

Captrol 500

RF Capacitance Point Level Switch

The Captrol 500 is a microcontroller-based RF capacitance point level switch designed for reliable high- or low-level detection in liquids, powders, and bulk solids. It delivers dependable switching performance using a driven-guard probe design that eliminates false trips caused by coating or buildup, while its solid-state electronics ensure long-term stability with no moving parts. For operators, maintenance personnel, and plant safety teams who need simple, accurate, and low-maintenance level control, the Captrol 500 provides one-touch Auto-Cal calibration, selectable fail-safe modes, and universal power input for flexible installation across industrial facilities.

Unlike mechanical switches that require repeated recalibration or suffer performance degradation in low-dielectric or fouling applications, the Captrol 500 maintains consistent accuracy through coating rejection circuitry and adjustable sensitivity (0.5–10 pF). Its explosion-proof cast-aluminum housing meets NEMA 4/5/7/8/12 requirements and supports integral or remote mounting, enabling safe operation in hazardous environments and easy access for calibration up to 50 ft away.



Key Features

One-Touch Auto-Cal

Fast, tool-free calibration eliminates multi-step adjustments, allowing operators to commission the switch quickly without test equipment or expert tuning.

Driven-Guard Probe Design

The guard energizes a field around coating buildup, preventing conductive films from influencing the measurement and ensuring stable switching in fouling applications.

Microcontroller-Based RF Sensing

Provides drift-free, repeatable switching with high immunity to electrical noise, dielectric changes, and environmental variations.

Universal Power Input

Accepts 115/230 VAC or 24 VDC, enabling one model to operate globally and reducing stocking complexity across multiple facilities.

Selectable Fail-Safe Mode

Allows users to choose energized-on-rise or energized-on-fall, ensuring predictable behavior during power loss or wiring faults.

Adjustable Sensitivity & Delay

Fine-tunes response for powders, foams, and viscous liquids, with delay settings that prevent nuisance trips from splashing or turbulence.



Typical Applications



POWDERS & BULK SOLIDS

Detects low-DK powders reliably using RF capacitance, avoiding false trips common with mechanical probes in light-density materials.



STICKY OR COATING LIQUIDS

Driven-guard design rejects buildup, ensuring accurate switching even when viscous or conductive films accumulate on the probe.



CHEMICAL STORAGE TANKS

Maintains calibration stability despite dielectric changes, providing dependable level indication for corrosive or varying-composition liquids.



PUMP & OVERFLOW CONTROL

Provides fast, reliable relay actuation to protect pumps from dry-run conditions or prevent tank overflow during filling operations.



HAZARDOUS OR REMOTE LOCATIONS

Explosion-proof housing and remote electronics enable ground-level calibration without climbing tanks or opening energized enclosures.



NON-METALLIC VESSEL MONITORING

Supports installations in fiberglass, plastic, or concrete tanks using an external ground reference placed parallel to the probe.

Benefits



Rapid Calibration

Auto-Cal pushbutton eliminates manual trimming, allowing fast and consistent field setup with minimal operator training.



Fouling Immunity

Driven-guard circuitry prevents false triggering from coatings, ensuring stable operation in sticky, viscous, or buildup-prone applications.



Universal Power Flexibility

One model handles AC or DC power, simplifying spare parts, installation planning, and facility standardization.



High EMI Robustness

Static suppression and RF shielding protect the sensing circuit from electrical noise, ensuring reliable switching near motors or VFDs.



Predictable Fail-Safe Safety

Selectable fail-safe ensures the relay moves to a known state during faults, improving pump protection and alarm reliability.



Clear Visual Status

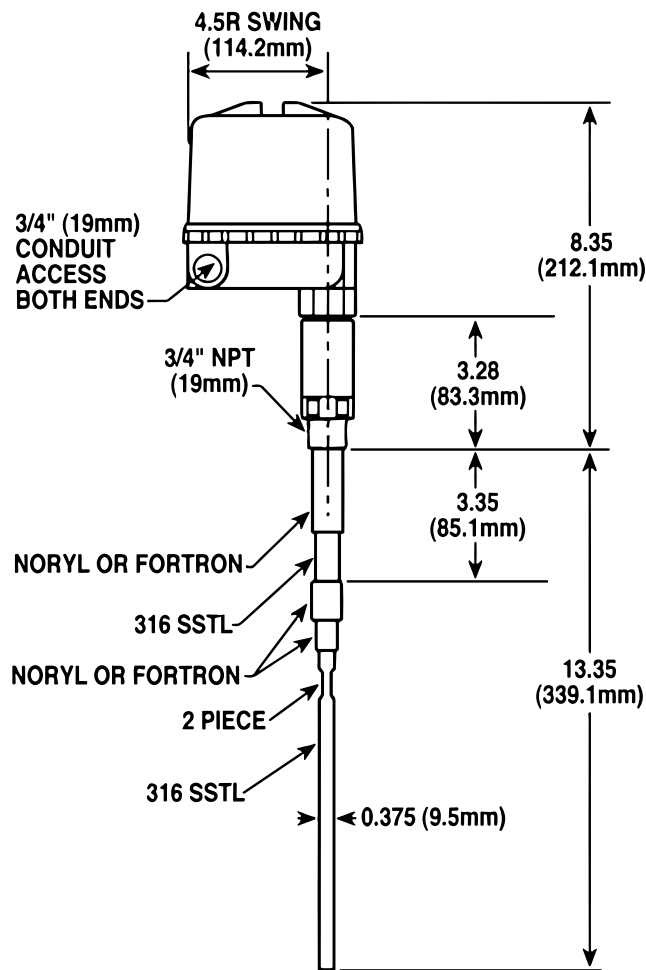
LED indicators provide immediate feedback on alarm state & calibration, supporting quick verification and troubleshooting in the field.



Technical Specifications & Key Features

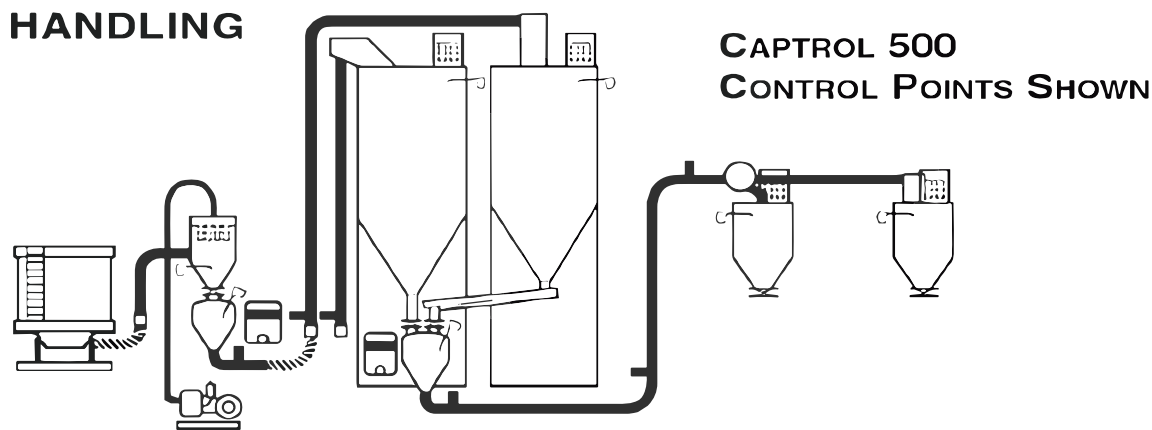
Technology:	Microcontroller-based RF capacitance point level switch
Mounting Options:	Integral or Remote (up to 50 ft cable)
Power Supply:	115 VAC (95–135 V), 230 VAC (180–270 V), or 24 VDC (18–28 V)
Power Consumption:	< 3 VA
Output:	SPDT or DPDT relay (5 A @ 115/230 VAC, 3 A @ 26 VDC, non-inductive)
Frequency:	50–60 Hz
Sensitivity Range:	Adjustable 0.5 pF to 10 pF
Response Time:	Adjustable 0.1 to 30 seconds
Fail-Safe Mode:	Field selectable—High Level or Low Level
Temperature Limits:	- Electronics: –40 °F to +160 °F (–40 °C to +71 °C) - Probes: –40 °F to +450 °F (–40 °C to +232 °C) depending on model
Pressure Limits:	- Standard probes: up to 500 psi (3.4 MPa) - Teflon® probes: up to 400 psi (2.8 MPa)
Indicators:	- Green LED: Probe capacitance above setpoint - Red LED: Relay energized
Housing:	Cast aluminum, explosion-proof, NEMA 4, 5, 7, 8, 12
Enclosure Hazardous Area Ratings:	NEC Class I, Groups C & D; Class II, Groups E, F, G
Probe Styles:	- GIMF – Guarded Injection Molded Fortron - GIMN – Guarded Injection Molded Noryl (food-grade) - GT / GTH – Guarded Teflon® (316 SS or Hastelloy center rod) - GC – Guarded Ceramic (up to 750 °F) - GFC – Flexible Cable Probe (up to 25 ft) - GAR – Guarded Abrasion Resistant Stainless Steel
Accessories:	Sensitivity sleeve, flange adapters, 90° probe bends, lagging extensions
Calibration:	Auto-Cal pushbutton; no tools required

Dimensions



Typical System Layout

MATERIAL HANDLING



Model Number Selection

The model number will consist of a base number 500 followed by 4 sets of option tables:

Part Number Structure

D500-ABC-DEFGH-IJKL-MN

Part PrefixD500

Part Number	ABC- Electronic Control Options
I00	Integrated
R00	Remote mount electronics with 50 ft. cable (50 ft. max)
R10	Includes: 10 ft. cable, 1" mounting flange, enclosure
R0H	Remote mount electronics with 50 ft. cable High temp cable
R1H	10 ft. cable, 1" mounting flange, enclosure, High temp cable

Part Number	DEFGH- Sensing Probe (specify insertion length in notes)
GIMN0	GIMN = Guarded Noryl, 316 S.S., 14" length
GIMF0	Guarded Fortron, 316 S.S., 14" length
GT000	Retrieving data. Wait a few seconds and try to cut or copy again.
GT1/2	Guarded Teflon, ½" center rod, 316 S.S., 6" length
GC000	Guarded Ceramic, high temp (750° F max)
GFC00	GIMN with 316 S.S. flexible cable (25 ft. max)
GTH00	Guarded Teflon, ¼" center rod, Hastelloy, 36" or less
GTT00	Guarded Teflon, Teflon sealed active, 18" length
THD00	Non-Guarded, Teflon sealed active (available bare)

NOTE 1: CSA Approved for NEC Class 1, Groups C, D; NEC Class II, Groups E, F, G; Divisions 1& 2 when used with THD or KHD Probe CSA Approved for Ord. Loc.

Summary

The Captrol 500 brings modern microcontroller precision and effortless one-touch calibration to RF capacitance point level control. With flexible mounting, wide probe selection, and proven explosion-proof reliability, it delivers superior accuracy and uptime for liquid, slurry, and solid applications across chemical, food, wastewater, and energy industries. Combining durability, simplicity, and intelligence, the Captrol 500 sets the benchmark for safe, low-maintenance level detection and switching.

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Part Number	IJKL- Process Mounting
0000	None
NPT0	NPT Standard, threaded ¾" or 1" NPT connection
F1.5	F1.5 Flange, 1½", 316 S.S.
T1.5	T1.5 Teflon faced flange, 1½", 316 S.S.
H1.5	H1.5 Flange, 1½", Hastelloy
S1.5	S1.5 Tri-clover, 1½", 316 S.S.
X1.5	X1.5 Tri-clover, 1½", Teflon faced
F2.0	F2.0 Flange, 2", 316 S.S.
T2.0	T2.0 Teflon faced flange, 2", 316 S.S.
H2.0	H2.0 Flange, 2", Hastelloy
S2.0	S2.0 Tri-clover, 2", 316 S.S.
X2.0	X2.0 Tri-clover, 2", Teflon faced
F3.0	F3.0 Flange, 3", 316 S.S.
T3.0	T3.0 Teflon faced flange, 3", 316 S.S.
H3.0	H3.0 Flange, 3", Hastelloy
S4.0	S4.0 Tri-clover, 4", 316 S.S.
X4.0	X4.0 Tri-clover, 4", Teflon faced
F4.0	F4.0 Flange, 4", 316 S.S.
F5.0	F5.0 Flange, 5", 316 S.S.
T5.0	T5.0 Teflon faced flange, 5", 316 S.S.
H5.0	H5.0 Flange, 5", Hastelloy
F6.0	F6.0 Flange, 6", 316 S.S.
T6.0	T6.0 Teflon faced flange, 6", 316 S.S.
H6.0	H6.0 Flange, 6", Hastelloy

Part Number	MN- Special Features
00	None
S2	Sensitivity sleeve, 2"
90	90° downward bend on probe active section
H0	High temp 12" lagging extension (GT, GC, GTH)
S5	Sensitivity sleeve, 5"