

Cap Point 520

DATA SHEET

R.F. Capacitance Liquid-Bulk Level



FUNCTION

Point level control of liquids or bulk solids
High and low level control (single unit)
Out of limits indicator, control

TYPICAL USES

High Level Alarm or Control
Low Level Alarm or Control
Pump/Conveyor Control

PRIMARY AREAS OF APPLICATION

The CAP Point 520 is an ideal solution for many level control problems. Most liquids are potential applications for the Cap Point 520 as are free flowing granular products.

Liquids - Petroleum products

Eg: Crude oil, refined oil, kerosene, ethylene glycol, gasoline, etc.

Liquids - Organic solvents

Eg: Ethylene, methyl and isopropyl alcohol, as well as toluene, heptane, turpentine, acetone, etc.

Liquids - Conductive

Eg: Water, acids, diluted acids (within the limits of probe sensor gland housing and insulation), water with impurities.

Slurries

Eg: Coal/water, lime/water, virtually any conductive slurry.

Liquids - Interface

Eg: Petroleum products and water.

Bulk Solids

Eg: Cereal grains, plastic pellets and powders, sand ores, crushed coal, coke and most free flowing granular products.

FEATURES

- Long cable lengths
Cables between pre-amplifier and amplifier may be up to 800 feet.
- Versatile
A single amplifier with probe sensor can provide 2 independent relay outputs.
- Fail-Safe
A simple field selectable DIP Switch determines the high or low fail-safe mode.
- Rugged
Totally solid state electronics. Probe pre-amplifier mounted in explosion proof cast Aluminum housing. Remote amplifier mounted in NEMA 4X housing.
- Versatile power supply
The standard unit accepts 120, 240 Volts AC, or low voltage 15 to 24 DC inputs.
- Immune to static/Immune to RFI
The probe input circuit is protected from static electrical discharges. The circuit is immune to RFI.
- Immune to product build-up
A unique circuit used in the pre-amplifier provides immunity to product build-up of conductive or non-conductive materials.
- High sensitivity
Maximum sensitivity is 0.5 pfd. The proper selection of high gain probe sensors insures that the Cap Point 520 will reliably detect and control low dielectric materials.
- Independent set point and differential adjust
Set point and differential are non-interacting and independent adjustments. Adjustments are located in remote housing.
- Versatile
Probe sensors may be installed horizontally or vertically.
- Calibration
All calibration adjustments are located in remote housing.



PRINCIPLE OF OPERATION

The Delavan R.F. capacitance Cap Point 520 system consists of a Pre-amplifier mounted in a cast aluminum explosion proof housing. This housing normally is integrally mounted on the rear of the sensor probe.

The system uses a remote amplifier that can be mounted as much as 800 feet from probe sensor location. All calibration and field adjustments are made at remote location.

Probes are manufactured in a variety of insulating materials and types of metal. The active length of the probe will vary subject to the specific application of the system. The probe may be mounted in a vertical or horizontal position. Normally, the probe is threaded into a process vessel with a 3/4" or 1" N.P.T. connection. The probe sensor is energized with a radio frequency signal (about 2 MHz). When the process level changes, a change of capacitance occurs resulting in a small change in frequency. This change is compared with preset values in the electronic measuring circuit. After proper amplification, this signal is used to provide a change of state condition which operates the relay.

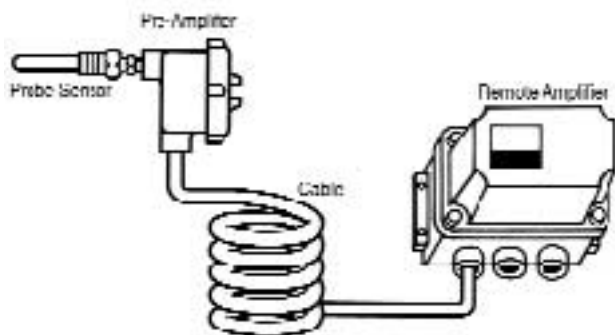
The Cap Point 520 system is available with a single relay with DPDT contacts or two relays with 1 set of SPDT contacts each. These relays when used, can be independently calibrated in the field.

The Cap Point 520 system is factory calibrated to operate with a fixed 0.5 second time delay. An option is available that provides a field adjustment from 50 milliseconds to 10 seconds. A pair of DIP switches are provided to set the instrument to operate in a high or low fail-safe mode.

Multi-turn potentiometers are provided for calibration of set-point and differential. These two adjustments, along with range changes of the DIP switch, permit the application of the Cap Point 520 to almost any point level situation. An important feature is the ZERO Set-point and Differential adjustments. They are non-interacting and independent of each other.

A simple step-by-step calibration permits the application of this system to almost any level control situation. The flexible calibration procedure can be made with level changes from empty to full or full to empty.

Typical System
CAP POINT 520



SPECIFICATIONS

Supply Voltage	Nominal 115 Volts AC 230 Volts AC 15-24 DC	Absolute Limits 90-135 Volts AC 180-270 Volts AC
Power	Less than 6 volt-amperes	
Frequency, AC Power	50-60Hz, 40Hz minimum	
Fail-safe Switch Selectable	High Level Fail-Safe Position: Relay is de-energized when liquid is present Low Level Fail-Safe Position: Relay is de-energized when liquid is not present	
Model 520-1	Single Relay, 2 Form C DPDT Switches	
Model 520-2 each	Two Relays, 1 Form C SPDT Switch	
Relay Ratings	5 amp @ 115 Volts AC Non-inductive 2.5 amp @ 230 Volts AC Non-inductive 3 amp @ 26 Volts DC Non-inductive	
Indicators Status (1 Set each Relay)	Two, light emitting diodes (LED) RED - illuminated when probe capacitance is greater than set-point YELLOW - illuminated when relay is energized	
Differential	0.5 pfd minimum to 100,000 pfd, maximum 0.08 inches of water to 200 feet of water (field adjustable)	
Temperature Range (Amplifiers)	-40°F to +160°F (-40°C to +70°C)	
Stability	± 0.01%/°F	
Sensitivity	± 1% of base capacitance up to 1,000 pF	
Other Features	Set point and differential adjustments are completely independent of each other	
Time Delay	Standard — 0.5 second on make, fixed Optional — Variable 50 milliseconds to 10 seconds, adjustable	

PRE-AMPLIFIER

Cast Aluminum with Fused Polyester Finish	Meets NEMA 4, 5, 7, 9, 12; NEC Class I — Group C, D; NEC Class II — Group E, F, G
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REMOTE AMPLIFIER

Glass Reinforced Polyester Enclosure, S.S. Trim	NEMA 4X
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HOW TO ORDER

520-1	Single Relay or
520-2	Two Relay
Specify cable length	

DELAVAN Process Instrumentation
an [REDACTED] Company

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