650 DELTA

USE AND INSTALLATION INSTRUCTIONS

Read the instructions before use. This control must be installed in accordance with the rules in force.

9.957.059 04

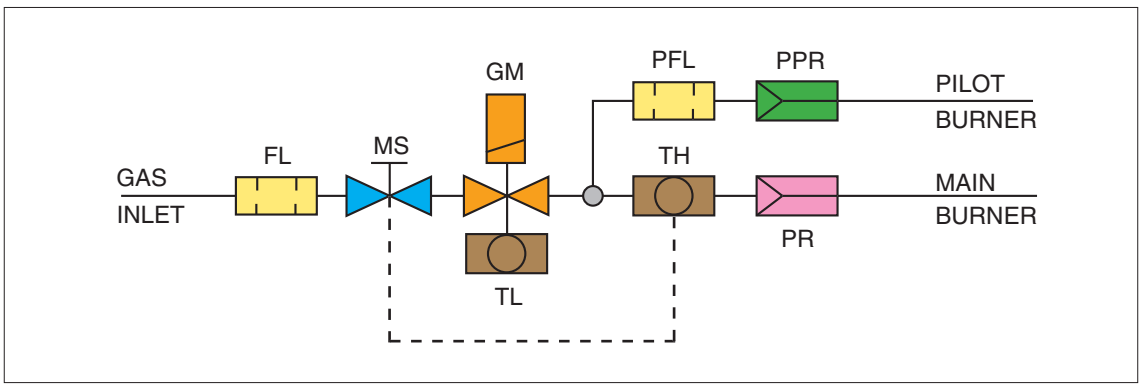
650 DELTA is a combination gas control with thermoelectric flame supervision device and ON/OFF thermostatic control.
650 DELTA is designed and intended for gas fired storage water heaters.

TECHNICAL DATA

Inlet gas connection	1/2" NPT
Main burner outlet	0.7500 - 18 - UNS 2B inverted flare
Pilot outlet	7/16"- 24 - UNS 2B
Mounting shank	3/4" NPT
Thermocouple connection	11/32" ASA
Outlet pressure test point	1/8" NPT
Installation position	any position with shank in horizontal position
Gas families	Natural Gas or Liquefied Petroleum Gas
Maximum inlet pressure	1/2 PSI
Main outlet pressure setting range	3"... 5" w.c. for NG and 8"...12" w.c. for LPG
Pilot outlet pressure setting range	3"... 6" w.c. for NG and 8"...12" w.c. for LPG
Ambient temperature range	32...175 °F

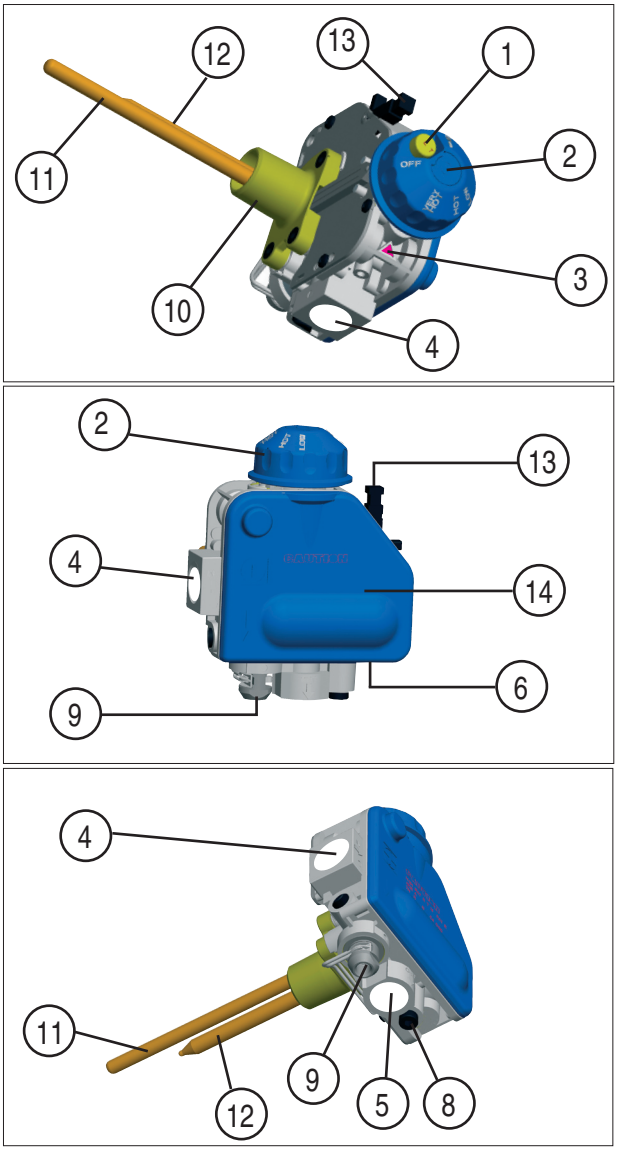
MAIN FEATURES

- Inlet filter (FL)
- Control knob for off, pilot and temperature selection (MS)
- Thermoelectric flame supervision device (GM)
- Non-resettable safety thermostat (TL)
- ON/OFF adjustable thermostat (TH)
- Pressure regulator on main burner (PR)
- Pilot filter (PFL)
- Pressure regulator on pilot burner (PPR)
- Outlet pressure test point



VALVE DESCRIPTION

1 Ignition button for thermoelectric flame supervision device
2 Control knob
3 Reference arrow mark
4 Gas inlet with protective dust cap
5 Main gas outlet with protective dust cap
6 Pilot outlet
8 Outlet pressure test point
9 Thermocouple connection
10 Mounting flange
11 Thermostat Rod
12 ECO Well
13 Piezoelectric igniter (Optional)
14 Plastic cover (Optional)



THERMOSTAT REGULATION SPECIFICATIONS

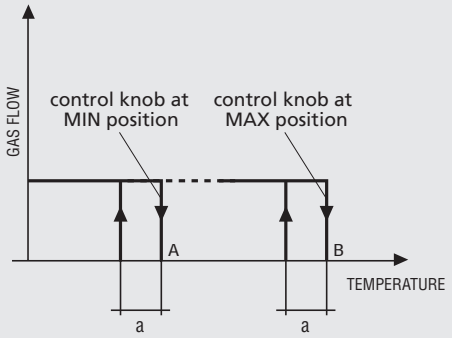
Thermostat Features

- **Regulating thermostat**

Differential (a)	16 +/-5.5 °F

- **ECO**

Type	one-shot
Calibration	196 +0/-9 °F



STOP

Do not install, replace, or in any way modify the gas valve or the appliance. Always use a QUALIFIED Gas Appliance Service Technician to service appliances this valve is installed on. ALWAYS READ AND FOLLOW ALL THE ENCLOSED INTRUCTIONS.

INSTALLATION

When installation of this product begins…

1. Read all of these instructions carefully. Failure to follow these instructions could damage the product or cause dangerous conditions.
2. Check the ratings given in the instructions and on the appliance to make certain that the control is suitable for your application.
3. All operations of installation, setting and adjustments must be undertaken exclusively by a qualified Gas Appliance Service Technician following the instruction specified in this catalog and those in the instruction manual of the appliance in which the valve is installed.
4. After installation is complete, verify that the appliance is operating as indicated in these instructions.

WARNING!

Oxygen Depletion Hazard.

Can cause injury or death by asphyxiation.

Do not use valves for vented appliances on unvented or vent free appliances. Do not use valves for unvented or vent free appliances on vented appliances.

WARNING!

Fire or Explosion Hazard.

Can cause property damage, severe injury or death.

Follow these instructions completely.

1. Turn off gas supply to the appliance before installation, and perform Gas Leak Test after the installation is completed.
2. Always install the sediment trap in the gas supply line to prevent contamination of the gas control.
3. Do not force the control knob. Use only your hand to turn the knob. If the knob does not move by hand, the valve should be replaced by a qualified service technician.

CAUTION!

⚠ Electrical shock or equipment damage hazard.

Can shock individuals or short equipment circuitry.

Make sure to disconnect all electrical supplies before beginning the installation process.

IMPORTANT

- These gas controls are shipped with anti-contamination seals over inlets and outlets.
- Do not remove the seals until ready for connection to piping; remove dust caps only when installing.

WARNING!

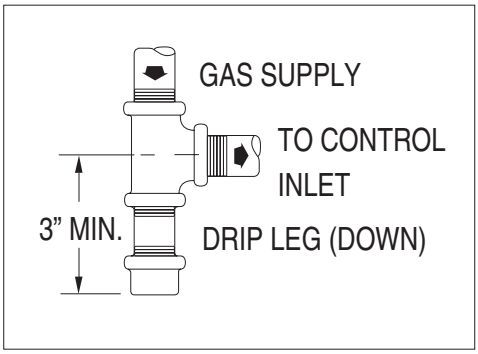
Avoid any foreign matter getting into the device, check inlet and outlet pipes for cleanness.

WARNING!

In case of overpressure of the input gas on the valve greater than 14.5 PSI, replace the valve.

INSTALL PIPING TO GAS VALVE

All piping must comply with local codes and ordinances or with the National Fuel Gas code (ANSI Z223.1 NFPA No. 54) whichever applies. Tubing installation must comply with approved standards and practices. Use appropriately sized fittings when connecting aluminum tubing to the pilot outlet.



1. Use new, clean and correctly reamed pipe free from burrs, chips, debris and any foreign matter. When tubing is used, make sure the ends are square and clean. All tubing bends must be smooth and without deformation.
2. Run pipe or tubing to the valve. If tubing is used, obtain a tube-to-pipe coupling to connect the tubing to the valve.
3. Install sediment trap (Drip Leg) in the supply line to the gas valve.

INSTALLING THE VALVE

1. Install the valve using the provided mounting flange. Screw using using the specific tool SIT code 0.999.996, suitable as accessory. Tighten to 45 ÷ 60 ft·bs torque.
2. Mount the valve so the flow of gas is consistent with the gas flow arrows on the valve.
3. Apply a moderate amount of quality pipecompound to the pipe only, leaving two end threads bare. On LP installations, use compound that resists exposure to LP gas.
4. Remove seals over inlet and outlet if necessary.
5. Connect pipe to valve inlet and outlet. Place wrench on valve in position (see Fig. 2). Tighten inlet connection to 30 ft·lbs torque, outlet connection to 20 +/-10 ft·lbs torque.
6. Thread pipe into the valve until a gas tight seal is achieved. Typically, for NPT thread, penetration is usually no more than the diameter of the pipe or 2 and 1/4 turns thread. Valve distortion or mechanical failure can result if the pipe is inserted too deeply.
7. Connect pilot tubing to valve with appropriately sized fittings. Recommended torque 40 ÷ 70 lbf·in.
8. Confirm gas tight seals with gas leak test.
9. Connect thermocouple to safety magnet. Hand tighten, and then rotate 1/4 turn with wrench appling a torque not higher than 10 ÷ 20 lbf·in.

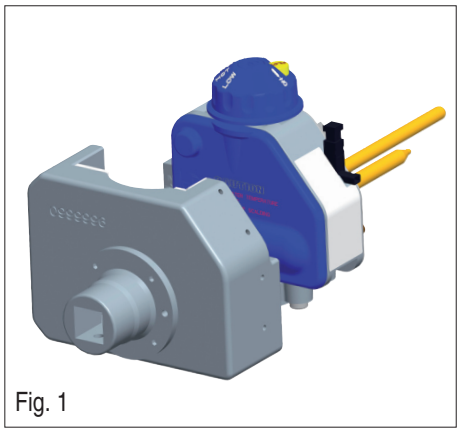


Fig. 1

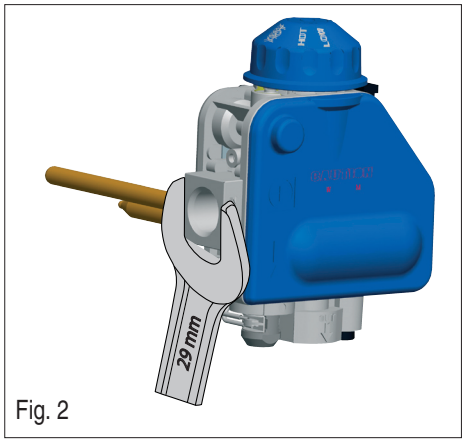


Fig. 2

WARNING!
Do not immerse in water or subject the control to temperatures exeeding 175 °F operating ambient temperature..

WARNING!
AVOID ANY DAMAGE TO THE DEVICE (KNOCKS,FALLS,ETC.). IN CASE OF FALL OF THE VALVE, IT IS RECOMMENDED NOT TO USE IT.

WARNING!
THE 650 DELTA VALVE IS DISPOSABLE. THE VALVE ALREADY MOUNTED ON A STORAGE WATER HEATER MUST NOT BE REMOVED FROM THE STORAGE WATER FOR REUSE ON ANOTHER WATER HEATER.

WARNING!
- Do not tamper with sealed parts.
- Do not loosen assembly screws.
- Do not remove labels and marking.

WARNING!
Observe recomended torques.
Use only specified spanner grips when making the connections (see Fig. 1 and Fig. 2).

WARNING!
DO NOT OPERATE THE DEVICE WHEN THE STORAGE WATER HEATER IS NOT FILLED WITH WATER.

OPERATION

STOP!
It is imperative that you read and follow all safety warnings before lighting the pilot burner. Refer to ANSI Z21.10 and ANSI Z21.78.

WARNING!
If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury, or loss of life.

WARNING!
Make certain that the water heater is completely filled with water before attempting to ignite the pilot burner or otherwise operate the gas control.

Note: All knob settings referenced to the reference arrow marks (a) in Fig. 3.

IMPORTANT: Always start operation from the OFF position of the control knob.

CAUTION!
Wait a minimum of (5) five minutes before attempting to re-light the pilot burner after the gas control has been switched to the OFF position and/or the pilot flame has been extinguished. Repeat the pilot ignition sequence starting from the OFF position. (Fig. 3)

Pilot flame ignition

Start from the OFF position (Fig.3). Rotate the control knob counter-clockwise ↶ to the PILOT position (Fig.4). Press and hold the ignition button PILOT (b) for thirty (30) seconds or more and simultaneously press several times the Piezo Igniter button (c) to light the pilot flame (Fig.5). Release the ignition button PILOT and make sure that the

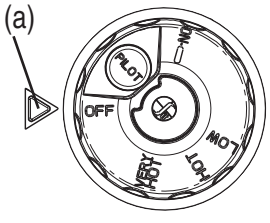


Fig. 3: **OFF position**

pilot flame remains lit. If it goes out, repeat the ignition process, starting from the OFF position.

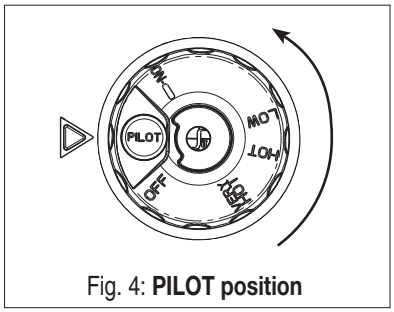


Fig. 4: **PILOT position**

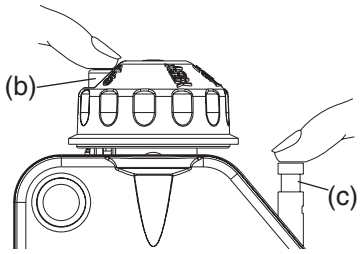


Fig. 5: **Ignition button PILOT and Piezo Igniter button**

Main burner ignition

Turn the control knob counter-clockwise ↶ to the ON position (Fig.6). Gas will flow to the main burner when the water temperature stored within the appliance is lower than the set-point temperature.

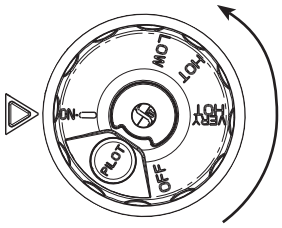


Fig. 6: **ON position**

Temperature setting

To increase the water temperature set-point rotate the control knob counter-clockwise ↶ to the desired temperature setting (Fig.7). The gas path to the main burner opens when the water temperature within the appliance is lower than the temperature set-point.

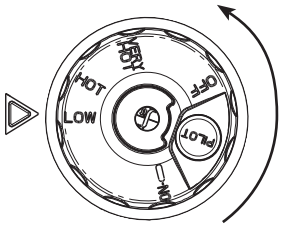


Fig. 7: **LOW position**

To decrease the water temperature set-point, rotate the control knob clockwise ↷ to the desired temperature setting (Fig.8). The gas path to the main burner opens when the water temperature within the appliance is lower than the temperature set-point.

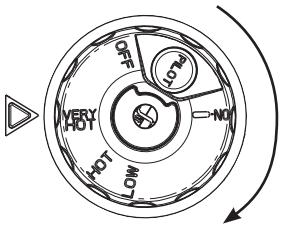


Fig. 8: **VERY HOT position**

Stand-by position

To maintain a flame at the pilot burner with the main burner off, turn the control knob clockwise ↷ to the PILOT position (Fig.9).

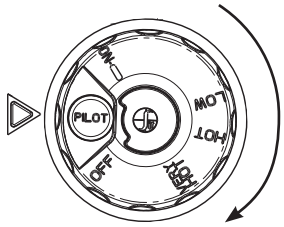


Fig. 9: **PILOT position**

Turning off

Turn the control knob clockwise ↷ to the OFF position (Fig.10).

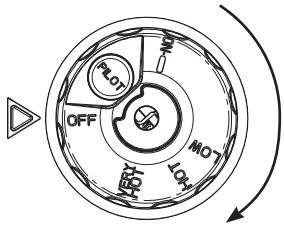


Fig. 10: **OFF position**

SETTINGS AND ADJUSTMENTS

The valve is preset at the factory, and is not field adjustable.

Verify the outlet pressure via the 1/8"NPT outlet pressure test plug (8 in Fig. 11). Upon completion of testing, the sealing plug must be reinstalled using a 3/16" hex key, with 22 lbf·in of torque and a gas leak test must be performed.

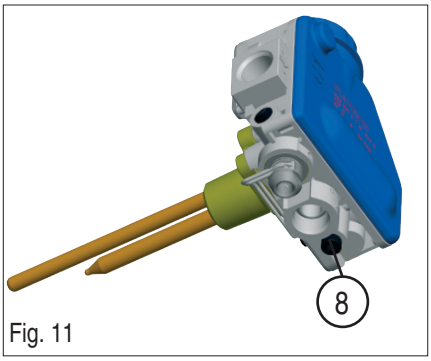


Fig. 11

FINAL CHECKS

WARNING!

Fire or Explosion hazard.

Can cause damage to property and severe injury or death.

Do not force the control knob. Use only your hand to turn the knob. If the knob does not move by hand, the valve should be replaced by a trained service technician.

PERFORM GAS LEAK TEST

WARNING!

Stand away from the main burner while lighting.

Hidden gas leaks can cause flashbacks in the appliance area. Check for gas leaks with rich soap and water solution any time work is done on a gas system.

GAS LEAK TEST

- Using a solution of soapy water, paint the piping connections, which are upstream of the control.

  The presence of bubbles indicates a gas leak.

  If a leak is detected, tighten the pipe connections and repeat leak test.
- Light the main burner following the lighting instructions..
- With the main burner in operation, paint all piping connections from the valve with a soap and water solution.
- If another leak is detected, tighten the connection.
- If after tightening the connections the leak is still present, replace the leaky part or valve. Shut off the main gas supply before attempting replacement of parts or the valve.

SHUTDOWN PERFORMANCE TEST

WARNING!
Fire or Explosion Hazard.
Can cause severe injury or death.
Perform the safety shutdown check any time work is done on a gas system.

1. Place the appliance in operation. The pilot and main burners should be lit.
2. Place gas control knob in PILOT position. Main burner should extinguish and pilot should remain lit.
3. Extinguish pilot flame. Pilot gas safety shutoff proves complete shutdown due to the fact the safety shutoff valve prohibits main burner and pilot gas flow.
4. Wait at least five minutes for the safety magnet to reset and residual gas to clear from the combustion chamber.
5. Relight pilot burner and operate the system through one complete cycle to ensure all functions operate correctly.

PIEZOELECTRIC IGNITER REPLACEMENT

WARNING!

The piezoelectric igniter should be replaced by a qualified service technician.

The appliance and the gas valve may be hot: wait until the temperature has dropped before touching the appliance or the gas valve.

1. Turn the control knob of the gas valve clockwise ↷ to the OFF position.
2. Turn off gas supply at the appliance service valve.
3. Remove the female cable connector from the male igniter connector.
4. Remove the old igniter from the gas valve making lever with a flat screwdriver of appropriate size, as shown in Fig.12 & 13. Discard the old igniter.
5. Position the new igniter, available as spare part SIT code 0073002, into his seat of the gas valve, as shown in Fig.14. Apply by hand a maximum force of 44 lbf (20 Kgf) on the button of the igniter. The applied force makes operating the igniter which will generate one click and one spark in air. Continuing to apply the force, a second click is made. The second click confirms full insertion and the mechanical locking of the body of the new igniter into its seat, as shown in Fig. 15. **Once inserted, do not remove the igniter.**
6. Reconnect the female connector of the electric cable to the male igniter connector.
7. Relight pilot burner and operate the system through one complete cycle to ensure all functions are correct.

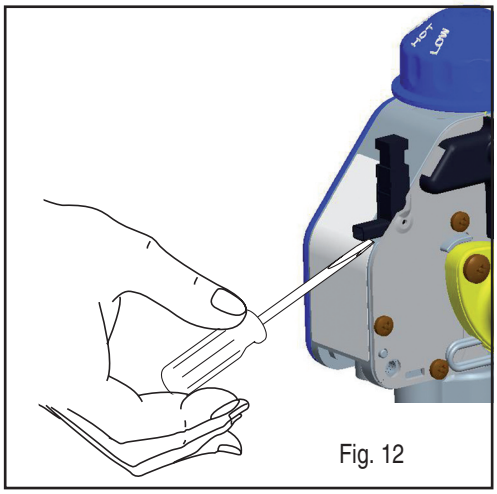


Fig. 12

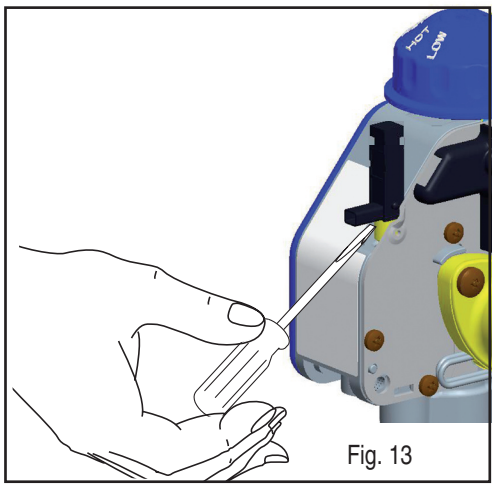


Fig. 13

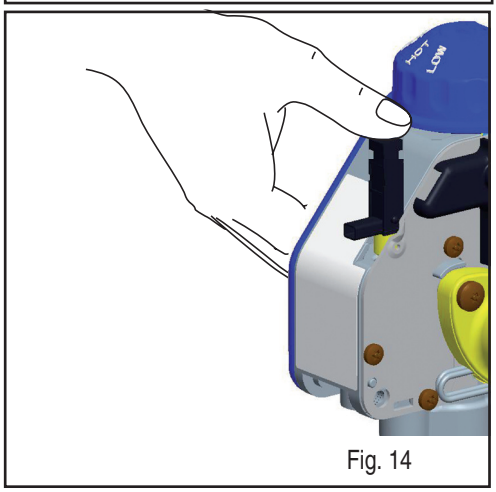


Fig. 14

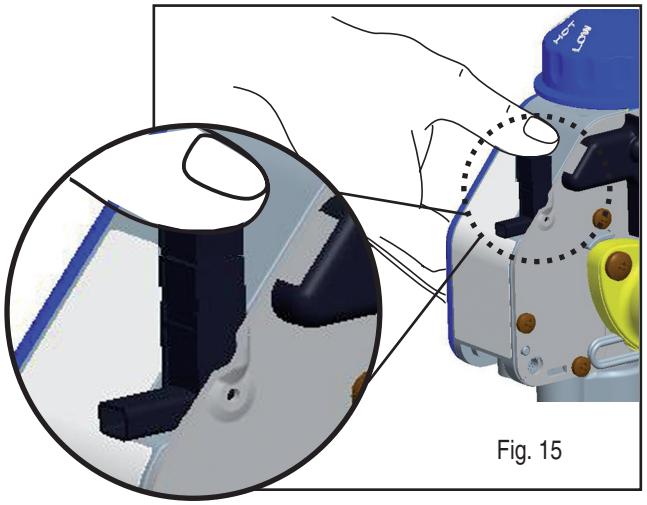
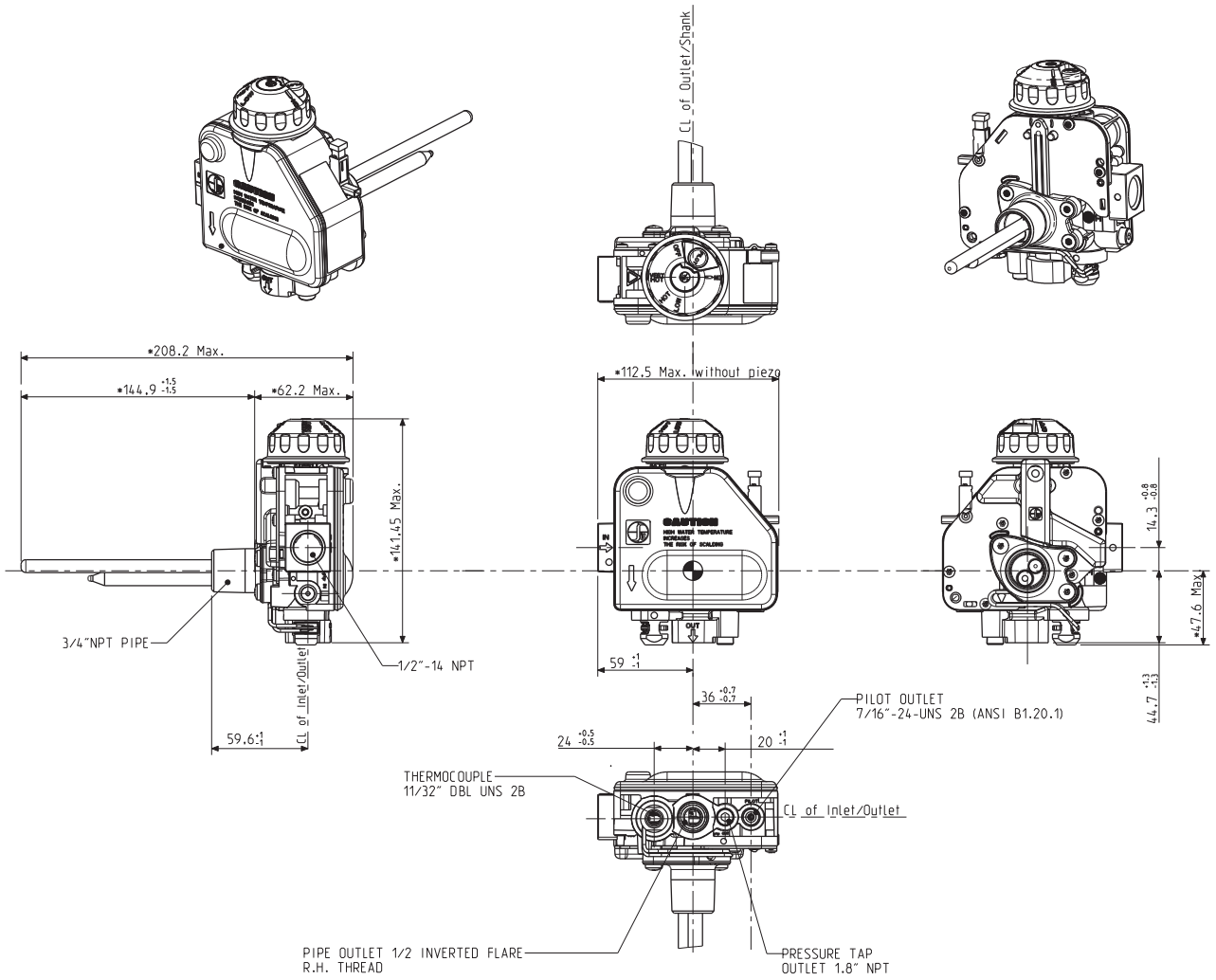


Fig. 15

DIMENSIONAL DRAWING



Dimensions are in millimeters.


SITGroup