



INSTALLATION, OPERATION, AND MAINTENANCE MANUAL
WELKER® AUTOMATIC SENTRY

MODEL
ALD-7

DRAWING NUMBER
AD058CP.2

MANUAL NUMBER
IOM-008

REVISION
Rev. C, 02/05/2024

TABLE OF CONTENTS

	SAFETY	3
1.	PRODUCT INFORMATION	4
1.1	Introduction	4
1.2	Product Description	4
1.3	Specifications	5
1.4	Equipment Diagrams	6
2.	INSTALLATION & OPERATION	10
2.1	Before You Begin	10
2.2	Useful Information	10
2.3	Installation Instructions	11
2.4	Removal Instructions	11
3.	MAINTENANCE	12
3.1	Before You Begin	12
3.2	Maintenance	12
3.3	Float Assembly Maintenance	13
3.4	Coalescer Assembly Maintenance	13
3.5	LE-2 Assembly Maintenance	13
3.6	Valve Replacement Maintenance	13
3.7	Troubleshooting Guidelines	14
	APPENDIX	15
	Referenced or Attached Documents	15

SAFETY

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® Automatic Sentry, ALD-7. 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 Welker® Automatic Sentry – ALD-7 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 Welker® Automatic Sentry – ALD-7, 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 might have additional requirements and specifications that are not listed in this manual.*

1.2 Product Description

The Welker® ALD-7 Automatic Sentry is an automatic liquid dump device. The Sentry has been designed for use in systems where it is desirable to remove excess liquids from a wet gas stream.

The Welker® Automatic Sentry provides operators with the means to coalesce and automatically dump free liquids from an instrument air or gas supply. The Sentry's **coalescer** provides coarse filtration of the supply, while the Liquid Eliminator (LE-2) provides fine filtration of the supply.

The unit should always be mounted vertically because the high-density polyethylene float is attached to a pivot valve arm that only operates correctly when the assembly is vertical.

Welker® recommends locating a Sentry installation in a straight section of inlet piping before and below the instrumentation it supplies. This unit provides a ¼" FNPT optional port that gives operators the means of adding an Instrument Regulator. This unit also provides a ¾" NPT optional port that provides operators with the means of adding a High-Level Switch that would alarm if the unit were not working properly.

Welker® might custom design the ALD-7 Automatic Sentry 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 might vary depending on the customization of your equipment.

Table 1: ALD-7 Automatic Sentry Specifications

Products Sampled	Natural Gas or Other Gaseous Fluids Compatible With the Materials of Construction
Materials of Construction	316/316L Stainless Steel, Buna-N, and FKM
Maximum Allowable Operating Pressure	2160 psig @ -20 °F to 120 °F (149 barg @ -28.8 °C to 48.8 °C)
Temperature Range	0 °F to 120 °F (-28.8 °C to 48.8 °C)
Connections	½" FNPT Inlet Connection ¼" FNPT Outlet Connections (Qty = 2)
Filter Media	Copolymer Filter Element / Cartridge Assembly (in the LE-2)
Mounting	Mounting Bracket
Weight	Approx. 101 lb
Dimensions	25½" x 7" x 15" (Length x Width x Height)
Features	LE-2 Coalescer Shed Plate Float With Downcomer
Electrical Area Classification	Can Be Used in Hazardous Areas
Options	¾" NPT or 2" NPT Port for Adding a High-Level Switch Hydrostatic Test at 1.5 MAOP For Up to 15 Minutes With Certificate NACE Certification Instrument Regulator Gas Sampler Stainless Steel Tag

1.4 Equipment Diagrams

Figure 1: Welker® ALD-7 Automatic Sentry Diagram

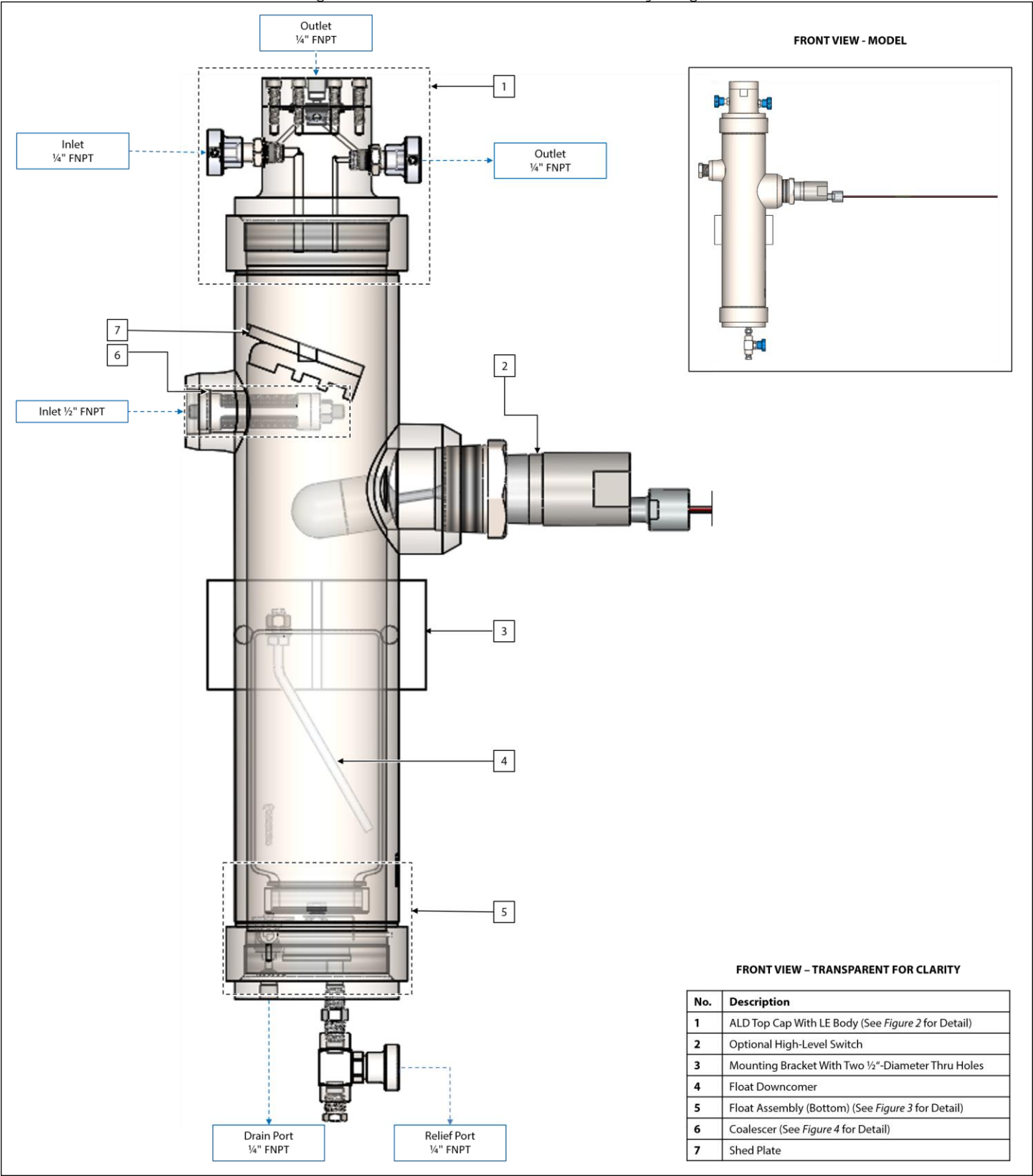
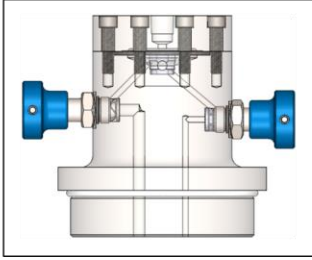


Figure 2: Welker® ALD-7 Automatic Sentry Diagram – Top Cap With LE Body

MODEL, TRANSPARENT FOR CLARITY



No.	Description
1	LE-2 Cap
2	Filter Cartridge Assembly
3	O-Ring
4	Thread Insert
5	Liquid Drain to Valve A
6	O-Ring
7	ALD Body
8	ALD Top Cap With LE Body
9	Outlet Conduit From Valve B
10	Outlet ¼" FNPT
A	Liquid Purge (Needle Valve 1)
B	Liquid Inlet (Needle Valve 2)

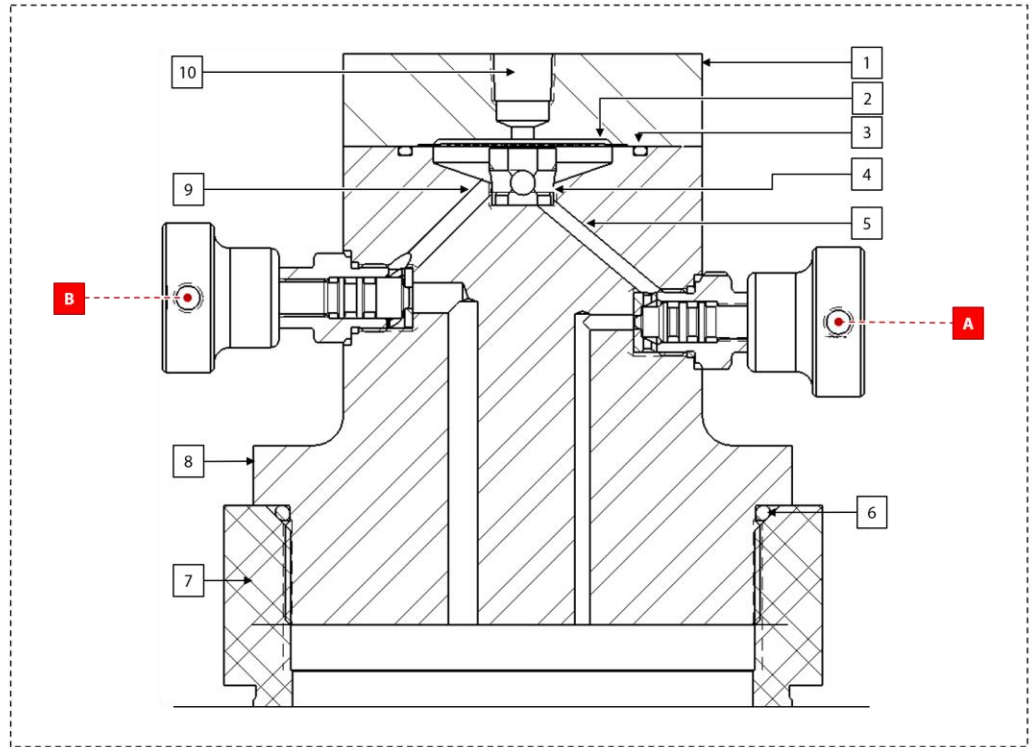
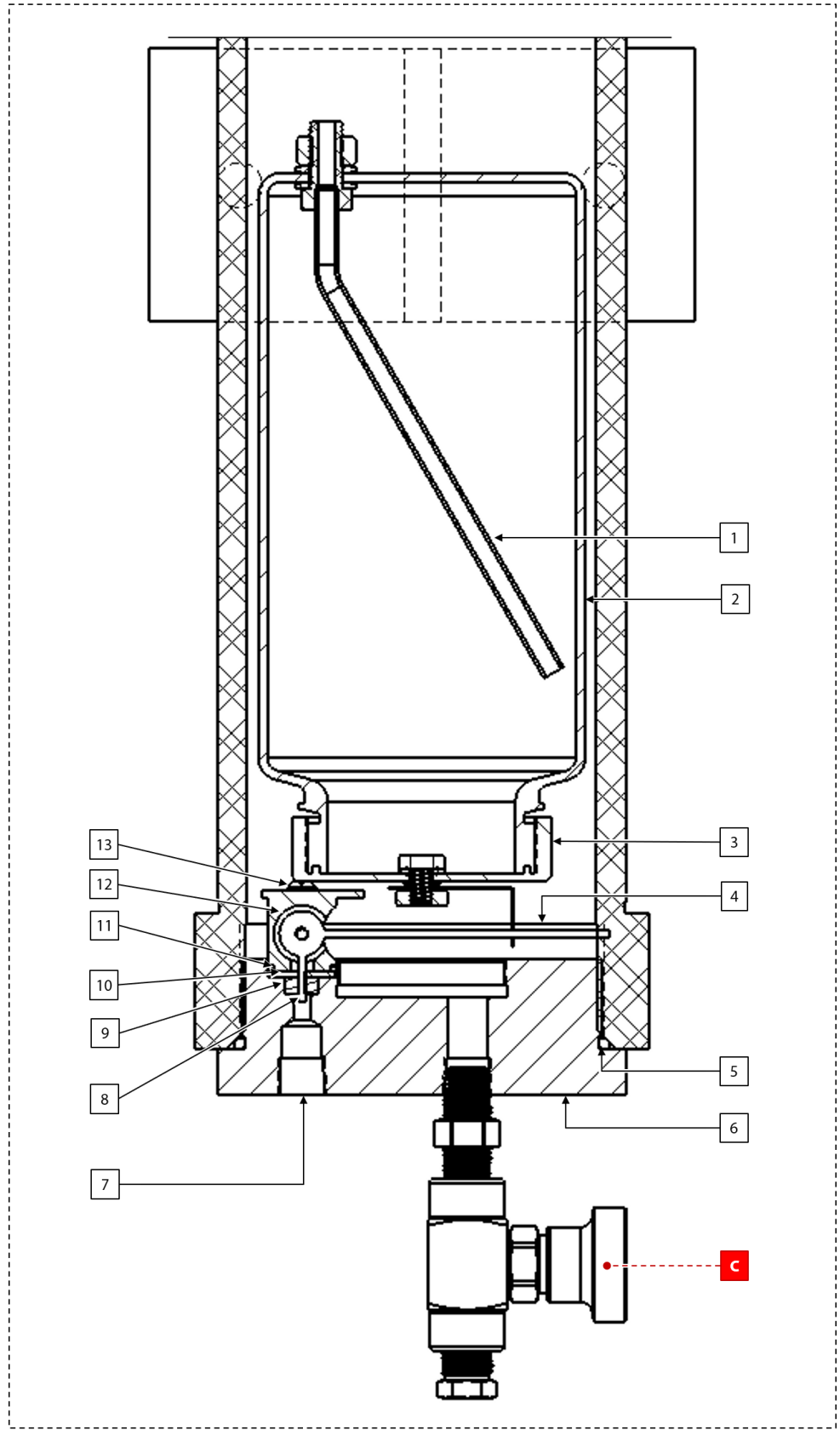
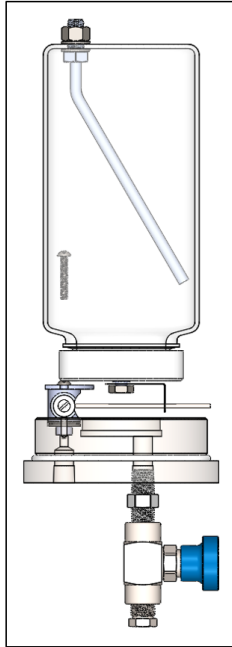


Figure 3: Welker® ALD-7 Automatic Sentry Diagram – Float Assembly

MODEL – TRANSPARENT FOR CLARITY



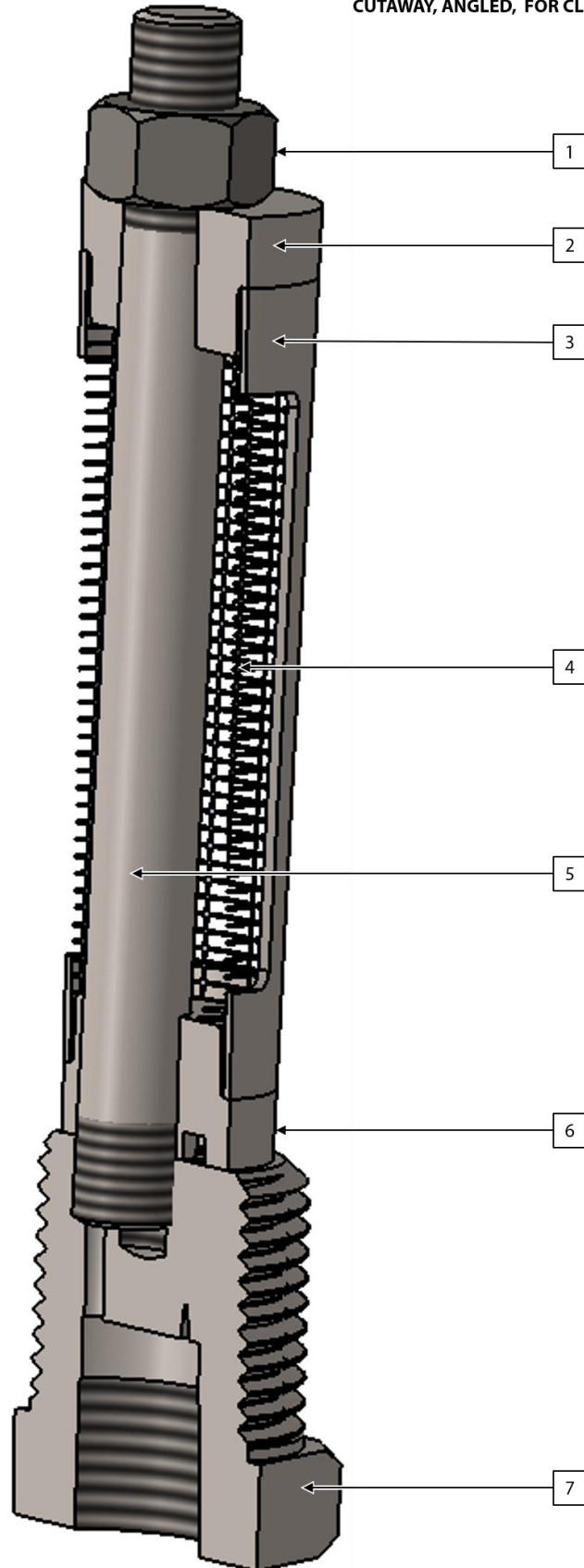
No.	Description
1	Float Downcomer
2	Float
3	Float SA
4	Pivot Arm
5	O-Ring
6	ALD Base
7	Automatic Drain Port
8	Pivot Short Arm
9	Spacer
10	Gasket
11	O-Ring
12	Pivot Valve Assembly
13	Machine Screw (Qty = 2)
C	Manual Drain Valve

Figure 4: Welker® ALD-7 Automatic Sentry Diagram – Coalescer

MODEL, PARTIALLY TRANSPARENT
FOR CLARITY



CUTAWAY, ANGLED, FOR CLARITY



No.	Description
1	Hex Nut
2	Coalescer Bottom End Cap
3	Shroud
4	Filter Element
5	Tie Bolt
6	Coalescer Top Cap
7	Coalescer Inlet Reducer

SECTION 2: INSTALLATION & OPERATION

2.1 Before You Begin



After unpacking the unit, check the equipment for compliance and any damage that might 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.

2.2 Useful Information



The Sentry must always be mounted in a vertical position so the float will work correctly.



Always test the unit prior to installation (see *Section 2.3*) to ensure the Sentry is dumping correctly.



When maintenance is required on the float and associated assemblies in the lower body, the operator can shut off the supply valve to **the unit's coalescer** inlet, relieve the pressure on the unit as noted in 3.1 through 3.6, then unscrew the bottom cap of the Sentry without moving the Sentry from its working location.



When maintenance is required only on the coalescer, the operator can shut off the **supply valve to the unit's coalescer** inlet, relieve pressure on the unit by following Maintenance Sections 3.1 through 3.6, then remove the inlet piping and unscrew the coalescer from the coalescer port without removing the Sentry unit from its working location.



If there is danger of water falling out and freezing in the Sentry body, Welker® recommends—prior to putting pressure on the Sentry body—that a light oil be poured into the outlet port until the Sentry begins to dump oil.

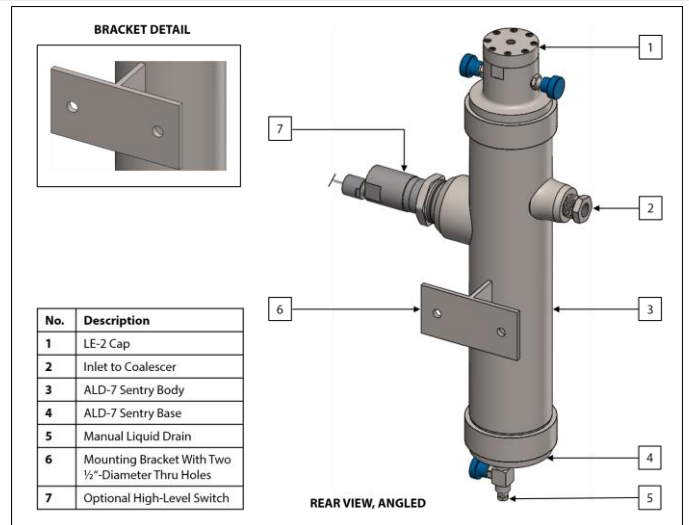


At atmospheric pressure, the Sentry could dump approximately 15 gph. The same would apply if dumping by gravity into a lower section of pipe. At 500 psig to atmospheric pressure, the Sentry could dump approximately 25 gph.

2.3 Installation Instructions

1. Mount the Welker® Automatic Sentry securely to a panel or, using a U-bolt, secure it to a pole. Two ½"-diameter thru holes are provided on the mounting bracket (see *Figure 1* and *Figure 5*).
2. The Welker® Automatic Sentry is ready for operation without further preliminary adjustments. However, Welker® recommends testing the dump at the time of installation by pouring water, or other liquid, into one of the available ports in the Sentry body. The Sentry does not allow any liquid to escape until the float starts to lift. Once the float starts to lift, liquid should begin to run out **of the Sentry's automatic drain port**.
3. Float: Neutral Position—Shutoff results when the rubber gasket fits tightly around the pivot arm assembly. Because the liquid exit hole is smaller than the pivot arm and the gasket is completely backed up by the steel body, the valve action is considered pressure balanced. The force that would try to push the arm down against the exit hole is taken up by the pivot arm bearing, thus eliminating this force.
4. Float: Dumping Position—The float lifts the pivot arm which, in turn, moves the short arm to the right thus distorting the hole that had previously been sealing on the short arm. When this hole is distorted, liquid is free to flow through it on the side opposite the arm movement.
5. There are two ¼" NPT ports in the base of the Sentry. One, the automatic dump port, should be piped to an appropriate container or sump location. The other, a manual dump port, should have a manual blow down valve installed in it and should be plugged.
6. **Connect the inlet piping to the Sentry's inlet** (i.e., coalescer inlet).
7. Plug the high-level switch option port or install a high-level switch. If using a high-level switch, "run" leads as required for its operation.
8. Slowly open the pipeline isolation valve and allow pipeline pressure to the Sentry. Slowly pressurize the automatic liquid dump body. If the vessel is filled too fast, it is possible to create considerable differential pressure between the outside and the inside of the hollow float, which could collapse it.
9. Slowly open valves A and B (see *Figure 2*).
10. Check the entire system for leaks.
11. The unit is now ready for service.

Figure 5: ALD-7 Automatic Sentry Diagram – Mounting Bracket



2.4 Removal Instructions

1. The unit can be removed from the panel for ease of complete unit maintenance. If maintenance is desired while the unit is in place, refer to *Section 2.2, Useful Information* for instructions.
2. Close all inlet valves external to the unit.
3. Disconnect the tubing line to the coalescer inlet.



Relieve the pressure slowly. If pressure is relieved too quickly, it can cause the float to expand and possibly be damaged.



Valves A and B must be open to bleed the unit's pressure completely.

4. Remove the plug and open valve C (see *Figure 3*) in the manual drain port to drain all remaining free liquids.
5. Disconnect the wire leads to the high-level switch, if that option is used.
6. If it is desirable to remove the unit, then detach the bracket from the panel and take the Sentry to a clean area for maintenance.

SECTION 3: MAINTENANCE

3.1 Before You Begin

1. Welker® recommends that the unit have standard yearly maintenance under normal operating conditions. In cases of severe service, dirty conditions, excessive usage, or other unique applications that might lead to excess wear on the unit, a more frequent maintenance schedule might be appropriate.
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 because it might 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.



After the seals are installed, the outer diameter of shafts and inner diameter of cylinders may be lubricated to allow smooth transition of parts.

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 might vary by model.
 - a. Strap Wrench
 - b. **6" Adjustable Wrench**
 - c. **12" Adjustable Wrench**
 - d. Allen Key Wrench Set
 - e. Screwdriver

3.2 Maintenance

1. The unit can be removed from the panel for ease of complete unit maintenance. If maintenance is desired while the unit is in place, refer to *Section 2.2, Useful Information* for instructions.
2. If desired, after removal of the bracket from the panel, depressurize the Sentry according to *Removal Instructions* in *Section 2.4*, lay the unit on its side in a clean area, and follow *Sections 3.3 through 3.6* for complete maintenance.



Check valves for leaks and repair or replace as necessary during reinstallation.

3. After maintenance is complete, the Sentry can be re-installed by following the steps in *Section 2.3*.

3.3 Float Assembly Maintenance

1. With the pressure relieved from the Sentry, remove the base (see *Figure 3*).
2. Slide the float off the pivot valve assembly.



When the float is reassembled on the arm, the swivel should be facing away from the pivot valve body.

3. Remove the machine screws and the pivot valve bracket will come out with the pivot valve assembly attached. The pivot valve should be allowed to swing freely without being too loosely mounted.
4. Remove the O-ring and rubber gasket that seals on the short pivot valve arm. Replace the O-ring and gasket.
5. Reattach the pivot valve to the base. The yoke should be pulled down snugly but not too tight.



One can pull the pivot valve down so tight that the short arm would make contact with the metal base space, thus rendering free operation impossible. Therefore, test the long pivot arm to ensure that the short arm is not touching the metal base and that it can move freely.

6. Replace the base / pivot valve assembly into the Sentry body.

3.4 Coalescer Assembly Maintenance

1. Normally the coalescer requires no maintenance. However, Welker® recommends occasionally checking the inside of the coalescer if the flowing fluid is known to have foreign particles (e.g., iron oxide, sand) present in it.
2. After relieving pressure from the Sentry and removing the tubing from the coalescer inlet, unscrew the coalescer assembly from the Sentry body.
3. Place a wrench on the coalescer inlet reducer flats and unscrew the hex nut from the coalescer tie bolt (see *Figure 4*).
4. Remove the coalescer bottom end cap and slide the shroud off the tie bolt, revealing the 10-micron screen. If necessary, replace or clean the screen and reassemble the coalescer.
5. Screw the coalescer assembly back into the Sentry body.
6. Reattach the inlet tubing.

3.5 LE-2 Assembly Maintenance

1. Unscrew the cap screws (shown in the *Figure 2* model inset) and remove the LE-2 cap from the Sentry. Then remove the O-ring (No. 3 in *Figure 2*) and cartridge assembly from the ALD top cap with LE body (*Figure 2*).
2. Using a solvent, clean the inside of the ALD top cap.
3. Install a replacement cartridge assembly to the ALD top cap with LE body. Ensure that the grooved side of the cartridge body faces up to the outlet (No. 9 in *Figure 2*).
4. Replace the O-ring (No. 3 in *Figure 2*).
5. Remove and replace the O-ring at the base of the LE body (No. 6 in *Figure 2*).
6. Align the screw holes in the cap with the screw holes in the ALD top cap with LE body and return the LE-2 cap to the ALD top cap with LE body.
7. Following a cross-bolting sequence, install the cap screws to the LE-2 cap and tighten to 5 ft-lbs.
8. The LE-2 is now ready for installation.

3.6 Valve Replacement Maintenance

1. If valve B or valve A do not seal off, or if they start leaking at the base of the gland, the valve assemblies can be replaced with Welker® NV-1 and Welker® NV-2 valve kits (*Figure 2*).

3.3 Troubleshooting Guidelines

Table 2: Welker® Automatic Sentry Model ALD-7 Troubleshooting Guidelines		
Issues	Possible Causes	Solutions
Valve A and/or valve B are not functioning properly.	Either or both valves are not sealing off or either or both valves are leaking at the base of the gland.	Replace either or both the valve assemblies with Welker® NV-1 (valve A) and/or Welker® NV-2 (valve B) valve kit(s).
The coalescer is sluggish.	Excessive debris has accumulated within the coalescer.	Follow the steps in <i>Section 3.4 – Coalescer Assembly Maintenance</i> .
Free operation of the Sentry is impossible.	The pivot valve is pulled down so tight that the short arm makes contact with the metal base space.	Referring to <i>Section 3.3 – Float Assembly Maintenance</i> , while disassembled, test the long pivot arm to ensure that the short arm is not touching the metal base and that it can move freely.
The float is damaged.	Pressure was relieved too quickly, causing the float to expand and become damaged.	Contact your Welker® representative for float assembly replacement.

APPENDIX: REFERENCED OR ATTACHED DOCUMENTS

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

- IOM-025: Welker® Instrument Regulators Models IR-1, IR-2, IR-4, and IR-6
- IOM-031: Welker® Manual Sentry Model MLD-7
- IOM-033: Welker® Relief Valves Model RV-1, RV-2, RV-2CP, RV-3
- IOM-040: Welker® Automatic Liquid Dump Models ALD-1, ALD-3, ALD-5, ALD-19
- IOM-044: Welker® Instrument Regulator Model IR-7
- IOM-105: Welker® Instrument Valves Models NV-1 and NV-2
- IOM-227: Welker® Liquid Eliminator Model LE-2
- IOM-234: Welker® Relief Valves Models RV-110A and RV-110V

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

- None

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

- Assembly Drawing: AD058CP.2 (Welker® Automatic Sentry Model ALD-7)

NOTES



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

welker.com