

# MODULATING VALVE KIT



## INSTALLATION MANUAL

P/N 102296 Rev 0



Trusted. Tested. True.®

# Installation Manual

**WARNING:** If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- **Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**
- **WHAT TO DO IF YOU SMELL GAS**
  - **Do not try to light any appliance.**
  - **Extinguish any open flames.**
  - **Do not touch any electrical switch.**
  - **Immediately call your gas supplier. Follow the gas supplier's instructions.**
  - **If you cannot reach your gas supplier, call the fire department.**
- **Installation and service must be performed by a qualified installer, service agency or the gas supplier.**



**WARNING:** Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

## FOR YOUR SAFETY

**The use and storage of gasoline and other flammable vapors and liquids in open containers in the vicinity of this appliance is hazardous.**

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For more information about Chief Industries, Inc. and additional products or services please visit our website  
[www.agri.chiefind.com](http://www.agri.chiefind.com)

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**Packing List**

The shipment should contain the following items. Verify and inspect all items carefully when unpacking and before installing. In case of any shortage, contact your dealer. In case of damage during shipment, file a claim with the carrier.

Part Number	Description	Quantity
708644	BAG PLASTIC 8X9X.002	1
712927	PIPE PLUG 1/4" BLK STD	1
714147	NIPPLE 1/2"NPT X 2" SCH 40 BLK	3
714311	NIPPLE 3/4" NPT x 2" SCH 40 BLK	4
714519	TEE - 3/4" NPT x 3/4" NPT x 1/4" NPT BLK SCH 40	1
717488	KIT FLAME PROBE EXTENSION	1
719047	NIPPLE 3/4"NPT X 5.5" SCH 40 BLK	1
719278	MOD-VAL 90-210 3/4"-15' ARMCAP	1
735043	THERMOMETER 3.50 DIAL 6" STEM	1
736587	CARTON MOD VALVE 23X10.5X4 3/4	1
753913	ELBOW STREET 3/4" X 90 BLK STD	1
760249	TEE - 3/4" NPT x 1/4" NPT x 3/4" NPT BLK SCH 40	1
760421	REDUCER BUSH 3/4" - 1/2" NPT BLK	2
767962	CONNECTOR SQUEEZE 1"NPT .66 - .78	1
775924	BULLETIN 1106 NGE MOD VALVE KIT	1
851543	GAUGE 30LB 2" DIAL BACK/CONN	1

Please note that this manual, part number 102296 includes and references Bulletin 1178. This manual is for the installation and operation of a Caldwell NGE modulating valve, and is effective 1/1/2016.



### Before You Begin

Read this manual thoroughly before operating this heater. Keep this manual in a location for quick access and reference.

Your Caldwell heater is designed for safe and reliable operation when properly installed in combination with a Caldwell fan. However the heater requires electricity and flammable gas, which when improperly installed or when operated improperly, can be potentially dangerous. Anyone who will operate this unit should read the manual before installing or operating this unit. The following table, provided for your convenience, will aid in verifying that these individuals understand the proper operation of the heater. After completely reading the manual, this table should be filled in.

Date	Operator Signature	Owner Signature

## Installation

Be sure to read all installation instructions before beginning the installation. Figures in this bulletin are to be used as a reference; some installations may vary from what is shown in the figures.

Standing facing the burner in the direction of the airflow you will note the plumbing on the right side of the heater. Installation of the modulating valve will require rearrangement of the plumbing.

The following illustrations show how the plumbing will appear when properly rearranged and assembled. Follow these steps to install the modulating valve.

When reassembling plumbing lines use new sealant tape or sealant compound at all joints as required by local gas codes.

**Note: Be careful to not kink or break the capillary tube.**

### Axial Heater Installation

On CH18-NGE, CH24-NGE, and CH28-NGE heaters remove the pressure regulator (figure 1). This is accomplished by first loosening the set screw at the plumbing inline bracket and removing the eyebolt nut.

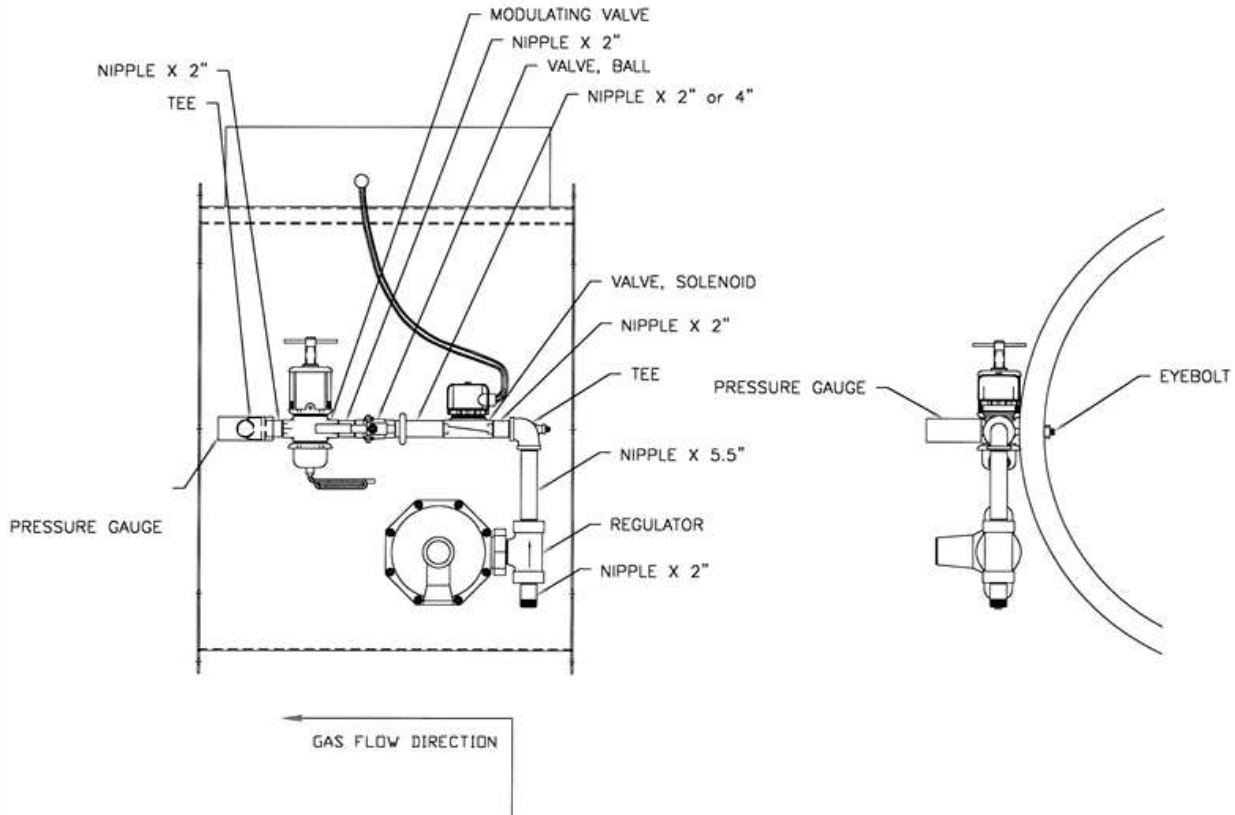


FIGURE 1: MODULATING VALVE KIT ASSEMBLY FOR AXIAL HEATERS

The plumbing assembly can now be pulled away from the housing. Assemble the plumbing line as shown with the additional parts that were supplied.

Assemble the modulating valve plumbing by taking the modulating valve and holding it such that the gas flow arrow is with the gas flow as shown in the appropriate figure. Next, thread the regulator onto the nipple as shown in the appropriate figure. When reinstalling the regulator verify the gas flow arrow is pointing downstream from the regulator.

On H18-NGE-PE, H24-NGE-PE heaters (figure 2), H28-NGE-PE, and H33-NGE-PE heaters (figure 1), loosen setscrew at the plumbing inline bracket and remove the eyebolt nut. Assemble the plumbing line as shown with the additional parts that were supplied.

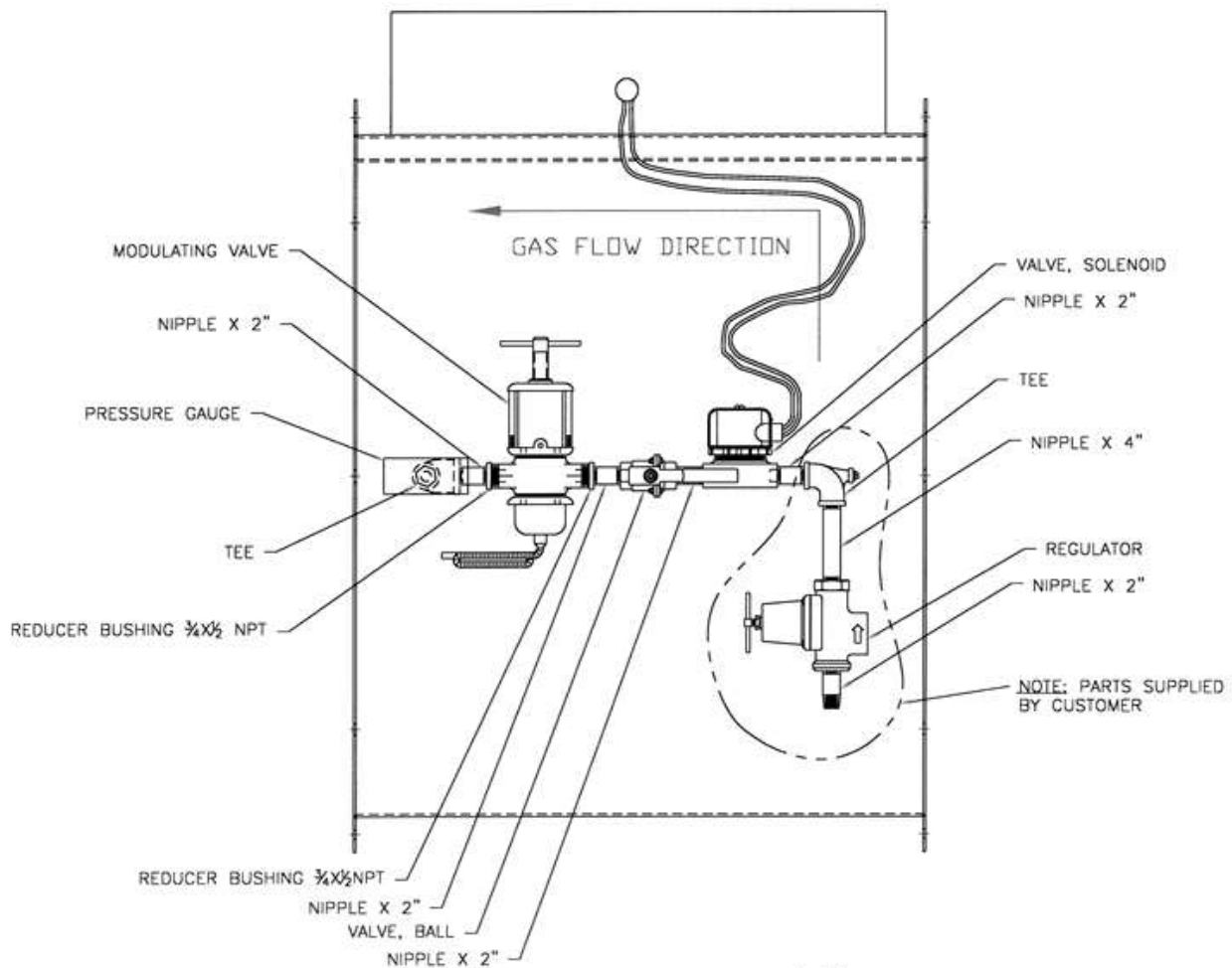


Figure 2: AXIAL HEATER WITH 1/2" PLUMBING

The modulating valve has a maximum inlet pressure of 30 PSI. Because, the available gas pressure to the heater can be greater than 30 PSI, and the available gas pressure can vary constantly, a pressure regulator must be installed upstream from the modulating valve. On H18-NGE and H24-NGE use regulator 715003. On H28-NGE and H33-NGE use regulator 753905 or obtain a regulator locally that meets the following specification.

- Regulator outlet pressure of 5 psi.
- Capacity at outlet pressure of 5 psi and rated capacity of the regulator must be three million BTU per hour.

Next, thread the regulator onto the nipple as shown in the appropriate figure. When reinstalling the regulator verify the gas flow arrow is pointing downstream from the regulator.

Install the 0-30# pressure gauge onto the 3/4" x 3/4" x 1/4" tee at the 1/4" connection of tee. Center the plumbing outlet at the burner inlet cone and retighten the setscrew and the eyebolt nut. After completing the assembly, check to see that all gas flows as shown in the appropriate figure.



**Note:** Unit should be checked for gas leaks using soap and water, and if present, leaks should be eliminated.

**Downstream Heater Installation:**

On H1015 and H2025 heaters (figure 3.1) assemble the plumbing lines as shown with the additional parts that were supplied.

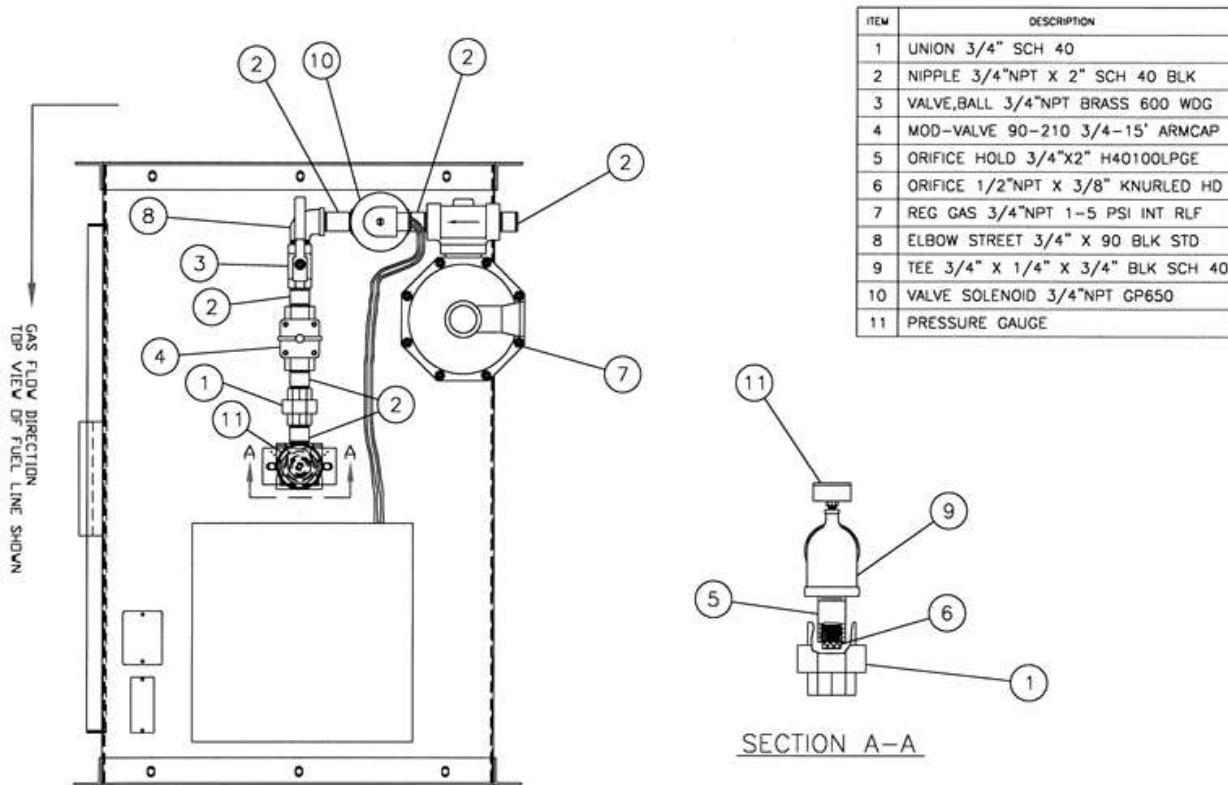


Figure 3.1: MOD VALVE KIT ASSEMBLY FOR DOWNSTREAM HEATERS (MODELS: H1015, H2025, OR CH1015)

Assemble the modulating valve plumbing by taking the modulating valve and holding it such that the gas flow arrow is with the gas flow as shown in the appropriate figure. The modulating valve has a maximum inlet pressure of 30 PSI. Because, the available gas pressure to the heater can be greater than 30 PSI, and the available gas pressure can vary constantly, a pressure regulator must be installed upstream from the modulating valve. On H1015 use regulator 753905. On H2025 use regulator 775502 or obtain a regulator locally that meets the following specification.

- Regulator outlet pressure of 5 psi.
- Capacity at outlet pressure of 5 psi and rated capacity of the regulator must be three million BTU per hour.

Next, thread the regulator onto the nipple as shown in the appropriate figure. When reinstalling the regulator verify the gas flow arrow is pointing downstream from the regulator.

On CH1015 heaters (figure 3.1) or on CH2025 heaters (figure 3.2) assemble the plumbing line as shown with the additional parts that were supplied.

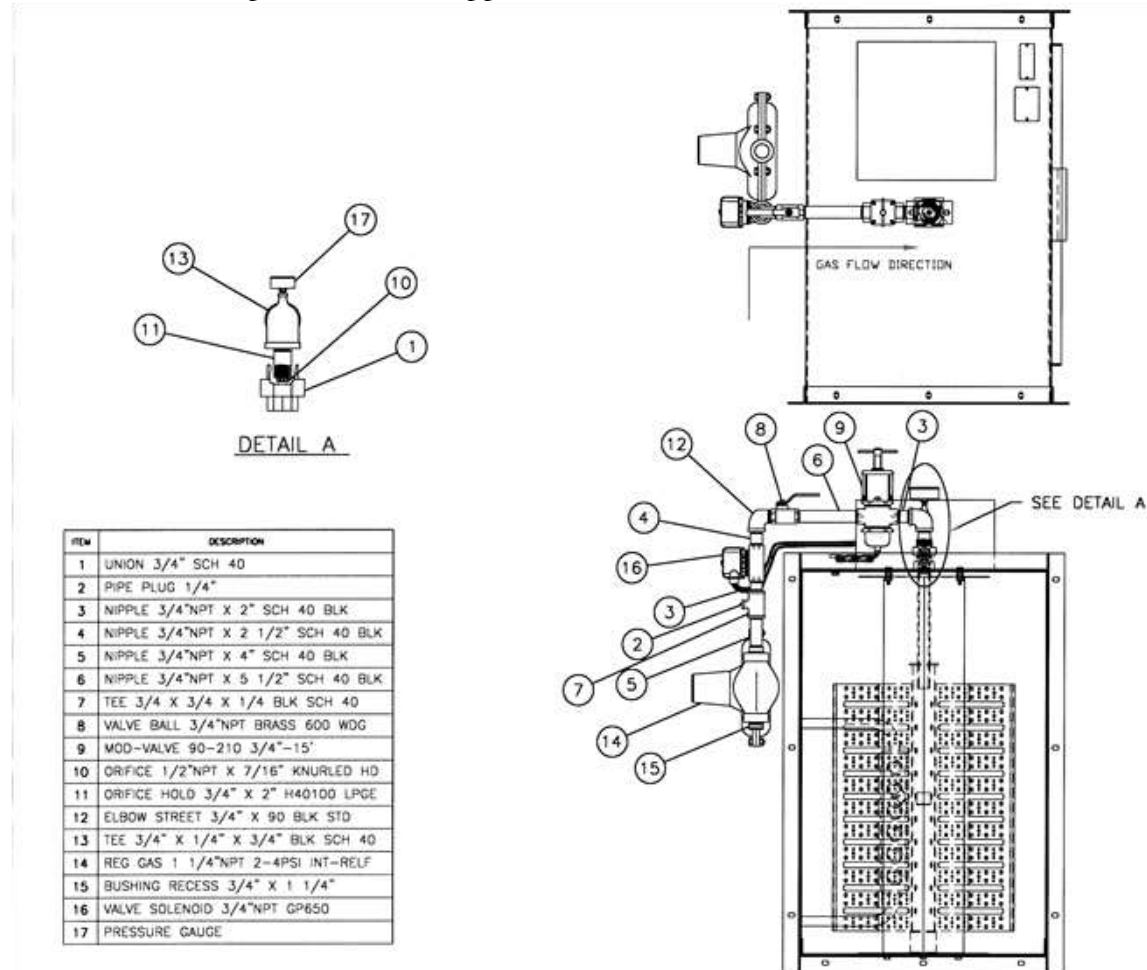


Figure 3.2: MOD VALVE KIT ASSEMBLY FOR DOWNSTREAM HEATERS (MODEL: CH2025)

Assemble the modulating valve plumbing by taking the modulating valve and holding it such that the gas flow arrow is with the gas flow as shown in the appropriate figure. Next, thread the regulator onto the nipple as shown in the appropriate figure. When reinstalling the regulator verify the gas flow arrow is pointing downstream from the regulator.

Install the 0-30# pressure gauge onto the 3/4" x 3/4" x 1/4" tee at the 1/4" connection of tee. Reconnect the union to the burner and retighten the setscrew and the eyebolt nut. After completing the assembly, check to see that all gas flows as shown in the appropriate figure.

**Note:** Unit should be checked for gas leaks using soap and water and, if present, leaks should be eliminated.

### Heat Sensor and Thermometer Location Installation

Refer to Figure 4 (one heater with mod valve) and Figure 5 (two heaters each with a mod valve) for typical installations.

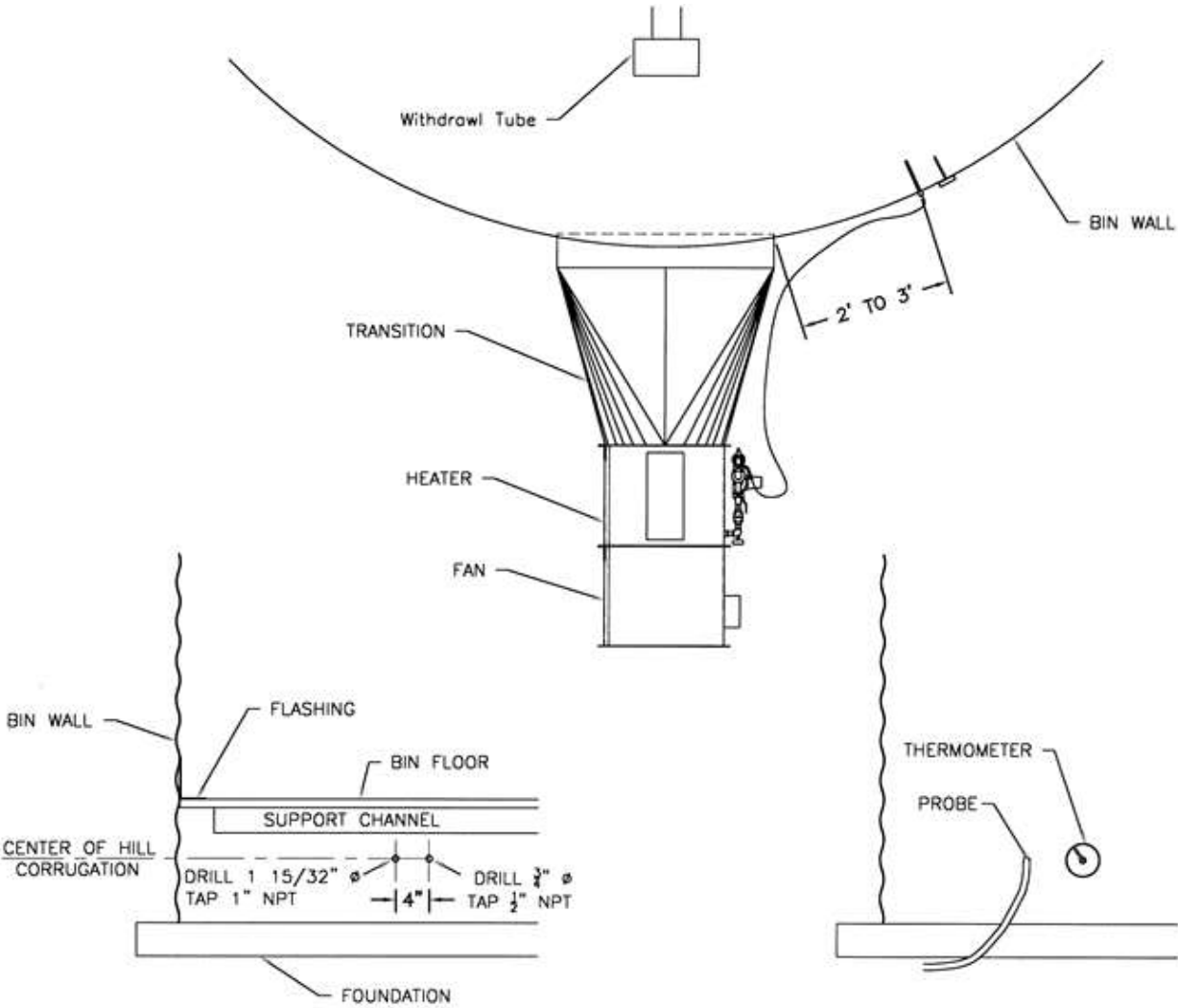


FIGURE 4: HEAT SENSOR AND THERMOMETER LOCATION FOR ONE HEATER WITH MODULATING VALVE

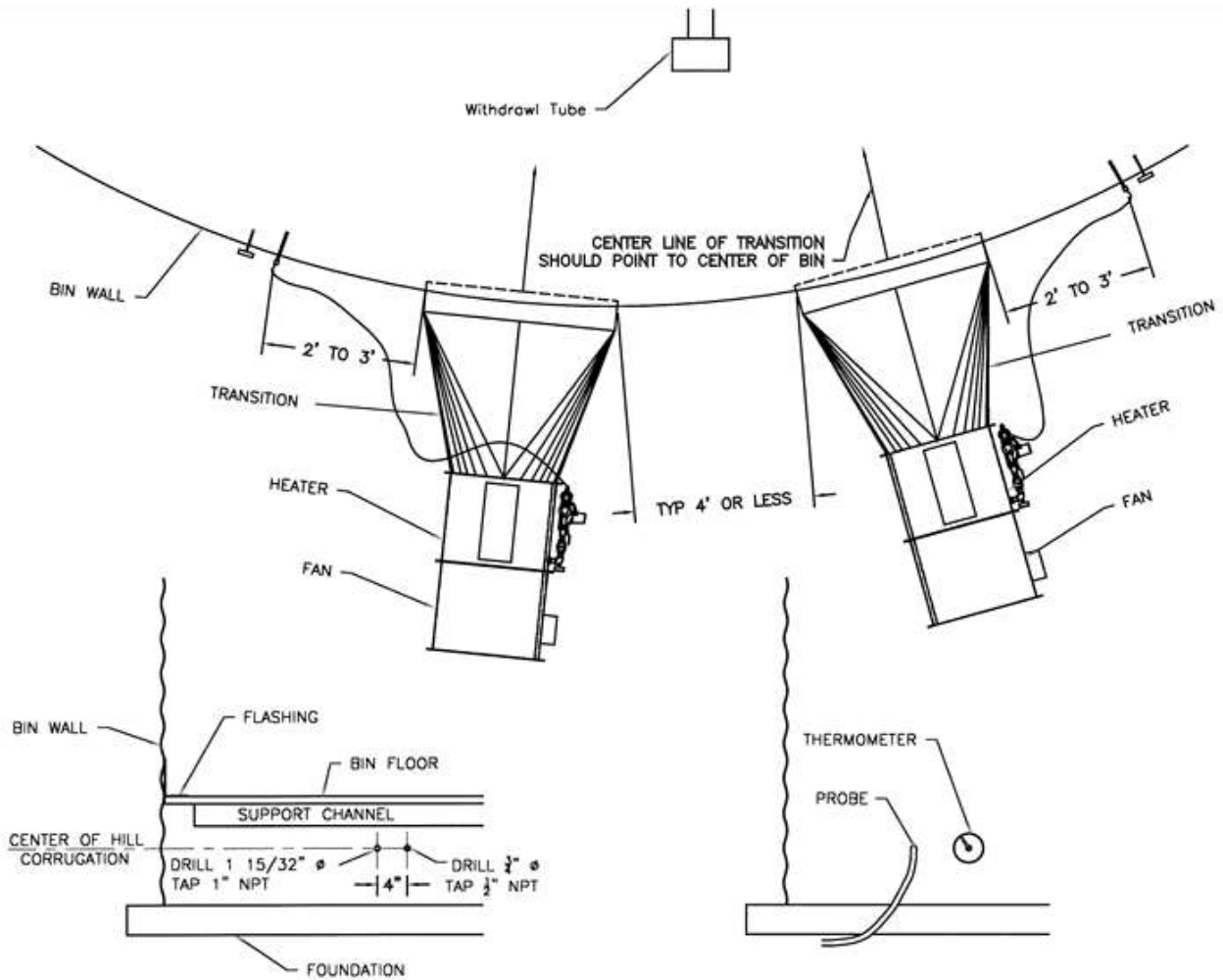


FIGURE 5: HEAT SENSOR AND THERMOMETER LOCATION FOR TWO HEATERS EACH WITH A MODULATING VALVE

### Heat Sensor Installation

Approximately 2 to 3 feet to the right side of the transition (if multiple installation see Figure 5 for locations) and halfway between the foundation and the bin floor and centered in the hill of the corrugation drill a 1 15/32" diameter hole tapped with 1" NPT threads.

Thread base of squeeze connector into the bin. Slip rubber squeeze connector and threaded cap over heat sensor with threaded end facing the bottom end of the sensor. Insert heat sensor into the bin making sure that the word "top" that is stamped in the heat sensor is in the upright position before tightening the squeeze connector in place.

Be careful not to break or kink the capillary tube. Heat sensor should extend completely into the bin without any obstructions. Heat sensor must be in a horizontal position or slightly tilted down to operate properly.

## **Thermometer Installation**

Approximately 4" to the right of the heat sensor drill a 3/4" hole and thread the hole to a 1/2" NPT. Mount the thermometer into this hole.

## Operating Instructions

**Note:** The modulating valve uses the plenum air temperature to regulate the gas flow into the burner maintaining a constant plenum air temperature.

1. Operation of the heater is the same as outlined in the heater manual provided with shipment.
2. Adjustment of the modulating valve is accomplished by turning the handle in (clockwise) to increase temperature range and turning it out (counterclockwise) to decrease the temperature range.
3. Maximum operating pressure of the modulating valve is 30 PSI.
4. Standard temperature range is 90-210 degrees F and this should not be exceeded or possible damage to the valve will result.
5. Low heat applications of the modulating valve may result in ignition shut down, because sufficient heat is not available at the flame probe. The flame probe bracket provided should then be added, as shown in Bulletin 975. The flame probe should be adjusted to sense the flame.

**Warning:** The regulators outlet pressure should be set approximately two psi higher than the gas pressure that is being delivered by the modulating valves during the coldest part of the day. Failure to do so could result in a grain bin fire. If the modulating valves mechanical workings would fail (ex. mechanical damage to capillary) the heaters firing rate would be dependent on the outlet pressure of the regulator. If the regulator is set with a high outlet gas pressure there is the possibility of fire from the high air temperature that would be delivered to the grain bin.

**Note:** The modulating valve is shipped with a blank orifice. Orifices provided with this assembly can be used to maintain a minimum temperature rise. For example: the green bypass orifice will maintain an approximate 30 degrees F temperature rise regardless of the modulating valve setting. A bypass orifice would be used to avoid ignition shut down from the flame sensor if the modulating valve operating temperature is changed repeatedly during operation. For an illustration on how to remove and change orifices, refer to the diagram on the package in which the orifices were shipped.

## STANDARD LIMITED WARRANTY

Caldwell Aeration Products

1. **Definitions.** The following terms, when they appear in the body of this Standard Limited Warranty for Caldwell Aeration Products in initial capital letters shall have the meaning set forth below:
  - A. Accepted Purchase Order shall mean the Purchase Order identified below.
  - B. Chief shall mean Chief Agri/Industrial, a division of Chief Industries, Inc.
  - C. Original Owner shall mean the original owner identified below.
  - D. Product shall mean the Agri/Industrial Equipment as described in the Accepted Purchase Order.
  - E. Reseller shall mean the authorized Chief Agri/Industrial Equipment dealer identified below.
  
2. **Limited Product Warranty.** Upon and subject to the terms and conditions set forth below, Chief hereby warrants to the Reseller, and, if different, the Original Owner as follows:
  - A. All new Products delivered to the Reseller or the Original Owner by Chief pursuant to the Accepted Purchase Order will, when delivered, conform to the specifications set forth in the Accepted Purchase Order;
  - B. All new Products delivered pursuant to the Accepted Purchase Order will, in normal use and service, be free from defects in materials or workmanship; and
  - C. Upon delivery, Chief will convey good and marketable title to the Products, free and clear of any liens or encumbrances except for, where applicable, a purchase money security interest in favor of Chief.
  
3. **Duration of Warranty and Notice Requirements.** Subject to the **Exceptions, Exclusions and Limitations** set forth below, the warranties set forth in Section 2 above shall apply to all covered non-conforming conditions that are discovered within the first twenty-four (24) months following delivery of the Product to the carrier designated by the Reseller and/or the Original Owner at Chief's manufacturing facility in Kearney, Nebraska (the "Warranty Period") and are reported to the Chief as provided in Section 4 below within thirty (30) days following discovery (a "Notice Period").
  
4. **Notice Procedure.** In order to make a valid warranty claim, the Reseller and/or the Original Owner must provide Chief with a written notice of any nonconforming condition discovered during the Warranty Period within the applicable Notice Period specified in Section 3 above. Said notice must be in writing; be addressed to Chief Industries, Inc., Agri/Industrial Division, Customer Service Department, P.O. Box 848, Kearney, NE 68848; and contain the following information: (a) the Customer's name and address; (b) the Reseller's name and address; (c) the make and model of the Product in question; (d) the current location of the Product; (e) a brief description of the problem with respect to which warranty coverage is claimed; and (f) the date on which the Product was purchased.

5. **Exceptions and Exclusions.** Anything herein to the contrary notwithstanding, the warranties set forth in Section 2 above do **not** cover any of the following, each of which are hereby expressly excluded:
- A. Defects that are not discovered during the applicable Warranty Period;
  - B. Defects that are not reported to the Chief Agri/Industrial Division Customer Service Department in conformity with the notice procedure set forth in Section 4 above within the applicable Notice Period specified in Section 3;
  - C. Any used or pre-owned Products;
  - D. Any Chief manufactured parts that are not furnished as a part of the Accepted Purchase Order;
  - E. Any fixtures, equipment, materials, supplies, accessories, parts or components that have been furnished by Chief but are manufactured by a third party;
  - F. Any Products which have been removed from the location at which they were originally installed;
  - G. Any defect, loss, damage, cost or expense incurred by the Reseller or the Original Owner to the extent the same arise out of, relate to or result, in whole or in part, from any one or more of the following:
    - (i) Usual and customary deterioration, wear or tear resulting from normal use, service and exposure;
    - (ii) Theft, vandalism, accident, war, insurrection, fire or other casualty;
    - (iii) Any damage, shortages or missing parts which result during shipping or are otherwise caused by the Reseller, the Original Owner and/or any third party;
    - (iv) Exposure to marine environments, including frequent or sustained salt or fresh water spray;
    - (v) Exposure to corrosive, chemical, ash, smoke, fumes, or the like generated or released either within or outside of the structure on which the Product is installed, regardless of whether or not such facilities are owned or operated by the Reseller, the Original Owner or an unrelated third party;
    - (vi) Exposure to or contact with animals, animal waste and/or decomposition;
    - (vii) The effect or influence the Product may have on surrounding structures, including, without limitation, any loss, damage or expense caused by drifting snow;
    - (viii) Any Product or portion thereof that has been altered, modified or repaired by the Reseller, the Original Owner or any third party without Chief's prior written consent;
    - (ix) Any Product or portion thereof that has been attached to any adjacent structure without Chief's prior written approval;
    - (x) Any Product to which any fixtures, equipment, accessories, materials, parts or components which were not provided as a part of the original Accepted Purchase Order have been attached without Chief's prior written approval;
    - (xi) The failure on the part of the Reseller, the Original Owner or its or their third party contractors to satisfy the requirements of all applicable statutes, laws, ordinances rules, regulations and codes, (including zoning laws and/or building codes);
    - (xii) The use of the Product for any purpose other than the purpose for which it was designed; and/or



- (xiii) The failure of the Reseller, the Original Owner and/or any third party to:
  - (a) properly handle, transport and/or store the Product or any component part thereof;
  - (b) properly select and prepare a site that is adequate for the installation and/or operation of the Product or any component part thereof;
  - (c) properly design and construct a foundation that is adequate for the installation and/or operation of the Product or any component part thereof;
  - (d) properly set up, erect, construct or install the Product and/or any component part thereof; and/or
  - (e) properly operate, use, service and/or maintain the Product and each component part thereof.

6. **Resolution of Warranty Claims.** In the event any nonconforming condition is discovered within the Warranty Period and Chief is notified of a warranty claim as required by Section 4 prior to the end of the applicable Notice Period set forth in Section 3 above, Chief shall, with the full cooperation of the Reseller and the Original Owner, immediately undertake an investigation of such claim. To the extent Chief shall determine, in its reasonable discretion, that the warranty claim is covered by the foregoing Limited Product Warranty, the following shall apply:

- A. Warranty Claims With Respect to Covered Non-Conforming Conditions Discovered Within the First Three Hundred Sixty Five (365) Days and Reported to Chief Within Thirty (30) Days of Discovery. In the case of a warranty claim which relates to a covered non-conforming condition that is discovered during the first three hundred sixty five (365) days of the Warranty Period and is reported to Chief as required by Section 4 within thirty (30) days of discovery as required by Section 3, Chief will, as Chief's sole and exclusive obligation to the Reseller and the Original Owner, and as their sole and exclusive remedy, work in cooperation with the Reseller and the Original Owner to correct such non-conforming condition, and in connection therewith, Chief will ship any required replacement parts to the "ship to address" set forth in the Accepted Purchase Order FOB Chief's facilities in Kearney, Nebraska, and will either provide the labor or reimburse the Reseller or the Original Owner, as may be appropriate in the circumstances, for any out of pocket expense the Original Owner may reasonably and necessarily incur for the labor that is required to correct such non-conforming condition, provided that if work is to be performed by the Reseller or a third party contractor, Chief may require at least two competitive bids to perform the labor required to repair or correct the defect and reserves the right to reject all bids and obtain additional bids. Upon acceptance of a bid by Chief, Chief will authorize the necessary repairs.
- B. All Other Warranty Claims. Except as is otherwise provided in subsection 6A above, in the case of all other warranty claims which relate to covered non-conforming conditions that are discovered during the Warranty Period and are reported to Chief as required by Section 4 within thirty (30) days following discovery, Chief will, as Chief's sole and exclusive obligation to the Reseller and the Original Owner, and as the Reseller's and the Original Owner's sole and exclusive remedy, ship any required replacement parts to the Original Owner at the "ship to address" specified in the Accepted Purchase Order FOB

Chief's facilities in Kearney, Nebraska; and in such event, Chief shall have no responsibility or liability to either the Reseller or the Original Owner for the cost of any labor required to repair or correct the defect.

7. **Warranty Not Transferable.** This Warranty applies only to the Reseller and the Original Owner and is **not transferable.** As such, this Warranty does **not** cover any Product that is sold or otherwise transferred to any third party following its delivery to the Original Owner.
8. **Limitation on Warranties, Liabilities and Damages.** The Reseller and the Original Owner expressly agree that the allocation of the risk, liability, loss, damage, cost and expense arising from any Product that does not conform to the limited warranty given in Section 2 above are fair and reasonable and acknowledge that such allocation was expressly negotiated by the parties and was reflected in the Purchase Price of the Product. Accordingly the Reseller and the Original Owner expressly agree as follows:
  - A. **Disclaimer of Implied Warranties.** EXCEPT AS IS OTHERWISE EXPRESSLY SET FORTH HEREIN, CHIEF MAKES NO OTHER REPRESENTATIONS OR WARRANTIES OF ANY KIND WHATSOEVER, WHETHER EXPRESS OR IMPLIED, BY OPERATION OF LAW, COURSE OF DEALING OR OTHERWISE WITH RESPECT TO THE PRODUCT, ANY COMPONENT PART THEREOF OR ANY OTHER GOODS OR SERVICES THAT CHIEF MANUFACTURES, FABRICATES, PRODUCES, SELLS OR PROVIDES TO THE DEALER OR THE ORIGINAL OWNER PURSUANT TO THE TERMS OF ANY ACCEPTED PURCHASE ORDER, INCLUDING WITHOUT LIMITATION ANY REPRESENTATION OR WARRANTY WITH RESPECT TO DESIGN, CONDITION, MERCHANTABILITY OR FITNESS OF THE PRODUCT OR ANY OTHER GOODS OR SERVICES FOR ANY PARTICULAR PURPOSE OR USE.
  - B. **Limitation on Liability.** EXCEPT AS IS OTHERWISE EXPRESSLY SET FORTH IN SECTION 6 ABOVE, CHIEF'S LIABILITY TO THE DEALER AND/OR THE ORIGINAL OWNER WITH RESPECT TO ANY DEFECTS IN ANY PRODUCTS OR FOR ANY OTHER GOODS OR SERVICES WHICH DO NOT CONFORM TO THE WARRANTIES SET FORTH ABOVE SHALL NOT, IN ANY EVENT, EXCEED THE ACTUAL COST OF SUCH NON-CONFORMING PRODUCT, GOODS OR SERVICES AS DETERMINED PURSUANT TO THE ACCEPTED PURCHASE ORDER; AND
  - C. **Limitation on the Nature of Damages.** EXCEPT AS EXPRESSLY PROVIDED IN SECTION 6 ABOVE, CHIEF SHALL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE TO THE DEALER, THE ORIGINAL OWNER OR ANY THIRD PARTY FOR ATTORNEY FEES COURT COSTS OR ANY OTHER SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL, LIQUIDATED OR PUNITIVE DAMAGES OF ANY NAME, NATURE OR DESCRIPTION AS A RESULT OF THE FAILURE OF ANY PRODUCT OR ANY OTHER GOODS OR SERVICES PURCHASED BY THE DEALER OR THE ORIGINAL OWNER FROM CHIEF PURSUANT

**TO THE ACCEPTED PURCHASE ORDER TO CONFORM TO THE LIMITED WARRANTIES SET FORTH IN SECTION 2 ABOVE.**

8. **Applicable Law.** This Limited Product Warranty has been issued, accepted and entered into by the Reseller, the Original Owner and Chief in the State of Nebraska and shall be governed by, and construed in accordance with, the internal laws of the State of Nebraska. Any legal action or proceeding with respect to any goods or services furnished to the Original Owner by Chief in connection herewith, or any document related hereto shall be brought only in the district courts of Nebraska, or the United States District Court for the District of Nebraska, and, by execution and delivery of this Limited Product Warranty, the undersigned Original Owner hereby accept for themselves and with respect to their property, generally and unconditionally, the jurisdiction of the aforesaid courts. Further, the undersigned Original Owner hereby irrevocably waives any objection, including, without limitation, any *forum non conveniens*, which it may now or hereafter have to the bringing of such action or proceeding in such respective jurisdictions.

**ACKNOWLEDGMENT OF RECEIPT**

By its signature hereto, the undersigned Reseller represents and warrants to Chief that the Reseller has provided a true, correct and complete copy of this Standard Limited Warranty to the Original Owner at the time the product was purchased.

Reseller Name and Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Original Owner Name and Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Accepted Purchase Order No. \_\_\_\_\_

Original Jobsite Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**RESELLER:**

By: \_\_\_\_\_  
Date

Print name and title

4821-6088-7329, v. 1



Should you have any questions concerning assembly instructions, parts or drawings, please feel free to contact us at any of the following.

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For more information about Chief Industries, Inc. and additional products or services visit our website  
[www.agri.chiefind.com](http://www.agri.chiefind.com)