Installation, Operation, and Maintenance

IntelliStation® 2

Domestic Hot Water Regulation

A Smart and Connected Digital Water Mixing Solution

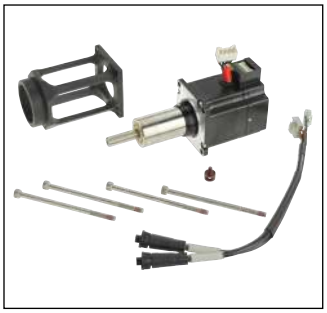
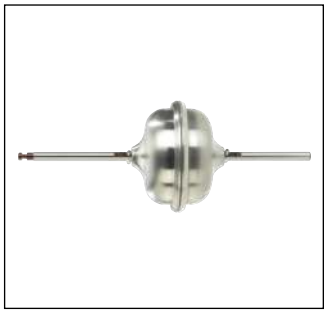
Repair Kits

For Models 2 and 2S

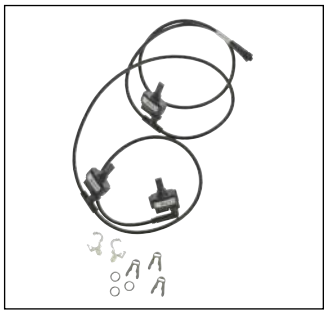
⚠ WARNING

Please read carefully before proceeding with installation. Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment.

These maintenance instructions do not replace the full product installation and operation instructions included in the original shipment of mixing valve and control unit.







POWERS™

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Repair kits and optional feature kits for IntelliStation 2 and 2S are available for all mixing valve sizes.

Use the repair kits to service the degraded or nonfunctional components of the mixing valve.

For enhancements and conveniences, add on one or more of these optional features kits:

- Cable Extension for flexibility to locate the Intellistation 2 control in a more convenient location separate from the mixing valve
- Digital Sensor Package including three temperature-pressure sensors to monitor hot inlet, cold inlet, and mixed water outlet (A separate four-sensor cable is available for monitoring recirculation.)
- Flow Sensor to support the water measurement application (Two types of clamp-on units are available.)
- NPT Tailpieces to facilitate installation flexibility

⚠ WARNING

As with any electrical product, care should be taken to guard against the potential risk of fire, electric shock, and injury to persons.

IntelliStation 2 must be powered down when parts are replaced on the mixing valve or when optional kits are installed.

Before opening the control cover, shut down the system, depressurize the valve, and drain water from the line.

Always power down the control by disconnecting the 120V source at the nearest switch, connection, or breaker panel.

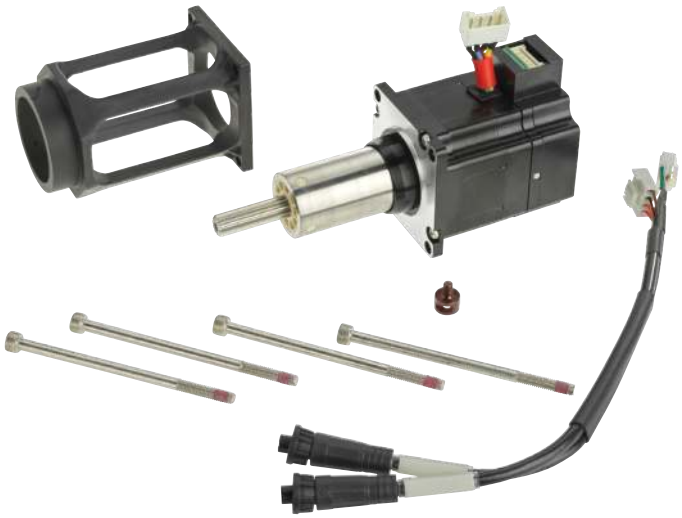
Power up the control only after parts have been properly installed and the mixing valve and control are completely reassembled.

Refer to IntelliStation 2 Installation, Operation, and Maintenance Manual for all safety and compliance information.

NOTICE

Installation of an optional flow sensor kit MUST be performed by qualified technicians, including licensed electricians and plumbers, following all manufacturer's instructions, complying with all local, state, federal and other governmental requirements, and with all building and construction codes and standards.

Actuator



NOTE: The procedures apply to all mixing valve sizes.

Wear on the motor requires replacement of the actuator from time to time. The following procedures cover how to service the actuator.

Kit contents

Actuator

Tube support

4 Bolts

Coupling

Power-encoder cable

Tools required

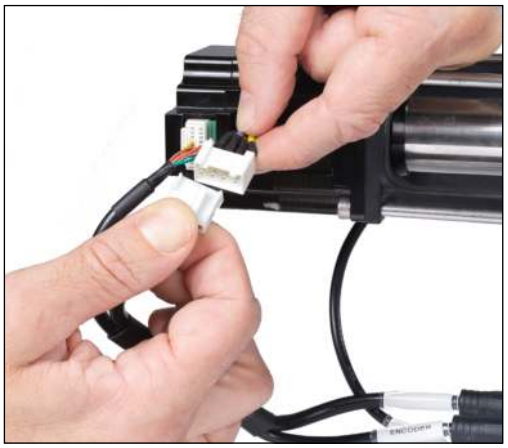
Adjustable wrench

Allen wrench, size M5

Preparation

Always power down the control by disconnecting the 120V source at the nearest switch, connection, or breaker panel.

Remove the actuator



1. Disconnect the larger ACTR connector from the port that hangs underneath the actuator by depressing the connector tab.



2. Disconnect the smaller ENCD connector from the recessed port on the actuator by depressing the connector tab.



3. Disconnect the cables from the ACTR and ENCD ports on the control unit by spinning the connector collars counter-clockwise.

Actuator



4. Use an adjustable wrench to turn the brass nut on the actuator clockwise as far as it can go and then back off 5 full turns.



5. Use an Allen wrench to unscrew the four bolts joining the actuator to the mixing valve; two on one side, two on the other.



6. Shift the actuator assembly to unhook the coupling.



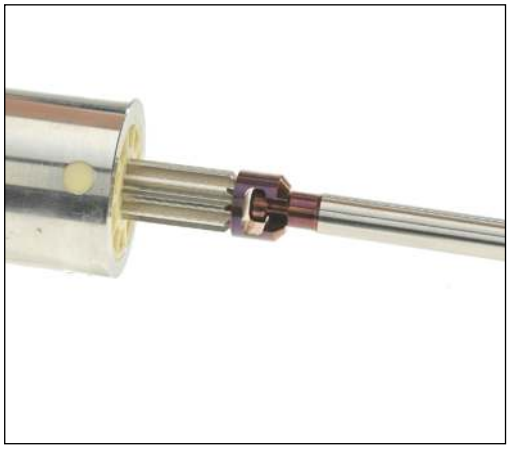
7. Remove the actuator and properly discard it later.

Actuator

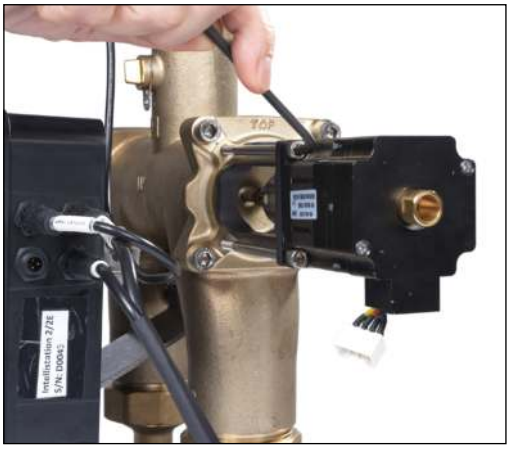
Install the replacement actuator



1. Slide the replacement actuator into the tube support.



2. When installing the actuator on the valve body, align the notch in the coupling with the groove on the shaft and swivel the actuator so that the groove slides into the coupling.



3. Make sure the cable connectors on the actuator are facing down so cables runs underneath the actuator. Insert each of the new four bolts through the tube support and into the valve body.



4. Tighten the bolts so the actuator is seated firmly in the tube support and valve body. Then attach the actuator cable to the motor and the control unit to finish. (See steps 1, 2, and 3 for visual aid.)

NOTE: During the initial power-up, the actuator makes noise as the valve recalibrates. This noise is normal and stops once the IntelliStation 2 user interface has finished loading.

Actuator Cable



NOTE: This procedure applies to all mixing valve sizes.

The power-encoder cable connects the control to the actuator. Replace immediately when damaged.

Kit contents

Power-encoder cable

Tools required

No tools required

Preparation

- Always power down the control by disconnecting the 120V source at the nearest switch, connection, or breaker panel.
- Remove the existing cable from the control unit and the actuator. Remove each circular connector by spinning the connector collar counterclockwise until loose and pulling the plug out. The connections on the actuator side of the cable are removed by depressing the locking tabs and pulling the connectors free. Discard the cable properly as electronic waste.





Unique connectors

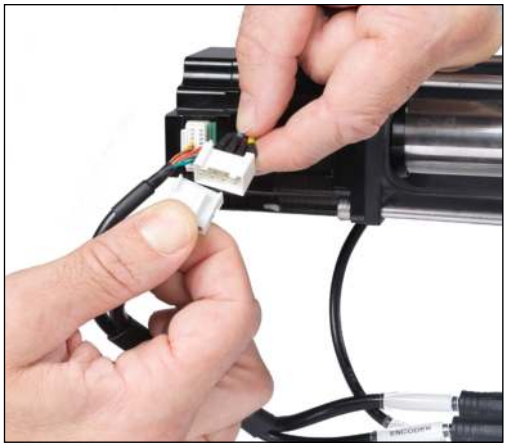
The control ports and cable connectors (TEMP, ACTR, and ENCD cables shown) are keyed to ensure proper connection of each cable to the designated port.

Actuator Cable

Replace the actuator cable



1. Attach the smaller ENCD connector to the recessed port on the actuator.



2. Attach the larger ACTR connector to the port that hangs underneath the actuator.



3. Connect the cables to the ACTR and ENCD ports on the control unit. The cables are labeled MOTOR and ENCODER and the connectors are keyed to fit only the designated ports.

Check Valves



¾" to 1"



1½"



2"

NOTE: This procedure applies to all mixing valve sizes.

Both the hot inlet and the cold inlet contain a check that must be replaced periodically to maintain the elimination of in-valve cross connections. Each inlet tailpiece has a union connection to the valve body. If the installer placed a second union on the piping to the inlet, then only the tailpieces need to be removed to service the checks. The mixing valve can remain mounted. Otherwise, the mixing valve must be dismounted to service to checks.

Before starting, make sure the replacement check valve kit matches the size of the mixing valve. The kit is available in sizes ¾" to 1", 1½", and 2".

Kit contents

2 Check valves with check O-rings attached

2 Inlet O-rings

Tools required

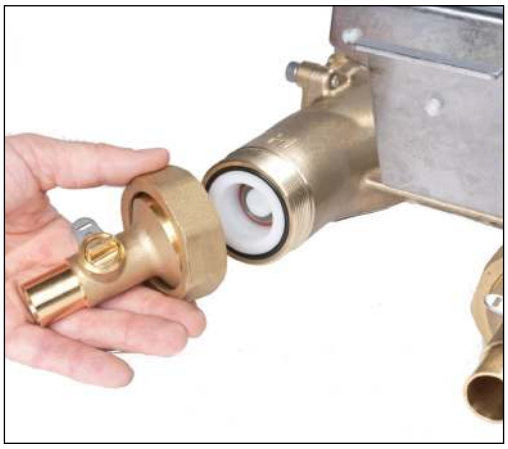
Pipe wrench

Installation tips

- For each check, there are two O-rings: one is part of the check; the other is to seal the inlet union joint.
- Never reuse the original O-rings even if there is no visible wear. Use the O-rings from the kit to complete the parts replacement.

Check Valves

Replace the inlet check valve



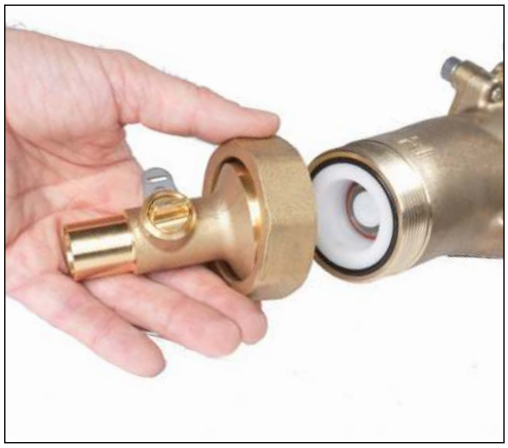
1. Using a pipe wrench, loosen the tailpiece union nuts to remove the inlet tailpieces.



2. Stick a finger into the check plunger and grab the side of the check to pull it out. Discard the check and both O-rings.



3. Align the replacement check with the ridges in the inlet and push the check in. The inlet O-ring must sit against the check and the valve body, as shown in steps 1 and 2.



4. Reinstall the tailpiece by placing the union surface of the inlet against the inlet O-ring and sliding the union nut into place. Tighten the nut enough to seal the joint. Repeat the procedure on the other inlet.

Endcaps and Shuttle



NOTE: This procedure applies to all mixing valve sizes. Use it to replace either the endcaps or the shuttle or to replace both endcaps and shuttle at the same time.

Periodically, new endcaps are needed to replace a leaking cap or internal seal. In this kit, the two endcaps come preassembled but are not identical. The endcap with the side openings is designed to fit the actuator. Replace the endcap on the actuator side first, then replace the endcap on the other side.

Before starting, make sure the replacement endcap kit matches the size of the mixing valve. The kit is available in sizes ¾" to 1½" and 2".

Kit contents

2 Endcaps

2 Seats (one with cutout to fit the actuator)

2 O-rings

8 Screws



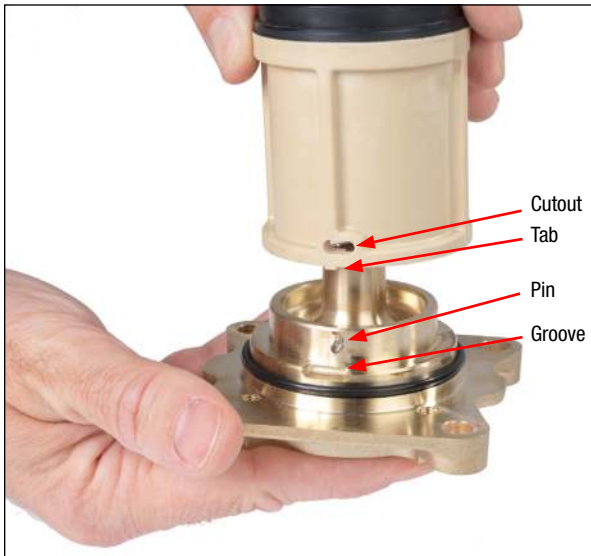
The shuttle kit is available in sizes ¾" to 1½" and 2".

Kit contents

Shuttle only

Tools required

¼" Allen key



Endcap assembly

If the endcap and the seat separated during shipping or handling, rejoin the two pieces by fitting the tab on the seat into the groove on the endcap. Insert the two endcap pins into the cutouts on the seat, then rotate the seat to lock it onto the endcap.

Endcaps and Shuttle

Detach the actuator and the endcap



1. Disconnect the larger ACTR connector from the port that hangs underneath the actuator by depressing the connector tab.



2. Disconnect the smaller ENCD connector from the recessed port on the actuator by depressing the connector tab.



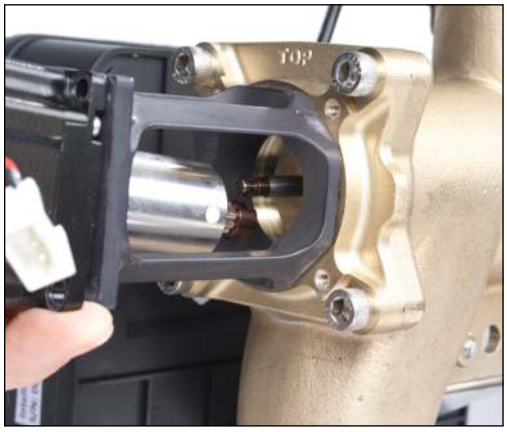
3. Disconnect the cables from the ACTR and ENCD ports on the control unit by spinning the connector collars counterclockwise.



4. Use an adjustable wrench to turn the brass nut on the actuator clockwise as far as it can go and then back off 5 full turns.



5. Use an Allen wrench to unscrew the four bolts joining the actuator to the mixing valve; two on one side, two on the other.



6. Shift the actuator assembly to unhook the coupling.

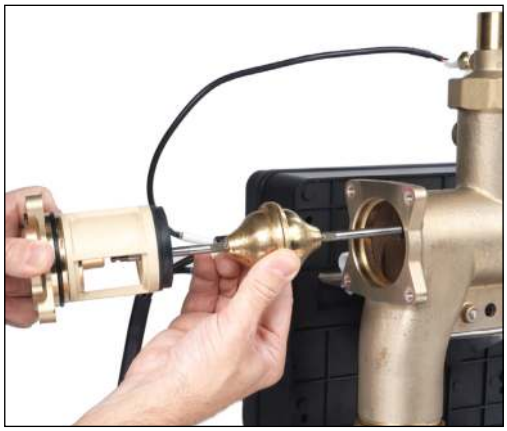
Endcaps and Shuttle



7. Remove the actuator and set it aside.



8. Loosen the four bolts on the endcap and remove it from the valve body.



9. Pull the endcap and shuttle out of the valve body and separate them.

   NOTE: Discard all parts of the used endcap assembly and/or the shuttle, if also being replaced.

Endcaps and Shuttle

Install the endcap replacement and the shuttle

NOTE: This procedure applies to endcap replacement on the actuator side of the mixing valve. Replacing the endcap on the other side of the valve is simpler. Follow the relevant steps of this procedure and the preceding one for instructional and visual aid.



1. Insert the new shuttle into the preassembled endcap, making sure the grooved end of the rod is located outside the valve body.



2. Install the endcap into the mixing valve while carefully aligning the shuttle rod so that it mates and inserts into the far side end-cap. (Make sure the TOP marking on the endcap is located on the mixing outlet side of the valve.) Reinstall and tighten the four bolts to seat the endcap in place. Then pull the shuttle rod out through the endcap far enough to connect to the actuator.

   NOTE: Insert the endcap-seat unit at a one o'clock angle then rotate the unit counterclockwise to the 12 o'clock position to line up the bolt holes. This helps hold the unit together during installation.



3. Slide the actuator into the tube support.



4. When installing the actuator on the valve body, align the notch in the coupling with the groove on the shaft and swivel the actuator so that the groove slides into the coupling.



5. Make sure the cable connectors on the actuator are facing down so cables runs underneath the actuator. Then insert each of the new four bolts through the tube support and into the valve body.



6. Tighten the bolts so the actuator is seated firmly in the tube support and valve body. Then attach the actuator cable to the motor and the control unit to finish. (See steps 1, 2, and 3 for visual aid.)

Tailpiece Replacement



NOTE: This procedure applies to all mixing valve sizes.

The standard mixing valve tailpieces (two inlets and one outlet) can be changed from standard press/sweat fittings to NPT threaded fittings. The kit includes all three replacement tailpieces and is available in these four pairings of inlet-outlet connection sizes:

¾" inlet, 1" outlet

1" inlet, 1¼" outlet

1½" inlet, 2" outlet

2" inlet, 2½" outlet

Three tailpiece NPT kit contents

2 Inlets, each with attached port plug, O-ring, and retaining clip

1 Outlet

2 Inlet O-rings

1 Outlet O-ring

Individual tailpiece press/sweat kit contents

Inlet: 1 inlet tailpiece with attached port plug, O-ring, and retaining clip, plus 1 inlet tailpiece O-ring

Outlet: 1 outlet tailpiece and 1 outlet tailpiece O-ring

Tools required

Crescent® wrench

Screwdriver

Installation tips

- Be sure the replacement tailpieces are the correct size for the mixing valve.
- Check that each assembled inlet tailpiece has been assembled with a plug, clip, and plug O-ring.
- At the tailpiece-valve connection points, inspect the inlet and outlet O-rings for damage. Use the O-rings provided in the kit to replace any O-ring that is broken or torn.

  NOTE: When replacing O-rings, make sure to use the correct size. Inlet and outlet O-ring sizes are different.
- When removing the original fittings from the mixing valve, keep temperature sensors and mounting nuts nearby. These parts must be reattached when the replacement tailpieces are installed.
- When changing tailpieces, ensure that the temperature sensor ports on the outlet and inlet tailpieces are facing forward in the same direction as the control display.

Tailpiece Replacement

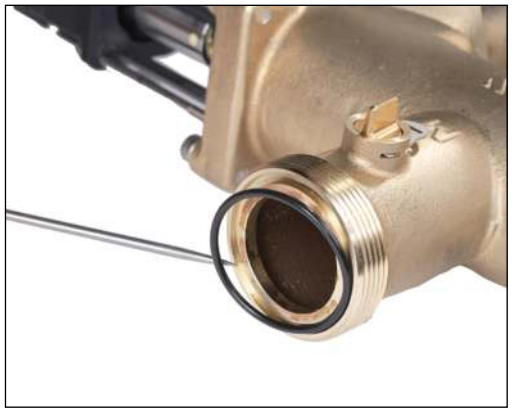
Attach the outlet tailpiece



1. Disconnect the sensor cable then unscrew the temperature sensor from the outlet tailpiece with the Crescent wrench and set the sensor aside. (For more information, see the Temperature Sensor procedure.)



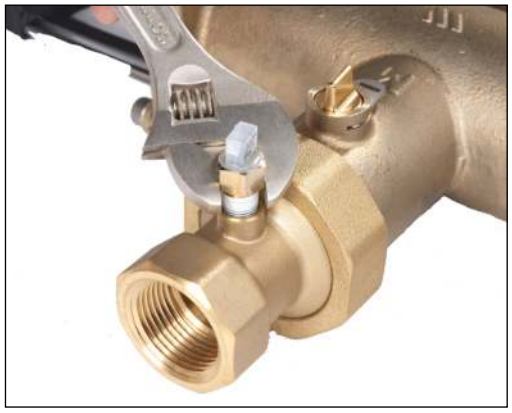
2. Remove the outlet tailpiece and set the mounting nut aside for reuse.



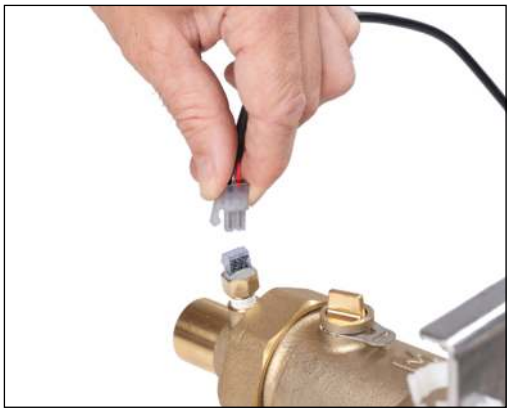
3. Examine the O-ring at the valve-tailpiece connection point and replace it if necessary.



4. Insert the replacement tailpiece through the mounting nut. Position the replacement outlet tailpiece onto the valve and O-ring then tighten the mounting nut. Make sure the port on the tailpiece is facing in the same direction as the control display.



5. Reinstall the temperature sensor and tighten the connection with the Crescent wrench.



6. Reattach the cable to the sensor.

   NOTE: For additional instructional and visual aid, see the Temperature Sensor procedure.

Tailpiece Replacement

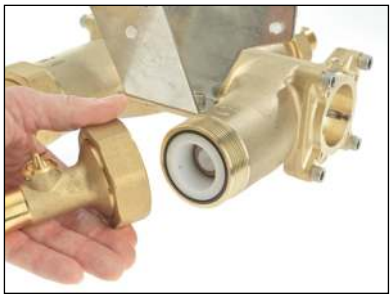
Attach the inlet tailpieces



1. Start with either inlet tailpiece and remove the retaining clip and the plug. (For instructions on plug removal, see the Digital Sensor Package procedure.



2. Dig out the O-ring with a screwdriver or another tool.



3. Loosen the inlet tailpiece nut and remove the tailpiece from the valve and set the mounting nut aside.



4. Examine the O-ring at the valve-tailpiece connection point and replace it if necessary, then reinsert the parts making sure the inlet O-ring sits against the check and the valve body.



5. Insert the replacement tailpiece through the mounting nut. Position the replacement outlet tailpiece onto the valve and O-ring then tighten the mounting nut. Make sure the port on the tailpiece is facing in the same direction as the control display.



6. Reassemble the plug and the mounting clip. (For instructions on installing the plug and clip, see the Digital Sensor Package procedure.



7. Push in the retaining clip with a screwdriver until it snaps into place. Repeat the on the other inlet tailpiece.

Temperature Sensor



NOTE: This procedure applies to all mixing valve sizes.

The main temperature sensor is an analog device. The NPT threaded sensor fits the port on the outlet tailpiece. The keyed connector on the sensor cable ensures proper connection to the control unit.

Kit contents

Analog temperature sensor

Sensor cable

Tools required

Adjustable wrench

Thread sealant or tape

Installation tips

- Always power down the control before replacing the sensor and sensor cable. Power up only after both parts have been properly installed.
- Properly discard all used parts.



Remove the sensor cable and the sensor



1. Detach the sensor cable from the TEMP port on the control unit.



2. Disconnect the cable from the analog temperature sensor by depressing the connector tab.



3. Use an adjustable wrench to unscrew the sensor from the port.

Replace the sensor and the sensor cable

1. Apply any required sealant or tape to the new sensor threads only.
2. Insert the new sensor stem into the sensor port on the outlet tailpiece and tighten with the adjustable wrench.
3. Attach the sensor cable to the sensor.
4. Connect the other end of the cable to the TEMP port on the control unit and tighten by spinning the connector collar clockwise.

Cable Extensions



NOTE: This procedure applies to all mixing valve sizes.

The cable extensions kit allows the control unit to be mounted separately from the mixing valve. With the cable extensions, the distance between the control unit and the mixing valve can be increased by 6 feet. The four extensions lengthen the standard cables for the Digital Sensor Package, bundled actuator power and encoder cords, and analog temperature sensor. Each cable extension is labeled and the connectors are keyed for mistake-proof installation.

Kit contents

DSP cable extension

Actuator power-encoder cable extensions

Analog temperature sensor cable extension

Tools required

No tools required

Preparation

Always power down the control before connecting the cable extensions.

Installation tip

For remote control mounting, remove the silver bracket from the mixing valve body and attach the bracket to another surface in a different location.

Install the cable extensions

NOTE: The cable extensions can be installed in any order.

- Connect one end of the cable extension labeled MOTOR to the actuator cable then attach the other end of the extension to the ACTR port on the control unit.
- Connect one end of the cable extension labeled OUTLET TEMP to the standard analog temperature cable then attach the other end of the extension to the TEMP port.
- Connect one end of the cable extension labeled ENCODER to the encoder cable then attach the other end of the extension to the ENCD port.
- If the Digital Sensor Package is in use, connect one end of the cable extension labeled SENSORS to the standard DSP cable then attach the other end of the extension to the SENS port.

Digital Sensor Package



NOTE: This procedure applies to all mixing valve sizes.

The optional Digital Sensor Package includes three sensors attached to a connection cable for measuring temperature and pressure at the mixed outlet, the cold inlet, and the hot inlet. The four-sensor cable, if purchased, includes the capability to monitor recirculation.

Each sensor must be installed at a specific location on the valve so that it can be properly recognized by the control. The control unit includes a keyed 3-pin quick-connect port for the sensor cable labeled SENS. The illustration below shows the connection of 3 and 4 sensor cables.

Kit contents

Factory tested cable with 3 or 4 sensors attached

2 Plastic clamps

3 or 4 O-rings

3 or 4 Retaining clips

Tools required

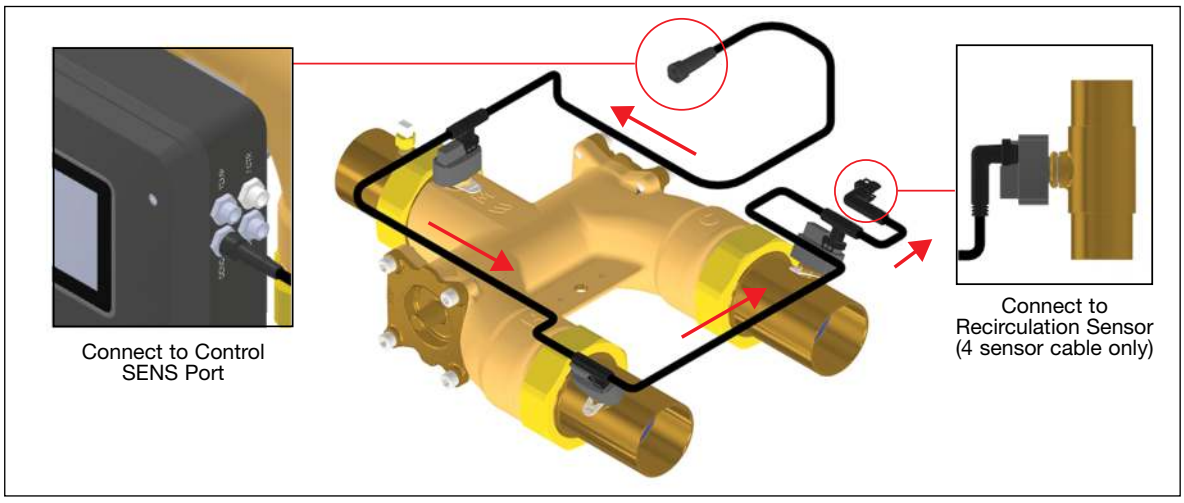
Flathead screwdriver

Preparation

Always power down the control unit before connecting the sensor cable.

Installation tips

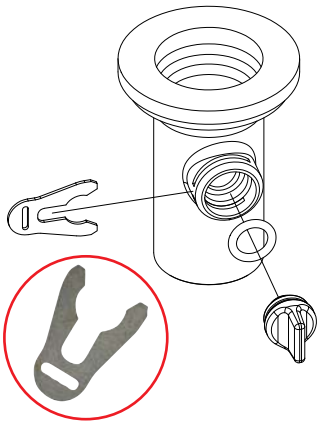
- The sensor package can be installed without dismounting the control unit.
- Each sensor port has a plug, a retaining clip, and an O-ring. (Store the port plugs to reinstall if the sensors are ever removed.)
- Use the O-rings provided in the sensor package. Never reuse the original O-rings. Do not install a new O-ring without first removing the original one.
- Make sure to remove the original retaining clips from the sensor ports and discard them.



Digital Sensor Package

Prep the ports for sensor installation

⚠ WARNING

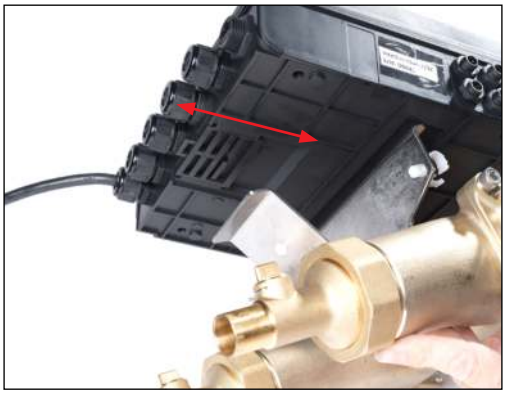


When installing the Digital Sensor Package, ALWAYS REPLACE the retaining clips on the sensor ports of the mixing valve.

The clips expand with use and, if reused, may lack the tension necessary to hold the sensors in place.

Failure to observe this warning may result in personal injury from scalding water or property damage from leaking water.

Ensure a new clip is used and firmly seated on each sensor port during installation or any maintenance that requires removal of the sensor package.



1. If necessary or desired, dismount the control unit by pulling down the tab on the back of the unit slightly, to allow the unit to be pulled forward and upward off the mounting bracket. The tab is located at the lower back side of the unit and sticks out slightly at the bottom. Store the unit in a safe location until you are ready to remount it.



2. Insert a screwdriver into the groove on the retaining clip and pull the clip out.



3. Pull the plug out of the port. Then extract the original O-ring if it was not removed with the plug. Use the end of the retaining clip or screwdriver to dig it out if necessary. Repeat steps 2 and 3 on the other sensor ports.

Digital Sensor Package

Install the sensor cable



1. Unwind the cable and insert an O-ring onto each sensor, sliding it down to the base of the sensor stem.

NOTICE

Do not place the O-ring in the groove on the sensor stem. The groove is for the retaining clip.



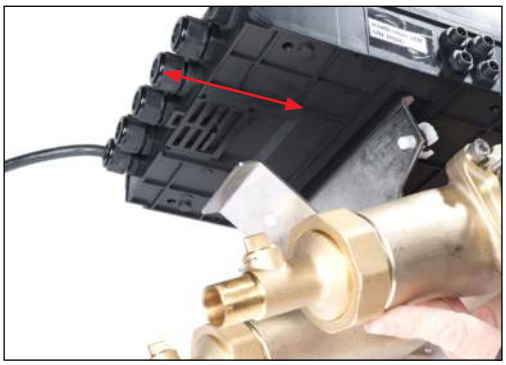
2. Install the first sensor on the mixed outlet. Insert the sensor with O-ring into the port as far as possible. While continuing to lightly press the sensor into the valve port, push in a retaining clip from the bottom to lock the sensor in place. Feel and listen for the click that signals proper installation.



3. Install the second sensor on the hot inlet (marked H) and push in the retaining clip from the left side. Feel and listen for the click that signals the sensor has been locked into place. Repeat to install the third sensor on the cold inlet (marked C), and optionally for the fourth sensor on the recirculation tee fitting.



4. Attach the plastic clamps to the mounting bracket to help manage and secure the cable.



5. Reattach the control unit to the mounting frame if it was dismounted. Hook the back of the unit onto the top of the mounting bracket first, then press the bottom of the unit into the bottom bracket. If necessary, pull down the release tab on the back of the unit slightly to guide the unit into the locked position.



6. Align the round end of the cable to the SENS port on the control unit, then push the cable in and tighten by spinning the connector collar clockwise. Reattach all other cables that may have been disconnected.

Flow Sensor

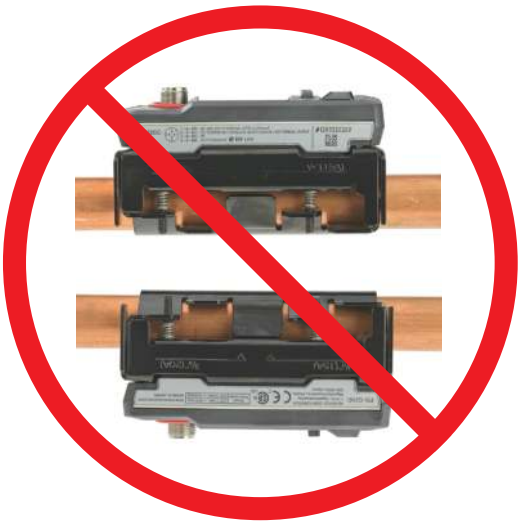
Getting familiar with mounting guidelines for the flow sensor is critical for ensuring that the sensor unit is installed at a suitable location on the pipe and is attached and aligned correctly to the pipe. Without proper installation and alignment, the sensor is unable to detect the flow of liquid or read the flow with accuracy.

Mounting Guidelines

- Do not mount the unit near pumps, bends, valves, or joints. Locate the sensor on a straight section of pipe.
- Do not mount the unit where air pockets form such as the highest section of the pipe system.
- Do not mount the unit on rusty and dirty pipes. If such pipes cannot be avoided, try to clean up or file down the buildup before mounting the sensor.
- When mounting the unit on a vertical pipe, ensure that the liquid is flowing upward.
- Do not use the equipment in environments outside of the temperature specification in the OEM manual or environments with high electrical interference fields.
- On horizontal pipes, mount the unit so that the display is perpendicular to the floor. This avoids air pockets on the top of the pipe or debris settling on the bottom of the pipe.
- Confirm that the guides on the top and bottom brackets are pressed against each other.
- Do not strip the screws. Tighten the unit to the pipe by hand or with a drill that has a torque adapter.
- Be careful not to bend the pins on the unit, particularly the ports that go between the main unit and the subunit.



Correct mounting of sensor in vertical or horizontal orientation



Incorrect mounting of sensor on top or bottom of pipe

Recommended Pipe Length

To improve the accuracy of flow rate measurement, locate the flow sensor unit on a straight section of pipe. Use the specified pipe lengths in the following table to locate the unit the proper distance from bends, joints, diffusers, reducers, control valves, and pumps. (D: Outer pipe diameter.) Example: For a 90° bend, L≥10D upstream means the length of pipe after the bend (or before the sensor) must be greater than or equal to 10 times the pipe diameter; L≥5D downstream means the length of pipe after the sensor (or before the bend) must be at least 5 times the diameter of the pipe.

CHARACTERISTIC	STRAIGHT PIPING LENGTH REQUIRED BEFORE FLOW SENSOR ON UPSTREAM SIDE	STRAIGHT PIPING LENGTH REQUIRED AFTER FLOW SENSOR ON DOWNSTREAM SIDE
90° bend	Before bend L ≥ 10D L ≥ 10D	L ≥ 5D
Tee-joint	Before tee-joint, each branch L ≥ 10D L ≥ 50D	L ≥ 10D
Expanding pipe	Before diffuser L ≥ 0.5D Diffuser L ≥ 1.5D L ≥ 30D	L ≥ 5D
Shrinking pipe	L ≥ 10D	L ≥ 5D
Flow control valve	L ≥ 30D	L ≥ 10D
Pump	L ≥ 50D	See above for requirements matching the pipe characteristic

Source: Japan Electric Measuring Instruments Manufacturers Association, Standard JEMIS032-1987.

Flow Sensor

Flow Sensor for Small Pipe Sizes ½" to 2"



Flow sensor, pipe sizes ½" to ¾"



Flow sensor, pipe sizes 1" to 1¼"



Flow sensor, pipe sizes 1½" to 2"



Power adapter with cable, optional cut-to-length power adapter cable, I/O cable, and cable glands

This clamp-on flow sensor kit is available for three ranges of pipe sizes: ½" to ¾", 1" to 1¼", and 1½" to 2".

Kit contents

Flow sensor with mounting bracket

Power adapter

Power adapter cable

Optional cut-to-length power adapter cable

I/O cable

2 Cable glands

Tools required

#2 Phillips screwdriver

Requirements

Power cord, open wiring

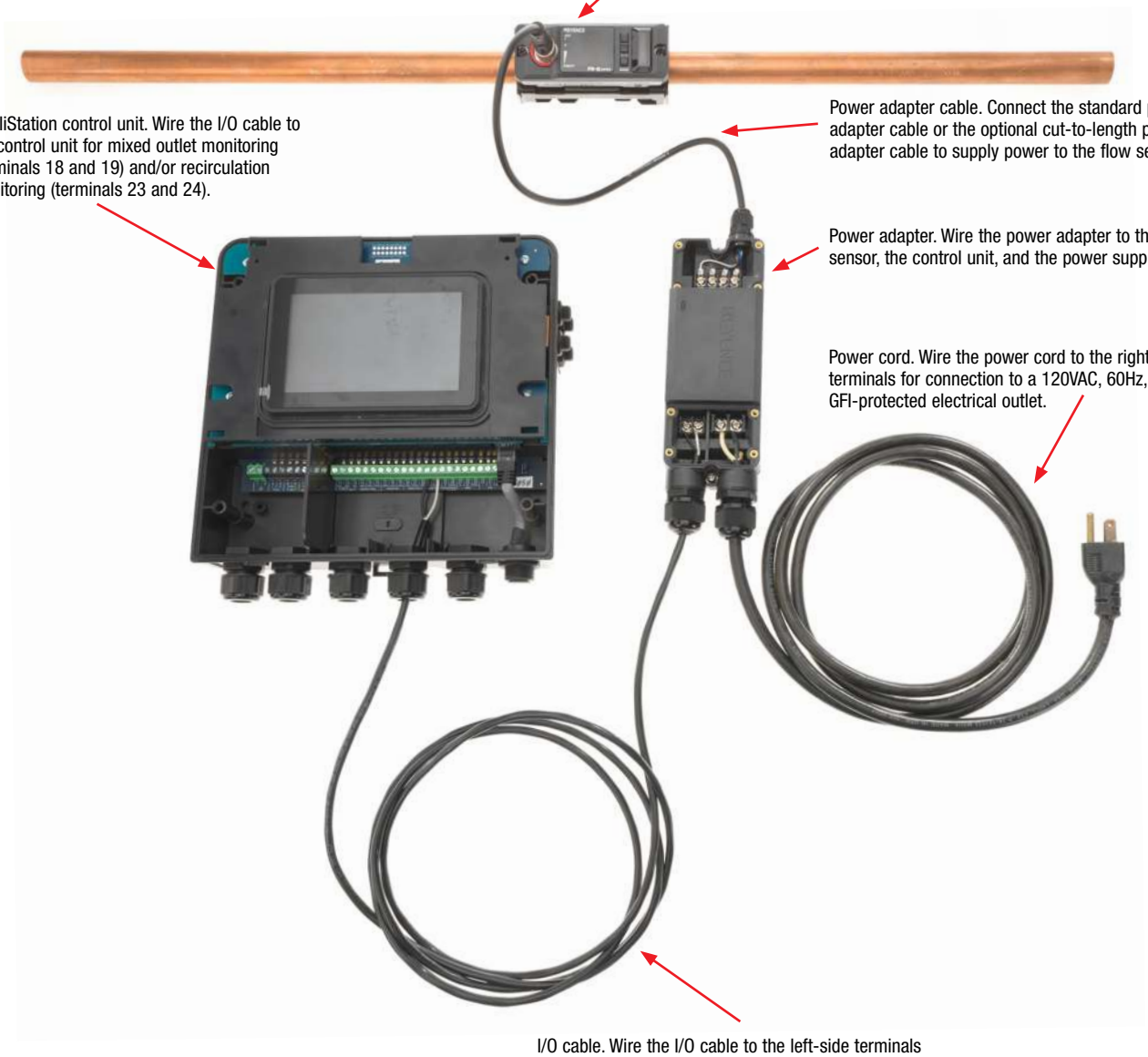
Installation tips

- Each flow sensor comes with a mounting bracket that is adjustable for the range of two pipe sizes. The mounting bracket consists of two pieces (upper bracket and base bracket) that join around a pipe for attaching the flow sensor unit.
- Rotate the base bracket 180 degrees to switch the diameter from one size to the other.
- To ensure the bracket is set for the correct diameter, place the upper bracket completely over the base bracket and check that the triangular indicator on each bracket is aligned one with the other.
- Note the complete alignment of the bracket when the two pieces are joined. On the pipe, the upper and base brackets must be installed end to end with no portion of either bracket extending beyond the other piece.
- Attach the bracket on a straight section of pipe that is an adequate distance from bends, joints, or other pipe formations.
- Locate the sensor away from direct sunlight or any other intense light and away from the radiation of a heat source.
- Ensure the sensor is located where it will not be submerged in water or other liquid.
- Whether the sensor unit is installed on the vertical or horizontal plane, the display screen must be perpendicular to the floor.
- At least two of the four stability indicators on the display screen must show steady illumination for adequate detection of flow. Only one steady indicator or one blinking indicator means detection stability is low. If necessary, change the location of the sensor unit to another straight section of pipe away from bends and joints so that at least two steady indicators are illuminated.

Flow Sensor

Install the mounting bracket and the flow sensor

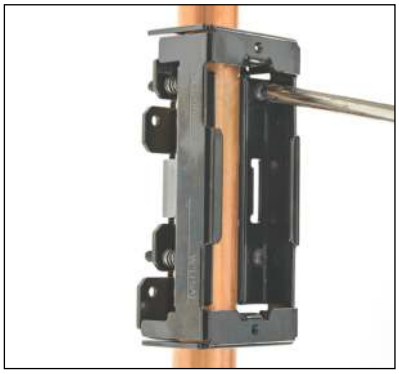
NOTE: The wiring of the flow sensor to the power source and to the control unit depends on the field configuration. A qualified electrical technician is required to complete this segment of the installation.



Flow Sensor



1. Place the base bracket on the back side of the pipe and align the upper bracket to it on the front side.



2. Join the brackets with the screws provided, tightening in a uniform manner to attain even mounting.



3. Connect either the standard power adapter cable or the optional cut-to-length power adapter to the sensor unit.



4. Connect the other end of the standard power adapter cable or the optional cut-to-length power adapter to the DC terminal port of the power adapter.

   If using the cut-to-length power adapter cable, remove the cover of the DC terminal block then disconnect and remove the existing connector cable. Thread the power adapter cable through the port and attach the WHITE wire to the ANLG terminal, BLACK wire to the N.C. terminal, BLUE wire to the 0V terminal, and BROWN wire to the 24V terminal.

   Reattach the cover and tighten the cable gland.



5. Remove the power supply cover to wire the I/O cable and the power cord.

   Connect the I/O cable to the left-side analog output block: BLACK wire to the ANLG terminal; WHITE wire to the COM terminal.

   Connect the power cord to the right-side AC power supply block: WHITE wire to the N terminal; BLACK wire to the L terminal.

   Reattach the cover and tighten the cable gland.



6. Remove the terminal cover from the control unit and attach the other end of the I/O cable.

   For mixed outlet monitoring, attach the I/O cable to the Outlet Flow terminals: BLACK wire to terminal 18 mA+ and WHITE wire to terminal 19 Com.

   For recirculation monitoring, attach the I/O cable to the Recirc Flow 2 terminals: BLACK wire to terminal 23 mA+ and WHITE wire to terminal 24 Com.

   Reattach the cover and tighten the cable gland. Plug the power cord into a 120VAC, GFI-protected electrical outlet.

Flow Sensor

Configure the sensor

Each flow sensor for small pipe sizes has three buttons for setting a configuration: Up arrow and Down arrow to scroll directionally through the menu structure and Mode to access the menu structure and choose a setting. The buttons are arranged vertically to the right of the display screen, as shown here.


Up arrow


Down arrow



Mode

When powering on the flow sensor for the first time, press Mode + Up arrow for 3 seconds to access the initial setup menu then follow these steps:

1. Use the Up or Down arrow to switch between nPn and PnP. Press Mode to choose PnP.
2. Press and hold the Up and Down arrows simultaneously to access the Unit menu. Then use the Up or Down arrow to switch from liters (L) to gallons (G). Press Mode to choose G.
3. Use the Up or Down arrow to choose AnLG, which sets Channel 1 as the control output and Channel 2 as the analog output. Press Mode to confirm the selection.
4. To change the flow direction (dir), use the Up or Down arrow to set =r (left to right) or L= (right to left). Press Mode to confirm the selection.
5. Use the Up or Down arrow to choose the bore diameter of the piping connected to the sensor (PiPE). Press Mode to confirm the selection.
6. Use the Up or Down arrow to choose End then press Mode to exit the initial settings menu.

To return to a previous screen, press Mode + Up arrow simultaneously. To restore default settings and restart this initialization process, hold down Mode and press the Up arrow 5 times.

NOTE: For complete instructions on configuration of the sensor settings, refer to the OEM manual.

IMPORTANT: The flow sensor must now be turned on in the IntelliStation 2 application. Consult the IOM-P-IntelliStation2 manual for settings.

Flow Sensor

Flow Sensor for Large Pipe Sizes 2½" to 5"



Flow sensor, pipe sizes 2½" to 3"



Flow sensor, pipe sizes 4" to 5"



Sensor connector cable, I/O cable, and cable glands

This clamp-on flow sensor kit is available for two ranges of pipe sizes: 2½" to 3" and 4" to 5".

Kit contents

Sensor connector cable

I/O cable

Cable glands

Tools required

#2 Phillips screwdriver

Requirements

Power cord, 3-prong, open wiring

Installation tips

- Attach the bracket on a straight section of pipe that is an adequate distance from bends, joints, or other pipe formations.
- Locate the sensor away from direct sunlight or any other intense light and away from the radiation of a heat source.
- Ensure the sensor is located where it will not be submerged in water or other liquid.
- Whether the sensor unit is installed on the vertical or horizontal plane, the display screen must be perpendicular to the floor.
- At least two of the four stability indicators on the display screen must show steady illumination for adequate detection of flow. Only one steady indicator or one blinking indicator means detection stability is low. If necessary, change the location of the sensor unit to another straight section of pipe away from bends and joints so that at least two steady indicators are illuminated.

Flow Sensor

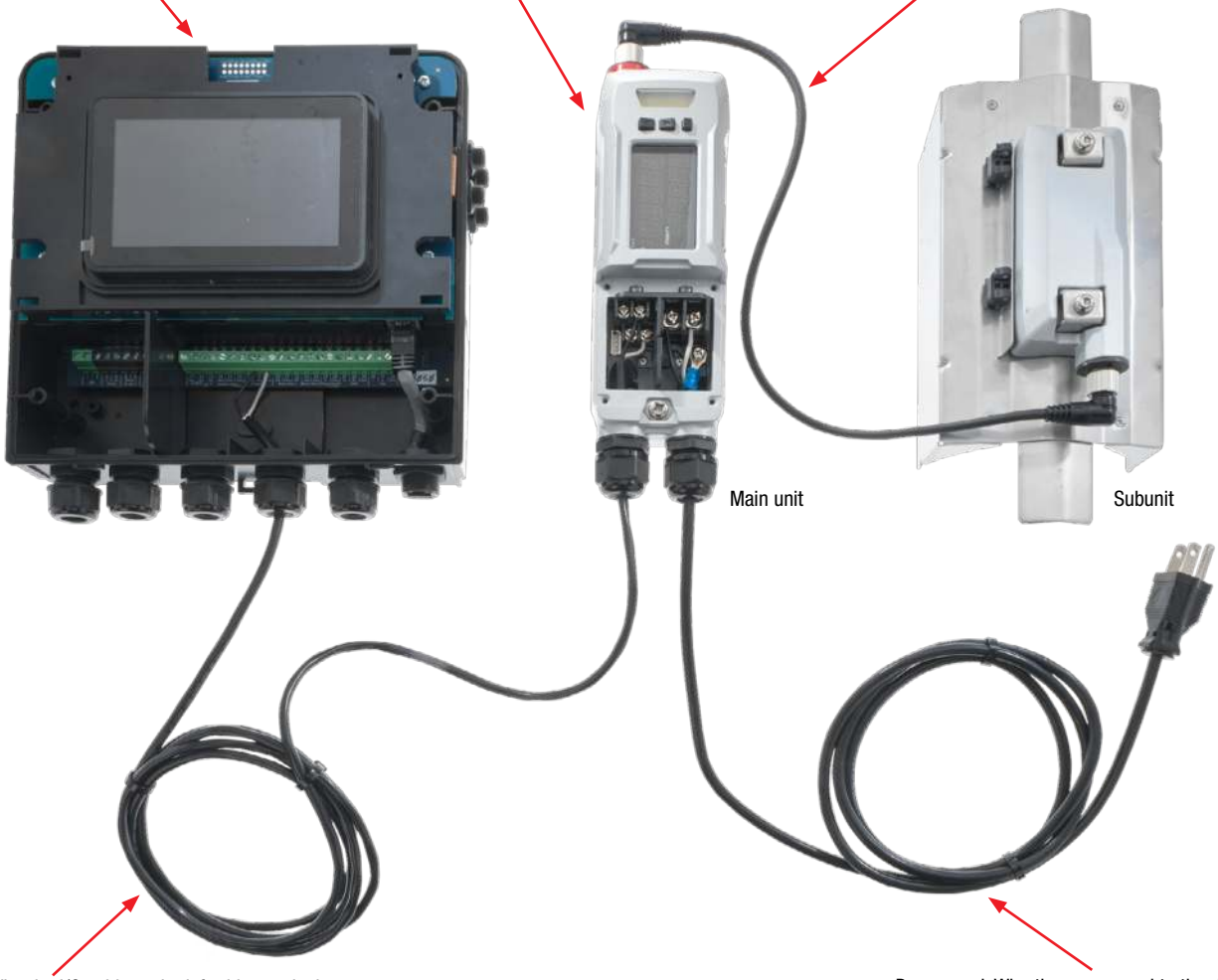
Install the mounting bracket and the flow sensor

NOTE: The wiring of the flow sensor to the power source and to the control unit depends on the field configuration. A qualified electrical technician is required to complete this segment of the installation.

IntelliStation control unit. Wire the I/O cable to the control unit for mixed outlet monitoring (terminals 18 and 19) and/or recirculation monitoring (terminals 23 and 24).

Flow sensor. The flow sensor consists of the main unit (positioned on the front side of the pipe) and the subunit (positioned on the back side of the pipe), joined by the connector cable. Install sensor unit on vertical or horizontal piping with the display screen perpendicular to the floor.

Sensor connector cable. Join the main unit to the subunit with the connector cable.

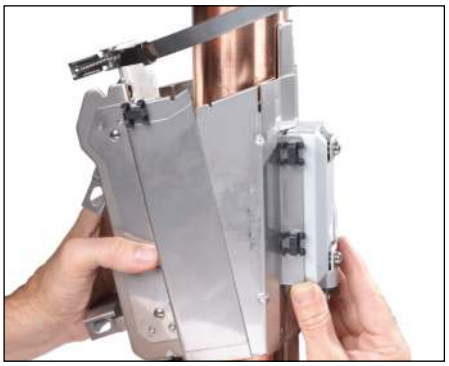


I/O cable. Wire the I/O cable to the left-side terminals to connect the flow sensor to the control unit for monitoring the mixed outlet or recirculation.

Power cord. Wire the power cord to the right-side terminals for connection to a 120VAC, 60Hz, GFI-protected electrical outlet.

Flow Sensor

Mount flow sensor 2½" to 3"



1. Place the base bracket and the upper bracket around the pipe.



2. Pull the belts tight around the pipe then close the tabs on the belts to join the base and the upper brackets.



3. Tighten the screws on the tabs to secure the brackets together.



4. Close the screw covers on each end.



5. Mount the sensor unit to the mounting bracket, securing it with the screws provided.



6. Remove the rubber cover from the connector port at the top of the unit and screw the sensor connector cable onto the main unit.



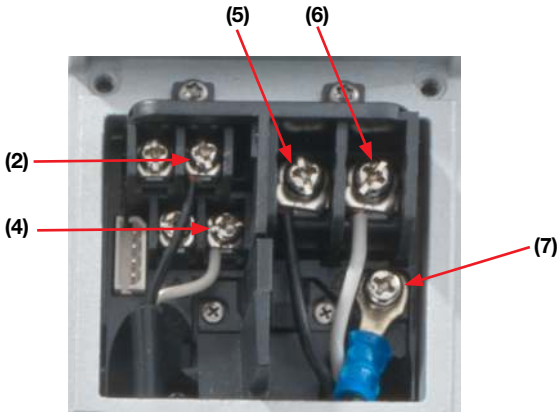
7. Thread the connector cable through the clamps on the bracket and screw the other end of the cable onto the subunit connector port.



8. Remove the power supply cover and port plugs, then disconnect the connector cable on the left side and pull out the cable.



9. Install a new cable gland on each port.

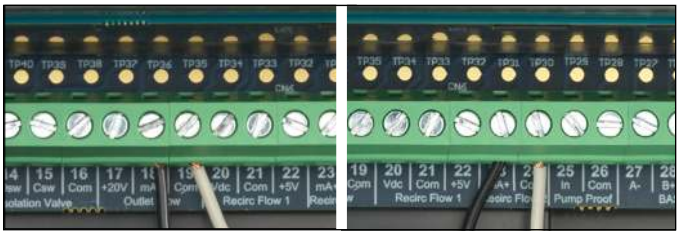


10. Thread the I/O cable through the left port. Thread the power cord through the right port.

    Attach the I/O cable to the left-side I/O terminal block: BLACK wire to the CH2 terminal (2); WHITE wire to the COM terminal (4).

    Attach the power cord leads to the right-side power supply terminal block: BLACK wire to the L terminal (5); WHITE wire to the N terminal (6); GREEN wire to the protective grounding terminal (7).

    Reattach the power supply cover.



11. Remove the terminal cover from the control unit and attach the other end of the I/O cable.

    For mixed outlet monitoring, attach the I/O cable to the Outlet Flow terminal block: BLACK wire to terminal 18 mA+ and WHITE wire to terminal 19 Com.

    For recirculation monitoring, attach the I/O cable to the Recirc Flow 2 terminal block: BLACK wire to terminal 23 mA+ and WHITE wire to terminal 24 Com.

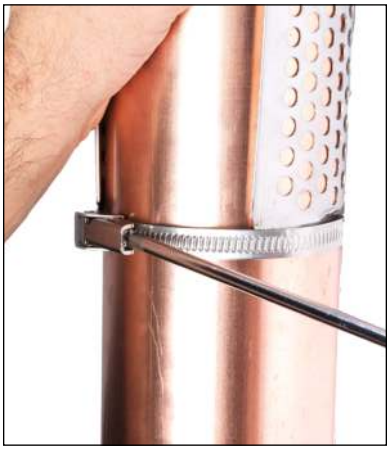
    Reattach the cover and tighten the cable gland.

Flow Sensor

Mount flow sensor 4" to 5"



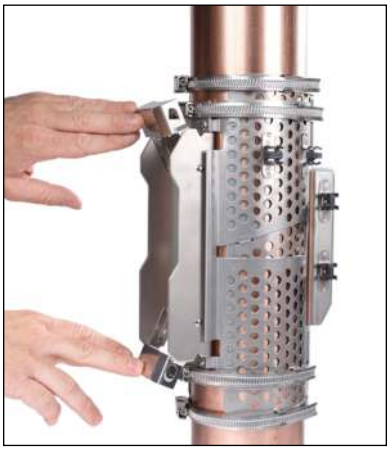
1. Place the base bracket with the subunit on the back side of the pipe.



2. Tighten the belt tab screws to lock the base bracket into place.



3. Add the upper bracket to the base bracket, locking the belts down. Make sure the small tabs on both sides of base bracket wrap around the angled edge of the upper bracket.



4. Close the screw covers.



5. Mount the sensor unit to the retaining bracket, securing it with the screws provided.



6. Remove the rubber cover from the connector port at the top of the unit and screw on the sensor connector cable.

Flow Sensor



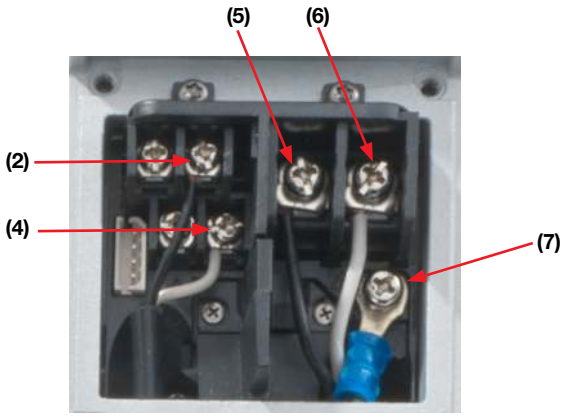
7. Thread the connector cable through the clamps on the bracket and screw the other end of the cable onto the subunit connector port.



8. Remove the power supply cover and port plugs, then disconnect the connector cable on the left side and pull out the cable.



9. Install a new cable gland on each port.

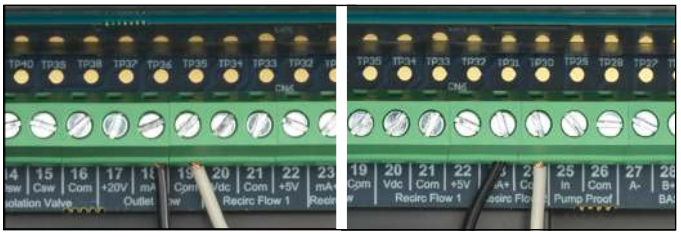


10. Thread the I/O cable through the left port. Thread the power cord through the right port

    Attach the I/O cable to the left-side I/O terminal block: BLACK wire to the CH2 terminal (2); WHITE wire to the COM terminal (4).

    Attach the power cord leads to the right-side power supply terminal block: BLACK wire to the L terminal (5); WHITE wire to the N terminal (6); GREEN wire to the protective grounding terminal (7).

    Reattach the power supply cover.



11. Remove the terminal cover from the control unit and attach the other end of the I/O cable.

    For mixed outlet monitoring, attach the I/O cable to the Outlet Flow terminal block: BLACK wire to terminal 18 mA+ and WHITE wire to terminal 19 Com.

    For recirculation monitoring, attach the I/O cable to the Recirc Flow 2 terminal block: BLACK wire to terminal 23 mA+ and WHITE wire to terminal 24 Com.

    Reattach the cover and tighten the cable gland.

Flow Sensor

Configure the sensor

Each flow sensor for large pipe sizes has three buttons for setting a configuration: Up arrow and Down arrow to scroll directionally through the menu structure and Mode to access the menu structure and choose settings. The buttons are arranged vertically to the right of the display screen, as shown here.


Up arrow


Down arrow



Mode

When powering on the flow sensor for the first time, set the configuration by following these steps:

1. Set the current date and time values by using the Up and Down arrows.
    a. Input YEAR then press Mode to confirm the selection.
    b. Input DATE (month and date) then press Mode to confirm the selection.
    c. Input TIME then press Mode to confirm the selection.
2. Press the Up or Down arrow to set channel 1 to OUT (Control output). Press Mode to confirm the selection.
3. Press the Up or Down arrow to set channel 2 to ANLG (Analog output). Press Mode to confirm the selection.
4. Press the Up or Down arrow to set the sensor output to PNP. Press Mode to confirm the selection.
5. To set the flow direction (DIR), use the Up or Down arrow to set =R (from left to right) or L= (from right to left). Press Mode to confirm the selection.
6. To set the flow unit to gallons, complete this two-part step.
    a. Press and hold Mode and the Down arrow simultaneously to access the measurement unit submenu, then use the Up or Down arrow to choose ON. Press Mode to confirm the selection.
    b. Press the Up or Down arrow to set the flow unit to G/MIN (gallons per minute). Press Mode to confirm the selection.
7. Set the temperature unit to Fahrenheit or Celsius by using the Up or Down arrow. Press Mode to confirm the selection.
8. Use the Up or Down arrow to choose the bore diameter of the piping to which the sensor is connected (PIPE). Press Mode to confirm the selection.
9. Press Mode to confirm the configuration (SAVE) then press Mode again to exit to the menu (END).

NOTE: To input advanced settings for this series of flow sensors, refer to the OEM manual for complete instructions.

IMPORTANT: The flow sensor must now be turned on in the IntelliStation 2 application. Consult the IOM-P-IntelliStation2 manual for settings.

Repair Kits

ORDERING CODE	MODEL NUMBER	DESCRIPTION
6555000	RK-IS2 CONTROLLER KIT	Control Kit, Wi-Fi and BAS Capable, Fits All Valve Sizes
6555001	RK-IS2 T&P 4 SENSOR KIT	Pre-piped System Digital Temperature and Pressure Sensor Kit with 4 Sensors
6555002	RK-IS2 FLOW KIT 1/2–3/4	Flow Sensor Kit for Pipe Sizes ½ IN to ¾ IN, Clamp on
6555003	RK-IS2 FLOW KIT 1–1 1/4	Flow Sensor Kit for Pipe Sizes 1 IN to 1¼ IN, Clamp on
6555004	RK-IS2 FLOW KIT 1 1/2–2	Flow Sensor Kit for Pipe Sizes 1½ IN to 2 IN, Clamp on
6555005	RK-IS2 FLOW KIT 2 1/2–3	Flow Sensor Kit for Pipe Sizes 2½ IN to 3 IN, Clamp on
6555006	RK-IS2 FLOW KIT 4–5	Flow Sensor Kit for Pipe Sizes 4 IN to 5 IN, Clamp on
6555007	RK-IS2 TP ADPT KIT 075VL	Tailpiece NPT Adapter Kit for 075VL, Sweat/Press to NPT Threaded End Connections
6555008	RK-IS2 TP ADPT KIT 100VL	Tailpiece NPT Adapter Kit for 100VL, Sweat/Press to NPT Threaded End Connections
6555009	RK-IS2 TP ADPT KIT 150VL	Tailpiece NPT Adapter Kit for 150VL, Sweat/Press to NPT Threaded End Connections
6555010	RK-IS2 TP ADPT KIT 200VL	Tailpiece NPT Adapter Kit for 200VL, Sweat/Press to NPT Threaded End Connections
6555011	RK-IS2 CABLE EXT KIT	Cable Extension Kit for Actuator, Encoder, Analog Sensor, and Digital Sensor Connections
6555012	RK-IS2 ACTUATOR KIT	Actuator Kit
6555013	RK-IS2 MIX TEMP SENSOR KIT	Analog Mixing Temperature Sensor Kit
6555014	RK-IS2 CAP/SEAT KIT SMALL	Cap and Seat Kit 075VL to 150VL
6555015	RK-IS2 CAP/SEAT KIT LARGE	Cap and Seat Kit 200VL
6555016	RK-IS2 TP O-RING 075VL–100VL	Tailpiece O-ring Kit 075VL to 100VL
6555017	RK-IS2 TP O-RING 150VL	Tailpiece O-ring Kit 150VL
6555018	RK-IS2 TP O-RING 200VL	Tailpiece O-ring Kit 200VL
6555019	RK-IS2 ACTUATOR CABLE KIT	Actuator Cable Kit
6555020	RK-IS2 CHECK RK 075VL–100VL	Check Repair Kit 075VL to 100VL
6555021	RK-IS2 CHECK RK 150VL	Check Repair Kit 150VL
6555022	RK-IS2 CHECK RK 200VL	Check Repair Kit 200VL
6555023	RK-IS2 TP KIT IN 075VL	Tailpiece for 075VL Inlet Sweat/Press
6555024	RK-IS2 TP KIT OUT 075VL	Tailpiece for 075VL Outlet Sweat/Press
6555025	RK-IS2 TP KIT IN 100VL	Tailpiece for 100VL Inlet Sweat/Press
6555026	RK-IS2 TP KIT OUT 100VL	Tailpiece for 100VL Outlet Sweat/Press
6555027	RK-IS2 TP KIT IN 150VL	Tailpiece for 150VL Inlet Sweat/Press
6555028	RK-IS2 TP KIT OUT 150VL	Tailpiece for 150VL Outlet Sweat/Press
6555029	RK-IS2 TP KIT IN 200VL	Tailpiece for 200VL Inlet Sweat/Press
6555030	RK-IS2 TP KIT OUT 200VL	Tailpiece for 200VL Outlet Sweat/Press
6555031	RK-IS2 T&P 3 SENSOR KIT	Valve Digital Temperature and Pressure Sensor Kit with 3 Sensors
6555032	RK-IS2 SS SHUTTLE SMALL 075VL–150VL	Stainless Steel Shuttle Kit 075VL to 150VL
6555033	RK-IS2 SS SHUTTLE LARGE 200VL	Stainless Steel Shuttle Kit 200VL

Notes

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