

2102824-001– rev. AB

# ENC82 Environmental Enclosure

## Installation Instructions



**TOTALFLOW**®

2102824-001 (AB)



## Intellectual Property & Copyright Notice

©2010 by ABB Inc., Totalflow ("Owner"), Bartlesville, Oklahoma 74006, U.S.A. All rights reserved.  
Any and all derivatives of, including translations thereof, shall remain the sole property of the Owner, regardless of any circumstances.

The original US English version of this manual shall be deemed the only valid version. Translated versions, in any other language, shall be maintained as accurately as possible. Should any discrepancies exist, the US English version will be considered final.

Notice: This publication is for information only. The contents are subject to change without notice and should not be construed as a commitment, representation, warranty, or guarantee of any method, product, or device by Owner.

Inquiries regarding this manual should be addressed to ABB Inc., Totalflow Products, Technical Communications, 7051 Industrial Blvd., Bartlesville, Oklahoma 74006, U.S.A.

## TABLE OF CONTENTS

Getting Help .....	v
Before You Call .....	v
Key Symbols .....	v
Safety Practices and Precautions .....	v
Safety Guidelines .....	vi
Safety First .....	vi
Equipment Markings .....	vi
Grounding the Product .....	vii
Operating Voltage .....	vii
Danger From Loss of Ground .....	vii
Safe Equipment .....	vii
<b>1.0 INTRODUCTION AND DESCRIPTION</b>	<b>1-1</b>
1.1 Standard Features .....	1-1
1.2 Optional Features .....	1-3
1.3 Order of Instruction .....	1-3
1.4 Locating Area for Installation .....	1-5
1.5 Unpacking & Inspection .....	1-5
1.5.1 Shipping Carton .....	1-5
1.5.2 Unpacking .....	1-5
1.5.3 Bill of Lading .....	1-5
1.5.4 Inspection .....	1-5
1.5.5 Damaged Components .....	1-5
<b>2.0 SAMPLE PROBE INSTALLATION</b>	<b>2-1</b>
2.1 Materials .....	2-1
2.2 Installation .....	2-1
<b>3.0 ENC82 ENVIRONMENTAL ENCLOSURE INSTALLATION</b>	<b>3-1</b>
3.1 Large Free Standing Environmental Enclosure Installation .....	3-1
3.1.1 Materials .....	3-1
3.1.2 Installation .....	3-1
3.2 Small Free Standing Environmental Enclosure Installation .....	3-2
3.2.1 Materials .....	3-2
3.2.2 Instructions .....	3-2
3.3 Large Pipe Mounted Environmental Enclosure Mounting Kit .....	3-4
3.3.1 Materials .....	3-4
3.3.2 Installation .....	3-4
3.4 Optional Support Leg Kit Installation .....	3-6
3.4.1 Materials .....	3-7
3.4.2 Instructions .....	3-7
3.5 Small Pipe Mounted Environmental Enclosure Mounting Kit .....	3-8
3.5.1 Materials .....	3-8
3.5.2 Installation .....	3-8
<b>4.0 NGC AND PERIPHERAL EQUIPMENT INSTALLATION</b>	<b>4-1</b>
4.1 NGC Installation .....	4-1
4.1.1 Materials .....	4-1

4.1.2	Instructions.....	4-1
4.2	Sample Conditioning Module Installation .....	4-3
4.2.1	Materials.....	4-3
4.2.2	Mounting .....	4-3
4.3	Sample Line Connections .....	4-5
4.3.1	Materials.....	4-5
4.3.2	Instructions.....	4-6
4.4	Carrier Gas Bottle Rack Installation .....	4-8
4.4.1	Materials.....	4-8
4.4.2	Instructions.....	4-9
4.5	Carrier Gas Regulator Installation .....	4-10
4.5.1	Materials.....	4-10
4.5.2	Instructions.....	4-11
4.6	ENC82L Calibration Gas Bottle Installation.....	4-11
4.6.1	Materials.....	4-12
4.6.2	Instructions.....	4-12
4.7	ENC82S Calibration Gas Bottle Installation .....	4-12
4.7.1	Materials.....	4-13
4.7.2	Instructions.....	4-13
4.8	Calibration Gas Regulator Installation .....	4-13
4.8.1	Materials.....	4-13
4.8.2	Instructions.....	4-14
4.9	Carrier Gas and Calibration Gas Connections .....	4-14
4.9.1	Materials.....	4-14
4.9.2	Instructions.....	4-14
4.10	Vent Line Connections .....	4-16
4.10.1	Materials.....	4-16
4.10.2	Instructions.....	4-16
4.11	ENC82L Enclosure Optional Pwr/Comm Outlet Box .....	4-17
4.11.1	Materials.....	4-17
4.11.2	Customer Supplied Materials.....	4-18
4.11.3	Instructions.....	4-18
4.12	ENC82L Optional Catalytic Heater Installation.....	4-23
4.12.1	Materials.....	4-24
4.12.2	Instructions.....	4-24
4.13	ENC82S Optional Catalytic Heater Installation .....	4-28
4.13.1	Materials.....	4-28
4.13.2	Instructions.....	4-28
4.14	Optional Electric Heater Installation .....	4-30
4.14.1	Materials.....	4-30
4.14.2	Instructions.....	4-31
4.15	Sealing Environmental Enclosure.....	4-32
4.15.1	Customer Supplied Materials.....	4-32
4.15.2	Instructions.....	4-32
<b>5.0</b>	<b>DC POWER INSTALLATION</b>	<b>5-1</b>
5.1	Instructions .....	5-1

## TABLE OF FIGURES

Figure 1–1 ENC82L Environmental Enclosure with Electric Heater .....	1–1
Figure 1–2 ENC82L Environmental Enclosure with Catalytic Heater .....	1–2
Figure 1–3 ENC82S Environmental Enclosure with Electric Heater .....	1–2
Figure 1–4 ENC82S Environmental Enclosure with Catalytic Heater .....	1–3
Figure 2–1 Sample Probe.....	2–1
Figure 2–2 Sample Probe Insertion.....	2–2
Figure 3–1 ENC82L–Enclosure Stand Installation .....	3–1
Figure 3–2 ENC82L–Enclosure Mounting Hardware .....	3–2
Figure 3–3 ENC82S–Enclosure Installation .....	3–3
Figure 3–4 ENC82S–Enclosure Mounting Hardware.....	3–3
Figure 3–5 ENC82L–Mounting Brackets.....	3–5
Figure 3–6 ENC82L–Mounting Hardware Installation.....	3–5
Figure 3–7 ENC82L–Adjustment Assembly .....	3–5
Figure 3–8 ENC82L–Pipe Mount installation .....	3–6
Figure 3–9 ENC82L–Chain Retainer Lock.....	3–6
Figure 3–10 ENC82L–Optional support leg Overview .....	3–7
Figure 3–11 ENC82S–Channel Tubing Installation.....	3–8
Figure 3–12 ENC82S–Pipe Mount Split Brackets.....	3–9
Figure 3–13 ENC82S– Pipe Mount Assembly .....	3–10
Figure 3–14 ENC82S–Pipe Mounted .....	3–10
Figure 4–1 ENC82L–NGC8200 Mounting Stand .....	4–1
Figure 4–2 ENC82S–NGC8200 Mounting Stand.....	4–2
Figure 4–3 Mounting the NGC8200.....	4–2
Figure 4–4 NGC Optional Mounting Flange Pipe.....	4–3
Figure 4–5 Sample System Mounting Kits .....	4–4
Figure 4–6 Sample Conditioning Modules .....	4–4
Figure 4–7 Single and Multiple Stream Sample Conditioning Assemblies .....	4–5
Figure 4–8 ENC82L–Environmental Enclosure Sample Boot.....	4–6
Figure 4–9 ENC82S–Environmental enclosure Sample Boot.....	4–7
Figure 4–10 Dual Bottle Rack Assembly.....	4–8
Figure 4–11 ENC82L–Dual Bottle Rack Installation.....	4–9
Figure 4–12 ENC82S–Dual Bottle Rack Installation .....	4–10
Figure 4–13 Carrier Gas Pressure Regulator with Relief Valve.....	4–11
Figure 4–14 Dual Carrier Gas Bottles and Rack.....	4–11
Figure 4–15 Calibration Bottle Location .....	4–12
Figure 4–16 Calibration Bottle Location .....	4–13
Figure 4–17 Calibration Gas Pressure Regulator with Relief Valve.....	4–14
Figure 4–18 Carrier and Calibration Gas Connections .....	4–15
Figure 4–19 Vent Line Connections on Feed-through Assembly.....	4–17
Figure 4–20 Power Communication Outlet Box Assembly .....	4–18
Figure 4–21 ENC82L Large Enclosure .....	4–19

Figure 4–22 Assembled Power/Communication Assembly .....	4–20
Figure 4–23 Power Wiring Diagram.....	4–21
Figure 4–24 Suggested RS-232 Wiring Instructions.....	4–22
Figure 4–25 Suggested RS-485 Wiring Instructions.....	4–23
Figure 4–26 Suggested RS-422 Wiring Instructions.....	4–23
Figure 4–27 Catalytic Heater Option in Environmental Enclosure.....	4–24
Figure 4–28 Catalytic Heater Assemblies .....	4–25
Figure 4–29 Thermostat Assembly Installed.....	4–25
Figure 4–30 Regulator and Filter/Drain Assembly Installed .....	4–26
Figure 4–31 Temperature Probe Installation .....	4–27
Figure 4–32 Electrical Pre-heater Wiring Instructions .....	4–27
Figure 4–33 ENC82S Filter/Drain Assembly Installation .....	4–29
Figure 4–34 ENC82S Catalytic Heater Pre-Heat Wiring .....	4–29
Figure 4–35 ENC82L Electric Heater Installed in Enclosure .....	4–30
Figure 4–36 ENC82S Electric Heater Installed in Enclosure.....	4–31
Figure 4–37 Electric Heater Option Wiring Instructions.....	4–31
Figure 4–38 ENC82S Electric Heater Option Wiring Instructions.....	4–32

## LIST OF TABLES

Table 1—1 Enclosure Installation Matrix .....	1–4
-----------------------------------------------	-----

## Getting Help

At Totalflow, we take pride in the on-going support we provide our customers. When you purchase a product, you receive documentation which should answer your questions; however, Totalflow Technical Support provides you an 800 number as an added source of information.

If you require assistance, call:

USA: (800) 442-3097





International: +1 9183384888

### Before You Call

- Know your Totalflow's model.
- Be prepared to give the customer service representative a detailed description of the problem.
- Note any alarms or messages as they appear.
- Prepare a written description of problem.
- Know your software version, board and optional part numbers.

## Key Symbols

The following symbols are used frequently in the manual. These are intended to catch your eye and draw your attention to important information.

- FYI**  Intended to draw your attention to useful information or to clarify a statement made earlier.
- TIP**  Intended to draw your attention to a fact that may be useful or helpful in understanding a concept.
- CAUTION**  Intended to draw your attention to a statement that might keep you from making a mistake, keep you from destroying equipment or parts, or keep you from creating a situation that could cause personal injury if caution is not used. Please refer to the "Safety Practices and Precaution" section for additional information.
- WARNING**  Intended to draw your attention to a statement regarding the likelihood of personal injury or fatality that could result from improper access or techniques used while working in hazardous locations. Please refer to the "Safety Practices and Precaution" section for additional information.

## Safety Practices and Precautions


This manual contains information and warnings which have to be followed by the user to ensure safe operation and to retain the product in a safe condition. Installation, maintenance and repairs should only be performed by a trained and qualified technician. Please refer to Certification Drawings shipped with this unit for specific guidelines. Extra copies of the certification drawings, referenced on the unit Name Tag, can be obtained, free of charge, by contacting Totalflow Technical Support at the number listed in the "Getting Help" section.


## Safety Guidelines

- DO NOT open the equipment to perform any adjustments, measurements, maintenance, parts replacement or repairs until all external power supplies have been disconnected.
- Only a properly trained technician should work on any equipment with power still applied.
- When opening covers or removing parts, exercise extreme care "live parts or connections can be exposed".
- Installation and maintenance must be performed by person(s) qualified for the type and area of installation according to National and Local codes.
- Capacitors in the equipment can still be charged even after the unit has been disconnected from all power supplies.

## Safety First

Various statements in this manual identified as conditions or practices that could result in equipment damage, personal injury or loss of life will be highlighted using the following icons.

**CAUTION**  Exercise caution while performing this task. Carelessness could result in damage to the equipment, other property and personal injury.

**WARNING**  STOP. Do not proceed without first verifying that a hazardous condition does not exist. This task may not be undertaken until proper protection has been accomplished, or the hazardous condition has been removed. Personal injury or fatality could result. Examples of these warnings include:

- Removal of enclosure cover(s) in a hazardous location must follow guidelines stipulated in the Certification Drawings shipped with this unit.
- If unit is installed or to be installed in a hazardous location, technician must follow the guidelines stipulated in the Certification Drawings shipped with this unit.
- Access to unit via PCCU cable in a hazardous location must follow guidelines stipulated in the Certification Drawings shipped with this unit.
- Connecting or disconnecting equipment in a hazardous location for installation or maintenance of electric components must follow guidelines stipulated in the Certification Drawings shipped with this unit.

DANGER indicates a personal injury hazard immediately accessible as one reads the markings.

CAUTION indicates a personal injury hazard not immediately accessible as one reads the markings, or a hazard to property, including the equipment itself.

## Equipment Markings



Protective ground (earth) terminal



**Grounding the Product**

If a grounding conductor is required, it should be connected to the grounding terminal before any other connections are made.

**Operating Voltage**

Before switching on the power, check that the operating voltage listed on the equipment agrees with the power being connected to the equipment.

**Danger From Loss of Ground**

A grounding conductor may or may not be required depending on the hazardous classification. If required, any interruption of the grounding conductor inside or outside the equipment or loose connection of the grounding conductor can result in a dangerous unit. Intentional interruption of the grounding conductor is not permitted.

**Safe Equipment**

If it is determined that the equipment cannot be operated safely, it should be taken out of operation and secured against unintentional usage.

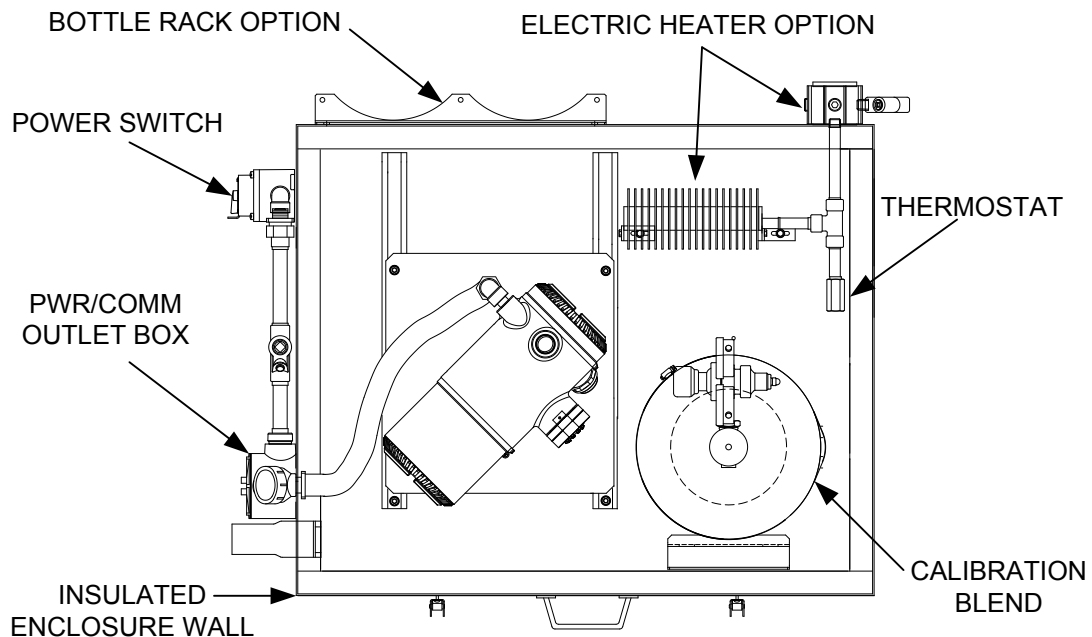
Blank Page

## 1.0 INTRODUCTION AND DESCRIPTION

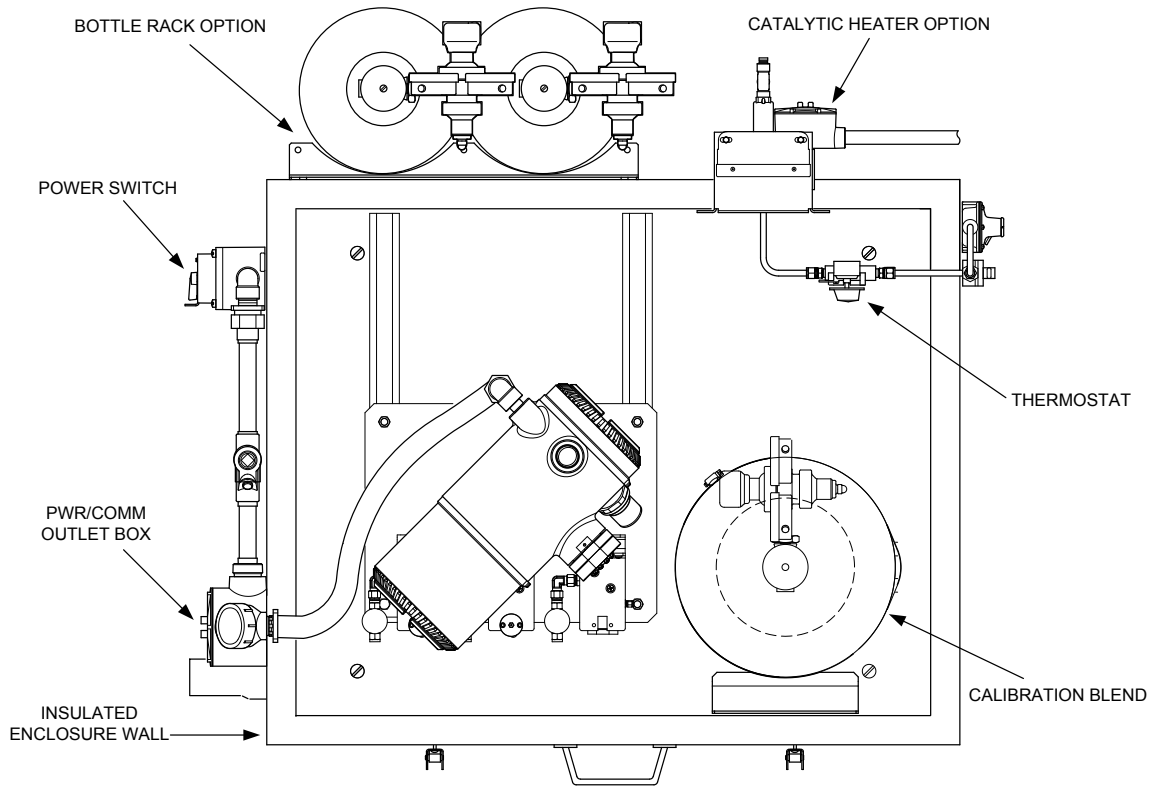
This document describes the installation of the Totalflow environmental enclosure and equipment designed for use with the NGC8200 chromatograph. Two enclosures are available for installation depending upon site requirements. The large enclosure (ENC82L) will hold a single or dual unit NGC and features a large foot print (38" w x 31" d x 30.5" h) (see Figure 1-1 and Figure 1-2). The small enclosure (ENC82S) is designed for a single NGC unit and features a smaller foot print (24" w x 19" d x 21" h) (see Figure 1-3 and Figure 1-4).

### 1.1 Standard Features

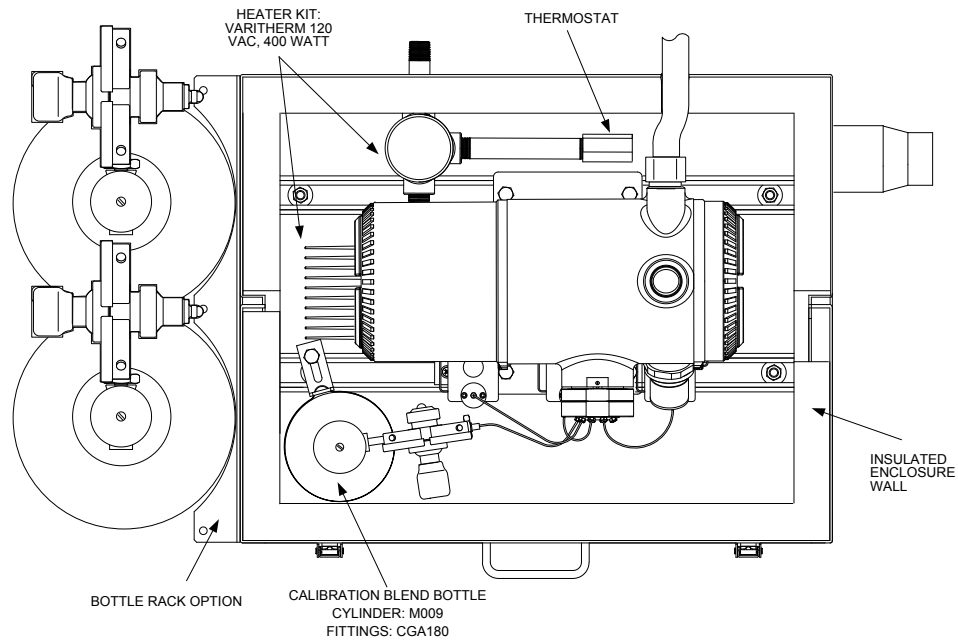
- Available with either an electric or catalytic heater option.
  - The catalytic heater is a 1500 Btu/hour input, includes a standard filter/drain kit.
  - The electric heater option features 120VAC/400W heater and thermostat.
- Sample conditioning system.
- Heated line entry.
- Rigid conduit.
- Mounts either as a free standing unit or pipe mounted unit.
  - Large enclosure may be pipe mounted on 4" through 12" pipe.
  - Small enclosure may be pipe mounted on 2" through 5" pipe.



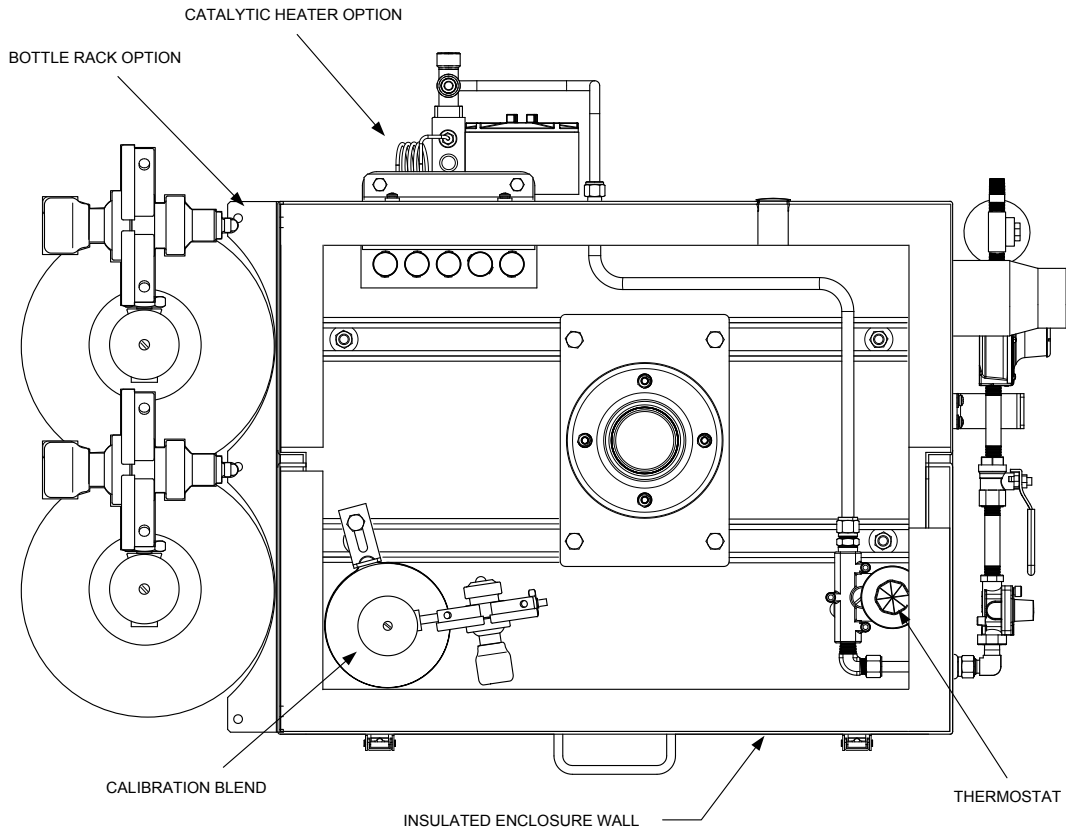
**Figure 1-1 ENC82L Environmental Enclosure with Electric Heater**



**Figure 1-2 ENC82L Environmental Enclosure with Catalytic Heater**



**Figure 1-3 ENC82S Environmental Enclosure with Electric Heater**



**Figure 1–4 ENC82S Environmental Enclosure with Catalytic Heater**

## 1.2 Optional Features

The following is a list of optional features:

- Calibration blend.
- DC power switch (large enclosure only).
- Dual bottle rack.

## 1.3 Order of Instruction

These instructions are listed in the suggested installation order. Depending upon how your system was configured, including the size of the enclosure, some of these instructions may not apply to your installation. Please refer to Table 1—1 to determine which instructions are required for your enclosure option. When optional equipment installation has been completed, refer to the “*NGC8200 User’s Manual*” for additional instructions software startup and operation.



The NGC8200 chromatograph is certified for installation in classified Hazardous Locations. The heaters and fittings in the environmental enclosure may not have the same ratings. All components of the installation, including accessories and fittings must be approved for the classification rating of the area of installation.

As with all installation and maintenance on the NGC8200 Chromatograph, please observe national and local codes for hazardous areas as required.

**Table 1—1 Enclosure Installation Matrix**

ENC82L	ENC82S	Instructions	Section
•		Large Free Standing Environmental Enclosure Installation	3.1
	•	Small Free Standing Environmental Enclosure Installation	3.2
•		Large Pipe Mounted Environmental Enclosure Installation	3.3
•		Optional Support Leg Kit Installation	3.4
	•	Small Pipe Mounted Environmental Enclosure Installation	3.5
•	•	NGC Installation	4.1
•	•	Sample Conditioning Module Installation	4.2
•	•	Sample Line Connections	4.3
•	•	Carrier Gas Bottle Rack Installation	4.4
•	•	Carrier Gas Regulator Installation	4.5
•		ENC82L Calibration Gas Bottle Installation	4.6
	•	ENC82S Calibration Gas Bottle Installation	4.7
•	•	Calibration Gas Regulator Installation	4.8
•	•	Carrier and Calibration Gas Connections	4.9
•	•	Vent Line Connections	4.10
•		ENC82L Enclosure Optional Pwr/Comm Outlet Box	4.11
•		ENC82L Optional Catalytic Heater Installation	4.12
	•	ENC82S Optional Catalytic Heater Installation	4.13
•	•	Optional Electric Heater Installation	4.14
•	•	Sealing Environmental Enclosure	4.15
•	•	DC Power Installation	5.0

## 1.4 Locating Area for Installation

The NGC should be located as close as possible to the sample probe installation point. This prevents the need for high gas flow rates through sample lines to assure analysis accuracy of current sample.

If there is more than one stream being analyzed, locate the NGC in a central location to all sample probe points.



**TIP**

Be certain the installation site is clean and free of foreign debris that could affect NGC operation.

## 1.5 Unpacking & Inspection

### 1.5.1 Shipping Carton

Ensure that there is no external damage to the shipping container. If there is significant visible external damage contact your receiving group and report the damage to the trucking company for a Freight Damage Claim.

### 1.5.2 Unpacking

The Environmental Enclosure and the NGC are shipped in a specially designed shipping cartons each of which contains the unit, mounting brackets (if applicable), list and wiring and interconnect diagrams. Optional equipment is shipped in a separate carton.

Carefully remove all internal and external packing material. Carefully remove all items from the box.

### 1.5.3 Bill of Lading

After removing protective shipping cover from NGC, compare shipped contents with those listed on Bill of Lading. All items should match those on Bill of Lading.

### 1.5.4 Inspection

Examine internal NGC components for evidence of damage.

Points of inspection are:

- Visually inspect exterior of unit for dents, chipped paint, scratches, damaged threads or broken glass plate, etc.
- Physically inspect rear interior mounted circuit boards, cables, front interior mounted circuit boards, for loose cables, boards, display and mounting screws etc.
- If applicable, inspect Calibration/Carrier gas bottles to be certain they are correct for the installation.

### 1.5.5 Damaged Components

If there is any damage, or if there are noticeable defects, notify your local Totalflow representative. Keep all shipping materials as evidence of damage, for carriers inspection. Totalflow will arrange for immediate repair or replacement.

Telephone: USA: (800) 442-3097 toll free      International: +1 9183384880

Blank Page



## 2.0 SAMPLE PROBE INSTALLATION

FYI



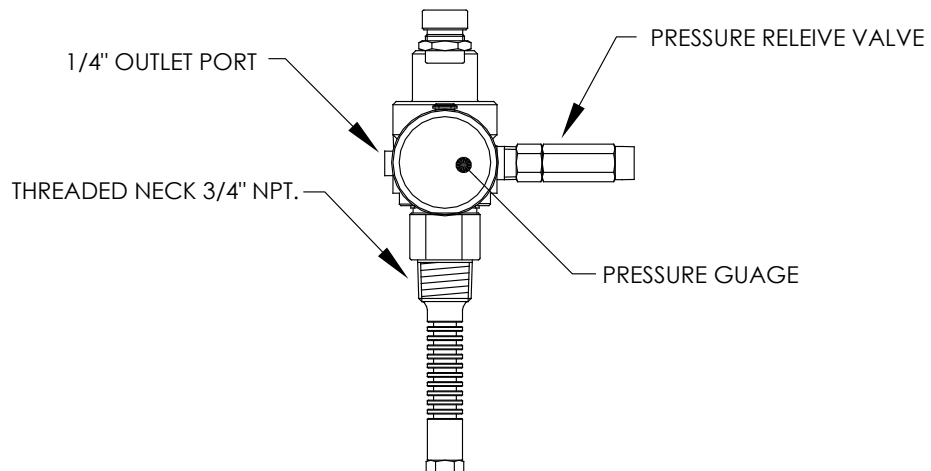
- 1) If a sample probe has previously been installed, you may skip these instructions.
- 2) Sample probe pipe coupling should be located on the top of the meter run and may be mounted vertical or horizontal.

### 2.1 Materials

- Horizontal pipe coupling  $\frac{3}{4}$ " NPT (previously installed)
- Sample probe (configuration to be determined by the technician based on installation and local codes.)
- Teflon tape or customer supplied pipe dope (suitable for chromatography)

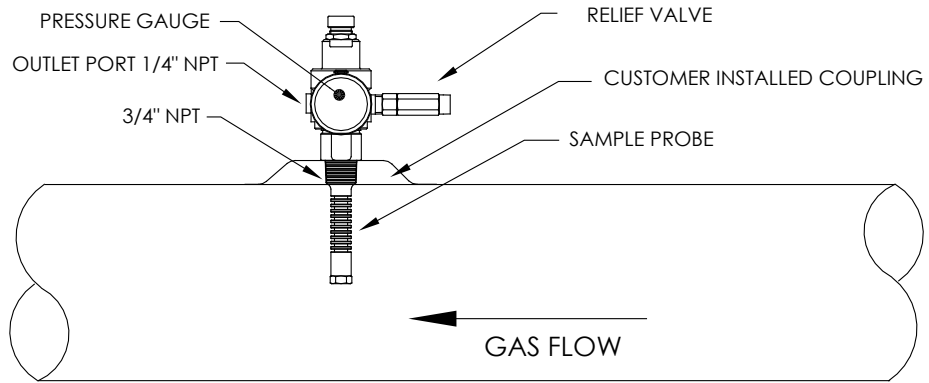
### 2.2 Installation

- 1) Shut down meter run and isolate from gas source. Be sure to use proper lockout and tagging procedures.
- 2) Bleed off gas from meter run
- 3) Ensure installed mounting coupling is free from dirt and debris.
- 4) Ensure sample probe threads are free from dirt and debris.
- 5) Using Teflon tape or pipe dope, wrap or cover NPT threads of sample probe (see Figure 2-1).



**Figure 2-1 Sample Probe**

- 6) Insert gas probe into pipeline coupling (see Figure 2-2).
- 7) Using the correct tool, tighten probe. Securely tighten so there is no gas leakage. **DO NOT OVER TIGHTEN.**
- 8) Install shut-off valve on secondary side of sample probe if desired.



**Figure 2-2 Sample Probe Insertion**

## 3.0 ENC82 ENVIRONMENTAL ENCLOSURE INSTALLATION

### 3.1 Large Free Standing Environmental Enclosure Installation

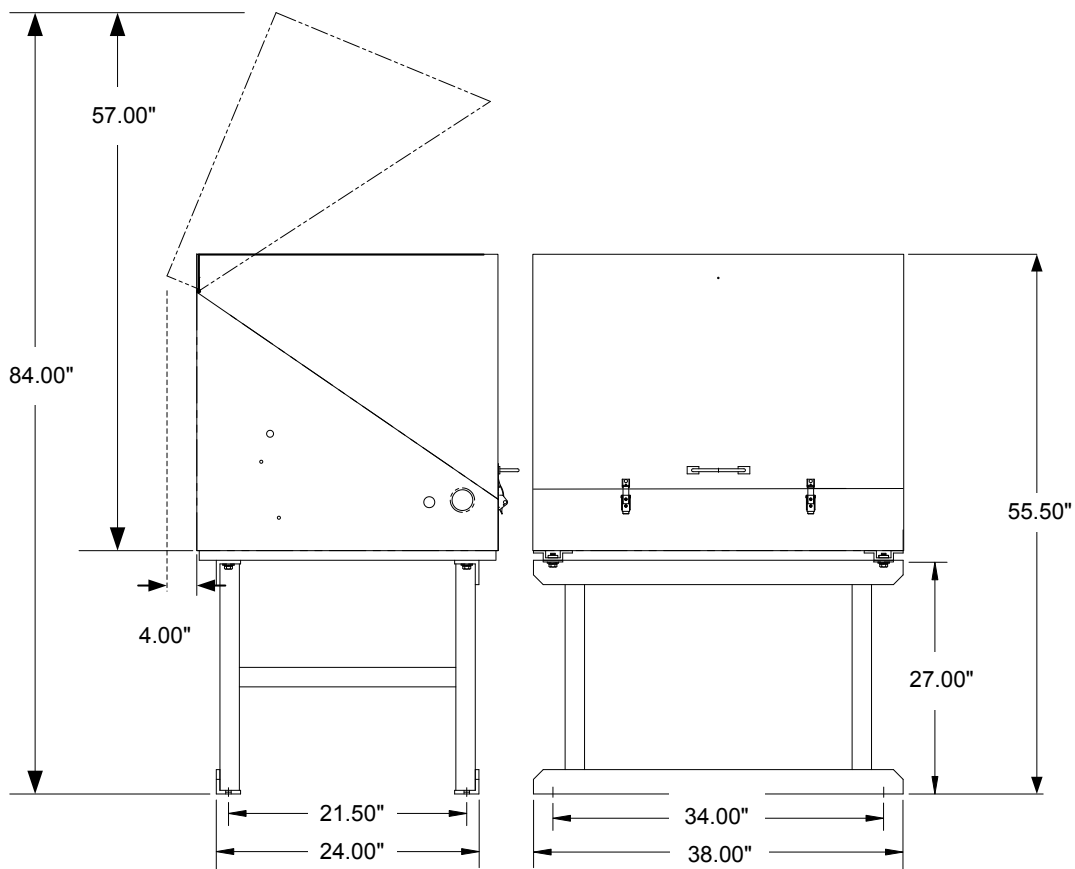
The following steps will typically require two people.

#### 3.1.1 Materials

- 4 ea. ½-13 x 1 ¼ SST bolt
- 4 ea. ½ SST flat washer
- 4 ea. ½" SST split Washer
- 1 ea. stand

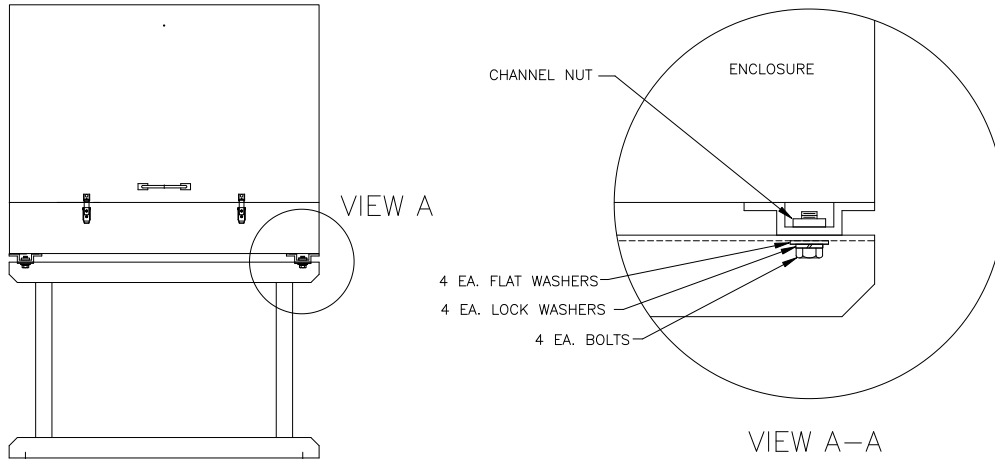
#### 3.1.2 Installation

- 1) Stand is made symmetrical, so top and bottom are identical. Locate stand base on a flat, stable, surface.
- 2) Set enclosure on top of stand, oriented so that the stand brace is horizontal with front of enclosure (see Figure 3-1).



**Figure 3-1 ENC82L-Enclosure Stand Installation**

- 3) Place a split washer, then a flat washer on one of the 1 ¼" bolts and insert through bolt hole located in the angle iron into the outermost corner of the enclosure (see Figure 3–2).
- 4) Move channel nut into position so that bolt will screw into nut. Screw bolt into nut. Do not tighten.



**Figure 3–2 ENC82L–Enclosure Mounting Hardware**

- 5) Repeat for all other corners.
- 6) Position enclosure on stand, centering stand underneath or offset as desired and tighten all bolts.
- 7) Foot plate mounting holes are pre-drilled for mounting to a pad. Hardware to be supplied by customer.

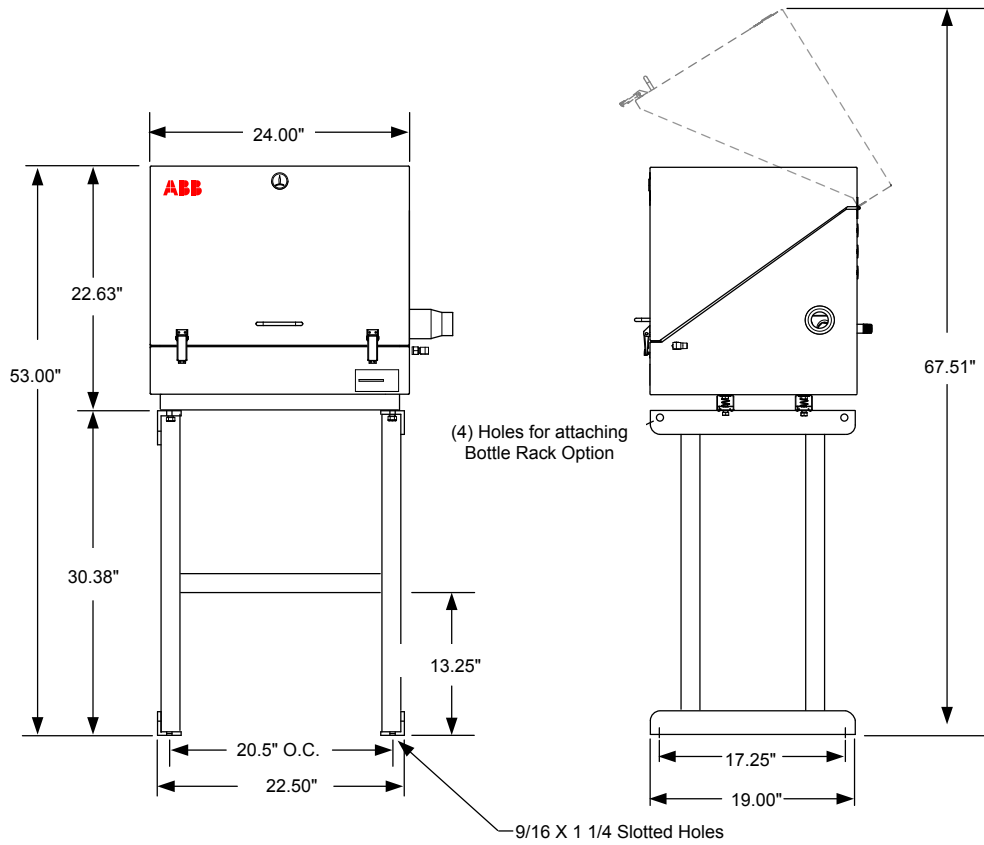
## 3.2 Small Free Standing Environmental Enclosure Installation.

### 3.2.1 Materials

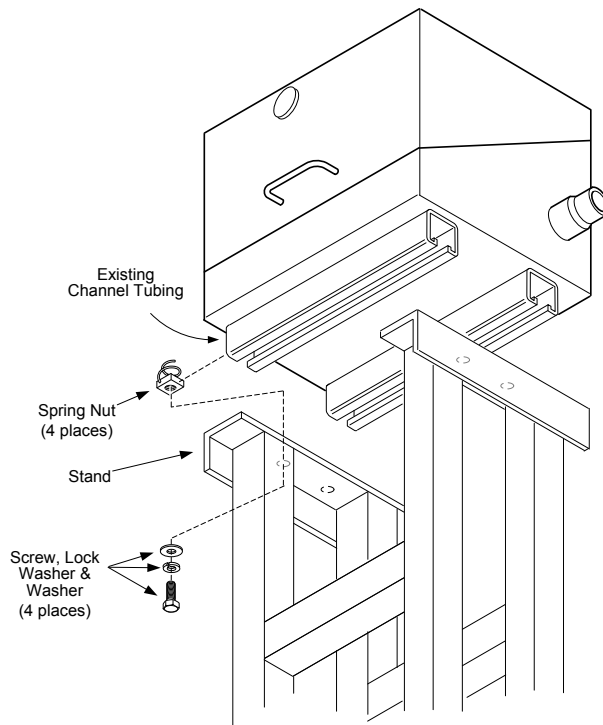
- 4 ea. ½-13 x 1 ¼ SST bolt
- 4 ea. ½ SST flat washer
- 4 ea. ½" SST split Washer
- 1 ea. stand

### 3.2.2 Instructions

- 1) Stand is NOT made symmetrical, locate angle iron with slotted holes for floor anchors and place stand base on flat, stable, surface.
- 2) Set enclosure on top of stand, oriented so that the stand brace is horizontal with front of enclosure (see Figure 3–3).
- 3) Place a split washer, then a flat washer on one of the 1 ¼" bolts and insert through bolt hole located in the angle iron into the outermost corner of the enclosure (see Figure 3–4).



**Figure 3-3 ENC82S-Enclosure Installation**



**Figure 3-4 ENC82S-Enclosure Mounting Hardware**

- 4) Move channel spring nut into position so that bolt will screw into nut. Screw bolt into nut. Do not tighten.
- 5) Repeat for all other corners.
- 6) Position enclosure on stand, centering stand underneath or offset as desired and tighten all bolts.
- 7) Foot plate mounting holes are pre-drilled for mounting to a pad. Hardware to be supplied by customer.

### 3.3 Large Pipe Mounted Environmental Enclosure Mounting Kit

If your installation includes a pipe mounted environmental enclosure, follow these instructions as well as the optional support leg instructions if applicable, otherwise continue to the next applicable set of instructions.

#### 3.3.1 Materials

- 4 ea. ½" -13 x 1 ¼ SST bolt
- 4 ea. ½" SST flat washer
- 4 ea. ½" SST split washer
- 2 ea. 2 ½" x ¼" 43" steel angle iron

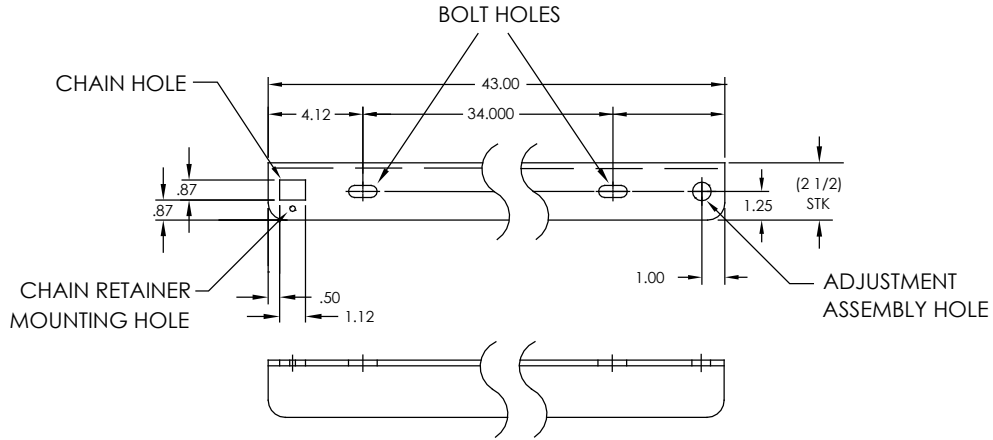
**FYI**



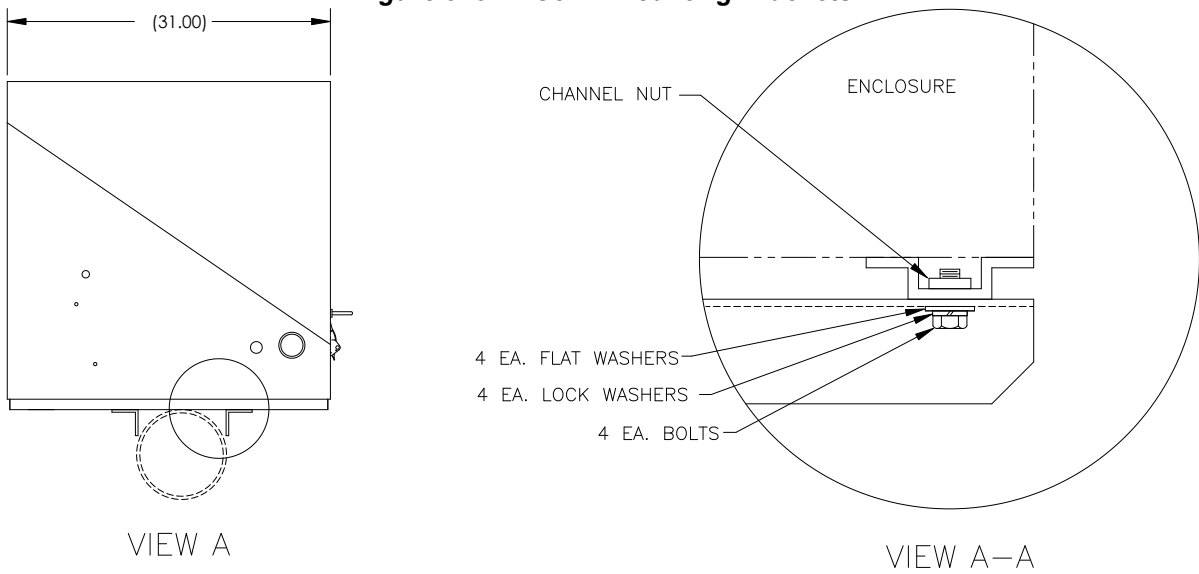
May be used in conjunction with optional support leg Kit. See support leg Installation procedures next in this chapter.

#### 3.3.2 Installation

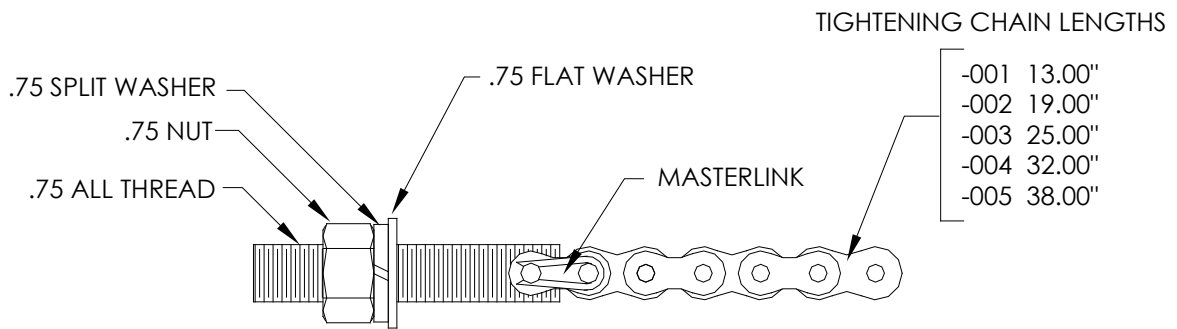
- 1) Set two pieces of angle iron (see Figure 3–5) on bottom of upside down enclosure, being sure the side with the holes is facing the bottom of the enclosure and the solid sides of the angle iron are facing each other. Angle iron should be spaced so that the diameter of the pipe will fit in between.
- 2) Place a split washer, then a flat washer on one of the 1 ¼" bolts (see Figure 3–6).
- 3) Insert the bolt through one of the slotted holes located in the angle iron into the outermost corner of the enclosure. Move channel nut into position so that bolt will screw into nut.
- 4) Screw bolt into nut, but leave loose for later adjustment.
- 5) Install other bolt, split washer and flat washer into other slotted hole.
- 6) Repeat for other angle iron. Final tightening of bolts is done after unit is mounted on pipe to allow for left to right and front to back positioning.
- 7) Remove nut and washers from adjustment assembly if necessary (see Figure 3–7).
- 8) Insert all-thread through round hole on adjustment side of angle iron.



**Figure 3-5 ENC82L-Mounting Brackets**



**Figure 3-6 ENC82L-Mounting Hardware Installation**



**Figure 3-7 ENC82L-Adjustment Assembly**

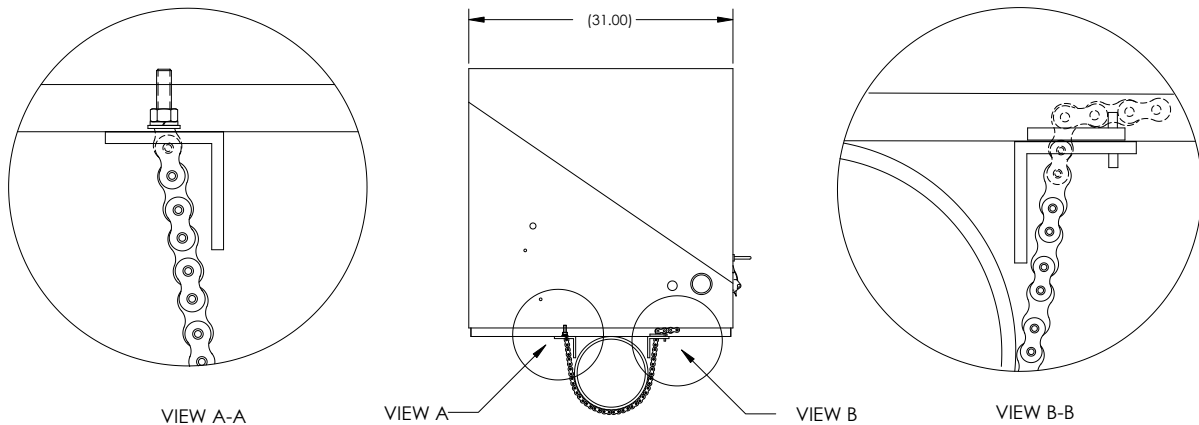
- 9) Place the flat washer, split washer and nut on all-thread.
- 10) Screw nut onto all-thread until top of nut is level with top of all-thread. Final tightening may be done after mounting chain is in place.

**FYI**

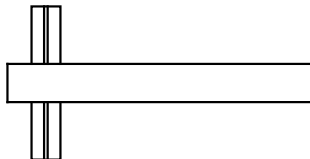


Lift enclosure above meter run allowing enough clearance to clear pipe.

- 11) Set enclosure on top of pipe in between the angle iron mounting brackets. Keep unit steady on top of pipe.
- 12) Wrap mounting chain underneath pipe (see Figure 3–8). Feed chain up through square retainer hole of angle iron and pull up until most of the slack has been taken out of mounting chain.
- 13) Feed long flat end of chain retainer (see Figure 3–9) through middle of a chain link then move retainer lock into position where round peg fits into small round mounting hole.



**Figure 3–8 ENC82L–Pipe Mount installation**



**Figure 3–9 ENC82L–Chain Retainer Lock**

- 14) Adjust enclosure into final position on the pipe and tighten nut on all-thread (adjustment assembly) until unit is securely in place.
- 15) Adjust enclosure position on angle iron if necessary then tighten bolts until secure.


### 3.4 Optional Support Leg Kit Installation

If your installation includes a pipe mounted environmental enclosure and requires an optional support leg, follow these instructions, otherwise continue to the next applicable set of instructions.



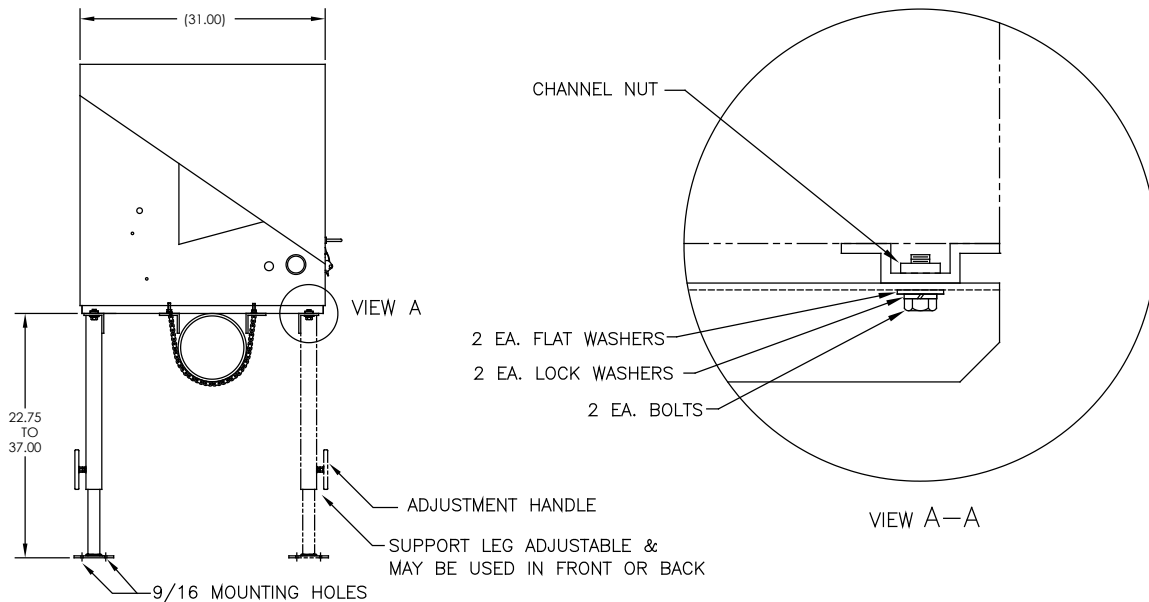
### 3.4.1 Materials

- 2 ea. 1/2-13 x 1 1/4 SST bolt
- 2 ea. 1/2 SST flat washer
- 2 ea. 1/2" SST split washer
- 1 ea. pre-assembled adjustable height support leg

**TIP**  Must use with pipe mounting kit.

### 3.4.2 Instructions

- 1) Set support leg underneath front or rear (or both if using 2 kits) of pipe mounted enclosure, oriented so that the leg brace is horizontal with front of enclosure (see Figure 3–10).
- 2) Place split washer, then flat washer on one of the 1 1/4" bolts.
- 3) Insert bolt through hole located in the angle iron into the outermost corner of the enclosure. Move channel nut into position so that bolt will screw into nut.



**Figure 3–10 ENC82L–Optional support leg Overview**

- 4) Screw bolt into nut, but leave loose for later adjustment. Repeat for other corner.
- 5) If installing two support legs, repeat for other angle iron. Final tightening of bolts may be done after support leg(s) are in desired positioned on a flat stable surface.
- 6) Loosen adjustment handle and drop leg foot down and retighten adjustment handle.
- 7) Foot plate mounting holes are pre-drilled for mounting to a pad. Hardware to be supplied by customer.

### 3.5 Small Pipe Mounted Environmental Enclosure Mounting Kit

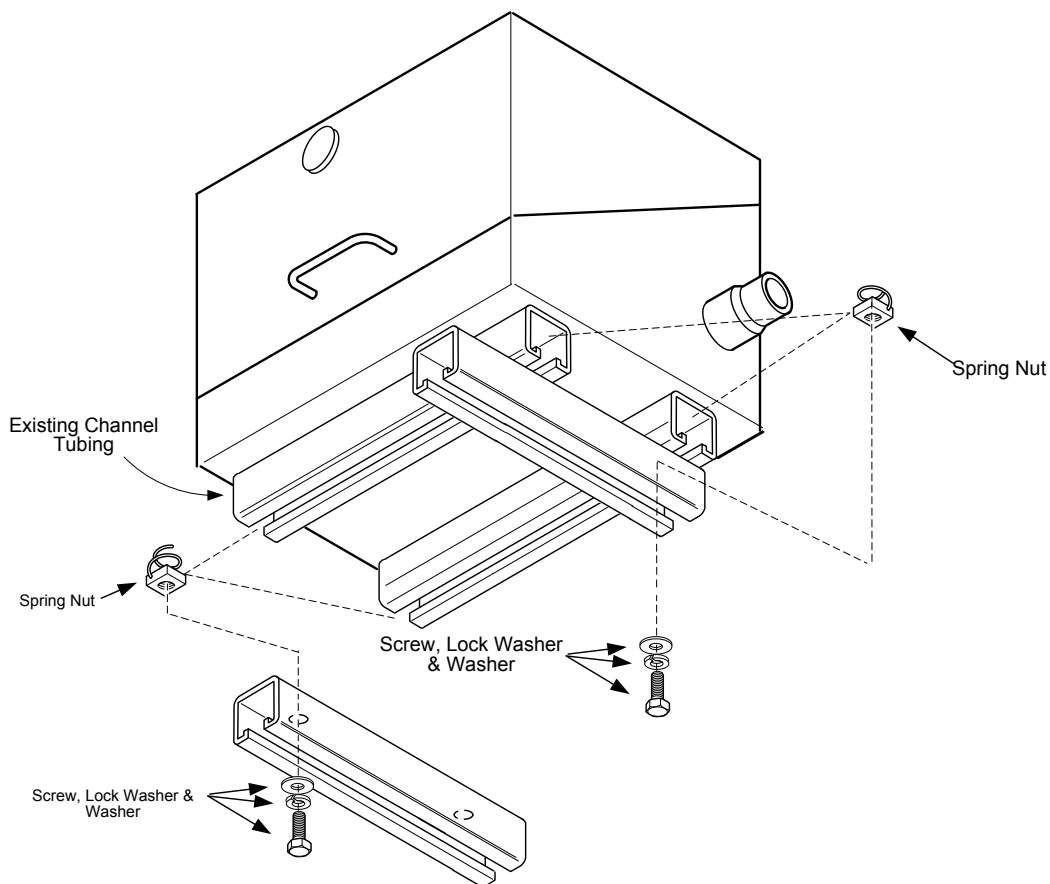
If your installation includes a pipe mounted environmental enclosure, follow these instructions if applicable, otherwise continue to the next applicable set of instructions. Mounting kit available for 2", 3", 4", and 6" pipe only.

#### 3.5.1 Materials

- 2 ea. split U-brackets w/hardware
- 2 ea. 10 1/2" channel tubes
- 4 ea. 1/2" Spring Nut
- 4 ea. 1/2" SST split washer
- 4 ea. 1/2-13 x 1 1/4 SST bolt
- 4 ea. 1/2" SST split washer

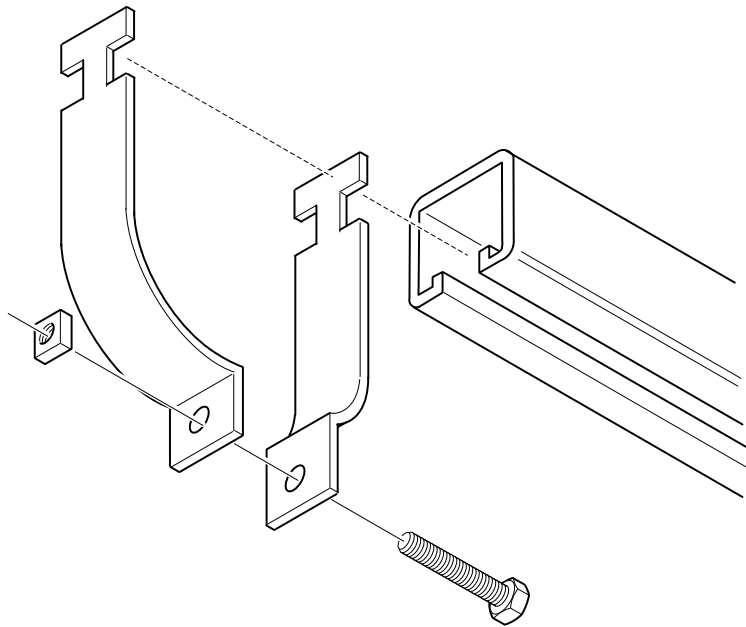
#### 3.5.2 Installation

- 1) Place enclosure upside down to gain access to channel tubing on bottom of enclosure.
- 2) Insert and move each spring nut into approximate position inside of existing channel tubing (see Figure 3-11).



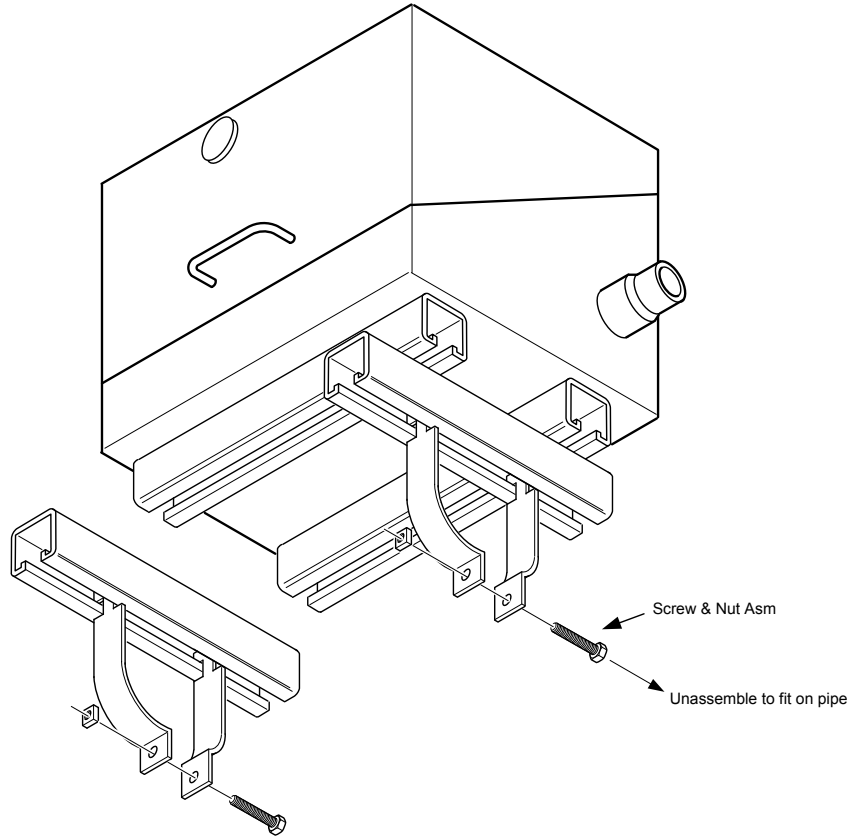
**Figure 3-11 ENC82S-Channel Tubing Installation**

- 3) Set two pieces of channel tubing on bottom of upside-down enclosure, being sure the side with the holes is facing the bottom of the enclosure and that they are at a 90 degree angle to the existing tubing.
- 4) Insert and move spring nut into approximate position inside of existing channel tubing.
- 5) Place split washer, then flat washer on one of the 1 ¼" bolts.
- 6) Insert bolt through hole located in the channel tubing into the spring nut inside of the existing channel tubing. Move channel nut into position so that bolt will screw into nut. Do not tighten.
- 7) Repeat for the remaining screws and nuts.
- 8) Remove screw and nut from both U-brackets (see Figure 3–12).

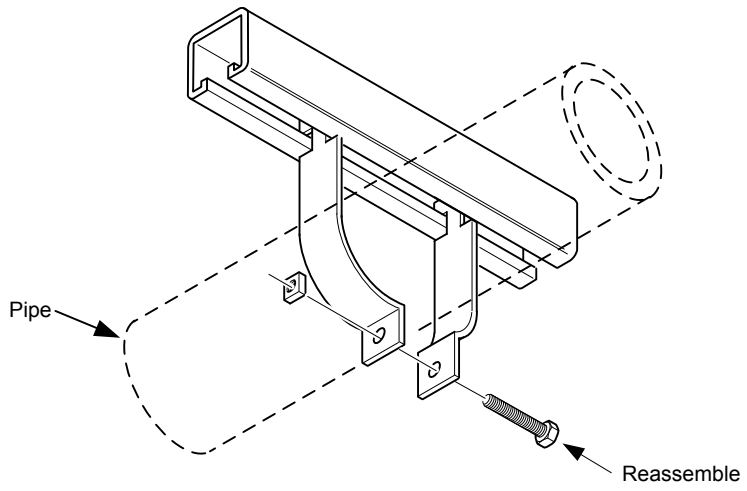


**Figure 3–12 ENC82S–Pipe Mount Split Brackets**

- 9) Slide both sides of the U-bracket into the newly mounted channel tubing (see Figure 3–13), being sure that the pieces are correctly oriented to fit around the pipe. Repeat for second bracket and tubing.
- 10) Separate U-brackets to allow mounting on pipe. Set unit on pipe and move brackets together surrounding the pipe.
- 11) Reassemble U-bracket with screw and nut. Leave loose until enclosure has been centered over pipe and adjusted for position (see Figure 3–14). Tighten.



**Figure 3-13 ENC82S- Pipe Mount Assembly**



**Figure 3-14 ENC82S-Pipe Mounted**

## 4.0 NGC AND PERIPHERAL EQUIPMENT INSTALLATION

### 4.1 NGC Installation

Both the large and small environmental enclosures are shipped with the NGC mounting system installed inside the environmental enclosure. The following instructions should be followed to install the NGC onto the mounting pipe.

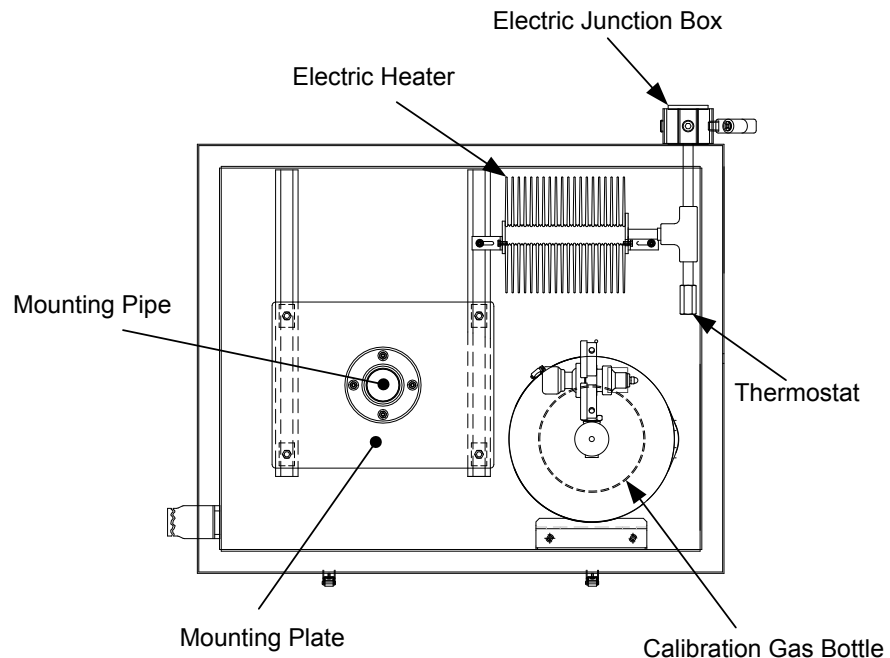
Before you begin, review the procedure and the materials required for installation.

#### 4.1.1 Materials

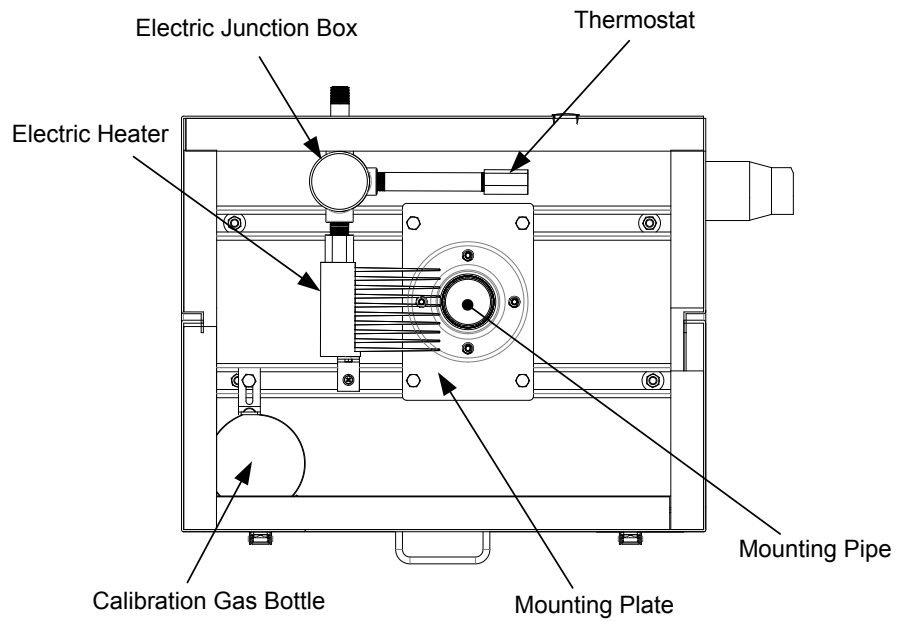
- Installed mounting pipe
- 4 ea. 5/16" hex socket screws (mounting pipe with flange kit option)
- NGC

#### 4.1.2 Instructions

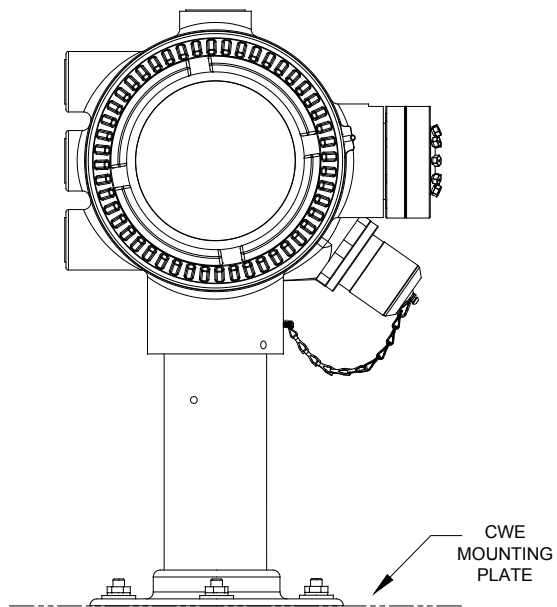
- 1) Inside of large or small enclosure (see Figure 4–1 or Figure 4–2), locate pipe stand.
- 2) Position NGC on top of 2" pipe stand (see Figure 4–3), adjust to close approximation for correct orientation.
- 3) If installation has the optional mounting pipe with flange, ensure screw holes in upper flange align with holes located in the NGC neck bottom (see Figure 4–4).



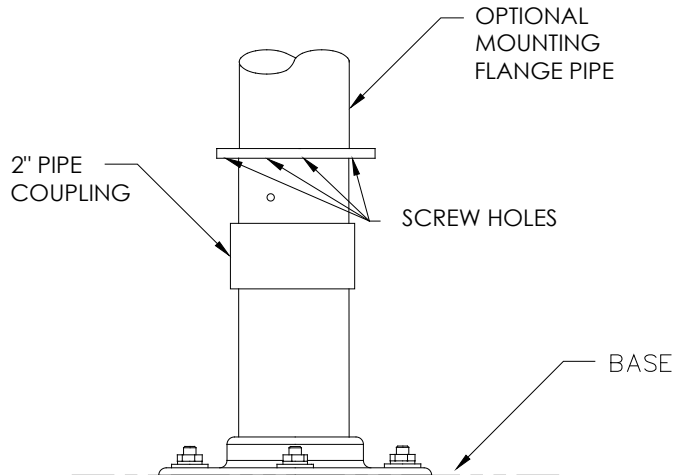
**Figure 4–1 ENC82L–NGC8200 Mounting Stand**



**Figure 4-2 ENC82S-NGC8200 Mounting Stand**



**Figure 4-3 Mounting the NGC8200**



**Figure 4–4 NGC Optional Mounting Flange Pipe**

- 4) Position unit on pipe. The front display of the unit would normally face left, with the feed-through assembly facing the front opening of the enclosure. This allows screen visibility, access to the feed-through assembly and termination panel located in the rear of the housing.
- 5) Secure in place by tightening the hex socket set screw located in the neck of the unit using a 1/8" hex wrench.
- 6) If the optional mounting pipe with flange is used, insert hex socket screw through hole in the welded flange into the neck bottom of unit and tighten using 1/4" hex wrench. Repeat for all screws.
- 7) Small adjustments may be made to orientation, by applying additional pressure to mounting pipe with pipe wrench, tightening mounting pipe into plate mounted flange.

**FYI**



When positioning the unit, you should take into consideration the mounting of the sample conditioning system, conduit locations and access to the rear end cap of the unit.

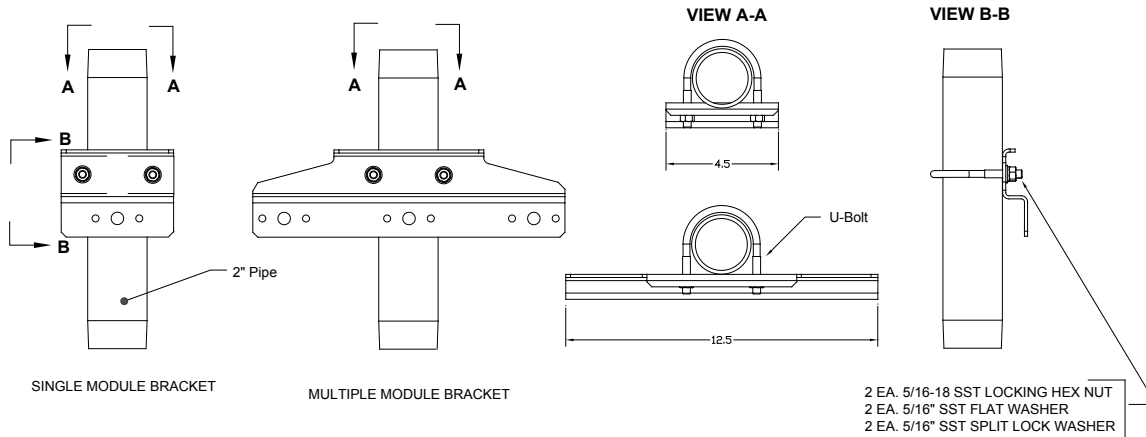
## 4.2 Sample Conditioning Module Installation

### 4.2.1 Materials

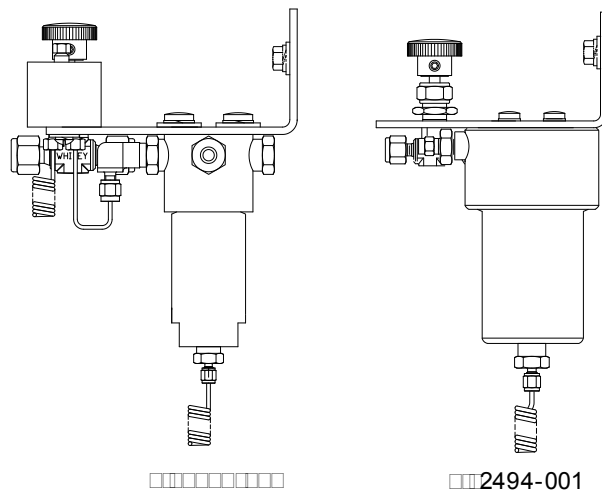
- Installed NGC
- Single or multiple module mounting kit (see Figure 4–5)
- 1 ea. .312 x 2.5 x 3.62 x 1.5 U-bolt
- 2 ea. 5/16" SST split washer
- 2 ea. 5/16" SST flat washer
- 2 ea. 5/16-18 SST lock nut
- Sample conditioning module(s) and hardware (see Figure 4–6)

### 4.2.2 Mounting

Both the single and multiple module mounting brackets are installed identically. The single module bracket holds a single stream sample conditioning module, while the multiple module bracket holds up to three sample conditioning modules.



**Figure 4-5 Sample System Mounting Kits**



**Figure 4-6 Sample Conditioning Modules**

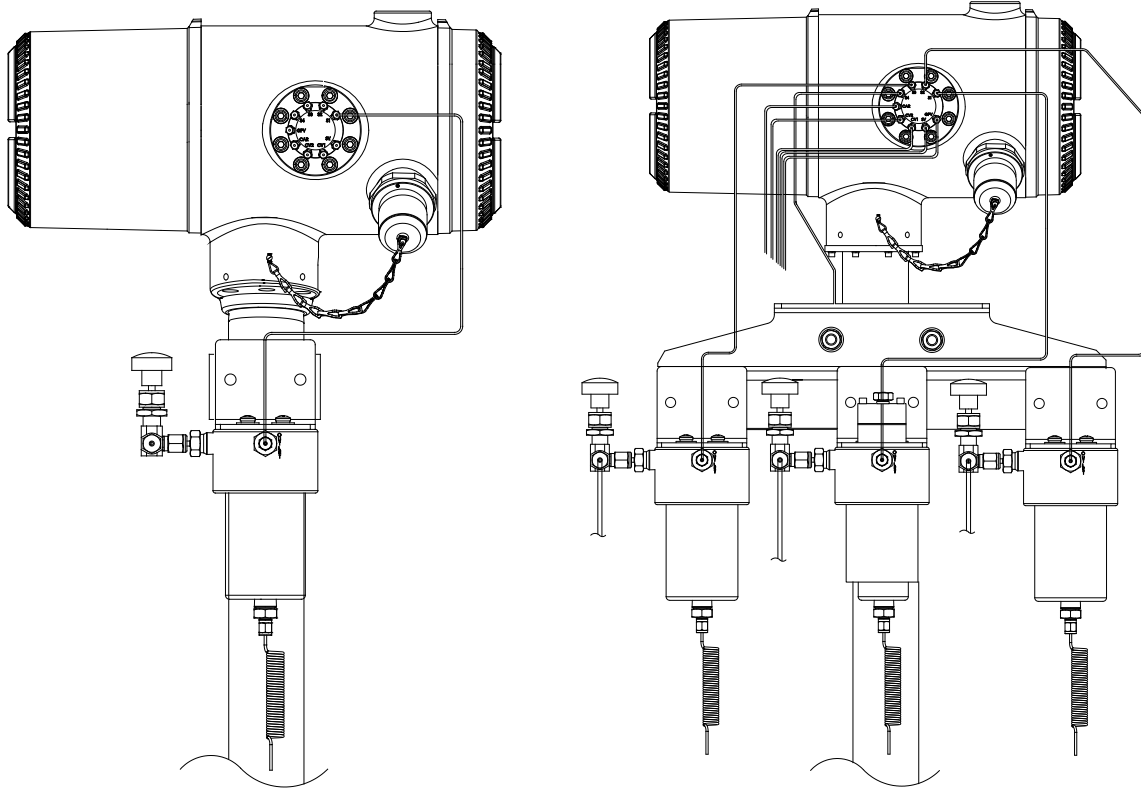
**4.2.2.1 Instructions**



When installing module bracket inside of the ENC82S small environmental enclosure, mounting bracket must be installed upside down to allow for required space. Otherwise, module bracket installed inside of the ENC82L large environmental enclosure should be oriented as shown in Figure 4-7.

- 1) On sample conditioning module, align the mounting holes to the corresponding holes in the bracket. Please see caution note above regarding orientation of the mounting bracket. Insert the bolt through the hole in the bracket, from front to back through the mounting hole in the module.
- 2) Place the split washer and then the flat washer on the bolt. Screw the nut onto the end of the bolt until finger tight. Repeat for the second mounting bolt. Tighten both nuts.





**Figure 4-7 Single and Multiple Stream Sample Conditioning Assemblies**

- 3) Repeat for all additional modules.
- 4) Straddle the mounting pipe with the U-bolt and insert the threaded ends through the holes located in the mounting bracket so that the bracket back fits flat against the pipe, and the module mounting lip sets away from the pipe.
- 5) Place the flat washer, then a split washer on the end of the U-bolt. Screw the nut onto the end of the bolt and finger tighten.
- 6) Repeat step 4 for the other side of the U-bolt.
- 7) Move bracket into position underneath the NGC, being careful to allow clearance for the sample conditioning module(s).
- 8) Tighten both nuts.

### 4.3 Sample Line Connections


Following installation of the sample conditioning module(s), the sample line from the sample probe to the sample conditioning system should be installed. Figure 4-6 shows the two conditioning modules available for installation with the NGC8200.

#### 4.3.1 Materials

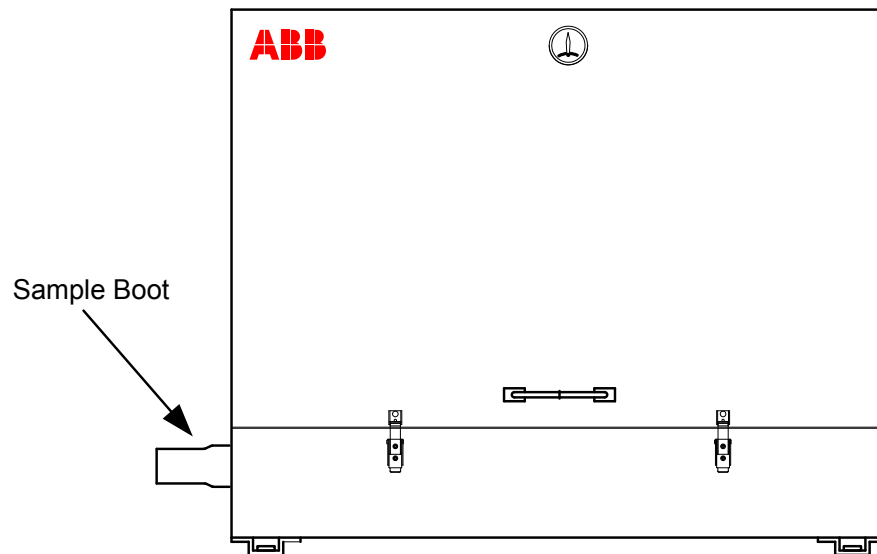
- Installed sample conditioning module for each stream.
- 1/8" SST chromatography grade transport tubing (amount to be determined by technician based on distance from sample probe to sample conditioning module and number of sample streams).

- 2 ea. ferrule and nut (for each sample stream)
- 1 ea. 1/4" NPT to 1/8" reducer or other size as determined from sample probe output port (for each sample stream)
- 1 ea. sample conditioning module transport tubing (supplied with sample conditioning module).
- 1/16" or larger vent tubing and materials for making connection to 1/16" purge coil to vent outside of enclosure (provided by customer for each stream)
- Heat trace materials provided by customer for each stream

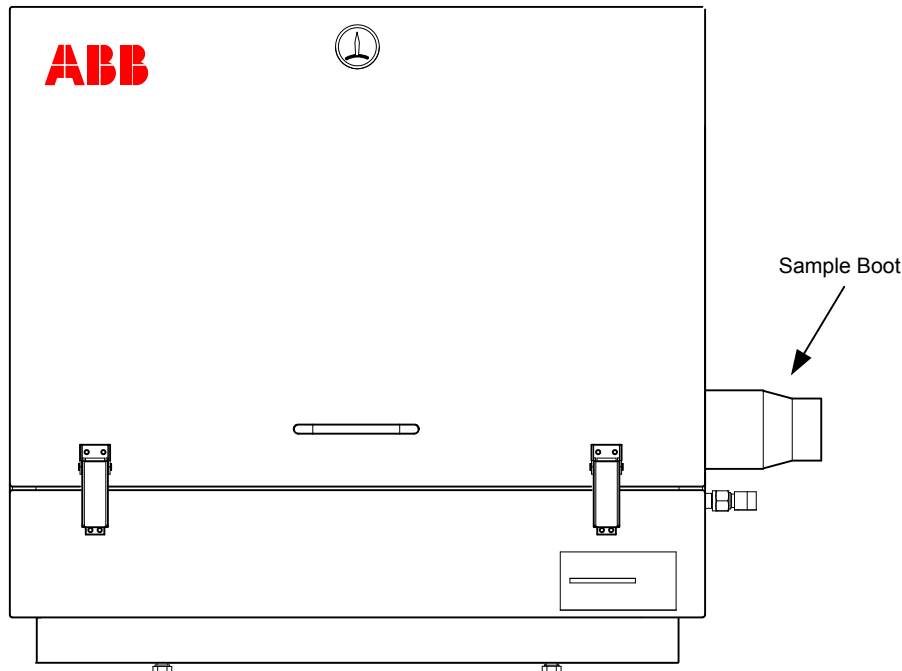
#### 4.3.2 Instructions

**TIP**  Be certain ends of stainless steel tubing are open and not restricted.

- 1) Locate sample input fitting on sample conditioning module (see Figure 4–6) and sample output fitting on installed sample probe.
- 2) Locate sample boot on side of environmental enclosure (see Figure 4–8 and Figure 4–9). Sample lines must feed through the sample boot located on the side of the enclosure.
- 3) Measure and cut SST tubing to required length. Feed sample tubing through sample boot.




**Figure 4–8 ENC82L–Environmental Enclosure Sample Boot**




**Figure 4–9 ENC82S–Environmental enclosure Sample Boot**


- 4) If necessary, install reducer into sample probe output fitting.
- 5) Install ferrule and nut onto one end of the sample tubing.
- 6) Insert tubing with ferrule into reducer/sample probe output fitting. Move nut down onto ferrule, screw onto fitting and tighten.
- 7) Install ferrule and nut onto other end of the sample tubing.
- 8) Insert ferrule into sample conditioning module input fitting. Move nut down onto ferrule, screw onto fitting and tighten.
- 9) Locate sample output fitting on sample conditioning module.
- 10) Locate sample input on NGC feed-through assembly and remove sealing screw.

**CAUTION**  Leave sealing screw in any unused ports. If unused stream ports are not sealed, moisture can enter the manifold which can damage the instrument and void warranty.

- 11) Make necessary bends in tubing to ease installation of the tubing into output fitting on sample conditioning module, and ferrule and valco nut into input on NGC feed-through assembly.
- 12) Insert tubing with ferrule into output fitting on sample conditioning module. Move nut down onto ferrule, screw onto fitting and tighten.
- 13) Remove plastic caps from restrictor coils, sealing screws from Feed-through column vents and sealing screw from sample vent lines.
- 14) Purge air from the transport tubing by opening the shut-off valve located on the sample probe.

**WARNING**  Be sure to follow requirements of national and local codes when performing this purge.


- 15) Insert tubing with ferrule into corresponding input port located on the NGC feed-through assembly. Move valco nut down onto ferrule, screw into port and tighten.
- 16) Repeat for each additional sample stream.

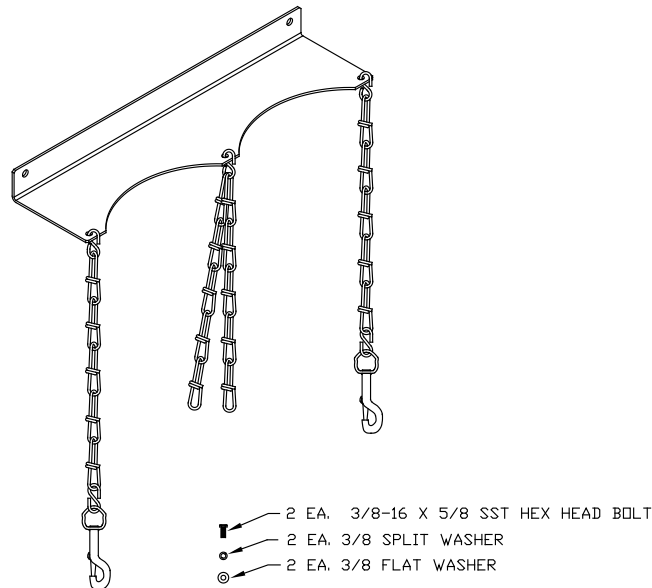
**CAUTION**  DO NOT over tighten. After securing tubing, check for gas leaks.

- 17) Measure and cut vent tubing to sufficient length to guarantee purge coils vent outside of enclosure. Feed vent tubing through sample boot.
- 18) Make necessary bends in tubing to ease installation of tubing into the required fittings on the end of sample conditioning module purge coil.
- 19) Please follow Heat Trace Manufacturer's suggested installation instructions for applying Heat Trace equipment to additional sample streams.

#### 4.4 Carrier Gas Bottle Rack Installation

The carrier gas bottle rack is used to hold carrier gas bottles and is installed on the back of the large environmental enclosure (see Figure 4–10) and on the side of the small environmental enclosure.

**FYI**  A gas regulator should be installed on each gas bottle.



**Figure 4–10 Dual Bottle Rack Assembly**

##### 4.4.1 Materials

- 1 ea. bracket with chain assembly attached
- 2 ea. 3/8"-16 x 5/8 SST hex head bolt
- 2 ea. 3/8" SST split washers
- 2 ea. 3/8" SST flat washers

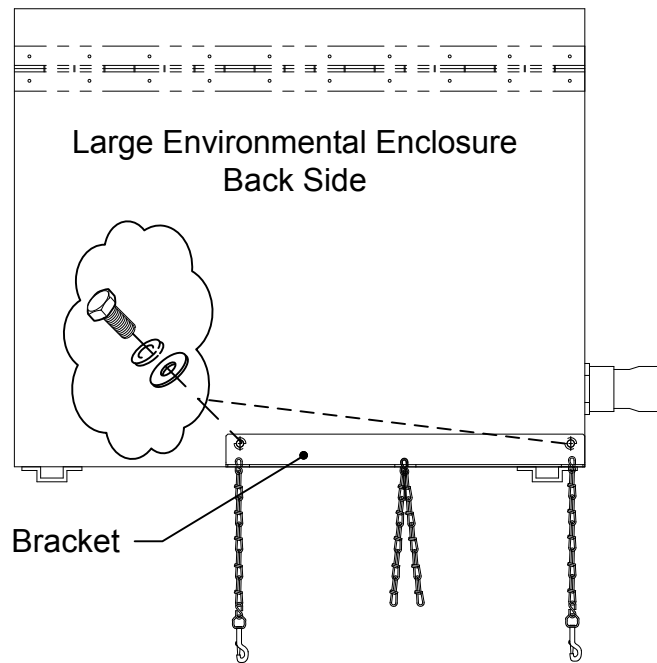
- 2 ea. 3/8" nuts (used for small enclosure only)

#### 4.4.2 Instructions

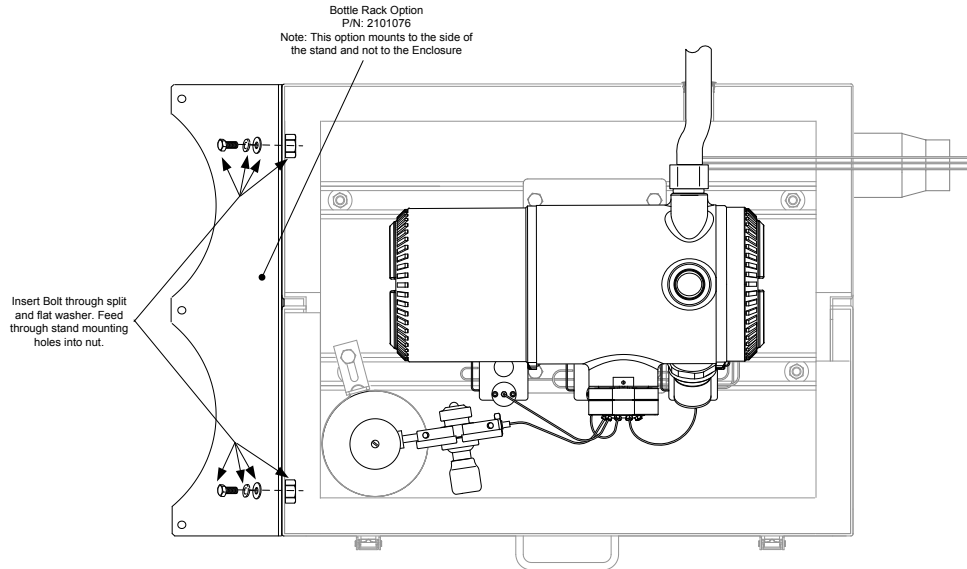


Installation instructions are similar for both the large and small environmental enclosures, however the bottle rack is installed on the side of the small free-standing enclosure stand which does not contain captive nuts. When the rack is installed on the back of the large enclosure, captive nuts are located inside of the enclosure wall.

- 1) Locate bracket holes on the rear of the large enclosure or the side of the small enclosure stand.
- 2) Place a split washer, then a flat washer on one of the 5/8" bolts and insert through bolt hole located in the bottle rack bracket into the corresponding hole. See Figure 4–11 for the large enclosure and Figure 4–12 for the small enclosure.
- 3) Screw bolt into captive nut on large enclosure or nut provided with small enclosure kit, tighten.
- 4) Repeat for second bolt.



**Figure 4–11 ENC82L–Dual Bottle Rack Installation**



**Figure 4–12 ENC82S–Dual Bottle Rack Installation**

- 5) Install carrier gas bottle in bottle rack.
- 6) Using chains, strap bottle(s) to rack by attaching bolt snap to one of the center chains.

## 4.5 Carrier Gas Regulator Installation

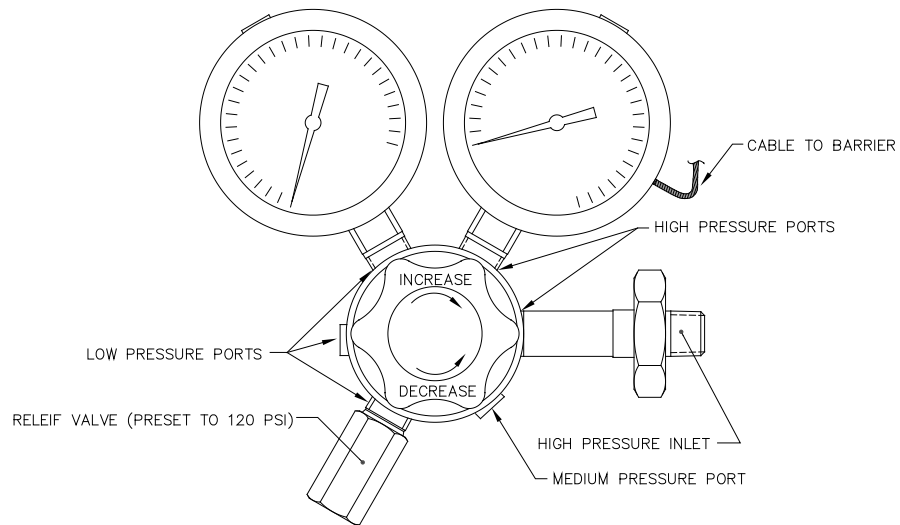
These instructions assume that the carrier gas bottle has previously been installed and are valid for all installations.



**DO NOT** connect a low pressure switch directly to the NGC without a barrier.

### 4.5.1 Materials

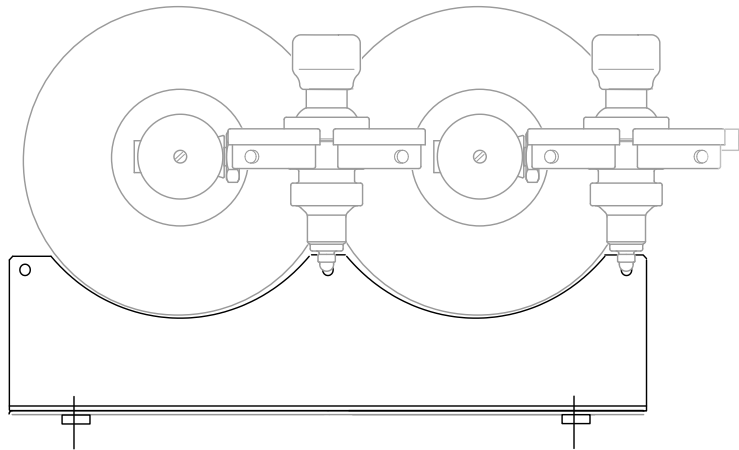
- Carrier regulator assembly (see Figure 4–13)
- Installed carrier gas bottle



**Figure 4–13 Carrier Gas Pressure Regulator with Relief Valve**

#### 4.5.2 Instructions

- 1) Remove protective cap from high pressure inlet if required.
- 2) Insert ferrule on regulator high pressure inlet into carrier gas bottle outlet.
- 3) Screw nut onto thread and tighten
- 4) Check for leaks.



**Figure 4–14 Dual Carrier Gas Bottles and Rack**

#### 4.6 ENC82L Calibration Gas Bottle Installation

The calibration gas bottle mounting rack is used to hold the calibration gas bottle when located inside of the large environmental enclosure. Refer to Figure 4–15.

**FYI**



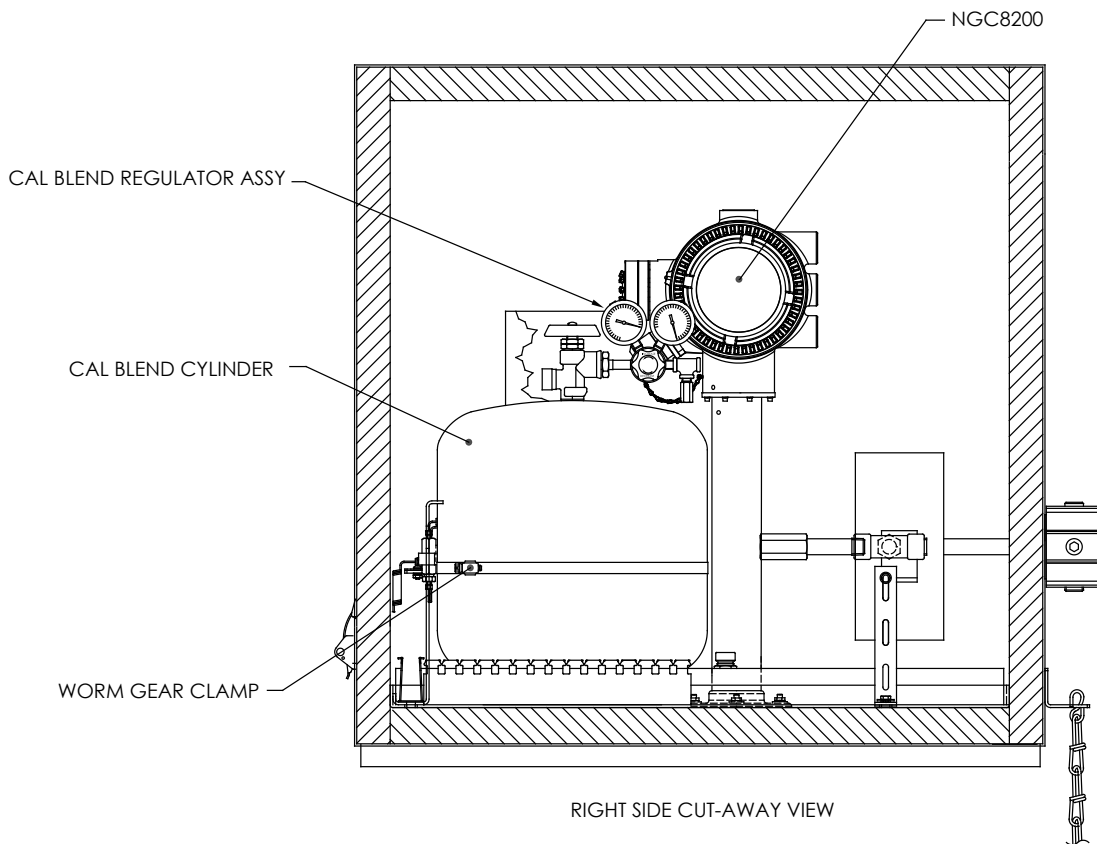
A gas regulator should be installed on each gas bottle.

#### 4.6.1 Materials

- Strapping material (shipped with environmental enclosure)
- Calibration gas blend bottle

#### 4.6.2 Instructions

- 5) Locate the bottle bracket in the right front area of the environmental enclosure (see Figure 4–15).
- 6) Set calibration bottle inside of enclosure, situated against the bottle bracket.
- 7) Thread strap through holes in bracket and around the bottle. Insert end of strap into worm gear.
- 8) Using a flat blade screwdriver, turn screw on worm gear until strap is snug.



**Figure 4–15 Calibration Bottle Location**

### 4.7 ENC82S Calibration Gas Bottle Installation

The calibration gas bottle mounting rack is used to hold the calibration gas bottle when located inside of the environmental enclosure. Refer to Figure 4–16.

**FYI**



A gas regulator should be installed on each gas bottle.

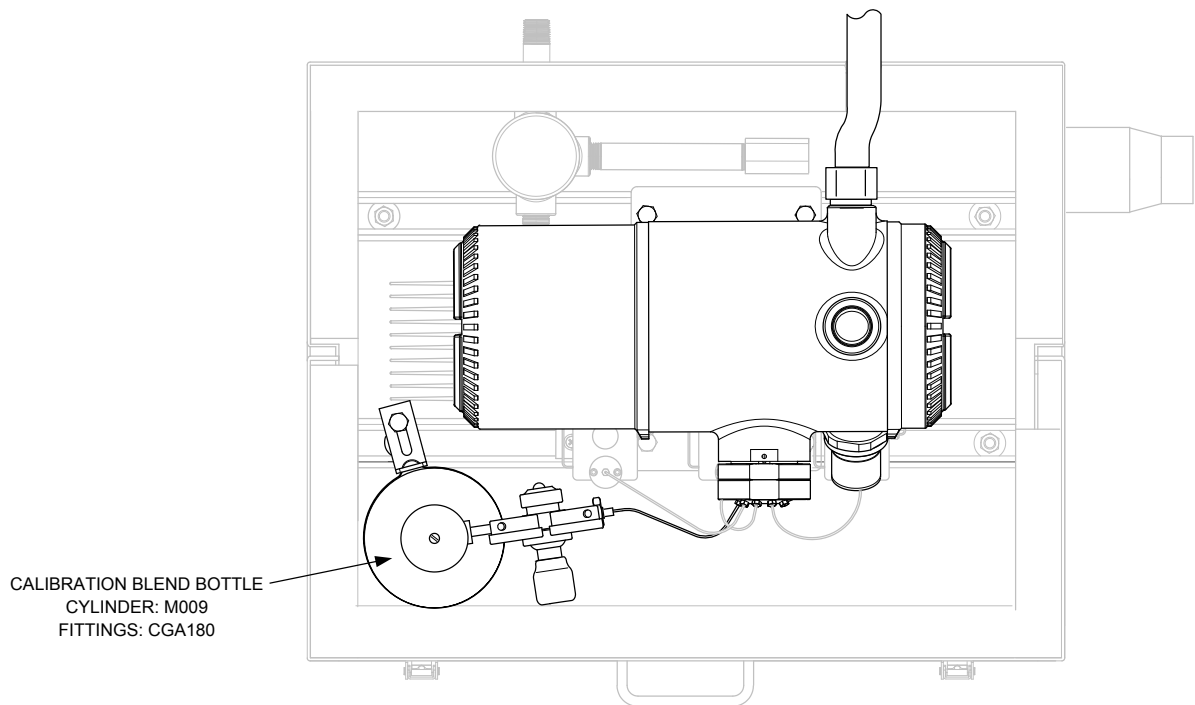


#### 4.7.1 Materials

- Strapping material (shipped with environmental enclosure)
- Calibration gas blend bottle

#### 4.7.2 Instructions

- 1) Locate the bottle bracket and bottle clamp in the left front area of the environmental enclosure (see Figure 4–16).
- 2) Loosen worm drive clamp if needed so that calibration bottle may be inserted through the clamp.
- 3) Set calibration bottle inside of clamp, situated against the bottle bracket.
- 4) Using a flat blade screwdriver, turn screw on worm gear until the strap around bottle is snug.



**Figure 4–16 Calibration Bottle Location**

### 4.8 Calibration Gas Regulator Installation

The following instructions are valid for all installations.



DO NOT connect low pressure switch directly to the NGC without a barrier.

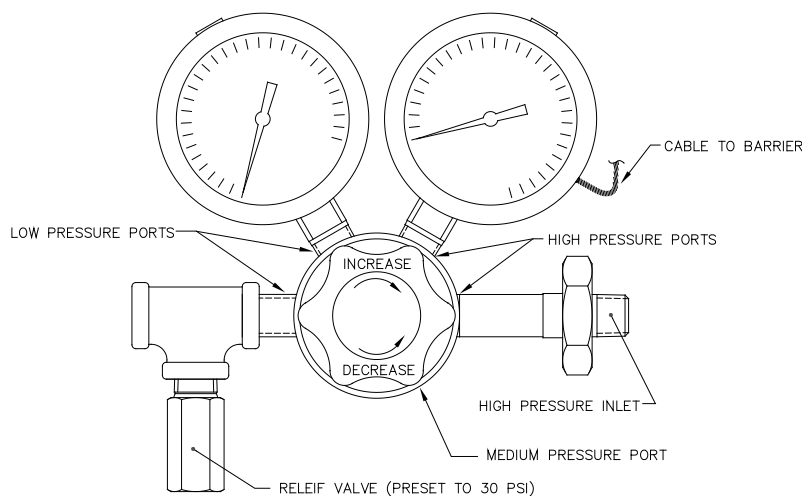
#### 4.8.1 Materials

- Calibration blend regulator assembly (see Figure 4–17)
- Installed calibration gas bottle

These instructions assume that the carrier gas bottle has previously been installed.

#### 4.8.2 Instructions

- 1) Remove protective cap from high pressure inlet if required.
- 2) Insert ferrule on regulator high pressure inlet into calibration gas bottle outlet.
- 3) Screw nut onto thread and tighten.
- 4) Check for leaks.



**Figure 4–17 Calibration Gas Pressure Regulator with Relief Valve**

### 4.9 Carrier Gas and Calibration Gas Connections

The following procedures describe the steps for connecting the external carrier gas and calibration gas lines from the respective regulators to the feed-through assembly on the NGC. They are applicable for both environmental enclosures.

#### 4.9.1 Materials

- Installed carrier gas pressure regulator
- 1/16" SST chromatography grade transport tubing (amount to be determined by technician based on distance from carrier gas bottle regulator to sample input filter).
- Installed calibration gas pressure regulator
- 1/16" SST chromatography grade transport tubing (amount to be determined by technician based on distance from calibration gas bottle regulator to sample input filter).
- 4 ea. 1/16" ferrule and nut
- 2 ea. 1/4" NPT to 1/16" Reducer or other size as determined from Carrier/calibration gas regulator.

**FYI**




These instructions assume that the regulators and gas bottles have previously been installed.

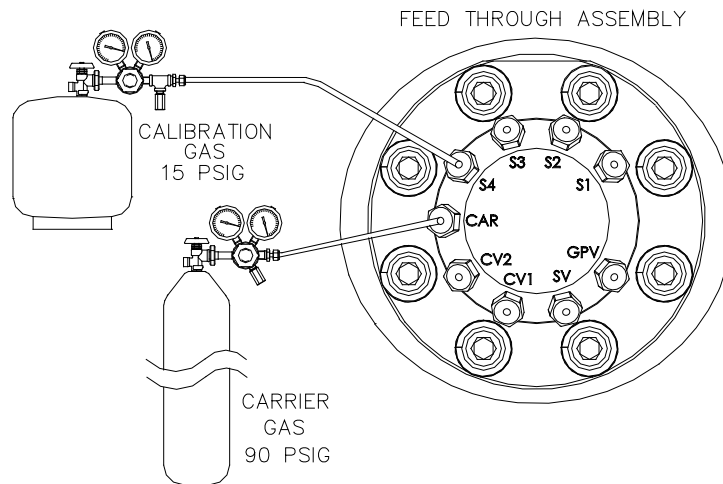
#### 4.9.2 Instructions

- 1) Locate carrier gas input port (CAR) on NGC feed-through assembly (see Figure 4–18).


- 2) Locate 1/4" low pressure output fitting on installed pressure regulator.
- 3) Measure and cut 1/16" SST tubing to required length.
- 4) Make necessary bends in tubing to ease installation of the tubing into NGC and pressure regulator.

**TIP**  Tube, ferrule and nut should always enter connection perpendicular.


- 5) Install reducer into carrier gas regulator.
- 6) Insert tube with ferrule into reducer/pressure regulator output fitting. Move nut down onto ferrule, screw onto fitting and tighten.
- 7) Carrier gas pressure should be set at 90 PSIG.
- 8) Purge air from the transport tubing by opening the shut-off valve located on the regulator.




**Figure 4–18 Carrier and Calibration Gas Connections**

**WARNING**  Be sure to follow local codes when performing this purge.


- 9) Insert tube with ferrule into carrier gas input port (CAR) on feed-through assembly. Move valco nut down onto ferrule, screw into port and tighten.
- 10) Determine input port for calibration gas (typically S4) on NGC feed-through assembly (see Figure 4–18).
- 11) Locate 1/4" low pressure output fitting on installed pressure regulator on calibration gas bottle.
- 12) Measure and cut 1/16" SST tubing to required length.
- 13) Make necessary bends in tubing to ease installation of the ferrule and tubing into NGC and pressure regulator.

**TIP**  Tube, ferrule and nut should always enter connection perpendicular.

- 14) Install reducer into calibration gas regulator if required.
- 15) Insert tube with ferrule into reducer/pressure regulator output fitting. Move nut down onto ferrule, screw onto fitting and tighten.
- 16) Calibration gas pressure should be set at 15 PSIG.
- 17) Purge air from the transport tubing by opening the shut-off valve located on the regulator.


**WARNING**  Be sure to follow local codes when performing this purge.

- 18) Insert tube with ferrule into calibration gas input port (S4) on feed-through assembly. Move valco nut down onto ferrule, screw into port and tighten.

**WARNING**  Leak test ALL gas connections when completed.

## 4.10 Vent Line Connections

The following procedure provides general steps for connecting the external vent lines from the respective output ports on the feed-through assembly. When the NGC is installed in a environmental enclosure, all vent lines **MUST** vent outside of the enclosure.

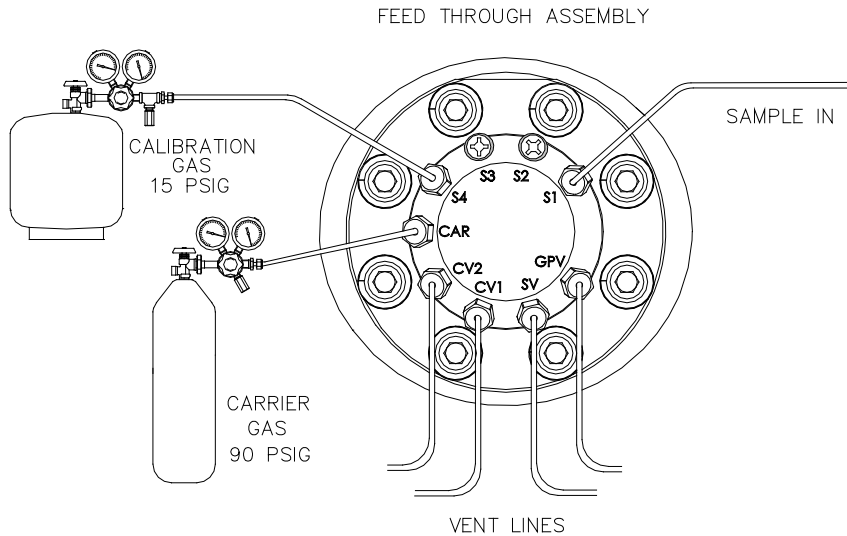
**WARNING**  Please follow local and national codes during this installation

### 4.10.1 Materials

- 4 ea. 1/16" ferrule and nut
- 4 ea. 1/16" SST vent tubing (supplied with NGC) or
- 4 ea. 1/16" SST tubing (amount to be determined by technician based on distance from NGC to external vent location).

### 4.10.2 Instructions

- 1) Locate GPV (gauge port vent), SV (sample vent), CV1 (column vent 1) and CV2 (column vent 2) ports on NGC feed-through assembly (see Figure 4–19). Remove sealing screws for vent ports.



**Figure 4–19 Vent Line Connections on Feed-through Assembly**

- 2) Using supplied vent tubing and ferrule, place nut and ferrule onto short end of bent tubing. Insert tubing, and ferrule into one of the vent ports being careful to keep tubing horizontal, with open end of tubing pointing down. Move valco nut down onto ferrule, screw into port and tighten.
- 3) Repeat Step 2 for all other vents as listed in Step 1.



**CAUTION** All 4 Vents **MUST** be open. Position vent tubing in a downward direction so that moisture does not accumulate in the tubing. Remember, ALL vent lines must exit enclosure.

## 4.11 ENC82L Enclosure Optional Pwr/Comm Outlet Box



**FYI** These instructions are only applicable to the large environmental enclosure. This option is **NOT** available for the small enclosure.

If installing the NGC inside a large environmental enclosure, use this procedure to install the optional RS-232/RS-485/RS-422 outlet box if required, otherwise continue to the next applicable instructions. Before you begin, review the procedure and the materials required for installation.

### 4.11.1 Materials

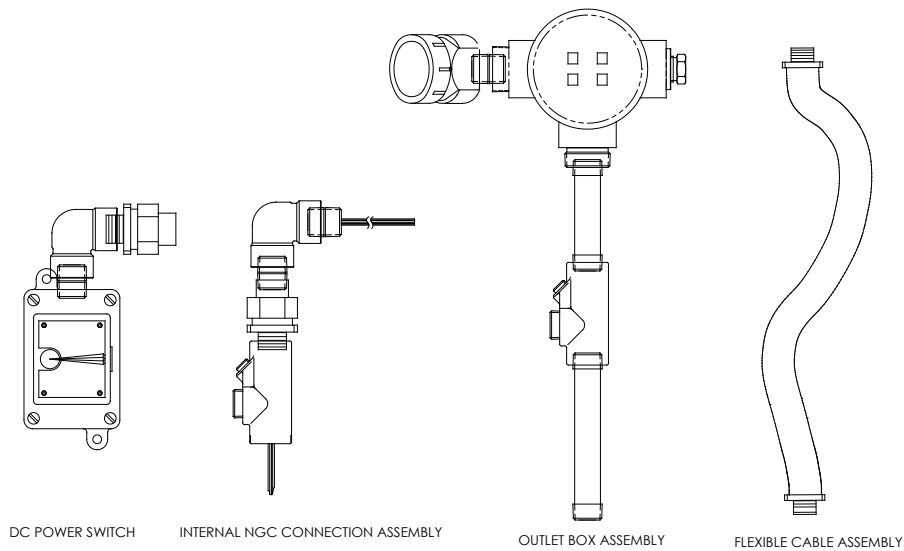
- 1 ea. outlet box assembly
- 1 ea. internal NGC connection assembly
- 1 ea. flexible cable assembly
- 1 ea. DC power switch box
- 1 ea. support bracket
- 2 ea. 10-32 x 3/4" SS pan head screw, phillips
- 2 ea. #10 SST flat washer
- 2 ea. #20 SST split washer

#### 4.11.2 Customer Supplied Materials

- 14 AWG Wire-materials for external wiring (to outlet box) not provided by Totalflow. Quantity to be determined by the technician based on installation and local codes.


#### 4.11.3 Instructions

- 1) Gain access to rear termination panel by loosening the countersunk hex socket locking set screw in the rear end cap using a 1/16" hex wrench, then unscrewing the end cap.
- 2) Remove hub plug from the bottom most access hub.
- 3) Beginning with the internal connection assembly (see Figure 4–20), feed the 13" wire bundle (elbow end of assembly) through open hub. Continue to pull wire past terminations until the nipple fitting is in position to screw into hub.



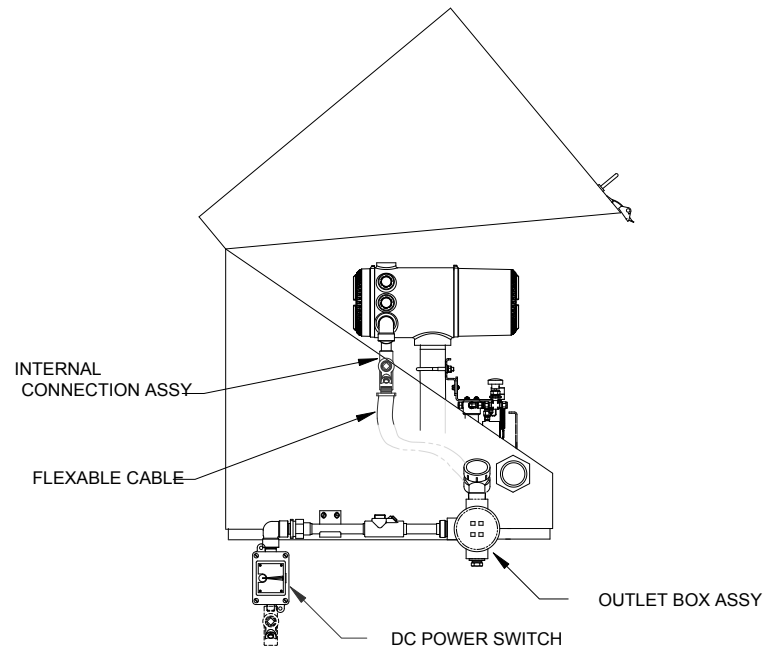
**Figure 4–20 Power Communication Outlet Box Assembly**

- 4) Moving assembly clockwise screw nipple fitting into hub until assembly is tight and hanging straight down at a 180°.
- 5) Feed other end of wire bundle through flexible cable assembly, beginning at end with sealing gasket, until threads meet conduit seal.
- 6) Rotate the flexible cable assembly clockwise, screwing threads into conduit seal until tight. For explosion proof installations, a minimum of 5 threads must be engaged.
- 7) Feed wires through the small hole located near the sample boot in the lower front of the enclosure (see Figure 4–21).
- 8) Remove cover from outlet box assembly.

**TIP**  Remove elbow cap on outlet box assembly to facilitate feeding the wrapped wire around the elbow.

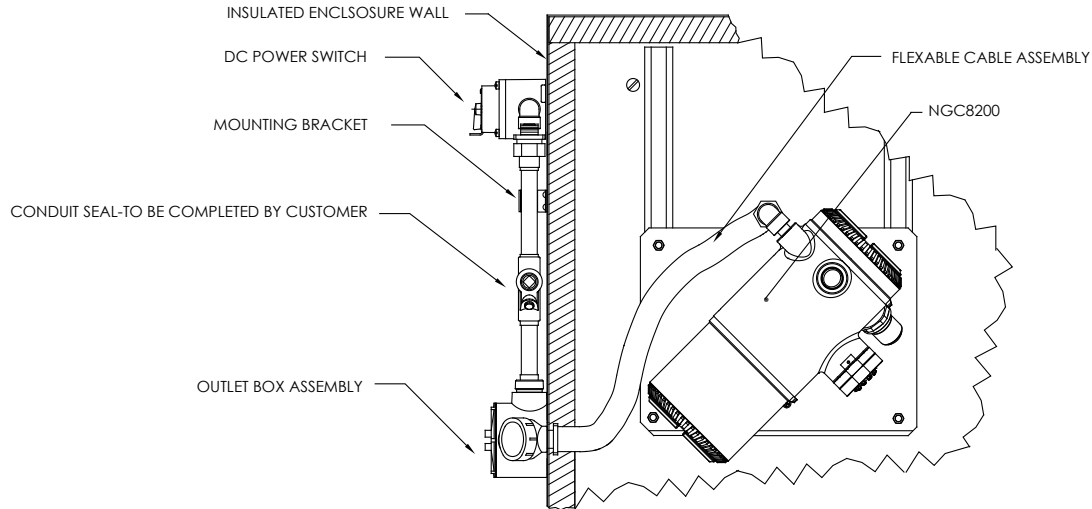
- 9) Feed wires through outlet box elbow and out past the wiring panel, moving assembly up to the threaded end of the cable.

- 10) Begin threading the outlet box assembly onto end of flexible cable assembly, rotating entire outlet box assembly clockwise until snug and in a vertical (360°) position. For explosion proof installations, the final assembly must have a minimum of 5 threads engaged.
- 11) Locate support bracket mounting holes on enclosure.
- 12) Place the split washer, then a flat washer on end of each screw.
- 13) Insert screw through mounting bracket and into hole on side of enclosure.
- 14) Using a phillips point screwdriver, start screw into hole, but do not tighten.
- 15) Repeat Steps 13 through 15 for second screw.



**Figure 4-21 ENC82L Large Enclosure**

- 16) Locate support bracket mounting holes on enclosure.
- 17) Place the split washer, then a flat washer on end of each screw.
- 18) Insert screw through mounting bracket and into hole on side of enclosure.
- 19) Using a phillips point screwdriver, start screw into hole, but do not tighten.
- 20) Repeat Steps 13 through 15 for second screw.
- 21) Level bracket and tighten screws until snug.
- 22) Move outlet box assembly down so that it rests on the mounting bracket (see Figure 4-22).



**Figure 4–22 Assembled Power/Communication Assembly**

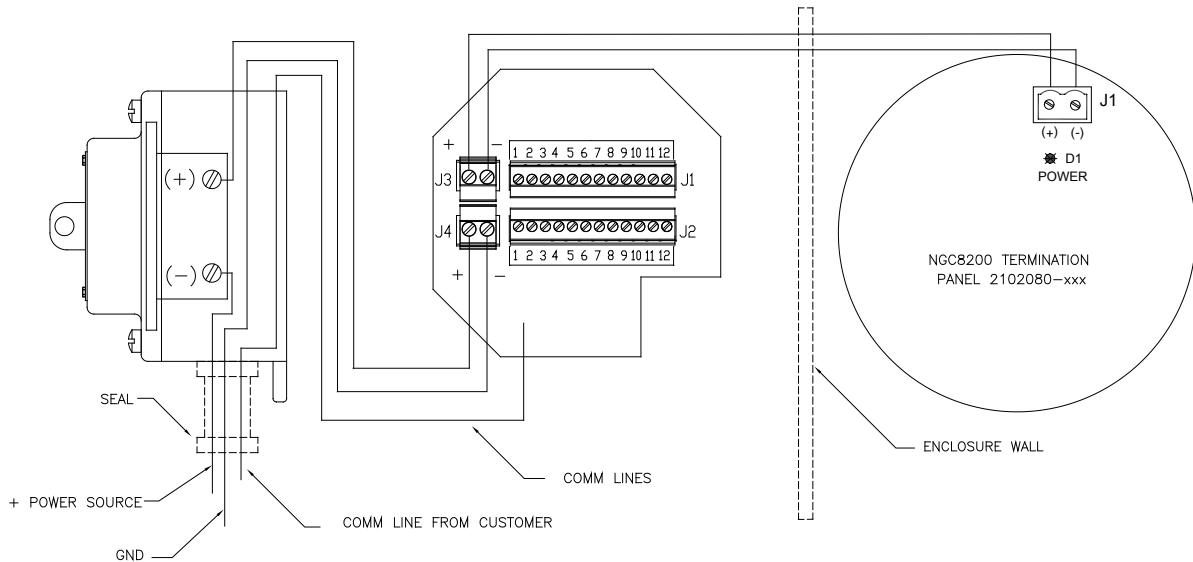
- 23) At the NGC termination panel, trim and strip wire ends.
- 24) Remove power field termination J1 connector from termination panel.
- 25) Using the wiring instructions in Figure 4–23, install each wire into the correct terminal and replace connector on board.
- 26) Trim and strip wire ends located in the external outlet box.
- 27) Remove power field termination J3 connector from outlet box panel.
- 28) Using the wiring instructions in Figure 4–23, install each wire into the correct terminal and replace connector on board.
- 29) Remove DC power switch box cover.
- 30) Remove the switch mounting screws and remove the switch.
- 31) Cut a 3' length of power (+) wire.



Optionally, communication wires maybe run directly to the spare conduit hub located on the bottom of the outlet box assembly. Follow requirements of national and local codes.


For the purpose of this manual, we will assume that communication wiring will be included with the power wiring in one conduit run.





**Figure 4-23 Power Wiring Diagram**

- 32)** Tape 3' power (+) wire, ground and communication wire ends together.
- 33)** Feed through conduit hub located on the bottom of the DC power switch box, past cover opening, around elbow and out.
- 34)** Continue pulling wire until approximately 2' of wire is extending out of the DC power switch box.

**TIP**  Be careful to not pull 3' power (+) wire past the DC power switch box opening.

- 35)** Feed excess wire through 6" nipple fitting, conduit seal, 5" nipple fitting and out into outlet box opening. Pull sufficient wire to complete field wiring.
- 36)** Remove power field termination J4 connector from outlet box panel.
- 37)** Using the wiring instructions in Figure 4-23, install power (+) and power (-) wires into the correct terminal pins and replace connector on board.
- 38)** Holding wires, slide DC power switch box up to 6" nipple fitting on end out outlet box assembly.
- 39)** Slide conduit union onto end of nipple fitting and screw on.
- 40)** Loosen terminal screws on DC power Switch.
- 41)** Using the wiring instructions in Figure 4-23, wire power (+) to upper terminal screw and tighten.
- 42)** Bring new power (+) wire into power switch enclosure and pull short length out to allow wiring.
- 43)** Using the wiring instructions in Figure 4-23, wire new power (+) length to bottom terminal screw and tighten.
- 44)** Re-install DC power switch into box.
- 45)** Using the wiring instructions in Figure 4-24 (RS-232), Figure 4-25 (RS-485) or Figure 4-26 (RS-422), make field connections to plug NGC termination panel com port (s) , re-insert into corresponding connector in termination panel.

- 46) Make field connections to plug J1, re-insert into corresponding connector in outlet box.
- 47) Make field connections to plug J2, re-insert into corresponding connector in outlet box.

FYI



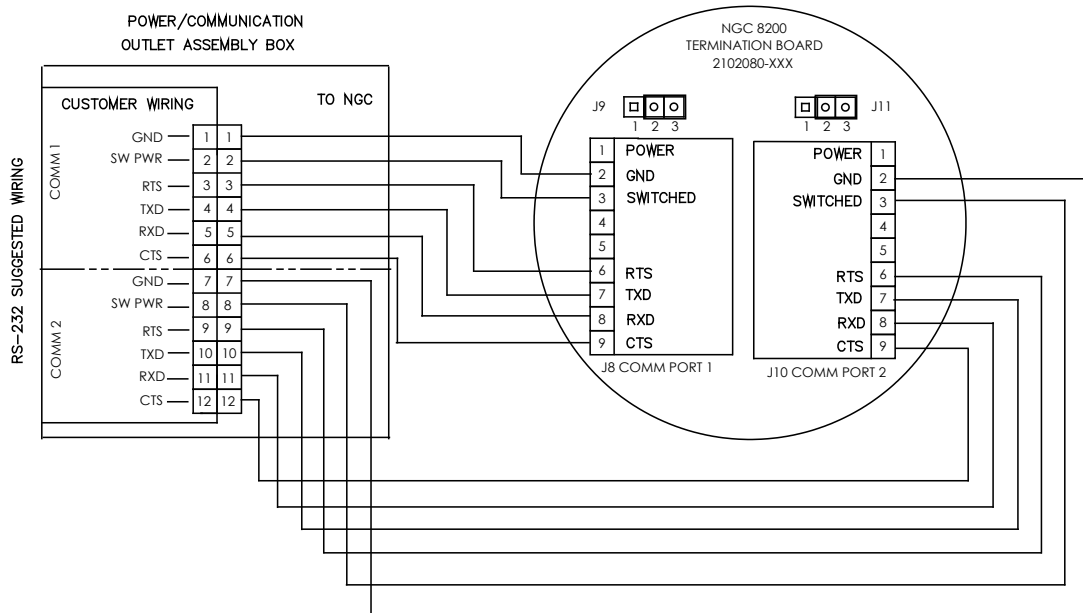
Communication wiring terminations inside the power/communication outlet box assembly are pass-through connections, meaning that J1-pin 1 is associated with J2-pin 1. Therefore, pin outs may be user defined and wiring Instructions for this assembly are only suggestions.

CAUTION

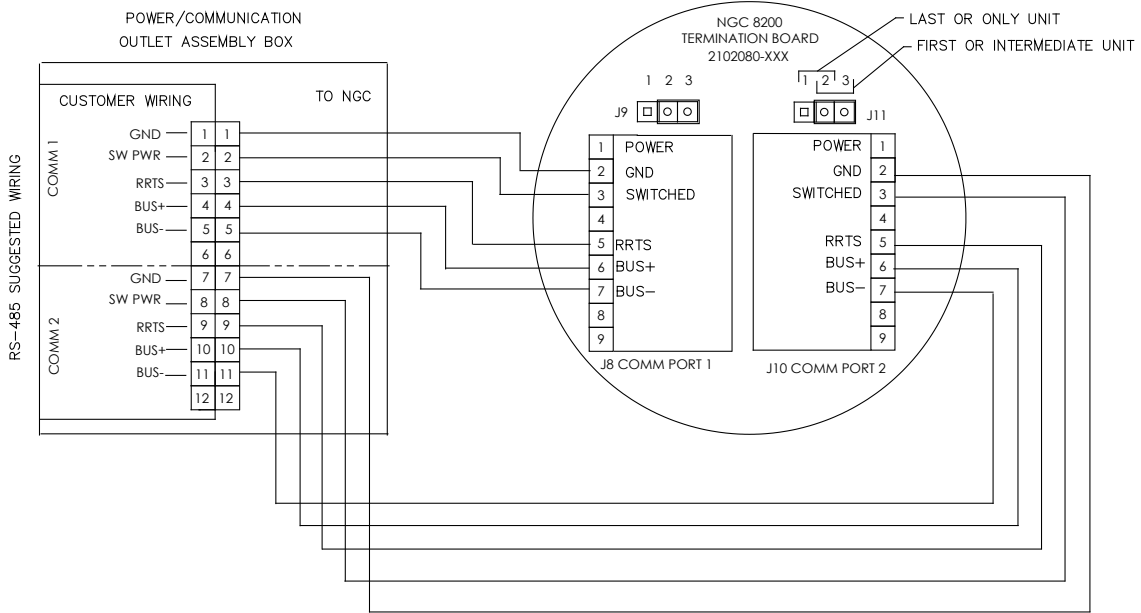


External wiring and connections should be performed by an experienced technician and follow requirements of national and local codes.

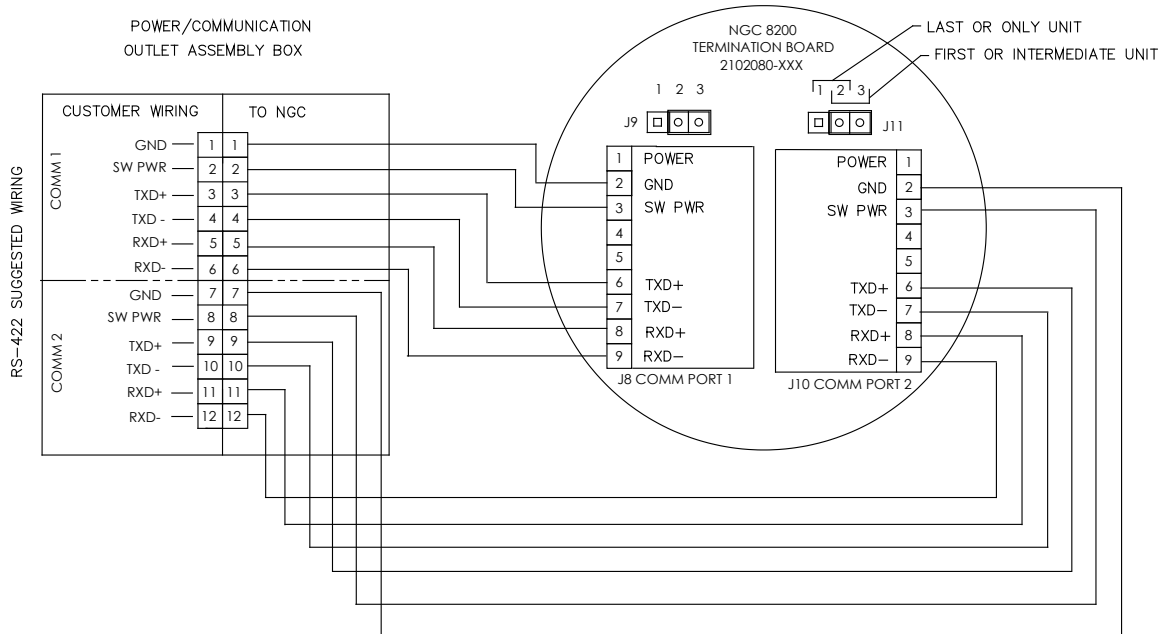
- 48) Following instructions included with unit, complete seal between DC power switch and outlet box assembly.



**Figure 4–24 Suggested RS-232 Wiring Instructions**



**Figure 4-25 Suggested RS-485 Wiring Instructions**



**Figure 4-26 Suggested RS-422 Wiring Instructions**

## 4.12 ENC82L Optional Catalytic Heater Installation

**FYI**



These instructions are only applicable to the large environmental enclosure. In the small environmental enclosure the catalytic heater is already installed.

The following procedures describe the steps for installing a catalytic heater for the environmental enclosure.



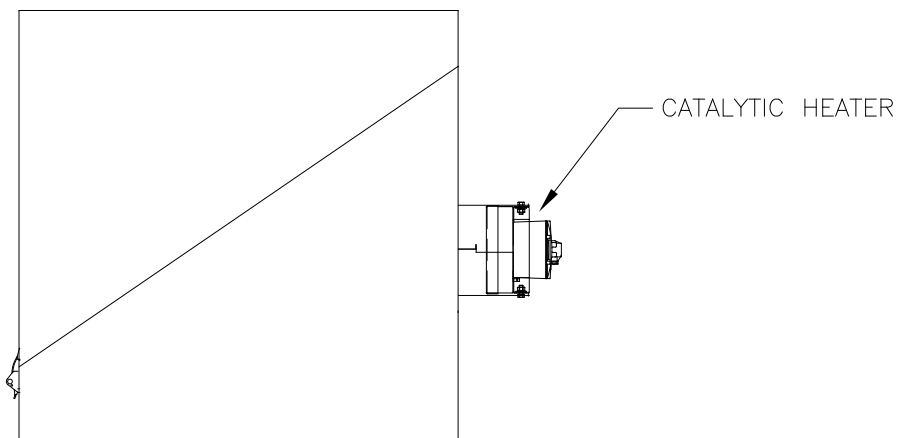
Verify the heater and fittings are approved for the classification rating of the area of installation.

#### 4.12.1 Materials

- Catalytic heater (installed at factory)
- Thermostat assembly with temperature probe
- Regulator assembly with shut-off
- T assembly
- Tubing
- Temperature probe mounting clip
- Teflon tape
- 1/4" male pipe connection from external gas source to catalytic heater. Materials for gas source is not be provided by Totalflow. Quantities and materials to be determined by the technician based on installation and local codes.
- DC power source wiring. Materials for external power source for electrical preheat wiring not provided by Totalflow. Quantities and materials to be determined by the technician based on installation and local codes.

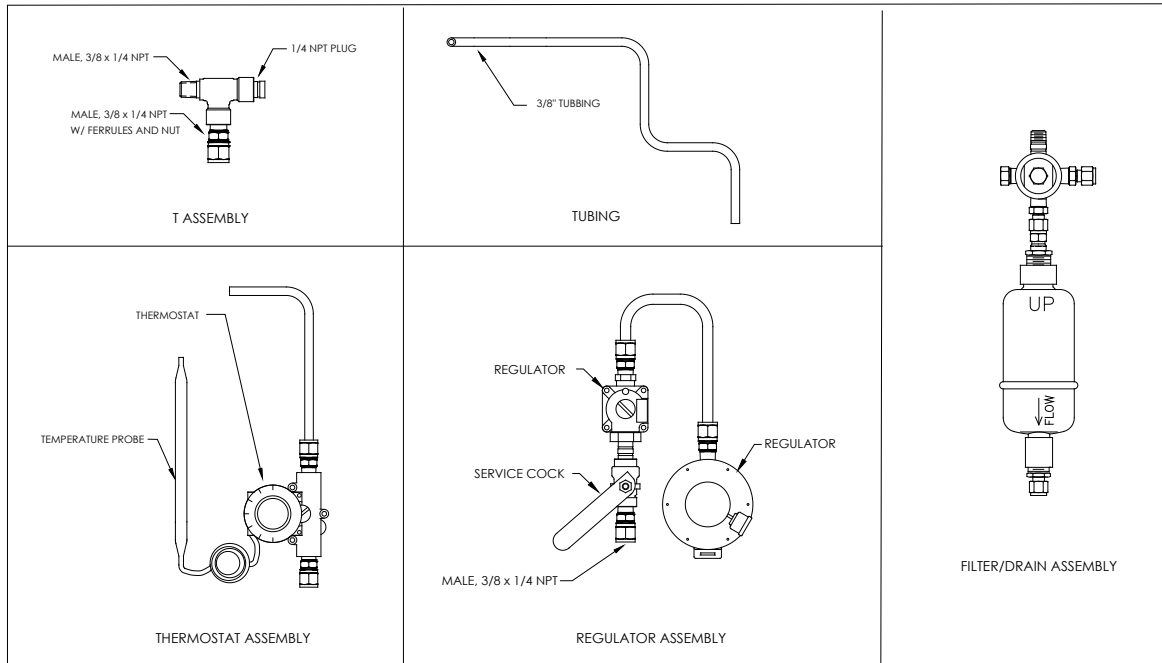
#### 4.12.2 Instructions

- 1) Locate the installed catalytic heater on the rear of the environmental enclosure (see Figure 4–27).
- 2) Remove protective end cap from catalytic heater input fitting if required.

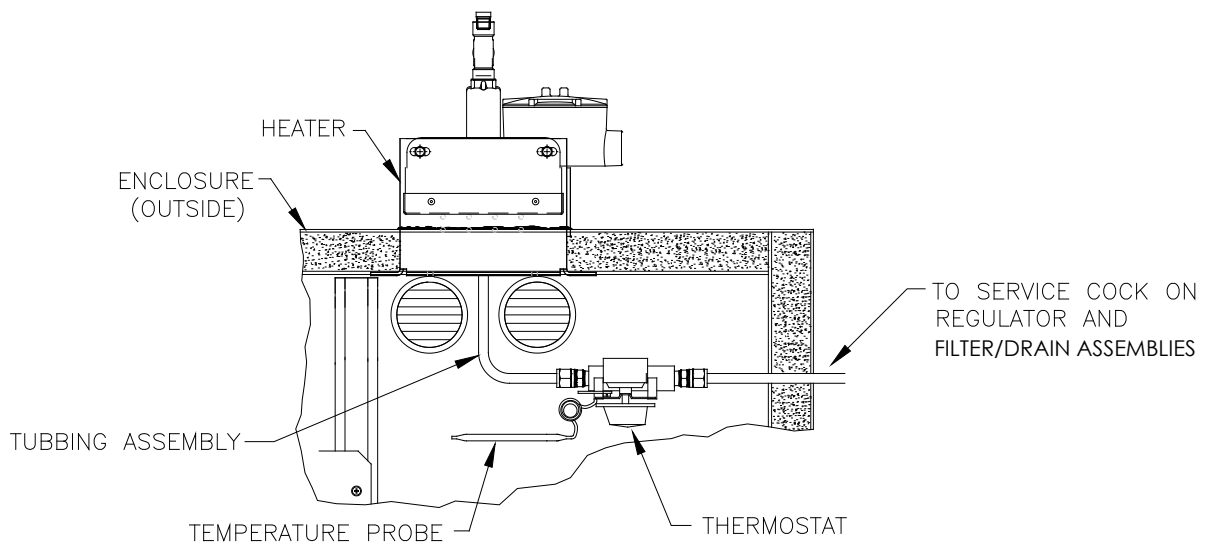


**Figure 4–27 Catalytic Heater Option in Environmental Enclosure**

- 3) Apply Teflon tape to threads male end of T assembly (see Figure 4–28).
- 4) Screw threaded end of T assembly into 1/4" female fitting located on the factory installed catalytic heater, by turning entire assembly clockwise until tight (see Figure 4–29).

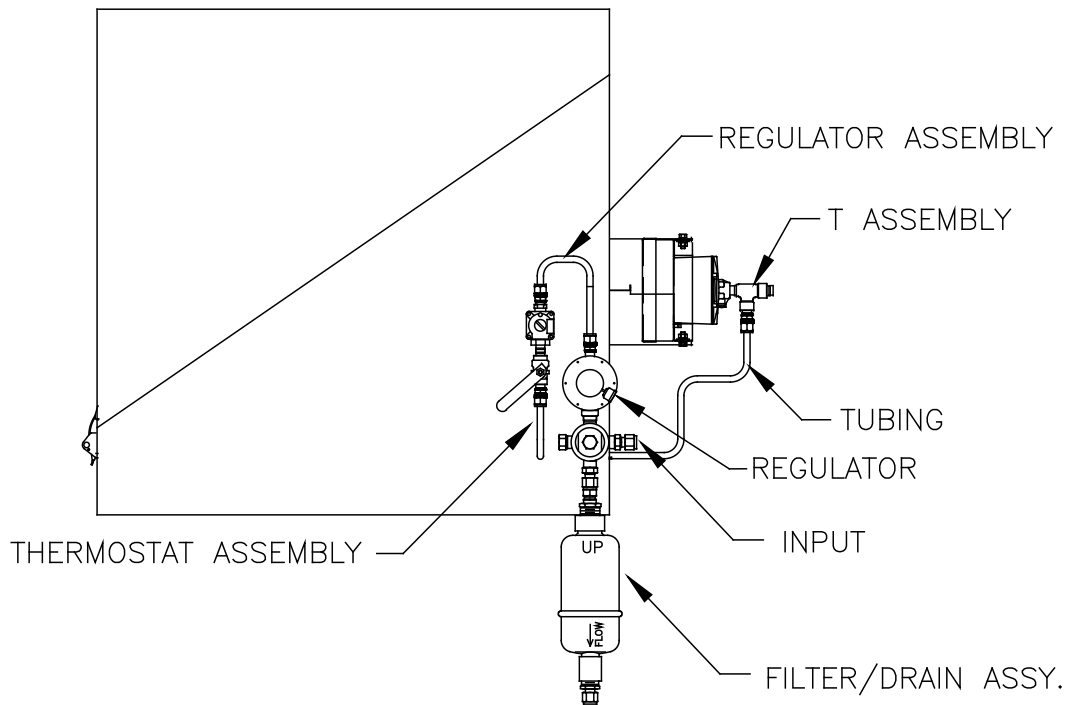


**Figure 4-28 Catalytic Heater Assemblies**



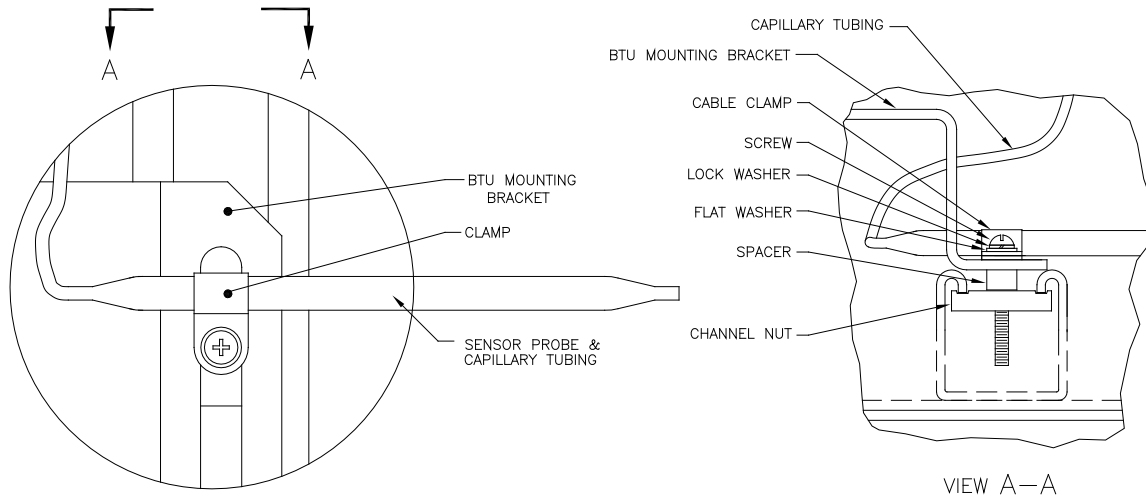
**Figure 4-29 Thermostat Assembly Installed**

- 5) Screw threaded end of T assembly into 1/4" female fitting located on the factory installed Catalytic heater, by turning entire assembly clockwise until tight (see Figure 4-30).
- 6) Remove ferrules and nut from bottom of T assembly. Apply Teflon tape to threads.
- 7) Insert short bent end of 3/8" tubing closest to longest straight portion of the tubing through hole located below catalytic heater.




**Figure 4–30 Regulator and Filter/Drain Assembly Installed**

- 8) Place nut, front ferrule and back ferrule onto opposite end of tubing and position so that the ferrules and nut screw onto the bottom of T assembly. Screw nut until tight.
- 9) Remove ferrules and nut from the thermostat end of the thermostat assembly. Apply Teflon tape to threads.
- 10) Insert tube end of thermostat assembly through exterior wall on the side of the enclosure (see Figure 4–30).
- 11) Place nut, front ferrule and back ferrule onto end of 3/8" bent tubing inside of the enclosure. Position thermostat assembly so that the nut and ferrules screw onto the thermostat assembly.
- 12) Remove ferrules and nut from end of the regulator assembly closest to service cock. Apply Teflon tape to threads.
- 13) Place nut, front ferrule and back ferrule onto end of thermostat assembly protruding from enclosure.
- 14) Hold the regulator assembly with the curved tubing up, above the protruding tubing. Screw ferrules and nut onto nipple (see Figure 4–30).
- 15) Apply Teflon tape to port one nipple on filter/drain assembly.
- 16) Insert port one nipple on filter/drain assembly into output port on regulator and tighten nut.
- 17) Gently uncoil temperature probe capillary tubing from thermostat and insert through hole located below the thermostatic gas valve, being careful to not crimp or make sharp bends in capillary tubing (see Figure 4–31).
- 18) Remove mounting screw and washers from right rear NGC mounting bracket (see Figure 4–31).




**Figure 4-31 Temperature Probe Installation**

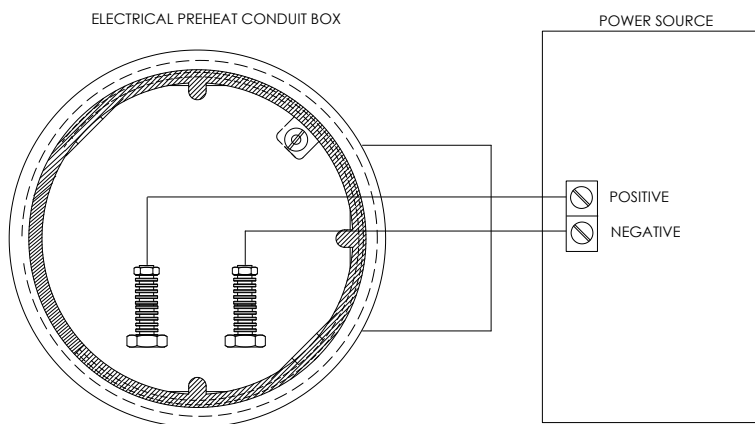
- 19) Insert screw with washers still in place through hole located on the mounting clip and re-insert through mounting bracket into channel nut (see Figure 4-31).
- 20) Position probe underneath the mounting clip. Tighten screw into channel nut to hold probe in place.

**WARNING**  Technician responsible for installing gas supply should follow local and national codes.

- 21) Using regulator manufacturer's instructions supplied with regulator, make external gas connections.


**WARNING**  Technician responsible for installing power supply should follow local and national codes.


- 22) Using the wiring instructions shown in Figure 4-32 and manufacturer's instructions enclosed with heater, make external connections.



**Figure 4-32 Electrical Pre-heater Wiring Instructions**

## 4.13 ENC82S Optional Catalytic Heater Installation

**FYI**  These instructions are only applicable to the small environmental enclosure.


**WARNING**  Verify the heater and fittings are approved for the classification rating of the area of installation.

If the optional catalytic heater is configured for the small environmental enclosure, external gas connections, electrical pre-heater wiring, and installation of the filter drain kit are all that are required.


### 4.13.1 Materials

- Teflon tape
- ¼" male pipe connection from external gas source to catalytic heater. Materials for gas source are not provided by Totalflow. Quantities and materials to be determined by the technician based on installation and local codes.
- DC power source wiring. Materials for external power source for electrical preheat wiring are not provided by Totalflow. Quantities and materials to be determined by the technician based on installation and local codes.

### 4.13.2 Instructions

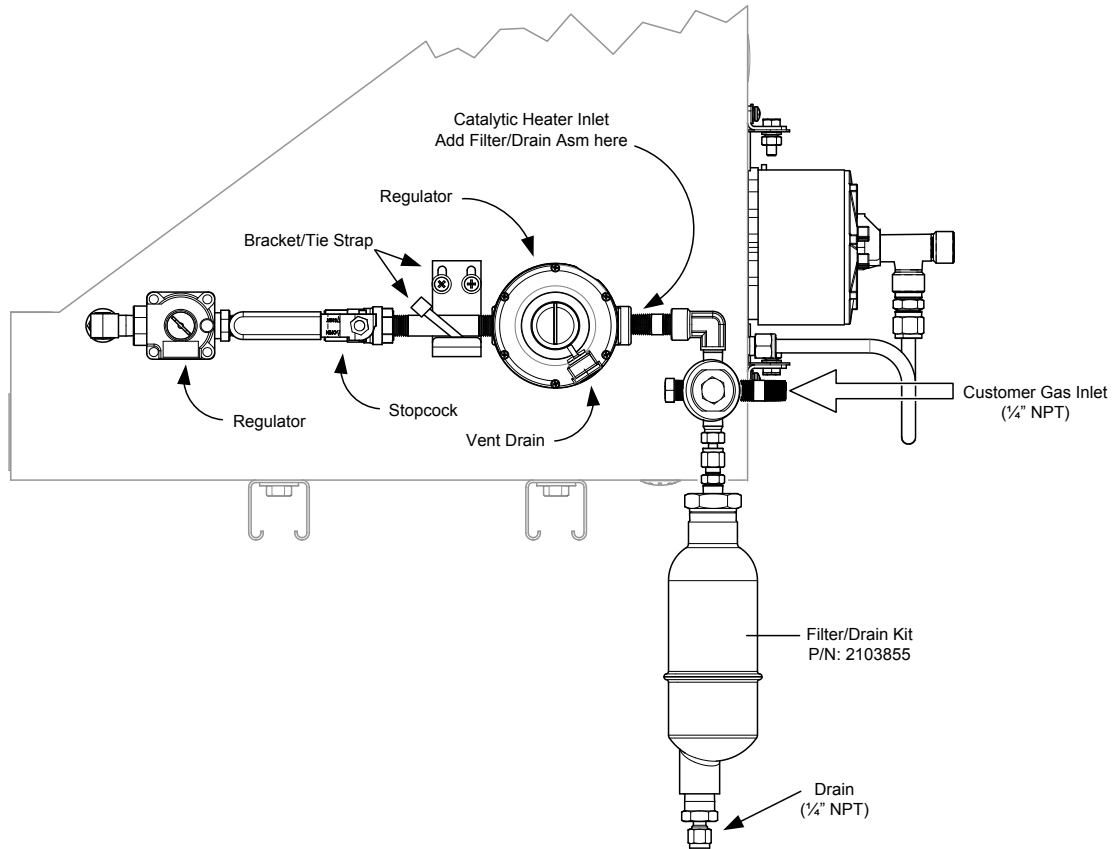
**WARNING**  Technician responsible for installing gas supply should follow local and national codes.

- 1) Using regulator manufacturers instructions supplied with regulator, make external gas connections.
- 2) Apply Teflon tape to port one nipple on filter/drain assembly.
- 3) Insert port one nipple on filter/drain assembly into output port on regulator and tighten nut (see Figure 4–33).

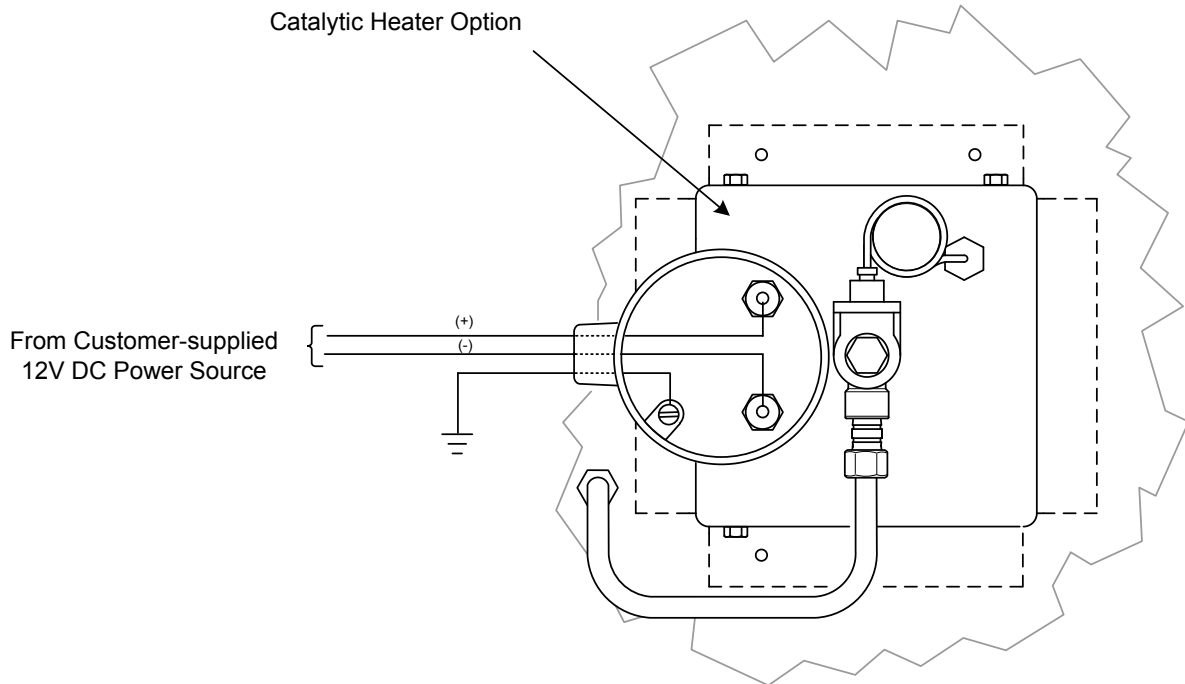
**WARNING**  Technician responsible for installing power supply should follow local and national codes.

- 4) Using the wiring instructions shown in Figure 4–32 and manufacturer's instructions enclosed with heater, make external connections.






**Figure 4-33 ENC82S Filter/Drain Assembly Installation**



**Figure 4-34 ENC82S Catalytic Heater Pre-Heat Wiring**


## 4.14 Optional Electric Heater Installation

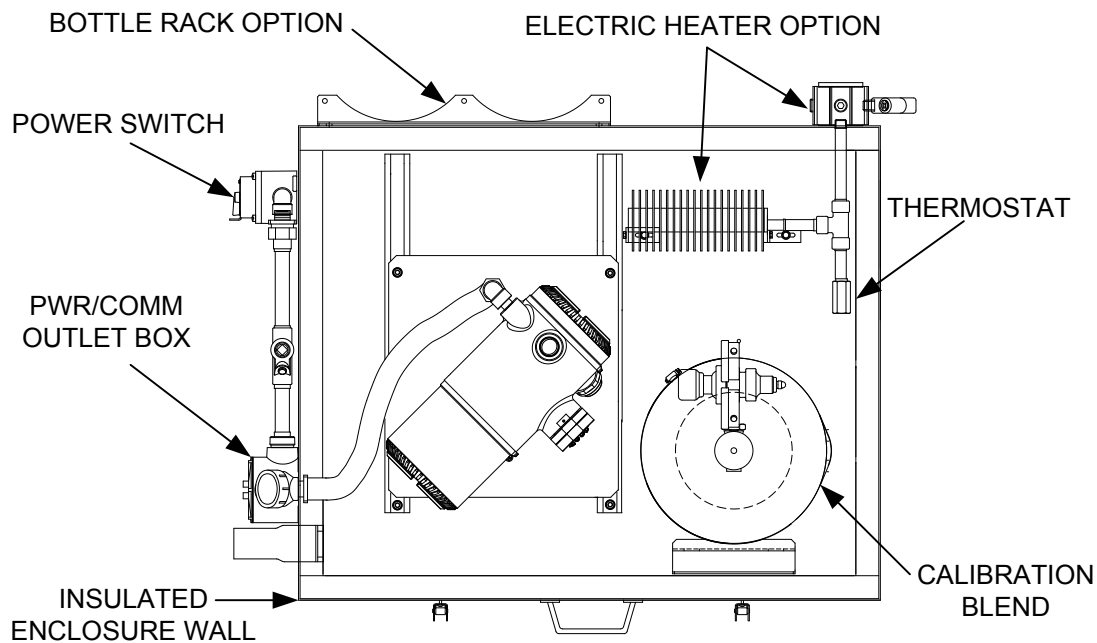
The following procedures describe the steps for wiring an electric heater for the environmental enclosure.

**WARNING**  Verify the heater and fittings are approved for the classification rating of the area of installation.

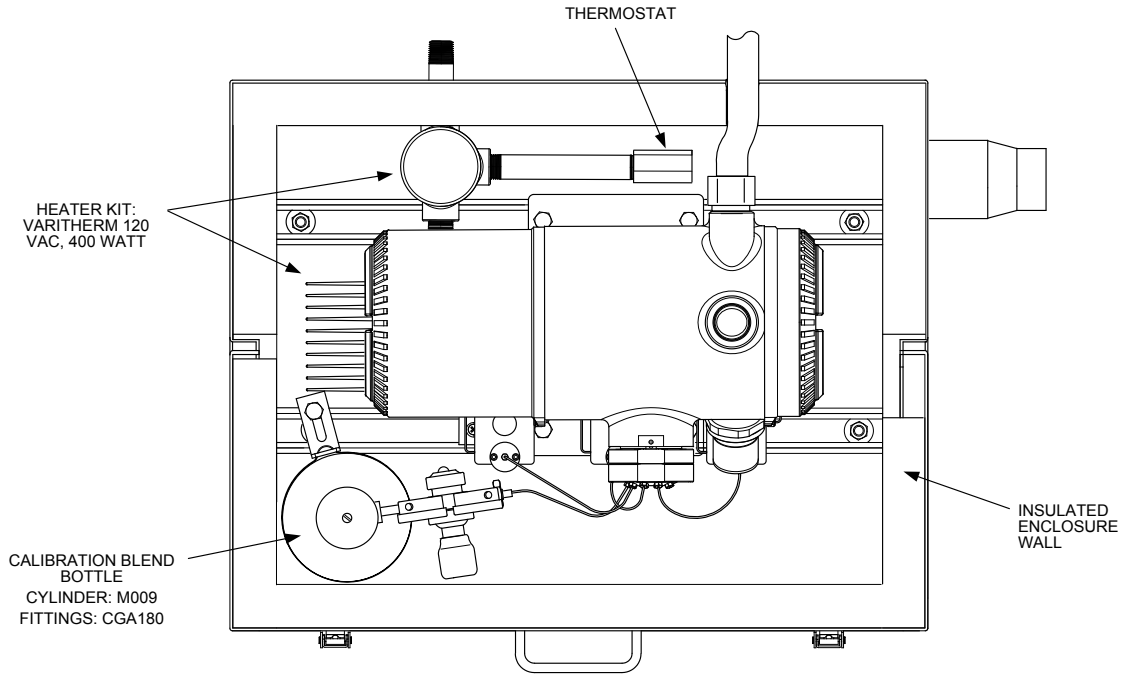
### 4.14.1 Materials

- Electric heater option (Factory Installed, see Figure 4–35 and Figure 4–36).
- AC power source wiring. Materials for external power source for electric heater wiring not provided by Totalflow. Quantities and materials to be determined by the technician based on installation and local codes.

**WARNING**  Technician responsible for installing power supply should follow local codes.



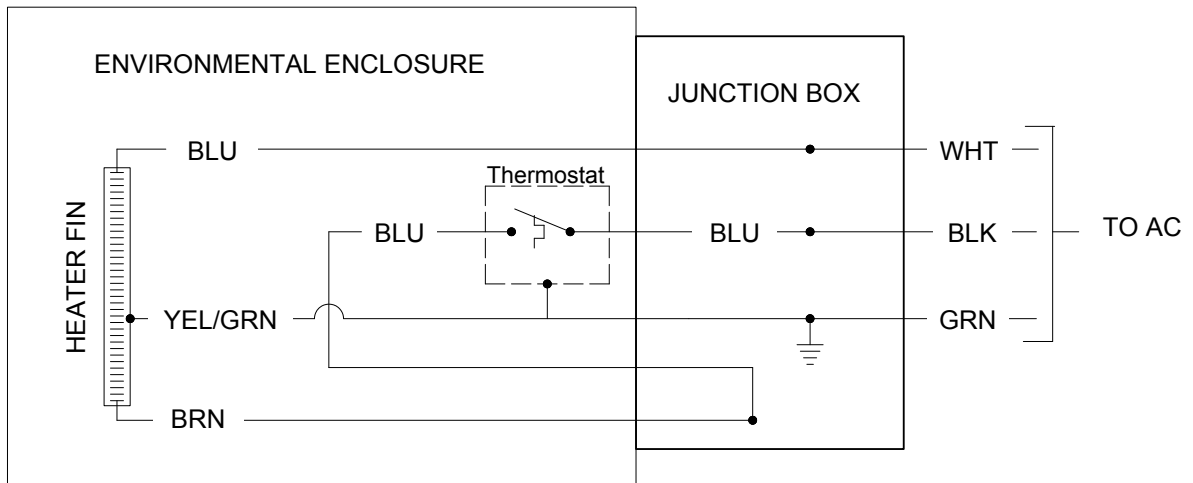
**Figure 4–35 ENC82L Electric Heater Installed in Enclosure**



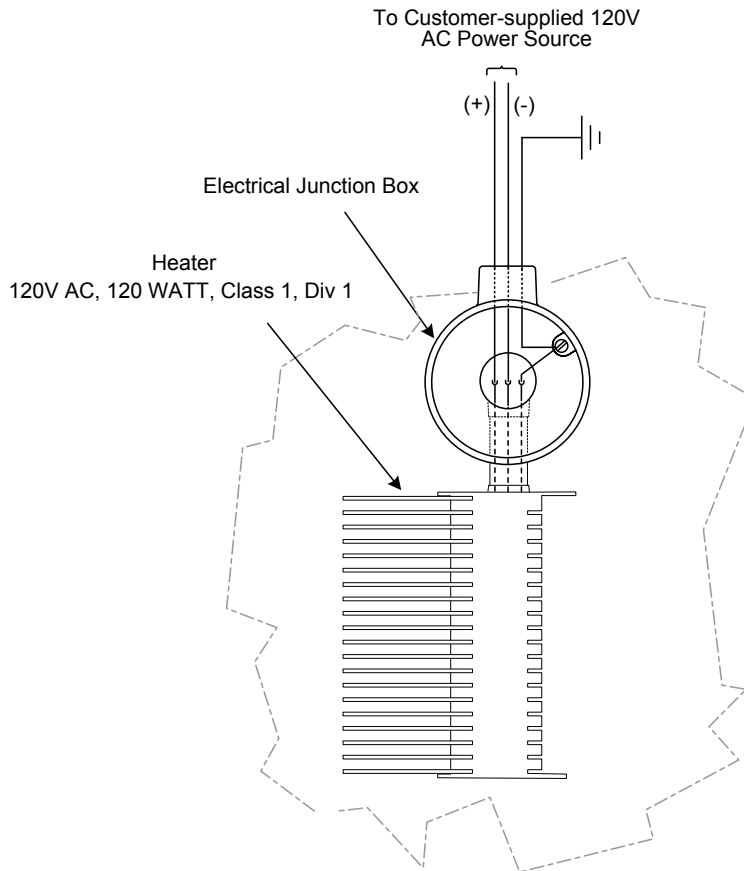
**Figure 4–36 ENC82S Electric Heater Installed in Enclosure**

**4.14.2 Instructions**

- 1) Using the wiring instructions shown in Figure 4–37 or and manufacturer’s instructions enclosed with heater, make external connections.



**Figure 4–37 Electric Heater Option Wiring Instructions**



**Figure 4–38 ENC82S Electric Heater Option Wiring Instructions**

## 4.15 Sealing Environmental Enclosure

When all sample and vent tubing has been installed and leak tested, sample boot must be sealed.

### 4.15.1 Customer Supplied Materials

- Aerosol insulating foam

### 4.15.2 Instructions

- 1) When all sample and vent connections are complete, apply aerosol insulating foam from inside the enclosure pointing toward the outside of boot, ensuring that the overspray falls outside the enclosure.

## 5.0 DC POWER INSTALLATION

These instructions assume that all external wiring has been completed to point where connections have been made to field termination connector, but the connector has not been plugged into the termination panel.

### 5.1 Instructions

- 1) Apply power:
  - If installation includes the ENCLOSURE Optional Pwr/Comm outlet box assembly:
    - Apply power to switch, turn switch to “ON” position.
  - If installation includes the Optional Equipment Unit with the Optional AC Charger:
    - Apply power to Charger regulator.
  - If installation includes a Solar panel connected to a Battery:
    - Plug in Charger regulator battery connector.
- 2) Test power using a Multi-Meter connected to J1 terminals of Phoenix connector to verify DC voltage:
  - 12 Volt unit: is between 12 and 16 volts.
  - 24 Volt unit: is between 21 and 28 volts.
- 3) If volts are within range, the power should be disconnected, Phoenix connector inserted into termination panel J1 connector and power re-applied. If NGC8200 has optional VGA Screen, unit will show “Totalflow Boot Loader” followed by navigational screen when functional.
- 4) Unit will begin start-up diagnostics and oven stabilization. This completes the hardware installation. Proceed to the “NGC8200 User’s Manual”, “Start-up “ section to begin unit setup and operation.

BLANK PAGE





ABB Inc.  
Totalflow Products  
7051 Industrial Blvd.  
Bartlesville, Oklahoma 74006

Tel: USA (800) 442-3097  
International 1-918-338-4880

2102824-001 (AB)

