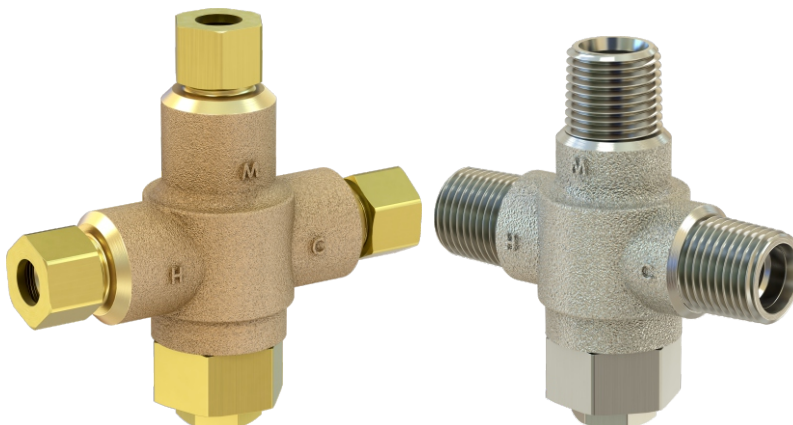




ACORN ENGINEERING COMPANY
P.O. BOX 3527
CITY OF INDUSTRY, CA 91744
UNITED STATES OF AMERICA
WWW.ACORNENG.COM

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

ST70 LAVATORY TEMPERING VALVE



Patent #9,989,017

Models ST70-38 / ST70CP-12



FOR TECHNICAL ASSISTANCE

1.800.743.8259

fieldservice@acorneng.com

Provide and install external check valves

NOTES TO THE INSTALLER:

- 1. Please leave this documentation with the owner of the fixture when finished.**
- 2. Please read this entire booklet before beginning the installation.**
- 3. Check your installation for compliance with plumbing and other applicable codes.**

LIMITED WARRANTY UNITED STATES AND CANADA

Acorn Controls warrants that its products are free from defects in material or workmanship under normal use and service for a period of one year from date of shipment. Acorn's liability under this warranty shall be discharged solely by replacement or repair of defective material, provided Acorn is notified in writing within one year from date of shipment, F.O.B. Industry, California.

This warranty does not cover installation or labor charges and does not apply to materials, which have been damaged by other causes such as mishandling or improper care or abnormal use. The repair or replacement of the defective materials shall constitute the sole remedy of the Buyer and the sole remedy of Acorn under this warranty. Acorn shall not be liable under any circumstances for incidental, consequential or direct charges caused by defects in materials, or any delay in the repair or replacement thereof. This warranty is in lieu of all other warranties expressed or implied. Product maintenance instructions are issued with each unit and disregard or non-compliance with these instructions will constitute an abnormal use condition and void the warranty.





ST70 Installation & Operation Manual

**WARNING:**

You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

FAILURE TO READ AND FOLLOW PROPER INSTALLATION AND MAINTENANCE INSTRUCTIONS MAY RESULT IN PRODUCT FAILURE WHICH CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY AND/OR DEATH.

Acorn Controls is not responsible for damages resulting from improper installation and/or maintenance. Installation of this valve shall be done in accordance with **Uniform Plumbing Code**.

TO ENSURE ACCURATE AND RELIABLE OPERATION OF THIS PRODUCT, IT IS ESSENTIAL TO:

- Properly design the system to minimize pressure and temperature variations.
- Implement an annual maintenance program to ensure proper operation and temperature setting of valve(s).
- This valve is factory preset. However, it can be adjusted to deliver scalding temperatures. It is the responsibility of the installer and or facility maintenance personnel to make sure valve outlet temperature does not exceed 110°F (43°C) after installation, maintenance or repair.

SUPPLIES REQUIRED:

(Not provided by Acorn)

1. Wall anchors, screws nuts and washers as required.
2. Teflon tape for sealing water connections.
3. Supply angle stops.
4. Supply hoses.
5. 5/8" wrench, adjustable wrench and 1/8" Allen wrench.

**IMPORTANT**

- Flush supply lines of all foreign material such as pipe dope, chips or solder prior to connecting to mixing valve.
- To ensure proper installation, review the manual thoroughly to verify rough-ins before beginning any work.
- Installation and field adjustment are the responsibility of the installer.
- Maximum water pressure is 125 psi (8.62 bars). Maximum inlet hot water temperature is 180° F (82° C). Temperature adjustment range is 85°F-115°F (29°C-46 C). Valve assembly must be drained prior to being subjected to freezing temperatures. Valve includes integral check valves.

ST70-12

PRESSURE DROP PSID (KPA)	Cv	5 (34)	10 (69)	15 (103)	20 (138)	30 (207)	45 (310)	60 (414)
FLOW RATE GPM (LPM)	0.7	1.5 (5.7)	2.1 (8)	2.6 (9.8)	3 (11.4)	3.7 (14)	4.5 (17)	5.2 (19.7)

ST70-38

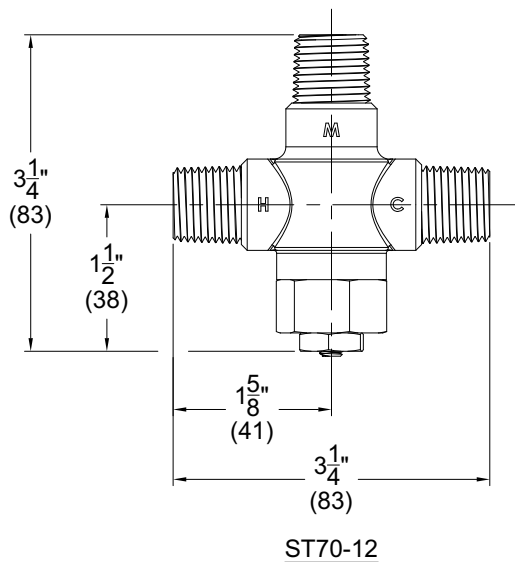
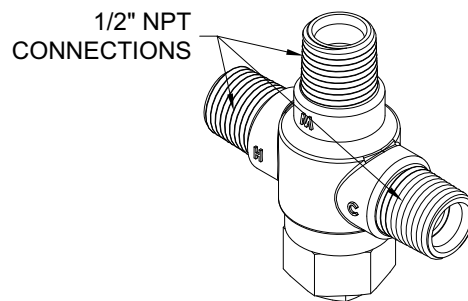
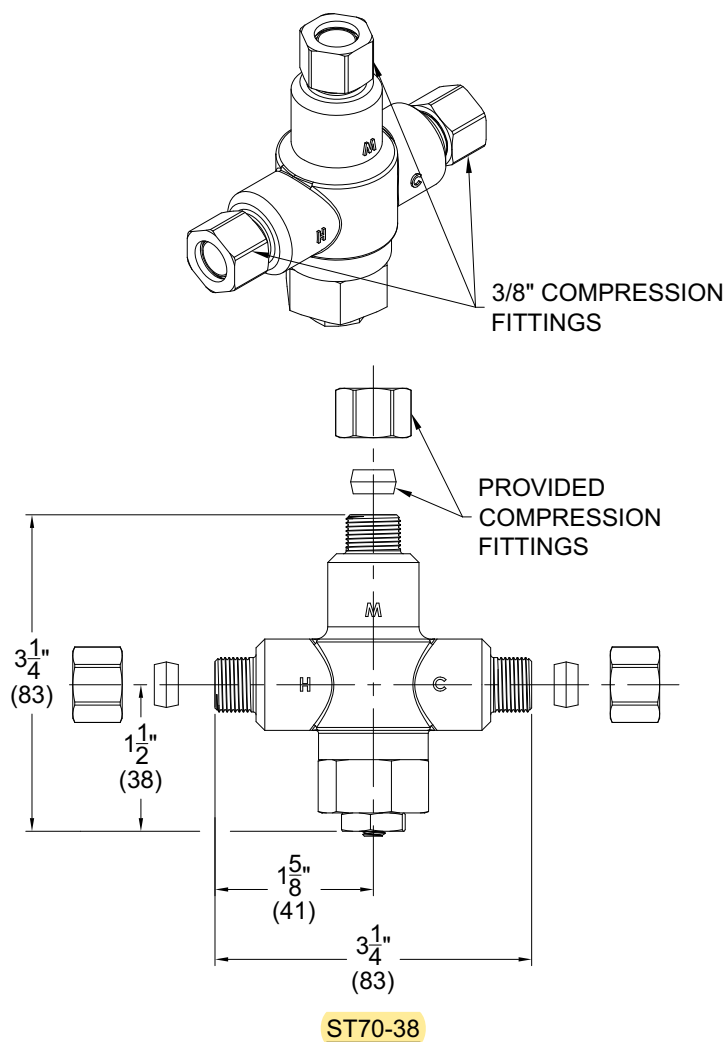
PRESSURE DROP PSID (KPA)	Cv	5 (34)	10 (69)	15 (103)	20 (138)	30 (207)	45 (310)	60 (414)
FLOW RATE GPM (LPM)	0.6	1.3 (5)	1.9 (7.1)	2.3 (8.7)	2.7 (10)	3.3 (12.4)	4 (15)	4.6 (17.5)





ST70 Installation & Operation Manual

ROUGH-IN DIMENSIONS:



NOTE;
ALL DIMENSIONS ARE IN INCHES (MM).



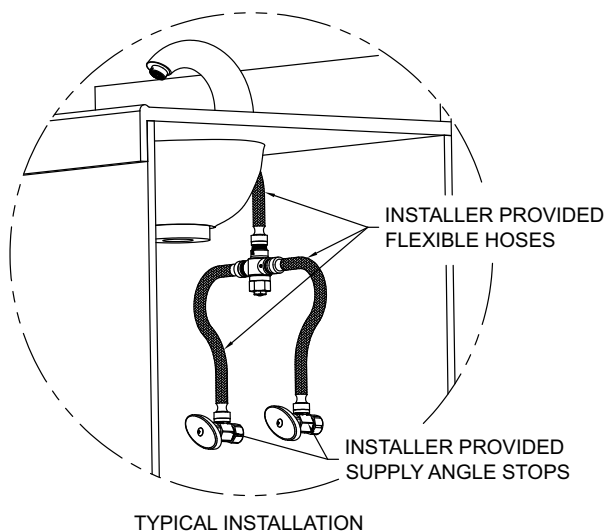
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ST70 Installation & Operation Manual

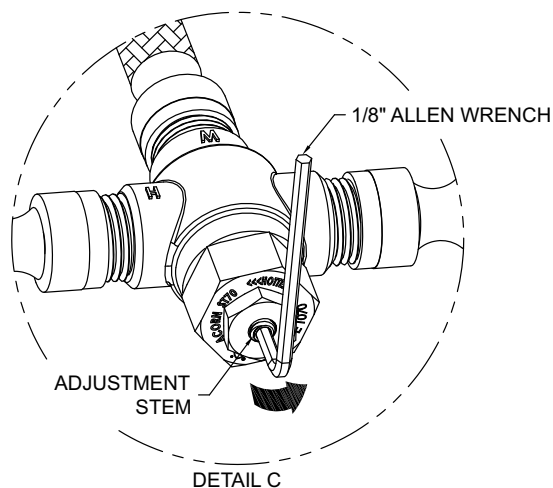
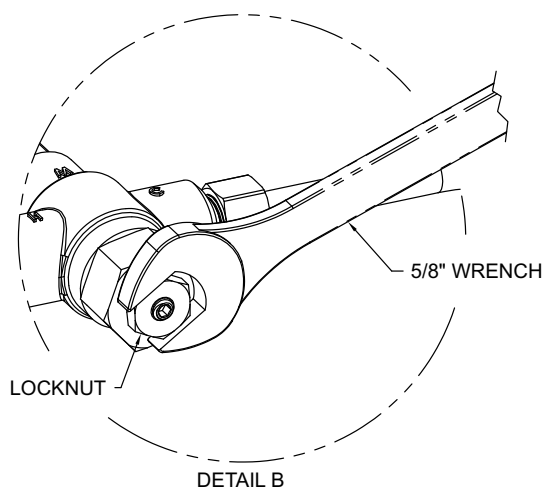
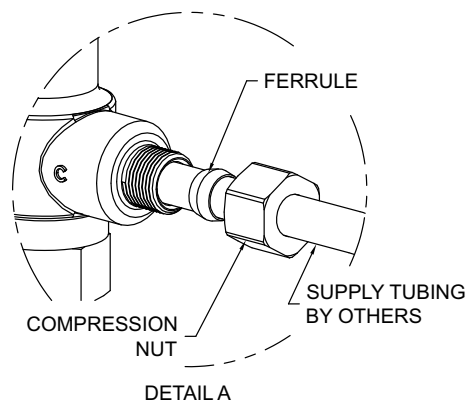
INSTALLATION:

1. Locate mixing valve in a suitable place accessible for servicing and adjusting. Valve should be as close as possible to point of use.
2. Thoroughly flush supplies.
3. Connect Hot and Cold supplies to mixing valve inlets and outlet to faucet(s). **ST70-12:** Valve connections are 1/2" NPT, for supply lines by others. **ST70-38:** Valve connections are 3/8" compression, *Detail A*. Supply tubing by others.
4. Turn on supplies and inspect for leaks. Tighten connections if leak(s) are detected.
5. Turn on faucet and allow to run until water temperature stabilizes. Measure water temperature. If water is not at desired temperature adjust as needed, (refer to adjustment section below). Maximum recommended outlet temperature is 105°F (41°C).



TEMPERATURE ADJUSTMENT:

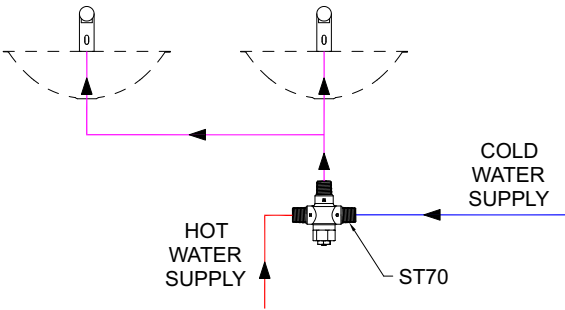
1. Loosen locknut. *Detail B*
2. Turn faucet on so water temperature can stabilize.
3. Using 1/8" allen wrench turn adjustment stem counter-clockwise for hotter or clockwise for colder outlet temperature. *Detail C*
4. Tighten locknut to prevent any unauthorized or accidental temperature adjustment.
5. Re-check temperature.



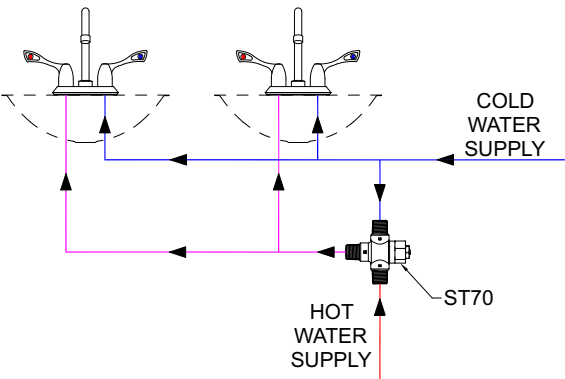
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PIPING DETAILS:



TYPICAL SINGLE TEMPERATURE FAUCET PIPING DETAIL



TYPICAL TWO HANDLE FAUCET PIPING DETAIL

- Valve Specifications:**
- Maximum Operating Pressure: 125 PSI (861 kPa)
 - Flow Rate @ 45 PSI (310 kPa) differential:
 - ST70-12: 4.5 GPM (17 LPM)
 - ST70-38: 4.0 GPM (15 LPM)
 - Minimum Flow Rate*: 0.4 GPM (1.5 LPM)
 - Maximum Hot Water Supply Temp: 180°F (82°C)
 - Minimum Hot Water Supply Temp**: 5°F (3°C) Above Set Point
 - Temperature Range*: 85°F-115°F (29°C-46°C)
 - Connections 1/2" NPT or 3/8" Compression

*In Accordance with ASSE 1070
**Under Normal Operating Conditions

TROUBLESHOOTING:

PROBLEM	CAUSE	SOLUTION
1. SET POINT DIFFICULT TO SET OR CANNOT BE REACHED	<ul style="list-style-type: none">SUPPLY TEMPS NOT WITHIN SPECIFIED LIMITSHOT AND COLD SUPPLIES ARE REVERSED	<ul style="list-style-type: none">CHECK DIFFERENTIAL PRESSURE BETWEEN SUPPLIES AND OUTLETREINSTALL VALVE WITH SUPPLIES CONNECTED TO MARKED INLETS
2. DOES NOT MAINTAIN OUTLET TEMPERATURE OR CHANGES OVER TIME	<ul style="list-style-type: none">FLUCTUATION IN SUPPLY PRESSURESCHECK VALVE/FILTERS BLOCKED WITH DEBRIS	<ul style="list-style-type: none">CHECK DIFFERENTIAL TEMPERATURE BETWEEN SUPPLIES AND OUTLETCLEAN CHECK VALVES/FILTERS
3. DISCHARGE TEMPERATURE TOO HOT OR TOO COLD	<ul style="list-style-type: none">VALVE NOT ADJUSTED PROPERLY	<ul style="list-style-type: none">READJUST VALVE TEMPERATURE PER INSTALLATION INSTRUCTIONS
4. CROSS FLOW	<ul style="list-style-type: none">CHECK VALVES FOULED	<ul style="list-style-type: none">CLEAN CHECK VALVES/FILTERS
5 NO FLOW FROM VALVE	<ul style="list-style-type: none">HOT AND COLD SUPPLY FAILURE OR SHUTOFFS CLOSEDCHECK VALVE/FILTERS BLOCKED WITH DEBRIS	<ul style="list-style-type: none">OPEN SHUTOFFS OR RESTORE HOT AND COLD SUPPLIESCLEAN CHECK VALVES AND FILTERS



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