



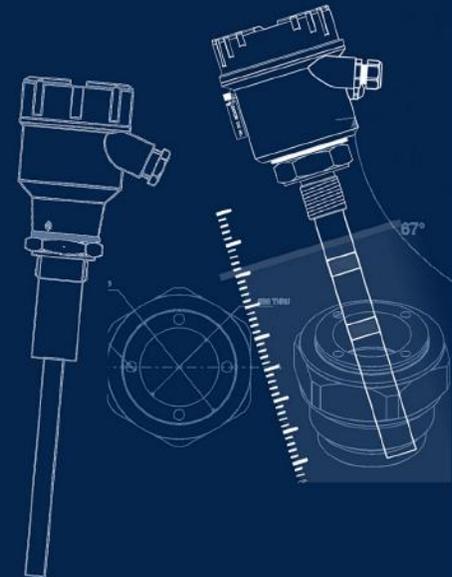
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# INSTRUCTION MANUAL

## CAPVEL-LP

Capacitance Level Transmitter

Version 2.1



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## Revision History

| Revision | Date        | Author(s) | Description           |
|----------|-------------|-----------|-----------------------|
| 1.0      | 15 Feb 2014 | RND       | First Version Editing |
| 1.1      | 05 Sep 2014 | MRK       | Applications Revision |
| 1.2      | 20 Jul 2015 | RND       | Features Revision     |
| 1.3      | 28 Dec 2015 | RND       | Specs Revision        |
| 1.4      | 02 Jun 2016 | RND       | Specs Revision        |
| 2.0      | 08 Jan 2017 | BRND      | Revised Format        |
| 2.1      | 17 Sep 2017 | BRND      | Branding Revisions    |

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- The images shown in this manual may differ from the actual instrument / housing in terms of dimensions, color and design. Please refer to GA drawings for dimensional details.
- Values (of performance) described in this manual were obtained under ideal testing conditions. Hence, they may differ under industrial environment and settings.

### General Instructions

- Instrument shouldn't block the material filling inlet.
- Secure the cover of housing tightly. Tighten the cable glands. For side mounting, the cable glands should point downwards.
- For side mounting, provide a baffle to prevent the material from falling on the probe.
- When handling forks, do not lift them using their tines. While using them with solids, ensure that material size is less than 10mm.
- Deforming the shape of the tines may interfere with the fork's operating frequency.
- Make all electrical connections as instructed in the manual. Don't power on the device before verifying the connections.

## 1 Introduction

CAPVEL-LP is a capacitance based continuous level transmitter. It consists of a sensing rod and electronic insert. In case of non-metallic tank or tank contains turbulent liquid there is provision to give still well tube. Capvel-LP is compact and easy to install measuring device and is suitable for all conductive and non-conductive liquids.



Figure 1: Capvel

## 2 Operating Principle

CAPVEL-LP is composed of specially developed capacitance change gauging circuit. It uses fast RISC based processor to perform all the complicated jobs of evaluating the level out of the capacitance. This capacitance is formed by the sense rod and the metallic container wall where containers are non-metallic or non-uniformly wide or having turbulent fluid, a metallic stilling well is provided. The amount of capacitance is proportional to the level of material between the sense rod and metallic wall of stilling tube or container.

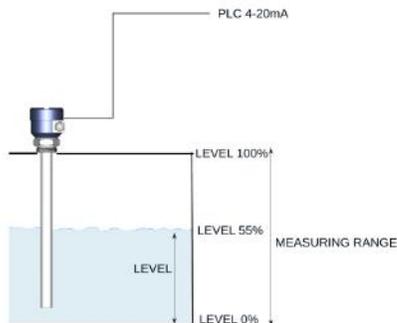


Figure 2: System Diagram

## 3 Features

- Power Supply - 24 - 50 V DC
- 4-20 mA Loop Powered (2-Wire)
- Temperature Durability - Up to 60°C (High Temperature Model on demand)
- Internal Temperature Compensation
- Easy Two Point Calibration Setting

- Suitable for wide range of liquids
- Low Cabling Cost

## 4 Applications

CAPVEL-LP is suitable for the following sets of applications:

- Water Treatment Plants
- Pharmaceutical and Dairy
- Fuel Level Sensing
- Breweries and Distilleries
- Utilities
- Vehicle Tracking System
- Oil & Refinery

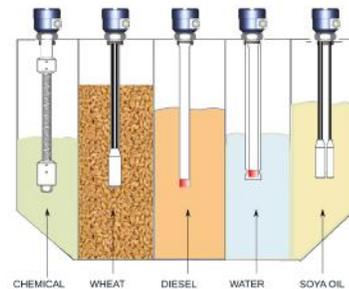


Figure 3: Application Media

## 5 Dimensional Layout

In Figure 4 you can see dimensional layout of capvel level transmitter. Figure 4 is showing side view and the back view of the instrument respectively.

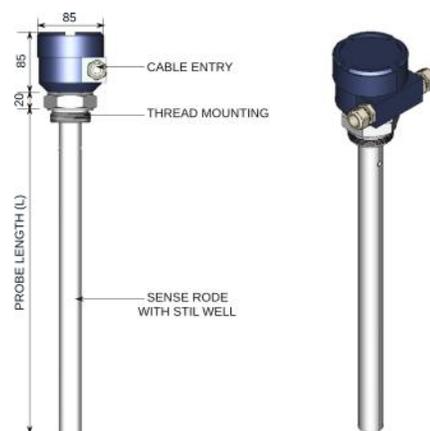


Figure 4: Dimensional Layout

## 6 General Specifications

Please refer to Table 1 for General Specifications.

| PARAMETER        | VALUE                    |
|------------------|--------------------------|
| Accuracy         | +/-2% of Full Scale      |
| Resolution       | +/-0.5% of Total Span    |
| Response Time    | 3 sec (typical)          |
| Measurement Span | 15 to 3000 pf above zero |

Table 1: General Specifications

## 7 Electrical Specifications

Please refer to Table 2 for Electrical Specifications.

| PARAMETER             | VALUE  |
|-----------------------|--|
| Internal Enclosure    | ABS plastic  |
| Supply                | 24-50V DC  |
| Operating Temperature | <ul style="list-style-type: none"> <li>• 0°C to +80°C (Probe)</li> <li>• 0°C to +60°C (Electronics)</li> </ul> |
| Current Consumption   | 20 mA maximum  |
| Certificates          | CE / CMRI (Flame proof)  |

Table 2: Electrical Specifications

## 8 Output Specifications

Please refer to Table 3 for Output Specifications.

| PARAMETER          | VALUE  |
|--------------------|--|
| Analog             | 4-20 mA 2-Wire Loop Power (Galvanically isolated / non-isolated) |
| Digital            | RS-485 (Optional)  |
| Sensor Indication  | Two LEDs for status indication                                   |
| Digital Indication | Data (+) and Data (-)*(With RS-485 Model) (Optional)             |

Table 3: Output Specifications

## 9 Mechanical Specifications

Please refer to Table 4 for Mechanical Specifications.

| PARAMETER             | VALUE  |
|-----------------------|--|
| Housing               | <ul style="list-style-type: none"> <li>• FP2C : Cast Aluminium weather &amp; flame proof powder coated paint suitable for gas group IIC</li> <li>• HCAP : Cast Aluminium weather proof Capvel Housing</li> </ul> |
| Electrical Connector  | 2 x 1/2" BSP / NPT, Brass  |
| Operating Temperature | Up to 1000°C   |
| Mounting              | <ul style="list-style-type: none"> <li>• Thread - 1 1/2" BSP / NPT</li> <li>• Flange - As per user specifications</li> <li>• Tri-Clamp - As per user specifications</li> </ul>                                   |
| Insulation            | Part / Full PTFE<br>Ceramic  |
| Gland type            | Single / Double Compression gland<br>PG - 13.5   |
| Probe Length          | 100 mm to 10,000 mm  |

Table 4: Mechanical Specifications

## 10 Installation Guidelines

### 10.1 Tank Mounting Installations

#### 10.1.1 For Regular Metallic Tank

Always mount the sensor perpendicular to the liquid surface and keep the sensor rod closer to tank wall. Generally for metallic tanks single sensor rod (without reference / grounding tube) is sufficient if the material is of high dielectric constant.

In case of oil, diesel (Material of low dielectric) and tank diameter is big, keep the distance of sensing rod closer to tank wall.

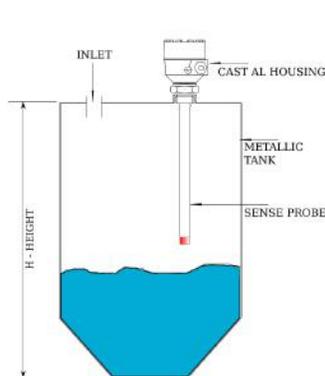


Figure 5: Mounting-Regular Metallic Tanks

### 10.1.2 For Regular Non-Metallic Tank

In case of non-metallic / lined tanks there is always a need of reference electrode. It can be in form of reference probe or still well grounding tube. Reference probe is generally recommended for corrosive liquids while still well tube will be suitable to avoid turbulence of liquid. It will help to provide better readings.

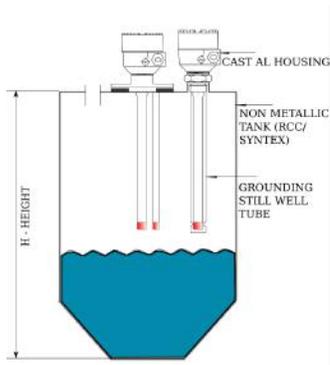


Figure 6: Mounting-Regular Metallic Tanks

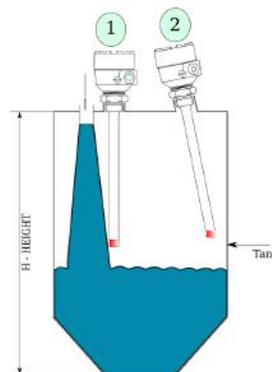


Figure 8: Incorrect Method of Mounting

### 10.1.3 Tanks contain Stirrer or Agitator

If the agitator is present in the tank, preferably mount the sensor in center between agitator blade and side wall. Always prefer to have sensor with still well rod to avoid turbulence.(Refer Figure 7)

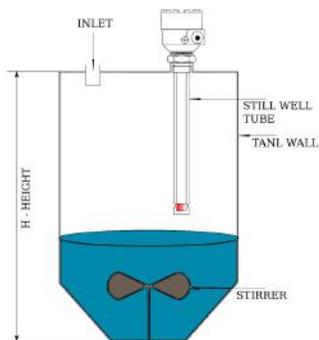


Figure 7: In Agitator Tank

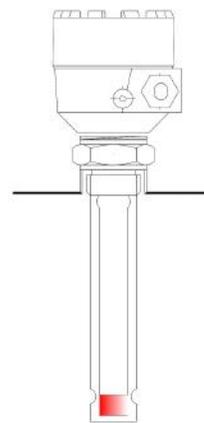


Figure 9: Threaded Connection

as per your requirement. The material is of M.S. / S.S. is available. The flange size is available from 1 1/2" to various sizes depending on the tank construction (Refer Figure 10).

- Note:**
- When installing threaded connection please ensure to have matching socket available at site.
  - When Installing a threaded flange, ensure that it matches the mounting threads of the sensor unit.
  - Tighten the thread by **RELEVANT TOOL**. When tightening the thread, hold the upper part of the unit and make sure that the seal is leak proof.

## 10.2 Mounting With Process Connections

### 10.2.1 Threaded Mountings

CAPVEL-LP is available with BSP / NPT threaded connection of various tube. Please ensure a matching socket is available to tighten threads in the tank. To install CAPVEL-LP, insert the thread end of probe into the aperture at the top of the tank (Refer Figure 9) size. Generally 1 1/2" BSP consider as a standard mounting size with still well.

### 10.2.2 Flange Mountings

CAPVEL-LP is also available with a flange connection

## 10.3 Electrical Connections

There are 02 PUTs available including supply, output and ground connection in CAPVEL-LP. As this is a loop powered model, there is no separate terminals required for external power supply. Refer Figure 12 for details.

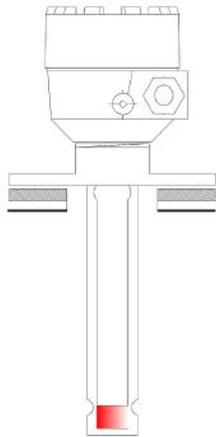


Figure 10: Flange Connection

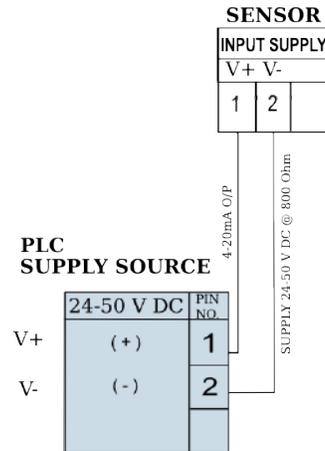


Figure 12: Input Supply Connections

**Note:** Please refer to the connection diagram for your model before connecting the device.

- You can also connect a multimeter or a digital indicator in series with the PLC for display.

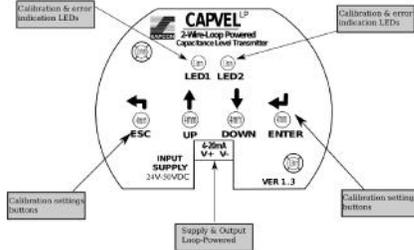


Figure 11: Electrical Top Panel

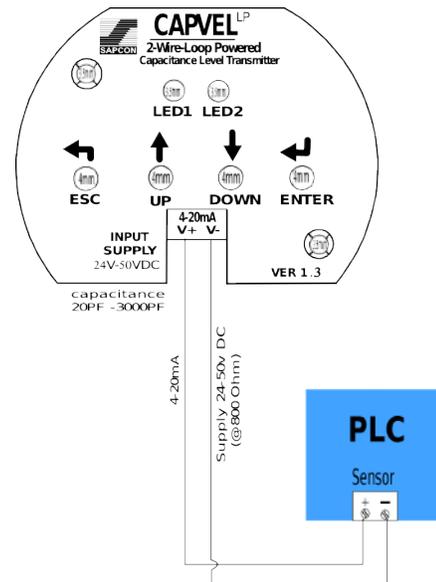


Figure 13: 4-20mA Connections(Active PLC)

### 10.3.1 Wiring Diagram for Power Supply

CAPVEL-LP comes with DC power supply range of 24-50 V DC. As this is a two wire system the same terminal will be used for getting 4-20 mA output.(Refer figure 13) Follow the steps mentioned below for connection:

- Connect the available DC supply from PLC or external supply to PUT 1 and 2 for respective positive (V+) and negative (V-).
- If available you can connect multimeter or output source in series with same loop, as it will carry the output 4-20 mA also.

### 10.3.2 Wiring Diagram for 4-20 mA Output

Capvel-LP can be connected with only active PLCs as it require supply source from the same device. Kindly follow the steps mentioned below:

#### For Active PLC

- Connect the PLCs + and - to PUT 1 and 2 respectively. (Refer Figure 13)

## 11 Calibration Procedure

CAPVEL-LP is not measuring level directly, its basic element is to measure two different level as HIGH and LOW, between this the device is giving the output. Current output is proportional to the (capacitance) level percentage. 4 mA is assigned to the 0 capacitance percentage (Low Level). 20 mA is assigned to 100% capacitance (High Level). Current output of the fault indication is 21 mA, with a delay of 5 seconds. Current output can be programmed for inverse operation: 4mA =100% (full), 20mA = 0% (empty).

### 11.1 Key Operations

General usage of keys has been described as follows:

- Enter: To enter in to PROGRAMMING MODE.
- Esc: To EXIT from programming mode without saving the data.
- Up: To set HIGH CALIBRATION point.
- Down: To set LOW CALIBRATION point.

## 11.2 Programming Features

- 4 mA output current (Direct) assignment to the minimum (0%) level.
- 20 mA output current (Direct) assignment to the maximum (100%) level.
- 4 mA output current (indirect) assignment to the minimum (0%) level by means of an intermediate level.
- 20 mA output current (Indirect) assignment to the maximum (100%) level by means of an intermediate level.
- Fault indication by current output: 21 mA.
- Reset to the Factory Default.

After connecting power supply, both the LEDs will glow simultaneously for few microsecond. It shows the device has got the sufficient power to run and both the LEDs are healthy.

## 11.3 Programming Procedure

As CAPVEL-LP is two wire system, it does not include any display because of the power consumption limitations. You can look in to the LEDs status to find the calibration settings.

### 11.3.1 Programming Steps

CAPVEL-LP can be easily programmed by the two point calibration settings. Although the device is factory set but it is always recommended to calibrate the instrument in the original service material. Follow the below steps to calibrate Capvel-LP over a required span:

- Press ENTER key up to 5 sec. to go in to programming mode.
- Now, for low level calibration, set the material level at desired set point and press DOWN key.
- The right LED will blink to save 4 mA count.
- Immediately both the LEDs will blink and sensor will exit from programming mode (AUTO EXIT FUNCTION).
- Similarly for high level calibration fill the material at desired high level point.

- Press ENTER for 5 seconds to go in to programming mode.
- Press UP key once, the LEFT key will blink to save the 20 mA count.
- Both the LED will blink and sensor will exit from programming mode.
- You can press ESC key any where, if you do not want to save the mA count.
- Sensor will exit from programming mode without saving the mA counts.
- Now the CAPVEL-LP has been calibrated over a required span.

## 11.4 Indirect Calibration

If the tank is partially filled, there is a provision in CAPVEL-LP of indirect assignment of minimum and maximum level to the output current with partially filled tanks.

$$\text{mA by } \% x = 16 * x/100 + 4$$

Indirect assignment requires the output current to be measured with higher accuracy. A current meter should be inserted in the 4 ... 20 mA loop before starting calibration. Assuming a tank filled up to 15% approximately and the task is to accomplish indirect assignment of low level to 4 mA the procedure is the following. Since the current output at the level of 20% is  $\text{lout} = (16 \text{ mA} \times 0.20) + 4 \text{ mA} = 7.2 \text{ mA}$  the current output should be changed with the keys up/ Down, until the value of 7.2 appears on the current meter.

This procedure should be repeated with another, higher level for indirect assignment of 20 mA to the maximum level. Obviously for the sake of greater accuracy (it is not even sure whether the assumption of 20% is correct) the direct assignment should be carried out as soon as possible.

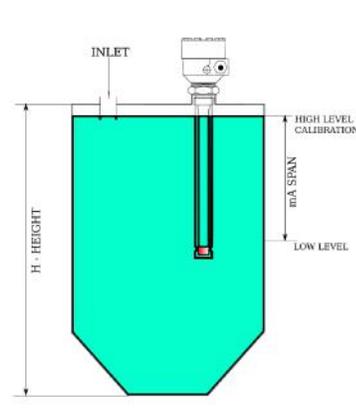


Figure 14: High Level Calibration

**Please follow the below steps to set partial low level for partially filled tanks:**

- Press DOWN key and keep it pressed, there will not be any change in LEDs state.
- Press ESC key and keep it pressed, then release both the keys.
- RIGHT LED will blink. Now CAPVEL-LP is in indirect programming mode.
- Set output current with UP and DOWN keys to the required values.
- Please note that the current meter should be inserted in 4-20 mA loop.
- Press ENTER key, right LED will blink to save the 4 mA count.
- Both the LED will blink and device will exit from programming mode.

**Now follow the below steps to set partial high level for partially filled tanks:**

- Press UP key and keep it pressed, there will not be any change in LEDs state.
- Press ESC key and keep it pressed, then release both the keys.
- LEFT LED will blink. Now CAPVEL-LP is in indirect programming mode.
- Set output current with UP and DOWN keys to the required values.
- Please note that the current meter should be inserted in 4-20 mA loop.
- Press ENTER key, Left LED will blink to save the 20 mA count.
- Both the LED will blink and device will exit from programming mode.

## 12 Calibration Procedure with LCD Display

CAPVEL-LP is available in display also. The similar two-wire system has been established with an additional feature of LCD display to show the readings on display. Current output is proportional to the (capacitance) level percentage. 4mA is assigned to the 0 capacitance percentage (Low Level). 20mA is assigned to 100% capacitance (High Level). Current output of the fault indication is 21mA, with a delay of 5 seconds.

### 12.1 Key Operation

General usage of Key Operations for CAPVEL-LP LCD display has been described below.

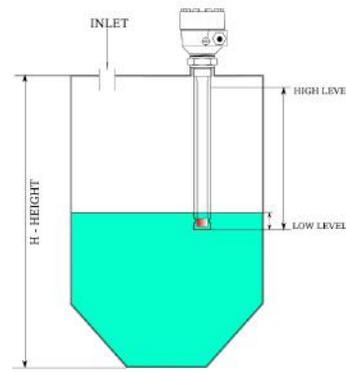


Figure 15: Low Level Calibration

- ENTER - To enter in to PROGRAMMING MODE or to Save the Setting.
- Esc - To EXIT from programming mode / submenu without saving the data.
- UP - To set HIGH CALIBRATION point / Scrolling the submenu.
- Down - To set LOW CALIBRATION point / Scrolling the submenu.

### 12.2 Programming Section for LCD Display

- 4mA output current (Direct) assignment to the minimum (0%) level.
- 20mA output current (Direct) assignment to the maximum (100%) level.
- 4mA output current (indirect) assignment to the minimum (0%) level by means of an intermediate level. It is defined by SCALE CALIB option.
- Through SCALE CALIB feature you can set 20mA output current (Indirect) assignment to the maximum (100%) level by means of an intermediate level.
- Fault indication by current output: 21mA.
- Reset to the Factory Default.

After connecting power supply, LCD will ON and it will show CAP-LP/VER or else it will show CALIB Error. If LCD is running properly it means device has got sufficient power to run, then it will come on Normal mode.

### 12.3 Programming Procedure

As CAPVEL-LP is two wire system, it has now included with LCD display with minimum power consumption. Now you can look in to the LCD display for various calibration settings.

### 12.3.1 Programming Steps

CAPVEL-LP can be easily programmed by the two point calibration settings. Although the device is factory set but it is always recommended to calibrate the instrument in the original service material.

#### Follow the below steps to calibrate CAPVEL-LP with LCD display over a required span:

- Press ENTER key to go in to programming mode. The LCD display will show CAL. PGM (2sec) then CAL.
- Now, again press ENTER key. The LCD display will show HI (It is ready for High Calibration).
- For High Level Calibration, set the material level at required set point then press ENTER key. Display will show HI-CAL-SAVE and return to high calibration.
- For low calibration press DOWN key. The LCD display will show Lo (It is ready for Low calibration).
- For Low Level Calibration, set the material level at required set point then press ENTER key. The LCD display will show Lo-CAL-SAVE and return to low calibration.
- Press ESC to exit from programming mode (Display Show CAL).
- Again press ESC key to exit from programming mode (The LCD display show the level of the material per/mA.).
- Now the CAPVEL-LP LCD display has been calibrated over a required SPAN.

There are some more features which is available with CAPVEL-LP LCD display to show various types of settings like Dis (For Display Per/mA), COM (For Communication), trb (For Turbulence), SCA (For Scale calibration).

#### Follow the below steps for Display Setting:

- Press ENTER key going to programming mode. The LCD display will show CAL. Then press DOWN key.
- You will see the menu dis on LCD screen.
- Press ENTER to see the sub menu.
- Here you will get two different options as AMP and PER, this shows the readings to be display in mA or in percentage.
- Press ENTER on the option you want, controller will save the command and exit automatically.

#### Now for CAPVEL-LP LCD display Communication Setting, please follow the below steps:

- Press ENTER key to see the submenu when LCD show COM.
- Here you will get three submenu like ID, Flo and Dur. You can set these submenu as per your requirement.

#### Similarly for Turbulence Settings follow the below steps:

- Press ENTER to see the submenu when LCD shows trb.
- Here you will get tb1 - tb9.
- You can set the turbulence value from 1 to 9 (In case of turbulence).
- It limits the output fluctuation and gives the average value of current fluctuation.

CAPVEL-LP is also available with a feature of SCAL FACTOR which means you can set you desire level at any point by giving the percentage value as per your need. For eg. you want a particular level at 80% of total span you can set it by SCAL H. Similarly you can set a semi low level limit by SCAL L.

#### Follow the below steps to use this feature:

- Press DOWN key four times and come to the option SCA.
- Press ENTER key, the LCD will show SCH.
- Press ENTER again, LCD will show H 80.
- Now set the desire semi high level limit say 70% H 70.
- Press ENTER to save the value.
- Now Press DOWN key to show SCL.
- Repeat the same procedure with low level setting and press ENTER to save.

## 13 Handling Precautions

- Install the instrument as per given in mounting arrangement diagrams.
- Do not mount the instrument from side of the tank (Always avoid horizontal positions).
- Mounting threads should tightened properly.
- Always choose a still well option in case of turbulence in tank.
- Ensure the proper connection settings.
- Do not remove electronics from probe unless needed or to change it.
- Check the continuity between probe ground & tank ground (Metallic Tank).
- Read the instruction manual before installing the system.

## 14 Warranty

Instrument is manufactured as per the purchase order specification. Standard guarantee for twelve months from the date of commissioning or eighteen

months from the date of supply Which ever is earlier. Guarantee is against manufacturing defects. We undertake to correct such defects which are due to workmanship, at our expenses, instrument should be forwarded to us on freight paid basis with seals unbroken. The guarantee is valid for our customer and does not extent to third parties or caused by mishandling, accident or abnormal conditions.

## 15 Error Detection & Remedies

CAPVEL-LP has some external mode of checks to identify malfunctions or incorrect operating conditions. The LED indicates the error messages as per the operating condition. Also if an error is identified CAPVEL-LP changes its analog output to 21 mA (Refer Table 5).The LCD indicates the error message as per the operating condition. Also if an error is identified CAPVEL-LP LCD changes its analog output value to 21mA (Refer Table 6)

| CODE NUMBER | ERROR DESCRIPTION                      | LED BLINKING                                     | CURRENT OUTPUT | ERROR ON SERIAL | TROUBLE SHOOTING                                   |
|-------------|--|--|----------------|-----------------|--|
| 1           | Calibration Error                      | Alternatively LED 1 and LED 2 two times Blinking | 21mA           | ECAL            | Calibration is wrong, please recalibrate correctly |
| 2           | Probes are OPEN circuited              | LED 1 and LED 2 Blinking in 1 sec                | 21mA           | PrOP            | Check the probes with multimeter                   |
| 3           | Probes are SHORT Cir-cuited            | LED 1 and LED 2 continue ON                      | 21mA           | PrSC            | Check the probes with multimeter                   |
| 4           | OVER Capacitance                       | LED 1 Two Times Blinking with 500ms Delay        | 21mA           | PrHI            | Tank and Probe Dimensions are not matched          |
| 5           | Under CAPACITANCE                      | LED 2 TWO times blinking then 500ms delay        | 21mA           | PrLO            | Tank and Probe Dimensions are not matched          |
| 6           | Internal reference got open circuited  | LED 1 Three times blinking then 500ms Delay      | -              | RFOP            | Internal fault in sensor                           |
| 7           | Internal reference got short circuited | LED 2 three times blinking then 500 ms delay     | -              | RFSC            | Internal fault in sensor                           |
| 8           | Hardware Failure                       | Alternate LED 1 and LED 2 blinking in 1 seconds  | 21mA           | -               | Contact services                                   |

Table 5: Error Indication and Remedies

| CODE NUMBER | ERROR DISPLAY | ERROR DESCRIPTION                     | TROUBLE SHOOTING                                    | REMARK              |
|-------------|---------------|---------------------------------------|---|---------------------|
| 1           | PRO           | Probe are OPEN circuited              | Check the probe with multimeter                     | mAmp output 21mAmp  |
| 2           | PRS           | Probe are SHORT circuited             | Check the probes with multimeter                    | mAmp output 21mAmp  |
| 3           | CAL           | Calibration Error                     | Calibration is wrong, please re-calibrate correctly | mAmp output 21mAmp  |
| 4           | PrH           | Over Capacitance                      | Tank and Probe dimensions are not matching          | mAmp output 21mAmp  |
| 5           | PrL           | Under Capacitance                     | Tank and Probe dimensions are not matching          | mAmp output 21mAmp  |
| 6           | Rfo           | Internal reference got open circuited | Internal fault in sensor                            | mAmp output 21 mAmp |
| 7           | RfS           | Internal reference got open circuited | Internal fault in sensor                            | mAmp output 21mAmp  |
| 8           | OSC           | Oscillations Stopped                  | Internal fault in sensor                            | mAmp output 21 mAmp |

Table 6: Error Indication and Remedies

## Product Selection Code - Capvel

|   |  |
|---|--|
| <b>Product</b>                            | CAPVEL_LP - Capacitance Type Wire Loop Powered Level Transmitter (For Conductive or Non-Conductive Liquids, Slurries & Powdered Compounds)   |
| <b>Type</b>                               | I : Integral (sensor in same unit)   |
| <b>Housing</b>                            | FP2C : Cast Aluminium weather & flame proof powder coated paint suitable for gas group IIC<br>HCAP : Cast Aluminium weather proof Capvel Housing   |
| <b>Probe Housing Cable Entry</b>          | PCPG13 : PG 13.5, Polyamide<br>PCB5S : 1/2" BSP, SC Gland, Brass<br>PCB5D : 1/2" BSP, DC Gland, Brass<br>PCN5D : 1/2" NPT, DC Gland, Brass   |
| <b>Output (Depends on "Product")</b>      | 2MAMP : 4-20mA Current Loop 2 wire transmitter (Max. 750 ohms) over current safe and compatible with PLC and SCADA Analog Inputs   |
| <b>Power Supply (Depend on "Product")</b> | DC4 : 24 to 48V DC   |
| <b>Reference (Optional)</b>               | REF : Yes (Incase of Non-Metallic Tanks) (Except Insulation "C")<br>STWGI : Still Well, GI (Galvanized Iron) (Only with "RDP")<br>STWS4 : Still Well, SS 304 (Only with "RDP")<br>STWS6 : Still Well, SS 316 (Only with "RDP")   |
| <b>Probe Type</b>                         | RDP : Rod Probe<br>ROP : Rope Probe (Except "Still well")  |
| <b>Rope Type</b>                          | R4S4C : $\phi 4$ , SS 304, PTFE Coated (Only with "F")<br>R12GI : $\phi 12$ , GI (Galvanized Iron) (Only with "P" & Except "Reference")<br>R12S4 : $\phi 12$ , SS 304 (Only with "P" & Except "Reference")<br>R12S6 : $\phi 12$ , SS 316 (Only with "P" & Except "Reference")<br>R12GIC : $\phi 12$ , GI (Galvanized Iron), PTFE Coated (Only with "P" & Except "Reference")<br>R12S4C : $\phi 12$ , SS 304, PTFE Coated (Only with "P" & Except "Reference")<br>R12S6C : $\phi 12$ , SS 316, PTFE Coated (Only with "P" & Except "Reference")<br>R12GIJ : $\phi 12$ , GI (Galvanized Iron), PTFE Jacketed (Only with "P", "F" & Except "Reference")<br>R12S4J : $\phi 12$ , SS 304, PTFE Jacketed (Only with "P", "F" & Except "Reference") |
| <b>Mounting</b>                           | MB15MS : Screwed Thread, BSP 1-1/2", MS Plated<br>MN15MS : Screwed Thread, NPT 1-1/2", MS Plated<br>MB15S4 : Screwed Thread, BSP 1-1/2", SS 304<br>MN15S4 : Screwed Thread, NPT 1-1/2", SS 304   |

## Product Selection Code - Capvel

| Mounting        |  |
|-----------------|--|
| MB15S6          | Screwed Thread, BSP 1-1/2", SS 316                                 |
| MN15S6          | Screwed Thread, NPT 1-1/2", SS 316                                 |
| TC10S4          | 1" Tri-Clamp, SS 304   |
| TC10S6          | 1" Tri-Clamp, SS 316   |
| TC15S4          | 1-1/2" Tri-Clamp, SS 304   |
| TC15S6          | 1-1/2" Tri-Clamp, SS 316   |
| TC20S4          | 2" Tri-Clamp, SS 304   |
| TC20S6          | 2" Tri-Clamp, SS 316   |
| F15MS           | 1-1/2" ASA Flange, 10mm thickness, MS Plated (Except "Still Well") |
| F15S4           | 1-1/2" ASA Flange, 10mm thickness, SS 304 (Except "Still Well")    |
| F15S6           | 1-1/2" ASA Flange, 10mm thickness, SS 316 (Except "Still Well")    |
| FA15MS          | 1-1/2" ANSI Flange, MS Plated (Except "Still Well")                |
| FA15S4          | 1-1/2" ANSI Flange, SS 304 (Except "Still Well")                   |
| FA15S6          | 1-1/2" ANSI Flange, SS 316 (Except "Still Well")                   |
| F20MS           | 2" ASA Flange, 10mm thickness, MS Plated                           |
| F20S4           | 2" ASA Flange, 10mm thickness, SS 304                              |
| F20S6           | 2" ASA Flange, 10mm thickness, SS 316                              |
| FA20MS          | 2" ANSI Flange, MS Plated  |
| FA20S4          | 2" ANSI Flange, SS 304   |
| FA20S6          | 2" ANSI Flange, SS 316   |
| F25MS           | 2-1/2" ASA Flange, 10mm thickness, MS Plated                       |
| F25S4           | 2-1/2" ASA Flange, 10mm thickness, SS 304                          |
| F25S6           | 2-1/2" ASA Flange, 10mm thickness, SS 316                          |
| FA25MS          | 2-1/2" ANSI Flange, MS Plated                                      |
| FA25S4          | 2-1/2" ANSI Flange, SS 304   |
| FA25S6          | 2-1/2" ANSI Flange, SS 316   |
| F30MS           | 3" ASA Flange, 10mm thickness, MS Plated                           |
| F30S4           | 3" ASA Flange, 10mm thickness, SS 304                              |
| F30S6           | 3" ASA Flange, 10mm thickness, SS 316                              |
| FA30MS          | 3" ANSI Flange, MS Plated  |
| FA30S4          | 3" ANSI Flange, SS 304   |
| FA30S6          | 3" ANSI Flange, SS 316   |
| Insulation Type |  |
| P               | Part PTFE  |
| F               | Full PTFE  |
| C               | Ceramic (Only for "45T" & "100T", Except "REF")                    |

## Product Selection Code - Capvel

|                              |  |
|------------------------------|--|
| <b>Sense</b>                 |  |
| SS4                          | : SS 304 (Only with "RDP")                 |
| SS6                          | : SS 316 (Only with "RDP")                 |
| RWMS                         | : Rope Weight, MS Plated (Only with "ROP") |
| RWS4                         | : Rope Weight, SS 304 (Only with "ROP")    |
| RWS6                         | : Rope Weight, SS 316 (Only with "ROP")    |
| <b>Operating Temperature</b> |  |
| 10T                          | : Upto 100°C                               |
| 25T                          | : Upto 250°C                               |
| 45T                          | : Upto 450°C                               |
| 100T                         | : Upto 1000°C                              |
| <b>Standoff Material</b>     |  |
| STS4                         | : SS 304                                   |
| STS6                         | : SS 316                                   |
| STGI                         | : GI (Galvanized Iron)                     |
| <b>Probe Length</b>          |  |
| 1H30H                        | : 100 to 3000mm (Only with "RDP")          |
| 5H100H                       | : 500 to 10000mm (for ø4 Rope)             |
| 10H100H                      | : 1000 to 10000mm ( for ø12 Rope)          |

Example -

**CAPVEL\_LP-I-FP2C-PCB5D-2MAMP-DC4-STWS4-RDP-MB15S4-P-SS4-25T-STS4-1H30H**

## 16 Customer Support

Thank you for going through the instructions given in this manual. To further ease the process of installation and use, we have developed special demo videos which are hosted on YouTube.

Sapcon's YouTube channel, SAPCON INSTRUMENTS, lists all these videos: <https://goo.gl/dnxfcz>

Should you require further information regarding installation, use or working of the instrument, please don't hesitate to contact us. Kindly provide the following information at the time of contacting:

- Instrument Model and Serial Number
- Purchase Order Number and Date of Purchase
- Description of the query
- Your contact details

In an attempt to serve you better, we are open seven days a week (9:30am to 7:30pm). We are available at:

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