

These level controls can eliminate spills, material waste and downtime by preventing bin overflows, plugged chutes and empty bins. They work equally well as high- or low-level indicators in plastic, food, chemical, mineral slurry and many other applications, solids or liquids.

This gives you the flexibility and control you need to maximize the performance of your process to improve your bottom line.

## Thermo Scientific Ramsey CAP Series Capacitance Level Controls



### Features & Benefits

- Extreme sensitivity
- No radio frequency interference
- Quick-set calibration provides simple selection of detection sensitivity
- Calibration stability from -40°C to +85°C (-40°F to +185°F)
- UL listed/CSA approved
- NEMA 4X
- Hazardous area approvals
- Shielded probes with plastic sleeves suitable for most solids, liquids and slurries
- No false readings from sidewall build-up
- Unsurpassed static discharge protection

The Thermo Scientific Ramsey CAP Series capacitance level controls are designed for difficult point level monitoring applications of bulk solid materials in bins, vessels and chutes. This design also makes them excellent for use in liquids and slurries.

They work equally well as high- or low-level indicators in plastic, food, chemical, mineral slurry, and many other material applications.

These capacitance level controls detect the presence or absence of material by sensing the difference in dielectric constant between the material stored in the vessel and empty air. To detect these sometimes small changes, the sensors use a unique detection circuit that provides the highest available sensitivity. Also, unlike other capacitance sensors, the operating frequency of the CAP Series is well below the RF level so it is immune to RF interference and is not subject to FCC regulation.

The CAP series is designed to be flexible and easy to use in your facility. The screw-off cover provides easy access to the system electronics. Calibration is quick and simple using adjustable potentiometers. Other control settings, such as a high low/low fail safe selector switch and a time delay that is adjustable up to 30 seconds, provide the flexibility needed for all of your process or material control situations.

These level controls have many features to prevent false indications. The adjustable time delay minimizes false indications from sudden material shifts or splashing. Active shielding eliminates false indications caused by material build-up and plastic sleeves prevent false indications from wet or conductive material coatings. This makes the CAP Series level controls excellent options for use with dusty or sticky materials.

### Robust Electronics

The CAP Series capacitance level controls have the most robust electronics available in the industry. A unique time constant detector with a reference circuit and a measurement circuit give these units extreme sensitivity to detect difficult materials with very low dielectric constants. It also allows the sensing field to operate at 6 khz, well below the RF band, making these units immune to RF interference from portable radios or other sources. The utilization of a reference circuit makes these devices immune to calibration changes due to temperature. Once set, the calibration will stay the same over the entire operating temperature range, making constant recalibrations unnecessary. For added protection for your processes four levels of static discharge protection are built into the units, providing unsurpassed protection.

### Rugged Design

The ruggedly built units are able to withstand the toughest conditions encountered in material handling situations. The robust housings are die cast aluminum with a powder coat finish. All rod style probes are made from 3/8-inch diameter 316 stainless steel to withstand more abuse and provide greater sensitivity.

### Easy to Use

The CAP Series is designed to be easy to use in your facility. The screw-off cover provides easy access to the system electronics. Calibration is simply and quickly performed by using the single turn coarse and fine adjustment potentiometers. Other control settings provide the flexibility needed for any process or material control situations. The high/low fail safe selector switch allows the sensors to be set for fail-safe at low when material is absent, or at high when material is present. When a power interruption occurs, the control will indicate the condition that the user deems safe for the application. The time delay is easily adjustable up to 30 seconds with a potentiometer. This allows the user to minimize false indications from sudden material shifts or splashing liquids.

### Active Shielding

The diagram illustrates the active shielding technology. A probe is shown on the left with a sensing field (represented by concentric arcs) extending to the right. A layer of material buildup is shown on the probe tip. A shielding field (represented by a wavy line) is emitted from the probe tip, pushing the material buildup away from the sensing field. Labels include 'Shielding Field', 'Material Buildup', and 'Sensing Field'.

All Ramsey CAP Series level controls feature an active shielding technology to eliminate false readings from material build-up. The shield emits a competing signal which forces the sensing field farther out away from the probe body. This means the sensor is examining a larger area around the probe and is able to look past any material build-up directly on the probe.

Additionally, some probes have plastic sleeves to help prevent false readings. The plastic sleeves stop damp or conductive material build-up from shorting out the sensing field signal.

### Electronics Options

CAP Series electronics come in four basic versions. Almost any probe combination can be ordered with either the standard CAP-AC or one of the other versions.

	Switch selectable 120/240 VAC power supply	Universal power supply for 24 to 24 VAC or VDC	For combustible dust environments	For explosive gas environments
<b>CAP-AC (Standard)</b>	●		●	
<b>CAP-ACX (Optional)</b>	●		●	●
<b>CAP-DC (Optional)</b>		●	●	
<b>CAP-DCX (Optional)</b>		●	●	●

## Standard Probe Assemblies

**CAP-AC-SL**

- 270 mm (10.63 in) long probe
- Active shielding
- Delrin® sleeve
- Useful for point level detection of most materials in bins, tanks, chutes and spouts

**CAP-AC-ST**

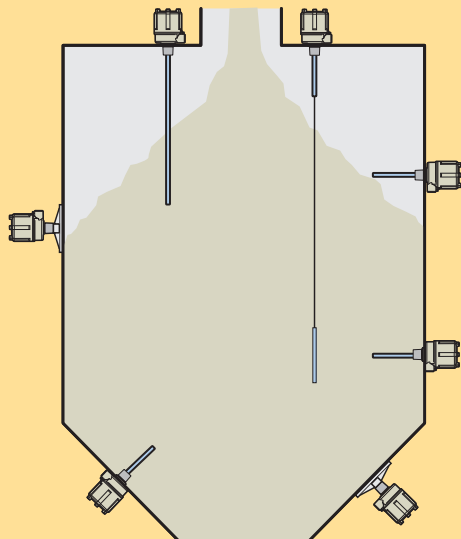
- 165.10 mm (6.5 in) long probe
- Active shielding
- Delrin sleeve
- Useful in low level applications or tight spaces where minimum probe intrusion is needed

**CAP-AC-24C**

- 609.60 mm (24 in) long bare stainless steel probe
- Active shielding
- Short Delrin sleeve over the active shield portion of the probe only
- Can be field cut to 203.20 mm (8 in) long or extended to 2.44 m (8 ft)
- Versatile model is especially useful in top mount applications

**CAP-AC-FL**

- Flush mount probe
- Active shielding
- Polyethylene face
- Useful where probe intrusion is undesirable
- Adapters available for mounting on thick wall vessels

**Many Possible Options**

Besides the standard models shown above many other assemblies are possible, including:

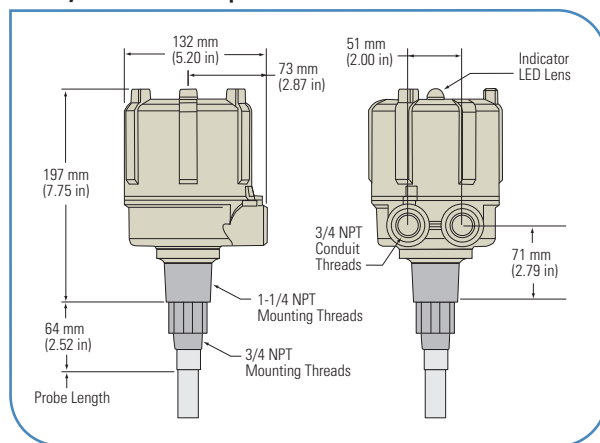
- Optional control electronics
- Custom order probe lengths
- Teflon® sleeves
- Extended length active shielding for mounting through a nozzle or standpipe
- Completely bare probes
- Flexible SST cable probes
- High temperature options
- Fittings with different mounting
- Remote mount electronics
- Food grade options
- Contact Thermo Fisher Scientific for more information on available options.

## Thermo Scientific Ramsey CAP Series

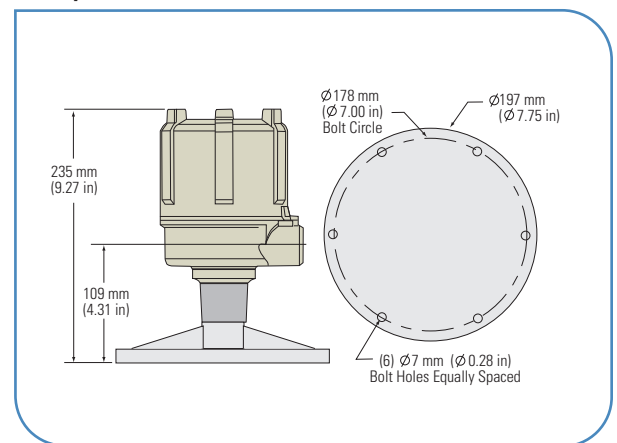
### General Specifications

Input Power	CAP-AC / CAP-ACX	120 / 240 VAC Switch Selectable
	CAP-DC / CAP-DCX	24 to 240 VAC/VDC
Output Relay	All Models	(1) DPDT—10 Amp @ 250 VAC; Switch selectable High/Low fail safe modes
Sensitivity Setting	All Models	1 to 10 picofarads, quick-set single turn coarse and fine potentiometers
Time Delay	All Models	Adjustable up to 30 seconds
Status Indicator	CAP-AC / CAP-DC	Internal and External LED
	CAP-ACX / CAP-DCX	Internal LED only
Enclosure	All Models	Cast aluminum with white powder coat finish, NEMA 4X; Three turn screw-on cover
Temperature	All Models	-40°C to +85°C (-40°F to 185°F) ambient temperatures
Conduit Entry	All Models	Dual 3/4" NPT
Hazardous Area Ratings	CAP-AC / CAP-DC	CSA - Class II, Div 1 & 2, Groups E, F, & G
	CAP-ACX / CAP-DCX	CSA—Class I, Div 1 & 2, Groups C & D
		CSA - Class II, Div 1 & 2, Groups E, F, & G

### Ramsey CAP Series with probe



### Ramsey CAP Series flush mount



### Standard Probe Assemblies Specifications

Probe	CAP-AC-SL	5/8" 316 SST rod, 10.63" long w/ Delrin Sleeve
	CAP-AC-ST	5/8" 316 SST rod, 6.5" long w/ Delrin Sleeve
	CAP-AC-24C	5/8" 316 SST rod, 24" long, bare
	CAP-AC-FL	Flush Mount, polyethylene face
Mounting	CAP-AC-SL	1-1/4" NPT and 3/4" NPT on 316 SST fitting
	CAP-AC-ST	1-1/4" NPT and 3/4" NPT on 316 SST fitting
	CAP-AC-24C	1-1/4" NPT and 3/4" NPT on 316 SST fitting
	CAP-AC-FL	Flush mount, Ø5.75" hole; Ø7.00" bolt circle
Pressure	CAP-AC-SL	50 PSI using 1-1/4" mount, 500 PSI using 3/4" mount
	CAP-AC-ST	50 PSI using 1-1/4" mount, 500 PSI using 3/4" mount
	CAP-AC-24C	50 PSI using 1-1/4" mount, 500 PSI using 3/4" mount
	CAP-AC-FL	250 PSI, flush mount
Process Temperature	CAP-AC-SL	121°C (250°F) standard or 260°C (500°F) with optional Teflon sleeve
	CAP-AC-ST	121°C (250°F) standard or 260°C (500°F) with optional Teflon sleeve
	CAP-AC-24C	121°C (250°F)
	CAP-AC-FL	65°C (150°F) standard or 450°F optional high temp model with Teflon face

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