

Proximity Sensors Capacitive Thermoplastic Polyester Housing Types CA30CAN/CAF.....

CARLO GAVAZZI



- 4TH Generation TRIPLESIELD™
- Adjustable sensing distance: 2 - 20 mm flush or 4-30 mm non-flush
- Protection: short-circuit, transients and reverse polarity
- Dust and humidity compensation
- Dust or temperature alarm output
- Rated operational voltage: 10-40 VDC
- Output: DC 200 mA, NPN or PNP
- Standard Output: NO and NC
- LED indications for power-supply, output and stability
- IP67, IP68, IP69K, Nema 1, 2, 4, 4X, 5, 6, 6P, 12
- Cable and M12 connector versions available



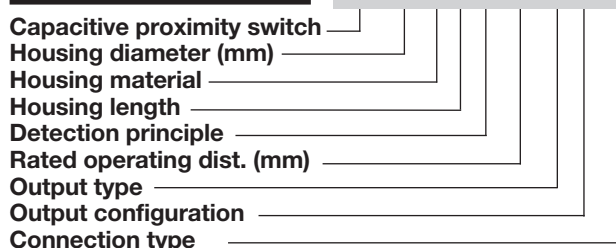
Product Description

The CA30CA.. capacitive proximity switches feature an improved 4TH generation *TRIPLESIELD™* technology. Furthermore, these sensors feature increased immunity to electromagnetic interference (EMI), especially to frequency drives. Not only does 4TH generation *TRIPLESIELD™* feature an increased EMI, but it also increases the immunity to humidity and dust. The implementation of stability indication eases the setup procedure, as both Stable ON and Stable OFF positions are indicated by

the green and yellow LEDs. The sensing distance is increased by 20 - 25 % allowing room for additional stable detection. The dust alarm function gives an early warning that the sensing surroundings have to be cleaned. The temperature alarm function raises an alarm if the sensing surface goes beyond 60 degree Celsius. The sensor housing is featuring IP69K as well as approval by ECOLAB for cleaning and disinfection agents.

Ordering Key

CA30CAN25NAM1



Type Selection



Housing diameter	Sensor type	Output type	Output function	Connection	Rated operating distance (S _n)	Ordering no. Standard	Ordering no. Dust alarm	Ordering no. Temperature alarm
M 30	Flush	NPN	NO+NC	Cable	0 - 16 mm	CA30CAF16NA		
M 30	Flush	NPN	NO+NC	M12 Plug	0 - 16 mm	CA30CAF16NAM1		
M 30	Flush	PNP	NO+NC	Cable	0 - 16 mm	CA30CAF16PA		
M 30	Flush	PNP	NO+NC	M12 Plug	0 - 16 mm	CA30CAF16PAM1		
M 30	Flush	PNP	NO	Cable	0 - 16 mm		CA30CAF16PODU ¹⁾	CA30CAF16POTA ¹⁾
M 30	Flush	PNP	NC	Cable	0 - 16 mm		CA30CAF16PCDU ¹⁾	CA30CAF16PCTA ¹⁾
M 30	Flush	PNP	NC	M12 Plug	0 - 16 mm		CA30CAF16PCM1DU ²⁾	
M 30	Non-Flush	NPN	NO+NC	Cable	0 - 25 mm	CA30CAN25NA		
M 30	Non-Flush	NPN	NO+NC	M12 Plug	0 - 25 mm	CA30CAN25NAM1		
M 30	Non-Flush	PNP	NO+NC	Cable	0 - 25 mm	CA30CAN25PA		
M 30	Non-Flush	PNP	NO+NC	M12 Plug	0 - 25 mm	CA30CAN25PAM1		
M 30	Non-Flush	PNP	NO	Cable	0 - 25 mm		CA30CAN25PODU ³⁾	CA30CAN25POTA ³⁾
M 30	Non-Flush	PNP	NC	Cable	0 - 25 mm		CA30CAN25PCDU ³⁾	CA30CAN25PCTA ³⁾

¹⁾ Replaced by CA30CAF16BPA2IO
²⁾ Replaced by CA30CAF16BPM1IO
³⁾ Replaced by CA30CAN25BPA2IO

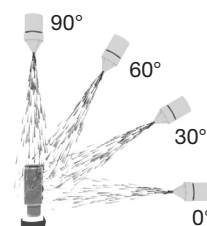
Specifications EN 60947-5-2

Rated operating distance (S _n) Non-flush mounted sensor	0 - 25 mm (factory setting 25 mm), (ref. target 75x75 mm ST37, 1 mm thick, grounded)	Flush mounted sensor	0 - 16 mm (factory setting 16 mm - non-flush mounted) (ref. target 48x48 mm ST37, 1 mm thick, grounded)
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Specifications (cont.) EN 60947-5-2

Sensitivity control	Adjustable by potentiometer	Connection	
Electrical adjustment	11 turns	Cable	PVC, Ø5.2 x 2 m, 4 x 0.34 mm ²
Mechanical adjustment	16 turns		Oil proof, grey
Adjustable distance		Plug (M1)	M12 x 1 - 4 pin
Flush types	2 to 20 mm	Temperature alarm output	60°C ± 5°C
Non-flush types	4 to 30 mm	Response time examples	
Effective operating dist. (S_r)	$0.9 \times S_n \leq S_r \leq 1.1 \times S_n$	$T_A = 25^\circ\text{C}$	16 sec @ T _{EXC} = 800°C
Usable operating dist. (S_u)	$0.85 \times S_r \leq S_u \leq 1.15 \times S_r$		390 sec @ T _{EXC} = 80°C
Repeat accuracy (R)	≤ 5%	TRIPLESHIELD™	
Hysteresis (H)	3 - 20%	Exceeding the norms for capacitive sensors	
Rated operational volt. (U_B)	10 to 40 VDC (ripple incl.)	Electrostatic discharge	
Ripple	≤ 10%	(EN61000-4-2)	
Output function	NPN or PNP	Contact discharge	> 40 kV
Output switching function	N.O. and N.C.	Air discharge	> 40 kV
Rated operational current (I_a)	≤ 200 mA (continuous)	Electrical fast transients/burst	
Capacitive load	100 nF	(EN 61000-4-4)	±4kV
No-load supply current (I_o)	≤ 12 mA	Surge	
Voltage drop (U_d)	≤ 2.0 VDC @ 200 mA DC	(EN 61000-4-5)	
Minimum operational current (I_m)	≥ 0.5 mA	Power-supply	> 2kV (with 500 Ω)
OFF state current (I_r)	≤ 100 μA	Sensor output	> 2kV (with 500 Ω)
Protection	Short-circuit, reverse polarity, transients	Wire conducted disturbances	
Frequency of operating cycles (f)	50 Hz	(EN 61000-4-6)	> 20 Vrms
Response time OFF-ON (t_{on})	≤ 10 ms	Power-frequency magnetic fields (EN 61000-4-8)	
Response time ON-OFF (t_{off})	≤ 10 ms	Continuous	> 60 A/m, 75.9 μ tesla
Power ON delay (t_v)	≤ 200 ms	Short-time	> 600 A/m, 759 μ tesla
Indication		Radiated RF electromagnetic fields (EN 61000-4-3)	> 20 V/m
Target detected	LED, yellow	Shock (IEC 60068-2-32)	30 G / 11ms, 3 pos, 3 neg per axis
Power and detection stability	LED, green	Rough handling shocks (IEC 60068-2-31)	twice from 1 m 100 times from 0.5 m
Environment		Vibration (IEC 60068-2-6)	10 to 150 Hz, 1 mm / 15 G
Installation category	III (IEC 60664, 60664A; 60947-1)	Housing material	
Degree of pollution	3 (IEC 60664, 60664A; 60947-1) 	Body	PBT, grey, 30% glass reinforced
Degree of protection	IP 67, IP 68/60 min., IP69K* 	Cable gland	PA12, black
NEMA type	1, 2, 4, 4X, 5, 6, 6P, 12	Fingernuts	PA12, black
Operating temperature	-30 to +85°C (-22 to +185°F)	Trimmershaft	Nylon
Max. temperature on sensing face	120°C (248°F)	Weight	
Storage temperature	-40 to +85°C (-40 to +185°F)	Cable version	190 g
Rated insulation voltage	1 kVAC (rms) IEC protection class III	Plug version	106 g
Tightening torque	≤ 7.5 Nm	Approvals	cULus (UL508), ECOLAB
		CE-marking	Yes
		MTTF_a	829 years @ 40°C (+104°F)

* The IP69K test according to DIN 40050-9 for high-pressure, high-temperature wash-down applications. The sensor must not only be dust tight (IP6X), but also able to withstand high-pressure and steam cleaning. The sensor is exposed to high-pressure water from a spray nozzle that is fed with 80°C water at 8'000-10'000 KPa (80-100bar) and a flow rate of 14-6L/min. The nozzle is held 100-150 mm from the sensor at angles of 0°, 30°, 60° and 90° for 30s each. The test device sits on a turntable that rotates with a speed of 5 times per minute. The sensor must not suffer any damaging effects from the high pressure water in appearance and function.



Adjustment Guide

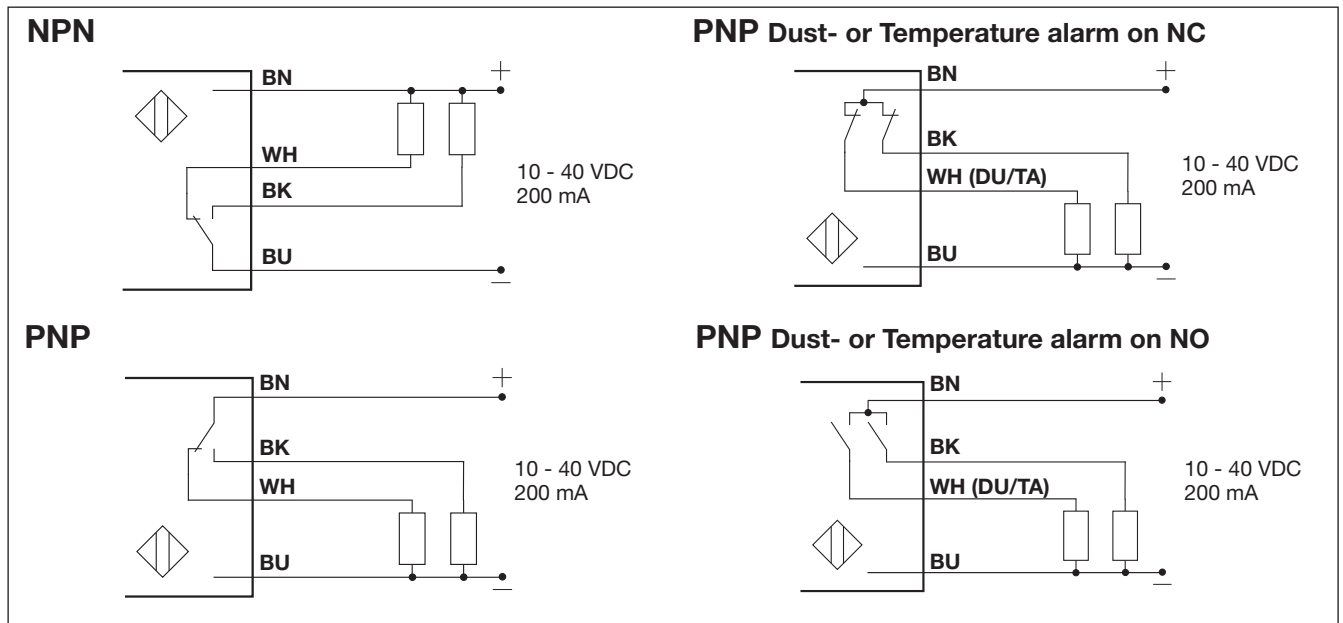
The environments in which capacitive sensors are installed can often be unstable as regards temperature, humidity, object distance and industrial (noise) interference. This is why Carlo Gavazzi offers, as a stand-

ard feature in all TRIPLESHIELD™ capacitive sensors, a user-friendly sensitivity adjustment instead of a fixed sensing range. Likewise, these sensors provide an extended sensing range to accommodate mechanically

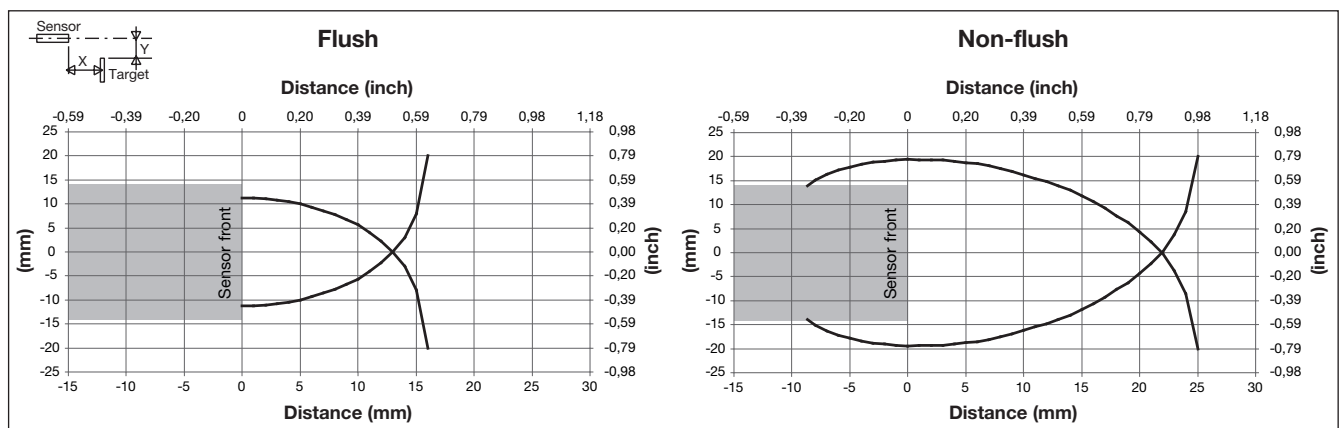
demanding areas and temperature stability to ensure high immunity to electromagnetic interference (EMI) and a minimum need for adjusting sensitivity if the temperature varies.

Note:
The sensors are factory set (default) to nominal sensing range S_n .

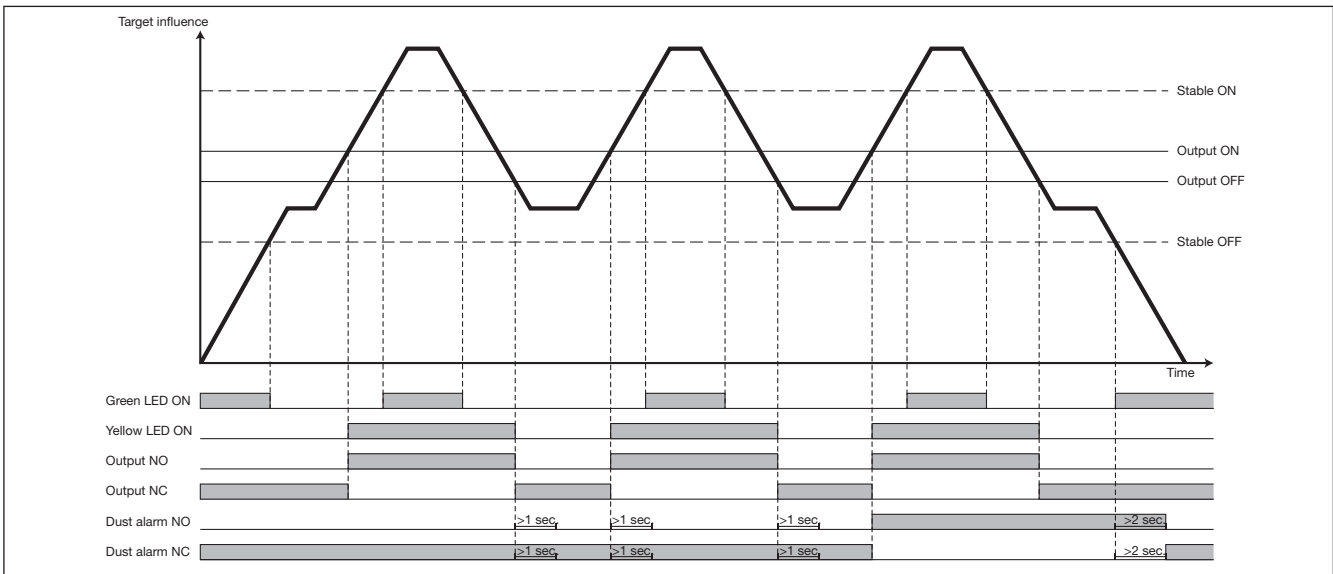
Wiring Diagram



Detection Diagram



Detection Stability Indication



Dimensions

