CA
Технические характеристики

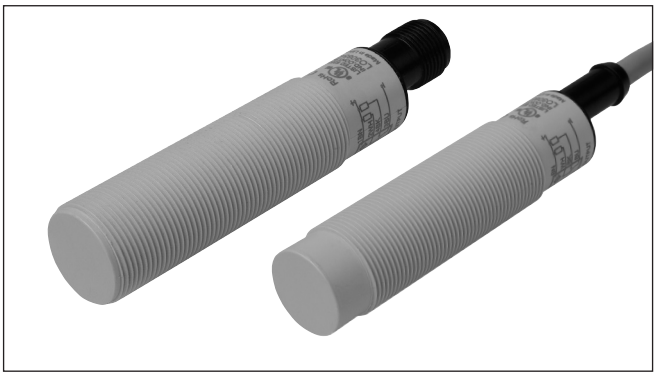
По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

Россия (495)268-04-70
Киргизия (996)312-96-26-47
Казахстан (7172)727-132

cgo@nt-rt.ru || https://gavazzi.nt-rt.ru/

Proximity Sensors Capacitive Thermoplastic Polyester Housing Types CA18CAN/CAF.....



- **4TH Generation *TRIPLESHIELD*™**
- **Adjustable sensing distance: 2 - 10 mm Flush or 3-15 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, Target and Stability**
- **IP67, IP68, IP69K, Nema 1, 2, 4, 4X, 5, 6, 6P, 12**
- **Cable and M12 connector versions available**

Product Description

The CA18CA.. capacitive proximity switches feature an improved 4TH Generation *TRIPLESHIELD*™ technology. Furthermore, these sensors feature increased immunity to electromagnetic interference (EMI), especially to frequency drives. Not only does 4TH Generation *TRIPLESHIELD*™ 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 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 Celcius.
The sensor housing is featuring IP69K as well as approval by ECOLAB for cleaning- and disinfection agents.

Ordering Key

CA18CAN12NAM1

- **Capacitive proximity switch**
- **Housing diameter (mm)**
- **Housing material**
- **Housing length**
- **Detection principle**
- **Rated operating dist. (mm)**
- **Output type**
- **Output configuration**
- **Connection type**

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 18	Flush	NPN	NO+NC	Cable	0 - 8 mm	**CA18CAF08NA**		
M 18	Flush	NPN	NO+NC	M12 Plug	0 - 8 mm	**CA18CAF08NAM1**		
M 18	Flush	PNP	NO+NC	Cable	0 - 8 mm	**CA18CAF08PA**		
M 18	Flush	PNP	NO+NC	M12 Plug	0 - 8 mm	**CA18CAF08PAM1**		
M 18	Flush	PNP	NO	Cable	0 - 8 mm		CA18CAF08PODU[1]	CA18CAF08POTA[1]
M 18	Flush	PNP	NC	Cable	0 - 8 mm		CA18CAF08PCDU[1]	CA18CAF08PCTA[1]
M 18	Non-Flush	NPN	NO+NC	Cable	0 - 12 mm	**CA18CAN12NA**		
M 18	Non-Flush	NPN	NO+NC	M12 Plug	0 - 12 mm	**CA18CAN12NAM1**		
M 18	Non-Flush	PNP	NO+NC	Cable	0 - 12 mm	**CA18CAN12PA**		
M 18	Non-Flush	PNP	NO+NC	M12 Plug	0 - 12 mm	**CA18CAN12PAM1**		
M 18	Non-Flush	PNP	NO	Cable	0 - 12 mm		CA18CAN12PODU[2]	CA18CAN12POTA[2]
M 18	Non-Flush	PNP	NC	Cable	0 - 12 mm		CA18CAN12PCDU[2]	CA18CAN12PCTA[2]

[1] Replaced by CA18CAF08BPA2I0
[2] Replaced by CA18CAN12BPA2I0

Specifications EN 60947-5-2

Rated operating distance (S_n) Non-flush mounted sensor	0 - 12 mm (factory setting 12 mm), (ref. target 36x36 mm ST37, 1 mm thick, grounded)	Flush mounted sensor	0 - 8 mm (factory setting 8 mm - non-flush mounted) (ref. target 24x24 mm ST37, 1 mm thick, grounded)

CARLO GAVAZZI

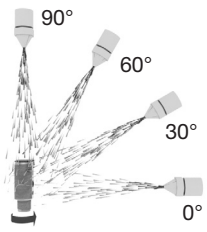
Specifications (cont.) EN 60947-5-2

Sensitivity control	Adjustable by potentiometer
Electrical adjustment	11 turns
Mechanical adjustment	16 turns
Adjustable distance	
Flush types	2 to 10 mm
Non-flush types	3 to 15 mm
Effective operating dist. (S_r)	0.9 x $S_n \leq S_r \leq$ 1.1 x S_n
Usable operating dist. (S_u)*	0.85 x $S_r \leq S_u \leq$ 1.15 x S_r
Repeat accuracy (R)	≤ 5%
Hysteresis (H)	3 - 20%
Rated operational volt. (U_B)	10 to 40 VDC (ripple incl.)
Ripple	≤ 10%
Output function	NPN or PNP
Output switching function	N.O. and N.C.
Rated operational current (I_e)	≤ 200 mA (continuous)
Capacitive load	100 nF
No-load supply current (I_o)	≤ 12 mA
Voltage drop (U_d)	≤ 2.0 VDC @ 200 mA DC
Minimum operational current (I_m)	≥ 0.5 mA
OFF state current (I_r)	≤ 100 µA
Protection	Short-circuit, reverse polarity, transients
Frequency of operating cycles (f)	50 Hz
Response time OFF-ON (t_{on})	≤ 10 ms
Response time ON-OFF (t_{off})	≤ 10 ms
Power ON delay (t_v)	≤ 200 ms
Indication	
Target detected	LED, yellow
Power and detection stability	LED, green
Environment	
Installation category	III (IEC 60664, 60664A; 60947-1)
Degree of pollution	3 (IEC 60664, 60664A; 60947-1)
Degree of protection	IP 67, IP 68/60 min., IP69K** (IEC 60529; 60943-1)
NEMA type	1, 2, 4, 4X, 5, 6, 6P, 12
Operating temperature	-30 to +85°C (-22 to +185°F)
Max. temperature on sensing face	120°C (248°F)
Storage temperature	-40 to +85°C (-40 to +185°F)
Rated insulation voltage	1 kVAC (rms) IEC protection class III
Tightening torque	≤ 2.6 Nm

Connection	
Cable	PVC, Ø5.2 x 2 m, 4 x 0.34 mm² Oil proof, grey
Plug (M1)	M12 x 1 - 4 pin
Temperature alarm output	60°C ± 5°C
Response time examples	
T_A = 25°C	14 sec @ T_{EXC} = 800°C 315 sec @ T_{EXC} = 80°C
TRIPLESHIELD™	
Exceeding the norms for capacitive sensors	
Electrostatic discharge (EN61000-4-2)	
Contact discharge	> 40 kV
Air discharge	> 40 kV
Electrical fast transients/burst (EN 61000-4-4)	±4kV
Surge (EN 61000-4-5)	
Power-supply	> 2kV (with 500 Ω)
Sensor output	> 2kV (with 500 Ω)
Wire conducted disturbances (EN 61000-4-6)	> 20 Vrms
Power-frequency magnetic fields (EN 61000-4-8)	
Continous	> 60 A/m, 75.9 µ tesla
Short-time	> 600 A/m, 759 µ tesla
Radiated RF electromagnetic fields (EN 61000-4-3)	> 20 V/m
Shock (IEC 60068-2-27)	30 G / 11ms, 3 pos, 3 neg per axis
Rough handling shocks (IEC 60068-2-31)	2 times from 1m 100 times from 0,5m
Vibration (IEC 60068-2-6)	10 to 150 Hz, 1 mm / 15 G
Housing material	
Body	PBT, grey, 30% glass reinforced
Cable gland	PA12, black
Fingernuts	PA12, black
Trimmershaft	Nylon
Weight	
Cable version	150 g
Plug version	75 g
Approvals	cULus (UL508), ECOLAB
CE-marking	Yes
MTTF$_d$	825 years @ 40°C (+104°F)

* For Flush type sensor flush mounted in conductive material, the usable operating distance (Su) is 0.80 x $S_r \leq S_u \leq$ 1.2 x S_r for temperatures exceeding 0 - 60 °C (32 - 140°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.



CARLO GAVAZZI

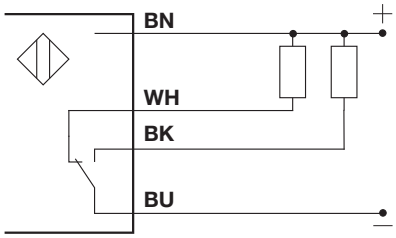
Adjustment Guide

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

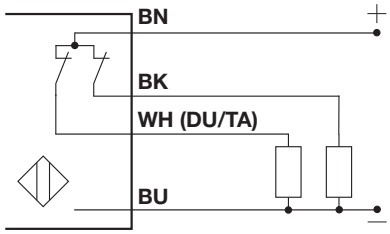
Note:
The sensors are factory set (default) to nominal sensing range Sn.S_n.

Wiring Diagram

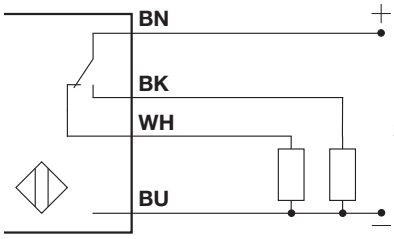
NPN



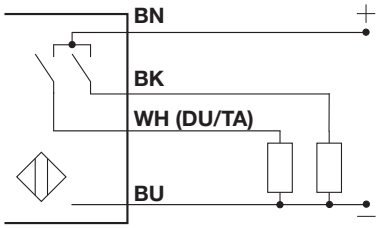
PNP Dust- or Temperature alarm on NC



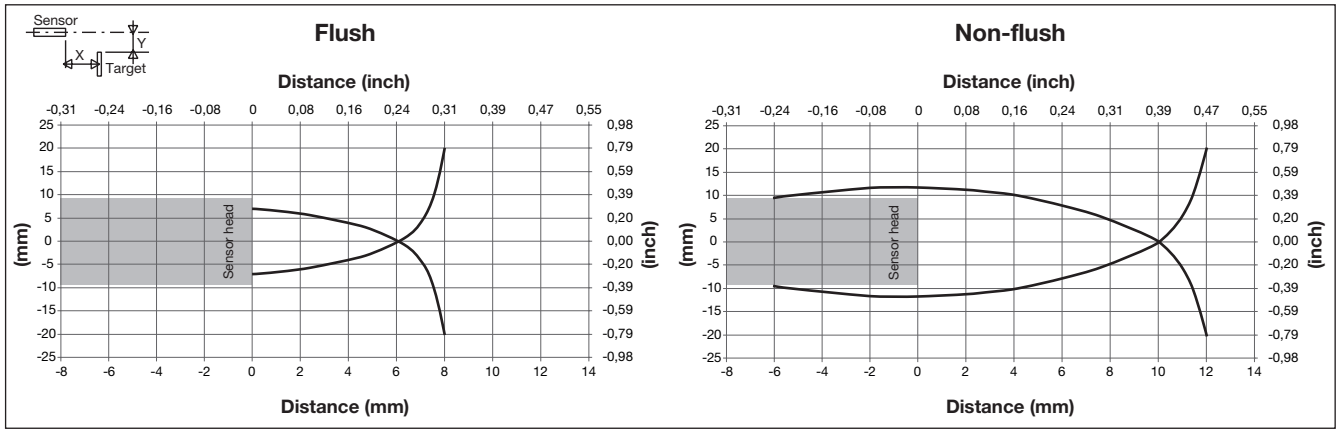
PNP



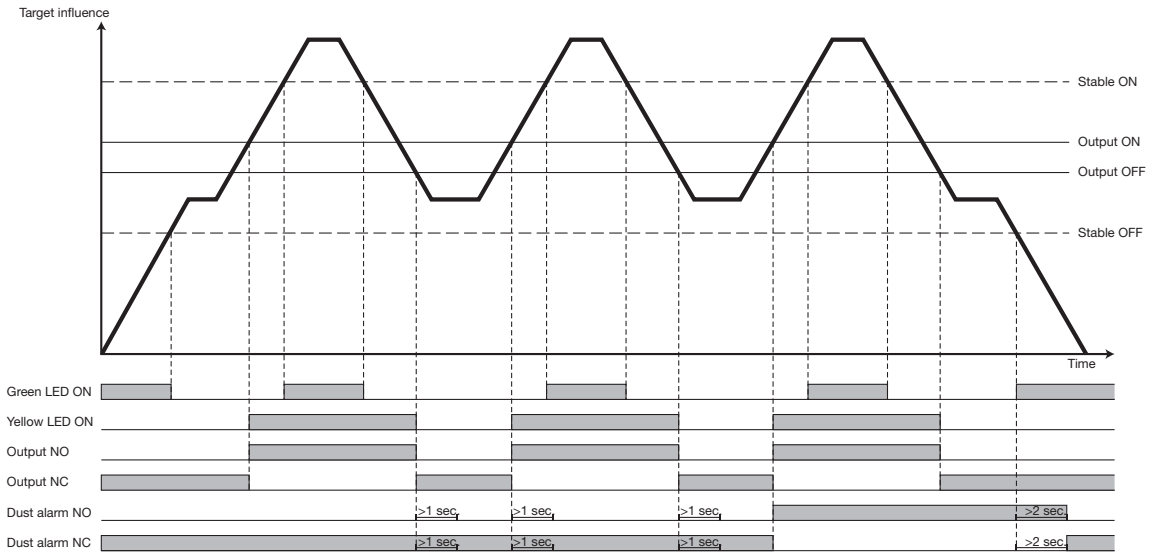
PNP Dust- or Temperature alarm on NO



Detection Diagram

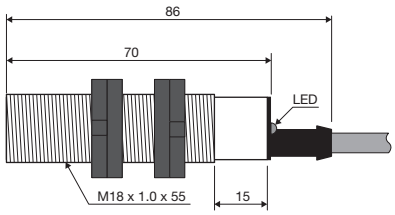


Detection Stability Indication

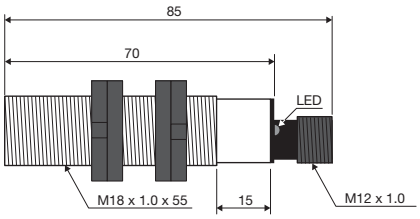


Dimensions

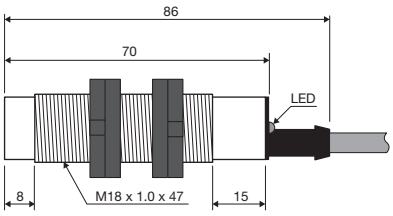
CA18CAF....



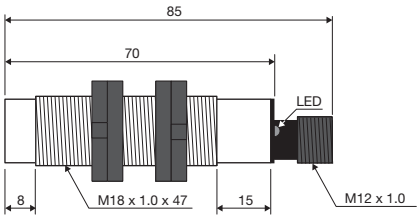
CA18CAF....M1



CA18CAN....



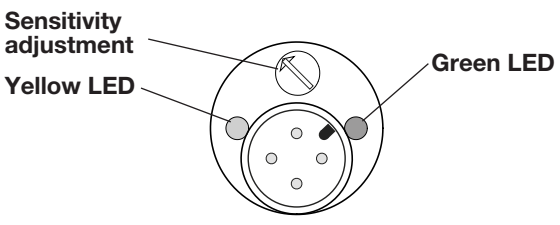
CA18CAN....M1

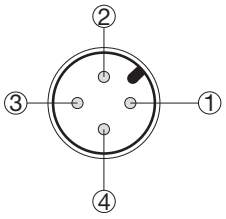


Cable

Plug

The back of the sensor





Colour code

1 Brown
2 White
3 Blue
4 Black

CARLO GAVAZZI

Installation Hints

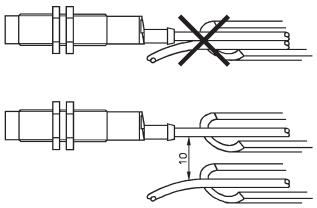
Capacitive sensors have a unique ability to detect almost any material in liquid or solid form. Capacitive sensors are able to detect metallic as well as non-metallic objects. However, their traditional use is for non-metallic materials such as:

- **Plastics Industry**
  Resins, regrinds or moulded products.
- **Chemical Industry**
  Cleansers, fertilizers, liquid soaps, corrosives and petrochemicals.
- **Wood Industry**
  Saw dust, paper products, door and window frames.
- **Ceramics & Glass Industry**
  Raw materials, clay or finished products, bottles.
- **Packaging Industry**
  Package inspection for level or contents, dry goods, fruits and vegetables, dairy products.

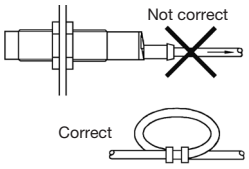
Materials are detected due to their dielectric constant. The bigger the size of an object, the higher the density of material, the better or easier it is to detect the object.

The nominal sensing distance for a capacitive sensor is referred to a grounded metal plate (ST37). For additional information regarding dielectric ratings of materials please refer to Technical Information.

To avoid interference from inductive voltage/ current peaks, separate the prox. switch power cables from any other power cables, e.g. motor, contactor or solenoid cables

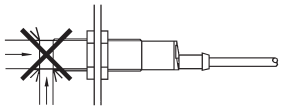


Relief of cable strain



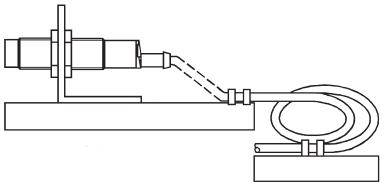
The cable should not be pulled

Protection of the sensing face



A proximity switch should not serve as a mechanical stop

Switch mounted on mobile carrier



Any repetitive flexing of the cable should be avoided

Delivery Contents

- Capacitive switch: CA18CAN/CAF.....
- User manual
- 2 x M18 fingernuts
- Screwdriver
- **Packaging:** Cardboard box

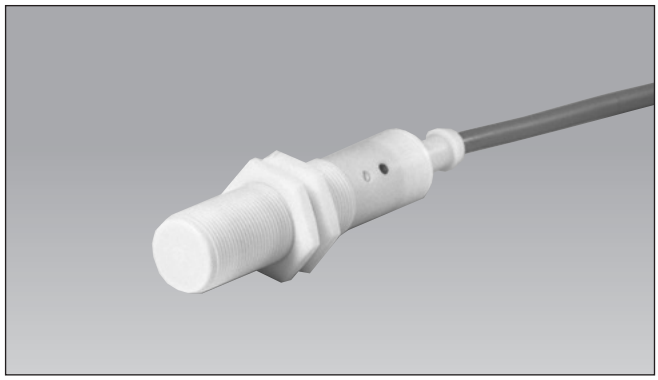
Accessories

- Connector type CONB14NF-... -series.
- Mounting Brackets AMB18-S.. (straight), AMB18-A.. (angled)

Proximity Sensors Capacitive Teflon Housing Type CA, M18, DC

TRIPLESHIELD™

CARLO GAVAZZI



- Featuring ***TRIPLESHIELD***™ sensor protection
- Adjustable sensing distance 3-8 mm
- Rated operational voltage: 10-40 VDC
- Output: DC 200 mA, NPN or PNP
- Make and break switching function
- LED indication
- High noise immunity
- Flush types
- Cable versions

Product Description

Capacitive proximity switches with sensing distance of 8 mm flush mounted in metal. 4-wire DC output with both make (NO) and break (NC) switching.

White M18 Teflon housing with 2 m cable. Ideal for use in level applications in the chemical, semi-conductor and food & beverage industries.

Ordering Key

CA 18 FLF 08 NA

- **Type**
- **Housing style**
- **Housing size**
- **Housing material**
- **Housing length**
- **Detection principle**
- **Sensing distance**
- **Output type**
- **Output configuration**

Type Selection

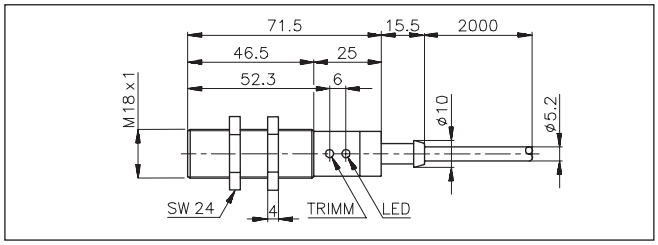
Housing diameter	Rated operating dist. (S_n) [1]	Mounting	Ordering no. Transistor NPN Make & break switching	Ordering no. Transistor PNP Make & break switching
M18	8 mm	Flush (built-in)	**CA18FLF08NA**	**CA18FLF08PA**

[1] Object: Grounded steel plate

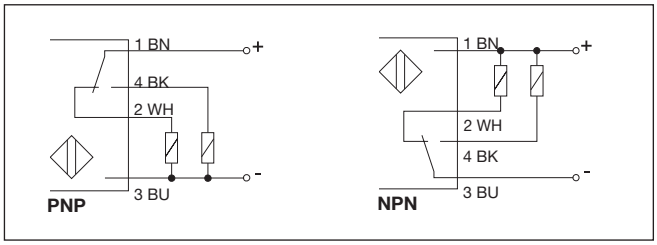
Specifications

Rated operating dist. (S_n)	3 to 8 mm factory set at 8 mm
Sensitivity	Adj. 270° turn pot. meter
Effective operation dist. (S_r)	$0.9 \times S_n \le S_r \le 1.1 \times S_n$
Usable operation dist. (S_u)	$0.8 \times S_r \le S_u \le 1.2 \times S_r$
Repeat accuracy (R)	≤ 5%
Hysteresis (H)	4 to 20% of sensing distance
Rated operational volt. (U_B)	10 to 40 VDC (ripple included)
Ripple	≤ 10%
Rated operational current (I_e) Continuous	≤ 200 mA
No-load supply current (I_o)	≤ 10 mA
Voltage drop (U_d)	≤ 2.5 VDC at max. load
Protection	Reverse polarity, short-circuit, transients
Frequency of operating cycles (f)	30 Hz
Indication for output ON	LED, yellow
Environment Degree of protection	IP 67 (Nema 1, 3, 4, 6, 13)
Temperature Operating temperature Storage temperature	 -25° to +80°C (-13° to +140°F) -40° to +85°C (-40° to +149°F)
Housing material Body, front, nuts	 Teflon
Connection Cable	 Grey, 2 m, 4 x 0.34 mm^2 Oil proof PVC
Weight	110 g
CE-marking	Yes

Dimensions



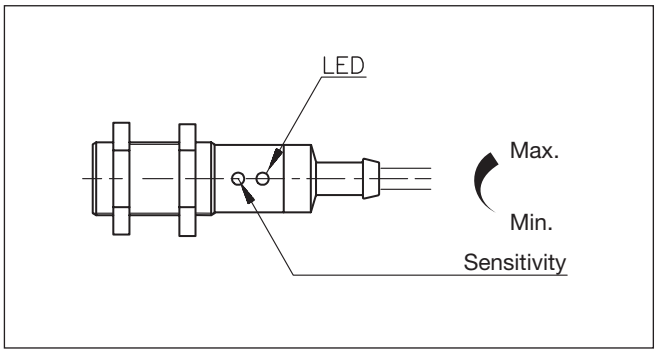
Wiring Diagrams



Adjustment Guide

The environments in which capacitive sensors are installed can often be unstable regarding temperature, humidity, object distance and industrial (noise) interference. Because of this, Carlo Gavazzi offers as standard features in all *TRIPLESHIELD*™ capacitive sensors a user-friendly sensitivity adjustment instead of having a fixed sensing range, extended sensing range to accommodate mechanically demanding areas, temperature stability to ensure minimum need for adjusting sensitivity if temperature varies and high immunity to electromagnetic interference (EMI).

Note:
Sensors are factory set (default) to maximum rated sensing range.



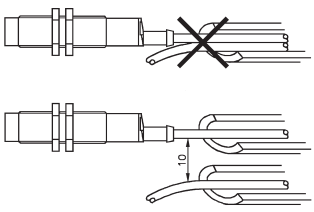
Installation Hints

Capacitive sensors have the unique ability to detect almost all materials, either in liquid or solid form. Capacitive sensors can detect metallic as well as non-metallic objects, however, their traditional use is for non-metallic materials such as:

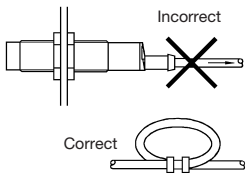
- **Plastic Industry**
  Resins, regrinds or moulded products.
- **Chemical Industry**
  Cleansers, fertilisers, liquid soaps, corrosives and petrochemicals.
- **Wood Industry**
  Saw dust, paper products, door and window frames.
- **Ceramic & Glass Industry**
  Raw material, clay or finished products, bottles.
- **Semi-conductor Industry**
- **Food & Beverage Industry**
- **Packaging Industry**
  Package inspection for level or contents, dry goods, fruits and vegetables, dairy products.

Materials are detected due to their dielectric constant. The bigger the size of an object, the higher the density of material, the better or easier it is to detect the object. Nominal sensing distance for a capacitive sensor is referenced to a grounded metal plate (ST37). For additional information regarding dielectric ratings of materials please refer to Technical Information.

To avoid interference from inductive voltage/ current peaks, separate the prox. switch power cables from any other power cables, e.g. motor, contactor or solenoid cables

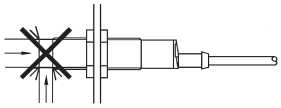


Relief of cable strain



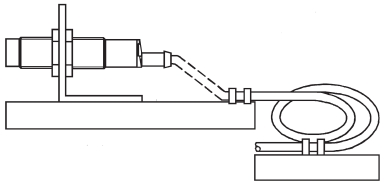
The cable should not be pulled

Protection of the sensing face



A proximity switch should not serve as mechanical stop

Switch mounted on mobile carrier



Any repetitive flexing of the cable should be avoided

Delivery Contents

- Capacitive switch: CA18FL...
- Screw driver
- 2 nuts
- **Packaging:** Cardboard box
- Installation & Adjustment Guide

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

- **4TH Generation TRIPLESHIELD™**
- **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 *TRIPLESHIELD*™ technology. Furthermore, these sensors feature increased immunity to electromagnetic interference (EMI), especially to frequency drives. Not only does 4TH generation *TRIPLESHIELD*™ 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

- **Capacitive proximity switch**
- **Housing diameter (mm)**
- **Housing material**
- **Housing length**
- **Detection principle**
- **Rated operating dist. (mm)**
- **Output type**
- **Output configuration**
- **Connection type**

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)

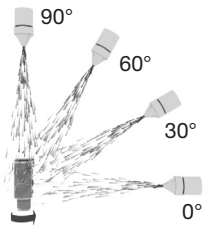
CARLO GAVAZZI

Specifications (cont.) EN 60947-5-2

Sensitivity control	Adjustable by potentiometer
Electrical adjustment	11 turns
Mechanical adjustment	16 turns
Adjustable distance	
Flush types	2 to 20 mm
Non-flush types	4 to 30 mm
Effective operating dist. (S_r)	0.9 x $S_n \le S_r \le$ 1.1 x S_n
Usable operating dist. (S_u)	0.85 x $S_r \le S_u \le$ 1.15 x S_r
Repeat accuracy (R)	≤ 5%
Hysteresis (H)	3 - 20%
Rated operational volt. (U_B)	10 to 40 VDC (ripple incl.)
Ripple	≤ 10%
Output function	NPN or PNP
Output switching function	N.O. and N.C.
Rated operational current (I_e)	≤ 200 mA (continuous)
Capacitive load	100 nF
No-load supply current (I_o)	≤ 12 mA
Voltage drop (U_d)	≤ 2.0 VDC @ 200 mA DC
Minimum operational current (I_m)	≥ 0.5 mA
OFF state current (I_r)	≤ 100 µA
Protection	Short-circuit, reverse polarity, transients
Frequency of operating cycles (f)	50 Hz
Response time OFF-ON (t_{on})	≤ 10 ms
Response time ON-OFF (t_{off})	≤ 10 ms
Power ON delay (t_v)	≤ 200 ms
Indication	
Target detected	LED, yellow
Power and detection stability	LED, green
Environment	
Installation category	III (IEC 60664, 60664A; 60947-1)
Degree of pollution	3 (IEC 60664, 60664A; 60947-1)
Degree of protection	IP 67, IP 68/60 min., IP69K* (IEC 60529; 60943-1)
NEMA type	1, 2, 4, 4X, 5, 6, 6P, 12
Operating temperature	-30 to +85°C (-22 to +185°F)
Max. temperature on sensing face	120°C (248°F)
Storage temperature	-40 to +85°C (-40 to +185°F)
Rated insulation voltage	1 kVAC (rms) IEC protection class III
Tightening torque	≤ 7.5 Nm

Connection	
Cable	PVC, Ø5.2 x 2 m, 4 x 0.34 mm² Oil proof, grey
Plug (M1)	M12 x 1 - 4 pin
Temperature alarm output	60°C ± 5°C
Response time examples	
T_A = 25°C	16 sec @ T_{EXC} = 800°C 390 sec @ T_{EXC} = 80°C
TRIPLESHIELD™	
Exceeding the norms for capacitive sensors	
Electrostatic discharge (EN61000-4-2)	
Contact discharge	> 40 kV
Air discharge	> 40 kV
Electrical fast transients/burst (EN 61000-4-4)	±4kV
Surge (EN 61000-4-5)	
Power-supply	> 2kV (with 500 Ω)
Sensor output	> 2kV (with 500 Ω)
Wire conducted disturbances (EN 61000-4-6)	> 20 Vrms
Power-frequency magnetic fields (EN 61000-4-8)	
Continuous	> 60 A/m, 75.9 µ tesla
Short-time	> 600 A/m, 759 µ tesla
Radiated RF electromagnetic fields (EN 61000-4-3)	> 20 V/m
Shock (IEC 60068-2-32)	30 G / 11ms, 3 pos, 3 neg per axis
Rough handling shocks (IEC 60068-2-31)	twice from 1 m 100 times from 0.5 m
Vibration (IEC 60068-2-6)	10 to 150 Hz, 1 mm / 15 G
Housing material	
Body	PBT, grey, 30% glass reinforced
Cable gland	PA12, black
Fingernuts	PA12, black
Trimmershaft	Nylon
Weight	
Cable version	190 g
Plug version	106 g
Approvals	cULus (UL508), ECOLAB
CE-marking	Yes
MTTF$_d$	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.



CARLO GAVAZZI

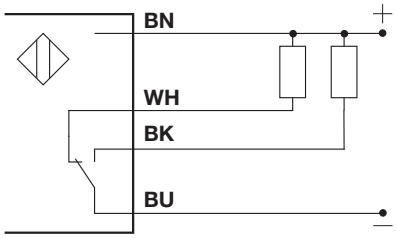
Adjustment Guide

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 standard 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.

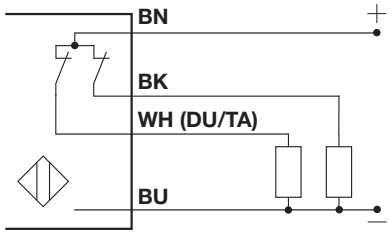
Note:
The sensors are factory set (default) to nominal sensing range S_n.

Wiring Diagram

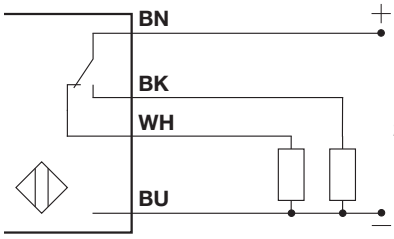
NPN



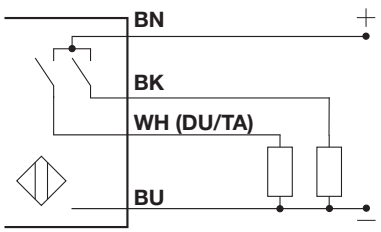
PNP Dust- or Temperature alarm on NC



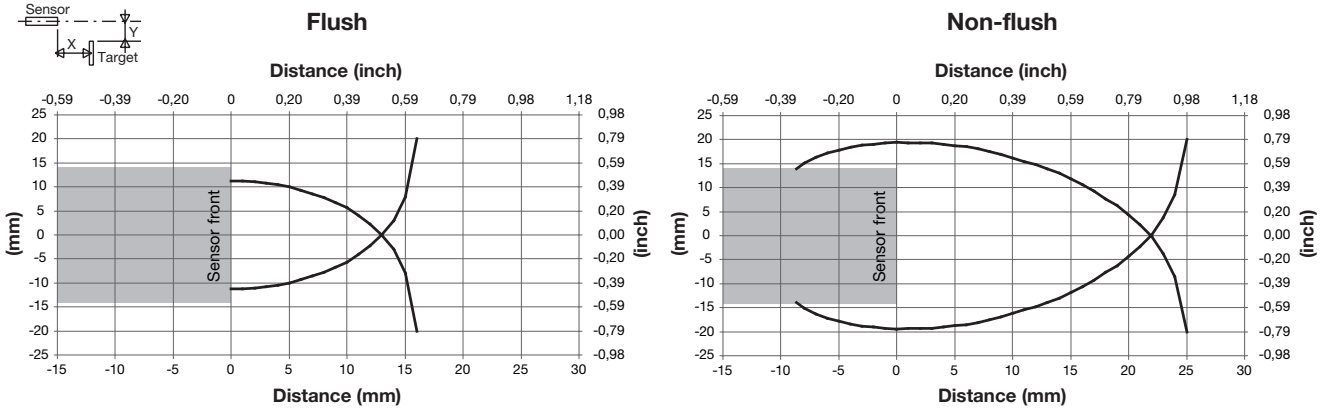
PNP



PNP Dust- or Temperature alarm on NO

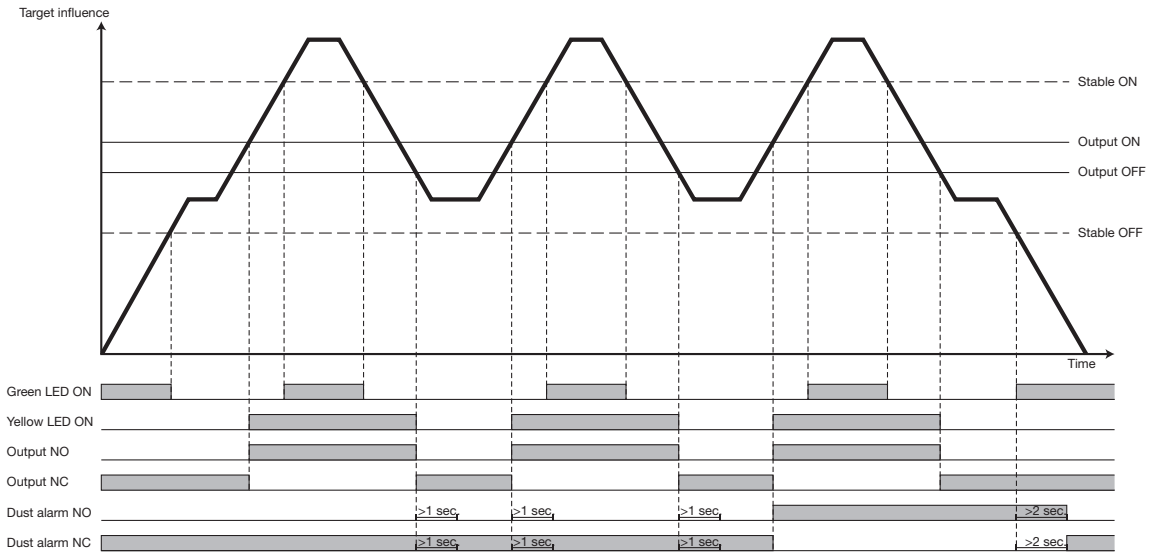


Detection Diagram



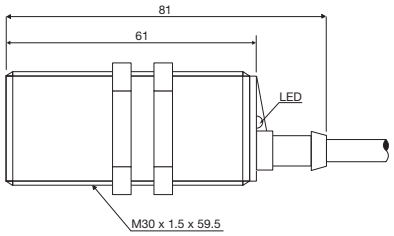
CARLO GAVAZZI

Detection Stability Indication

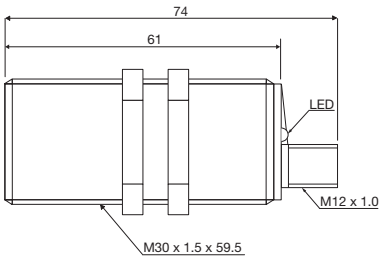


Dimensions

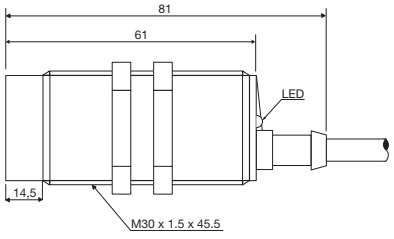
CA30CAF....



CA30CAF....M1

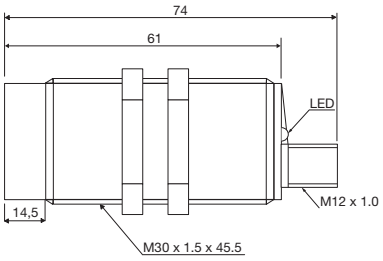


CA30CAN....



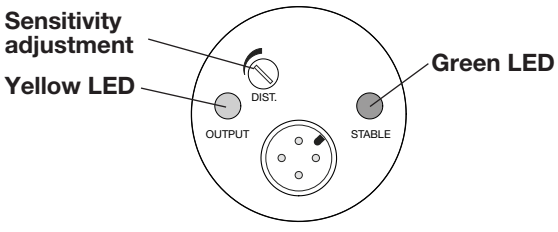
Cable

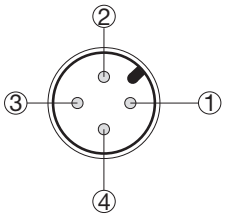
CA30CAN....M1



Plug

Back of sensor





Colour code

1 Brown
2 White
3 Blue
4 Black

CARLO GAVAZZI

Installation Hints

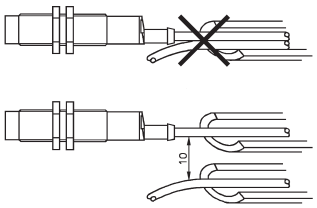
Capacitive sensors have a unique ability to detect almost any material in liquid or solid form. Capacitive sensors are able to detect metallic as well as non-metallic objects. However, their traditional use is for non-metallic materials such as:

- **Plastics Industry**
  Resins, regrinds or moulded products.
- **Chemical Industry**
  Cleansers, fertilizers, liquid soaps, corrosives and petrochemicals.
- **Wood Industry**
  Saw dust, paper products, door and window frames.
- **Ceramics & Glass Industry**
  Raw materials, clay or finished products, bottles.
- **Packaging Industry**
  Package inspection for level or contents, dry goods, fruits and vegetables, dairy products.

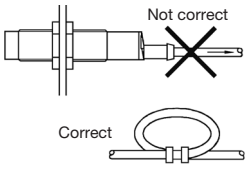
Materials are detected due to their dielectric constant. The bigger the size of an object, the higher the density of material, the better or easier it is to detect the object.

The nominal sensing distance for a capacitive sensor is referred to a grounded metal plate (ST37). For additional information regarding dielectric ratings of materials please refer to Technical Information.

To avoid interference from inductive voltage/ current peaks, separate the prox. switch power cables from any other power cables, e.g. motor, contactor or solenoid cables

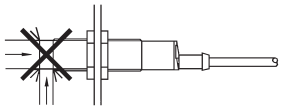


Relief of cable strain



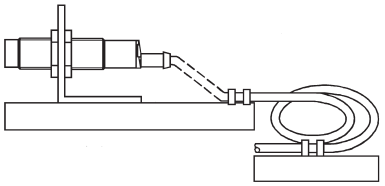
The cable should not be pulled

Protection of the sensing face



A proximity switch should not serve as mechanical stop

Switch mounted on mobile carrier



Any repetitive flexing of the cable should be avoided

Delivery Contents

- Capacitive switch: CA30CAN/CAF.....
- User manual
- 2 x M30 fingernuts
- Screwdriver
- **Packaging:** Cardboard box

Accessories

- Connector type CONB14NF-... -series.
- Mounting Brackets AMB30-S.. (straight), AMB30-A.. (angled)

Proximity Sensors Capacitive Thermoplastic Polyester Housing Type CA, M 30, 2-wire AC/DC

TRIPLESHIELD™

CARLO GAVAZZI

- **Featuring TRIPLESHIELD™ Sensor Protection**
- **Temperature stability**
- **Humidity compensation circuit**
- **Adjustable sensing distance 2-16 mm or 2-25 mm**
- **Rated operational voltage: 20-250 VAC/DC**
- **Output: Power MOSFET**
- **Make and break switching function, selectable**
- **LED indication**
- **High noise immunity**
- **Flush and non-flush types**
- **Cable and plug versions available**

Product Description

Capacitive proximity switches with either sensing distance 16 mm flush mounted or 25 mm sensing distance non-flush mounted. 2-wire AC/DC output with a switch for choosing NO and NC switching. Grey M 30 polyester housing with 2 m PVC cable or plug. Ideal for use in level and plastic machinery applications.

Ordering Key

CA30CLF25CPM6

- **Type: Cap. proximity switch**
- **Housing style**
- **Housing size**
- **Housing material**
- **Housing length**
- **Detection principle**
- **Sensing distance**
- **Output type**
- **Output configuration**
- **Connection**

Type Selection

Housing diameter	Rated operating dist. (S_n) [1]	Mounting	Ordering no. Power MOSFET, cable Make & break switching	Ordering no. Power MOSFET, plug Make & break switching
M30 [2]	16 mm	Flush (built-in)	**CA30CLF16CP**	**CA30CLF16CPM6**
M30	25 mm	Non-flush	**CA30CLN25CP**	**CA30CLN25CPM6**

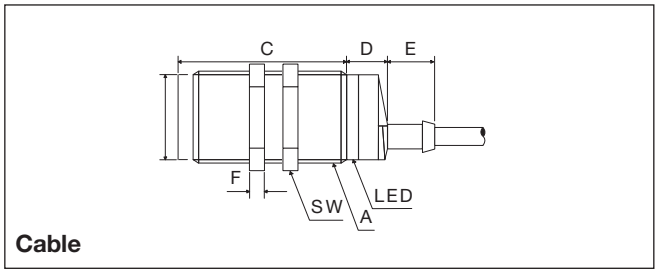
[1] Object: Grounded steel plate

[2] No humidity compensation

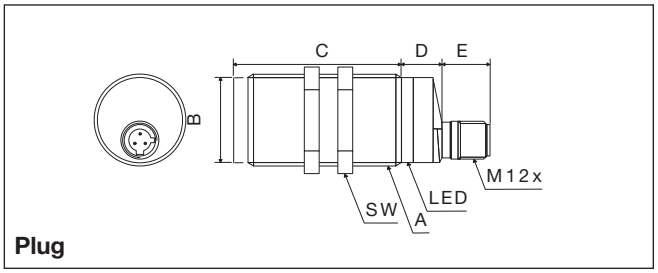
Specifications

Rated operating dist. (S_n)	
CA30CL.16CP..:	2 to 16 mm (preset at 16 mm)
CA30CL.25CP..:	2 to 25 mm (preset at 25 mm)
Sensitivity	Adj. multiturn pot.meter
Effective operating dist. (S_r)	$0.9 \times S_n \le S_r \le 1.1 \times S$
Usable operating dist. (S_u)	$0.8 \times S_r \le S_n > 1.2 \times S_r$
Repeat accuracy (R)	≤ 5%
Hysteresis (H)	4 to 20% of sensing distance
Rated operational volt. (U_B)	20 to 250 VAC/DC (ripple included)
Ripple	≤ 10%
Rated operational current (I_e)	
Continuous	≤ 250 mA DC @ $T_A \le 50°C$ ≤ 200 mA DC @ $T_A \le 80°C$ ≤ 350 mA AC @ $T_A \le 50°C$ ≤ 250 mA AC @ $T_A \le 80°C$
Short-time	< 2.5 A (max. 20 ms)
Min. load current	10 mA
OFF-state current (I_r)	< 1.9 mA (@ 20-250 VAC) < 1.7 mA (@ 20-250 VDC)
Voltage drop (U_d)	≤ 5.5 VAC/DC @ $I_{e\,max}$
Protection	Transients, reverse polarity
Power ON delay	≤ 200 ms
Freq. of operating cycles (f)	10 Hz
Indication for output ON	LED, yellow
Environment	
Degree of protection	IP 67 (Nema 1, 3, 4, 6, 13)
Temperature (T_A)	
Operating temperature	-25° to +80°C (-13° to +176°F)
Storage temperature	-40° to +85°C (-40° to +185°F)
Housing material	
Body	Grey, thermoplastic polyester
Cable end	Polyester
Nuts	Black reinforced nylon
Connection	
Cable	Grey, 2 m, 2 x 0.5 mm^2 Oil proof, PVC
Plug (-6)	M12 x 1 double keyed
Cable for plug (-6)	CON.-6A-series
Weight (incl. nuts)	**CA30CL.16CP..:** 140 g **CA30CL.25CP..:** 150 g
Approvals	UL, CSA
CE-marking	Yes

Dimensions



Cable



Plug

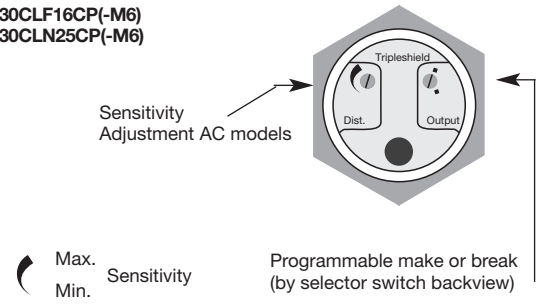
Type	A	B Ø mm	C mm	D mm	E mm	F mm	SW mm
CA30CLF16CP(-M6)	M 30 x 1.5 x 50	28	50	13.6	15.4	5	36
CA30CLN25CP(-M6)	M 30 x 1.5 x 50	28	62	13.6	15.4	5	36

Adjustment Guide

The environments in which capacitive sensors are installed can often be unstable regarding temperature, humidity, object distance and industrial (noise) interference. Because of this, Carlo Gavazzi offers as standard features in all *TRIPLESHIELD*™ capacitive sensors a user-friendly sensitivity adjustment instead of having a fixed sensing range, extended sensing range to accommodate mechanically demanding areas, temperature stability to ensure minimum need for adjusting sensitivity if temperature varies and high immunity to electromagnetic interference (EMI).

Note:
Sensors are factory set (default) to maximum rated sensing range.

CA30CLF16CP(-M6)
CA30CLN25CP(-M6)



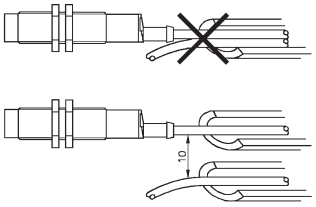
Installation Hints

Capacitive sensors have the unique ability to detect almost all materials, either in liquid or solid form. Capacitive sensors can detect metallic as well as non-metallic objects, however, their traditional use is for non-metallic materials such as:

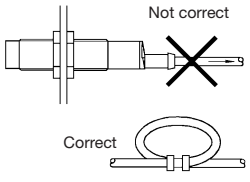
- **Plastic Industry**
  Resins, regrinds or moulded products.
- **Chemical Industry**
  Cleansers, fertilisers, liquid soaps, corrosives and petrochemicals.
- **Wood Industry**
  Saw dust, paper products, door and window frames.
- **Ceramic & Glass Industry**
  Raw material, clay or finished products, bottles.
- **Packaging Industry**
  Package inspection for level or contents, dry goods, fruits and vegetables, dairy products.

Materials are detected due to their dielectric constant. The bigger the size of an object, the higher the density of material, the better or easier it is to detect the object. Nominal sensing distance for a capacitive sensor is referenced to a grounded metal plate (ST37). For additional information regarding dielectric ratings of materials please refer to Technical Information.

To avoid interference from inductive voltage/ current peaks, separate the prox. switch power cables from any other power cables, e.g. motor, contactor or solenoid cables

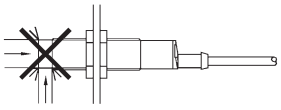


Relief of cable strain



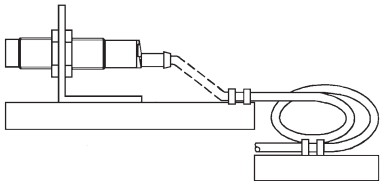
The cable should not be pulled

Protection of the sensing face



A proximity switch should not serve as mechanical stop

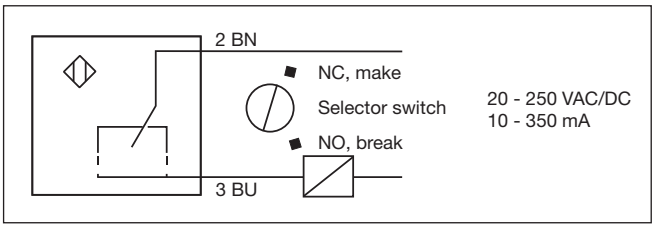
Switch mounted on mobile carrier



Any repetitive flexing of the cable should be avoided

CARLO GAVAZZI

Wiring Diagram



Delivery Contents

- Capacitive switch: CA30..CL...CP (-M6)
- Screw driver
- 2 nuts
- **Packaging:** Cardboard box
- Installation & Adjustment Guide (MAN CAP ENG/GER)

Accessories

- Plugs CONH6A.. serie.

For further information please refer to “Accessories”.

Capacitive Level Detector For Plastic & Rubber Thermoplastic Polyester Housing Types CA, M30, M32, DC, Self-Teach

TRIPLESHIELD™

CARLO GAVAZZI

- **Designed for plastic and rubber applications**
- **For dry bulk material detection**
- **Featuring *TRIPLESHIELD*™ Sensor Protection**
- **Self-Teach of sensing distance or remotely by means of wire**
- **Withstands up to 120°C on the sensing surface**
- **Automatic detection of NPN or PNP load**
- **Selectable make or break switching by means of remote function**
- **Protection: Short-circuit, transients and reverse polarity**
- **Humidity compensation**
- **5 years of warranty**

Product Description

Capacitive level detector with specialized and optimized features for level detection in plastic and rubber applications.
The sensor will adapt automatically to the application when power-on for the first time. The adjustment is easy to change by means of the remote teach-in function. The sensor front can withstand temperatures up to 120°C.
3-wire DC output with selectable make (NO) or break (NC) switching. Grey polyester housing with 2 m PVC cable or M12 plug (Only M30).

Ordering Key

CA30CLN25BPM1

- **Capacitive proximity switch**
- **Housing diameter (mm)**
- **Housing material**
- **Housing length**
- **Detection principle**
- **Rated operating dist. (mm)**
- **Output type**
- **Output configuration**
- **Connection type**

Type Selection

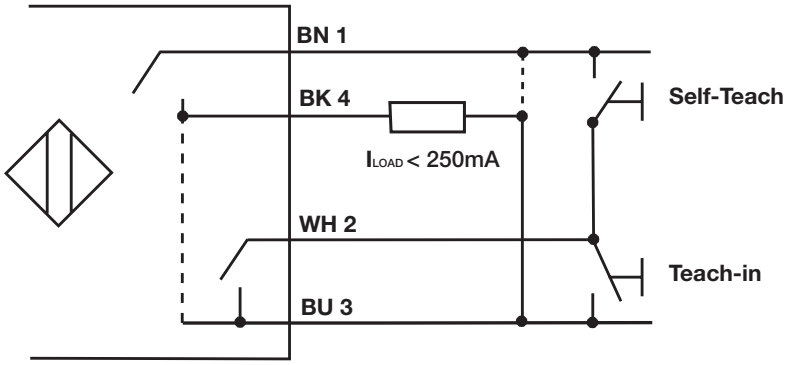
Housing diameter	Ordering no. Cable	Ordering no. Plug
M30	**CA30CLN25BP**	**CA30CLN25BPM1**
M32	**CA32CLN25BP**	

Specifications

Sensitivity	Adjustable (Self-Teach)
Repeat accuracy (R)	≤ 5%
Hysteresis (H)	5 - 10%
Rated operational volt. (U_B)	10 to 40 VDC (ripple incl.)
Ripple	≤ 10%
Rated operational current (I_e)	≤ 250 mA (continuous)
No-load supply current (I_o)	≤ 12 mA
Voltage drop (U_d)	≤ 2.5 VDC @ max. load
Protection	Short-circuit, reverse polarity, transients
***TRIPLESHIELD*™ protection-EMC**	
IEC 1000-4-2/EN 61000-4-2	30 kV
IEC 1000-4-3/EN 61000-4-3	> 15 V/m
IEC 1000-4-4/EN 61000-4-4	4 kV
IEC 1000-4-6/EN 61000-4-6	> 10 V_{rms}
Frequency of operating cycles (f)	5 Hz
Indication	
For output ON	LED, yellow
For calibration	LED, red

Environment		
Degree of protection		IP 68
Operating temperature		-20° to +85°C (-4° to +185°F)
Max. temperature on sensing face		120°C (248°F)
Storage temperature		-40° to +85°C (-40° to +185°F)
Housing material		
Body		Grey, thermoplastic polyester
Cable end		Polyester, softened
Nuts		Black, PA12 Grilamid
Connection		
Cable	M30	Grey, 2 m, 4 x 0.34 mm²
	M32	Grey, 2 m, 4 x 0.75 mm²
		Oil proof, PVC
Plug (M1)		M12 x 1
Cable for plug (M1)		CON.1A-series
Weight		
Cable version - M30 / M32		150 g/230 g
Plug version - M 30		70 g
Approvals		UL, CSA
CE-marking		Yes

Wiring Diagram



The PNP- or NPN-load will automatically be detected.

Always connect the white wire to (+) supply for running mode (Locked setup)

Installation

First time calibration

Install and wire the sensor according to the above wiring diagram. Remember to connect the white wire, the 4th wire, to (+) supply

The very first time the sensor is powered up, the sensor will automatically adapt to the surroundings and calculate an optimal sensitivity by itself – no matter what kind of plastic material to be detected.

As long as the white wire is connected to (+) supply, the sensor will be locked and be in running mode.

New	Action	Description of sensor setup
First time calibration	New sensor	Factory settings
	Install the sensor in the application	-
	Connect the sensor electrical. White wire to (+) supply	-
	Power ON	Self-Teach: Red LED blinking The sensor is now in running mode

Locked sensor set-up

No other adjustment is needed. As long as the white wire is connected to (+) supply, the set-up of the sensor is locked, and will not change during another power down/up.

Locked	Action	Description of sensor setup
	Sensor running	Last setup
	Power OFF	-
	Power ON (Startup delay 600ms)	No Self-Teach. The sensor is now in running mode

Re-calibration of the sensor

If needed, a new Self-Teach can be activated by disconnecting the white wire from (+) supply, and then connect it again to (+) supply.

You have now activated a new Self-Teach and the sensor will now re-calibrate and calculate a new sensitivity according to the application. Be sure that the application is empty – no object to detect.

Self-Teach	Action	Description of sensor setup
Force new Self-Teach	Disconnect white wire	-
	Connect white wire to (+) supply	Self-Teach: Red LED blinking The sensor is now in running mode
	Power OFF	-
	Power ON (Startup delay 600 ms)	The sensor is still in running mode

Every time the white wire is being disconnected from (+) supply, the Self-Teach function will be initiated and take place when connecting it again to (+) supply

Self-Teach	Action	Description of sensor setup
Force new Self-Teach	Power OFF	-
	Disconnect white wire	-
	Power ON (Startup delay 600 ms)	-
	Connect white wire to (+) supply	Self-Teach: Red LED blinking The sensor is now in running mode

Remote teach-in

It is possible to teach-in either background or object, like the CAxxCLL sensors with normal teach-in function.

Teach-in Background

Teach-in	Action	Description of sensor setup
Remote Teach-in background	Disconnect white wire	-
	Be sure that the application is empty Connect the white wire to (-) supply > 3 sec. Remove the wire during the next 3 seconds.	The red LED will flash once per second Remote teach-in of background
	Connect white wire to (+) supply	Self-Teach: Red LED blinking The sensor is now in running mode

Teach-in Object

Teach-in	Action	Description of sensor setup
Remote Teach-in object	Disconnect white wire	-
	Be sure that the application is **with** object. Connect the white wire to (-) supply > 6 sec. Remove the wire during the next 3 seconds.	The red LED will flash twice per second Remote teach-in of object
	Connect white wire to (+) supply	The sensor is now in running mode

Teach-in Background and Object

Teach-in	Action	Description of sensor setup
Remote Teach-in of back-ground and object	Disconnect white wire	-
	Background: Be sure that the application is empty. Connect the white wire to (-) supply > 3 sec. Remove the wire during the next 3 seconds.	The red LED will flash once per second Remote teach-in of background
	Object: Be sure that the application is **with** object. Connect the white wire to (-) supply > 6 sec. Remove the wire during the next 3 seconds.	The red LED will flash twice per second Remote Teach-in of object
	Connect white wire to (+) supply	The sensor is now in running mode

Toggle between normally open and normally closed

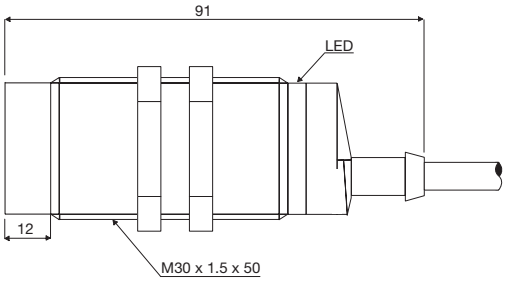
It is possible to toggle between normally open and normally closed by means of the teach-in function.

Teach-in	Action	Description of sensor setup
Normally open <> Normally closed	Disconnect white wire	-
	Connect the white wire to (-) supply > 9 sec. Remove the wire during the next 3 seconds.	The red LED will flash three times per sec-ond Toggle between NO and NC
	Connect white wire to (+) supply	The sensor is now in running mode

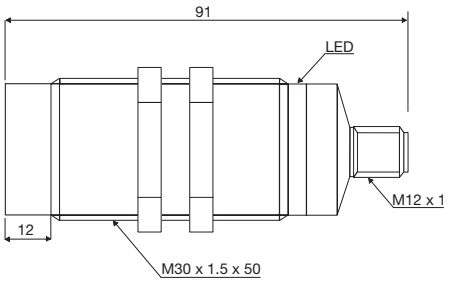
Dimensions

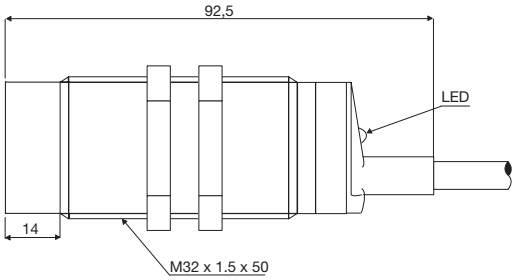
M30 and M32

Cable



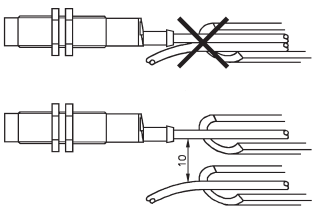
Plug



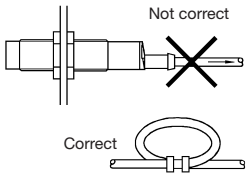


Installation Hints

To avoid interference from inductive voltage/ current peaks, separate the prox. switch power cables from any other power cables, e.g. motor, contactor or solenoid cables

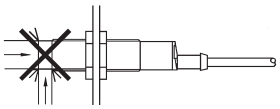


Relief of cable strain



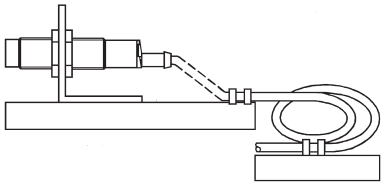
The cable should not be pulled

Protection of the sensing face



A proximity switch should not serve as mechanical stop

Switch mounted on mobile carrier



Any repetitive flexing of the cable should be avoided

Delivery Contents

- Capacitive switch: CA..CLN25BP..
- Manual
- **Packaging:** Cardboard box

Accessories

- Plugs CON.1A.. series.

По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

Россия (495)268-04-70
Киргизия (996)312-96-26-47
Казахстан (7172)727-132

cgo@nt-rt.ru || https://gavazzi.nt-rt.ru/