

ERECTA SWITCH

by Compac Engineering Inc.

Reusable Level Sensing for Chemical Containers: *A Smarter Approach to Jug, Pail, and Drum Monitoring*



Custom 4-hole cap assembly — top view



Assembled ERECTA SWITCH dual-level configuration in 2.5-gallon detergent jug

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Executive Summary

Chemical dispensing equipment — from industrial food-service machines to precision cleaning systems — relies on a continuous, uninterrupted supply of detergent, sanitizer, or process chemical. When a container runs dry without warning, the results range from equipment damage to product contamination to costly production downtime.

This whitepaper presents a field-proven, reusable liquid level sensing solution developed by Compac Engineering Inc. using the ERECTA SWITCH modular float switch system. The solution was originated from a direct engineering collaboration with a leading commercial kitchen ventilation manufacturer seeking to automate detergent container monitoring in their wash-down equipment. Through rapid application analysis, Compac engineers identified a configuration problem with the customer's existing approach, designed a superior solution, assembled a complete evaluation sample at no charge, and delivered it within days.

The resulting configuration — a custom-fabricated cap fitted with two independent ERECTA SWITCH single-stem float switches, slosh shields, and bulkhead fittings — provides reliable high and low level detection in 2.5-gallon jugs. Critically, the entire assembly is designed to be reusable: it transfers from depleted container to fresh container in seconds, eliminating disposable sensor waste and enabling automated reorder and changeover alerts.

This same approach scales directly to 5-gallon pails, 15-gallon carboys, and 55-gallon drums — making it a universal platform for any chemical company seeking to offer their customers a smarter, automated container management accessory.

The Problem: Monitoring Chemicals in Portable Containers

Industrial and commercial equipment that relies on liquid chemicals — detergents, sanitizers, lubricants, adhesives, rinse aids — faces a fundamental operational challenge: knowing when a container is getting low before it runs out completely.

Traditional approaches to this problem are inadequate in portable-container applications:

- Visual inspection requires manual rounds and is easily missed on busy production floors.
- Weight-based sensors are expensive, require calibration, and do not integrate cleanly with jug caps.
- Single-point float switches signal only empty, providing no advance warning.
- Multi-level switches on a single stem are problematic in top-entry jug applications where fluid intake and output tubes occupy the same cap space, causing float travel interference.

The challenge intensifies when containers must be changed frequently. Any sensing hardware mounted to a dedicated container becomes disposable — discarded with the empty jug — which is both wasteful and expensive.

What the market requires is a reusable, self-contained sensor assembly that mounts through the container cap, delivers high and low level signals, does not interfere with fluid transfer tubes, and transfers cleanly from container to container at changeover.

Case Study: Commercial Kitchen Ventilation Equipment

Application Background

A leading manufacturer of commercial kitchen ventilation systems approached Compac Engineering with a request for a two-level float switch solution for 2.5-gallon detergent jugs used in their industrial wash-down equipment. The customer had already prototyped a 3D-printed replacement cap to consolidate the fluid intake tube, fluid output tube, and a single-stem dual-level float switch into a single jug-top assembly.

The customer's objective was simple: detect fluid at 5 inches and 12 inches from the top rim of the jug — providing a "Low" warning at 5 inches and a "Empty / Change Container" signal at 12 inches.

Compac Engineering's Collaborative Process

Rather than quoting from a specification alone, Compac Engineering requested that the customer ship their sample jug and cap assembly for direct evaluation. This hands-on approach is a hallmark of the ERECTA SWITCH problem-solving methodology: analyze the actual application, identify failure modes before they reach production, and propose the simplest solution that works reliably.

Upon receiving and evaluating the sample, Compac engineers identified a critical interference problem:

- The customer's 3-hole cap placed the fluid intake and output tubes directly adjacent to the float switch stem.
- A single-stem dual-level switch in this configuration would have the hoses running through the float travel zone. As the float rises and falls with fluid level, it would collide with the hoses — either jamming the float or displacing the hose routing. The design could not function reliably.

Compac engineers immediately developed an alternative approach that eliminated the interference problem entirely:

- Two independent single-stem float switches — one for high level (5"), one for low level (12") — installed in dedicated holes in a custom 4-hole cap, physically separating each switch float from the tube paths.
- Slosh shields (10-782 series) added to each switch to protect float travel from fluid turbulence during jug handling and equipment vibration.
- 10-701-BH-PP bulkhead fittings used to mount each stem through the cap, secured with jam nuts and sealed with O-rings for a leak-free, removable connection.
- 10-700-S3-PP 3-hole spacers incorporated to route and secure the fluid tubes along each stem, keeping hoses organized and clear of float travel paths.

Compac 3D-printed a new 4-hole cap matching the customer's existing cap geometry, assembled the complete sensor package, and shipped it to the customer as a no-charge evaluation sample — fully assembled and ready to install. The entire process from sample receipt to sample shipment was completed in days.

Assembled Solution — Photographs



Figure 1: Side view — assembled dual-level ERECTA SWITCH configuration in cut-away 2.5-gallon detergent jug. High-level switch (5") and low-level switch (12") are physically separated, with slosh shields and tube spacers clearly visible.



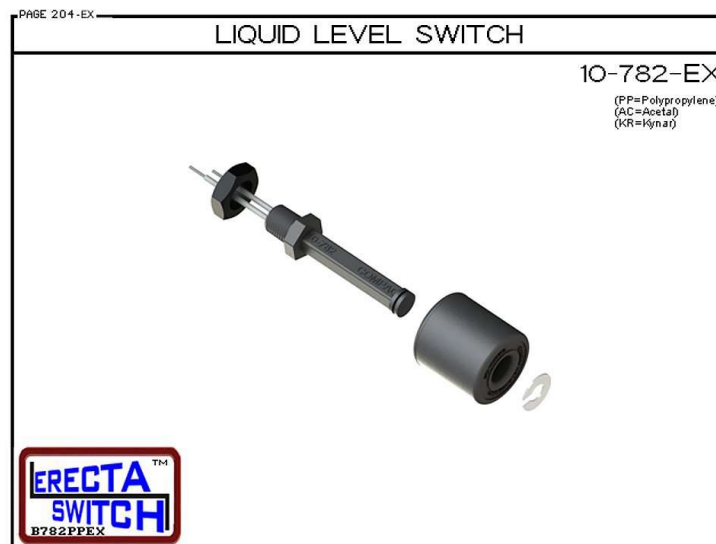
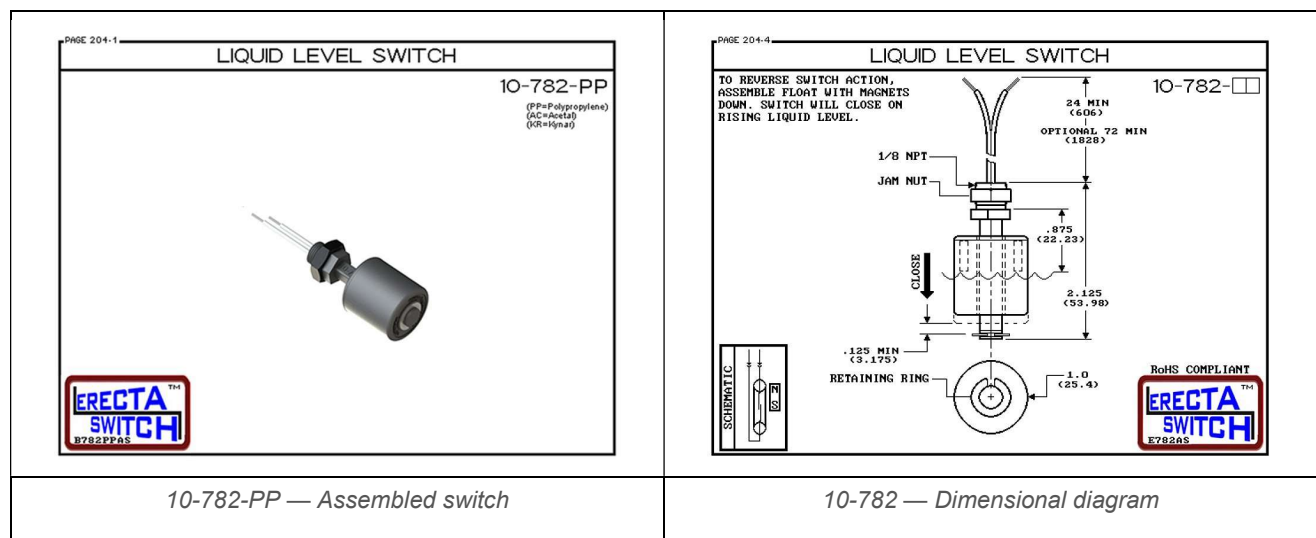
Figure 2: Top view — 4-hole custom cap with two bulkhead-mounted float switch stems and two fluid tube ports. Jam nuts and O-ring seals provide secure, leak-free, reusable mounting.

Component Reference: ERECTA SWITCH System

The solution is assembled entirely from standard ERECTA SWITCH catalog components — no custom-machined parts, no proprietary connectors. Every element is available for direct order from Compac Engineering.

10-782 Series — Liquid Level Switch (Single Stem)

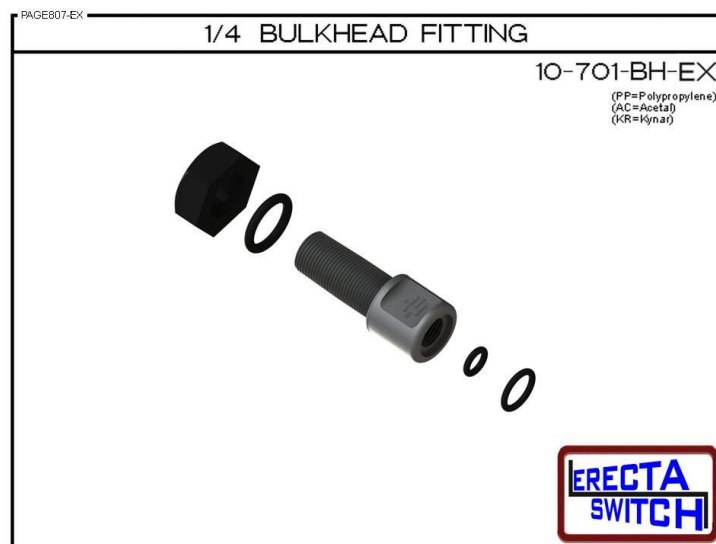
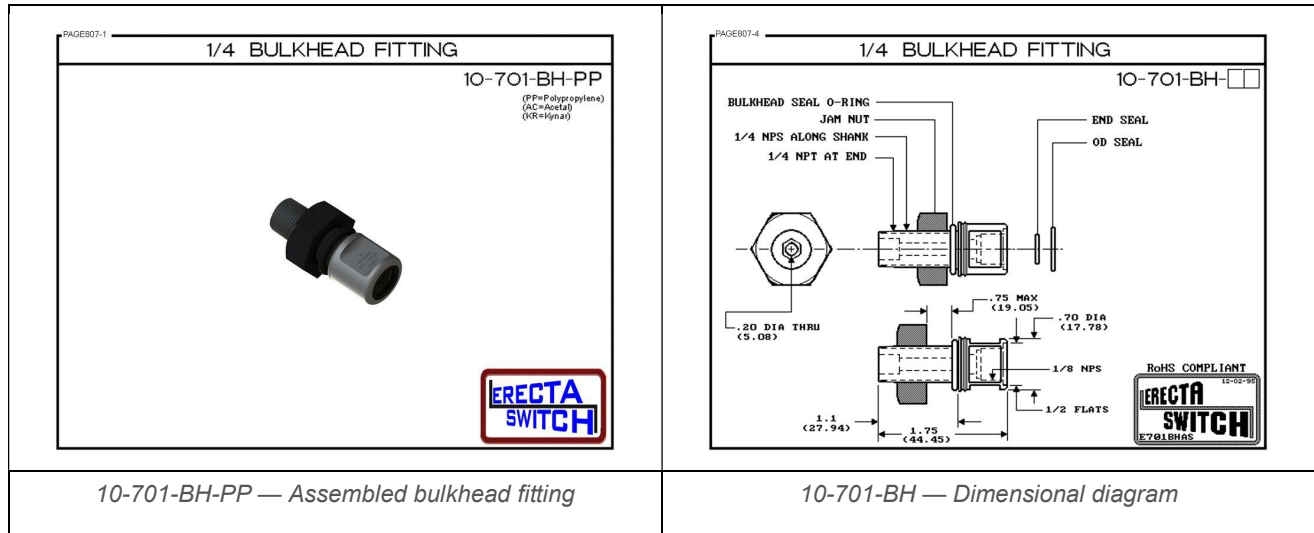
The core sensing element. The 10-782 is a compact, top-entry float switch with a 1/8" NPT threaded fitting and jam nut for bulkhead or cap mounting. The cylindrical float rides the stem and actuates a reed switch at the set point. Available in polypropylene (PP), acetal (AC), and Kynar (KR) for broad chemical compatibility. A retaining ring secures the float and prevents loss during container changeover. Switch action is field-reversible (open or closed on rising level) by inverting the float.



10-782 — Exploded view showing stem, float, retaining ring, and jam nut

10-701-BH-PP — 1/4" Bulkhead Fitting

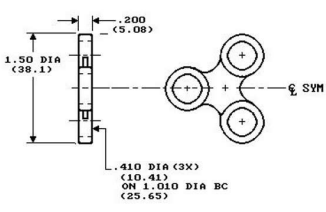
The bulkhead fitting provides the sealed, removable mount for each switch stem through the jug cap. The 1/4" NPS shank passes through the cap hole; the jam nut draws the fitting tight against the cap surface, compressing an O-ring seal on each face for a leak-free installation. The 1/4" NPT end threads directly to the float switch. This fitting is the mechanism that makes the assembly reusable: unscrew the jam nut, lift the sensor assembly clear, and reinstall on a fresh cap in seconds.



10-701-BH — Exploded view showing jam nut, O-ring seals, and threaded shank

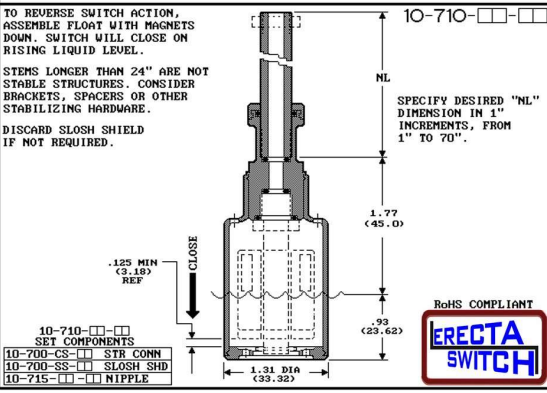
10-700-S3-PP — 3-Hole Spacer (Support)

The 3-hole spacer is a polypropylene disc that clamps to the switch stem and provides two additional guide channels for routing fluid tubes. In this application, one spacer per stem keeps the intake and output hoses organized along the stem length and physically separated from the float travel zone. The spacer is 1.50" in diameter with three 0.410" holes on a 1.010" bolt circle, and slides to any position along the stem before being locked in place.

3 HOLE SPACER (SUPPORT) 10-700-S3-PP (PP=Polypropylene) (AC=Acetal) (R=Kynar)  ERECTA SWITCH 10-700-S3-PP — 3-hole tube spacer	3 HOLE SPACER (SUPPORT) 10-700-S3- (PP=Polypropylene) (AC=Acetal) (R=Kynar)  RoHS COMPLIANT ERECTA SWITCH 10-700-S3 — Dimensional diagram
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10-710 Series — Extended Stem Set (Reference)

For applications requiring sensing at depths greater than those achievable with the standard 10-782 stem length, the 10-710 Extended Stem Set provides additional reach. The extended stem threads to the float switch body and is available in 1" increments from 1" to 70". This component is included as reference for drum and carboy applications where container depth exceeds the standard stem capability.

EXTENDED STEM SET 10-710-PP- (PP=Polypropylene) (AC=Acetal) (R=Kynar)  ERECTA SWITCH 10-710-PP — Extended stem, assembled	EXTENDED STEM SET 10-710- TO REVERSE SWITCH ACTION, ASSEMBLE FLOAT WITH MAGNETS DOWN. SWITCH WILL CLOSE ON RISING LIQUID LEVEL. STEMS LONGER THAN 24" ARE NOT STABLE STRUCTURES. CONSIDER BRACKETS, SPACERS OR OTHER STABILIZING HARDWARE. DISCARD SLOSH SHIELD IF NOT REQUIRED.  RoHS COMPLIANT ERECTA SWITCH 10-710 — Dimensional diagram
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10-710-PP-EX — Exploded view of extended stem set components

The Reusable Container Sensing Platform: A Market Opportunity

The Gaylord Industries application is not an isolated use case. It is a representative example of a problem that exists across virtually every industry that dispenses chemicals from portable containers. The ERECTA SWITCH reusable cap assembly concept is directly applicable — without modification to the sensing components — to the following container formats:

- 2.5-gallon jugs — detergents, sanitizers, food-service chemicals
- 5-gallon pails — cleaning concentrates, lubricants, adhesives, coatings
- 15-gallon carboys — laboratory reagents, process chemicals, agricultural inputs
- 55-gallon drums — bulk chemical supply, industrial process fluids

The Chemical Company Accessory Model

This solution represents a compelling accessory product for chemical companies to offer their customer base. Consider the value proposition:

- A chemical company sells 500 customers a detergent product in 2.5-gallon jugs. Each customer changes jugs weekly. Without sensing, changeover is manual — discovered when equipment fails or product runs out.
- With a reusable ERECTA SWITCH cap assembly, each customer receives a “smart cap” that provides a low-level warning signal and a change-now signal — eliminating dry-run events and enabling automated reorder triggers integrated with the customer’s equipment controls or building management system.
- The cap assembly is reusable across every container change. The chemical company sells the cap kit once as a setup accessory and benefits from improved customer satisfaction, reduced waste claims, and a differentiated product offering.
- At scale, the chemical company may choose to have Compac Engineering produce pre-assembled cap kits matched to their specific container geometry and chemical compatibility requirements — a private-label, OEM accessory that ships alongside every chemical order.

Configuration Scalability

The ERECTA SWITCH system is fully modular. Sensing depth, float action, stem material, and electrical termination are all field-configurable. A standard accessory kit for a 2.5-gallon jug application requires:

- 2× 10-782-PP liquid level switches (one per level, set to customer-specified depths)
- 2× 10-701-BH-PP bulkhead fittings (one per switch)
- 2× 10-700-S3-PP 3-hole spacers (for tube management)
- 1× custom or standard cap matched to container thread and geometry

For drums and carboys, the 10-710 extended stem set provides the additional depth. Kynar (KR) material options are available for aggressive chemical environments including strong acids, bases, and solvents.

Why ERECTA SWITCH and Compac Engineering

ERECTA SWITCH is not an off-the-shelf catalog product with a fixed form factor. It is a modular problem-solving system designed from the ground up to be configured, assembled, and adapted to the specific geometry and chemical environment of each application. Compac Engineering Inc., the inventor and manufacturer of the ERECTA SWITCH line, brings decades of direct application engineering experience to every inquiry.

What differentiates the Compac Engineering approach:

- Application-first methodology: We request samples. We analyze actual hardware. We identify failure modes before they reach production.
- Rapid prototyping: Custom caps, brackets, and assemblies are produced in-house — enabling no-charge evaluation samples to reach the customer in days, not weeks.
- Modular flexibility: Every dimension, depth, material, and electrical configuration is specifiable without tooling changes or minimum order commitments.
- OEM partnership capability: Compac Engineering supports chemical companies, equipment OEMs, and distributors with private-label kit configurations, volume pricing, and ongoing application support.
- Chemical compatibility expertise: Material selection guidance for PP, acetal, and Kynar across the full range of industrial chemical environments.

Request Your No-Charge Evaluation Sample

If your application involves monitoring fluid levels in portable containers — jugs, pails, carboys, or drums — Compac Engineering invites you to submit your container or cap for application analysis. We will evaluate your specific geometry, identify the optimal ERECTA SWITCH configuration, assemble a complete sample, and ship it to you for evaluation at no charge.

If you are a chemical company interested in offering a reusable level sensing accessory kit to your customers, contact us to discuss OEM and private-label configuration options.

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