same position.
6. Remove the temperature spindle and drive nut from the cover.
7. Remove the thermostat assembly and actuator (inside port sleeve).



## Rada Z358-40 Servicing and Maintenance (Refer to Figures 10-1 and 10-2 on Page 10)

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8. Remove the four retaining screws located on the flange around the port sleeve (see Figure 10-2).
9. Insert a bar (maximum of 6 mm diameter) through the holes provided at the front of the port sleeve and use this with a slight twisting action to carefully pull the shuttle assembly out of the body. (See Figure 10-1).

**Warning:** Due to critical nature of the application the port sleeve assembly shown in Figure 10-1 is designed to be non-serviceable beyond this point.

**Further disassembly may compromise factory adjustment and setting specifications and will void all warranties and free Armstrong from all liabilities.**

10. Insert a new Rada Z358-40 identified port sleeve assembly into the valve body and secure in position with the four screws.

**When replacing the port sleeve assembly, ensure that the replacement part has the marking “Z358-40” on the port sleeve assembly retaining flange.**

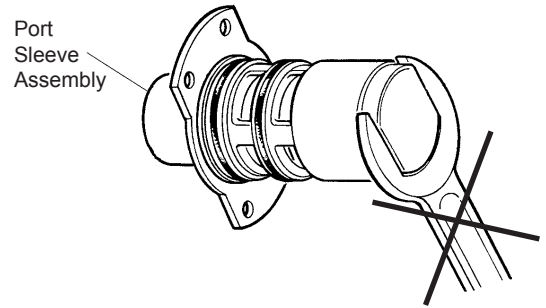
11. Install the actuator sleeve and the thermostat assembly into the shuttle assembly.
12. Install the drive nut and the temperature spindle into the cover.  
**Note:** The drive nut will need to be aligned with the grooves inside the cover.
13. Fit the cover, ensuring the end of the thermostat locates correctly into the drive nut. Rotate the cover so that it is positioned in the same position as it was when you removed it. Secure the cover in position with the eight screws.
14. Fit the pressure washer and secure the spindle in position with the circlip. Make sure that the circlip locates correctly in the groove in the temperature spindle.
15. Before fitting the hub, the temperature will need resetting; refer to Commissioning on Page 7.
16. Fit the cover shroud and secure in position with the two screws.
17. Fit the temperature knob and secure with the screw.

**Important: Re-commission and re-validate the commissioning following the protocol detailed on Pages 7 and 8 of this booklet.**

**Warning:** Rada Z358-40 has a specially designed non serviceable replacement port sleeve assembly (see Figure 10-1). Ensure that the marking Z358-40 appears on the face of the retaining flange.

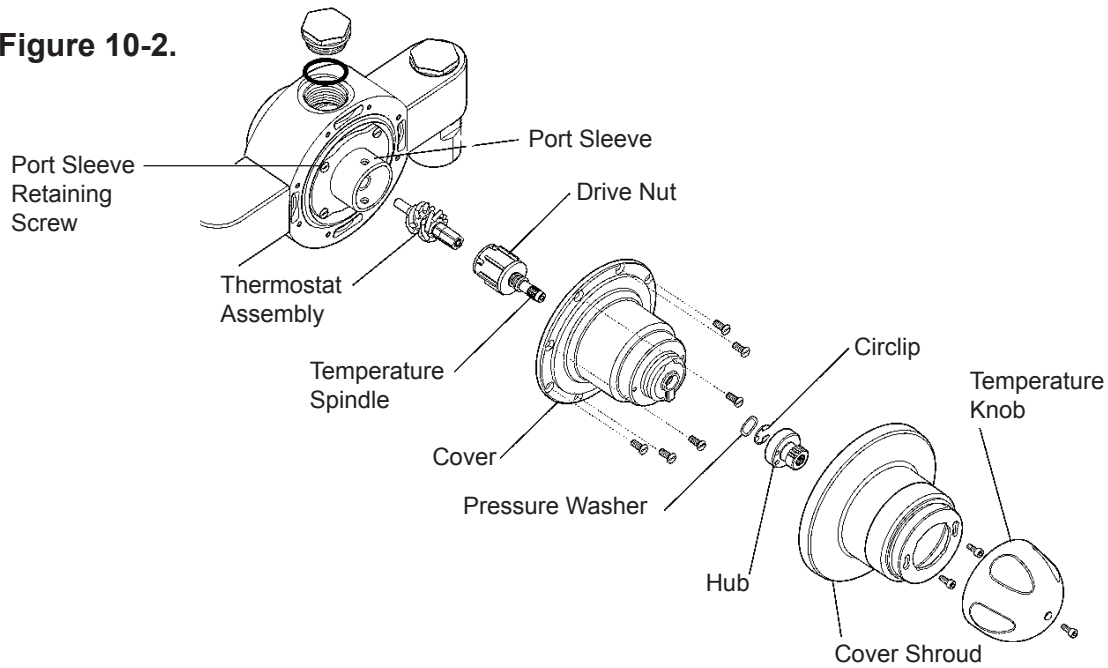
**Important:** Do not install a replacement port sleeve assembly which does not have the Z358-40 identifier. Call the factory immediately Toll Free 1-888-HOT-HOSE.

**Figure 10-1.**  
**Port Sleeve Assembly**



Do not disassemble Port Sleeve Assembly

**Figure 10-2.**



**Warning:** Due to critical nature of the application the port sleeve assembly shown in Figure 10-1 is designed to be non-serviceable beyond this point.

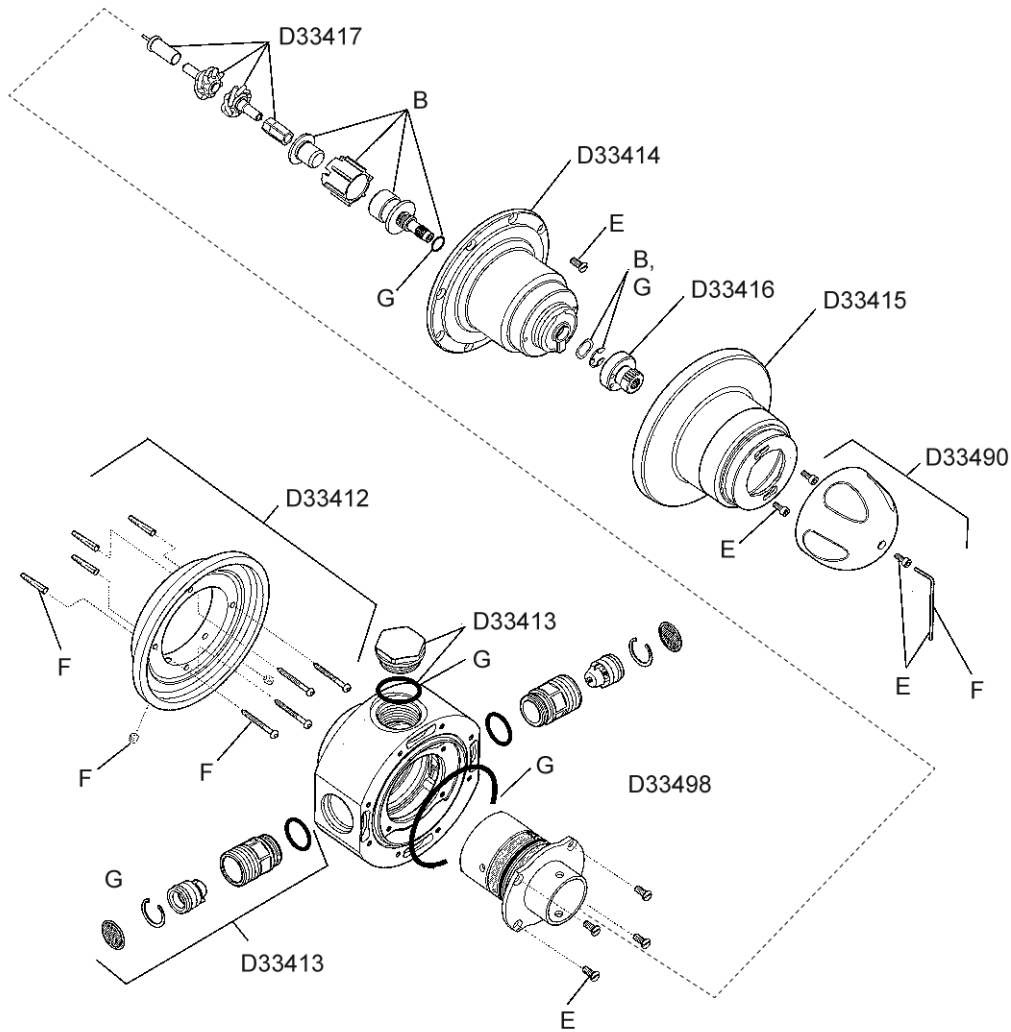
**Further disassembly may compromise factory adjustment and setting specifications and will void all warranties and free Armstrong from all liabilities.**

## Rada Z358-40 Spare Parts

**Warning:** Model Z358-40 has a specially designed non-serviceable replacement port sleeve assembly cartridge. Ensure that the marking Z358-40 appears on the face of the retaining flange.

Important: Do not install a replacement port sleeve assembly which does not have the Z358-40 identifier. Call us immediately Toll Free 1-888-HOT-HOSE.

Part No.	Description
D33490	Z358 Knob Pack
D33412	Backplate Pack
D33413	Drain Plug
D33414	Cover (Brass)
D33415	Cover Shroud
D33416	Hub Pack
D33417	Thermostat Pack
D33418	Drive Mechanism Pack - components identified "B"
D33498	Cartridge Z358-40 Replacement
D33421	Cover Screw Pack - components identified "E"
D33422	Fixing Screw Pack - components identified "F"
D33423	O-Seal Pack - components identified "G"
D33424	NPT Inlet Adapter



**Minimum Inlet Hot Water Supply Temperature**

Rada Z358-40 will require a minimum inlet hot water supply temperature, which must be correlated with the anticipated seasonal inlet cold water supply temperature (use worst case/coldest scenario) as per Table 12-1 below.

Check Table 2 shown on Page 2 for reference when specifying inlet hot water supply temperatures.

Be sure to acknowledge the bacterial growth issues associated with low temperature hot water storage.

**Table 12-1. All figures based upon nominally equal supply pressures.**

Blend Temp. °F	Cold Water Temperature °F				
	33	40	50	60	70
65	92	86	77	69	-
66	94	88	79	71	-
67	96	89	81	73	-
68	98	91	83	75	-
69	100	93	85	76	68
70	102	95	87	78	70
71	103	97	88	80	72
72	105	99	90	82	74
73	107	100	92	84	75
74	109	102	94	86	77
75	111	104	96	87	79
76	113	106	98	89	81
77	114	108	99	91	83
78	116	110	101	93	85
79	118	111	103	95	86
80	120	113	105	97	88
81	122	115	107	98	90
82	124	117	109	100	92
83	125	119	110	102	94
84	127	121	112	104	96
85	129	122	114	106	97
86	131	124	116	108	99
87	133	126	118	109	101
88	134	128	120	111	103
89	136	130	121	113	105
90	138	132	123	115	107
91	140	133	125	117	108
92	142	135	127	119	110
93	144	137	129	120	112
94	145	139	131	122	114
95	147	141	132	124	116

## Fault Diagnosis

Symptom	Cause/Action
<b>1. Only hot or cold water from outlet.</b>	a. Inlet supplies reversed (i.e. hot supply to cold inlet). Check - Rectify.
	b. No hot water reaching mixing valve. Check.
	c. Check strainers and inlet fittings for blockage.
	d. Refer to <b>symptom 5 below</b> .
	e. Installation conditions continuously outside operating parameters.
	f. Normal function of mixing valve: indicates hot water inlet supply failure/interruption.
<b>2. Fluctuating or reduced flow rate.</b>	Normal function of mixing valve when operating conditions are unsatisfactory.
	a. Check strainers and inlet/outlet fittings for flow restriction.
	b. Ensure that minimum flow rate is sufficient for supply conditions.
	c. Ensure that dynamic inlet pressures are nominally balanced.
	d. Ensure that inlet temperature differentials are sufficient.
	e. (Subject to rectification of supply conditions). Check thermostatic performance; renew thermostat pack assembly if necessary (036-523-06).
f. Normal function of mixing valve: indicates hot water inlet supply failure/interruption.	
<b>3. No flow from mixing valve outlet.</b>	Check that all inlet flow controls are fully open.
	a. Check strainers and inlet/outlet fittings for blockage.
	b. Cold supply failure; thermostat holding correct shutdown function: rectify, and return to <b>2e above</b> .
<b>4. Blend temperature drift.</b>	Indicates operating conditions have changed.
	a. Refer to <b>symptom 2a above</b> .
	b. Hot supply temperature fluctuation(rectify and refer to <b>Commissioning</b> Page 7).
c. Supply pressure fluctuation (rectify and refer to <b>Installation</b> Page 5).	
<b>5. Hot water in cold supply or vice-versa.</b>	Indicates check valves require maintenance (refer to <b>Maintenance</b> Page 9).
<b>6. Maximum blend temperature setting too hot or too cool.</b>	a. Indicates incorrect <b>temperature setting</b> (refer to <b>Commissioning</b> Page 7).
	b. As <b>symptom 4 above</b> .
	c. As <b>symptom 5 above</b> .
	d. Check minimum inlet hot water supply table on Page 12 to ensure there is adequate hot/cold differential.
	e. Ensure that inlet pressures are nominally balanced.
<b>7. Water leaking from valve body.</b>	Seal(s) worn or damaged.
	a. Obtain Seal Pack, and renew all seals.
<b>8. Cold water does not flow after hot supply failure.</b>	a. Incorrect valve model installed. Check and rectify.
	b. Incorrect internal port sleeve assembly installed. Check identification code detailed on Page 11 and rectify.
	c. Check strainers and inlet/outlet fittings for blockage.
	d. Cold supply failure.
<b>9. How water continues to flow after cold supply failure.</b>	a. Incorrect valve commissioning. Validate the commissioning as detailed on Page 8.
	b. Less than 5°F outlet temperature rise. Normal function of Mixing Valve.



## Limited Warranty and Remedy

Armstrong Hot Water Group, 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:

#### Flo-Direct Gas Fired Water Heater

The stainless steel structure and stainless steel internals (flame, tube, pall rings, supports, etc.) shall have a ten (10) year non-prorated guarantee against burn out or any structural failure caused by materials and workmanship. Provided only clean potable water is heated. The other components on the Flo-Direct, such as valves, combustion equipment, electrical controls, and the burner shall have a two (2) year non-prorated guarantee against failure caused by materials and workmanship.

#### Flo-Rite-Temp Instantaneous Water Heater

The tube bundle shall have a 10-year guarantee against failure caused by materials or workmanship provided by Armstrong but not against gasket failure or damage caused by corrosion, water hammer or lack of proper cleaning.

#### Flo-Rite-Temp Packaged Instantaneous Water Heater

Two (2) years from the date of installation, but not longer than 27 months from the date of shipment. See above for tube bundle guarantee.

#### Flo-Eco High Efficiency Gas Water Heater

The heat exchanger and supplied integral components such as the burner, the electrical controls and valving shall have a two (2) year warranty from the date of installation but no longer than 27 months from the date of shipment. The tank and replaceable tank liner shall have a 5 year warranty from the date of shipment.

**The Brain – Model DRV80** and derivative assemblies shall have a 5-year all component parts warranty.

*Designs, materials, weights and performance ratings are approximate and subject to change without notice.  
Visit [armstronginternational.com](http://armstronginternational.com) for up-to-date information.*



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