

Capacitance Level Sensors

Features



- Suitable for a wide range of media
- Easy in-stu range adjustment
- Unaffected by pressure or vacuum

Specification

Output	4-20mA
Supply	20Vdc – 38Vdc
Insertion Length	0.5 to 3m
Process Connection	1" B.S.P.
Process Temperature	100 C Max
Ambient Temperature	-20 C to +60 C
Max. Pressure	20bar @ 20 C
Electrode Insulation	Polypropylene
Termination Housing	ABS
Electrical Connections	Screw terminals
Country of Origin	UK

Product Codes

LS-CAP1-x.x

Level detector for conducting liquids

LS-CAP2-x.x

Level detector for non-conducting liquids

x.x = Probe length as follows:

0.5	=	0.5m
1.0	=	1m
1.5	=	1.5m
2.0	=	2m
2.5	=	2.5m
3.0	=	3m

Technical Overview

The LS-CAP1 and LS-CAP2 are capacitance based level sensors designed for level measurement in tanks or sumps providing a 4-20mA output relating to the level of fluid in the tank. The LS-CAP1 is suitable for conducting liquids such as water whilst the LS-CAP2 is designed for use with clean, low viscosity non-conducting liquids such as oil.

Installation

Electrodes are supplied to specified lengths, under no circumstances they must not be cut

Electrodes are usually mounted vertically in the vessel. Where the mounting point is metal, there must be good electrical connection with electrode mounting boss.

Where the vessel contents are Electrical Non-Conducting such as fuel or lubricating oils, hydrocarbons etc. A concentric is normally supplied. This type of electrode can be mounted anywhere in the vessel avoiding incoming flow and excessive turbulence. The concentric electrode can be used in either metal or non-metal vessels. Where the electrode is not of the concentric type, electrode position is important and advice should be sought.

Where the vessel contents are Electrically Conducting such as most water based liquids the electro should be mounted clear of the vessel side and away from any incoming flow. A stainless steel bracket is available for fixing to a vertical surface and holds the electrode 150mm from the side. The electrode mounting boss must have good electrical contact with the contents of the vessel in order to provide the 'earthy' reference necessary for capacitance operated systems. This can be achieved using one of the following methods:

Mounting the electrode directly to a metal vessel.

Connecting the 'earth stud' of the mounting boss to existing metal in the vessel providing this extends down below the tip of the electrode. This may be a pipe or metal ladder etc.

The concentric Electrode having an insulated inner electrode has an outer sleeve extending from the boss and is therefore complete in itself.

For turbulent conditions it may be necessary to mount the electrode within a stilling pipe. If the pipe is metal it must be connected to the electrode mounting boss. If the pipe is plastic an earthing wire must be used down the length of the pipe and connected to the mounting boss.

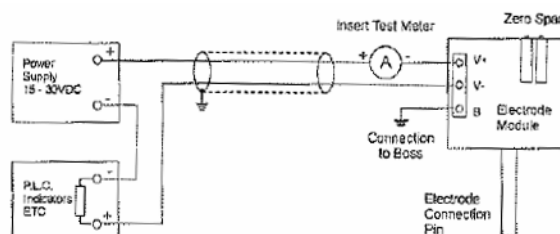
Installation (continued)

A stainless steel wire with weight can be supplied for this. For insulated rod electrodes, a stainless steel steady bracket is available and can be used with the mounting bracket to hold and electrode 150mm from a vertical surface.

Connections & Set-up

Remove cover and pass the cable through the cable gland and make the electrical connections as required. Taking care to observe polarity, as incorrect connection will damage the transmitter.

A milliammeter suitable for measuring a 4-20mA signal should be connected in series with the V+ terminal at the electrode terminating head.



Note that zero and span potentiometers require 15 turns for full travel of the wiper. Due to a slipping clutch, end of travel can only be confirmed by observing the position of the Red wiper through the transparent side of the housing. The Red wiper is at the top when full clockwise.

With the vessel empty the SPAN adjustment should be turned fully clockwise. The ZERO adjustment should then be adjusted to obtain a reading of 4.00mA Turn the ZERO anti-clockwise to decrease the reading - clockwise to increase.

Fill the vessel to full level and turn the SPAN adjustment anticlockwise until a reading of 20.0mA is obtain - clockwise rotation to increase.

Note that due to the range of adjustment available and a 'current clamp' circuit at approximately 25mA, it can take many turns to bring the reading into the 4-20mA range.

With concentric electrodes, the zero can be set with the electrode withdrawn from a full vessel after allowing the electrode to drain.

Maintenance

Having no moving parts, LS-CAP systems are generally trouble free. Routine maintenance is limited to an occasional check that the electrode is not fouled. Malfunction can often be traced to:

Material clinging to the electrode rod

Moisture in the terminating head due to poor cable seal or cap not being secure.

Damage to the plastic sheath of the insulated electrodes.

First line fault finding

Check voltage across $V+V-$. This should be in excess of 15 Volts when current output is 20mA.

Check the mounting boss has good electrical connection with the vessel contents

Unplug the LS-CAP module and check there is no leakage path between the electrode rod and the mounting boss/earth. Reading below 5 meg ohms should be investigated.