



INSTALLATION, OPERATION, AND MAINTENANCE MANUAL  
WELKER® TRANSPORTABLE CRUDE OIL CONTAINER

**MODEL**  
TCC-5

**DRAWING NUMBERS**  
AD417C0  
AD557C0

**MANUAL NUMBER**  
IOM-197

**REVISION**  
Rev. 0, 12/20/2016

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## 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® Transportable Crude Oil Container, TCC-5. 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 Transportable Crude Oil Container is of a mechanical 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 Transportable Crude Oil Container, please contact a Welker® representative immediately.

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**Address:** 13839 West Belfort Street  
Sugar Land, TX 77498

### 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® TCC-5 Transportable Crude Oil Container is an atmospheric sample container designed to collect and transport stabilized liquid product.

Product level can be visually verified on site by referring to the liquid level gauge on the top of the TCC-5. Optional equipment can be added to enable remote operation: a high level switch to signal the Programmable Logic Controller (PLC) once the desired volume of sample has been collected and a magnetostrictive level indicator to communicate product level to the PLC.

The TCC-5 is designed to be installed to a Welker® MSTCC Laboratory Mixing Skid, which mixes the collected sample for basic sediment and water (BS&W) monitoring and cleans the TCC-5 after use. The internal spray bar with nozzle ensures that the walls and top of the TCC-5 are reached during mixing and cleaning. The outlet and return quick-connect stems allow the TCC-5 to be quickly installed to and disconnected from the MSTCC's flexible hoses with quick-connects.



For this manual, the term "PLC," or Programmable Logic Controller, will be used to refer to the PLC, DCS, or other signal control system used by the customer to activate and operate the solenoid.

*Welker may custom design the TCC-5 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 customizations of your equipment.**

Table 1: TCC-5 Specifications	
Applications	Collection of Products That Are Stable or Stratify at Atmospheric Conditions Transportation of Samples to Laboratory for Mixing and Analysis
Materials of Construction	316/316L Stainless Steel Container With Stainless Steel Fittings Carbon Steel Container With Carbon Steel Fittings Carbon Steel Container With Stainless Steel Fittings
Maximum Allowable Operating Pressure	136 psig @ -20 °F to 100 °F (9 barg @ -28 °C to 37 °C)
Volume	5 US Gallons (18.9 Liters)
Features	Compatible With Welker® MSTCC Laboratory Mixing Skids Portable Precision Spray Bar With Nozzle Pressure Gauge Quick-Connects Relief Valve Rounded Bottom Vacuum Breaker Visual Liquid Level Gauge ASME Code Stamped (Stainless Steel Container)
Options	High Level Switch Lid Style Magnetostrictive Level Indicator

1.4 Equipment Diagrams

Figure 1: TCC-5 With Standard Lid Diagram

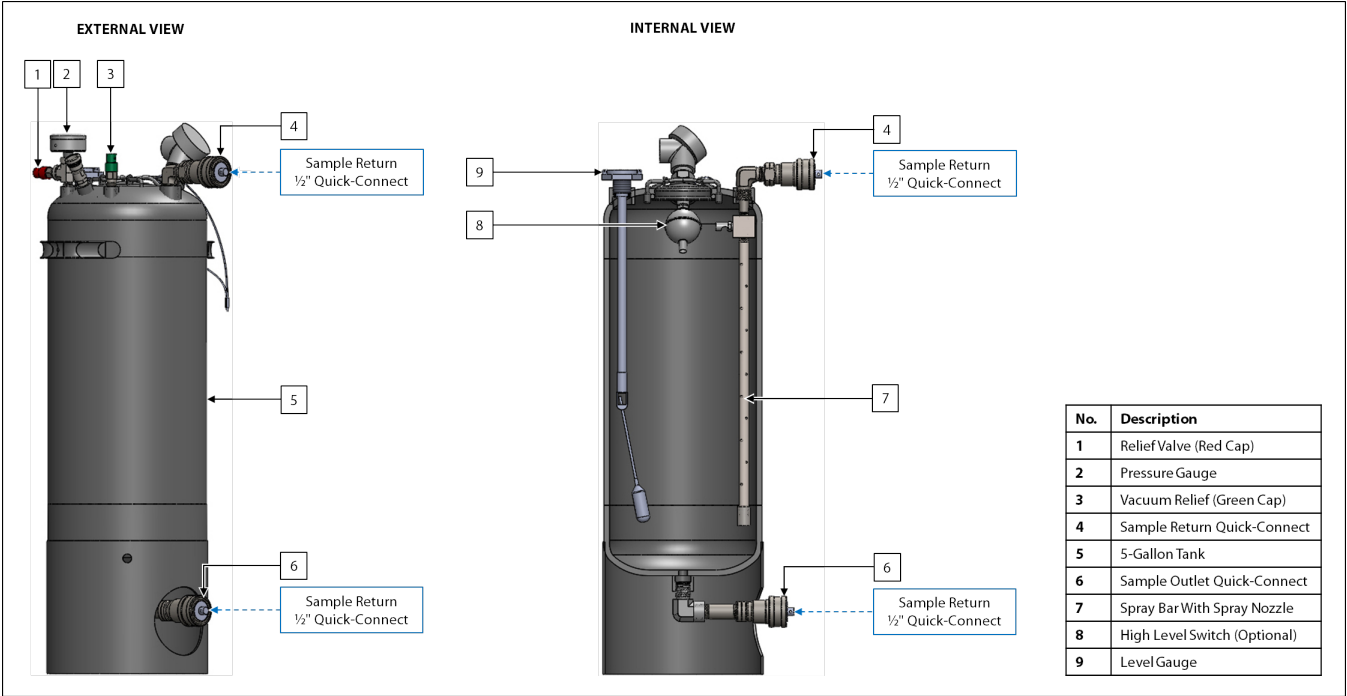
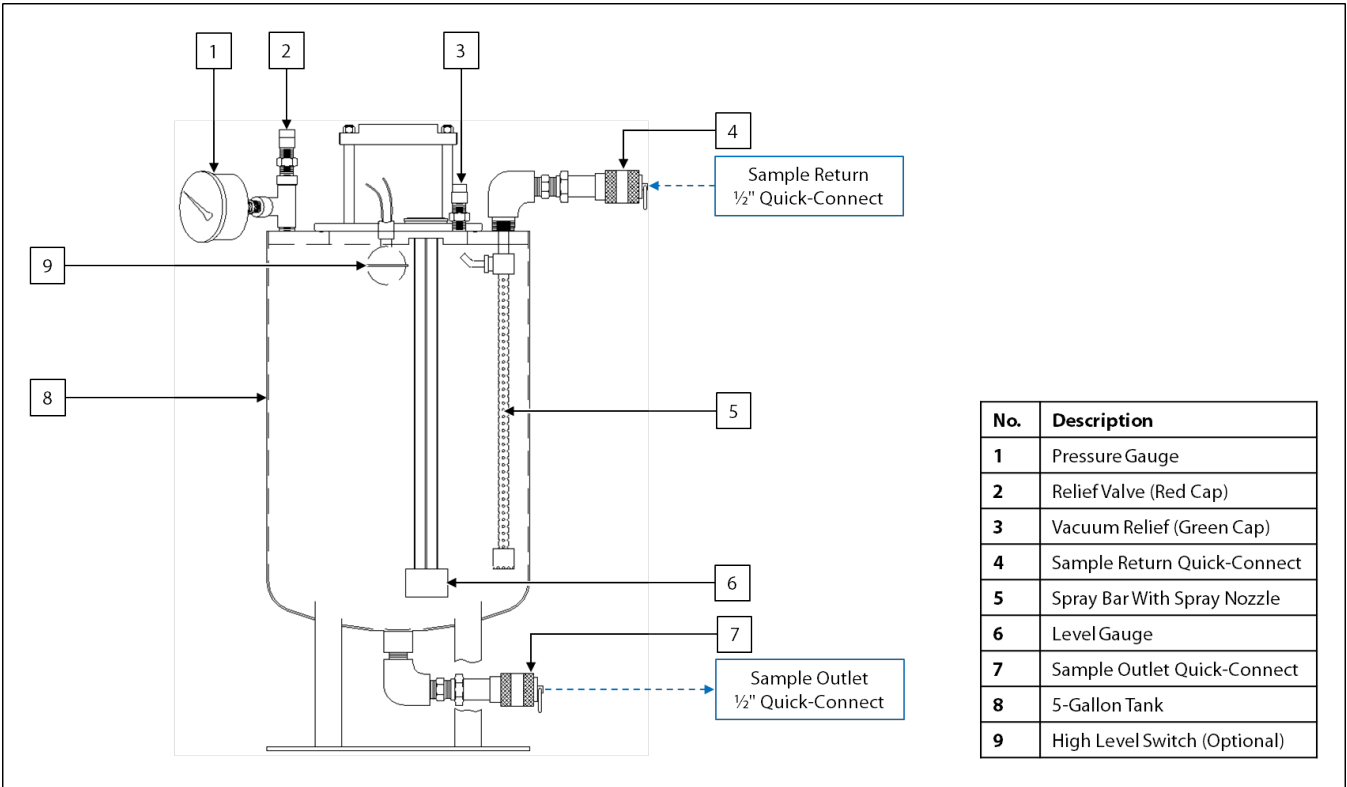
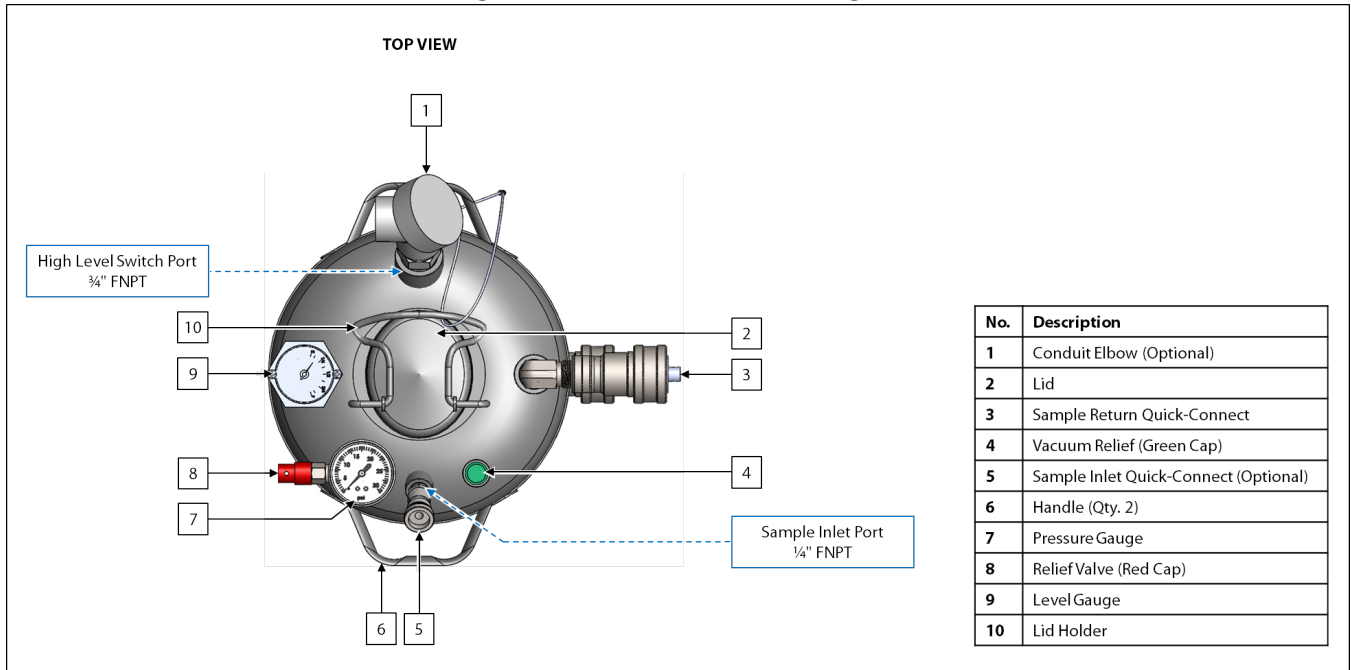


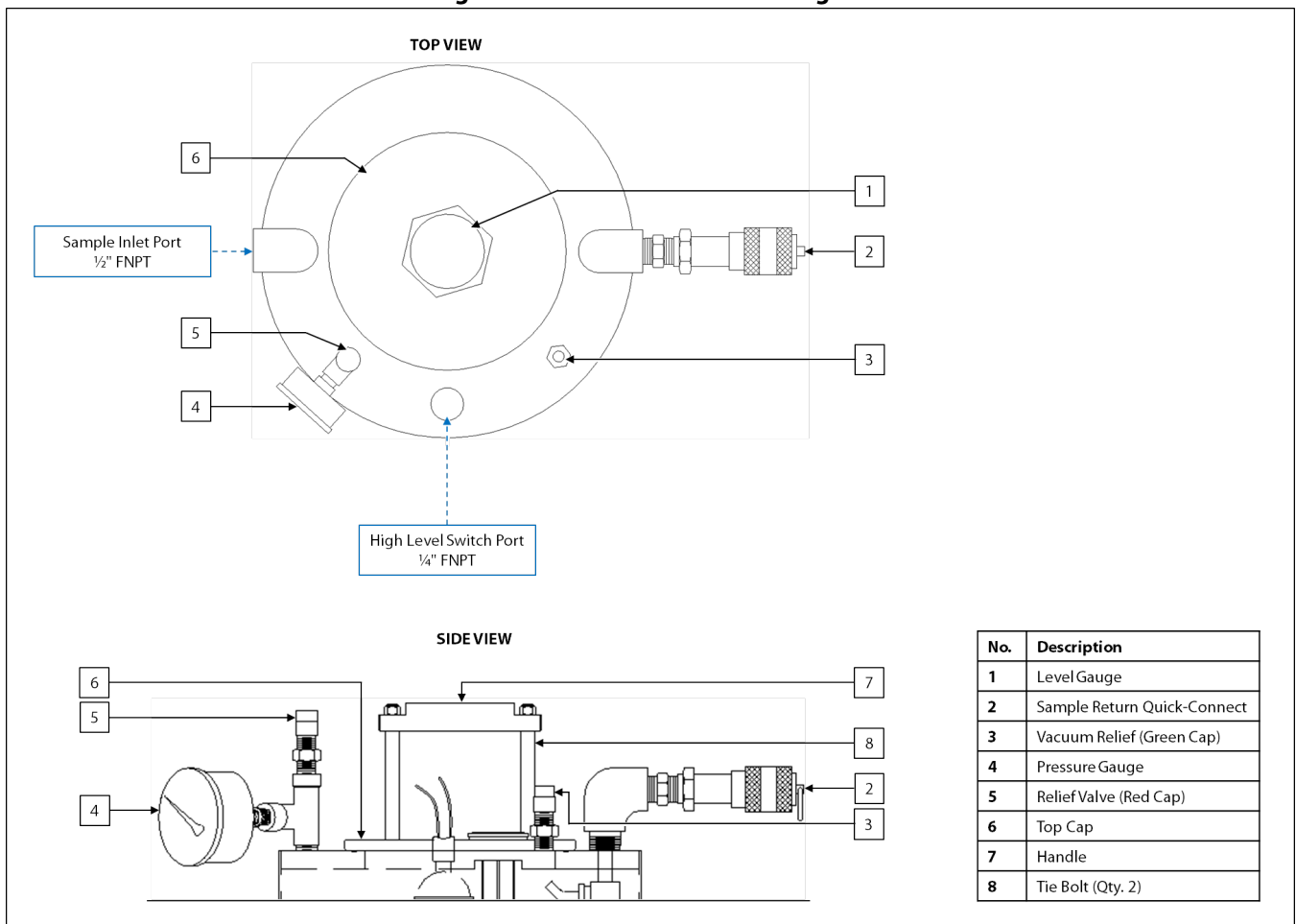
Figure 2: TCC-5 With Screw-On Lid Diagram



**Figure 3: TCC-5 Standard Lid Diagram**



**Figure 4: TCC-5 Screw-On Lid Diagram**



## 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.



These instructions are written with the assumption that a Welker® MSTCC Laboratory Mixing Skid will be used to mix the contents of the TCC. While it is possible to use the MSTCC and the TCC with equivalent third-party equipment, the MSTCC has been designed to take full advantage of the features of the TCC to provide a quality sample for basic sediment and water (BS&W) monitoring.



Ensure that the TCC is clean and free of contaminants that might affect the sample. See *Section 3.2, Cleaning the TCC-5 Without Using an MSTCC*, or refer to the *Installation, Operation, and Maintenance (IOM) Manual* for the Welker® MSTCC Laboratory Mixing Skid for instructions on properly cleaning the TCC.



2.2 Installing the TCC-5 to the Sampling System

- 1. Remove the plug from the sample inlet port on the TCC-5 (Figure 3 or Figure 4).



Welker recommends installing a quick-connect to the sample inlet port on the TCC and connecting the sampler to the TCC using a flexline with quick-connect.

- 2. Connect from the sampler outlet port to the sample inlet on the TCC-5 (Figure 3 or Figure 4). The sampler should be positioned above or level with the sample inlet on the TCC-5.

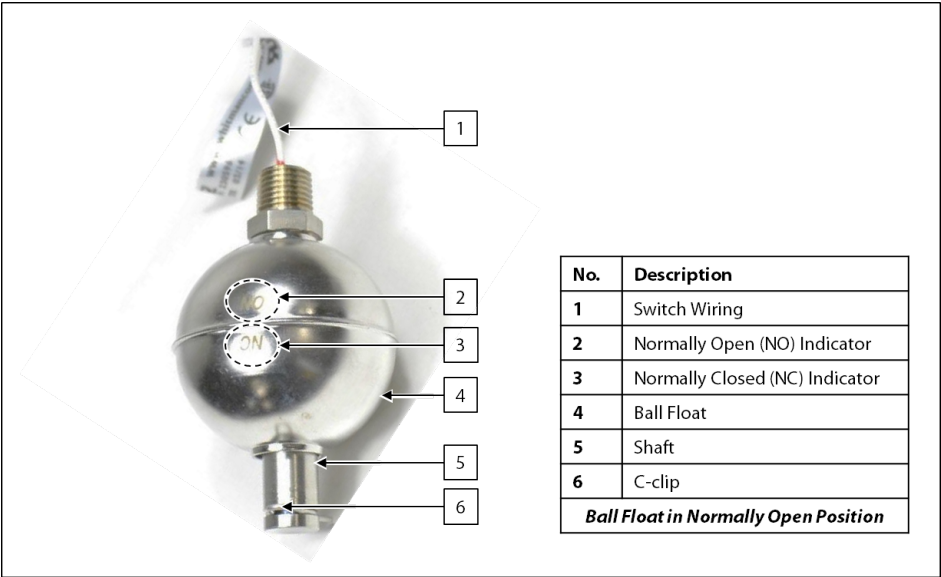


Customer-supplied tubing must slope downward from the sampler to the TCC to ensure that all of the product sampled (BS&W) flows to the TCC.

- 3. If the TCC-5 is equipped with the optional high level switch, connect the high level switch to an alarm signal, safety device, or PLC in accordance with system requirements (Figure 3 or Figure 4).
- 4. The optional high level switch comes factory-set to the normally open (NO) position. If desired, the optional high level switch may be set to the normally closed (NC) position. To set the optional high level switch to be normally closed, continue to step 5.

Setting the (Optional) High Level Switch

Figure 5: Optional High Level Switch



- 5. Open the lid of the TCC-5, and then locate the ball float.
- 6. Remove the C-clip from the shaft, and then remove the ball float from the shaft.
- 7. Reverse the orientation of the ball float so that the normally closed (NC) indicator is on top.
- 8. Return the C-clip to the shaft to secure the ball float to the shaft.

## 2.3 Closing the Lid of the TCC-5



If the lid of the TCC is not properly closed before operation, the sample may be compromised. An improperly closed lid may allow water to enter or vapors to escape the sample.



If the TCC-5 is equipped with the standard lid, continue to step 1.  
If the TCC-5 is equipped with the screw-on lid, proceed to step 4.

### **Standard Lid**

1. Lightly lubricate the O-ring on the lid. The O-ring may become brittle and crack if not covered with a thin layer of lubricant prior to use.



Welker recommends a silicone-based lubricant, such as Molykote® 111, for use with this unit.

2. Gripping the lid holder, situate the lid inside the opening of the TCC-5 (*Figure 4*).
3. Gently pull up on the lid while pushing down on the lid holder (*Figure 4*). The lid holder should close with a small amount of pressure. If you meet resistance requiring more than gentle pressure, check the alignment of the lid before proceeding, as it may need to be corrected.



Do not push down on the lid holder with excessive force or try to force the lid holder into place. Doing so may bend the prongs, the lid, or the tank itself. This will permanently ruin the lid alignment, and the tank will leak until serviced or replaced.

### **Screw-On Lid (Optional)**

4. Lightly lubricate the O-ring on the lid. The O-ring may become brittle and crack if not covered with a thin layer of lubricant prior to use.



Welker recommends a silicone-based lubricant, such as Molykote® 111, for use with this unit.

5. Align the threads of the lid with the threads at the top of the tank.
6. Turn the handle clockwise until the lid seals with the tank (*Figure 3*).

## 2.4 Mixing Operations

1. Ensure that the lid of the TCC-5 is properly closed. See *Section 2.3, Closing the Lid of the TCC-5*, for instructions on properly closing the lid of the TCC-5.



If the lid of the TCC is not properly closed before operation, the sample may be compromised. An improperly closed lid may allow water to enter or vapors to escape the sample.

2. Install the TCC-5 to a Welker® MSTCC Laboratory Mixing Skid. Refer to the *Installation, Operation, and Maintenance (IOM) Manual* for the laboratory mixing skid for instructions on installing the TCC-5 to the skid.
3. To retrieve a homogenous sample from the TCC-5, refer to the *Installation, Operation, and Maintenance (IOM) Manual* for the MSTCC for correct operating procedures.
4. Allow the contents of the TCC-5 to mix in accordance with company policy.



Never remove the lid during mixing operations, as this will cause sample to spray out of the TCC.

5. Once the contents of the TCC-5 have been thoroughly mixed, take a spot sample. Refer to the *Installation, Operation, and Maintenance (IOM) Manual* for the MSTCC for instructions.



Consult company policy for the volume of sample required for testing.

6. After extracting the required amount of sample, the TCC-5 can be cleaned using the MSTCC. Refer to the *Installation, Operation, and Maintenance (IOM) Manual* for the MSTCC for instructions on cleaning the TCC-5 while the skid is still in operation. To clean the TCC-5 without using the MSTCC, see *Section 3.2, Cleaning the TCC-5 Without Using an MSTCC*.

### 3.1 Before You Begin

1. **Welker recommends that the TCC-5 be cleaned after each use.** If the TCC-5 is stored for some time prior to use, the TCC-5 may need to be cleaned prior to being installed to a sampling system.
2. All maintenance and cleaning of the unit should be performed on a smooth, clean surface.

### 3.2 Cleaning the TCC-5 Without Using an MSTCC



The TCC may be drained and cleaned while still connected to the Welker® MSTCC Laboratory Mixing Skid. Refer to the *Installation, Operation, and Maintenance (IOM) Manual* for the MSTCC for instructions.

1. Drain the contents of the TCC-5.
2. Relieve pressure within the TCC-5.



The TCC must be depressurized before opening the lid of the TCC. Removing the lid of the TCC under pressure could cause severe injury.

3. Open the lid of the TCC-5.
4. Wipe down or flush the TCC-5 with a cleaning solvent.



Welker recommends cleaning the TCC with a quick-evaporating solvent, such as acetone. Refer to the appropriate company policy for the approved quick-evaporating solvent. Use chemical solvents safely, following all personal protective equipment (PPE) and usage directions listed on the solvent label and Material Safety Data Sheet (MSDS).

5. Carefully dry the inside of the TCC-5 with a clean, dry cloth.
6. If the cloth becomes dirty or if product is visible on the cloth when drying the TCC-5, repeat steps 4 and 5 until the cloth is clean upon removal.
7. Close the lid of the TCC-5. See *Section 2.3, Closing the Lid of the TCC-5*, for instructions on properly closing the lid of the TCC-5.
8. The cleaned TCC-5 may be installed to a sampling system. See *Section 2.2, Installing the TCC-5 to the Sampling System*, for instructions.

## APPENDIX A: REFERENCED OR ATTACHED DOCUMENTS

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

- IOM-036: Welker® MSTCC Laboratory Mixing Skid
- IOM-136: Welker® MSTCCA Laboratory Mixing Skid

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

- ABB Inc. K-TEK AT100/AT100S Magnetostrictive Level Transmitter (Welker® IOM-V308)
- Apollo Valves 76-100 Series Stainless Steel Ball Valve with Mounting Pad 1/4" - 1" (Welker® IOM-V141)
- Emerson Electric Co. Appleton® U-Line® Factory Sealed 20 Amp Plugs and Receptacles (Welker® IOM-V074)
- Lumberg Automation Mini Male Receptacle RSF 30-05/XX (Welker® IOM-V336)
- Madison Company M5600 Stainless Steel Full Size Float Level Switch Sensor (Welker® IOM-V332)
- Parker Hannifin Corporation Instrumentation Quick Coupling Products (Welker® IOM-V293)
- Rochester Gauges, Inc. Magnetic Liquid-Level Gauges for 7300 Series (Welker® IOM-V334)
- Rochester Gauges, Inc. Magnetic Liquid-Level Gauges 8600 Series (Welker® IOM-V329)
- Swagelok® Check Valves C, CA, CH, CP, and CPA Series (Welker® IOM-V076)
- Swagelok® One-Piece Instrumentation Ball Valves 40G Series and 40 Series (Welker® IOM-V085)
- Swagelok® Quick-Connects QC, QF, QM, and QTM Series (Welker® IOM-V088)
- TURCK Inc. Proximity Switch BC 5-S18-Y1X-0.2M-RS 4.21T (Welker® IOM-V331)
- Whitman Controls Corporation Vertical Mount Level Switch L60/L65 Series (Welker® IOM-V328)
- WIKA Bourdon Tube Pressure Gauges Type 232.53 and Type 233.53 (Welker® IOM-V171)

Welker® drawings and schematics suggested for use with this unit:

- Assembly Drawing: AD417CO (TCC-5 With Screw-On Lid)
- Assembly Drawing: AD557CO (TCC-5 With Standard Lid)

## NOTES

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