INSTALLATION, OPERATION, AND MAINTENANCE MANUAL
WELKER CHECKPOINT™ SAMPLE BITE VERIFICATION PANEL

DRAWING NUMBERS
AD909AA
AD909AB
AD909AC

MANUAL NUMBER
IOM-134

REVISION
Rev. A, 03/27/2023

TABLE OF CONTENTS

IMPORTANT SAFETY INFORMATION
READ ALL INSTRUCTIONS

Notes emphasize information and/or provide additional information to assist the user.

Caution messages appear before procedures that could result in damage to equipment if not observed.

Warning messages appear before procedures that could result in personal injury if not observed.

This manual is intended to be used as a basic installation and operation guide for the Welker Checkpoint™ Sample Bite Verification Panel. For comprehensive instructions, please refer to the IOM Manuals for each individual component. A list of relevant component IOM Manuals is provided in Appendix A of this manual.

The information in this manual has been carefully checked for accuracy and is intended to be used as a guide for the installation, operation, and maintenance of the Welker equipment described in this manual. Correct installation and operation, however, are the responsibility of the end user. Welker reserves the right to make changes to this manual and all products in order to improve performance and reliability.

BEFORE YOU BEGIN

Read these instructions completely and carefully.

IMPORTANT – Save these instructions for local inspector's use.

IMPORTANT – Observe all governing codes and ordinances.

Note to Installer – Leave these instructions with the end user.

Note to End User – Keep these instructions for future reference.

Installation of this Checkpoint™ Sample Bite Verification Panel is of a mechanical and electrical nature.

Proper installation is the responsibility of the installer. Product failure due to improper installation is not covered under the warranty.

If you received a damaged Checkpoint™ Sample Bite Verification Panel, please contact a Welker representative immediately.

Phone: 281.491.2331
Address: 13839 West Bellfort Street
Sugar Land, TX 77498

SECTION 1: PRODUCT INFORMATION

1.1 Introduction

We appreciate your business and your choice of Welker products. The installation, operation, and maintenance liability for this equipment becomes that of the purchaser at the time of receipt. Reading the applicable *Installation, Operation, and Maintenance* (IOM) *Manuals* prior to installation and operation of this equipment is required for a full understanding of its application and performance prior to use.*

If you have any questions, please call Welker at 1-281-491-2331.

**The following procedures have been written for use with standard Welker parts and equipment. Assemblies that have been modified may have additional requirements and specifications that are not listed in this manual.*

1.2 Product Description

The Welker *Checkpoint*™ Sample Bite Verification Panel is designed to be incorporated into a liquid sampling system for use as a volume verification method and system safety device.

The operator manually directs product flow from the sampler to the Checkpoint™ in order to collect a sample bite from the outlet. Once the sample bite has been collected, the operator manually redirects flow to the sample container, allowing normal operation to continue after minimal interruption. The collected sample volume is quantified to verify that the actual sample volume equals the desired sample volume, thus ensuring the representativeness of the sample. When used as a diagnostic tool, the Checkpoint™ can indicate the need for the sampler to be maintained or for the sample volume to be reset, reducing downstream troubleshooting and potential economic loss.

The Checkpoint™ is also equipped with a pressure switch and an external adjustable relief valve to protect the sample line from overpressurization. The pressure switch will signal the PLC when the sample line is overpressurized. The external adjustable relief valve is set higher than the pressure switch; in the event of continued overpressurization, this valve will relieve, thereby protecting the sample system.

For this manual, the term "Programmable Logic Controller" (PLC) will refer to the PLC, DCS, or other signal control used by the customer.

Welker may custom design the Checkpoint™ to suit the particular application and specifications of each customer.

1.3 Specifications

The specifications listed in this section are generalized for this equipment. Welker can modify the equipment according to your company's needs. **Please note that the specifications may vary depending on the customization of your equipment.**

Table 1: Checkpoint™ Specifications	
Products Sampled	Liquids Compatible With the Materials of Construction
Materials of Construction	316/316L Stainless Steel, Ethylene Propylene, Neoprene, and PTFE Others Available
Maximum Allowable Operating Pressure	2500 psig @ -10 °F to 120 °F (*172 barg @ -23 °C to 48 °C*) Others Available
Connections	**Pressure Switch Test Port and Safety Relief Test Port:** ¼" FNPT **Safety Relief Outlet:** ¼" Tubing **Sample Bite Verification Outlet, Sample Inlet, and Sample Outlet:** ¼" Tubing
Electrical Connections	DC 30 V DC 125 V AC 250 V
Panel Dimensions	16" x 20" (Width x Height)
Features	Pressure Switch Quick-Connects Two (2) Block and Bleed Valves
Electrical Area Classification	NEC Class I, Div. 1, Groups C&D, T3
Options	Panel Configuration Panel Material Relief Valves

1.4 Equipment Diagrams

Figure 1: Checkpoint™ Connections Diagram – Right Inlet

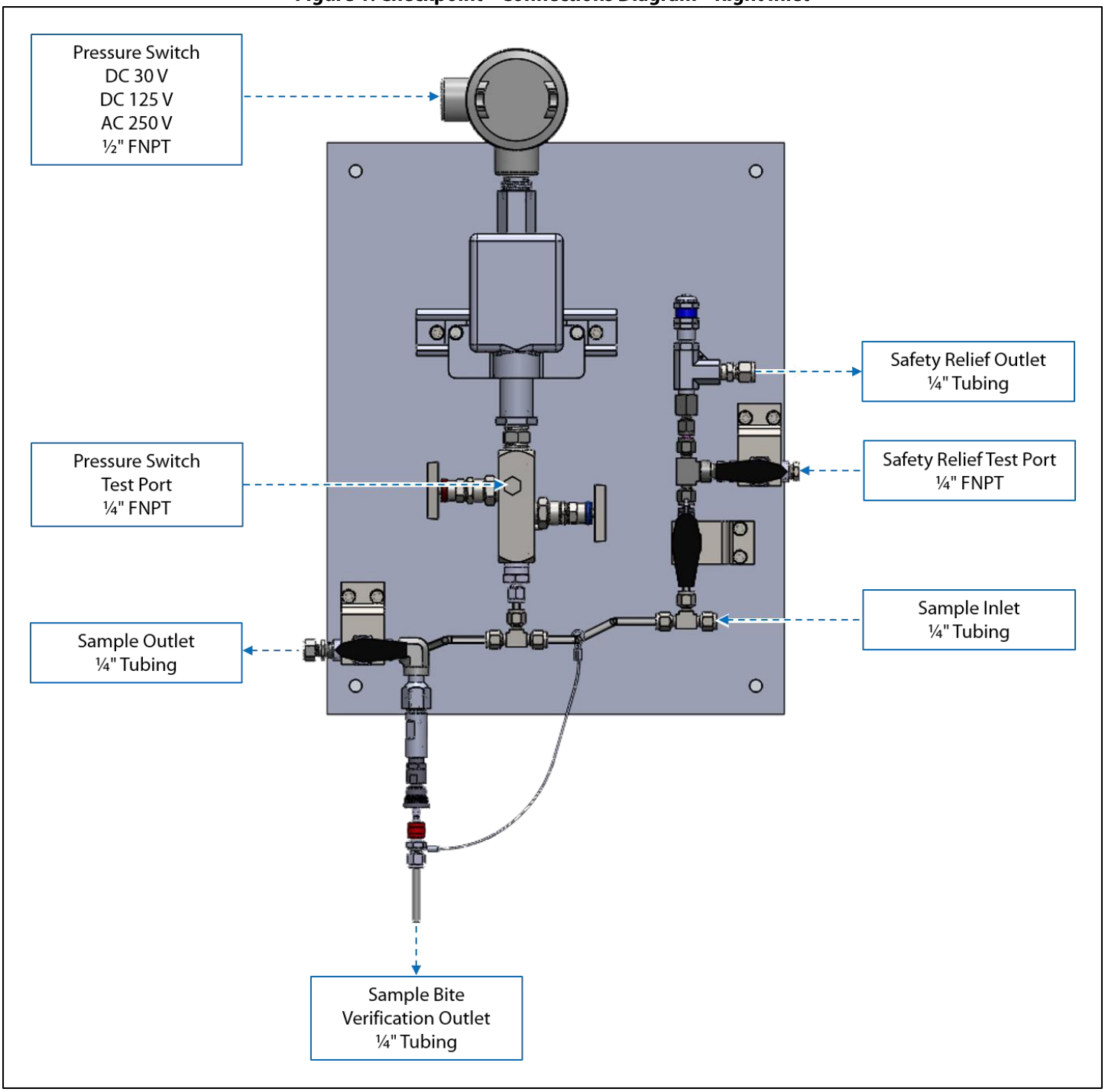


Figure 2: Checkpoint™ Connections Diagram – Left Inlet

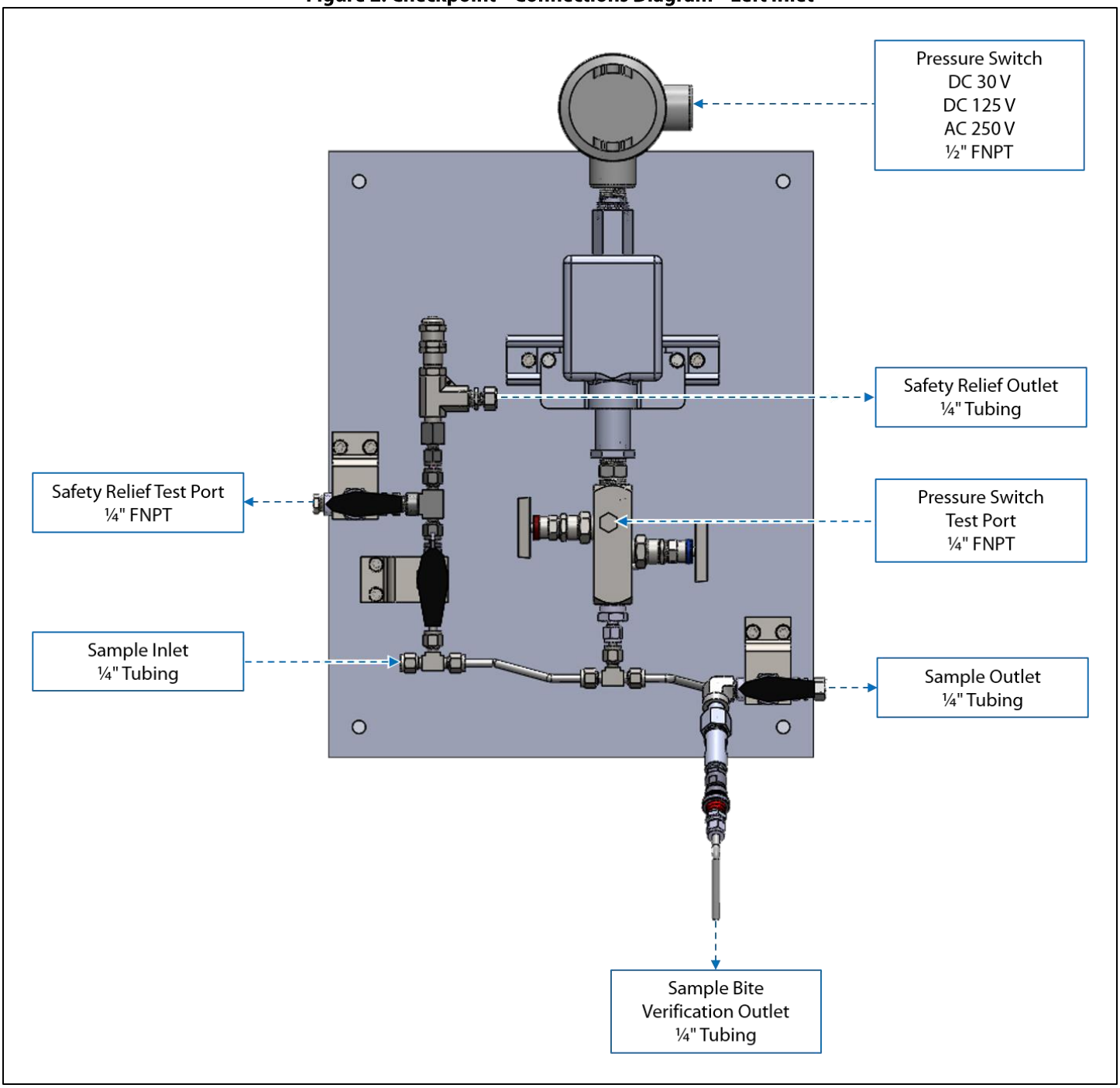
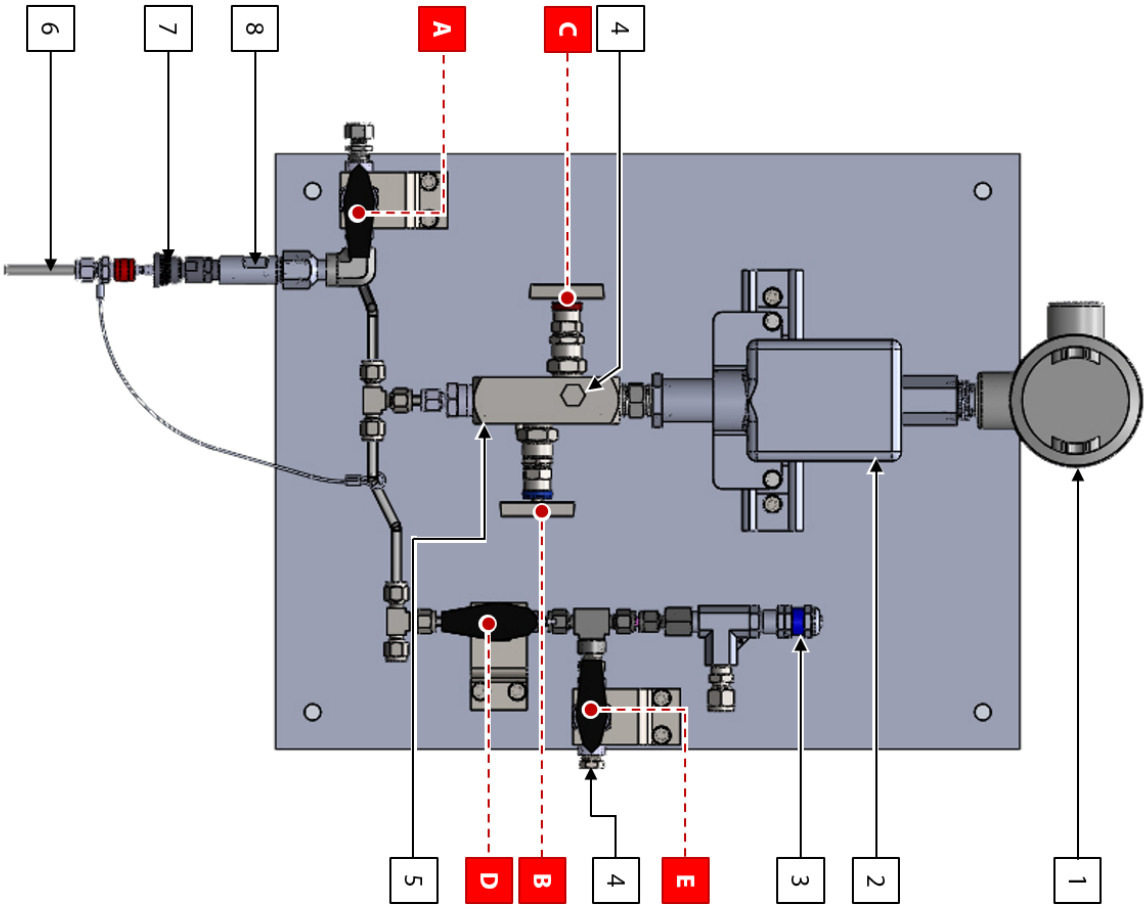
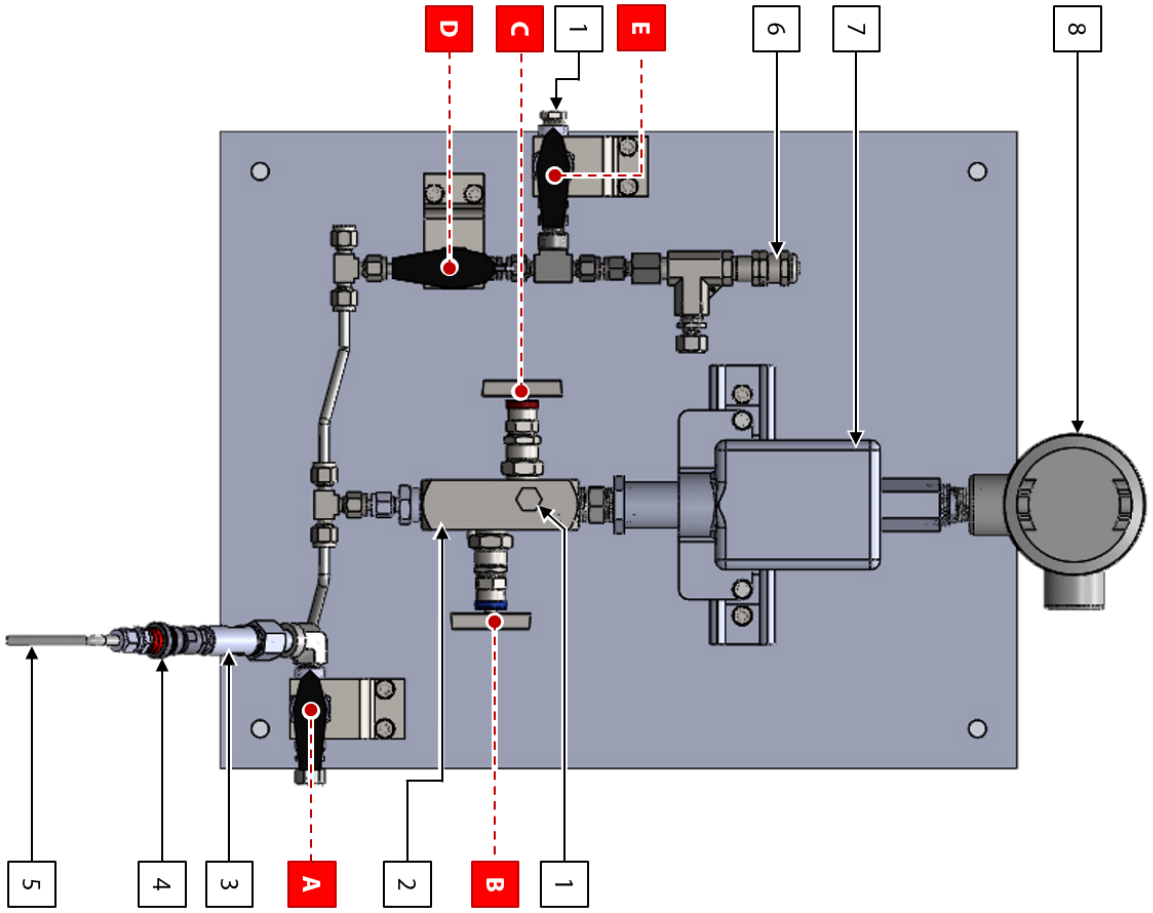


Figure 3: Checkpoint™ Diagram – Right Inlet



No.	Description
1	Terminal Housing
2	Pressure Switch
3	External Adjustable Relief Valve
4	Vent/Test Port (Shown Plugged)
5	Pressure Switch Calibration Manifold
6	Quick-Connect Stem and Tubing With Connecting Wire
7	Quick-Connect Body
8	Check Valve
A	Sample Bite Verification Outlet Valve
B	Pressure Switch Isolation Valve (Blue Dust Cap)
C	Pressure Switch Vent/Test Port Valve (Red Dust Cap)
D	External Adjustable Safety Relief Isolation Valve
E	External Adjustable Safety Relief Vent/Test Port Valve

Figure 4: Checkpoint™ Diagram – Left Inlet



No.	Description
1	Vent/Test Port (Shown Plugged)
2	Pressure Switch Calibration Manifold
3	Check Valve
4	Quick-Connect Body
5	Quick-Connect Stem and Tubing With Connecting Wire
6	External Adjustable Relief Valve
7	Pressure Switch
8	Terminal Housing
A	Sample Bite Verification Outlet Valve
B	Pressure Switch Isolation Valve (Blue Dust Cap)
C	Pressure Switch Vent/Test Port Valve (Red Dust Cap)
D	External Adjustable Safety Relief Isolation Valve
E	External Adjustable Safety Relief Vent/Test Port Valve

SECTION 2: INSTALLATION & OPERATION

2.1 Before You Begin

After unpacking the unit, check the equipment for compliance and any damage that may have occurred during shipment. Immediately contact a Welker representative if you received damaged equipment.

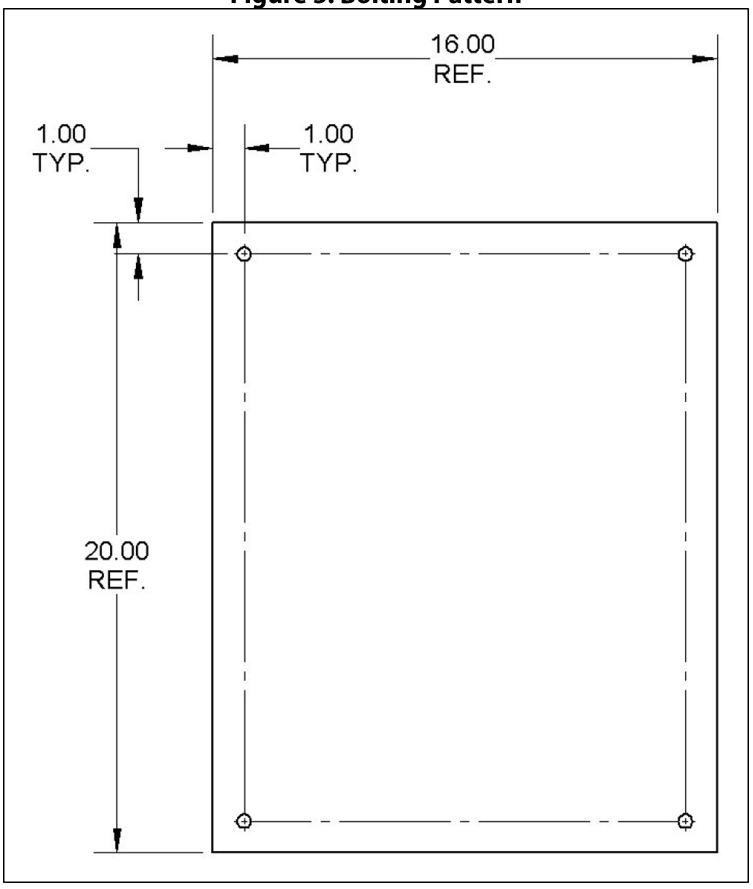
When sealing fittings with PTFE tape, refer to the proper sealing instructions for the brand used.

The Welker Checkpoint™ Sample Bite Verification Panel will ship panel-mounted and "hard tube"-connected with manufacturer-supplied fittings and hardware. However, the customer will need to supply some tubing and fittings in order to complete the installation of the system.

2.2 Installation

1. Mount the Checkpoint™ Sample Bite Verification Panel according to the bolting pattern as close to the customer sampling system as possible (*Figure 5*).

Figure 5: Bolting Pattern



2. Using appropriately sized customer-supplied tubing, connect from the sampler outlet to the sample inlet on the panel (*Figure 1* or *Figure 2*).

3. Using appropriately sized customer-supplied tubing, connect from the sample outlet on the panel to the sample container (*Figure 1* or *Figure 2*).

> Customer-supplied tubing must slope downward from the sampler to the sample container to ensure that all product and sediment flow to the sample container.

4. Connect an appropriate power supply to the terminal housing on the panel. Refer to the *Installation, Operation, and Maintenance* (IOM) *Manual* for the pressure switch for the lead color coding.

> All electrical connections must meet local and national electric codes, and excessive weight added to the conduit run must be supported.

5. Adjust the pressure switch to approximately 50 psig above the maximum allowable operating pressure of the pipeline (*Figure 3* or *Figure 4*). Refer to the *Installation, Operation, and Maintenance* (IOM) *Manual* for the pressure switch for instructions on setting the pressure switch.

> The pressure switch will signal the PLC when the system is overpressurized.

> Welker can pre-set the pressure switch if requested at the time of order.

6. Adjust the external adjustable relief valve to approximately 75 psig above the maximum allowable operating pressure of the pipeline (*Figure 3* or *Figure 4*). Refer to the *Installation, Operation, and Maintenance* (IOM) *Manual* for the external adjustable relief valve for instructions on setting the relief.

> As a system safety device, the external adjustable relief valve ensures that the system does not exceed maximum allowable operating pressure.

> Welker can pre-set the external adjustable relief valve if requested at the time of order.

2.3 Sample Bite Verification

1. Manually turn the handle on sample bite verification outlet valve A so that the arrow on the handle points toward the sample bite verification outlet (*Figure 3* or *Figure 4*).
2. Decide how many actuations will be made to verify the sample volume.

> Welker recommends a minimum of ten (10) actuations to verify the sample volume.

3. Grasp the quick-connect stem and tubing with connecting wire attached to the panel, and then install it to the quick-connect body (*Figure 3* or *Figure 4*). The quick-connect will audibly click into place.
4. Ensure that the sampler is ON, and then actuate the sampler.

> Several actuations may be necessary to fill the line with sample.

5. Hold an atmospheric container under the sample bite verification outlet to collect sample as it drips from the sample bite verification outlet.
6. Once sample begins to consistently pulse, replace the atmospheric container being held under the sample bite verification outlet with a graduated beaker.
7. Capture sample in the graduated beaker until the pre-determined number of actuations has been made.
8. Once the pre-determined number of actuations has been made, divert sample flow from the sample bite verification outlet. Manually turn the handle on sample bite verification outlet valve A so that the arrow on the handle points toward the sample outlet (*Figure 1* & *Figure 3* or *Figure 2* & *Figure 4*).

> Sample bite verification outlet valve A must remain open to the sampling system during sampling, purging, and flushing.

9. Disconnect the quick-connect stem and tubing with connecting wire from the quick-connect body (*Figure 3* or *Figure 4*).
10. Divide the volume of sample collected in the graduated beaker by the number of actuations made to determine the sample volume.
11. As necessary, adjust the sample volume on the sampler. Refer to the *Installation, Operation, and Maintenance* (IOM) *Manual* for the sampler for instructions on adjusting the sample volume.

SECTION 3: MAINTENANCE

3.1 Before You Begin

1. **Welker recommends that the unit have standard yearly maintenance.** Based on the operating conditions and/or site requirements, adjustments to the maintenance schedule may be necessary.
2. Prior to maintenance or disassembly of the unit, it is advisable to have a repair kit available for repairs of the system in case of unexpected wear or faulty seals.

New seals supplied in spare parts kits should be lightly lubricated before being installed to ease the installation of the seals and reduce the risk of damage when positioning them on parts. Wipe excess lubricant from the seals, as it may adversely affect analytical instrument results.

For sample-exposed seals, Welker recommends non-hydrocarbon-based lubricants, such as Krytox®.
For non-sample-exposed seals, Welker recommends either non-hydrocarbon-based lubricants or silicone-based lubricants, such as Molykote® 111.

3. All maintenance and cleaning of the unit should be performed on a smooth, clean surface.
4. Welker recommends having the following tools available for maintenance. Please note that the exact tools required may vary by model.
    a. Adjustable Wrench (Qty. 2)
    b. Flat Head Screwdriver
    c. Phillips Head Screwdriver
    d. Tubing Crimp and Accessories

3.2 Maintenance

1. During sampling, monitor the panel for leaks. If leaks are present, halt sampling and repair as necessary.
2. Occasionally, a panel component may need to be repaired or removed for manufacturer's recommended maintenance and/or for recalibration. To perform maintenance and/or recalibration on components:
    a. Depressurize the panel and close all valves.
    b. Turn OFF all electrical power to the panel.
    c. Drain the contents of the panel to the sample container.
    d. Disconnect the tubing and remove individual components for maintenance.
    e. For complete and proper maintenance on individual panel components, refer to their respective *Installation, Operation, and Maintenance* (IOM) *Manual*. A list of component *Installation, Operation, and Maintenance* (IOM) *Manuals* is available in *Appendix A, Referenced or Attached Documents*.
    f. For calibration of individual panel components, refer to their respective *Installation, Operation, and Maintenance* (IOM) *Manual*. A list of component *Installation, Operation, and Maintenance* (IOM) *Manuals* is available in *Appendix A, Referenced or Attached Documents.*
    g. After performing necessary maintenance on and calibration of component parts, reconnect all instrument tubing.
    h. Install the panel according to the instructions in *Section 2.2, Installation*.

Check valves for leaks and repair as necessary during reinstallation.

3.3 Calibration

Sampling can continue while calibration procedures are performed.

Refer to the company's calibration schedule to determine how frequently the pressure switch and external adjustable relief valve should be calibrated.

Pressure Switch

1. Close pressure switch isolation valve B and pressure switch vent/test port valve C (*Figure 3* or *Figure 4*).

Pressure switch isolation valve B has a blue dust cap below the valve handle.

Pressure switch vent/test port valve C has a red dust cap below the valve handle.

2. Remove the plug from the vent/test port on the pressure switch calibration manifold to vent any trapped pressure (*Figure 3* or *Figure 4*).
3. Open pressure switch vent/test port valve C to vent any trapped product (*Figure 3* or *Figure 4*).
4. Connect a customer-supplied inert gas supply to the vent/test port (*Figure 3* or *Figure 4*).
5. Regulate the inert gas supply to the factory-recommended pressure provided on the tag. When the calibration pressure has reached the factory-recommended pressure, the pressure switch will signal the PLC to prevent overpressurization.

If the PLC signals at a pressure other than the factory-recommended pressure, adjust the pressure switch accordingly. Refer to the Installation, Operation, and Maintenance (IOM) Manual for the pressure switch for instructions on adjusting the pressure switch.

6. After the pressure switch has been calibrated, disconnect the customer-supplied inert gas supply from the vent/test port, and then return the plug to the port (*Figure 3* or *Figure 4*).
7. Open pressure switch isolation valve B and pressure switch vent/test port valve C to resume normal operation.

External Adjustable Relief Valve

8. Close external adjustable safety relief isolation valve D and external adjustable safety relief vent/test port valve E (*Figure 3* or *Figure 4*).
9. Remove the plug from the vent/test port to vent any trapped pressure (*Figure 3* or *Figure 4*).
10. Open external adjustable safety relief valve vent/test port valve E to vent any trapped product (*Figure 3* or *Figure 4*).
11. Connect a customer-supplied inert gas supply to the vent/test port (*Figure 3* or *Figure 4*).
12. Regulate the inert gas supply to the factory-recommended pressure provided on the tag.
13. Remove the ¼" tubing from the safety relief outlet. When the calibration pressure has reached the factory-recommended pressure, the relief will crack, and the release of the inert gas from the safety relief outlet will be audible.
14. After the external adjustable safety relief valve has been calibrated, disconnect the customer-supplied inert gas supply from the vent/test port, and then return the plug to the port (*Figure 3* or *Figure 4*).
15. Open external adjustable safety relief isolation valve D and external adjustable safety relief vent/test port valve E to resume normal operation (*Figure 3* or *Figure 4*).

3.4 Troubleshooting

Table 2: Checkpoint™ Troubleshooting		
Issues	**Possible Causes**	**Solutions**
No sample is emerging from the sample bite verification outlet.	Sample bite verification outlet valve A is closed to the sampling system.	Manually turn the handle on sample bite verification outlet valve A so that the arrow on the handle points toward the sample bite verification outlet.
	The quick-connect stem and tubing with connecting wire has not been installed to the quick-connect body.	Grasp the quick-connect stem and tubing with connecting wire, and then install it to the quick-connect body. The quick-connect should audibly click into place.
	The sampler is not operating correctly.	Refer to the *Installation, Operation, and Maintenance* (IOM) *Manual* for the sampler for troubleshooting and maintenance instructions.
The verified sample volume is not the same as the desired sample volume.	The sampler is not collecting the correct sample volume.	Adjust the sample volume of the sampler. Refer to the *Installation, Operation, and Maintenance* (IOM) *Manual* for the sampler for instructions on adjusting the sample volume.
The pressure switch is signaling the PLC at a pressure other than the factory-recommended pressure.	The pressure switch has been miscalibrated, or it is time to recalibrate the pressure switch.	See *Section 3.3, Calibration*, for instructions on calibrating the pressure switch.
The external adjustable safety relief valve is relieving before the pressure switch signals the PLC.	The external adjustable safety relief valve may be miscalibrated, or the pressure switch may be miscalibrated.	See Section 3.3, Calibration, for instructions on calibrating the external adjustable safety relief valve and the pressure switch.
The pressure switch and/or external adjustable relief are not operating.	The pressure switch and/or external adjustable relief isolation valves are closed.	Open pressure switch isolation valve B and/or external adjustable safety relief isolation valve D (*Figure 3* or *Figure 4*).

APPENDIX A: REFERENCED OR ATTACHED DOCUMENTS

Welker *Installation, Operation, and Maintenance* (IOM) *Manuals* suggested for use with this unit:

- IOM-047: Welker inFlow™ Crude Oil Sampler Fixed Insertion
- IOM-052: Welker inFlow™ Crude Oil Sampler Manual Insertion
- IOM-053: Welker inFlow™ Crude Oil Sampler With AI Control™
- IOM-068: Welker AWL-3 Crude Oil Collection Assembly
- IOM-085: Welker LSS-1 Sampler With Morgan Timer
- IOM-116: Welker AWL-3HP Crude Oil Collection Assembly High Pressure
- IOM-117: Welker TCC-1 Transportable Crude Oil Container
- IOM-135: Welker Essentials™ Crude Oil Sampler
- IOM-165: Welker Plug & Purge™ Automatic Purging System
- IOM-178: Welker inFlow™ ACE Crude Oil Sampler Fixed Insertion
- IOM-186: Welker TCC Optimum™ Transportable Crude Oil Container
- IOM-189: Welker inFlow™ ACE Crude Oil Sampler Manual Insertion
- IOM-197: Welker TCC-5 Transportable Crude Oil Container
- IOM-206: Welker TCC-2 Transportable Crude Oil Container
- IOM-207: Welker TCC-3 Transportable Crude Oil Container
- IOM-208: Welker TCC-10 Transportable Crude Oil Container

Other *Installation, Operation, and Maintenance* (IOM) *Manuals* suggested for use with this unit:

- Ashcroft® B400 & B700 Snap Action Switches for Pressure Control (Welker IOM-V082)
- AS-Schneider E Series Valves and Manifolds (Welker IOM-V190)
- SOR Inc. Big Hermet Pressure Switches With Hermetically Sealed Electrical Switching Elements (Welker IOM-V191)
- Swagelok Company One-Piece Instrumentation Ball Valves 40G Series and 40 Series (Welker IOM-V085)
- Swagelok Company Proportional Relief Valves R Series (Welker IOM-V086)
- Swagelok Company Quick-Connects QC, QF, QM, and QTM Series (Welker IOM-V088)

Welker drawings and schematics suggested for use with this unit:

- Assembly Drawing: AD909AA (50–350 psig Relief Valve; Left Inlet)
- Assembly Drawing: AD909AB (350–750 psig Relief Valve; Right Inlet)
- Assembly Drawing: AD909AC (750–1500 psig Relief Valve; Left Inlet)

NOTES

13839 West Bellfort Street
Sugar Land, TX 77498
Phone: 281.491.2331

welker.com