



CE SERIES

Electric contacts

- ◆ snap-action contacts
- ◆ electronic contacts
- ◆ inductive contacts
- ◆ micro switch contacts

When you need a continuously instrument reading (pressure gauge or thermometer) and in the same time open or close an electric circuit system, you shall apply to the instrument electric contacts.

Three types are available:

- snap-action;
- electronic;
- inductive

A micro switch contacts are also available.

Instruments provided with electric contacts shown in this series are in accordance with standard

CEI EN 60947



Note about weights:

values to be added to standard execution weight for chosen instruments are:

- ~ Kg 0,20 for execution D (dry) DN 100 e 96x96;
- ~ Kg 0,46 for execution F (filled) DN 100;
- ~ Kg 0,21 for execution D (dry) DN 150 e 144x144;
- ~ Kg 0,79 for execution F (filled) DN 150.

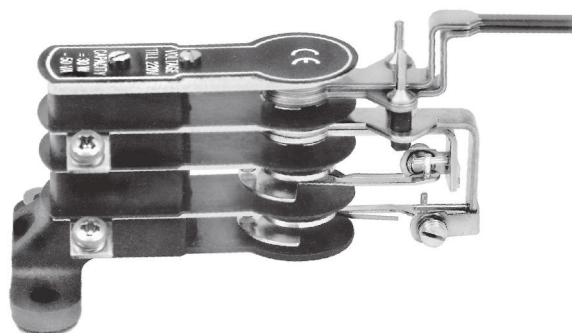
SNAP-ACTION CONTACTS

They are substantially real switches, driven by the instrument pointer. It is possible, by means of a device, to predetermine from outside the value at which you request the switching. Setting is possible on the entire range. When instrument pointer clashes with the set limit value, the contact elements, touching each other, cause the switching.

With double contact, this occurs at two values.

Characteristic of these devices is to have a permanent magnet fixed near the contact, it speeds up both opening and closure, independently from the instrument pointer rotation speed, and sparking is minimized.

Magnetic attraction makes contact almost insensible to vibrations; the intensity of this attraction could be changed according to the customer's needs.



TECHNICAL FEATURES

• Applications

for instruments of SP, PQ, DP, MP, MA and ST series.

• Switching action

(see table CE 3 at pages CE05 and CE06)

- single or double contact;
- separate circuit double contact;
- SPDT or DPDT contacts;
- triple contact (available on request).

• Casing

- high case for under dial contact;*
- (identification H)
- case with hood for contact on dial.
- (identification Q)
- *note: on dial for series DP, MP, ST, MA.

• Execution

- dry version;
- liquid filled version (silicone fluid).



- **Ambient temperature**

- - 20 ÷ + 60 °C.

- **Working**

- entire range extension.

- **Dimensions**

- see table CE 2 at page CE04.

- **Window**

- methacrylate disk (H);
- laminated safety glass disk thickness 6 mm (option V19) (H);
- methacrylate hood (if foreseen) (Q).

- **Adjusting lock**

- fixed key (standard);
- removable key (on request).

- **Electrical wiring**

- junction box with grounding:
- cable-gland PG 9;
- cable-gland M20 x 1,5.

- **Magnetic snap-action**

interference advance (in closure) or delay (in opening) between 2% and 4% of full scale value, referred to the set limit value. Deviation depends on the instrument pointer speed and on the magnetic attraction intensity.

When the customer gives no advice, the standard deviation is about 3% (change-over contacts are usually supplied without magnet).

note: the accuracy level of instrument is that stated in specific series but you read it differently in the contact intervention area.

- **Contact materials**

- golden silver alloy (standard);
- gold alloy (on request);
- platinum alloy (on request).

Table CE 1

Electrical parameters

Voltage	Direct current	Control category	Alternating current	Control category
230 V	100 mA	DC 12	120 mA	AC 12
	55 mA	DC 13	65 mA	AC 14
110 V	200 mA	DC 12	240 mA	AC 12
	100 mA	DC 13	130 mA	AC 14
50 V	300 mA	DC 12	450 mA	AC 12
	160 mA	DC 13	200 mA	AC 14
24 V	400 mA	DC 12	600 mA	AC 12
	200 mA	DC 13	250 mA	AC 14
Maximum load: =30 W / ~50 VA			Maximum thermal current: 0,7 A	

note: change-over contacts are usually supplied without magnets, so the maximum load and thermal current value are: =10 W/ ~18VA - 0,4A; for other electrical parameters feel free to consult our technical department

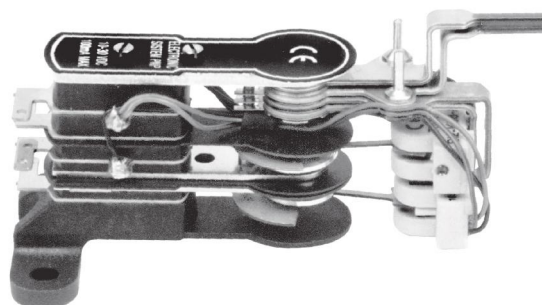
ELECTRONIC CONTACTS

Due to their proximity type of switching, electronics contacts may be used for almost all industrial applications.

For their switching accuracy, these contacts are suitable for precision measuring instruments, for liquid filled or low pressure instruments.

Compared to inductive contacts, this system is cheaper because it avoids the use of an amplifier relay.

Electronics contacts with a PNP output are particularly suitable for switching small DC loads (10 ÷ 30 V DC, ≤100 mA), for instance PLC signals inputs.





TECHNICAL FEATURES

- **Applications**
for instruments of SP, PQ, DP, MP, MA and ST series.
- **Switching action**
(see table CE 4 at page CE07)
- single contact or duoble.
- **Casing**
 - high case for under dial contact;*
(identification H)
 - case with hood for contact on dial.
(identification Q)
- *note: on dial for series DP, MP, ST, MA.
- **Execution**
 - dry version;
 - liquid filled version (silicone fluid).
- **Ambient temperature**
- - 20 ÷ + 60 °C.
- **Working**
- entire range extension.
- **Dimensions**
- see table CE 2 at page CE04.
- **Window**
 - methacrylate disk (H);
 - laminated safety glass disk thickness 6 mm
(option V19) (H);
 - methacrylate hood (if foreseen) (Q).
- **Adjusting lock**
 - fixed key (standard);
 - removable key (on request).
- **Electrical wiring**
junction box with grounding:
 - cable-gland PG 9;
 - cable-gland M20 x 1,5.

INDUCTIVE CONTACTS

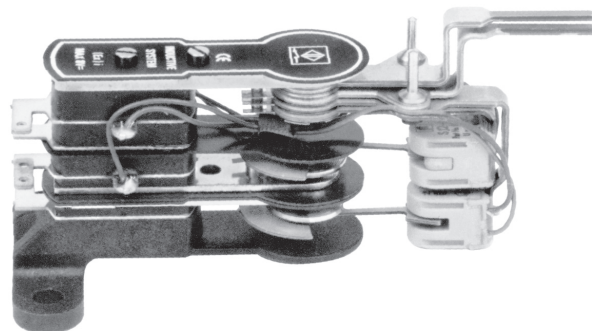
Intrinsically safe

They work like electrical switches, but here interference is made by a relay that receive (by means of an amplifier), the signal coming from an inductive coupling.

The instrument pointer drives, with its movement, a metal flag; in a set position, the flag interacts with a high frequency magnetic field producing a signal that is supplied to the relay.

For their operating performance, inductive contacts are intrinsically safe, so they are used in all dangerous areas where there are explosive gases and mixtures, like in chemical and oil-bearing plants.

The absence of every type of contact between the coupling elements avoids any wear problem and ensures an unlimited and maintenance-free service life.



TECHNICAL FEATURES

- **Classification**
- II 2 G EEx ia IIC T6.
- **Applications**
for instruments of SP, PQ, DP, MP, MA and ST series.
- **Switching action**
(see table CE 5 at page CE08)
- single or double contact.
- **Supply voltage**
- 8 V CC.
- **Casing**
 - high case for under dial contact;*
(identification H)
 - case with hood for contact on dial.
(identification Q)
- *note: on dial for series DP, MP, ST, MA.
- **Execution**
 - dry version;
 - liquid filled version (silicone fluid).
- **Ambient temperature**
- - 20 ÷ + 60 °C.
- **Working**
- entire range extension.
- **Dimensions**
- see table CE 2 at page CE 04
- **Window**
 - methacrylate disk (Es. H);
 - aminated safety glass disk thickness 6 mm
(option V19) (Es. H);
 - methacrylate hood (if foreseen) (Es. Q).
- **Adjusting lock**
 - fixed key (standard);
 - removable key (on request).
- **Electrical wiring**
junction box with grounding:
 - cable-gland PG 9;
 - cable-gland M20 x 1,5.
- **Amplifier relay**
supplied only on request.



Table CE 2

Dimensions of instruments with electric contacts or with transducer

Bottom direct mounting		Flush mounting with 3-hole fixing	
<p>high case</p> <p>SP 308</p>	<p>hood</p>	<p>high case</p> <p>SP 311</p>	<p>hood</p> <p>ST 383</p>
<p>SP 308 - MP 319 / 419 / 320 / 420 / 321 / 421 MA 325 / 425 - ST 375 / 378 / 379</p>			
Flush mounting with clamp		Flush mounting with clamp	
<p>high case</p> <p>SP 312</p>		<p>high case</p> <p>PQ 318</p>	
Surface mounting with 3-hole fixing		Back direct mounting	
<p>high case</p> <p>SP 313</p>	<p>hood</p> <p>ST 380</p>	<p>high case</p> <p>SP 315</p>	<p>hood</p> <p>ST 374</p>
<p>(1) For instruments series SP and ST with micro switch contacts the size is 57 mm.</p> <p>(2) For instruments series SP and ST with micro switch contacts the size is 64 mm.</p>			<p>Differential pressure gauge</p> <p>DP 360 / 460 / 361</p>
<p>note: Usually instruments with electric contact are supplied with high case. (identification H) The case with methacrylate hood (id. Q) is foreseen for SP308 model "low cost", for gauges series MP, MA, DP, TP, for thermometers series ST and instruments with triple contact or DPDT (for triple contact or DPDT dimension B = 50 or 57 mm has to be increased of 16 mm).</p>			


Table CE 3.1

Single and double snap-action contacts interference types

Wiring scheme	Type	The instrument pointer moves clockwise and when it reaches the set limit value...	After the interference ...
	CM 01	...makes the contact	... i circuit is closed
	CM 02	...breaks the contact	... circuit is open
	CM 11	...makes the 1st contact ...makes the 2nd contact	... 1st circuit is closed ... 2nd circuit is closed
	CM 22	...breaks the 1st contact ...breaks the 2nd contact	... 1st circuit is open ... 2nd circuit is open
	CM 12	...makes the 1st contact ...breaks the 2nd contact	... 1st circuit is closed ... 2nd circuit is open
	CM 21	...breaks the 1st contact ...makes the 2nd contact	... 1st circuit is open ... 2nd circuit is closed

note: for vacuum gauges interferences are opposite to those above indicated for the pointer usually rotates anticlockwise



Table CE 3.2

Separate and change-over snap-action contacts interference types

Wiring scheme	Type	The instrument pointer moves clockwise and when it reaches the set limit value...	After the interference ...
	CS 11 separate	...makes the 1st contact ...makes the 2nd contact	... 1st circuit is closed ... 2nd circuit is closed
	CS 22 separate	...breaks the 1st contact ...breaks the 2nd contact	... 1st circuit is open ... 2nd circuit is open
	CS 12 separate	...makes the 1st contact ...breaks the 2nd contact	... 1st circuit is closed ... 2nd circuit is open
	CS 21 separate	...breaks the 1st contact ...makes the 2nd contact	... 1st circuit is open ... 2nd circuit is closed
	CM 03 change-over	... makes and in the same time breaks the contact	SPDT
	CM 33 change-over	... makes and in the same time breaks the 1st contact ... makes and in the same time breaks the 2nd contact	DPDT

note: for vacuum gauges interferences are opposite to those above indicated for the pointer usually rotates anticlockwise



Table CE 4

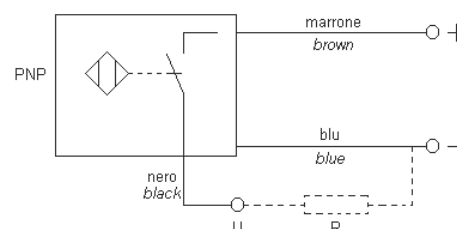
Electronic contacts interference types

Wiring scheme	Type	The instrument pointer moves clockwise and when it reaches the set limit value carries the metal flag...	After the interference ...
	CT 01	...into the control head	... control circuit is closed
	CT 02	...out of the control head	... control circuit is open
	CT 11	...1st contact into the control head ...2nd contact into the control head	... control circuit is closed ... control circuit is closed
	CT 22	...1st contact out of the control head ...2nd contact out of the control head	... control circuit is open ... control circuit is open
	CT 12	...1st contact into the control head ...2nd contact out of the control head	... control circuit is closed ... control circuit is open
	CT 21	...1st contact out of the control head ...2nd contact into the control head	... control circuit is open ... control circuit is closed

With a PNP switching apparatus, the switched output (U) is a connection towards "+" (brown).

The load (R) between (U) and the connection towards "-" (blue) should be selected in the way not to exceed the maximum switching current (100 mA).

No direct connection between U con "-"

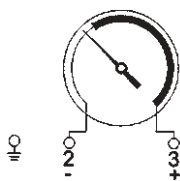
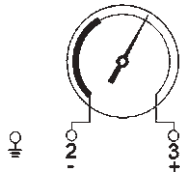
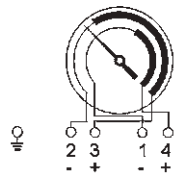
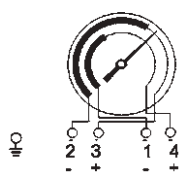
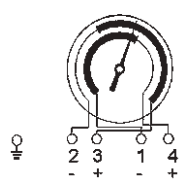
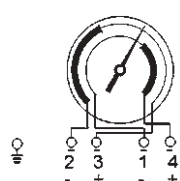


note: for vacuum gauges interferences are opposite to those above indicated for the pointer usually rotates anticlockwise



Table CE 5

Inductive contacts interference types

Wiring scheme	Type	The instrument pointer moves clockwise and when it reaches the set limit value carries the metal flag...	After the interference ...
	CI 01	...out of the control head	... control circuit is closed
	CI 02	...into the control head	... control circuit is open
	CI 11	...1st contact out of the control head ...2nd contact out of the control head	... control circuit is closed ... control circuit is closed
	CI 22	...1st contact into the control head ...2nd contact into the control head	... control circuit is open ... control circuit is open
	CI 12	...1st contact out of the control head ...2nd contact into the control head	... control circuit is closed ... control circuit is open
	CI 21	...1st contact into the control head ...2nd contact out of the control head	... control circuit is open ... control circuit is closed

Connecting cable

"+" (brown)

"-" (blue)

Basic functions

As long as the metal flag is in the control head, a low control current of ≤ 1 mA flows and the initiator is at high impedance. Whenever the metal flag is outside the control head, a high control current of ≥ 3 mA flows and the initiator is at low impedance. Upon reversal of operation mode from operating current to rest current, the types description must be changed accordingly.

note: for vacuum gauges interferences are opposite to those above indicated for the pointer usually rotates anticlockwise



MICRO SWITCH CONTACTS

Those devices represent a valid alternative to the traditional contact snap-action. The less sensibility of the electric action is compensated by the higher switching and of a longer life of the device.

Instrument with micro-switch contact



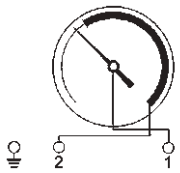
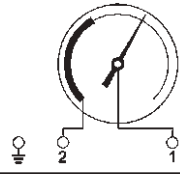
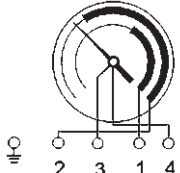
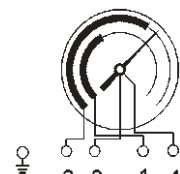
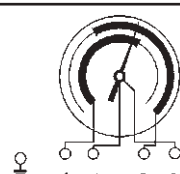
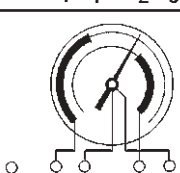
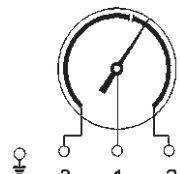
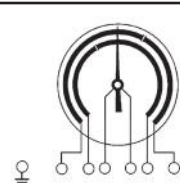
TECHNICAL FEATURES

- **Applications**
for instruments of SP and ST series.
- **Switching action**
(see table CE 7 at page CE10)
 - single contact;
 - separate circuit double contact;
 - SPDT o DPDT contacts.
- **Working current**
 - 250 V CA max - 5 A max.
- **Execution**
 - dry version.
- **Ambient temperature**
 - - 20 ÷ + 60 °C.
- **Working**
 - entire range extension.
- **Dimensions**
 - see table CE 2 at page CE04.
- **Window**
 - methacrylate disk.
- **Adjusting lock**
 - removable key.
- **Electrical wiring**
junction box with grounding:
 - cable-gland PG 9 for single or SPDT contact;
 - cable-gland M20 x 1,5 for double or DPDT contact.
- **Contact material**
 - pure silver 999,9.
- **Switching accuracy**
 - 2 ÷ 5% of full scale value.



Table CE 7

Single and double micro switch contacts interference types

Wiring scheme	Type	The instrument pointer moves clockwise and when it reaches the set limit value...	After the interference ...
	MS 01	...makes the contact	... circuit is closed
	MS 02	...breaks the contact	... circuit is open
	MS 11 separate	...makes the 1st contact ...makes the 2nd contact	... 1st circuit is closed ... 2nd circuit is closed
	MS 22 separate	...breaks the 1st contact ...breaks the 2nd contact	... 1st circuit is open ... 2nd circuit is open
	MS 12 separate	...makes the 1st contact ...breaks the 2nd contact	... 1st circuit is closed ... 2nd circuit is open
	MS 21 separate	...breaks the 1st contact ...makes the 2nd contact	... 1st circuit is open ... 2nd circuit is closed
	MS 03 change-over	...makes and in the same time breaks the contact	SPDT
	MS 33 change-over	...makes and in the same time breaks the 1st contact ...makes and in the same time breaks the 2nd contact	DPDT

note: for vacuum gauges interferences are opposite to those above indicated for the pointer usually rotates anticlockwise