CARLO GAVAZZI
Automation Components

CARLO GAVAZZI

ICS series - Inductive proximity sensors

Sensors

ICS12/18/30
Inductive sensors

In applications like food production where harsh chemicals are used during cleaning processes, a standard sensor would corrode and fail prematurely. The new series of ICS inductive proximity sensors feature an extremely robust design with a superior resistance to high pressure and high temperature cleaning processes. All the materials used are chemically compatible with most of the industrial cleaning solutions used in Food & Beverage applications.

The new ICS12, ICS18 and ICS30 inductive proximity DC sensors are ECOLAB certified and rated to IP67, IP68 and IP69K standards. Thanks to the built-in microcontroller, all sensors are individually compensated and ensure accurate and repeated operation over the entire temperature range.

Washdown series

Carlo Gavazzi's new ICS series family of inductive proximity sensors represents the ideal solution for demanding applications characterized by harsh environmental conditions.

The new range includes:
- M12, M18, M30 housings
- Standard and extended sensing range from 2 to 22 mm

All sensors come with:
- High-grade stainless steel housing (AISI 316L)
- IP67, IP68 and IP69K ratings
- Short-circuit, reverse polarity and transient protection

Several installation possibilities:
- Flush or non-flush versions
- M12 disconnect plug
- NPN or PNP output types with NO or NC output functions

Excellent performances:
- Increased operating temperature between -40°C and +80°C (-40°F and +176°F) for ICS12 and ICS18
- Increased operating temperature between -40°C and +85°C (-40°F and +185°F) for ICS30
- High detection speed and operating frequency
- Gold-plated pins ensure reliable connection in any condition

Approvals:
- CE (EN60947-5-2)
- cULus (UL508)
- ECOLAB certified

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Features and benefits

ECOLAB and FDA-certified

Independent tests were performed by ECOLAB on the ICS inductive proximity sensors, with permanent full immersion for 28 days, in detergents and disinfectant solutions commonly used in food and beverage industry, in a concentration 30% higher than those normally re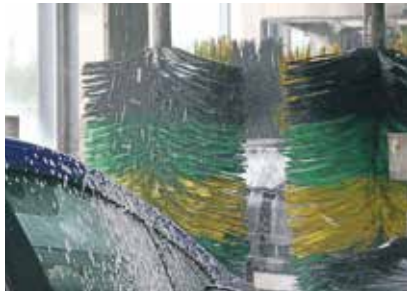commended. The ICS sensors test results confirmed that they are perfectly compatible with these highly aggressive chemical agents. Furthermore, the plastic cap of the sensors is constructed of FDA-certified material for the food and beverage industry.

Harsh environment

ICS12, ICS18 and ICS30 inductive sensors are ideally suited for reliable detection even under extreme environmental conditions. They have industry standard high grade stainless steel housing (AISI 316L) and they fulfil the most stringent requirements concerning impermeability, thanks to the certified IP69K rating. ICS sensors are built to withstand high pressure up to 100 bar (1,450 psi) and high temperature water at 80°C (176°F) washdown. The extended sensing distance allows the sensor to be mounted at a higher distance from the target, thus reducing the risk of breakdowns, thus providing a lower failure rate.

Assured traceability and best application control

The traceability of the new ICS family is guaranteed by the permanently legible laser engraved part number and serial number on the housing of the sensor, ensuring the information stays intact after any cleaning process. The LED (4x90° for ICS12 and ICS18) is highly and easily visible from any direction. In addition to the indication of the switching state, when the LED blinks with a frequency of 2Hz, it indicates a short-circuit or overload condition, thus simplifying troubleshooting.

ICS family

- High grade stainless steel housing
- Easy-to-view LED indication
- Laser printing
- ECOLAB certified
- FDA-certified plastic
- IP68 and IP69K rating
- High resistance Grilamid sensor back (M30 only)

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Inductive sensors

The ideal cordset

For an integrated and reliable solution, it is very important to use the right accessory. Our CONB14NF washdown series connectors assure the highest resistance against aggressive chemicals, detergents and acids and are extremely watertight.

They are characterized by stainless steel threaded joint and by industrial protection class IP67, IP68 and IP69K, when in a locked position with the sensor. They have an operating temperature between -40°C and +90°C (-40°F and +194°F) and are UL and ECOLAB certified.

They feature an M12 female connector and molded cable, straight and angle version with 2 or 5 m cable, NPN or PNP versions with or without LED.

Applications

Agriculture and heavy mobile equipment

The installation of high reliability electronic components in agricultural and earth-moving vehicles is critical, due to the harsh conditions of the environment. Agricultural machineries are exposed to difficult outdoor conditions, such as wide temperature variations, high stress due to cleaning processes with high pressure and high temperature steam jets. The new ICS sensors provide reliable position detection of the moving parts even in such harsh environment thanks to the solid construction and excellent tightness with certified IP68 and IP69K ratings and to the wide operating temperature range. The high operating frequency also allows for high speed detection of a rotating gear.

Packaging and food & beverage

Companies that manufacture packaging machines for food need the right electronic components to assure the best application control and the continuous operation also after the periodic harsh cleaning process. The new ICS washdown sensors have been designed for food & beverage applications. The ECOLAB certification ensures the resistance to industrial cleaning agents, such as alkaline or chlorine foam and acid foam disinfectants. The material used for the plastic cap is FDA certified. The robust design along with the IP68 and IP69K protection ratings, make the ICS the optimal choice in these demanding applications.

Renewable energy

A solar tracker keeps a solar photovoltaic panel oriented toward the sun throughout the day in order to maximize energy output. Inductive sensors can be used to provide feedback on the position of the tracker during the normal working function or in some particular situations, such as wind security position. ICS proximity sensors ensure maximum performance, durability, and reliability in any condition, thanks to a robust mechanical design and to the onboard advanced microprocessor, that provides the most accurate detection in the whole temperature range, between -40°C and +80°C (-40°F and +176°F).

Sensors

The ICS12 family, DC power supply

Body length	Output	Output function	M12-DC washdown series			
			Standard range		**Extended range**	
			Flush mountable	**Non-flush mountable**	**Flush mountable**	**Non-flush mountable**
Long	NPN	NO	ICS12LF02NOM1-FB	ICS12LN04NOM1-FB	ICS12LF04NOM1-FB	ICS12LN08NOM1-FB
		NC	ICS12LF02NCM1-FB	ICS12LN04NCM1-FB	ICS12LF04NCM1-FB	ICS12LN08NCM1-FB
	PNP	NO	ICS12LF02POM1-FB	ICS12LN04POM1-FB	ICS12LF04POM1-FB	ICS12LN08POM1-FB
		NC	ICS12LF02PCM1-FB	ICS12LN04PCM1-FB	ICS12LF04PCM1-FB	ICS12LN08PCM1-FB
Sensing distance			2 mm	4 mm	4 mm	8 mm
Output current (Ie)			$\leq$ 200 mA @ 50°C (122°F); $\leq$ 150 mA @ 50° to 80°C (122° to 176°F)			
Operating frequency (f)			$\leq$ 2000 Hz			
Rated operational voltage (Ub)			10 to 36 V DC (ripple included)			
No load supply current (Io)			$\leq$ 15 mA			
Off-state current (Ir)			$\leq$ 10 µA			
Voltage drop (Ud)			$\leq$ 2.0 V DC @ 200 mA DC			
Output function			NPN or PNP			
Voltage transient			1 kV/0.5 J			
Sensor protection			Shortcircuit (A), reverse polarity (B) and transients (C)			
Repeat accuracy (R)			$\leq$ 5%			
Power on delay (tv)			50 ms			
Differential travel (Hysteresis)			1 to 20% of the sensing distance			
Led indication			Output ON: yellow LED (4x90°)			
Degree of protection			IP 67, IP 68 (1 meter, 7 days), IP 69K (IEC 60529; 60943-1)			
Indication for short circuit/overload			LED blinking (f = 2 Hz)			
Electrostatic discharge			Contact discharge: 4 kV. Air discharge: 8 kV (EN 61000-4-2)			
Electrical fast transients/burst			2 kV (EN 61000-4-4)			
Wire conducted disturbances			3 V (EN 61000-4-6)			
Power - frequency magnetic fields			30 A/m (EN 61000-4-8)			
Radiated RF electromagnetic fields			3 V/m (EN 61000-4-3)			
Ambient temperature			Operating: -40 to +80°C (-40 to +176°F). Storage: -40 to +80°C (-40 to +176°F)			
Short exposure during cleaning process			100°C (212°F) for 15 minutes			
CE marking			According to EN 60947-5-2			
Approvals			cULus (UL508), ECOLAB			
MTTFd			770 years @ 50°C (122°F)			
Vibration			10 to 55 Hz, (amplitude 1.0 mm; sweep cycle 5 min; IEC 60068-2-6) in X, Y and Z direction			
Shock			30 G /11 ms. 10 shocks in X, Y and Z direction (IEC 60068-2-27)			
Material			Body: stainless steel (AISI 316L); Front cap: grey PPS (FDA-certified)			
Tightening torque			$\leq$ 25 Nm			
Connector			M12 x 1, 4-pin			
Dimensions			Flush and non-flush: M12 x 64.8 mm			
Weight incl. packaging			$\leq$ 35 g			
Accessories, additional			Connectors: CONB14NF-... types. Mounting brackets: AMB12-...			

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Inductive sensors

The ICS18 family, DC power supply

Body length	Output	Output function	M18-DC washdown series			
			Standard range		Extended range	
			Flush mountable	Non-flush mountable	Flush mountable	Non-flush mountable
Long	NPN	NO	ICS18LF05NOM1-FB	ICS18LN08NOM1-FB	ICS18LF08NOM1-FB	ICS18LN12NOM1-FB
		NC	ICS18LF05NCM1-FB	ICS18LN08NCM1-FB	ICS18LF08NCM1-FB	ICS18LN12NCM1-FB
	PNP	NO	ICS18LF05POM1-FB	ICS18LN08POM1-FB	ICS18LF08POM1-FB	ICS18LN12POM1-FB
		NC	ICS18LF05PCM1-FB	ICS18LN08PCM1-FB	ICS18LF08PCM1-FB	ICS18LN12PCM1-FB
Sensing distance			5 mm	8 mm	8 mm	12 mm
Output current (Ie)			$\leq$ 200 mA @ 50°C (122°F); $\leq$ 150 mA @ 50° to 80°C (122° to 176°F)			
Operating frequency (f)			$\leq$ 1500 Hz			
Rated operational voltage (Ub)			10 to 36 V DC (ripple included)			
No load supply current (Io)			$\leq$ 15 mA			
Off-state current (Ir)			$\leq$ 10 µA			
Voltage drop (Ud)			$\leq$ 2.0 V DC @ 200 mA DC			
Output function			NPN or PNP			
Voltage transient			1 kV/0.5 J			
Sensor protection			Short-circuit (A), reverse polarity (B) and transients (C)			
Repeat accuracy (R)			$\leq$ 5%			
Power on delay (tv)			50 ms			
Differential travel (Hysteresis)			1 to 20% of the sensing distance			
Led indication			Output ON: yellow LED (4x90°)			
Degree of protection			IP 67, IP 68 (1 meter, 7 days), IP 69K (IEC 60529; 60943-1)			
Indication for short circuit/overload			LED blinking (f = 2 Hz)			
Electrostatic discharge			Contact discharge: 4 kV. Air discharge: 8 kV (EN 61000-4-2)			
Electrical fast transients/burst			2 kV (EN 61000-4-4)			
Wire conducted disturbances			3 V (EN 61000-4-6)			
Power - frequency magnetic fields			30 A/m (EN 61000-4-8)			
Radiated RF electromagnetic fields			3 V/m (EN 61000-4-3)			
Ambient temperature			Operating: -40 to +80°C (-40 to +176°F). Storage: -40 to +80°C (-40 to +176°F)			
Short exposure during cleaning process			100°C (212°F) for 15 minutes			
CE marking			According to EN 60947-5-2			
Approvals			cULus (UL508), ECOLAB			
MTTFd			850 years @ 50°C (122°F)			
Vibration			10 to 55 Hz, (amplitude 1.0 mm; sweep cycle 5 min; IEC 60068-2-6) in X, Y and Z direction			
Shock			30 G /11 ms. 10 shocks in X, Y and Z direction (IEC 60068-2-27)			
Material			Body: stainless steel (AISI 316L); Front cap: grey PPS (FDA-certified)			
Tightening torque			$\leq$ 25 Nm			
Connector			M12 x 1, 4-pin			
Dimensions			Flush and non-flush: M18 x 63 mm			
Weight incl. packaging			$\leq$ 70 g			
Accessories, additional			Connectors: CONB14NF-... types. Mounting brackets: AMB18-...			

Sensors

The ICS30 family, DC power supply

Body length	Output	Output function	M30-DC washdown series			
			Standard range		Extended range	
			Flush mountable	Non-flush mountable	Flush mountable	Non-flush mountable
short	NPN	NO	ICS30SF10NOM1-FB	ICS30SN15NOM1-FB	ICS30SF15NOM1-FB	ICS30SN22NOM1-FB
		NC	ICS30SF10NCM1-FB	ICS30SN15NCM1-FB	ICS30SF15NCM1-FB	ICS30SN22NCM1-FB
	PNP	NO	ICS30SF10POM1-FB	ICS30SN15POM1-FB	ICS30SF15POM1-FB	ICS30SN22POM1-FB
		NC	ICS30SF10PCM1-FB	ICS30SN15PCM1-FB	ICS30SF15PCM1-FB	ICS30SN22PCM1-FB
Long	NPN	NO	ICS30LF10NOM1-FB	ICS30LN15NOM1-FB	ICS30LF15NOM1-FB	ICS30LN22NOM1-FB
		NC	ICS30LF10NCM1-FB	ICS30LN15NCM1-FB	ICS30LF15NCM1-FB	ICS30LN22NCM1-FB
	PNP	NO	ICS30LF10POM1-FB	ICS30LN15POM1-FB	ICS30LF15POM1-FB	ICS30LN22POM1-FB
		NC	ICS30LF10PCM1-FB	ICS30LN15PCM1-FB	ICS30LF15PCM1-FB	ICS30LN22PCM1-FB
Sensing distance			10 mm	15 mm	15 mm	22 mm
Output current (Ie)			$\leq$ 200 mA @ 50°C (122°F); $\leq$ 150 mA @ 50° to 80°C (122° to 176°F); $\leq$ 100 mA @ 80° to 85°C (176° to 185°F)			
Operating frequency (f)			$\leq$ 1000 Hz			
Rated operational voltage (Ub)			10 to 36 V DC (ripple included)			
No load supply current (Io)			$\leq$ 15 mA			
Off-state current (Ir)			$\leq$ 10 µA			
Voltage drop (Ud)			$\leq$ 2.0 V DC @ 200 mA DC			
Output function			NPN or PNP			
Voltage transient			1 kV/0.5 J			
Sensor protection			Short-circuit (A), reverse polarity (B), transients (C) and wire breakage (D)			
Repeat accuracy (R)			$\leq$ 5%			
Power on delay (tv)			50 ms			
Differential travel (Hysteresis)			1 to 20% of the sensing distance			
Led indication			Output ON: yellow LED			
Degree of protection			IP 67, IP 68 (1 meter, 7 days), IP 69K (IEC 60529; 60943-1)			
Indication for short circuit/overload			LED blinking (f = 2 Hz)			
Electrostatic discharge			Contact discharge: 4 kV. Air discharge: 8 kV (EN 61000-4-2)			
Electrical fast transients/burst			2 kV (EN 61000-4-4)			
Wire conducted disturbances			3 V (EN 61000-4-6)			
Power - frequency magnetic fields			30 A/m (EN 61000-4-8)			
Radiated RF electromagnetic fields			3 V/m (EN 61000-4-3)			
Ambient temperature			Operating: -40 to +85°C (-40 to +185°F). Storage: -40 to +85°C (-40 to +185°F)			
Short exposure during cleaning process			100°C (212°F) for 15 minutes			
CE marking			According to EN 60947-5-2			
Approvals			cULus (UL508), ECOLAB			
MTTFd			750 years @ 50°C (122°F)			
Vibration			10 to 55 Hz, (amplitude 1.0 mm; sweep cycle 5 min; IEC 60068-2-6) in X, Y and Z direction			
Shock			30 G /11 ms. 10 shocks in X, Y and Z direction (IEC 60068-2-27)			
Material			Body: stainless steel (AISI 316L); Front cap: grey PPS (FDA-certified); Sensor back: Grilamid			
Tightening torque			$\leq$ 75 Nm			
Connector			M12 x 1, 4-pin			
Dimensions short body			M30 x 47.5 mm	M30 x 59.5 mm	M30 x 47.5 mm	M30 x 59.5 mm
Dimensions long body			M30 x 67.5 mm	M30 x 79.5 mm	M30 x 67.5 mm	M30 x 79.5 mm
Weight incl. packaging			$\leq$ 130 g			
Accessories, additional			Connectors: CONB14NF-… types. Mounting brackets: AMB30-…			

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