

Warning: Please read the HCI installation & operation instructions prior to performing any installation, operation or maintenance of HCI components. Failure to follow the instructions may void the warranty, see performance guarantee and warranty guidelines.

Conditions of Sale

Performance Guarantee:

The company guarantees to the original purchaser that the equipment of its manufacture will perform at the rated capacity as stated only when (1) properly installed, connected, started, operated and maintained in accordance with Company instruction(s) and/or information Guide(s), as revised from time to time, and (2) used for the applications specified and (3) used in the environments as specified or as limited. If equipment is part of a greater system, the Company accepts responsibility only for the equipment manufactured by it.

This equipment must be installed, operated and maintained in accordance with the appropriate instruction(s) and/or information guide(s), as revised from time to time, purchases of the company's equipment waive subrogation on all items covered under their own or other insurance.

Warranty Information

The Company, for a period of five years from the date of shipment, warrants each product or system of its own manufacture to the original purchaser to be free from defects in material and workmanship under normal use, service and maintenance. Normal use, service and maintenance means:

- A. Not in excess of the maximum pressures, temperatures, volumes and rated capacities or other parameters specified in the Company's Product Bulletins, Specifications Sheets, and/or quotation(s).
- B. Using only fluids specified in the Company's Product Bulletins, Specifications Sheets, and/or quotation(s).
- C. Operation and maintenance in compliance with the appropriate instructions and/or information guides.

Warning: Read prior to the introduction of any chemicals to the system.

Caution: Introduction of chemical cleaners, stabilizers and solvents into the system may cause damage to the seats, seals, liners and gaskets or cause stress corrosion cracks in the product. Consult a water treatment specialist whenever introducing chemicals. It is important that you analyze all aspects of your systems components and the systems application with any introductions of chemicals into a system. It is solely the responsibility of the purchaser, contractor or engineer to review the material specification sheets for compatibility of these products. Due to the variety of operating conditions and applications for these products or systems, the user, is responsible for his or her own analysis and testing, and is solely responsible for making the final selection of the products and systems assuring that all performance, safety and warning requirements of the application are met. The products described herein, including without limitation, product features, specifications, designs are subject to change by Hydronic Components Inc. at any time without notice. To obtain a copy of the most current product specification sheets, installation & operation instructions or other printed material located in the product catalog, please visit www.hcitermiator.com or contact Hci at 1-800-313-HVAC.

HCI Union Nut Torque Ratings in lb/ft:

Union Nut Torque Ratings are for the following HCI Products:

Terminator A
Terminator B
Terminator (New)
Terminator U
Terminator S
Terminator Y

All products above use the following Torque Ratings per size listed:

1/2" & 3/4" Sizes 45.0 - 62.0 lb/ft
1" Sizes 59.0 - 73.7 lb/ft
1-1/4" Size 81.1 - 95.9 lb/ft
1-1/2" Size 110.6 - 125.3 lb/ft

General Information

The installation and operation data contained above represents the basics for successful use by the end user. That of course, is the goal for us here at Hci.

We are very interested at all times to customer feedback with regards to how we can make our products and our literature better. Please do not hesitate to contact your local sales representative or us directly at 1-800-313-HVAC with your questions, comments, or suggestions. You can visit us on the web at www.hcitermiator.com for product specifications, coil piping package / hose kit details and more.

Soldering, Installation, Operation and Maintenance Instructions for Terminator System Components

Soldering instructions:

WARNING! THESE VALVES ARE DESIGNED FOR SOFT SOLDERING INTO LINES WITH THE VALVE IN THE CLOSED POSITION WITH MELTING POINT TEMPERATURES NOT TO EXCEED 465 DEG. F. SEATS WILL BE DAMAGED IF HIGHER TEMPERATURES ARE EMPLOYED. PRESSURE RATINGS ON THE SOLDER JOINTS ARE ADJUSTED IN ACCORDANCE WITH ANSI B 16.18. BEFORE APPLYING HEAT, ALWAYS WRAP A WET RAG AROUND THE VALVE BODY.

1. When soldering, remove the O-ring at union connection to prevent damage of the seal.
2. Always solder the valve with the ball in the closed position. Never solder the downstream end of the valve while there is upstream pressure/or fluid trapped in the cavity around or in the ball. Make sure to cycle valve two or three times to insure no water is trapped in the ball or surrounding cavity. WARNING thermal expansion of this trapped fluid could produce excessive internal pressure and cause damage to valve seats or burst if heated excessively.
3. Care MUST be taken when heating the solder joints so as not to damage valve seats. Before applying heat, wrap a wet rag around the valve body. When applying heat direct the flame away from the valve body at the solder end connection of the valve. Great care must be taken when using oxyacetylene torches for heating, DO NOT OVER HEAT to avoid damage to the valve seats. Please refer to above warning.

Harris Stay Brite Silver Bearing Soldering

Silver Soldering:

IF SILVER SOLDERING TENSILE STRENGTH OF 14,000 PSI IS REQUIRED A LOW TEMPERATURE SILVER SOLDER IS REQUIRED. HCI RECOMMENDS HARRIS STAY BRITE SILVER BEARING SOLDER DUE TO A LIQUIDUS POINT AT 430 DEG. F. WARNING! THESE VALVES ARE DESIGNED FOR SOLDERING INTO LINES WITH THE VALVE IN THE CLOSED POSITION WITH MELTING POINT TEMPERATURES NOT TO EXCEED 465 DEG. F. SEATS WILL BE DAMAGED IF HIGHER TEMPERATURES ARE EMPLOYED. PRESSURE RATINGS ON THE SOLDER JOINTS ARE ADJUSTED IN ACCORDANCE WITH ANSI B 16.18.

1. When soldering, remove the O-ring at union connection to prevent damage of the seal.
2. Always solder the valve with the ball in the closed position.
3. Care MUST be taken when heating the solder joints so as not to damage valve seats. Please refer to above warning.

HARRIS STAY BRITE SILVER BEARING SOLDER

WARNING: PROTECT yourself and others. Read and understand this information.

FUMES AND GASES can be hazardous to your health.

HEAT RAYS (INFRARED RADIATION) from flame or hot metal can injure eyes.

· Before use, read and understand the manufacturer's instructions, Material Safety Data Sheet (MSDSs), and your employer's safety practices.

· Keep your head out of fumes.

· Use enough ventilation, exhaust at the flame, or both, to keep fumes and gases from your breathing zone and the general area.

· Wear correct eye, ear, and body protection.

· See American National Standard Z49.1, *Safety in Welding, Cutting, and Allied Processes*, published by the American Welding Society, 550 N.W. LeJeune Road, Miami, Florida 33126; OSHA Safety and Health Standards, available from the U.S.

Government Office, Washington, DC 20402

STATEMENT OF LIABILITY — DISCLAIMER

Any suggestion of product applications or results is given without representation or warranty, either expressed or implied. Without exception or limitation, there are no warranties of merchantability or of fitness for particular purpose or application. The user must fully evaluate every process and application in all aspects, including suitability, compliance with applicable law and non-infringement of the rights of others. J.W. Harris Co., Inc. and its affiliates shall have no liability in respect thereof.

NOMINAL COMPOSITION:

Silver 3.4-3.8 %

Tin Remainder

PHYSICAL PROPERTIES:

Color Bright Silver

Solidus 430°F (221°C)

Liquidus 430°F (221°C)

Electrical Conductivity 16.4

Elongation 48%

Tensile Strength 14,000 psi

Shear Strength 10,600 psi

All statements, information and data given are believed to be accurate and reliable but are presented without guarantee, warranty or responsibility of any kind, expressed or implied.

Additional information available at our web site: www.jwharris.com (513) 754-2000 9/01 DC

HCI

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Installation, Operation and Maintenance Instructions for Terminator System Components

Soldering instructions:

WARNING! THESE VALVES ARE DESIGNED FOR SOFT SOLDERING INTO LINES WITH THE VALVE IN THE CLOSED POSITION WITH MELTING POINT TEMPERATURES NOT TO EXCEED 465 DEG. F. SEATS WILL BE DAMAGED IF HIGHER TEMPERATURES ARE EMPLOYED. PRESSURE RATINGS ON THE SOLDER JOINTS ARE ADJUSTED IN ACCORDANCE WITH ANSI B 16.18. BEFORE APPLYING HEAT, ALWAYS WRAP A WET RAG AROUND THE VALVE BODY.

1. When soldering, remove the O-ring at union connection to prevent damage of the seal.
2. Always solder the valve with the ball in the closed position. Never solder the downstream end of the valve while there is upstream pressure/or fluid trapped in the cavity around or in the ball. Make sure to cycle valve two or three times to insure no water is trapped in the ball or surrounding cavity. WARNING thermal expansion of this trapped fluid could produce excessive internal pressure and cause damage to valve seats or burst if heated excessively.
3. Care MUST be taken when heating the solder joints so as not to damage valve seats. Before applying heat, wrap a wet rag around the valve body. When applying heat direct the flame away from the valve body at the solder end connection of the valve. Great care must be taken when using oxyacetylene torches for heating, DO NOT OVER HEAT to avoid damage to the valve seats. Please refer to above warning.

NEW Terminator

1. Valve is designed to allow diagnosis and service of terminal units. Valve should be installed with union between handle and coil. This allows the coil to be isolated and removed.
2. The valve should be installed with the stem and/or readout port on or above the horizontal centerline. DO NOT install valve with the readout port facing down, as debris from the line can clog up the port during the readout process, which may cause it to leak.
3. The PT readout port is provided to obtain readings across the coil when used in pairs. 1/8" test probes are used to obtain readings through the membrane of the readout port. DO NOT remove the readout port from the threaded tapping when line is under pressure.
4. The valve is equipped with two 1/4" port tappings. This gives the New Terminator the ability to provide a second accessory on the valve, such as a coil drain or vent. If such an accessory is included, install so that the drain is located on the bottom of the pipe and a vent is on the top of the pipe.
5. On chilled water systems, the readout port may seep after a reading is taken. Re-install port cap, and wait approximately one minute. Re-check port. If seepage is still present, re-insert probe and remove slowly to allow port to seal.

Terminator Y (1/2"-2" Sizes)

These valves are designed with an integral strainer for the protection of downstream equipment such as coils and/or control valves. For proper operation, the valve should be installed with the flow arrow on valve body pointing in the direction of flow. The inlet of the valve assembly is the valve body side closest to the handle, the outlet is the union/tailpiece side.

Installation:

The valve should be installed with the stem and/or readout port on or above the horizontal centerline. DO NOT install valve with the readout port facing down, as debris from the line can clog up the port during the readout process, which may cause it to leak.

Operation:

1. The PT readout port is provided to obtain pressure/temperature readings across the coil when used in pairs. 1/8" test probes are used to obtain readings. DO NOT remove the test port from tapping when line is under pressure.
2. On chilled water systems, the readout port may seep after a reading is taken. Re-install port cap, and wait approximately one minute. Re-check port. If seepage is still present, re-insert probe and remove slowly to allow port to seal.

Strainer Service:

1. Cleaning the "Y" strainer is accomplished by opening the blowdown valve installed at the blowdown connection or by simply removing the plug in the end cap. The screen can also be removed from the body by isolating the pressure conditions, removing the cover and sliding out the screen. DO NOT remove the cover or screen when line is under pressure.
2. Care should be taking in cleaning screens. After removing, they should be soaked in a cleaning solution or cleaned by using a brush. Do not allow trapped material to harden in the screen, as it will be difficult to remove. A regular cleaning schedule should be maintained so that the screens do not become clogged.

Terminator Y & S (2-1/2"-12" Sizes)

These valves are designed with an integral strainer for the protection of downstream equipment such as coils and/or control valves. For proper operation, the valve should be installed with the flow arrow on valve body pointing in the direction of flow.

Installation:

1. Assemble and tighten the flanges to the valve.
2. Align and place the assembly to the mating piping.
3. Tack weld the flanges/adaptors to pipe. DO NOT finish welding to the pipe with the valve body bolted between flanges/adaptors. This will result in serious heat damage to the valve seat.
4. Remove the flange/adaptor bolting and valve from between the flanges/adaptors.
5. Finish welding the flanges/adaptors to the pipe and allow the flanges/adaptors to cool completely before proceeding.
6. Install butterfly valve. DO NOT use flange gaskets. The molded butterfly valve gasket will seal against standard ANSI flanges.
7. Turn the disc to full open position. Center valve and hand tighten bolts.
8. Slowly close to check for adequate disk clearance.
9. Return disk to full open position and cross-tighten all bolts.

NOTE: Cap bolts are furnished and installed on the Terminator S in the 2-1/2"-3" sizes. (2) through bolts furnished by others are required for field installation on Terminator S 4"-12" sizes to make BFV to strainer body connection.

Operation:

1. The PT readout port is provided to obtain pressure/temperature readings across the coil when used in pairs. 1/8" test probes are used to obtain readings. DO NOT remove the test port from tapping when line is under pressure.
2. On chilled water systems, the readout port may seep after a reading is taken. Re-install port cap, and wait approximately one minute. Re-check port. If seepage is still present, re-insert probe and remove slowly to allow port to seal.

Strainer Service:

1. Cleaning the "Y" strainer is accomplished by opening the blowdown valve installed at the blowdown connection or by simply removing the plug in the bushing or flange cover. The screen can also be removed from the body by isolating the pressure conditions, removing the cover and sliding out the screen. DO NOT remove the cover or screen when line is under pressure.
2. Care should be taking in cleaning screens. After removing, they should be soaked in a cleaning solution or cleaned by using a brush. Do not allow trapped material to harden in the screen, as it will be difficult to remove. A regular cleaning schedule should be maintained so that the screens do not become clogged.

Soldering instructions:

WARNING! THESE VALVES ARE DESIGNED FOR SOFT SOLDERING INTO LINES WITH THE VALVE IN THE CLOSED POSITION WITH MELTING POINT TEMPERATURES NOT TO EXCEED 465 DEG. F. SEATS WILL BE DAMAGED IF HIGHER TEMPERATURES ARE EMPLOYED. PRESSURE RATINGS ON THE SOLDER JOINTS ARE ADJUSTED IN ACCORDANCE WITH ANSI B 16.18. BEFORE APPLYING HEAT, ALWAYS WRAP A WET RAG AROUND THE VALVE BODY.

1. When soldering, remove the O-ring at union connection to prevent damage of the seal.
2. Always solder the valve with the ball in the closed position. Never solder the downstream end of the valve while there is upstream pressure/or fluid trapped in the cavity around or in the ball. Make sure to cycle valve two or three times to insure no water is trapped in the ball or surrounding cavity. **WARNING** thermal expansion of this trapped fluid could produce excessive internal pressure and cause damage to valve seats or burst if heated excessively.
3. Care **MUST** be taken when heating the solder joints so as not to damage valve seats. Before applying heat, wrap a wet rag around the valve body. When applying heat direct the flame away from the valve body at the solder end connection of the valve. Great care must be taken when using oxyacetylene torches for heating, **DO NOT OVER HEAT** to avoid damage to the valve seats. Please refer to above warning.

Terminator S (1/2"-2" Sizes)

1. This valve is designed to allow diagnosis and service of terminal units. Valve should be installed with union between handle and coil. This allows the coil to be isolated and removed.
2. The valve should be installed with the stem and/or readout port on or above the horizontal centerline. **DO NOT** install valve with the readout port facing down, as debris from the line can clog up the port during the readout process, which may cause it to leak.
3. The valve is designed with an integral strainer for the protection of downstream equipment such as coils and/or control valves. For proper operation, the valve should be installed with the flow arrow on valve body pointing in the direction of flow.

Operation:

1. The PT readout port is provided to obtain pressure/temperature readings across the coil when used in pairs. 1/8" test probes are used to obtain readings. **DO NOT** remove the test port from tapping when line is under pressure.
2. On chilled water systems, the readout port may seep after a reading is taken. Re-install port cap, and wait approximately one minute. Re-check port. If seepage is still present, re-insert probe and remove slowly to allow port to seal.

Strainer Service:

Note: Strainer service requires snap ring pliers.

1. Close valve by turning valve handle to closed position. (Handle is at right angle to pipe)
CAUTION! VALVE MUST BE FULLY CLOSED PRIOR TO REMOVAL OF ACCESS CAP. FAILURE TO FULLY CLOSE VALVE MAY RESULT IN PERSONAL INJURY.
2. Relieve pressure from side access cap by opening cap slowly or by removing plug in cap.
3. Remove snap ring out of side of valve using snap ring pliers.
4. Remove strainer basket out of side of valve and clean or replace.
5. Re-install strainer basket, snap ring, cap, & cap plug.
6. Open valve to return terminal unit into service.

Backflushing the Terminator S:

Note: Backflushing the Terminator S requires the use of an optional blowdown valve in side cap in lieu of plug.

1. Close valve by turning valve handle to closed position. (Handle is at right angle to pipe)
CAUTION! OPTIONAL BLOWDOWN VALVE MUST BE FULLY CLOSED PRIOR TO CLOSING Terminator S VALVE. FAILURE TO FULLY CLOSE BLOWDOWN VALVE MAY RESULT IN PERSONAL INJURY. (SEE Fig A)
2. Remove brass cap located to the right of Terminator S valve stem.
3. Using an allen wrench, thread pin under brass cap counter clockwise to open internal backflush port.
4. Open optional blowdown valve, taking preparations for water flow into a bucket or floor drain. (SEE Fig B)
5. Allow valve to backflush for at least 4 seconds.
6. Close blowdown valve.
7. Using allen wrench, thread internal backflush port pin clockwise until seated.
8. Replace brass cap.
9. Open Terminator S valve to return terminal unit into service.

Fig A

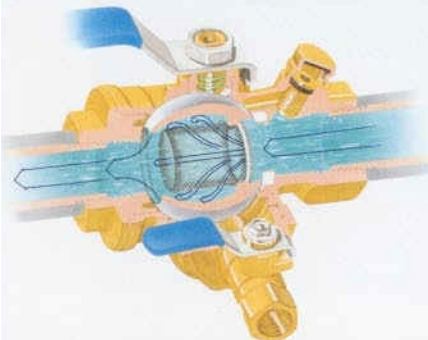


Fig B



Soldering instructions:

WARNING! THESE VALVES ARE DESIGNED FOR SOFT SOLDERING INTO LINES WITH THE VALVE IN THE CLOSED POSITION WITH MELTING POINT TEMPERATURES NOT TO EXCEED 465 DEG. F. SEATS WILL BE DAMAGED IF HIGHER TEMPERATURES ARE EMPLOYED. PRESSURE RATINGS ON THE SOLDER JOINTS ARE ADJUSTED IN ACCORDANCE WITH ANSI B 16.18. BEFORE APPLYING HEAT, ALWAYS WRAP A WET RAG AROUND THE VALVE BODY.

1. When soldering, remove the O-ring at union connection to prevent damage of the seal.
2. Always solder the valve with the ball in the closed position. Never solder the downstream end of the valve while there is upstream pressure/or fluid trapped in the cavity around or in the ball. Make sure to cycle valve two or three times to insure no water is trapped in the ball or surrounding cavity. WARNING thermal expansion of this trapped fluid could produce excessive internal pressure and cause damage to valve seats or burst if heated excessively.
3. Care MUST be taken when heating the solder joints so as not to damage valve seats. Before applying heat, wrap a wet rag around the valve body. When applying heat direct the flame away from the valve body at the solder end connection of the valve. Great care must be taken when using oxyacetylene torches for heating, DO NOT OVER HEAT to avoid damage to the valve seats.
Please refer to above warning.

Terminator B

Installation:

1. The Terminator B is a flow readout and balancing device. For it to operate properly, the flow arrow on the valve body must be in the direction of flow.
2. The valve should be installed with the stem and/or readout port on or above the horizontal centerline. DO NOT install valve with the readout port facing down, as debris from the line can clog up the port during the readout process, which may cause it to leak.

Operation:

1. The PT readout port is provided to obtain differential pressure/temperature readings for flow measurement and balancing. 1/8" test probes are used to obtain readings. DO NOT remove test port from tapping when line is under pressure.
2. To take readings, a differential pressure gauge calibrated in inches of water must be used. Connect the "high" side line to the port marked "H" (closest to the union), and the "low" side line to the port marked "L" (closest to the handle). The reading taken is then used with the Terminator B Pressure Drop Diagram (located in Components Specification Section, behind Terminator B spec sheet) to determine the flow rate.

Note: For best results, make sure that the pipe in which the valve is installed, is free of debris, and that the water is devoid of entrained air.

To Balance:

1. Take an initial flow reading with the valve fully open as described in Step 2 above. Use this reading as a baseline for the valve.
2. Using a flow chart for the valve, determine the differential pressure needed across the venturi to obtain the required flow rate. Record this differential pressure on the balancing sheet.
3. Throttle the valve until the desired differential pressure is indicated on the gauge. Loosen the memory stop on the valve handle, and rotate the stop counterclockwise until it rests on the valve body stop. Tighten the memory stop.
4. Record the indicator pad setting on balancing sheet next to differential pressure reading. This will allow the valve to be properly reset in the event that the memory stop setting is lost.

Note: On chilled water systems, the readout ports may seep after a reading is taken. Re-install port caps, and wait one minute. Re-check port. If seepage is still present, re-insert port and remove slowly to allow port to seal.

To Vent Air:

This valve has been designed to take advantage of the cavitation which often occurs across valves on the low pressure (outlet) side of the coil. An air vent tapping has been provided on top of the ball valve which will vent air ONLY if the valve is partially opened or closed. To vent a coil:

1. Make sure an optional air vent is installed in tapping. If not, one may be installed at any time that the ball valve is fully closed.
2. Close the valve at least 50%, but no more than 80%. Open vent to purge air from coil.

Terminator MS

Installation:

The Terminator MS is a flow readout metering device. For it to operate properly, the flow arrow on the valve body must be in the direction of flow.

1. Weld the flanges/adaptors to the pipe and allow the flanges/adaptors to cool completely before proceeding.
2. Align and place the assembly to the mating piping. Assemble and tighten the flanges of venturi to the pipe flanges.

Operation:

1. The PT readout port is provided to obtain differential pressure/temperature readings for flow measurement and balancing. 1/8" test probes are used to obtain readings. DO NOT remove test port from tapping when line is under pressure.

2. To take readings, a differential pressure gauge calibrated in inches of water must be used. Connect the "high" side line to the port marked "H" (closest to the union), and the "low" side line to the port marked "L" (closest to the handle). The reading taken is then used with the Terminator B Pressure Drop Diagram (located in Components Specification Section, behind Terminator B spec sheet) to determine the flow rate.

Note: For best results, make sure that the pipe in which the valve is installed, is free of debris, and that the water is devoid of entrained air.

To Balance Flow: (If a butterfly valve is downstream)

1. Take an initial flow reading with the valve fully open as described in Step 2 above. Use this reading as a baseline for the valve.
2. Using a flow chart for the valve, determine the differential pressure needed across the venturi to obtain the required flow rate. Record this differential pressure on the balancing sheet.
3. Throttle the valve until the desired differential pressure is indicated on the gauge. Loosen the memory stop on the valve handle, and rotate the stop counterclockwise until it rests on the valve body stop. Tighten the memory stop.
4. Record the indicator pad setting on balancing sheet next to differential pressure reading. This will allow the valve to be properly reset in the event that the memory stop setting is lost.

Note: On chilled water systems, the readout ports may seep after a reading is taken. Re-install port caps, and wait one minute. Re-check port. If seepage is still present, re-insert port and remove slowly to allow port to seal.

To Vent Air:

This valve has been designed to take advantage of the cavitation which often occurs across valves on the low pressure (outlet) side of the coil. An air vent tapping has been provided on top of the ball valve which will vent air ONLY if the valve is partially opened or closed. To vent a coil:

1. Make sure an optional air vent is installed in tapping. If not, one may be installed at any time that the ball valve is fully closed.
2. Close the valve at least 50%, but no more than 80%. Open vent to purge air from coil.

Soldering instructions:

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1. When soldering, remove the O-ring at union connection to prevent damage of the seal.
2. Always solder the valve with the ball in the closed position. Never solder the downstream end of the valve while there is upstream pressure/or fluid trapped in the cavity around or in the ball. Make sure to cycle valve two or three times to insure no water is trapped in the ball or surrounding cavity. WARNING thermal expansion of this trapped fluid could produce excessive internal pressure and cause damage to valve seats or burst if heated excessively.
3. Care MUST be taken when heating the solder joints so as not to damage valve seats. Before applying heat, wrap a wet rag around the valve body. When applying heat direct the flame away from the valve body at the solder end connection of the valve. Great care must be taken when using oxyacetylene torches for heating, DO NOT OVER HEAT to avoid damage to the valve seats.
Please refer to above warning.

Terminator A (1/2"- 1-1/2" Sizes)

Installation:

1. The Terminator A is an automatic flow balancing device. For it to operate properly, the flow arrow on the valve body must be in the direction of flow. The inlet of the valve assembly is the union/tailpiece side, the outlet is the valve body side closest to the handle.
2. The valve should be installed with the readout ports on or above the horizontal centerline. DO NOT install valve with the readout port facing down, as debris from the line can clog up the port during the readout process, which may cause it to leak. The valve can be installed vertically or horizontally.
3. There are no minimum upstream or downstream straight-piping requirements for the Terminator A.

Operation:

The Terminator A valves are pre-assembled in the factory with spring loaded cartridges individually calibrated for GPM flow rates. They are designed to maintain that flow rate within the rated PSI range specified; IE. 2-50 PSI, the first number indicates the minimum differential pressure in PSI required for that cartridges GPM rating. The second number indicates the maximum differential pressure in PSI for that cartridges GPM rating.

Flow Rate Verification:

Verification of flow rate can be achieved by measuring the differential pressure across the valve using the PT ports provided. (These ports are only for verification and not for flow measurement or GPM adjusting, to achieve a different flow rate a new cartridge must be installed.) If the differential pressure measures in between the specified pressure range the specified flow should be achieved. SEE NOTE BELOW - Dirt/debris or entrapped air can cause improper readings.

Note: For best results, make sure that the pipe in which the valve is installed, is free of debris, and that the water is devoid of entrained air. Air and/or debris will cause the Terminator A to function improperly. A strainer with a minimum 20 mesh screen is recommended upstream of the Terminator A to prevent clogging.

Cartridge Removal:

The Terminator A valves are pre-assembled in the factory with spring loaded cartridges individually calibrated for GPM flow rates. These cartridges are field changeable even after the valve is installed in the line/system. Removal of these cartridges requires no special tools.

1. Shut-off supply and return side isolation valves.
2. Drain coil.
3. Carefully remove the end cap and pull the cartridge out with your fingers.
4. Place O-ring/gasket on the replacement cartridge, carefully insert into valve body.
5. Replace and tighten end cap.
5. Slowly return isolation valves to the open position.
6. Vent air.

Soldering instructions:

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1. When soldering, remove the O-ring at union connection to prevent damage of the seal.
2. Always solder the valve with the ball in the closed position. Never solder the downstream end of the valve while there is upstream pressure/or fluid trapped in the cavity around or in the ball. Make sure to cycle valve two or three times to insure no water is trapped in the ball or surrounding cavity. WARNING thermal expansion of this trapped fluid could produce excessive internal pressure and cause damage to valve seats or burst if heated excessively.
3. Care MUST be taken when heating the solder joints so as not to damage valve seats. Before applying heat, wrap a wet rag around the valve body. When applying heat direct the flame away from the valve body at the solder end connection of the valve. Great care must be taken when using oxyacetylene torches for heating, DO NOT OVER HEAT to avoid damage to the valve seats.
Please refer to above warning.

Terminator U

Installation:

1. The union should be installed with the readout port on or above the horizontal centerline. DO NOT install union with the readout port with readout port facing down, as debris from the line can clog the port during the readout process, which may cause it to leak.

Operation:

1. The PT readout port is provided to obtain differential pressure/temperature readings across the coil when used in pairs.
2. On chilled water systems, the readout ports may seep after a reading is taken. Re-install port caps, and wait one minute. Re-check port. If seepage is still present, re-insert port and remove slowly to allow port to seal.

Terminator BFV (2-1/2"-12" Sizes)

1. Valve is designed to allow service of terminal units. This allows the coil to be isolated and removed.

Installation:

1. Assemble and tighten the flanges to the valve.
2. Align and place the assembly to the mating piping.
3. Tack weld the flanges/adaptors to pipe. DO NOT finish welding to the pipe with the valve body bolted between flanges/adaptors. This will result in serious heat damage to the valve seat.
4. Remove the flange/adaptor bolting and valve from between the flanges/adaptors.
5. Finish welding the flanges/adaptors to the pipe and allow the flanges/adaptors to cool completely before proceeding.
6. Install butterfly valve. DO NOT use flange gaskets. The molded butterfly valve gasket will seal against standard ANSI flanges.
7. Turn the disc to full open position. Center valve and hand tighten bolts.
8. Slowly close to check for adequate disk clearance.
9. Return disk to full open position and cross-tighten all bolts.

Flexible Hoses

Installation:

1. Adhere to allowable radius of bend. (See table below)
2. Verify the installation conditions do not cause torsion of flexible. (See figure 1 below)
3. If necessary modify the installation in the event that it is not possible to adhere to the allowable radius of bend (see paragraph 1 below). For example, add an intermediary right angle fitting (See figure 2 below).
4. Do not submit the connectors to tension, either from the installation, or as a result of pressure or expansion (see figure 3 below).
4. The braiding of the flexible must never be in contact with cement, plaster or all other materials or fluids capable of causing corrosion.

FIGURE 1

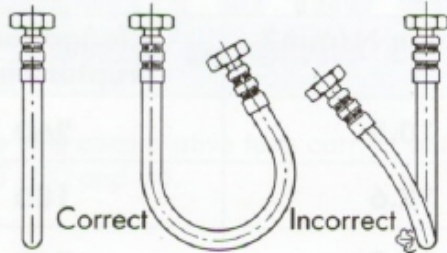


FIGURE 2

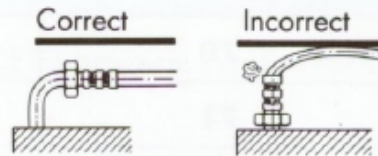
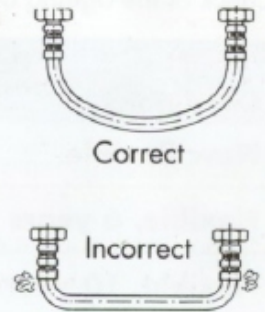


FIGURE 3



ON INSTALLATION: Avoid absolutely any tension due to stretching during the course of tightening the connectors. Do not turn fittings in the hose. Do not twist hose. Avoid sharp bends, kinking or twisting of the hose during installation. The 1/2", 3/4" and 1" hose connection is a metal to metal seal. The brass mating surfaces should be smooth and free of debris. The 1-1/4", 1-1/2" and 2" hose connection use a specially design gasket, do not install without the gasket. Do not use pipe dope or tape sealants on the metal to metal or gasket connection adapters when connecting to the swivel nut.

- A. Install and tighten the fixed male connector.
- B. Remove the swivel adapter from the swivel nut. Install and tighten the union adaptor.
- C. Install and tighten the adaptor to the swivel nut. Use two spanners in order to screw the union together: One to hold the hexagon of the adaptor. The other to tighten the nut at the same time.

IMPORTANT: Do not re-screw the fixed connector or adaptor after tightening of the swivel nut ; this will cause tensioning of the flexible with a risk of rapid deterioration at this point.

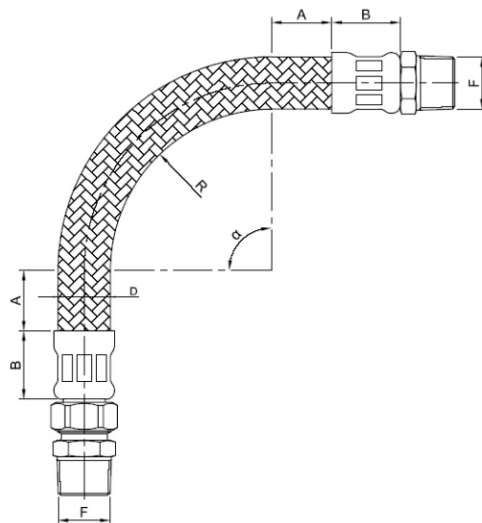
On removal, take precautions. If the flexible incorporates two fixed connectors, at least one must be installed on a counter-part fitting with a swivel connector or a union, if not installation is impossible.

INSPECTION: Hci recommends a good maintenance practice and periodic inspections, typically when servicing other components at the unit or at the installation site. Check all hoses for small water leaks, residue, discoloration on the exterior braid and fittings. If a leak is detected, stop service to the unit and replace hose immediately. Do not attempt to the repair hose.

Caution: Introduction of chemicals into the system or unit may cause damage to the inner core of the hose. Consult a water treatment specialist for chemical compatibility before using any chemical additives.

Warning: Hoses are designed for hydronic heating and cooling service only, not for gas.

FLEXIBLE ALLOWING A BEND



I.D.	F	Length (inch)	R _{min.} (mm)	A _{min.} (mm)	B (mm)	D (mm)	α _{max.}
13	1/2 - 14 NPT	12"	60	40	23	17	89°
		18"	60	40	23	17	180°
		24"	60	40	23	17	180°
		36"	60	40	23	17	180°
19	3/4 - 14 NPT	12"	80	55	35	26	32°
		18"	80	55	35	26	126°
		24"	80	55	35	26	180°
		36"	80	55	35	26	180°
25	1 - 11,5 NPT	12"	110	65	35	35	5°
		18"	110	65	35	35	75°
		24"	110	65	35	35	142°
		36"	110	65	35	35	180°
32	1 1/4 - 11,5 NPT	18"	120	100	46	42	30°
		24"	120	100	46	42	92°
		36"	120	100	46	42	180°
		18"	200	140	62	53	5°
40	1 1/2 - 11,5 NPT	24"	200	140	62	53	27°
		36"	200	140	62	53	104°
		24"	280	230	57	63	5°
50	2 - 11,5 NPT	36"	280	230	57	63	42°