2101998-002 (AB)

Totalflow®

Cold Weather Enclosure and Equipment Installation Manual

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2101998-002 (AB)

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INTRODUCTION

This document describes the installation of the Totalflow Cold Weather Enclosure designed for use with the Btu 8000/8100 Transmitter, Btu 8000/8100 Transmitter and optional equipment in the enclosure. These instructions are listed in the suggested installation order. Depending upon how your system was configured, some of these instructions may not apply to your installation. When optional equipment installation has been completed, refer to the "*Btu Startup Guide*" for additional instructions on testing connections for gas leaks, applying power to unit and software startup. Refer to the "*Btu Transmitter User's Manual*" for detailed information.

NOTE: These instructions assume that the Cold Weather Enclosure has been assembled and installed in the appropriate location and that the Sample Probe has been installed, either using the Sample Probe Cutout inside the enclosure, or elsewhere.

As with all installation and maintenance on the Btu 8000/8100 Transmitters, please observe local codes for hazardous areas as required.

I. Unpack and Inspect

The Cold Weather Enclosure, Btu Transmitter and optional equipment are all shipped in specially designed shipping cartons, which contains the equipment and serial number/parts list.

Carefully remove all internal and external packing material. Be certain there is no external damage. Carefully remove all items from the box.

1) Bill of Lading

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

2) Inspection

Examine shipping container and internal components for evidence of damage. Points of inspection are:

- Inspect exterior of unit for dents, chipped paint, scratches, etc.
- Visually inspect interior mounted equipment, cables, parts, fittings and connecting lines etc. for damage
- If applicable, inspect Calibration/Carrier gas bottles to be certain they are correct for the installation.

3) 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 carrier's inspection. Totalflow will arrange for immediate repair or replacement.

Telephone:

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

II. Sample Probe Mounting

Note: 1) If Sample Probe has been previously mounted, continue to the next applicable set of instructions.
2) Sample Probe Pipe coupling should be located on the top of the meter run and should be a horizontal mount coupling.
3) If Sample Probe to be located inside of the Cold Weather Enclosure, it MUST be mounted prior to seating the Cold Weather Enclosure on the meter run.

A. Materials

- Horizontal Pipe Coupling ¾" 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)

B. 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 (see Figure 1).
5) Using Teflon tape or Pipe Dope, wrap or cover NPT threads of Sample Probe.

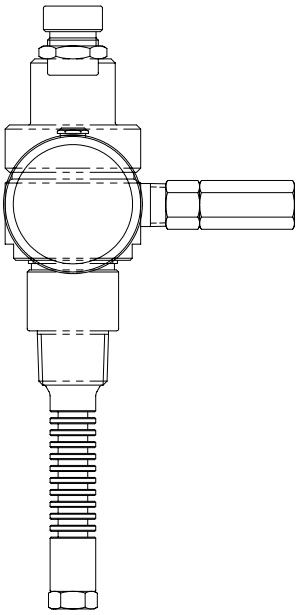

Figure 1 Sample Probe

6) Insert gas probe into pipeline coupling (see Figure 2).
7) Using the correct tool, tighten probe. Securely tighten so there is no gas leakage. DO NOT OVERTIGHTEN.
8) Install Shut-off valve on Sample Probe if desired.

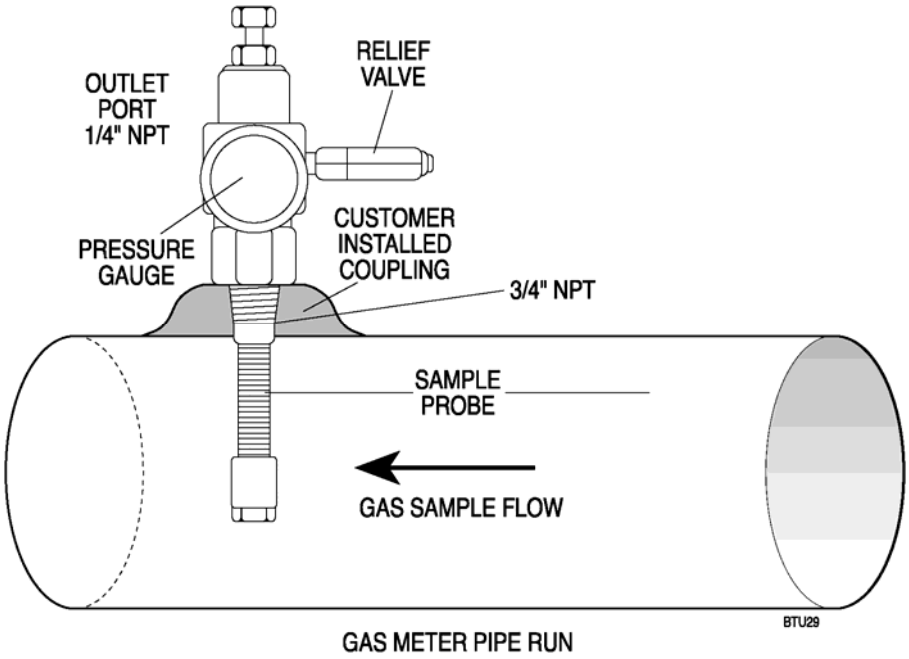

Figure 2 Sample Probe Insertion

III. Freestanding Enclosure Mounting Kit

A. Materials

- 4 ea. ½-13 x 1 1/4 SST Bolt
- 4 ea. ½ SST Flat Washer
- 4 ea. ½" SST Split Washer
- 2 ea. 2 ½" x ¼" 43" Steel Angle Iron
- 1 ea. Pipe Stand

B. Assembly and Installation

1) Stand is made symmetrical, so top and bottom are identical. Locate stand base on a flat, stable, surface.

Note: The following step will typically require two people.

2) Set enclosure on top of stand, oriented so that the stand brace is horizontal with front of enclosure (see Figure 3).

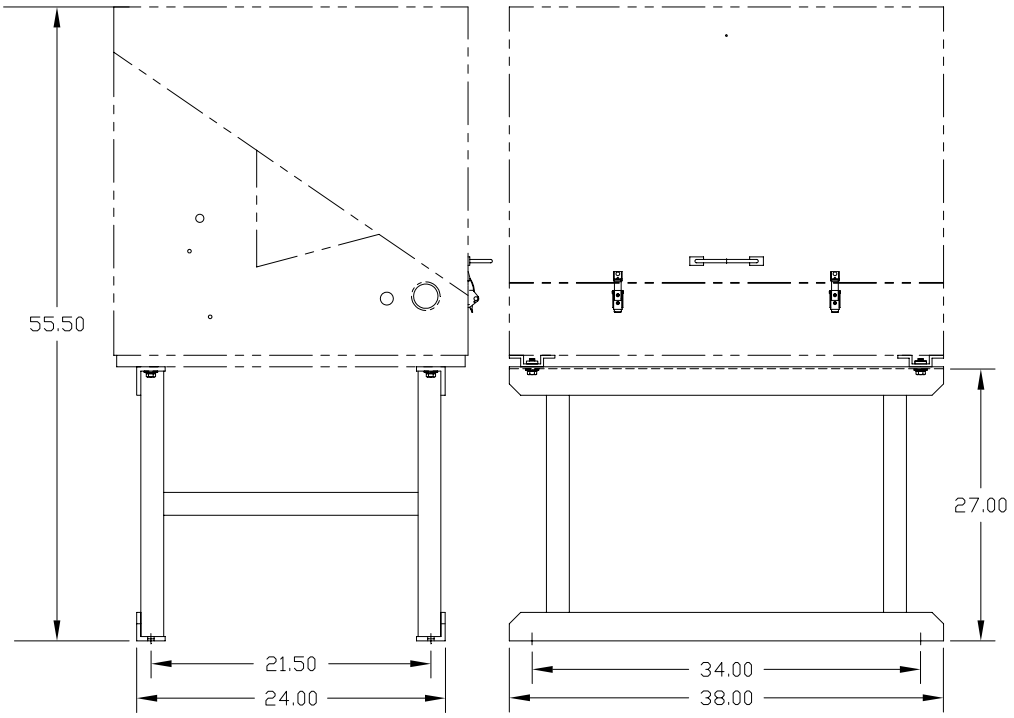

Figure 3 Typical Stand Mount Installation

3) Place a lock 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 4).
4) Move channel nut into position so that bolt will screw into nut. Screw bolt into nut, but leave loose for later adjustment.

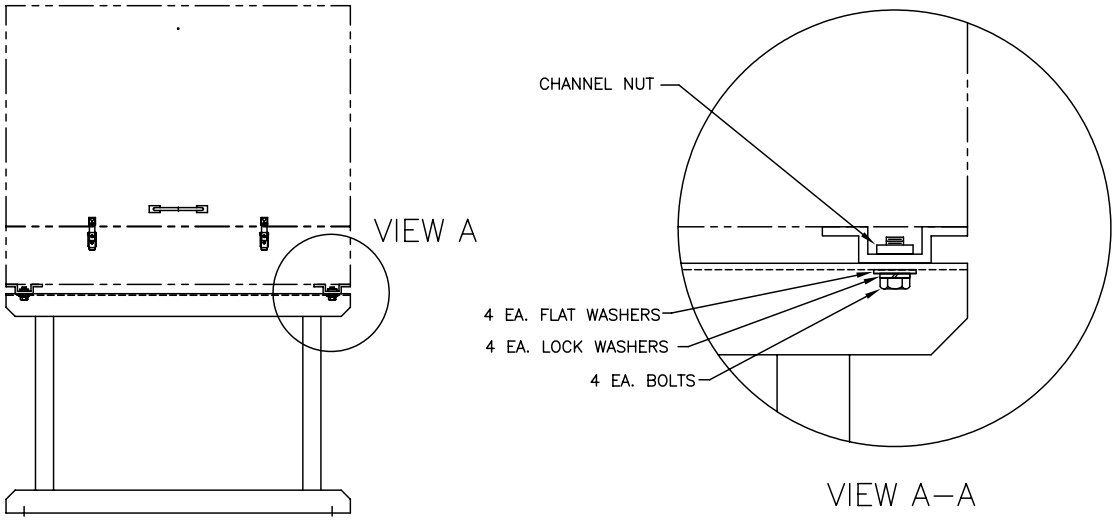

Figure 4 Mounting Hardware

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.

IV. Pipe Mounted Enclosure Mounting Kit

Note: May be used in conjunction with optional Support Leg Kit

A. Materials

- 4 ea. ½" -13 x 1 1/4 SST Bolt
- 4 ea. ½" SST Flat Washer
- 4 ea. ½" SST Split Washer
- 2 ea. 2 ½" x ¼" 43" Steel Angle Iron

B. Assembly and Installation

1) Set two pieces of angle iron (see Figure 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.

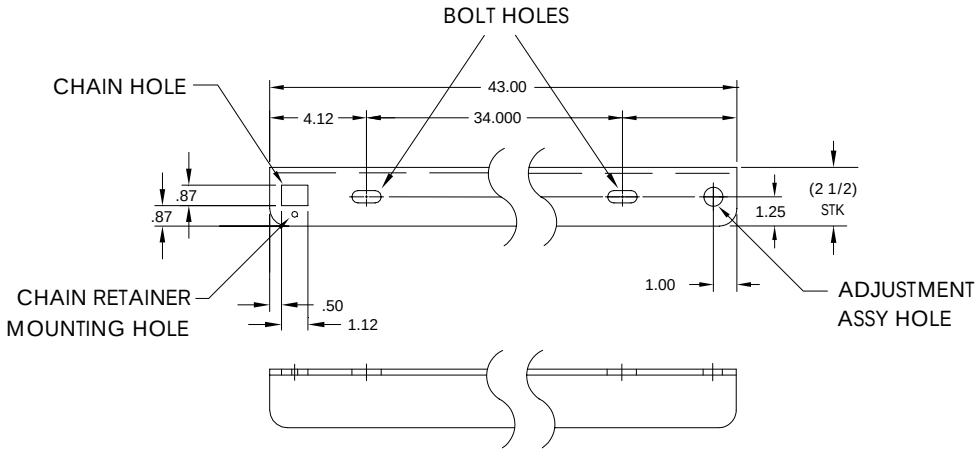

Figure 5 Mounting Brackets

2) Place a lock washer, then a flat washer on one of the 1 ¼" bolts (see Figure 6).

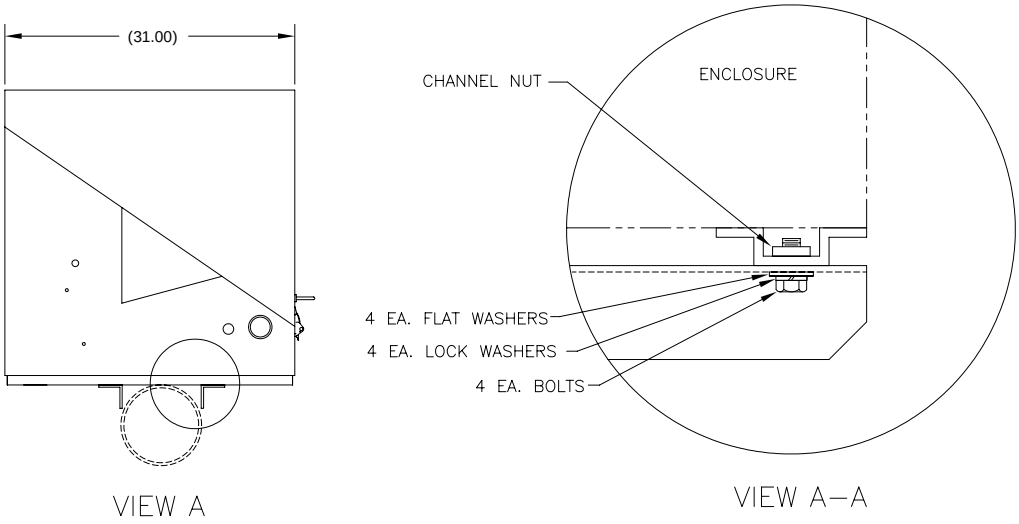

Figure 6 Mounting Hardware Overview

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, lock 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 7).
8) Insert All Thread through round hole on adjustment side of angle iron.
9) Place the flat washer, split washer and nut on all thread.
10) Screw nut onto all thread until to of nut is level with top of all thread. Final tightening may be done after mounting chain is in place.

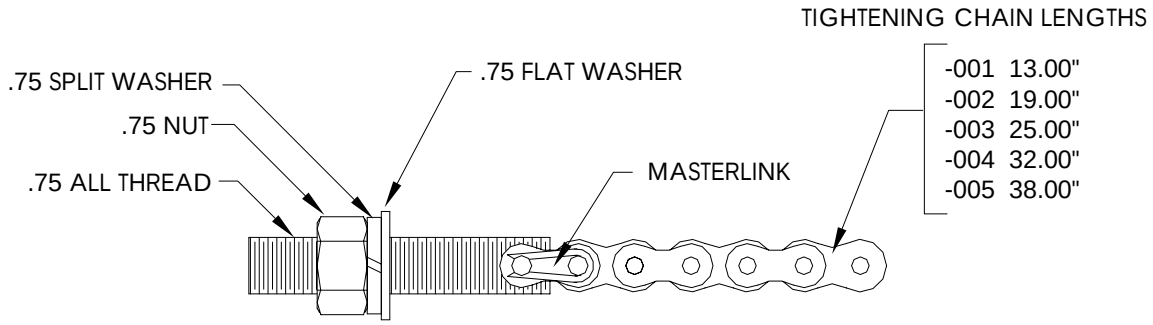

Figure 7 Adjustment Assembly

11) If applicable, remove Sample Probe Access Plate from inside the enclosure by removing the 6 phillips head screws and lifting the Access Plate with attached insulation from hole (see Figure 8).

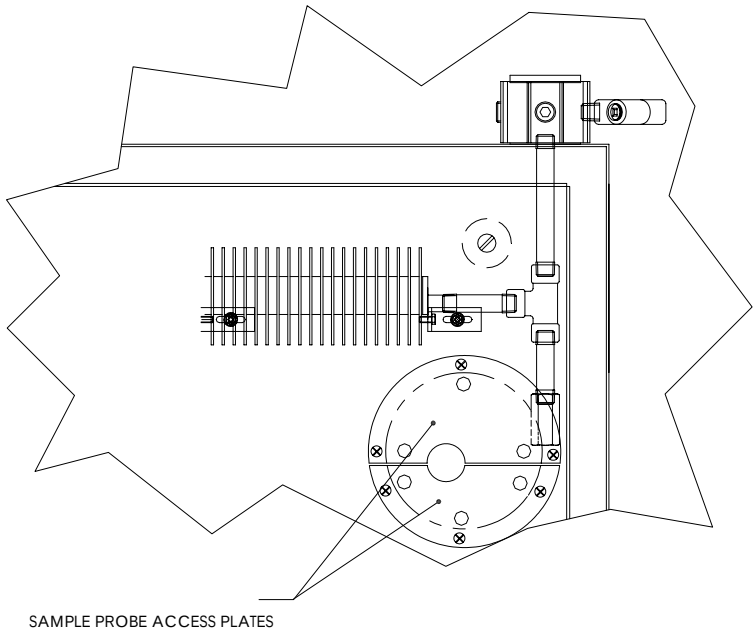

Figure 8 Sample Probe Access Plates

Note: The following step will typically require two people. If Sample Probe is to be located inside the enclosure, it must first be installed in meter run.

12) Lift enclosure above meter run allowing enough clearance to clear pipe and installed Sample Probe if applicable.

13) Set enclosure on top of pipe in between the facing angle iron mounting brackets, being careful to insert mounted sample probe through corresponding hole if applicable. Keep unit steady on top of pipe.

14) Wrap mounting chain underneath pipe. 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.

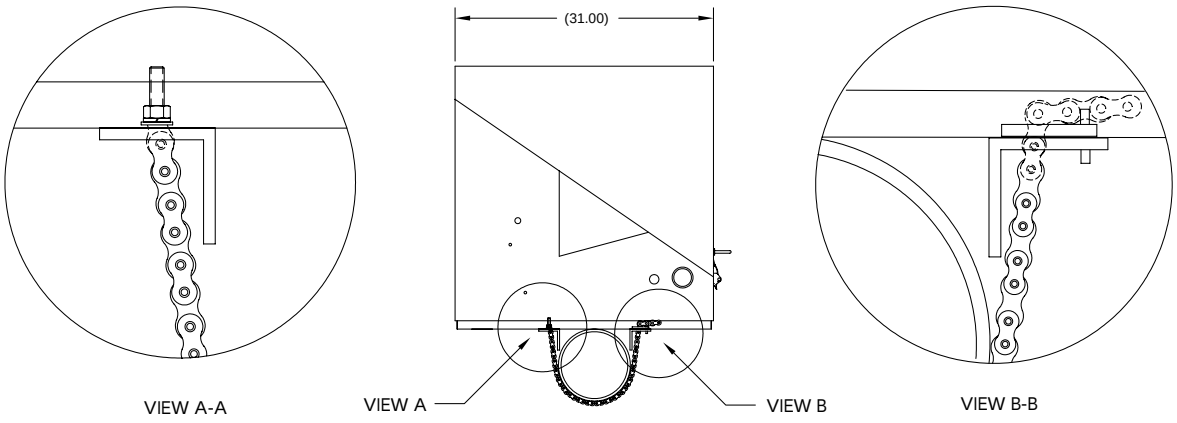

Figure 9 Pipe Mount installation

15) Feed long flat end of Chain Retainer (see Figure 10) through middle of a chain link then move retainer lock into position where round peg fits into small round mounting hole.

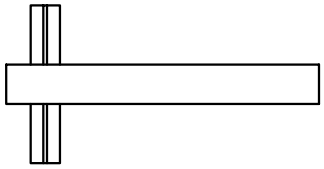

Figure 10 Chain Retainer Lock

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

V. Optional Support Leg Kit installation

Note: Must use with Pipe Mounting Kit

A. Materials

- 2 ea. ½-13 x 1 1/4 SST Bolt
- 2 ea. ½ SST Flat Washer
- 2 ea. ½" SST Split Washer
- 1 ea. Pre-assembled adjustable height Support Leg

B. Assembly and Installation

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 11).

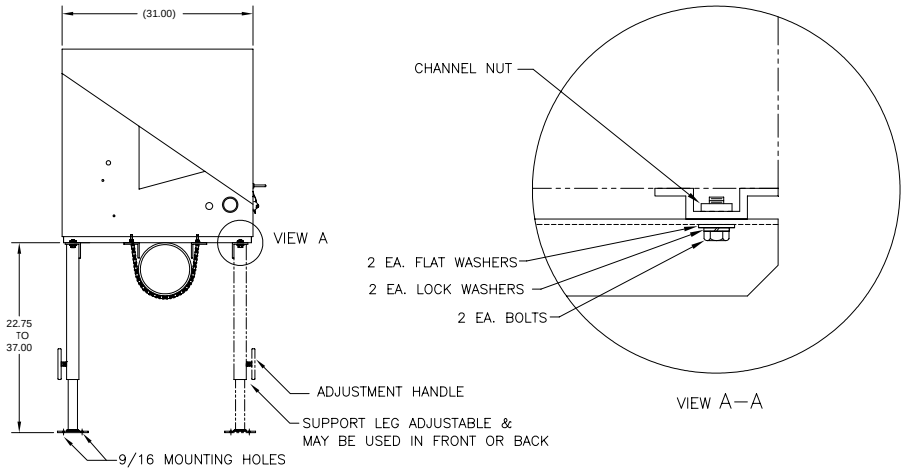

Figure 11 Optional Support Leg Overview

2) Place lock washer, then flat washer on one of the 1 ¼" 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.
4) Screw bolt into bolt, 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.

VI. Sample Probe Access Cover Installation

A. Installation and Insulation

1) Cover faceplate of Sample Probe Gauge, open end of relieve valve and Probe Outlet with a something similar to masking tape. This will protect lens from overspray with aerosol insulation.
2) Spray aerosol insulation around base of installed probe and enclosure bottom.
3) Quickly reinsert both halves of the Access Cover.
4) Align screw holes and attach cover plates with screws removed earlier in this installation process (see Figure 12).

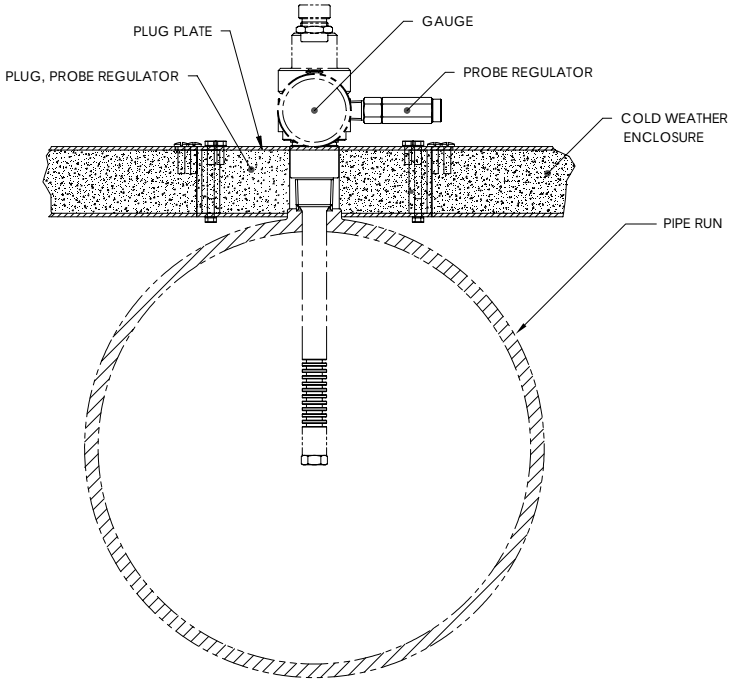

Figure 12 Installed Sample Probe and Access Plate Insulation

VII. Analyzer Mounting

A. Materials

- 1 ea. Installed Cold Weather Enclosure
- 1 ea. Btu 8000/8100 Transmitter
- 4 ea. 5/16” – 18 UNC X 1” Hex Head Screw
- 4 ea. 5/16” x .575 x .078 SST Split Lock Washer
- 4 ea. 5/16” SST Flat Washer

B. Installation

1) Place Btu Transmitter inside of the Cold Weather Enclosure, oriented so that Sample Filters face the front and slotted mounting holes align with mounting tracks (see Figure 13).

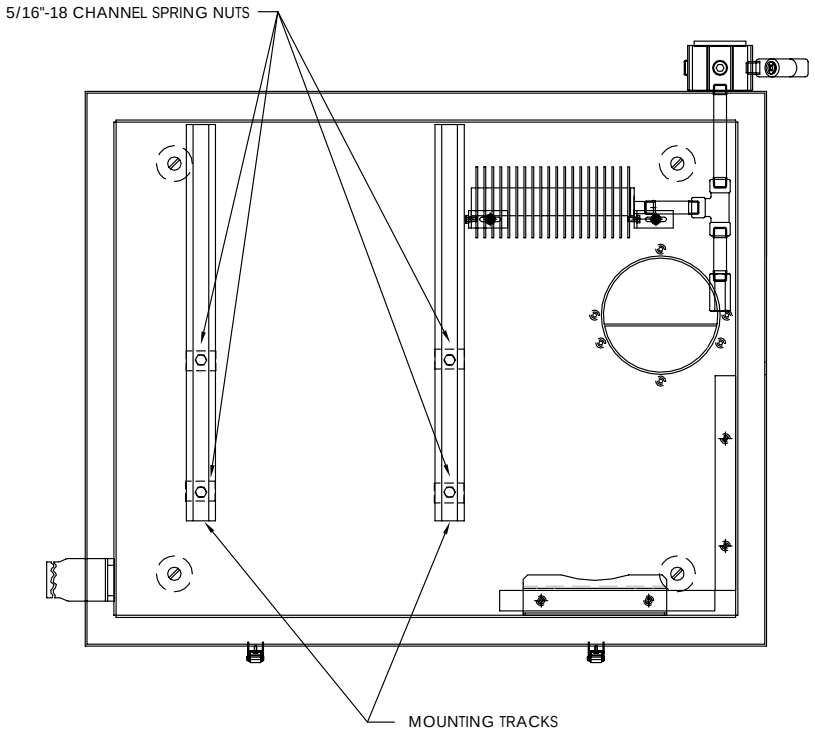

Figure 13 Cold Weather Enclosure Interior

2) Move Channel Spring Nuts into position underneath slotted mounting holes.
3) Place split washer, then flat washer on one of the 5/16” screws and insert through the one of the 4 mounting slots on the base of the Transmitter into the corresponding Channel Nut. Do not tighten until unit is in final position.
4) Repeat for other 3 Screws/Channel Nuts.

VIII. RS-232 Optional Kit

A. Materials

- 1 ea. RS-232 Outlet Box Assembly
- 1 ea. RS-232 Internal Connection Assembly
- 1 ea. 9” Flexseal Cable Assembly with Termination Unions
- 5 ea. #6 Terminal Rings
- Materials for external wiring may not be provided by Totalflow. Quantities and materials to be determined by the technician, based on installation and local codes.

B. Assembly and Installation

1) Remove left side access plate from enclosure (see Figure 14).

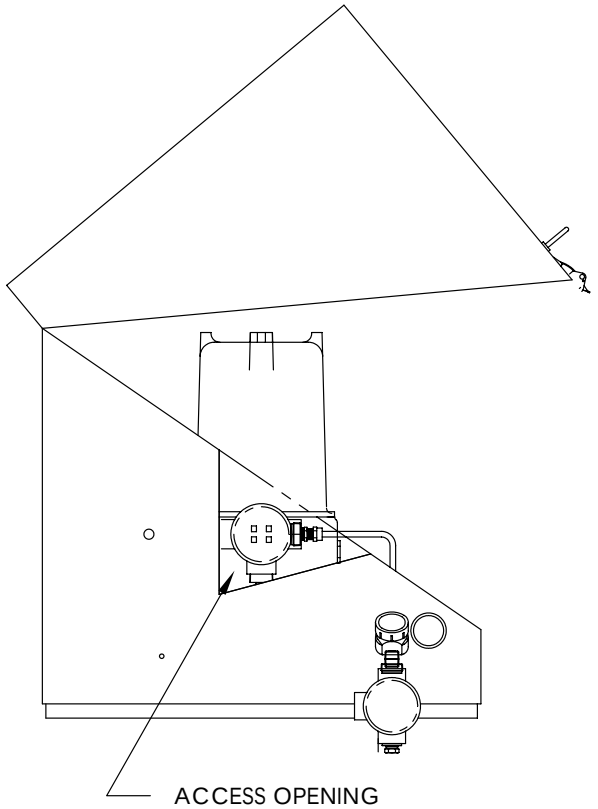

Figure 14 Cold Weather Enclosure Access Panel Removed

2) Beginning with the Internal Assembly, insert the nipple fitting end through the mounting hole from the inside to outside (see Figure 15).
3) Holding the Box Assembly in place on the outside of the enclosure, Insert end of the Internal Assembly into the elbow of the Box Assembly.

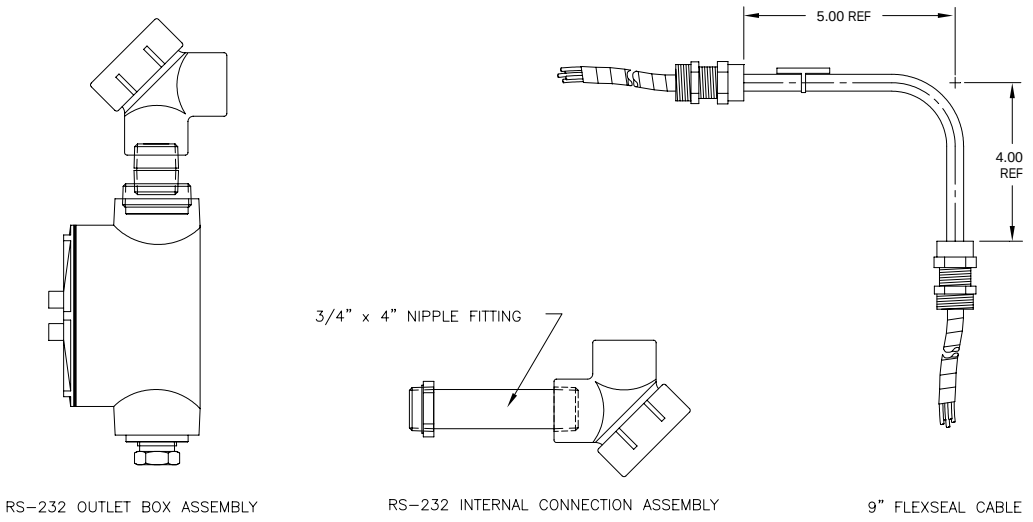

Figure 15 RS-232 Option Assemblies

4) Screw 3/4" drive nut, located on the Internal Assembly nipple fitting, through insulated wall onto the elbow joint located on the external assembly (see Figure 16).

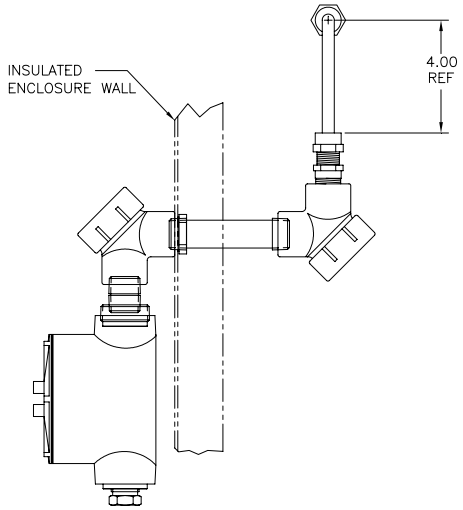

Figure 16 Assembled RS-232 Option

NOTE: Remove Elbow Cap on both assemblies to facilitate feeding the wrapped wire around the elbow.

5) Remove External Outlet Box Cover.
6) Insert the long end of the Flexseal Mineral Cable through Internal Assembly, passing through the enclosure wall, and around the external elbow.
7) Continue feeding the wire through to outlet box. Pull wrapped wires through past terminals located inside the Outlet Box.
8) Trim and strip wire ends located in the external Outlet Box.
9) Install Insulated #6 Terminal Rings on all wire ends and crimp.

10) Using the Wiring Instructions in Figure 17, remove terminal screws and install each wire on the correct terminal (see Figure 18).

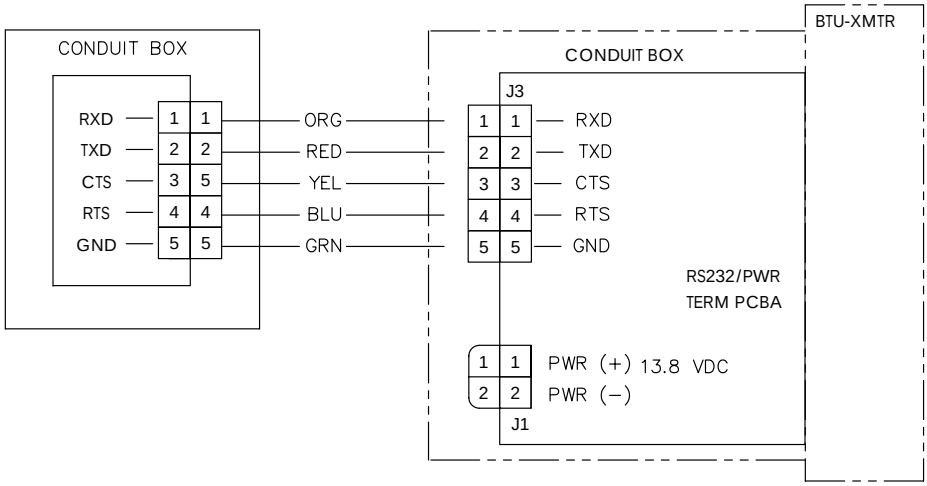

Figure 17 RS-232 Option Wiring Diagram

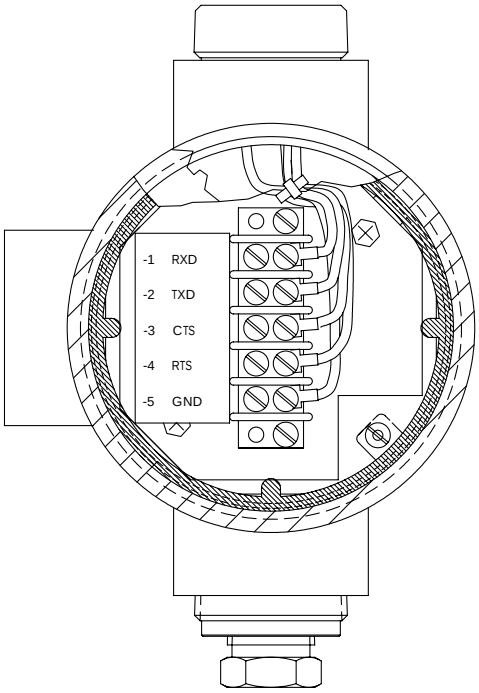

Figure 18 Wired Outlet Box

11) Remove cover from Btu Transmitter Conduit Box.

12) Insert the other end of wrapped wire through conduit port on Btu Transmitter Conduit Box, and pull out past Terminations. Continue to pull wire past terminations until the first piece of the termination union is in position to screw into port.

13) Screw termination union (piece one) into port until snug.

14) Slide the flare fitting behind piece one, followed by the final piece of the termination union. Screw union into the back of the first piece until snug.
15) Trim and strip wire ends located in the Btu Conduit Box (see Figure 19).
16) Remove communication connector plug from board.
17) Using Figure 16, make field connections to plug and re-insert into corresponding connector in RS-232 Option Outlet Box.
18) Restore cover to Btu Conduit Box.

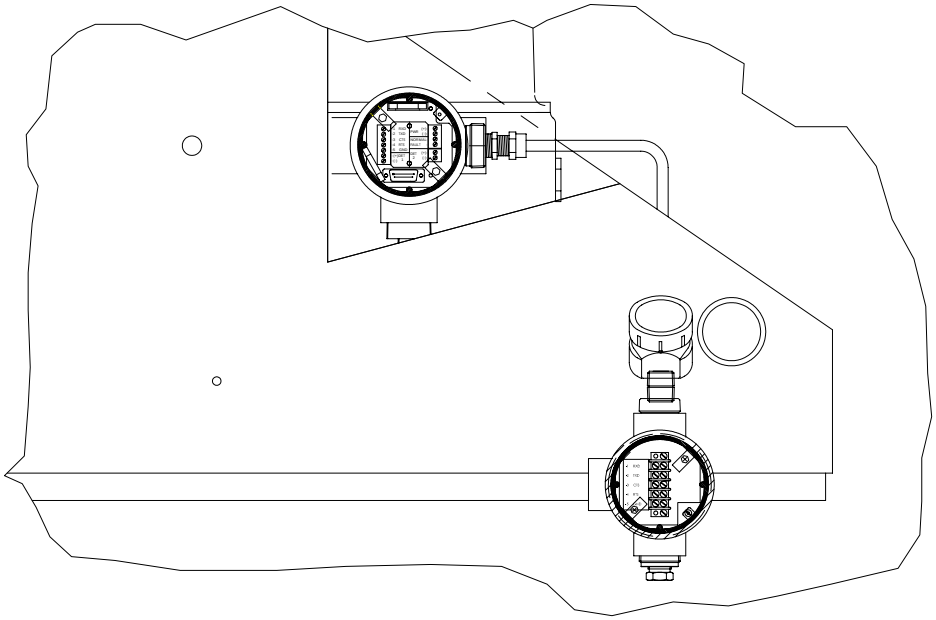

Figure 19 Installed RS-232 Option

C. RS-232 External Connections

NOTE: External wiring and connections should be preformed by an experienced technician.

1) Using the wiring instructions shown in Figure 16, make all external connections.
2) Restore cover to external RS-232 Option Outlet Box.

IX. Power Switch Option Kit

A. Materials

- 1 ea. Power Option Outlet Box Assembly
- 1 ea. Power Option Internal Connection Assembly
- 1 ea. 20” Flexseal Cable Assembly with Termination Unions
- Materials for external wiring may not be provided by Totalflow. Quantities and materials to be determined by the technician, based on installation and local codes.

B. Assembly and Installation

1) Beginning with the Internal Assembly, insert the nipple fitting through the mounting hole from the inside to outside (see Figure 20).
2) Holding the Box Assembly in place on the outside of the enclosure, Insert end of the Internal Assembly into the elbow of the Box Assembly (see Figure 21).
3) Screw 3/4” drive nut, located on the Internal Assembly nipple fitting, through insulated wall onto the elbow joint located on the external assembly.

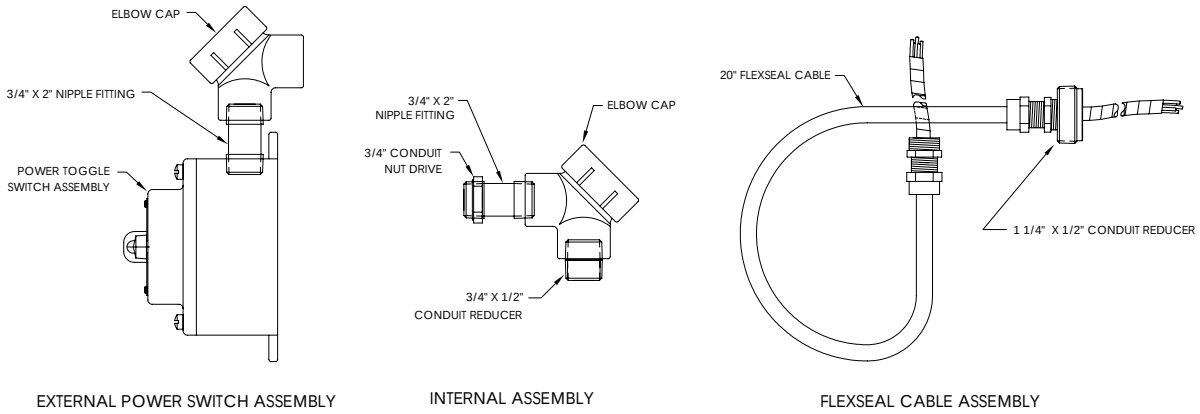

Figure 20 Power Switch Assembly

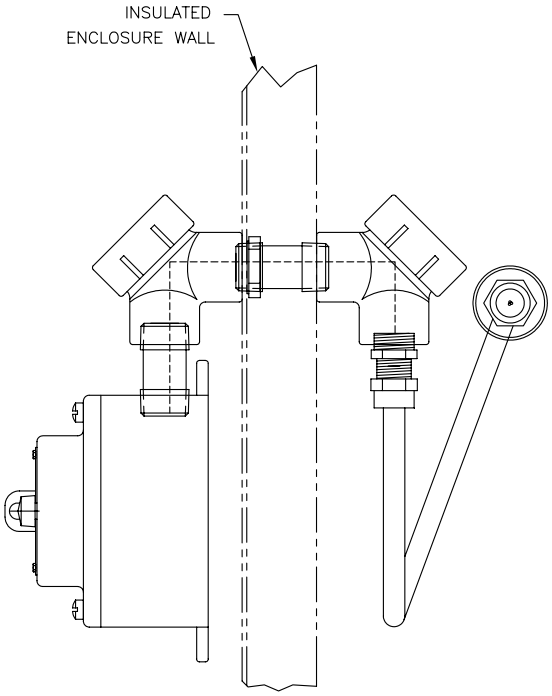

Figure 21 Assembled Power Switch

NOTE: Remove Elbow Cap on both assemblies to facilitate feeding the wrapped wire around the elbow.

4) Remove External Outlet Box Cover.
5) Remove the switch mounting screws and remove the switch.
6) Insert the wrapped wire end of the Flexseal Mineral Cable (Conduit Reducer end) through Internal Assembly elbow, passing through the enclosure wall, and around the external elbow.
7) Continue feeding the wire through to outlet box until wrapped wires are free.
8) Screw conduit nut drive into outlet box port (see Figure 21)
9) Trim and strip wire ends exiting in the external Outlet Box.
10) Using the Wiring Instructions in Figure 22, loosen terminal screws on back of switch and install each wire on the correct terminal. Field splice the Black wires together. Wire Red wire from outside source to negative terminal screw. White wire is not used.

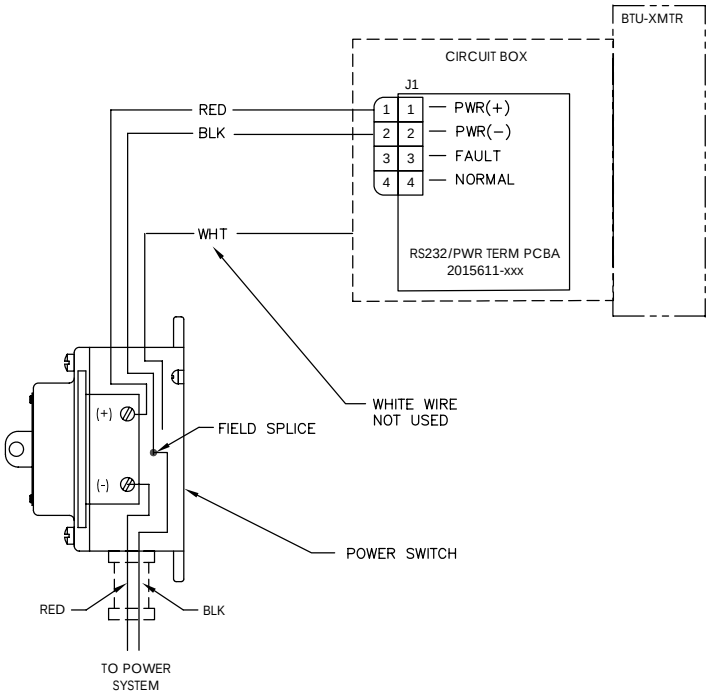

Figure 22 Power Option Wiring Instructions

11) Remove cover from Btu Transmitter Circuit Box (see Figure 23).
12) Insert the other end of wrapped wire through port on Btu Transmitter Circuit Box, and pull out past Terminations. Continue to pull wire past terminations until the first piece of the termination union is in position to screw into port.
13) Screw conduit reducer into port.
14) Slide the flare fitting behind piece one, followed by the final piece of the termination union. Screw union into the back of the first piece until snug.
15) Trim and strip wire ends located in the Btu Circuit Box.
16) Remove power connector plug from board.
17) Using wiring instructions in Figure 22, make field connections to plug and re-insert into corresponding connector in Btu Circuit Box.

18) Replace cover on Btu Transmitter Conduit Box.

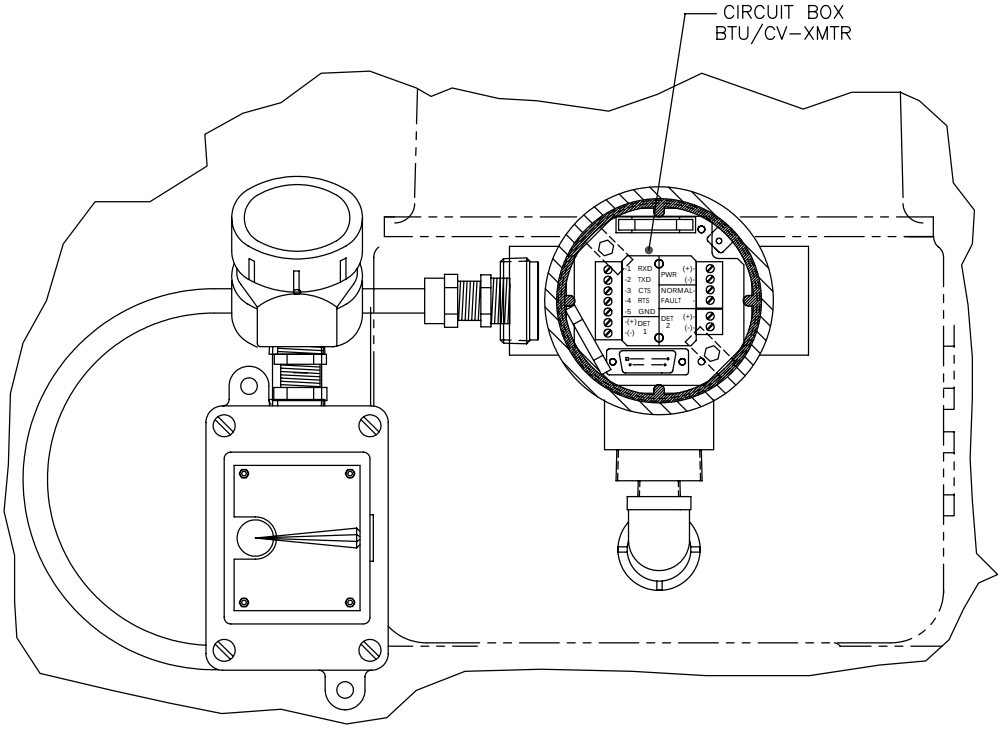

Figure 23 Installed Power Switch Option

C. Power Switch External Connections

NOTE: Before continuing, verify that inbound power wires are NOT HOT! External wiring and connections should be preformed by an experienced technician.

1) Using the wiring instructions shown in Figure 18, make all external connections.
2) Re-install the switch inside of the Outlet Box.
3) Re-install Power Switch Box cover plate. Insure switch is in the off position.

X. Sample System Conditioning Modules

A. Materials

- 1 ea. Sample System Mounting Bracket
- 10 ea. .164-32 x ½" SST Pan Head Screw
- 4 ea. .164 x .40 Split Washer
- 4 ea. .164 x .375 Flat Washer
- 1–3 ea. Type (1–4) Sample Conditioning Modules and Transport Tube assembly
- Customer supplied materials for venting restrictors outside of the enclosure.

B. Bracket Installation

1) Locate machined mounting bracket holes on bracket (see Figure 24) and back of Transmitter.
2) Place split washer, then flat washer on one of the ½" screws and insert through the mounting holes located in the bracket into one of the associated holes in the Transmitter's enclosure (see Figure 25).

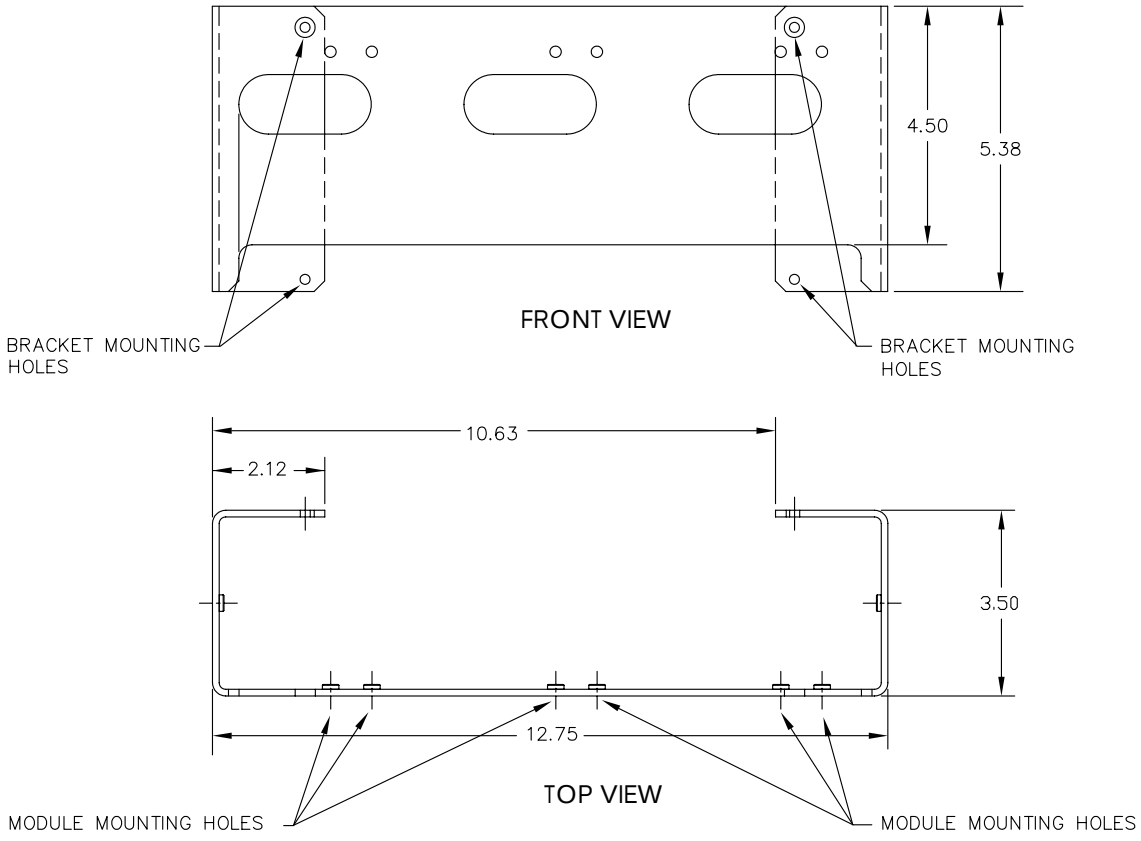

Figure 24 Mounting Bracket

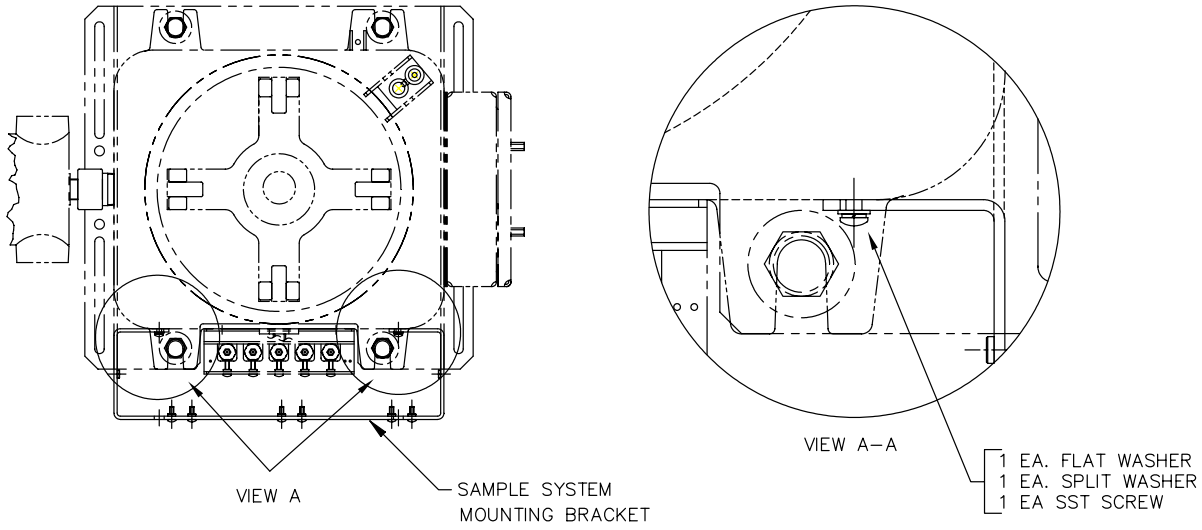

Figure 25 Sample Conditioning Module Mounting Bracket Installation

C. Module Installation

Sample Conditioning Module installation will vary depending upon how many sample streams are used. The Btu 8000/8100 will handle up to 3 sample streams. Five types of conditioning modules are available for configuration. Each modules appearance will vary, they will install onto the mounting bracket in the same manner, and the locations are interchangeable. For this reason, the following instructions will be somewhat generic (see Figures 26 through 30).

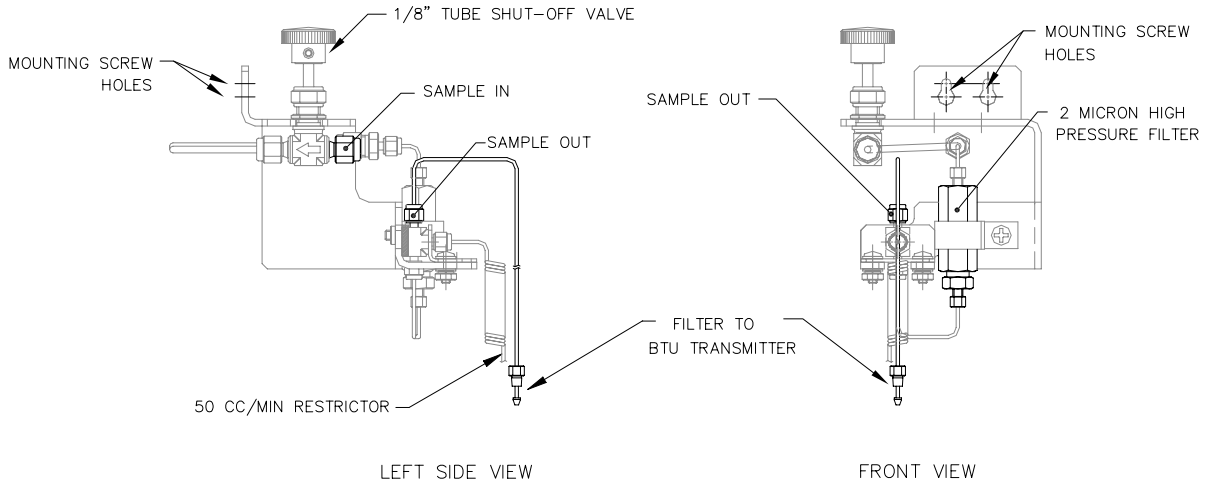

Figure 26 Type 1 Sample Conditioning Module

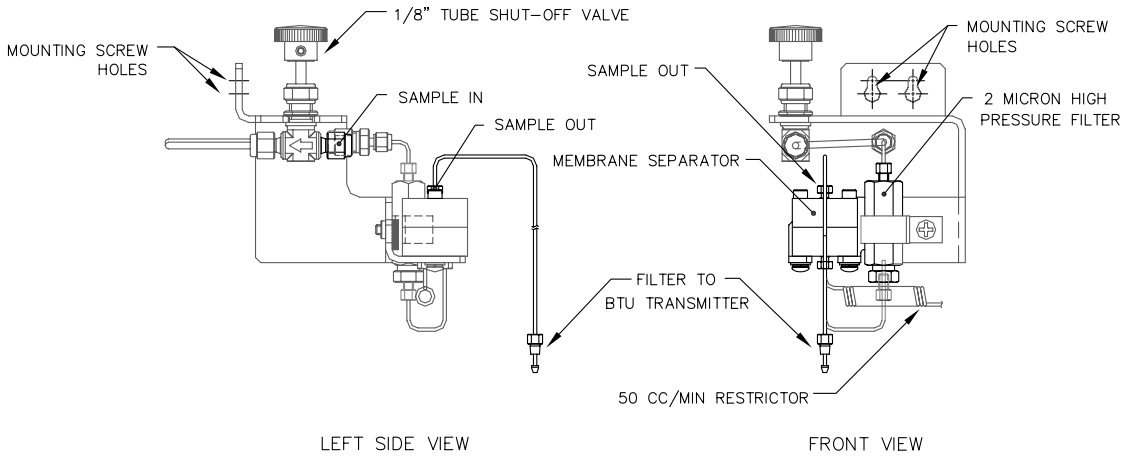

Figure 27 Type 2 Sample Conditioning Module

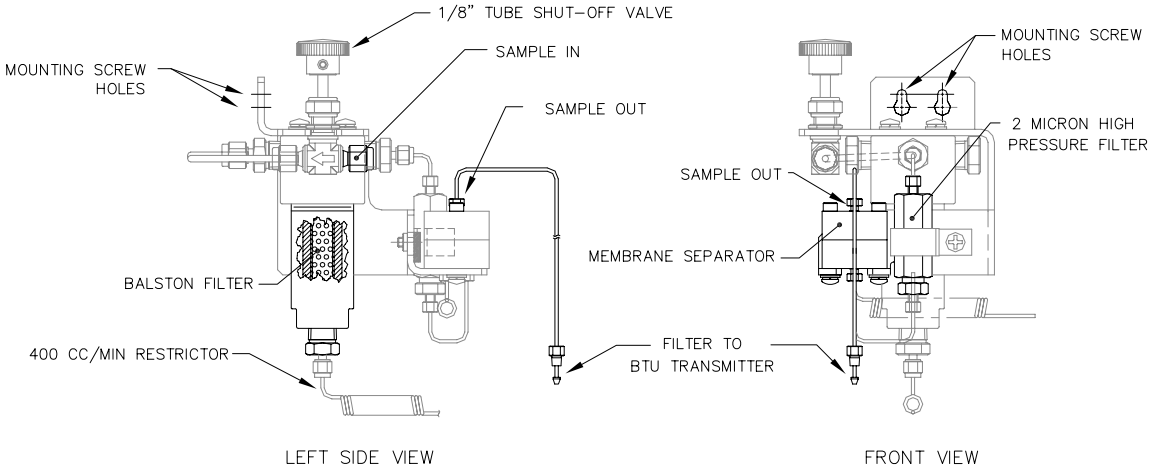

Figure 28 Type 3 Sample Conditioning Module

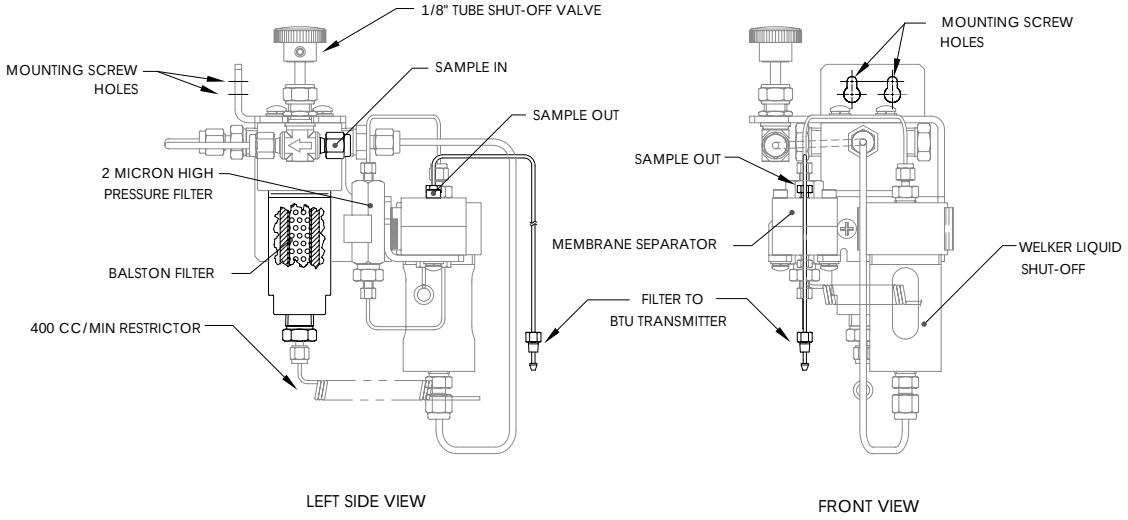

Figure 29 Type 4 Sample Conditioning Module

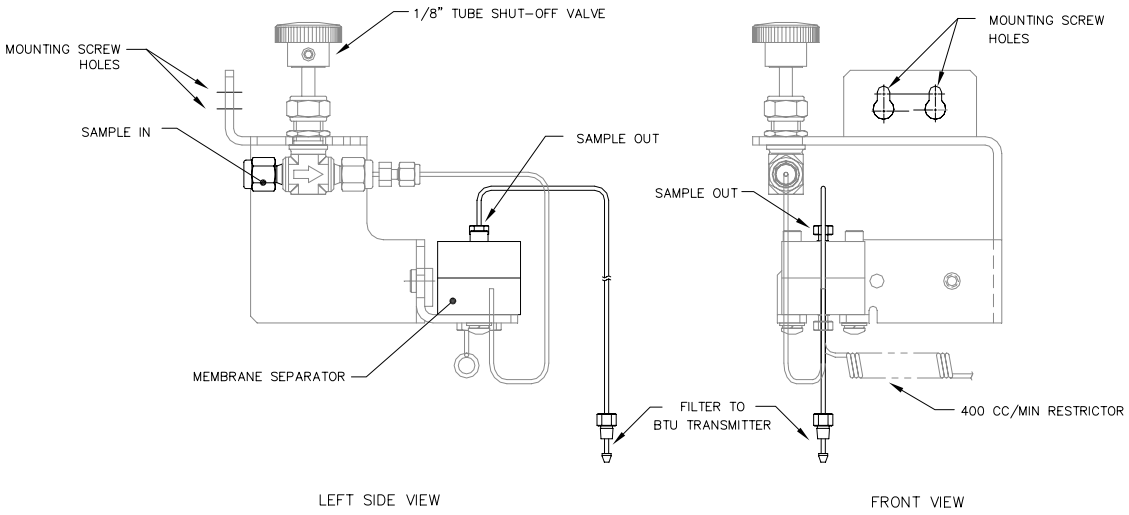

Figure 30 Type 5 Sample Conditioning Module

NOTE: Module location on mounting bracket will determine corresponding stream numbers for the Btu 8000/8100.

1) Using one of the remaining screws from the bracket installation, locate mounting screw holes on the module and insert screw through one of the pair of module holes and into the corresponding hole in the mounting bracket. Repeat for second hole. Tighten.
2) Repeat for additional sample conditioning modules.
3) Locate the Sample Out fitting on the module (see Figure 31). Starting with the short end of the Transport Tube Assembly make bends in tubing as required to fit the long end of the assembly into corresponding Sample Input Filter Input located on the bottom of the filter (see Figure 32).

NOTE: Tube, Ferrule and Nut should always enter connection perpendicular.

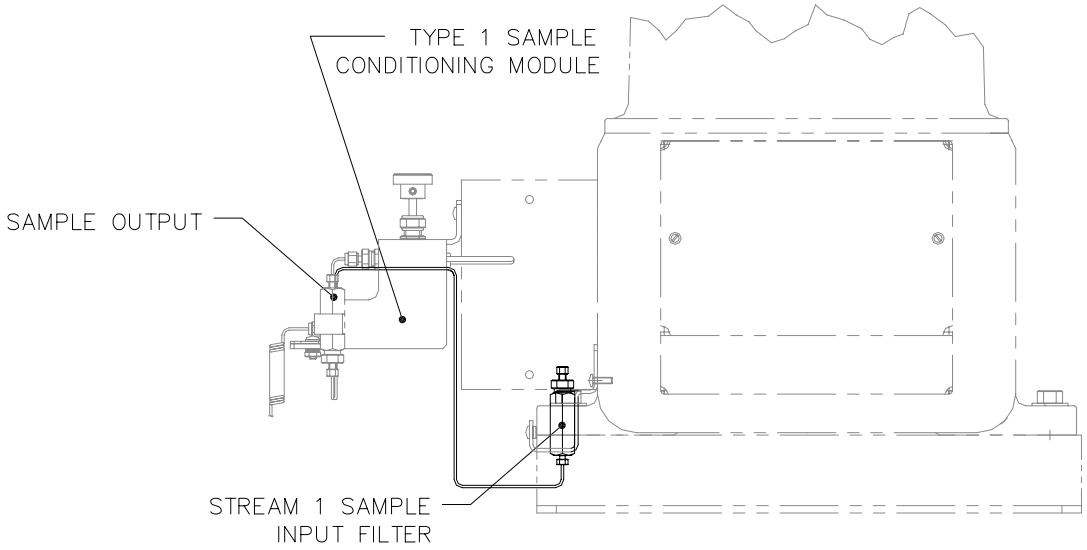

Figure 31 Transport Tube Assembly to Analyzer Filter

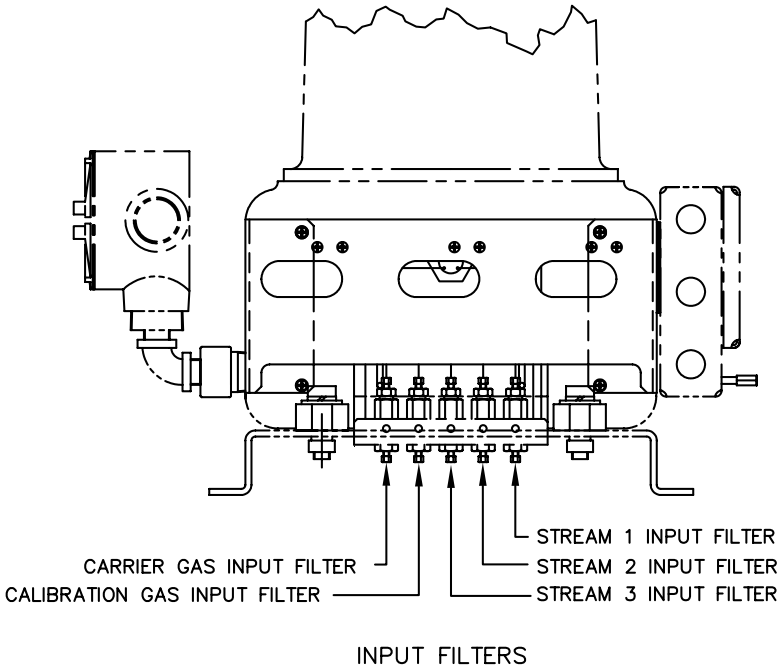

Figure 32 Btu Transmitter Sample Input Filters

4) Using the short end of the Transport Tube Assembly, insert the ferrule into the fitting. Move the nut down onto ferrule, screw onto fitting and tighten
5) Remove sealing screw from bottom of corresponding Sample Input Filter.
6) Insert the ferrule into the fitting on the bottom of the Sample Input Filter. Move the nut down onto ferrule, screw onto fitting and tighten.
7) Repeat Steps 3–6 for each Sample Conditioning Module installed.
   A) Leave sealing screws in any unused filters.

NOTE: Totalflow strongly recommends venting ALL 50cc and 400cc restrictors outside the Cold Weather Enclosure.

XI. Sample Line Connections

NOTE: These instructions assume that the Sample Probe has previously been installed and is located inside of the Cold Weather Enclosure. If multiple sample streams are to be run to the Btu Transmitter (located inside of the enclosure), please see "Additional Sample Line Connections" located later in this manual.

A. Materials

- 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. 1/8" Ferrule and nut (for each Sample Stream)
- 1 ea. ¼" NPT to 1/8" Reducer or other size as determined from Sample Probe Output (for each Sample Stream)

B. Assembly and Installation

1) Locate sample input fitting on Sample Conditioning Module (see Figures 26–30).
2) Locate sample output fitting on installed Sample Probe.
3) Measure and cut SST Tubing to required length.
4) Make necessary bends in tubing to ease installation of the ferrule and nut into Sample Conditioning Module.

NOTE: Tube, Ferrule and Nut should always enter connection perpendicular.

5) If necessary, install reducer into Sample Probe output fitting.
6) Insert ferrule into reducer/Sample Probe output fitting. Move nut down onto ferrule, screw onto fitting and tighten.
7) Remove plastic caps from Sample vent lines and Detector vent lines.
8) Purge air from the transport tubing by opening the shut-off valve located on the Sample Probe.

NOTE: Be sure to follow local codes when performing this purge.

9) Insert ferrule into Sample Conditioning Module Input Connection. Move nut down onto ferrule, screw onto fitting and tighten.
10) Repeat for each Sample Stream.

XII. Additional Sample Line Connections

A. Materials

- Customer Installed Additional Sample Steam
- Heat Trace Materials provided by customer for each additional steam
- Aerosol Insulating Foam (supplied with enclosure)

B. Installation

Note: Please follow Heat Trace Manufacturer's suggested installation instructions for applying Heat Trace equipment to additional Sample Streams.

1) Locate Sample Boot on side of Cold Weather Enclosure (see Figure 33).
2) Using instructions covered previously under "Sample Line Connections", run Sample Line from Sample Probe through Sample Boot, to Sample Conditioning Module located at the Btu Transmitter.
3) Repeat for each additional Sample Stream.
4) When Sample Line 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) Apply Heat Trace Materials.

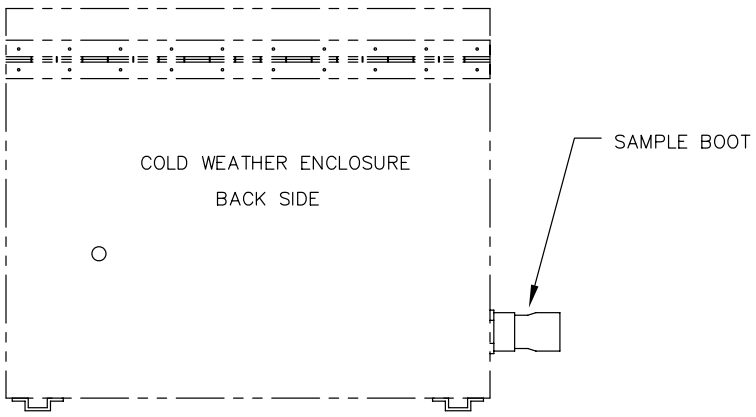

Figure 33 Sample Boot

XIII. Carrier Gas Bottle Rack & Bottle

A. 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

B. Assembly and Installation

1) Place a lock 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 located along the bottom edge of the enclosure and tighten (see Figures 34–35).

NOTE: Enclosure hole contains a Captive Nut.

2) Repeat for second bolt.

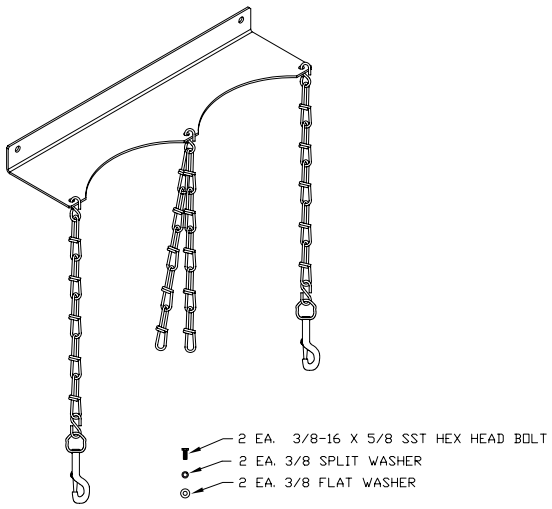

Figure 34 Dual Bottle Rack Assembly

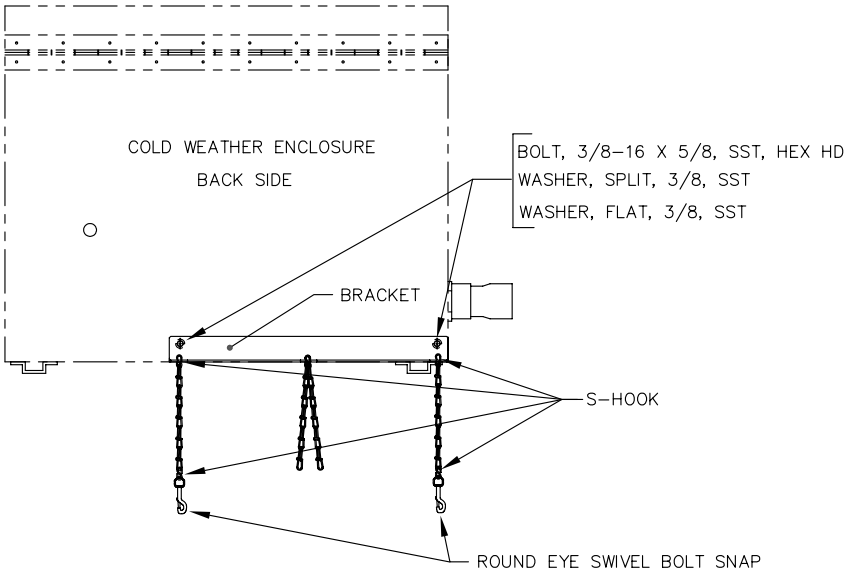

Figure 35 Dual Bottle Rack Installation

3) Install Carrier Gas Bottle in bottle rack.
4) Using chains, strap bottle(s) to rack by attaching Bolt Snap to one of the center chains.
5) Repeat Step 4 if installing a second bottle.

XIV. Carrier Gas Regulator with Low Pressure Switch

NOTE: These instructions assume that the Carrier Gas bottle has previously been installed.

A. Materials

- Carrier Regulator Assembly with Low Pressure Switch (see Figure 36)
- Installed Carrier Gas Bottle

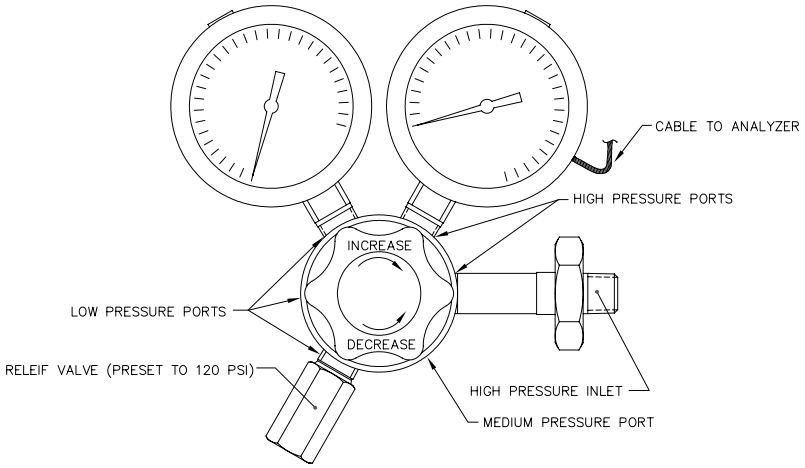

Figure 36 Carrier Gas Pressure Regulator with Relief Valve

B. Installation

1) Remove protective cap from High Pressure Inlet if required.
2) Insert Ferrule on High Pressure Inlet into Carrier Gas Bottle Outlet.
3) Screw nut onto thread and tighten.
4) Attach Wires for the High Pressure Gauge to one of the Digital Inputs located in the Intrinsically Safe Termination Enclosure attached to the side of the Btu Transmitter Enclosure (see Figure 37).
   A) Remove Termination block connector from one of the DIs.
   B) Connect the Black wire to the "-" terminal.
   C) Connect the Red wire to the "+" terminal.
   D) Insert the Termination block into the corresponding connector on the board.

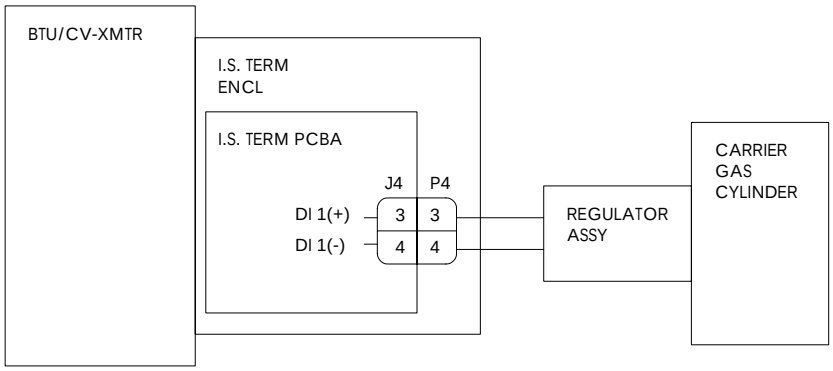

Figure 37 Carrier Gas Low Pressure Switch Installation

XV. Carrier Gas Connections

NOTE: These instructions assume that the Pressure Regulator has previously been installed.

A. Materials

- Installed Carrier Gas Pressure Regulator with Low Pressure Switch
- 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).
- 2 ea. 1/16" Ferrule and nut
- 1 ea. ¼" NPT to 1/16" Reducer or other size as determined from Carrier Gas Regulator.

B. Installation

1) Locate Carrier Gas Input Filter on Btu Transmitter (see Figure 38).
2) Locate ¼" 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 ferrule and nut into Sample Conditioning Module.

NOTE: Tube, Ferrule and Nut should always enter connection perpendicular.

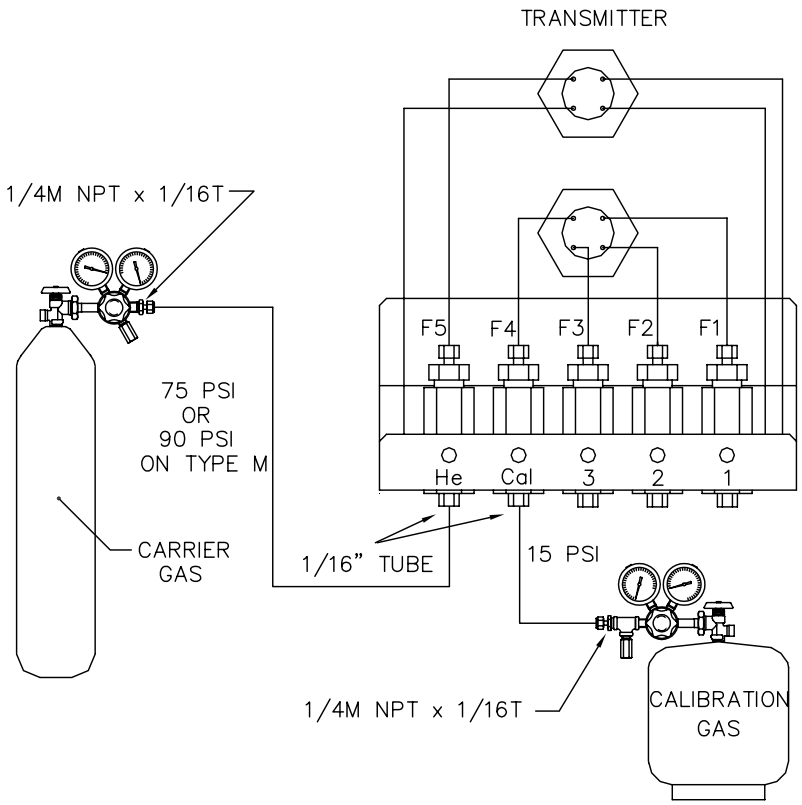

Figure 38 Carrier and Calibration Gas Connections

5) Install reducer into Carrier Gas Regulator.
6) Insert 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 75 PSI or 90 PSI on Type M Btu installation.
8) Purge air from the transport tubing by opening the shut-off valve located on the Sample Probe.

NOTE: Be sure to follow local codes when performing this purge.

9) Insert ferrule into Corresponding Sample Input Filter Connection. Move nut down onto ferrule, screw onto fitting and tighten.

XVI. Calibration Gas Bottle

A. Materials

- Calibration Blend Bottle
- Strapping material (shipped with Cold Weather Enclosure)

B. Installation

1) Locate the bottle bracket in the right front area of the Cold Weather Enclosure (see Figure 39).

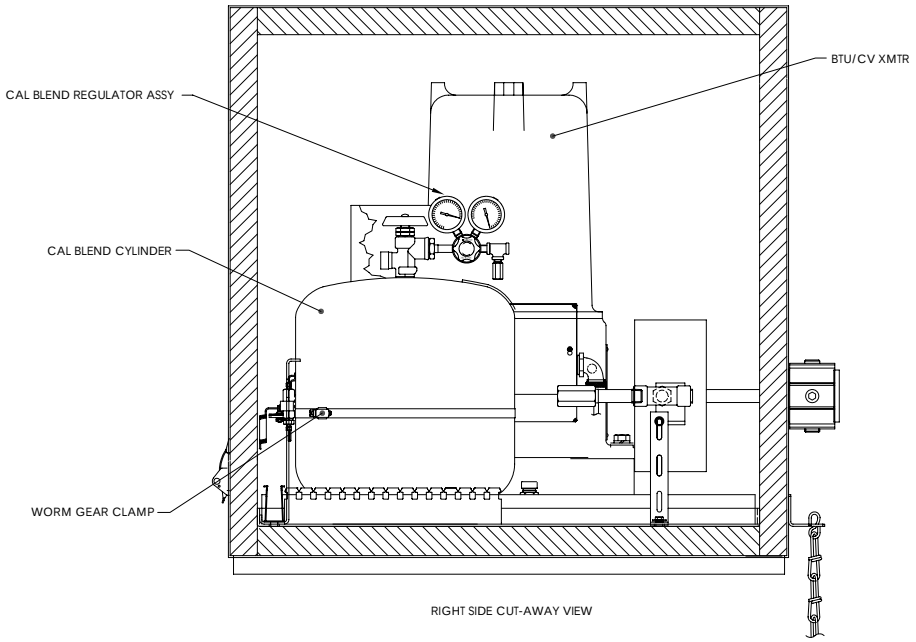

Figure 39 Calibration Bottle Location

2) Set Calibration bottle inside of enclosure, situated against the Bottle Bracket.
3) Thread strap through holes in bracket and around the bottle. Insert end of strap into Worm Gear.
4) Using a flat blade screw driver, turn screw on Worm Gear until strap is snug.

XVII. Calibration Gas Regulator with Low Pressure Switch

NOTE: These instructions assume that the Carrier Gas bottle has previously been installed.

A. Materials

- Calibration Blend Regulator Assembly with Low Pressure Switch (see Figure 40)
- Installed Calibration Gas Bottle

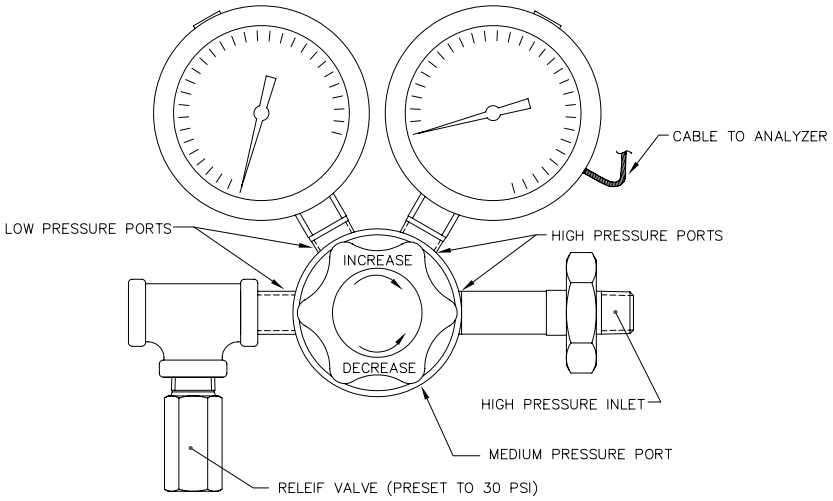

Figure 40 Calibration Gas Pressure Regulator with Relief Valve

B. Instructions

1) Remove protective cap from High Pressure Inlet if required.
2) Insert Ferrule on High Pressure Inlet into Calibration Gas Bottle Outlet.
3) Screw nut onto thread and tighten.
4) Using instructions shown in Figure 41, attach Wires for the High Pressure Gauge to one of the Digital Inputs located in the Intrinsically Safe Termination Enclosure attached to the side of the Btu Transmitter Enclosure.

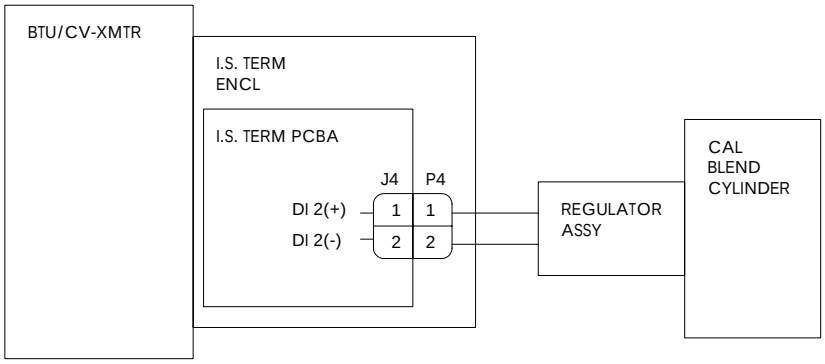

Figure 41 Carrier Blend Pressure Regulator with Relief Valve

A) Remove Termination block connector from one of the DIs.
B) Connect the Black wire to the "-" terminal and Red wire to the "+" terminal.
C) Insert the Termination block into the corresponding connector on the board.

XVIII. Calibration Gas Connections

NOTE: These instructions assume that the Pressure Regulator has previously been installed.

A. Materials

- Installed Calibration Blend Regulator Assembly with Low Pressure Switch
- 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).
- 2 ea. 1/16” Ferrule and nut
- 1 ea. ¼” NPT to 1/16” Reducer or other size as determined from Calibration Gas Regulator.

B. Installation

1) Locate Sample Input Filter on Btu Transmitter (see Figures 26–30).
2) Locate ¼” 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 ferrule and nut into Sample Conditioning Module.

NOTE: Tube, Ferrule and Nut should always enter connection perpendicular.

5) Install reducer into Calibration Gas Regulator.
6) Insert ferrule into reducer/Pressure Regulator output fitting. Move nut down onto ferrule, screw onto fitting and tighten.
7) Calibration Gas Pressure should be set at 15 PSI.
8) Purge air from the transport tubing by opening the shut-off valve located on the Sample Probe.

NOTE: Be sure to follow local codes when performing this purge.

9) Insert ferrule into Corresponding Sample Input Filter Connection. Move nut down onto ferrule, screw onto fitting and tighten.

XIX. RS-485 Barrier Option Installation

A. Materials

- I.S. Barrier RS-485 Barrier Assembly (2 or 5 Wire)
- Barrier Support Bracket
- 2 ea. 10-32 x ½ SST Pan Head Screw, Phillips
- 2 ea. #10 SST Flat Washer
- 2 ea. #20 SST Split Lock Washer
- Materials for external wiring may not be provided by Totalflow. Quantities and materials to be determined by the technician, based on installation and local codes.

B. Bracket and Barrier Installation

1) Locate machined mounting bracket holes on bracket.

2) Place split washer, then flat washer on one of the ½" screws and insert through the mounting holes located in the bracket into one of the associated holes located on the right back side of the enclosure.
3) Repeat for the second hole.
4) Tighten both screws
5) Remove Locknut from end of the Barrier elbow.
6) Insert wires feeding from elbow of Barrier through mounting hole located on the lower right side towards the front of the enclosure.
7) Continue feeding wires and threaded end of elbow through hole.
8) Insert wires through locknut and screw locknut back onto the threaded end of elbow, resting the main body of the barrier on the install support bracket.
9) Tighten locknut.
10) Run wires around the inside of the enclosure as shown in Figure 42.

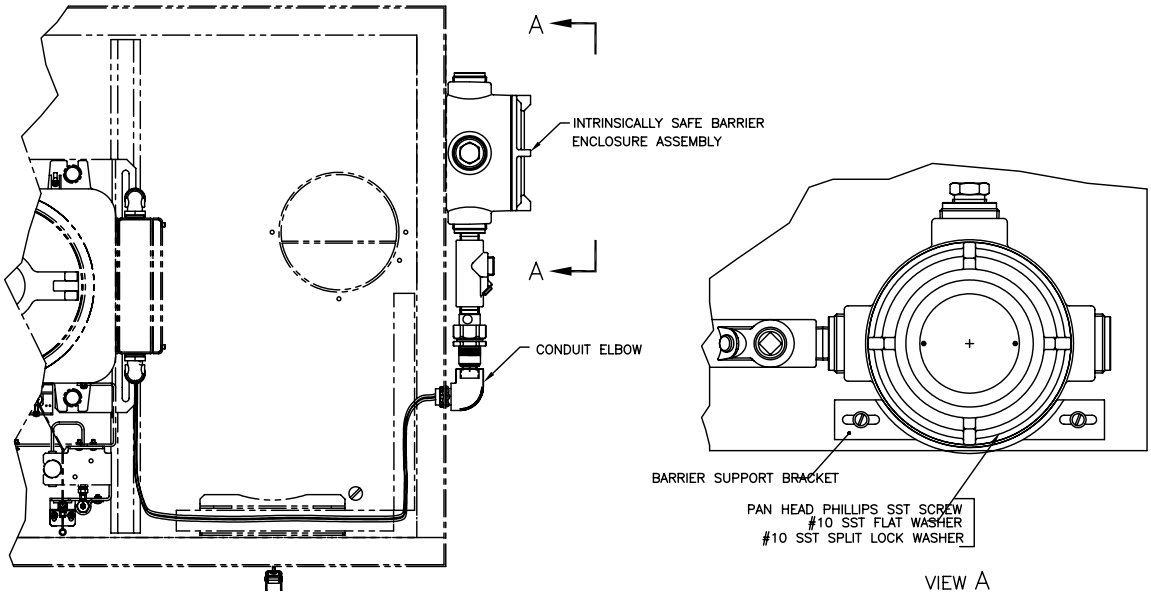

Figure 42 Barrier Support Bracket Installation

11) Using a 7/64" Hex Wrench, remove the cover plate from the I.S. Termination Box located on the side of the Btu.
12) Feed wires through one of the access holes located on the side of the box.
13) Trim and strip wire ends now located in the Box.
14) Remove communication connector plug from board.
15) Using the Wiring Instructions in Figure 43, make field connections to plug. Insert each wire in the corresponding pin and tighten keeper screw.
16) Repeat for each wire.
17) Make necessary changes to J6 for RS-485 Bus.

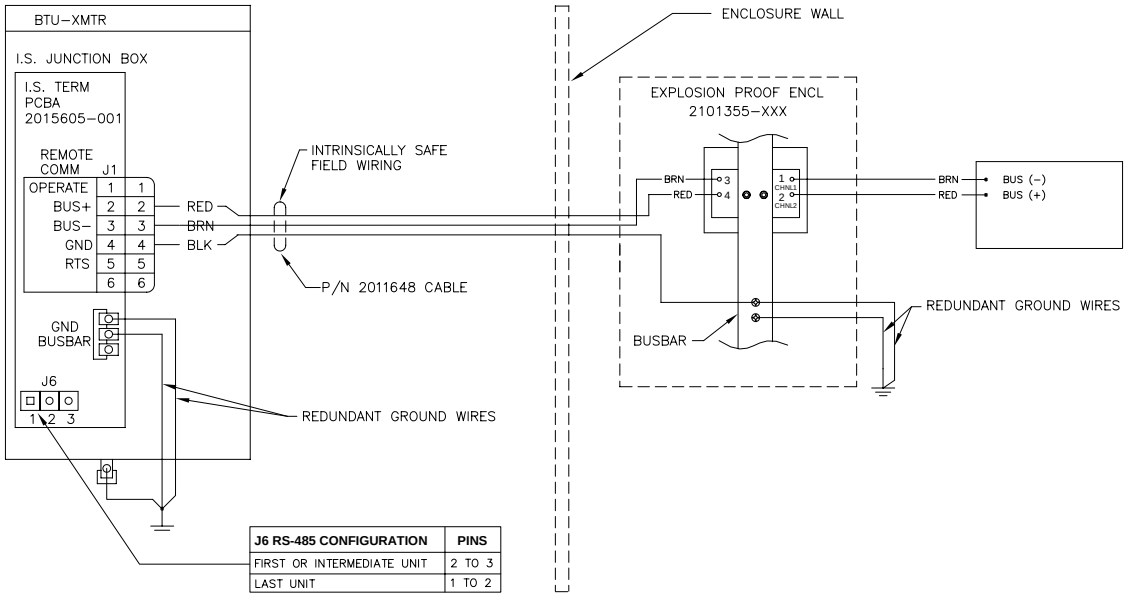

Figure 43 RS-485 I.S. Barrier Option Wiring Interconnect

C. RS-485 External Connections

NOTE: External wiring and connections should be preformed by an experienced technician.

1) Using the wiring instructions shown in Figure 43, make all external connections.

XX. Catalytic Heater Option Installation

A. Materials

- Catalytic Heater (installed at factory)
- Thermostat/Regulator Assembly
- Temperature Probe Mounting Clip
- Teflon Tape
- ¼" male pipe connection from External gas source to Catalytic Heater. Materials for gas source may 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 may not be provided by Totalflow. Quantities and materials to be determined by the technician, based on installation and local codes.

B. Assembly and Installation

1) Locate the installed Catalytic Heater on the rear of the Cold Weather Enclosure (see Figure 44).
2) Remove protective end cap from Thermostat/Regulator Assembly if required.

3) Apply Teflon tape to threads on Assembly if required.
4) Screw threaded end of Assembly into ¼" female fitting located on the installed Catalytic Heater, by turning entire Assembly clockwise until tight (see Figure 45).

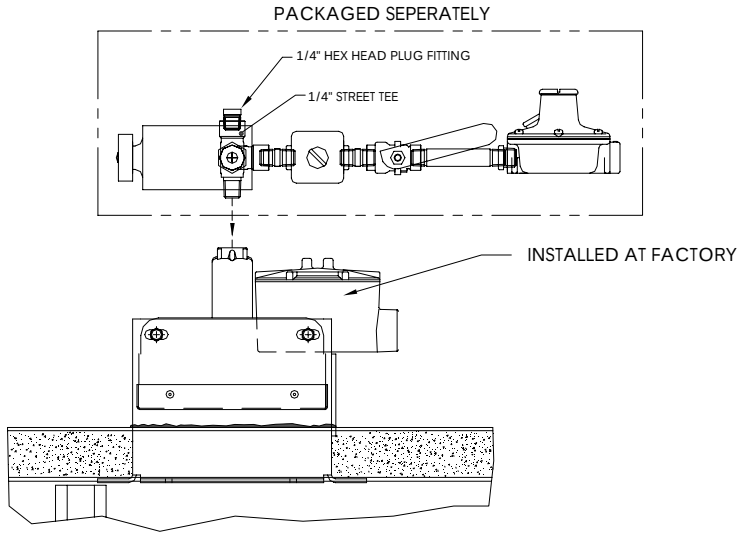

Figure 44 Catalytic Heater Option and Thermostat/Regulator Assembly

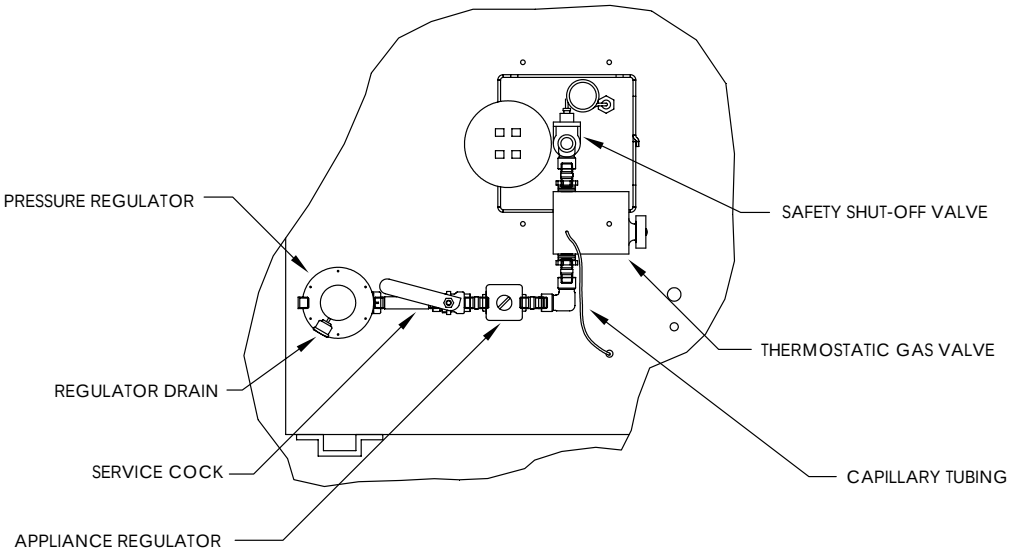

Figure 45 Thermostat/Regulator Assembly Installed

5) 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.
6) Remove Mounting screw and washers from right rear Btu Mounting Bracket.
7) 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 46).

8) Position probe underneath the Mounting clip. Tighten screw into channel nut to hold probe in place.

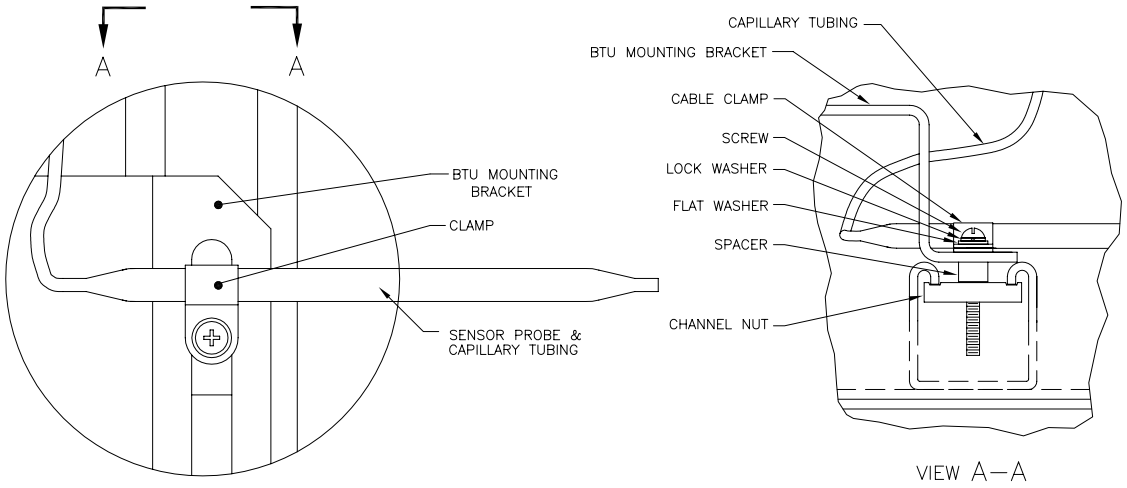

Figure 46 Temperature Probe Installation

C. External Gas Connections

NOTE: Technician responsible for installing gas supply following local codes.

1) Using Regulator manufacturers instructions supplied with Regulator, make external gas connections.

D. External Power Supply Connections

NOTE: Technician responsible for installing power supply following local codes.

1) Using the wiring instructions shown in Figure 47 and Manufacturers Instructions enclosed with Heater, make external connections.

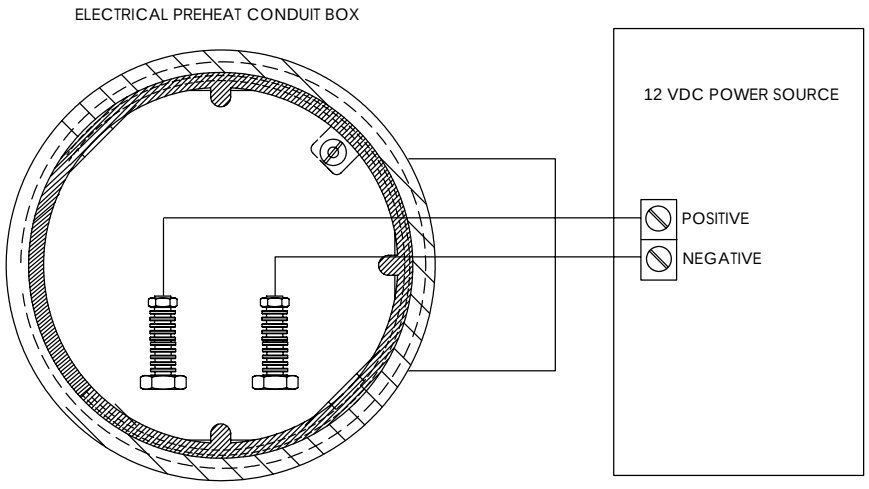

Figure 47 Electrical Pre-heater Wiring Instructions

XXI. Electric Heater Option Installation

A. Materials

- Electric Heater Option (Factory Installed, see Figure 48)
- AC Power source wiring. Materials for external Power source for Electric Heater wiring may not be provided by Totalflow. Quantities and materials to be determined by the technician, based on installation and local codes.

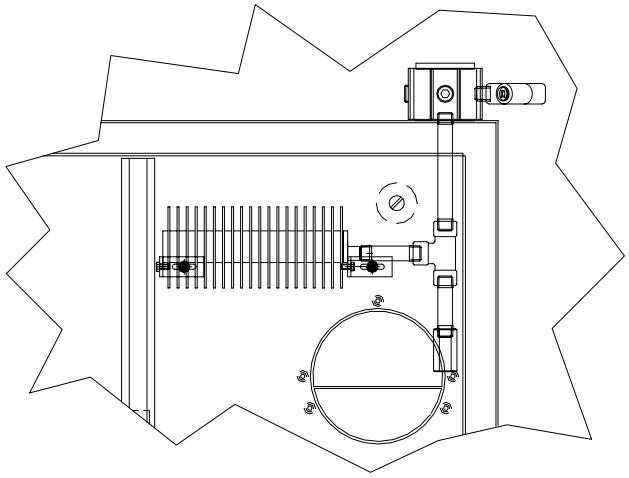

Figure 48 Electric Heater Option-Factory Installed

B. External Power Supply Connections

NOTE: Technician responsible for installing power supply following local codes.

1) Using the wiring instructions shown in Figure 49 and Manufacturers Instructions enclosed with Heater, make external connections.

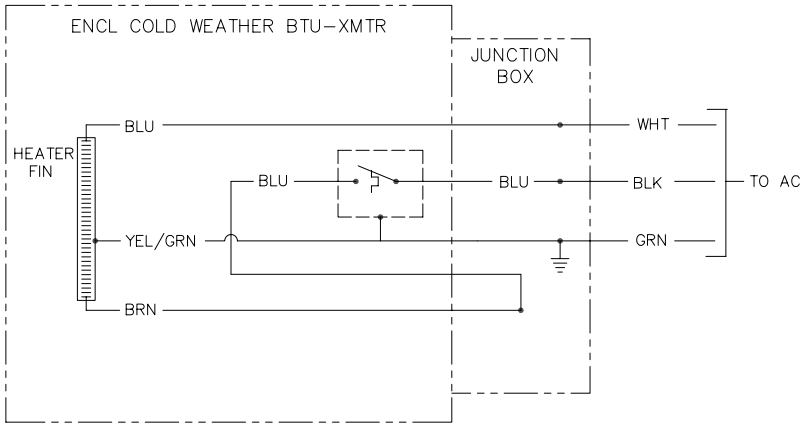

Figure 49 Electric Heater Option Wiring Instructions

XXII. External PCCU Cable Option Installation

A. Materials

- External PCCU Cable with Dust Cap

B. Assembly and Installation

1) Remove Dust Cap from PCCU Cable if necessary.
2) Remove Nut from connector (see Figure 50).

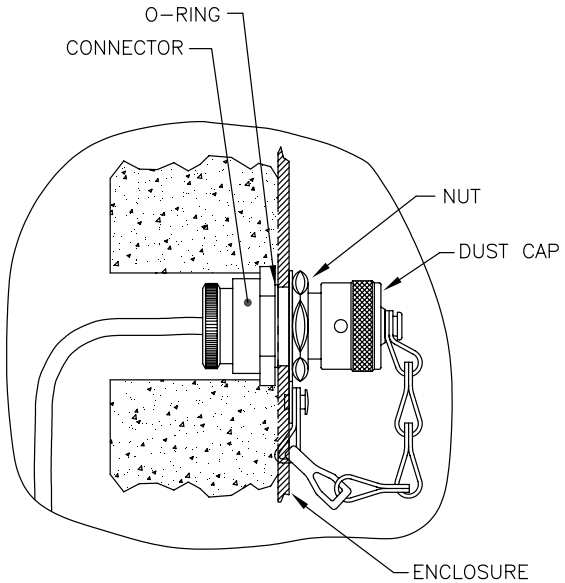

Figure 50 External PCCU Cable Option Installation

3) From the inside of the enclosure, insert connector end through PCCU hole located on the right side of the enclosure, so that connector extends to the outside of enclosure and O-Ring fits against the inside wall.
4) Re-install nut on the outside of the connector and tighten.
5) Using supplied screw, screw end of Dust Cap chain into hole located near the PCCU hole.
6) Run remainder of cable around the front interior and down along the side of the center track (see Figure 51).
7) Connect interior end of cable connector to PCCU connection located on the outside of the I.S. Barrier Box on the side of the Transmitter.

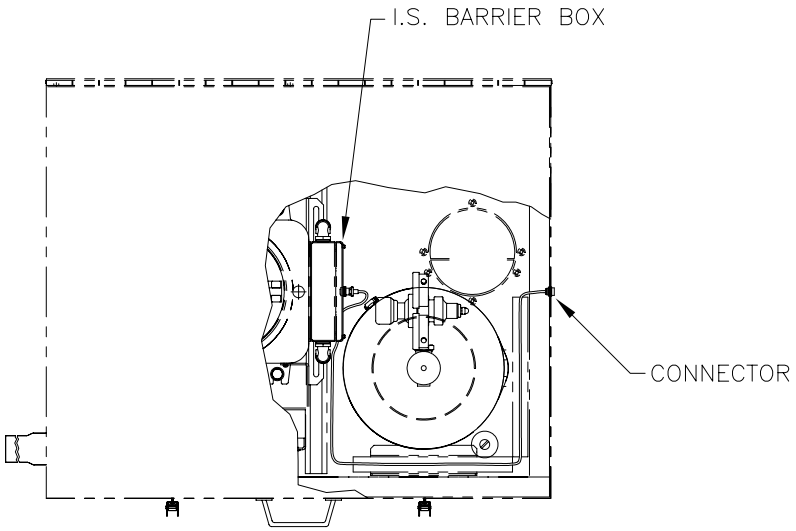

Figure 51 External PCCU Cable Option Installed

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