GENERAL SPECIFICATIONS OF INDUCTIVE AND CAPACITIVE SENSORS - EN50032

ACTIVE FACE
The active face of proximity sensor is the surface from which emits an oscillating field where a metallic object (inductive) or any material (capacitive) results in a change of state of the sensor without entering in contact with it.

EMBEDDABLE (FLUSH MOUNTING) SENSORS (TS)
The metal body covers the sensing area on all sides allows the unit to be installed in metal parts or next to other sensors without causing problems of reciprocal interference.

NOT EMBEDDABLE (NON FLUSH MOUNTING) SENSORS (PS)
The metal body leaves uncovered part of the sensing area resulting in an increased sensing distance. During installation it is important to remember the minimum distances from metallic parts in the case of inductive units and from any type of material in the case of capacitive units. It is not possible to mount more than one sensor side by side.

SUGGESTIONS FOR MOUNTING
• Follow the indications listed in the technical characteristics for the various families of sensors.
• Take note of the temperature limits indicated for each family of sensors. Incorrect installation may result in a modification in the switching distance causing a change in equipment performance.
• When using sensors in areas where chemicals are present it is advisable that they be installed so as not to come in direct contact with these substances as it may be difficult to establish their corrosiveness. Generally speaking the plastic parts have a high resistance to oil, salts, petrol and other hydrocarbons. It is recommended that further information be requested from our technical department.
• Do not pull the cable with excessive force and if necessary use protective tubing.
• Avoid repetitive movements between cable and sensor if necessary follow the instructions in the diagram.

<table>
<thead>
<tr>
<th>INDUCTIVE SENSORS</th>
<th>1 x Sn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aq 37</td>
<td>1 x Sn</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>0,9 x Sn</td>
</tr>
<tr>
<td>Brass-bronze</td>
<td>0,5 x Sn</td>
</tr>
<tr>
<td>Aluminium</td>
<td>0,4 x Sn</td>
</tr>
<tr>
<td>Copper</td>
<td>0,4 x Sn</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAPACITIVE SENSORS</th>
<th>1 x Sn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metals</td>
<td>1 x Sn</td>
</tr>
<tr>
<td>Water</td>
<td>1 x Sn</td>
</tr>
<tr>
<td>Plastic</td>
<td>0,5 x Sn</td>
</tr>
<tr>
<td>Glass</td>
<td>0,5 x Sn</td>
</tr>
<tr>
<td>Wood</td>
<td>0,4 x Sn</td>
</tr>
</tbody>
</table>

REDUCTION FACTORS IN INDUCTIVE AND CAPACITIVE SENSORS
If the object to be sensed is not Fe37 (inductives) or material other than metal (capacitives) the intervention distance reduces.
Futhermore if the object to be sensed has dimensions and thickness less than those indicated then the intervention distance will be further reduced.

DESCRIPTION OF TECHNICAL TERMS
SWITCHING DISTANCE (Sn)
This is the switching distance measured at 20°C and nominal supply voltage, using a square piece of Fe 360 (EN60947-5-2) steel of 1 mm. thickness the side of which must be equal to or greater than the diameter of the active surface. In this condition the sensor switches in a Sn range of ± 10% Sn.

HYSTERESIS
Hysteresis is the distance between switching in both directions at nominal voltage and temperature values. The value is expressed as a percentage of the switching distance.
REPEATABILITY
This indicates the intervention point variation of the sensor operated at the same conditions and in the same way.

SWITCHING FREQUENCY
The switching frequency is the maximum possible number of impulse repetitions per second. This is determined by the measurement method according to DIN EN 50010 (right drawing). The max. values of the switching frequency of each sensor are indicated on the technical characteristics.

RATED VOLTAGE (Vn)
The rated voltage indicates the power supply values where the sensor works perfectly.

RESIDUAL RIPPLE
Ripple is the alternating voltage superimposed on the D.C. voltage (peak-peak) in %.

MAXIMUM OUTPUT CURRENT
Is the maximum current the sensor can generate in continuous operation.

MINIMUM OUTPUT CURRENT
It is the minimum current value which should flow through the sensor in order to guarantee a safe working.

PEAK CURRENT
The peak current indicates the maximum current value that the sensor can bear in a limited period of time.

RESIDUAL CURRENT
It is the residual current which flows through the sensor when it is open.

ABSORPTION
Is the maximum current absorption of the sensor in relation to the maximum off load voltage.

VOLTAGE DROP
It is the voltage drop measured across the sensor.

SHORT CIRCUIT PROTECTION
Most of the D.C. sensors have incorporated a protection which prevents the internal circuit from being damaged by a short circuit or overload of the output.

When the short circuit is removed the sensor is automatically reactivated.

PROTECTION AGAINST REVERSAL OF POLARITY
All the sensors are protected against reversal of polarity, this prevents the internal components from being damaged by incorrect power-supply connection.

GENERAL SPECIFICATIONS OF INDUCTIVE AND CAPACITIVE SENSORS - EN50032

CONNECTION FOR INDUCTIVE AND CAPACITIVE SENSORS

CONNECTION OF D.C. TYPES IN SERIES (AND LOGIC)
In some applications it is necessary to obtain two corresponding signals before an action is carried out. Two sensors connected in this way will activate one output when they are excited simultaneously. When D.C. amplified types are used it is necessary to take into account the voltage drop present at the output of each sensor (<1,8V) the maximum load current of the sensors used and the current absorption of each single sensor (<10mA) as well as the final load.

PROTECTION AGAINST INDUCTIVE PEAKS
All the sensors are protected against damage caused by the disconnection of inductive loads. It is advisable to keep the cable of the power conductors separate.

ISOLATION RESISTANCE
Expressed in ohm between the sensor circuit and the metal body, applying a voltage of 500 VCA.

IP RATING
This is the IP rating of the body which contains the electrical parts expressed in IP followed by two numbers. In the case of inductive and capacitive switches the first is always 6 (complete protection against dust) and the second can be 5 (protected against jets of water) or 7 (protection against immersion for a fixed time).

TEMPERATURE LIMITS
Range of temperature within which the functions is guaranteed as per the technical characteristics.

TEMPERATURE VARIATION
Maximum variation in the intervention distance (Sn) within the limits of temperature allowed expressed as a percentage of ± 10% Sn.

TYPE OF OUTPUT
All the inductive and capacitive sensors are of the different types N-O-C-A specified in page 5 and 57.

TYPE OF OUTPUT
For all MEYLE sensors the standard definitions are used N.O. normally open N.C. normally closed. This refers to the state of the sensor in the absence of switching material.

Most sensors can be supplied in the N.O. + N.C. output.

CONNECTION OF A.C. TYPES IN SERIES OR IN PARALLEL
A.C. sensors can be connected in series taking into account the voltage drop (≤ 6V) present in the sensor when connected in parallel. The load current (≤ 4mA) should be summed and attention should be given when in the minimum load condition (high load impedance).

Such connections should in any case not be done as a function anomalous to the sensor can be generated. The “voltage drop” and the “residual current” is important in this type of connection.

24V A.C. POWER SUPPLY
In sensors supplied with 24V A.C. the voltage drop (≤ 6V) existing in the sensor and the possible voltage drop due to the connecting wires between the sensor and the load should be taken into account.

In order to maintain an adequate voltage it is recommended that the supply voltage be increased by at least 6V.
PROXIMITY CAPACITIVE SENSORS SC SERIES

WORKING PRINCIPLE
Capacitive sensors contain an oscillator transistor in the front section. The oscillating circuit R-C (resistor-capacitor) is influenced by variations in capacity in fact when any material, solid or liquid (water, wood, metals, coffee, powders, etc.) come into contact with the active surface of the sensor the capacitance increases putting into action the oscillator up until the threshold of trigger inverts. By introducing a change in the condition of the final stage and therefore in the command of the external load a potentiometer makes fine adjustments to the switching distance. All the sensors are protected against a change of polarity and electrical disturbances of inductive origin, and they are protected against short circuits. They can be supplied with rapid or delayed switching. The plastic parts of the MEYLE capacitive sensors (body, plugs, outlets and locknuts) are made of makrolon which is not toxic, non static and resistant to abrasives.

CHOICE OF A CAPACITIVE SENSOR
When choosing a capacitive sensor the final use should be kept in mind, that is the material to be controlled, its form and composition. The reduction factors related to every material should be remembered and also their physical mass.

If possible it is recommended to use partially screened model, that is not mounted flush with the surface as it is possible to take advantage of the much greater sensitive field, this means that the sensor need not be set to the maximum where it would be more prone to effects from temperature variations, humidity, powder deposits, etc.

If it is necessary to install the sensor flush with the surface it is advised to make a setting which is not too close to the maximum.

The main difference between the totally screened and partially screened types of sensors is that at equal intervention distances the former requires a sensitivity of about the double of the latter and therefore functions under more critical conditions.

APPLICATIONS
Capacitive sensors are used widely as limit switches which are sensitive to all types of materials, as limit controls for sensing the maximum and minimum levels of liquids, powders, granules, etc. in silos and various containers. They can also be used for sensing or counting metallic and non metallic objects.

SENSITIVITY ADJUSTMENT
It is advisable that the sensitivity adjustment be carried out when the sensor is connected in the definite operational position and should be adjusted at the intermediate position between the minimum and maximum values. In the working of the capacitive sensor the air acts as dielectric and it is necessary to take into account that strong variation of humidity can cause, if the adjustment is very fine, a variation of the same. The sensing range is determined in respect to the material and object dimensions to be controlled and can change in respect to the variation of the temperature of about 10% at a temperature of -20 + 70 °C. The sensitivity increases when the trimmer is rotated in the clockwise direction and decreases in the anti-clockwise direction. The adjustment can be carried out once the plastic protection screw is removed. If the sensor is mounted on a metallic support it is necessary to make an earth connection in order to avoid alterations in the sensing distance of the sensor.

SENSITIVITY ADJUSTMENT

COUNTING OF METAL OR NON METAL PARTS

LEVEL CONTROL IN CONTACT WITH SOLID OR LIQUIDS MATERIALS

LEVEL CONTROL WITH NON METALLIC CONTAINERS

SENSITIVITY ADJUSTMENT

CABLE
PROXIMITY CAPACITIVE SENSORS SC SERIES

DELAYED MODELS

These are capacitive sensors which give an output signal to the load which can have an adjustable time delay up to 15 min. To its energization and deenergization switching in both N.O. and N.C. types. They are supplied only in the Ø 40 mm model A.C. The available ranges of delay are the following: 1 sec. to 1 min. - 15 sec. to 15 min. A trimmer for adjusting the time has a scale of 0 to 100. These sensors are used in different industrial applications, particularly in the food industry as level controls where a time delay is specifically required without having to install an external timer between the sensor and the load. In order to carry out the adjustment of the sensitivity the timer trimmer should be zeroed. (See page 64).

VERSION C

SENSORS VERSION C FOR DIRECT VOLTAGE (4 WIRES)
These are amplified D.C. sensors which contain an output amplifier in addition to the oscillator. They are supplied as 4 wires with antiphase outputs in the types NPN and PNP. As standard, this version of sensor is protected against short circuit, absolutely protected against polarity inversion and current peaks created by the disconnection of inductive loads. These sensors can be supplied with power supplies: ALNC - ALTP. They are adapted for inputs of programmable controllers.

SENSORS VERSION FOR ALTERNATING OR DIRECT VOLTAGE (2 WIRES)
These are amplified sensors with two wires which function both in A.C. and D.C., these products as well having an oscillator have a mosfet output amplifier incorporated which is able to open and close a load very quickly. The load which is connected in series with the sensor is passed through by the same residual current that it is supplied by. It is particularly important to pay attention to the low consumption relay, in fact it is important to ensure that:
- the required current for the switching of the relay is EQUAL to or SUPERIOR to the minimum output current required by the sensor;
- the current required of the secure releasing of the relay is SUPERIOR to the residual current of the sensor. If these parameters are not respected there will be an uncertain switching of the relay. Furthermore attention must be given to high impedance input connections of electronic commands as the residual current in the sensor could be sufficient to cause activation.

In the closed state a voltage drop can be found this should be taken into account especially when there is a low voltage supply.

All AC/DC capacitive sensors are short circuit protected (up to 50 Vdc and 250 Vac). They are also protected against voltage transients coming from the power supply or generated by the load. They are compatible with P.L.C. units.

SENSORS VERSION R WITH RELAY (5 WIRES)
These are amplified sensors which can operate with both AC and DC power supplies. The sensors as well as the oscillator and amplifier have incorporated a relay which provides one changeover output contact from 1Amp. at 220 Vac. The external load can be connected to the NO or NC contact of the relay, this solution guarantees greater security in the presence of high loads (up to 1A) which is different to sensors with output. Types with instantaneous intervention are available (page 62) or delayed with programmable functions (page 64).

SUGGESTION FOR SUPPLYING VOLTAGE TO CAPACITIVE SENSORS

The supply voltage should be adjusted according to the characteristics of the sensor used. It is recommended to use a transformer with secondary voltage Vac lower than the direct voltage Vdc required. The secondary voltage Vac is found as follows:

\[ \text{Vac} = \frac{\text{Vdc}}{1.41} \]
CAPACITIVE SENSORS M18 x 1

CYLINDRICAL HOUSING PLASTIC OR METALLIC
4 WIRES D.C. - VERSION-C
2 WIRES A.C. - VERSION-A

**TECHNICAL CHARACTERISTICS**

**Dimensions mm**

<table>
<thead>
<tr>
<th>AMPLIFIED</th>
<th>4 WIRE D.C.</th>
<th>ANTIPHASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPN</td>
<td>NO+NC</td>
<td>SC18P - CE10 PNP NO + NC</td>
</tr>
<tr>
<td>PNP</td>
<td>NO+NC</td>
<td>SC18P - CE10 PNP NO + NC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AMPLIFIED 2 WIRES A.C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
</tr>
<tr>
<td>NC</td>
</tr>
</tbody>
</table>

**Switching distance (Sn) adjustable**

- D.C.: 0 ÷ 10 mm
- A.C.: 0 ÷ 5 mm

**Continuous voltage (residual ripple ≤10%)**

- D.C.: 10 ÷ 55 V
- A.C.: 20 ÷ 250 V

**Alternating voltage 50÷60 Hz**

- D.C.: 10 Hz
- A.C.: < 1 Hz

**Hysteresis (%)Sn**

- D.C.: In relation to Sn
- A.C.: < 1

**Switching frequency**

- D.C.: 10 Hz
- A.C.: < 1 Hz

**Repeatability (at constant temperature) mm**

- D.C.: 200 in D.C. - 300 in A.C.
- A.C.: < 1

**Max peak current for 20 ms A**

- D.C.: 1.5
- A.C.: ≤ 1

**Absorption at 24 Vdc mA**

- D.C.: < 1.8 in D.C. - < 6 in A.C.
- A.C.: Incorporate in D.C.

**Voltage drop (sensor ON) V**

- D.C.: ≥ 10 V
- A.C.: ≥ 10

**Short circuit protection**

- D.C.: Incorporated
- A.C.: Incorporated

**Temperature limits °C**

- D.C.: -20 ÷ +70
- A.C.: -20 ÷ +70

**IP rating**

- D.C.: 65
- A.C.: 65

**Housing**

- D.C.: Gray plastic (Makrolon)
- A.C.: Nickel-plated brass

**Cable PVC**

- D.C.: 4 x 0.25 mm² in D.C.
- A.C.: 3 x 0.35 mm² in A.C.

**Connector plug**

- D.C.: H (only D.C.)
- A.C.: H (only D.C.)

**Protection housing**

**WIRING DIAGRAMS**

**VERSION C**

*VERSION A*

N.B.: Upon request cable for sensors with different lengths 3.5 - 5 - 7.5 - 10 metres is available.

**CONNECTION WITH H - K PLUGS**

FOR THE CONNECTORS SEE PAGE 83

**MODELS AVAILABLE WITH H PLUG**

FOR M12 CONNECTORS

- SC18M-CS...H
- SC18M-CT10...H
- SC30P-CE25...H
- SC30M-C20...H
- SC30M-CE25...H
CAPACITIVE SENSORS M30 x 1.5
CYLINDRICAL HOUSING PLASTIC OR METALLIC
4 WIRES D.C. - VERSION-C

* Types available with protection against electrostatic charges up to 27KV.

<table>
<thead>
<tr>
<th></th>
<th>SC30P - CE25 NPN NO + NC*</th>
<th>SC30P - CE25 PNP NO + NC*</th>
<th>SC30P - CE25 NPN NO + NC K</th>
<th>SC30P - CE25 PNP NO + NC K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>0 ÷ 25</td>
<td>0 ÷ 25</td>
<td>0 ÷ 20</td>
<td>0 ÷ 20</td>
</tr>
<tr>
<td>In relation to Sn</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorporated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorporated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 20 ÷ + 70</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Red plastic (Makrolon)
- Nickled brass

Possible mounting (SCM-P)
Possible mounting (SCM-K)

INSTRUCTIONS FOR CORRECT INSTALLATION

EMBEDDABLE

Side by side mounting
Flush mounting

NOT EMBEDDABLE

Side by side mounting
Non flush mounting
CAPACITIVE SENSORS M30 x 1.5
CYLINDRICAL HOUSING METALLIC
4 WIRES D.C.
VERSION-C

TECHNICAL CHARACTERISTICS
Dimensions mm

<table>
<thead>
<tr>
<th>AMPLIFIED 4 WIRES D.C. ANTIPHASE</th>
<th>NPN</th>
<th>NO+NC</th>
<th>PNP</th>
<th>NO+NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC30M - CE25 NPN NO + NC</td>
<td></td>
<td></td>
<td>SC30M - CE25 PNP NO + NC</td>
<td></td>
</tr>
<tr>
<td>SC30M - CE25 NPN NO + NC K</td>
<td></td>
<td></td>
<td>SC30M - CE25 PNP NO + NC K</td>
<td></td>
</tr>
</tbody>
</table>

Switching distance (Sn) adjustable: 0 ÷ 25 mm
Continuous voltage (residual ripple ≤10%) V: 10 ÷ 55
Alternating voltage 50÷60 Hz V: In relation to Sn
Hysteresis (%Sn) mm: In relation to Sn
Switching frequency Hz: 10
Repeatability (at constant temperature) mm: < 1
Max output current mA: 300
Min output current mA: Incorporated
Max peak current for 20 ms A: Incorporated
Absorption at 24Vdc mA: ≤ 10
Residual current mA: Incorporated
Voltage drop (sensor ON) V: < 1.8
Short circuit protection: Incorporated
Led: Incorporated
Temperature limits °C: -20 ÷ +70
IP rating IP: 67
Housing: Nickelled brass
Cable PVC: 2m
Connector plug: H (on request)
Protection housing: Possible mounting (SCM-K)

WIRING DIAGRAMS
VERSION C
N.B.: Upon request cable for sensors with different lengths 3.5 - 5 - 7.5 - 10 metres is available.

CONNECTION WITH K PLUG
FOR CONNECTORS TYPE 12 (PAGE 85)

VIEW OF MALE CONNECTOR K
1 = Blue / -
2 = Brown / +
4 / + = Black / Output NPN - PNP / NO
3 = White / Output NPN - PNP / NC
1 / 2 = NO - NC Programmable
**CAPACITIVE SENSORS M30 x 1.5**

CYLINDRICAL HOUSING PLASTIC OR METALLIC

2 WIRES A.C./D.C.

VERSION-A

<table>
<thead>
<tr>
<th>SC30P - AE25 NO*</th>
<th>SC30P - AE25 NO/NC K PROGRAMMABLE</th>
<th>SC30M - A20 NO*</th>
<th>SC30M - A20 NO/NC K PROGRAMMABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>0 ÷ 25</strong></td>
<td><strong>0 ÷ 25</strong></td>
<td><strong>0 ÷ 20</strong></td>
<td><strong>0 ÷ 20</strong></td>
</tr>
</tbody>
</table>

20 ÷ 250

20 ÷ 250

In relation to Sn

10

< 1

500

10 (Min. release current)

1.5

≤ 2

< 6

Incorporated (Up to 50V in d.c.)

Incorporated

- 20 + + 70

67

65

67

65

Blue plastic makrolon

Nickelled brass

3 x 0.50 mm²

3 x 0.50 mm²

K (type 12)

K (type 12)

Possible mounting (SCM-P)

Possible mounting (SCM-K)

**INSTRUCTIONS FOR CORRECT INSTALLATION**

**EMBEDDABLE**

Side by side mounting

Flush mounting

**NOT EMBEDDABLE**

Side by side mounting

Non flush mounting

* Models with NO/NC programmable output are available on request.
CAPACITIVE SENSORS M30 x 1.5
CYLINDRICAL HOUSING METALLIC
2 WIRES A.C./D.C.
VERSION-A

NOT EMBEDDABLE (NON FLUSH MOUNTING)

TECHNICAL CHARACTERISTICS
Dimensions mm

<table>
<thead>
<tr>
<th>AMPLIFIED 4 WIRES D.C. ANTIPHASE</th>
<th>NPN</th>
<th>PNP</th>
<th>NO+NC</th>
<th>NO+NC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NPN</td>
<td>PNP</td>
<td>NO+NC</td>
<td>NO+NC</td>
</tr>
<tr>
<td>Switching distance (Sn) adjustable mm</td>
<td>0 ÷ 25</td>
<td>0 ÷ 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous voltage (residual ripple ≤10%) V</td>
<td>20 ÷ 250</td>
<td>18 ÷ 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternating voltage 50÷60 Hz V</td>
<td>20 ÷ 250</td>
<td>18 ÷ 240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hysteresis (%Sn) mm</td>
<td>In relation to Sn</td>
<td>In relation to Sn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching frequency Hz</td>
<td>10</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeatability (at constant temperature) mm</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max output current mA</td>
<td>500</td>
<td>Changeover 1A - 220Vac</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min output current mA</td>
<td>10 (Min. release current)</td>
<td>&lt; 20 Relay on</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max peak current for 20 ms A</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absorption mA</td>
<td>&lt; 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual current mA</td>
<td>≤ 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage drop (sensor ON) V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short circuit protection</td>
<td>Incorporated (Up to 50V in d.c.)</td>
<td>Incorporated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Led</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature limits ºC</td>
<td>- 20 ÷ + 70</td>
<td>- 20 ÷ + 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP rating IP</td>
<td>67</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>Nickelled brass</td>
<td>Red plastic makrolon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable PVC 2m</td>
<td>3 x 0.50 mm²</td>
<td>5 x 0.35 mm²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connector plug</td>
<td></td>
<td>Possible mounting (SCM-K)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection housing</td>
<td></td>
<td>Possible mounting (SCM-P)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

WIRING DIAGRAMS

VERSION C
BROWN
BLACK
WHITE
BLUE
PNC NO-NC

VERSION A
BLUE
YELLOW/GREEN
BROWN
BLACK
WHITE

VERSION R
RED
YELLOW/GREEN
BROWN
BLUE
WHITE

N.B.: Upon request cable for sensors with different lengths 3.5 - 5 - 7.5 - 10 metres is available.

* Models with NO/NC programmable output are available on request.

CONNECTION WITH K PLUG
FOR CONNECTOR TYPE 12 (PAGE 85)

VIEW OF MALE CONNECTOR K
1 / 2 = ~ NO - NC Programmable

Meyer Industrie-Electronic GmbH - MEYLE
Carl-Bosch-Straße &
49525 Lengerich/Germany
Internet: www.meyle.de
Tel: (+49) 05481/9345-0
Fax: (+49) 05481/9345-12
E-Mail: sales@meyle.de
### CAPACITIVE SENSORS M40 x 1.5

**CYLINDRICAL HOUSING PLASTIC**

4 WIRES D.C.

VERSION-C

**SC40P - CE35 NPN NO + NC**

**SC40P - CE35 PNP NO + NC**

<table>
<thead>
<tr>
<th></th>
<th>SC40P - AE35 NO</th>
<th>SC40P - AE35 TE/TD NO</th>
<th>SC40P - AE35 NC</th>
<th>SC40P - AE35 TE/TD NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ÷ 35</td>
<td>20 ÷ 250</td>
<td>20 ÷ 250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 ÷ 55</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In relation to Sn</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>500</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 2</td>
<td></td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1.8</td>
<td>Incorporated</td>
<td>Incorporated (Up to 50V in d.c.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorporated</td>
<td></td>
<td>Incorporated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 20 ÷ + 70</td>
<td></td>
<td>- 20 ÷ + 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>Blue plastic makrolon</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red plastic makrolon</td>
<td>3 x 0.50 mm²</td>
<td></td>
<td>2 x 0.50 mm²</td>
<td></td>
</tr>
</tbody>
</table>

**On request protection housing with 2 inch fixing**

### INSTRUCTIONS FOR CORRECT INSTALLATION

**NOT EMBEDDABLE**

- Sie by side mounting
- Non flush mounting

**SC40P-AE35 DELAYED - AVAILABLE RANGE**

**SC40P-AE35 TE NO**, delay on energization N.O. contact.

In the absence of material the sensor has an open contact. When the material enters the sensing area, the delay set starts. At the end of this time the contact closes. When the material leaves the sensing area, the contact opens instantaneously.

**SC40P-AE35 TE NC**, delay on energization N.C. contact.

In the absence of material the contact of the sensor is closed. When material enters the sensing area, the contact opens. When material leaves the area, the delay set starts, after which the contact opens.

**SC40P-AE35 TD NO**, delay on de-energization N.O. contact.

In the absence of material the contact of the sensor is open. When material enters the sensing area, the contact closes. When material leaves the area, the delay set starts, after which the contact opens.

**SC40P-AE35 TD NC**, delay on de-energization N.C. contact.

In the absence of material the contact of the sensor is open. When material enters the sensing area, the delay set starts, after which the contact opens. When material leaves the area, the contact closes instantaneously.

**RANGE OF STANDARD TIME DELAY**

FROM 1 to 15 minutes.
DELAYED PROGRAMMABLE CAPACITIVE SENSOR SC30P-RE25T TYPE

This proximity sensor belongs to the capacitive sensor family, it supplies a signal to the external load which can be delayed up to 10 min. when any material solid or liquid (water, glass, wood, metal, coffee, powders etc.) come into the sensing area, it is used principally as a level control. This model is completely programmable regarding the delay in energization and de-energization with open or closed output, the sensor does in fact contain a 1A 220V changeover relay. Due to its versatility, programmability and high power output compared to a normal electronic sensor, the stocking of product for the wholesaler is simplified as is the adaptability of the switch to any application. This sensor can be used with the protection housing SCM-R which is of POM and therefore satisfies the most severe abrasion resistance requirements. When used as a level control, this housing allows for the sensor to be substituted whenever required.

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching distance Sn adjustable</td>
<td>0 - 25 mm</td>
</tr>
<tr>
<td>Multivoltage power supply</td>
<td>18÷50 Vdc / 18÷240 Vac (50÷60 Hz)</td>
</tr>
<tr>
<td>Hysteresis (%Sn)</td>
<td>Depending on Sn</td>
</tr>
<tr>
<td>Max. switching frequency</td>
<td>Hz</td>
</tr>
<tr>
<td>Repeatability (at a constant temp.)</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Max. output current</td>
<td>mA</td>
</tr>
<tr>
<td>Absorption (relay activated)</td>
<td>20 mA</td>
</tr>
<tr>
<td>LED</td>
<td>Incorporated</td>
</tr>
<tr>
<td>Temperature limit</td>
<td>°C</td>
</tr>
<tr>
<td>IP rating</td>
<td>65</td>
</tr>
<tr>
<td>Standard range of delay</td>
<td>min.</td>
</tr>
<tr>
<td>Housing</td>
<td>Plastic (Makrolon)</td>
</tr>
<tr>
<td>Cable PVC</td>
<td>2 m</td>
</tr>
<tr>
<td>Protection housing</td>
<td>5 x 0.35 mm²</td>
</tr>
</tbody>
</table>

PROGRAMMABLE FUNCTION TABLE

<table>
<thead>
<tr>
<th>Function</th>
<th>Switch Pos.</th>
<th>Relay Output Wires Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE NO</td>
<td>B</td>
<td>Red / Black</td>
</tr>
<tr>
<td>TE NC</td>
<td>A</td>
<td>Red / White</td>
</tr>
<tr>
<td>TD NO</td>
<td>A</td>
<td>Red / White</td>
</tr>
<tr>
<td>TD NC</td>
<td>B</td>
<td>Red / White</td>
</tr>
</tbody>
</table>

PROGRAMMABLE FUNCTIONS

FUNCTION TE NO - delay on energization N.O. contact.
In the absence of material the sensor has an open contact. When the material enters the sensing area, the delay set starts. A the end of this time the contact closes. When the material leaves the sensing area, the contact opens instantly.

FUNCTION TE NC - delay on energization N.C. contact.
In the absence of material the contact of the sensor is closed. When material enters the sensing area, the contact opens. When material leaves the area, the delay set starts, after which the contact closes.

FUNCTION TD NO - delay on de-energization N.O. contact.
In the absence of material the contact of the sensor is open. When material enters the sensing area, the contact closes. When material leaves the area, the delay set starts, after which the contact opens.

FUNCTION TD NC - delay on de-energization N.C. contact.
In the absence of material the contact of the sensor is closed. When material enters the sensing area, the delay set starts, after which the contact opens. When material leaves the area, the contact closes instantly.

IDENTIFICATION REFERENCE

CAPACITIVE SENSORS
NON FLUSH
SWITCHING DISTANCE

SENSOR DIAMETER
RELAY
PLASTIC HOUSING

SC 30 P - RE 25 T1

T1 = 0.1 sec. - 1 min.
10 = 1 sec. - 10 min.

N.B.: Upon request cable for sensors with different lengths 3.5 - 5 - 7.5 - 10 metres is available.
PROTECTION HOUSING FOR CAPACITIVE SENSORS SCM

SPECIFICATIONS

This is used as a waterproof protective cover for the SC30M series with connector and SC30P series with cable output both for A.C. and D.C. supply. The SCM housing is of non toxic material (POM) and is provided with a 1 1/2” GAS thread which allows for its installation by using a standard fitting. This type of installation means that the sensor can be rapidly removed for testing without allowing the loss material from the container and protects the sensor from abrasion. Furthermore the use of the housing eliminates to a large degree variation in the sensitivity of the sensor due to deposits of material. It is also available the protection housing for SC40P capacitive sensors.

INSTALLATION PROCEDURE: HOUSING + SENSOR

DESCRIPTION:

A - Screw
B - Fixing spring
  K type
B1 - Fixing spring
  P type
B2 - N° 2 screw M4x8 mm
C - Connector
D - Capacitive sensor with connector
D1 - Capacitive sensor with cable
D2 - Capacitive sensor with relay output
E - Packing ring
F - SCM-K housing
G - SCM-P housing
H - SCM-R housing

Hole for sensitivity adjustment
Sensitivity adjustment
N° 2 hole for sensor fixing
Sensitivity adjustment
Slot for sensor fixing

N.B:

The protection is supplied with complete accessories for mounting.

EXAMPLE

1 TRADITIONAL INSTALLATION IN THE CONTAINER WALL
2 INSTALLATION WITH A PLASTIC WINDOW (THICKNESS ≤ 6mm)
3 INSTALLATION WITH SCM PROTECTION HOUSING

DIMENSIONS (mm)

C = flexible rubber cable exit

Meyer Industrie-Electronic GmbH – MEYLE
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Tel: (+49) 05481/93 85-0
Fax: (+49) 05481/93 85-12
E-Mail: sales@meyle.de
The high temperature sensors should be considered as part of the traditional range of sensors with the difference that electronic portion is completely separate from the sensing part which is in the form of an extension and can withstand temperature up to 250°C.

These products are used to control the levels of hot materials such as liquids, oil, powder and plastic granules. They also sense solid metallic and non-metallic bodies positioned in areas of high temperature.

The connecting cable between the sensor and the amplifier must be of standard length (2M or 5M). It is not capacitive, it resists to temperatures from -200 to +250°C it is connected to the sensor and it is provided with a screened connector for connection to the amplifier.

The amplifier is supplied in two different types, model ALSC-1CH which is suitable for one sensor and model ALSC-2CH which is suitable for two sensors, the model ALSC-1CH can be supplied with delayed sensing.

The sensors can be supplied in the following formats M18x1 and M30x1.5 made of stainless steel and PTFE.

### AMPLIFIERS TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>TYPES</th>
<th>ALSC - 1CH</th>
<th>ALSC - 2CH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensors</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>A.c. power supply</td>
<td>24 or 110/220</td>
<td>50-60 Hz</td>
</tr>
<tr>
<td>Absorption</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Operation indicator</td>
<td>Yellow led x 1</td>
<td>Yellow led x 2</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-20 ÷ +60</td>
<td></td>
</tr>
<tr>
<td>Output relay - changeover</td>
<td>1 relay - 5 A at 220 Vac</td>
<td>2 relay - 5 A at 220 Vac</td>
</tr>
<tr>
<td>Housing</td>
<td>Plastic</td>
<td></td>
</tr>
<tr>
<td>IP rating</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Sensitivity adjustment</td>
<td>Incorporated</td>
<td>Incorporated x 2 sensors</td>
</tr>
</tbody>
</table>

### TECHNICAL CHARACTERISTICS

SENSOR SC18M-HT / SC30M-HT

- Housing and fixing nuts in stainless steel AISI 303.
- Sensible part in PTFE.
- Cable length 2 m or 5 m.
- Plug connector for wiring to the amplifiers.
- Min./max. temperature range: -200 ÷ +250°C.
- Switching distance (Sn) type SC18M-HT: 5 mm.
- Switching distance (Sn) type SC30M-HT: 15 mm.
- IP rating: IP68.

### INSTALLATION INSTRUCTIONS

If the material to be controlled is in a metallic container check that it is earthed and connect terminal 3 of the amplifier to the earth.

If the container is not metallic, connect terminal 3 of the amplifier and the body of the sensor SC... M-HT to the earth by using the relative terminal. The connection wire between the sensor and the amplifier must be separated from the power supply.

### WIRING DIAGRAMS

- Relay connection for ALSC-1CH and ALSC-2CH amplifiers.

### DIMENSIONS (mm)

N.B.: For a correct fixing of the amplifiers it is recommended to use socket type B11 e and fixing spring type MF (Page 102).
CAPACITIVE SENSORS - APPLICATION EXAMPLES

- Contact level control for solids or liquids
- Level control for non-metallic containers using plastic or glass windows
- Level control for metal containers

Solid or liquid material presence control which are inside packaging or non-metallic containers

Controlling the height of a paper stack

Controlling the breakage in reels of non-metallic material (paper, plastic etc.)

Non-metallic tubing liquid flow control

Filling control

Loading

Level control with delayed sensor (in the example SC40P - AE35 TE15’ NC)

Control in tanks with material -200°C to +250°C (in the example SC30M-HT with separate ALS amplifier)

Handle with care - Fragile

Contact level control

For solids or liquids

Level control for non-metallic containers

Using plastic or glass windows

Level control for metal containers

Solid or liquid material presence control which are inside packaging or non-metallic containers

Controlling the height of a paper stack

Controlling the breakage in reels of non-metallic material (paper, plastic etc.)

Non-metallic tubing liquid flow control

Filling control

Automatic presence counting and sorting control of metallic and non-metallic articles

Loading

Level control with delayed sensor (in the example SC40P - AE35 TE15’ NC)

Control in tanks with material -200°C to +250°C (in the example SC30M-HT with separate ALS amplifier)