



*Installation, Operation, and
Maintenance Manual*

*Welker[®] Automatic Sentry
Model
ALD-7*

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 above. Correct operating and/or installation techniques, however, are the responsibility of the end user. Welker reserves the right to make changes to this and all products in order to improve performance and reliability.

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1. GENERAL

1.1 Introduction

We appreciate your business and your choice of Welker products. The Installation, Operation and Maintenance liability for this product becomes that of the purchaser at the time of receipt. Reading the applicable IO&M Manual prior to installation and operation of this equipment, is required so that you have a full understanding of its application and performance prior to commencement of use. If you have any questions, please call 1-800-776-7267 or 281-491-2331 in the USA.

1.2 Description

The Welker[®] Automatic Sentry (ALD Series) is an automatic liquid dump device with an integrated regulator. The Sentry has been designed for use in systems where it is desirable to remove excess liquids from a wet gas stream and to regulate the gas to instrumentation pressures.

The Sentry's regulator is non-relieving. Welker recommends that the regulator is used with a relief valve on the downstream side of the regulator body. Welker provides a variety of relief valves depending on application requirements. The Sentry's regulator incorporates a diaphragm for 0 – 100psi outlet pressures, which allows for more sensitivity at the lower outlet pressures. Outlet spring ranges are available for the regulator as follows:

0 - 25psi	Yellow
0 - 50psi	Green
0 - 100psi	Red

The Welker[®] Automatic Sentry provides the operator with the means to coalesce and automatically dump free liquids off of an instrument air or gas supply. It also provides coarse filtration of the supply.

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

The preferred location for installation of a Sentry is in a straight section of inlet piping before and below the instrumentation it supplies. This unit provides a ¾" NPT option port that allows the operator a means of adding a Thermal Dispersion Level Switch that would alarm the operator if the unit was not working properly.

1.3 Specifications

Products Sampled:	Natural gas or other gaseous fluids compatible with the materials of construction
Materials of Construction:	316 Stainless Steel, Buna-N and Viton [®]
Length:	27" (68.6cm)
Diameter:	4 ½" (11.4cm)
Weight:	Approximately 50 lbs (22.7kg)
Temperature range:	0° F to 300° F (-17.7° C to 149° C)
Maximum Working Pressure:	1440 psig (99.2 bar)
Inlet Connection:	½" NPT
Outlet Connection:	¼" NPT
Area Classification:	Can be used in hazardous areas

2. INSTALLATION INSTRUCTIONS

2.1 General

- 2.1.1 After unpacking the unit, check it for compliance and any damages which may have occurred during shipment.

NOTE: Claims for damages caused during shipment must be initiated by the receiver to the carrier. Welker is not responsible for any damages caused from mishandling by the shipping company.

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

2.2 Helpful Suggestions

- 2.2.1 The Sentry must always be mounted in the vertical position so that the float will work correctly.
- 2.2.2 Always test the unit to make sure the Sentry is dumping correctly prior to installation (see section 2.3.2).
- 2.2.3 When maintenance is required on the float and associated assemblies in the lower body, the operator can shut off the end users inlet valve to the unit, relieve the pressure on the unit as noted in 3.1 thru 3.6. Then, simply unscrew the bottom cap of the Sentry with out removing it from its working location.
- 2.2.4 When maintenance is required on only the coalescer, the operator can shut off the end users inlet valve to the unit, relieve pressure on the unit following steps 3.1 thru 3.6. Then, remove the inlet piping and simply unscrew the coalescer from the coalescer port without removing the unit from its working location.

- 2.2.5 When maintenance is required on the regulator portion of the Sentry, the operator can close the end users inlet valve to the unit, the regulator inlet valve and liquid purge valve, and proceed to relieve the pressure from the regulator portion of the unit by following steps 3.1 thru 3.5.
- 2.2.6 The fluid being removed may be dumped into an atmospheric container or it may be dumped, by gravity, into a sump. In order to accomplish the latter, it is necessary to have the Sentry's body above the point at which fluid will be dumped into the sump.
- 2.2.7 If there is danger of water falling out and freezing in the body, prior to putting pressure on the body it is recommended that a light oil is poured into the outlet port until the Sentry begins to dump the oil.
- 2.2.8 At atmospheric pressure, the Sentry could dump approximately 15gph (the same would apply if dumping by gravity into a lower section of pipe) and 25gph when dumping from 500psi to atmospheric pressure.
- 2.2.9 Under normal operating conditions, the Sentry maintains a static head consisting of approximately one pint of liquid. The action of the dumping mechanism is never violent and would not cause a disturbance to any type of instrumentation. This includes the differential on a differential recorder when the Sentry is used to keep liquids out of the manometer.
- 2.2.10 The high density polyethylene float has no pressure restrictions since pressure will be equalized between the inside and the outside of the float. A down-comer assembly is provided in the float so that if liquid is forced into the float it will not affect the unit's operation.

2.3 Installation Instructions

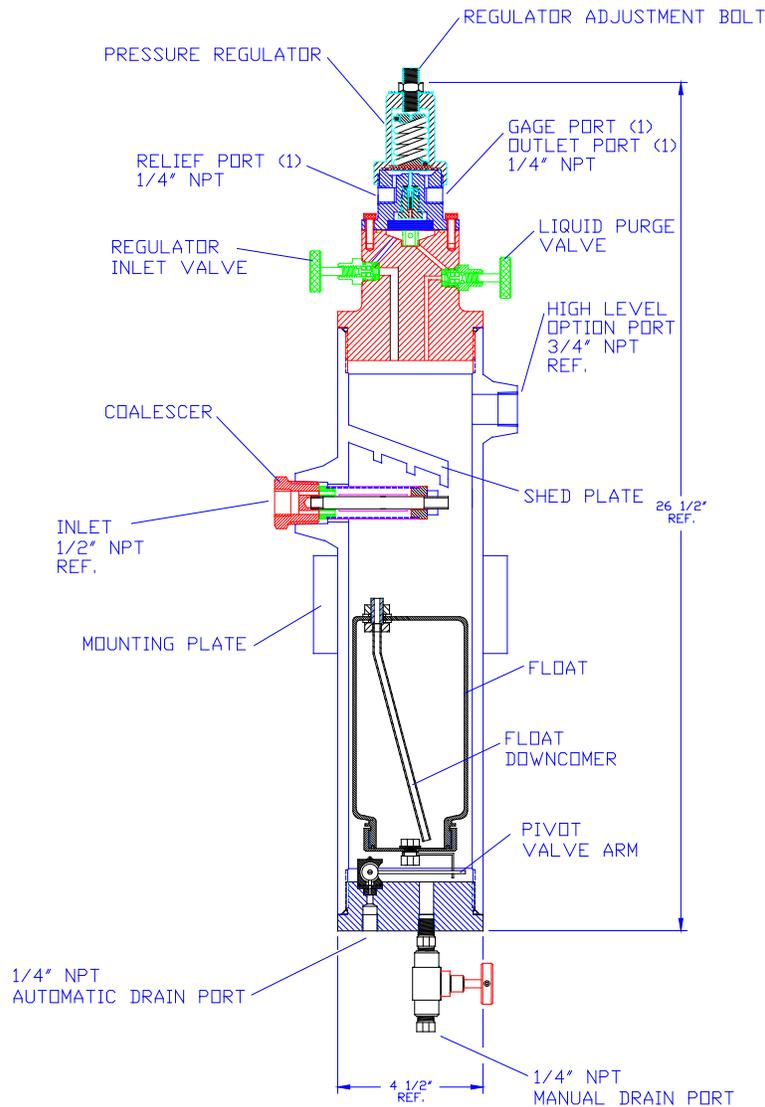


FIGURE 1

To place the unit in service, refer to figures 1 and 2 and follow these procedures:

- 2.3.1 Install a relief valve and a gauge in the appropriate regulator ports.
- 2.3.2 The Welker[®] Automatic Sentry is ready for operation without any preliminary adjustments; however, it is recommended that the dump be tested at the time of installation by simply pouring water, or other liquid, into one of the available open ports

in the dump body. The Sentry should not allow any liquid to escape until the float starts to lift. Liquid should begin to run out of the Sentry's automatic drain port.

Float – Neutral Position

Shutoff is a result of the rubber gasket fitting tightly around the pivot arm assembly. Since 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.

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.

- 2.3.3 There are two ¼” NPT ports in the base of the Sentry. One, the automatic dump port should be piped off 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.
- 2.3.4 Loosen the regulator's jam nut, and turn the adjustment screw counter clockwise until the regulator is completely closed; i.e., no setting or tension on the spring.
- 2.3.5 Connect a closed valve and tubing from the regulator outlet port to the downstream instrument.
- 2.3.6 Connect the inlet piping to the Sentry's inlet.
- 2.3.7 Plug the high level option port, or install a high level switch.

NOTE: If using a high level switch, “run” leads as required for its operation.

- 2.3.8 **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.
- 2.3.9 Open the regulator inlet valve and the liquid purge valve slowly. Check for leaks.
- 2.3.10 The outlet gauge of the regulator should read "0" psi, assuring that the regulator is not leaking internally.
- 2.3.11 Slowly turn the regulator adjusting screw clockwise to set the desired relief pressure.
- 2.3.12 Set the relief the valve (see relief valve IO&M).
- 2.3.13 Turn the adjusting screw in the counter clockwise direction to set the desired outlet pressure and tighten the jam nut.
- 2.3.14 Check the entire system for leaks.
- 2.3.15 The unit is now ready for service.

3. REMOVAL INSTRUCTIONS

- 3.1 The unit can be removed from the pipe stand or panel for ease of complete unit maintenance.
- 3.2 Close all inlet valves to the unit.
- 3.3 Loosen the regulator jam nut and turn the adjustment screw counter clockwise to close off the regulator.
- 3.4 Bleed any trapped pressure from the tubing between the instrumentation and regulator.
- 3.5 Disconnect the tubing line.
- 3.6 Slowly turn the regulator adjustment screw clockwise to bleed off the pressure in the Sentry's body.

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

CAUTION: The regulator inlet valve and the liquid purge valve must be open to bleed the units' pressure completely.

- 3.7 Remove the plug and open the valve on the manual drain port to drain all remaining free liquids.
- 3.8 Disconnect the inlet tubing to the Sentry and disconnect the wire lead to the high level switch if that option is used.
- 3.9 Remove the unit and take it to a clean area for maintenance.

4. MAINTENANCE

4.1 General

Prior to maintenance or disassembly of the unit, it is advisable to have a repair kit handy for the system in case of encountering unexpected wear or faulty seals.

We recommend that the unit have annual maintenance under normal operating conditions. In the case of severe service, dirty conditions, excessive cycling usage or other unique applications that may subject the equipment to unpredictable circumstances, a more frequent maintenance schedule may be appropriate.

New seals supplied in spare parts kits are not lubricated. They should be lightly coated with lubrication grease (silicone grease or other) before they are installed into the equipment. This helps in the installation of the seals while reducing the risk of damage when positioning them on the parts. After the seals are installed, some additional lubrication can be applied to shafts or cylinder inner diameters to allow smooth transition of parts.

Refer to figures 1 and 2.

The following tools will be required for disassembly and maintenance:

- Strap Wrench
- 6” Adjustable Wrench
- 12” Adjustable Wrench
- Allen Key Wrench Set
- Screw Driver

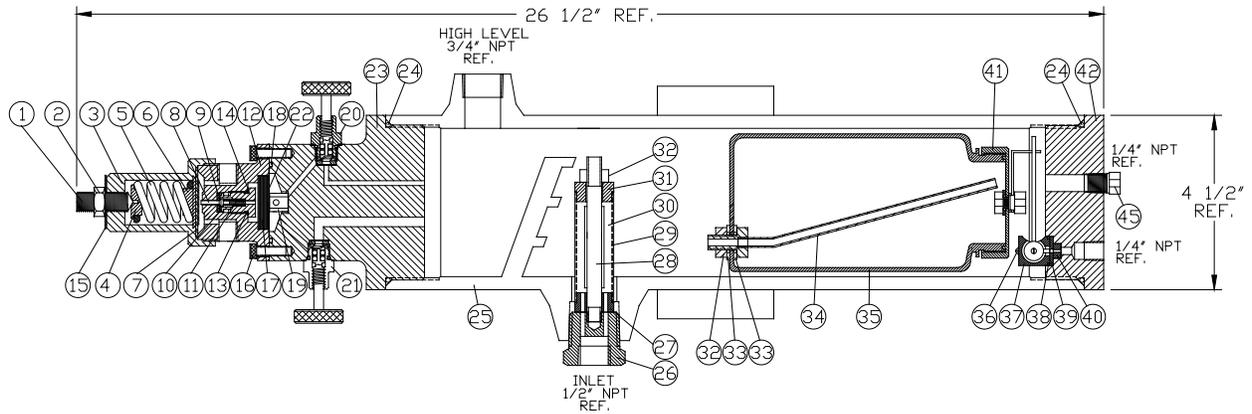


FIGURE 2

4.2 Complete Assembly Maintenance

4.2.1 Lay the Sentry on its side in a clean area and follow steps 4.3.1 thru 4.6.1 for complete maintenance.

4.2.2 Upon completion of maintenance, the Sentry can be re-installed following steps 2.3.1 through 2.3.16.

4.3 Float Assembly Maintenance

4.3.1 With the pressure relieved from the Sentry, remove the base #42.

4.3.2 Slide the float #35 off of the pivot valve assembly #37.

NOTE: When the float is re-assembled on the arm, the swivel should be facing away from the pivot valve body.

4.3.3 Remove the yoke screws #36 (2) and the pivot valve bracket will come out with pivot valve assembly attached. The pivot valve should be allowed to swing freely without being too loosely mounted.

4.3.4 Remove the o-ring #38 and rubber gasket #39 that seals on the short pivot valve arm. Replace the o-ring and gasket.

4.3.5 Re-attach the pivot valve to the base. The yoke should be pulled down snugly but not too tight.

NOTE: It is possible to pull the pivot valve down so tight that the short arm would make contact with the metal base spacer #40, and thus free operation would not be possible. Therefore, test the long pivot arm to make sure that the short arm is not touching the metal base and that it can move freely.

4.3.6 Replace the base / pivot valve assembly into the body.

4.4 Coalescer Assembly Maintenance

4.4.1 Normally the coalescer will require no maintenance. However, it is a good idea to check the inside of the coalescer occasionally if the flowing fluid is known to have foreign particles (i.e., iron oxide, sand, etc.) present in it.

4.4.2 After relieving pressure from the Sentry and removing the tubing from the coalescer inlet, un-screw the coalescer assembly from the body #25.

4.4.3 Place a wrench on the coalescer inlet reducer #26 flats and unscrew the hex nut #32 from the coalescer tie bolt #28.

4.4.4 Remove the coalescer bottom end cap #31 and slide the shroud #30 off the tie bolt revealing the 10 micron screen #29. If required, replace or clean the screen and reassemble the coalescer.

4.4.5 Screw the coalescer assembly back into the body.

4.4.6 Reattach the inlet tubing.

4.5 Regulator Assembly Maintenance

IMPORTANT: Maintenance on the Sentry's regulator should be performed only after the regulator is isolated from all pressure sources and internal pressure on the regulator has been relieved.

4.5.1 Unscrew the cap screws #16 (8) and remove the regulator sub-assembly from the Sentry's top cap #23. Clean the micron screen sub-assembly #17 and set it aside to reuse it or replace it. Throw away the membrane #22.

4.5.2 Loosen the jam nut #2 and turn the adjusting screw #1 counter clockwise until there is no tension on the spring #5.

4.5.3 Unscrew the spring housing #3 from the mid section #12.

4.5.4 Replace the spring #5 and diaphragm assembly #7 if necessary.

NOTE: Make sure that the top spring guide #4 is in place on the spring.

4.5.5 Re-install the spring housing to the mid-section.

4.5.6 Remove the flow ring #14 from the mid-section, and replace the seal #13.

4.5.7 Examine the poppet bevel #8 for damage. Replace if necessary.

4.5.8 Carefully pick out the seat #9 with a knife or pointed instrument. Examine the center hole of the seat for trash and/or scratches. Trash or scratches will prevent positive shut-off of the regulator. Replace the seat if necessary.

NOTE: Handle the seat carefully as it is easily damaged.

4.5.9 Place the poppet and the poppet spring #11 into the flow ring and guide the poppet back into the seat.

4.5.10 Tighten flow ring securely.

4.5.11 Examine the ports on the regulator for cleanliness.

4.5.12 Reuse or replace the micron screen subassembly.

4.5.13 The Sentry's regulator is now ready to be reattached to the top cap.

4.5.14 Re-install the regulator with a new membrane and tighten the hex socket cap screws.

4.6 Valve Replacement Maintenance

4.6.1 If the regulator inlet valve #21 or liquid purge valve #20 do not seal off, or if they start leaking at the base of the gland, the valve assemblies can simply be replaced with Welker[®] NV-1 and Welker[®] NV-2 valve kits (see the valve kit instructions).



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