

**American Society of Sanitary Engineering  
Seal (Certification) Program**

**Laboratory Evaluation Report for:  
Automatic Compensating Valves for Individual Showers and Tub/Shower  
Combinations**

**Tested under ASSE Standard 1016 Revised: 2005**

**Laboratory File Number:** \_\_\_\_\_

**Manufacturer** \_\_\_\_\_

**Model No.** \_\_\_\_\_

**Address** \_\_\_\_\_

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

**Other Identification Markings** \_\_\_\_\_

**Size** \_\_\_\_\_

**Connections (nominal pipe thread or copper water tube)** \_\_\_\_\_

General information and instructions for the testing engineer:

Within the text there may be items which are only advisory to conditions which experience indicates could be troublesome. It is not for evaluation related to acceptance of the product.

There may be other items for which the judgment of the test engineer will be involved. Should there be a question of compliance with that provision of the standard, a conference with the manufacturer should be arranged to enable a satisfactory solution of the question.

Should disagreement persist and compliance remain in question by the test agency, the agency shall, if the product is in compliance with all other requirements of the standard, file a complete report on the questionable items together with the test report, for evaluation by the ASSE Seal Control Board. The Seal Control Board will then review and rule on the question of compliance with the intent of the standard item involved.

Documentation of material compliance must be furnished by the manufacturer. He shall furnish to the testing agency, a bill of material which clearly identifies the material of each part included in the product construction. This identification must include any standards which relate thereto.

Product Name _____		
Model Number _____	Size(s) _____	
Date Submitted for Review _____	Date Review Complete _____	
Were the test units production models?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Or prototypes?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

**Section I**

**1.0 General**

**1.1 Application**

- Is this device intended for point-of-use?  Yes  
 No  
 Questionable
  
- Does this device provide the bather or bather's attendant access to the final flow and temperature control?  Yes  
 No  
 Questionable
  
- Does this device indicate that further mixing downstream of the device is required?  Yes  
 No  
 Questionable
  
- Does this device comply with the application section of this standard?  Yes  
 No  
 Questionable
  
- If questionable, explain: \_\_\_\_\_
  
- Is this device intended to comply with ANSI/ICC A117.1 for people with disabilities?  Yes  
 No

**1.2 Scope**

- Indicate the type of the individual control valve:  
 Type P
- Does the device have a mechanism that senses incoming hot and cold pressures and compensates for fluctuations in either to stabilize outlet temperature?  Yes  
 No  
 Questionable
  
- If questionable, explain: \_\_\_\_\_
- Type T
- Does the device have a mechanism that senses outlet temperature and compensates for fluctuations in either incoming hot and cold water temperature and/or pressure to stabilize outlet temperature?  Yes  
 No  
 Questionable
  
- If questionable, explain: \_\_\_\_\_
- Type P/T
- Does the device have a mechanism that senses outlet temperature and incoming hot and cold water pressures and compensates for fluctuations in incoming hot and cold water temperature and/or pressure to stabilize the outlet temperature?  Yes  
 No  
 Questionable

Is the device equipped with an adjustable means to limit the setting of the device towards the hot position?

- Yes
- No
- Questionable

If questionable, explain: \_\_\_\_\_

Is the device intended to be the final temperature control?

- Yes
- No
- Questionable

If questionable, explain: \_\_\_\_\_

**1.2.2 Pressure**

What is the maximum working pressure as stated by the manufacturer? \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

None specified by the manufacturer.

**1.2.3 Temperature**

What are the incoming hot and cold water temperature requirements as stated by the manufacturer?

Hot Water: \_\_\_\_\_ °F to \_\_\_\_\_ °F ( \_\_\_\_\_ °C to \_\_\_\_\_ °C)

Cold Water \_\_\_\_\_ °F to \_\_\_\_\_ °F ( \_\_\_\_\_ °C to \_\_\_\_\_ °C)

None specified by the manufacturer.

**Section II**

**2.0 Test Specimens**

2.1 How many devices of each model and/or type and size were submitted for testing? \_\_\_\_\_

2.2 How many devices of each model and/or type and size were utilized during the laboratory evaluation? \_\_\_\_\_

2.3 Were assembly and installation drawings and other data which are needed to enable a testing agency to determine compliance with this standard submitted with the device?

- Yes
- No
- Yes
- No

Were the drawings and data reviewed by the laboratory?

- Yes
- No

**Section III**

**3.0 Performance Requirements and Test Methods**

**3.1 High Temperature Conditioning Test**

What was the pressure on the hot and cold water supplies?

Hot water: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa) Cold water: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

What was the temperature of the hot and cold water supplies?

Hot water: \_\_\_\_\_ °F ( \_\_\_\_\_ °C) Cold water: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

What was the maximum outlet temperature attainable? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

What was the outlet flow rate set at? \_\_\_\_\_ GPM ( \_\_\_\_\_ L/min)

How long was the outlet flow continued? \_\_\_\_\_ minutes

Was the outlet temperature of the device adjustable from the full cold up to a minimum of 100.0 °F (37.8 °C) when the hot water inlet temperature range was from 120.0 °F to 180.0 °F (48.9 °C to 82.2 °C) and the cold water inlet temperature range was from 39.8 ° to 85.0 °F (3.9 °C to 29.4 °C)?

- Yes
- No
- Questionable

If questionable, explain: \_\_\_\_\_

Was the test performed in accordance with the standard?  Yes  
 No  
 Questionable

If questionable, explain: \_\_\_\_\_

**3.2 Working Pressure Test**

With the seating members closed and the outlet open ,what was the pressure used for this test?

\_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

Was there any indication of leakage?  Yes  
 No  
 Questionable

If questionable, explain: \_\_\_\_\_

What was the duration of the test? \_\_\_\_\_ minutes

With the seating members open and the outlet blocked, what was the pressure utilized for the test?

\_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

Was there any indication of leakage?  Yes  
 No  
 Questionable

If questionable, explain: \_\_\_\_\_

What was the duration of the test? \_\_\_\_\_ minutes

In compliance?  Yes  
 No

**3.3 Maximum Torque and/or Force Adjustment Test**

What is the maximum allowable rotary motion torque or axial motion force in ASME A112.18.1?

Rotary Torque: \_\_\_\_\_

Axial Force: \_\_\_\_\_

What rotary torque or axial force was required to adjust the device?

Rotary Torque: \_\_\_\_\_

Axial Force: \_\_\_\_\_

Was the rotary torque or axial force required to adjust the device equal to or less than the maximum allowed in ASME A112.18.1?

Yes  
 No  
 Questionable

If questionable, explain: \_\_\_\_\_

Is the device intended to be ADA compliant on the operating control of the levers?  Yes  
 No

**3.4 Life Cycle Test**

**Section 3.4.2.a**

At V1 (hot), the inlet flow pressure was: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa),  
 and the temperature was: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

At V3 (cold), the inlet flow pressure was: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa),  
 and the temperature was: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

The device outlet temperature was: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

The device outlet flow rate was: \_\_\_\_\_ GPM ( \_\_\_\_\_ L/min)

**Section 3.4.2.b**

Does the device have a separate volume control?  Yes  
 No

If the device has a separate volume control, was the volume control cycled once with each temperature cycle?  Yes

No

The control mechanism(s) were tested for \_\_\_\_\_ cycles at a rate of \_\_\_\_\_ cycles per minutes.

**Section 3.4.2.c**

What was the device's outlet temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

What was the device's outlet flow rate? \_\_\_\_\_ GPM ( \_\_\_\_\_ L/min)

At V1 (hot), the inlet flow pressures were: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa),  
and the temperature was: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

At V3 (cold), the inlet flow pressures were: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa),  
and the temperature was: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

At V2 (hot), the inlet flow pressures were: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa),  
and the temperature was: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

At V4 (cold), the inlet flow pressures were: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa),  
and the temperature was: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

The duration of Step 1 was: \_\_\_\_\_ seconds

The duration of Step 2 was: \_\_\_\_\_ seconds

The device was tested for \_\_\_\_\_ cycles.

Was the device retested to Section 3.2?  Yes

No

With the seating members closed and the outlet open ,what was the pressure used for this test?

\_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

Was there any indication of leakage?  Yes

No

Questionable

If questionable, explain: \_\_\_\_\_

What was the duration of the test? \_\_\_\_\_ minutes

With the seating members open and the outlet blocked, what was the pressure utilized for the test?

\_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

Was there any indication of leakage?  Yes

No

Questionable

If questionable, explain: \_\_\_\_\_

What was the duration of the test? \_\_\_\_\_ minutes

Was the packing nut readjusted?  Yes

No

If yes, does the device still meet the requirements of Section 3.3?  Yes

No

***(This section is to be completed only if the packing nut was readjusted)***

What rotary torque or axial force was required to adjust the device?

Rotary Torque:

Axial Force:

Was the rotary torque or axial force required to adjust the device equal to or less than the maximum allowed in ASME A112.18.1?  Yes

No

Questionable

If questionable, explain: \_\_\_\_\_

**3.5 Pressure and Temperature Variation Test**

Was the device installed in accordance with Figure 1?  Yes

No

Questionable

If questionable, explain: \_\_\_\_\_  
 What type of thermocouples were used for the test, and what was the response rate detect the 63.2% of step change?

T1:     Type J or  Type T  
           Response Time: \_\_\_\_\_ seconds  
 T2:     Type J or  Type T  
           Response Time: \_\_\_\_\_ seconds  
 T3:     Type J or  Type T  
           Response Time: \_\_\_\_\_ seconds

The sampling rate for T3 was: \_\_\_\_\_ hertz  
 In compliance?

- Yes
- No
- Questionable

If questionable, explain: \_\_\_\_\_

**3.5.2 Type P Devices**

**Section 3.5.2.1**

Incoming cold water supply pressure: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)  
 Incoming hot water supply pressure: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)  
 Incoming cold water temperature: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)  
 Incoming hot water temperature: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)  
 Outlet temperature at T3: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)  
 Flow rate: \_\_\_\_\_ GPM ( \_\_\_\_\_ L/min)

**Section 3.5.2.2**

Decrease the hot water supply pressure by 50%. What is the adjusted hot water supply pressure?  
 \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

The test duration was for \_\_\_\_\_ seconds.

Restore conditions as recorded in Section 3.5.2.1.

Increase the hot water supply pressure by 50%. What is the adjusted hot water supply pressure?  
 \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

The test duration was for \_\_\_\_\_ seconds.

Restore conditions as recorded in Section 3.5.2.1.

Decrease the cold water supply pressure by 50%. What is the adjusted cold water supply pressure?  
 \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

The test duration was for \_\_\_\_\_ seconds.

Restore conditions as recorded in Section 3.5.2.1.

Increase cold water supply pressure by 50%. What is the adjusted cold water supply pressure?  
 \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

The test duration was for \_\_\_\_\_ seconds.

Restore conditions as recorded in Section 3.5.2.1.

During the first five (5) seconds following each pressure change, was there any temperature spike greater than  $\pm 3.6$  °F ( $\pm 2.0$  °C) from the initial outlet set temperature that lasted more than one (1) second when measured at the  $\pm 3.6$  °F ( $\pm 2.0$  °C) line as noted in Figure 3?

- Yes
- No

After the initial five (5) seconds following each pressure change, was there any temperature variation at T3 greater than  $\pm 3.6$  °F ( $\pm 2.0$  °C) from the initial set temperature?

- Yes
- No

In compliance?

- Yes
- No
- Questionable

If questionable, explain: \_\_\_\_\_

**3.5.4 Type T Devices****3.5.4.1 Initial Set Conditions:**

Incoming cold water supply pressure: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

Incoming hot water supply pressure: \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

Incoming cold water temperature: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

Incoming hot water temperature: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

Outlet temperature at T3: \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

Flow rate: \_\_\_\_\_ GPM ( \_\_\_\_\_ L/min)

**Section 3.5.4.2**

Decrease the hot water supply pressure by 20%. What is the adjusted hot water supply pressure?

\_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

The test duration was for \_\_\_\_\_ seconds.

Restore conditions as recorded in Section 3.5.4.1.

Increase the hot water supply pressure by 20%. What is the adjusted hot water supply pressure?

\_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

The test duration was for \_\_\_\_\_ seconds.

Restore conditions as recorded in Section 3.5.4.1.

Decrease the cold water supply pressure by 20%. What is the adjusted cold water supply pressure?

\_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

The test duration was for \_\_\_\_\_ seconds.

Restore conditions as recorded in Section 3.5.4.1.

Increase cold water supply pressure by 20%. What is the adjusted cold water supply pressure?

\_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

The test duration was for \_\_\_\_\_ seconds.

Restore conditions as recorded in Section 3.5.4.1.

Increase the hot water supply temperature by 25.0°F ± 1.0°F (13.8°C ± .6°C) at a rate of 5.0°F ± 1.0°F (3.0°C ± .6°C) per minute.

What is the adjusted hot water temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

The test duration was for \_\_\_\_\_ seconds.

During the first five (5) seconds following each pressure change, was there any temperature spike greater than ± 5.4 °F (± 3.0 °C) from the initial outlet set temperature that lasted more than one and one-half (1.5) second when measured at the ± 5.4 °F (± 3.0 °C) line as noted in Figure 4?

 Yes No

During the first five (5) seconds following each incoming pressure or temperature change, was there any temperature spike greater than -9.0 °F (-5.0 °C) from the initial outlet set temperature that lasted more than one and one-half (1.5) seconds when measured at the -9.0 °F (-5.0 °C) line as noted in Figure 4?

 Yes No

After the initial five (5) seconds following each incoming pressure or temperature change, was there any temperature variation at T3 greater than ± 3.6 °F (± 2.0 °C) from the initial set temperature?

 Yes No

In compliance?

 Yes No Questionable

If questionable, explain: \_\_\_\_\_

**3.5.6 Type T/P Devices**

Submit test data per Sections 3.5.2.1, 3.5.2.2, 3.5.4.1 and 3.5.4.2 and the criteria information per Section 3.5.3 for Type P devices and 3.5.5 for Type T devices.

In compliance?

- Yes  
 No  
 Questionable

If questionable, explain: \_\_\_\_\_

**3.6 Cold Water Supply Failure Test, All Types**

What was the incoming cold water supply pressure? \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

What was the incoming hot water supply pressure? \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

What was the incoming cold water supply temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

What was the incoming hot water supply temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

What was the outlet temperature at T3? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

What was the flow rate? \_\_\_\_\_ GPM ( \_\_\_\_\_ L/min)

Upon cold water failure, state the time required for the flow rate to drop to 0.5 GPM (1.9 L/min): \_\_\_\_\_ seconds.

Did the outlet temperature at T3 exceed 120.0 °F (48.9 °C) prior to the reduction of flow to 0.5 GPM (1.9 L/min)?

- Yes  
 No  
 Yes  
 No  
 Questionable

In compliance?

If questionable, explain: \_\_\_\_\_

**3.7 Outlet Temperature and Flow Capacity Test**

What was the incoming cold water supply pressure? \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

What was the incoming hot water supply pressure? \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)

What was the flow rate: \_\_\_\_\_ GPM ( \_\_\_\_\_ L/min)

**Section 3.7.2.a**

What was the incoming cold water supply temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

What was the incoming hot water supply temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

With the device adjusted to the minimum outlet temperature, what was the outlet temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

With the device adjusted to the minimum outlet temperature, what was the outlet flow? \_\_\_\_\_ GPM ( \_\_\_\_\_ L/min)

Did the outlet temperature at T3 obtain 100.0 °F (37.7 °C)?

- Yes  
 No

**Section 3.7.2.b**

What was the incoming cold water supply temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

What was the incoming hot water supply temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

Maintain the device at the minimum outlet temperature. Adjust the device to the full hot position outlet temperature.

What was the outlet temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

What was the outlet flow? \_\_\_\_\_ GPM ( \_\_\_\_\_ L/min)

Did the outlet temperature at T3 exceed 120.0 °F (48.9 °C)?

- Yes  
 No

**Section 3.7.2.c**

What was the incoming cold water supply temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

What was the incoming hot water supply temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

Maintain the device at the minimum outlet temperature. Adjust the device to the full hot position outlet temperature.

What was the outlet temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

What was the outlet flow? \_\_\_\_\_ GPM ( \_\_\_\_\_ L/min)  
 Did the outlet temperature at T3 exceed 120.0 °F (48.9 °C)?

- Yes
- No

**Section 3.7.2.d**

What was the incoming cold water supply temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)  
 What was the incoming hot water supply temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)

Maintain the device at the minimum outlet temperature.

What was the outlet temperature? \_\_\_\_\_ °F ( \_\_\_\_\_ °C)  
 What was the outlet flow? \_\_\_\_\_ GPM ( \_\_\_\_\_ L/min)  
 Did the outlet temperature at T3 exceed 120.0 °F (48.9 °C)?

- Yes
- No

Did the device maintain a minimum flow rate of 2.25 GPM (8.5 L/min) throughout this test?

- Yes
- No

Did the device limit the outlet temperature to 120.0 °F (48.9 °C) or less throughout this test?

- Yes
- No

Was the device adjustable from the cold position up to a minimum of 100.0 °F (37.8 °C) outlet water temperature?

- Yes
- No

In compliance?

- Yes
- No
- Questionable

If questionable, explain: \_\_\_\_\_

**3.8 Hydrostatic Pressure Test**

What pressure was used for this test? \_\_\_\_\_ psi ( \_\_\_\_\_ kPa)  
 How long was the test conducted? \_\_\_\_\_ minutes

Was there any leakage from the device?

- Yes
- No
- Questionable

If questionable, explain: \_\_\_\_\_

**Section IV**

**4.0 Detailed Requirements**

**4.1 Markings**

Does the name or trademark of the OEM manufacturer or the name or trademark of the OEM's customer appear on the device?

- Yes
- No

Is the model marked on the device?

- Yes
- No

Is the type marked on the device?

- Yes
- No

What type is marked on the device?

- Type T
- Type P
- Type T/P

Does the type marked on the device match the type marked in Section 1.2 of this LERF?

- Yes
- No

Are the markings permanent?

- Yes
- No

Are the markings visible during field service?

- Yes
- No

Are there identifiable control settings?

- Yes
- No

Do the markings identify direction?

- Yes

- Are the marks permanent and clear?  No  
 Yes
- Are the marks visible after installation?  No  
 Yes  
 No

**4.2 Installation and Maintenance Instructions**

Were the manufacturer's instructions for installation, adjustment and maintenance included with the device?

- Yes
- No
- Does the device have an integral shut-off?  Yes  
 No
- Were warning instructions provided to install check valves on the inlets?  Yes  
 No
- Do the instructions specify how to adjust the temperature limit setting?  Yes  
 No

**4.3 Accessibility**

Are the internal parts accessible from the finished wall line for inspection, repair or replacement?

- Yes
- No

TESTING AGENCY \_\_\_\_\_

ADDRESS \_\_\_\_\_

PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_

TEST ENGINEER(S) \_\_\_\_\_

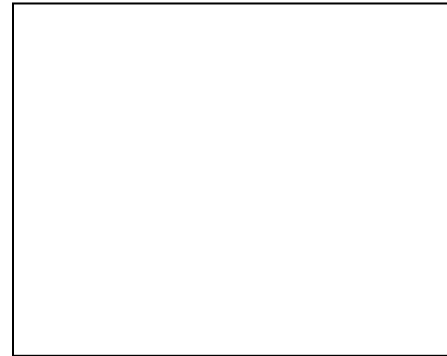
We certify that the evaluations are based on our best judgments and that the test data recorded is an accurate record of the performance of the device on test.

Signature of the official of the agency: \_\_\_\_\_

Title of the official: \_\_\_\_\_ Date: \_\_\_\_\_

Signature and seal of the Registered Professional Engineer  
supervising the laboratory evaluation:

\_\_\_\_\_  
Signature



Seal