

# Capacitive Proximity Sensors

## Protection Against:

- Electrostatic discharge
- Burst
- Airborne RF
- Wire-conducted noise
- High energy transients

**TRIPLESIELD™**

M12 Ø18  
M18  
M30  
Flat pack  
Ø32



# The New Generation of Intelligent

The new generation of intelligent capacitive sensors, combined with the innovative Tripleshield™ technology, have the features that will lead the way for the capacitive technology of the future: One capacitive sensor – thousands of applications. Like all previous generations of the patented Tripleshield™ series, the highest levels of protection against electrostatic discharge (ESD), RF and wire conducted noise, surges, and transient voltages are present. The new generation is designed with the newest microprocessor-based technology, allowing the flexibility for any features that may be required, including timing functions, filters, pulsed outputs, and even logical expressions. With all of the features available, there is no limit to applications that can be solved. CARLO GAVAZZI Tripleshield™ capacitive sensors – the capacitive leader for the 21st century.

**Teach-in** The single most important new feature is the innovative teach-in function. The user now has complete control over the sensing range, foreground detection, background detection, and hysteresis. With the simple push of a button, the user can program the sensors to detect virtually any material, whether directly or indirectly (i.e. detecting material inside of a container). The user can also program the sensor to ignore certain materials! All of these features can be programmed remotely via a remote teach wire, so it is possible to program the sensor from another location! Additionally, a self-teach unit is available, that automatically sets sensitivity levels when power is applied, offering a true tamper-proof design.



## Humidity Compensation Technology

Advanced humidity compensation technology allows the sensor to continually monitor and compensate for condensation on the face of the non-flush mounted sensor – guaranteeing accurate, consistent sensing!



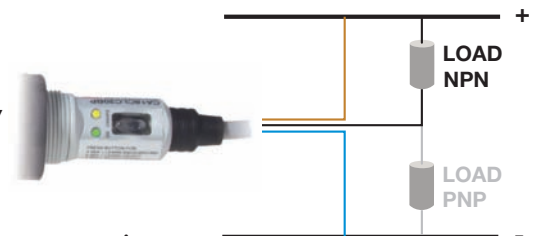
## Dirt and Moisture Compensation

Since most sensing environments are far from perfect or clean, the possibility exists that the sensor will be exposed to dirt and moisture, which could accumulate on the face of the sensor. With standard capacitive sensors, this could lead to false detection outputs, causing great inconvenience to the machine operator, through repeated false outputs and sensitivity adjustments. With this new generation of the Tripleshield™, we have incorporated dirt and moisture compensation technology, so the sensor will automatically adjust itself to changing levels of dirt and moisture accumulation on the sensing face, meaning more productivity for the user!



## NPN or PNP and NO or NC

The new generation Tripleshield™ sensors will now automatically detect the circuit type and adjust themselves to accommodate either an NPN or PNP load. Furthermore, the output configuration (NC or NO) can easily be selected using the push-button, meaning set up is greatly simplified!



# Capacitive Sensors

## Sensing Distance

Sensing ranges have been dramatically increased with the new generation of the Tripleshield™.

### M12

Flush mount – 4mm  
Non-flush mount – 8mm

### M18

Flush mount – 8mm  
Non-flush mount – 12mm

### M30

Flush mount – 16mm  
Non-flush mount – 30mm



## TRIPLESIELD™ The Ultimate in Sensor Protection

Thanks to the revolutionary technology from Carlo Gavazzi, the Tripleshield™ sensors are protected against disturbances caused by high levels of electrostatic discharge (ESD) up to 40 kV. The Tripleshield™ technology also protects the sensor against noise from inverters, mobile phones, wire conducted noise, surge and contactor noise. This high level of protection assures that the Tripleshield™ sensors will operate continuously and reliably in the most difficult of environments, where most sensors would fail.

Test	Standard	Product Standard EN 60947-5-2	Generic Immunity Standard Industrial Environment EN 50082-2	Carlo Gavazzi Tripleshield™ Sensor Protection
<b>ESD</b>	EN 61000-4-2 (IEC 1000-4-2)	4 kV cd/8 kV ad <sup>1)</sup>	4 kV cd/8 kV ad <sup>1)</sup>	<b>Up to 40 kV cd/ad<sup>1)</sup></b>
<b>RF Radiated</b>	EN 61000-4-3 (IEC 1000-4-3)	3 V/m 80 - 1000 MHz	10 V/m 80 - 1000 MHz	<b>&gt; 15 V/m</b>
<b>Burst</b>	EN 61000-4-4 (IEC 1000-4-4)	1 kV	2 kV	<b>Up to 4 kV</b>
<b>RF Wire Conducted</b>	EN 61000-4-6 (IEC 1000-4-6)	—	10 V/m 0.15 - 80 MHz	<b>&gt; 10 Vrms<sup>2)</sup></b>
<b>Surge</b>	IEC 255-5	1 kV, 500 ohm	—	<b>2.5 kV, 500 ohm</b>

1) cd = contact discharge  
ad = air discharge

2) For grounded metal housing. For other types: > 5 Vrms

## 3-Wire, 10-40 VDC

- **TRIPLESHIELD™** protection
- **TEACH-IN** function
- Remote setup through fourth wire
- Alarm output
- Automatic dirt and moisture compensation
- Humidity compensation circuit
- Automatic detection of NPN or PNP load
- Selectable make or break switching
- Thermoplastic polyester housing
- Plug or cable versions
- Ideal for the plastics, chemical, wood, ceramics, glass and packaging industries



## 4-wire, 10-40 VDC

- **TRIPLESHIELD™** protection
- Adjustable sensing distance
- Selectable make and break switching
- Flush or non-flush types
- Thermoplastic polyester or stainless steel housing
- Plug or cable versions
- Ideal for the plastics, chemical, wood, ceramics, glass and packaging industries



## 4-wire, 10-40 VDC

- **TRIPLESHIELD™** protection
- Adjustable sensing distance
- Selectable make and break switching
- Teflon, PVC or Polypropylene housing
- Ideal for the chemical, semiconductor and food & beverage industries



## 2-wire, 20-250 VAC

- TRIPLESHIELD™ protection
- Adjustable sensing distance
- SCR output
- Selectable make or break switching
- Flush or non-flush types
- Thermoplastic polyester or stainless steel housing
- Plug or cable versions
- Ideal for the chemical, semiconductor and food & beverage industries

Ø18  
M18  
M30  
Ø32



## 2-wire, 20-250 VAC/DC

- TRIPLESHIELD™ protection
- Adjustable sensing distance
- Humidity compensation circuit
- Power MOSFET output
- Selectable make or break switching
- Flush or non-flush types
- Thermoplastic polyester housing
- Plug or cable versions
- Ideal for the plastics, chemical, wood, ceramics, glass and packaging industries

M30



## 3 or 4-wire, 10-40 VDC

- TRIPLESHIELD™ protection
- Adjustable sensing distance
- Humidity compensation circuit  
*(in models with the Teach-in function)*
- Selectable make and/or break switching
- Thermoplastic polyester housing
- Plug or cable versions
- Ideal for the plastics, chemical, wood, ceramics, glass and packaging industries

Flat  
Packs



# ADVANTAGES OF CAPACITIVE SENSORS

Capacitive sensors detect all conductive and non-conductive materials, such as water, glass, plastics, and metals – without physical contact. Adjustable sensitivity makes it possible to “tune out” mounting hardware or intermediate barrier materials.

## TYPICAL APPLICATIONS

- Grain and plastic pellet detection
- Small parts detection and counting
- Liquid level detection
- Detecting or counting objects
- Paper or plastic strip detection
- Moisture and wet area detection
- Level control in non-metallic containers
- Level control/monitoring through a sight glass
- Presence and thickness of lumber
- Detecting or counting small plastic or metal parts moving through a tube

### PLASTICS INDUSTRY

- Dryers
- Vacuum Systems
- Hopper Level Control
- Conveyor Systems



### AGRICULTURE

- Grain Silos
- Automatic Feeding Systems
- Irrigation Systems



### WOOD INDUSTRY

- Window and Door Framing
- Sawdust/Wood Chip Level Control
- Wood Pallet Production



### MATERIAL HANDLING AND CONVEYOR INDUSTRY








- Wooden Pallet Detection on Conveyors
- Package Inspection
- Level Control for Filling Lines



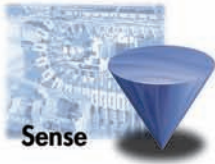
### FOOD AND BEVERAGE

- Level Detection in Bottles and Packages
- Position Control of Packaging
- Pallet Detection



Type number	Type	Output	Supply voltage	Connection		Sensing distance
<b>Thermoplastic polyester housing</b>						
CA18CLF08NA (M1)	4-wire DC	NPN - NO/NC	10-40 VDC	Cable (or Plug M12)		3-8mm Flush
CA18CLF08PA (M1)	4-wire DC	PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		
CA18CLN12NA (M1)	4-wire DC	NPN - NO/NC	10-40 VDC	Cable (or Plug M12)		3-12mm Non-flush
CA18CLN12PA (M1)	4-wire DC	PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		
CB18CLN12NA	4-wire DC	NPN - NO/NC	10-40 VDC	Cable		
CB18CLN12PA	4-wire DC	PNP - NO/NC	10-40 VDC	Cable		
EC3016NPAPL (-1)	4-wire DC	NPN - NO/NC	10-40 VDC	Cable (or Plug M12)		2-16 mm Flush
EC3016PPAPL (-1)	4-wire DC	PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		
EC3025NPAPL (-1)	4-wire DC	NPN - NO/NC	10-40 VDC	Cable (or Plug M12)		4-25 mm Non-flush
EC3025PPAPL (-1)	4-wire DC	PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		
CA18CLF08TC (M6)	2-wire AC	SCR - NC	20-250 VAC	Cable (or Plug M12)		3-8mm Flush
CA18CLF08TO (M6)	2-wire AC	SCR - NO	20-250 VAC	Cable (or Plug M12)		
CA18CLN12TC (M6)	2-wire AC	SCR - NC	20-250 VAC	Cable (or Plug M12)		3-12mm Non-flush
CA18CLN12TO (M6)	2-wire AC	SCR - NO	20-250 VAC	Cable (or Plug M12)		
CB18CLN12TOFT	2-wire AC w/timer	SCR - NO	20-250 VAC	Cable		
CB18CLN12TCFT	2-wire AC w/timer	SCR - NO	20-250 VAC	Cable		
EC3016TBAPL (-6)	2-wire AC	SCR - NO/NC	20-250 VAC	Cable (or Plug M12)		2-16 mm Flush
EC3025TBAPL (-6)	2-wire AC	SCR - NO/NC	20-250 VAC	Cable (or Plug M12)		4-25 mm Non-flush
CA30CLF16CP (M6)	2-wire AC/DC	Power MOSFET - NO/NC	20-250 VAC/DC	Cable (or Plug M12)		2-16mm Flush
CA30CLN25CP (M6)	2-wire AC/DC	Power MOSFET - NO/NC	20-250 VAC/DC	Cable (or Plug M12)		2-25mm Non-flush
CB32CLN20TO	2-wire AC	SCR - NO	20-250 VAC/DC	Cable		2-20mm Non-flush
CB32CLN20TOFT	2-wire AC w/timer	SCR - NO	20-250 VAC/DC	Cable		2-20mm Non-flush
CB32CLN20TC	2-wire AC	SCR - NC	20-250 VAC/DC	Cable		2-20mm Non-flush
CB32CLN20TCFT	2-wire AC w/timer	SCR - NC	20-250 VAC/DC	Cable		2-20mm Non-flush
CA12CLC08BP (M1)	<b>Teach-in</b>	NPN/PNP - NO/NC	10-40VDC	Cable (or Plug M12)		0.5-8mm Flush
CA18CLC12BP (M1)	<b>Teach-in</b>	NPN/PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		0.5-12mm Flush
CA18CLL12BP (M1)	<b>Teach-in</b>	NPN/PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		
CA30CLC30BP (M1)	<b>Teach-in</b>	NPN/PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		0.5-30mm Flush
CA30CLL30BP (M1)	<b>Teach-in</b>	NPN/PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		0.5-30mm Flush
CA30CLN25BP (M1)	<b>Self-teach</b>	NPN/PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		0.5-25mm Non-Flush
CD46CNC10BP	<b>Teach-in</b>	NPN/PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		0.5-10mm Flush
EC5525NPAP (-1)	Flat pack	NPN - NO/NC	10-40 VDC	Cable (or Plug M12)		4-25 mm Universal flush
EC5525PPAP (-1)	Flat pack	PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		and non-flush
<b>Stainless steel housing</b>						
EC3016NPASL (-1)	4-wire DC	NPN - NO/NC	10-40 VDC	Cable (or Plug M12)		2-16 mm Flush
EC3016PPASL (-1)	4-wire DC	PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		
EC3025NPASL (-1)	4-wire DC	NPN - NO/NC	10-40 VDC	Cable (or Plug M12)		4-25 mm Non-flush
EC3025PPASL (-1)	4-wire DC	PNP - NO/NC	10-40 VDC	Cable (or Plug M12)		
EC3016TBASL (-6)	2-wire AC	SCR - NO/NC	20-250 VAC	Cable (or Plug M12)		2-16 mm Flush
EC3025TBASL (-6)	2-wire AC	SCR - NO/NC	20-250 VAC	Cable (or Plug M12)		4-25 mm Non-flush
<b>Teflon housing</b>						
CA18FLF08NA	Teflon housing	NPN - NO/NC	10-40 VDC	Cable		3-8mm Flush
CA18FLF08PA	Teflon housing	PNP - NO/NC	10-40 VDC	Cable		
<b>PVC housing</b>						
CA18GLF08NA	PVC housing	NPN - NO/NC	10-40 VDC	Cable		3-8mm Flush
CA18GLF08PA	PVC housing	PNP - NO/NC	10-40 VDC	Cable		
<b>Polypropylene housing</b>						
CA18HLF08NA	Polypropylene housing	NPN - NO/NC	10-40 VDC	Cable		3-8mm Flush
CA18HLF08PA	Polypropylene housing	PNP - NO/NC	10-40 VDC	Cable		
CA18HLN12NA	Polypropylene housing	NPN - NO/NC	10-40 VDC	Cable		3-12mm Non-flush
CA18HLN12PA	Polypropylene housing	PNP - NO/NC	10-40 VDC	Cable		

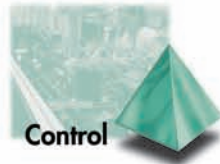
# The Complete Product Package



**Sense**  
 Inductive Proximity Sensors  
 Tripleshield™ Capacitive Sensors  
 Photoelectric Sensors  
 Inductive Loop Detectors  
 Ultrasonic Sensors  
 Level Sensors  
 Limit Switches  
 Magnetic Switches



**Switch**  
 Solid State Relays  
 Contactors and Overloads  
 Manual Motor Starters  
 Motor Controllers  
 Variable Frequency Drives  
 Electromechanical Relays  
 Pilot Devices  
 Cam Switches  
 Rotary Disconnects



**Control**  
 Energy Management  
 Digital Panel Meters  
 PID Controllers  
 Time Delay Relays  
 Current Monitoring Relays  
 Voltage Monitoring Relays  
 Three Phase Monitoring Relays  
 Signal Conditioners  
 Current Transformers  
 Enclosures



**Safety**  
 Light Curtains  
 Control Modules  
 Interlock Switches  
 Mat Systems  
 Magnetic Sensors



**Fieldbus**  
 Dupline Field & Installation Bus  
 Building Automation Systems  
 Elevator Systems

## A Global Force in Industrial Automation

**USA**  
**CARLO GAVAZZI INC.**  
 750 Hastings Lane  
 Buffalo Grove, IL 60089  
 Tel 847.465.6100  
 Fax 847.465.7373  
[Sales@CarloGavazzi.com](mailto:Sales@CarloGavazzi.com)

**CANADA**  
**CARLO GAVAZZI (CANADA) INC**  
 2660 Meadowvale Boulevard  
 Mississauga, Ontario L5N 6M6  
 Tel 905.542.0979, Fax 905.542.2248  
**CARLO GAVAZZI (CANADA) LTÉE**  
 3777 Boulevard du Tricentenaire  
 Montréal, Quebec H1B 5W3  
 Tel 514.644.2544, Fax 514.644.2808  
[Gavazzi@CarloGavazzi.com](mailto:Gavazzi@CarloGavazzi.com)

CARLO GAVAZZI has a multitude of sales offices spanning North America (not to mention our hundreds of distributors). Therefore, we can be viewed as "your local automation resource" - assisting you every step of the way in finding the proper solution for your various application requirements. Naturally, our job is greatly simplified as we have such a vast range of solutions to offer you via our comprehensive product package.

Our worldwide sales offices make us an ideal business partner, especially for manufacturers of exported machinery, as our products are available locally and they are CE marked.

Argentina • Australia • Austria • Bahrain • Belgium • Bolivia • Bosnia • Brazil • Brunei • Bulgaria • Canada  
 Chile • China • Columbia • Croatia • Cyprus • Czech • Denmark • Dominican Republic • Egypt • Estonia  
 Finland • France • Germany • Greece • Hungary • Hong Kong • Iceland • India • Indonesia • Iran • Ireland • Italy • Japan  
 Jordan • Kenya • Korea • Kuwait • Lebanon • Malaysia • Malta • Maroc • Mauritius • Mexico • Netherlands  
 New Zealand • Norway • Pakistan • Papua New Guinea • Paraguay • Peru • Philippines • Poland  
 Portugal • Qatar • Romania • Russia • Saudi Arabia • Serbia • Singapore • Slovakia • Slovenia • South Africa  
 Spain • Sultanate of Oman • Sweden • Switzerland • Taiwan • Thailand • Tunisie • Turkey  
 Ukraine • United Arab Emirates • United Kingdom • Uruguay • United States of America • Venezuela • Vietnam

• Regional / Area Sales Office  
 • District Sales Office

Capacitive Proximity Brochure 2/07

Your Authorized Distributor:

**CARLO GAVAZZI**  
 Automation Components

**USA** Phone: 847.465.6100 Fax: 800.222.2659  
**Canada** Ontario: 905.542.0979 Quebec: 514.644.2544  
**Website** [www.GavazziOnline.com](http://www.GavazziOnline.com)  
**Email** [Sales@CarloGavazzi.com](mailto:Sales@CarloGavazzi.com)

**CARLO GAVAZZI**

Visit our website for downloadable data sheets,  
 brochures & pricing: [www.GavazziOnline.com](http://www.GavazziOnline.com)