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BATCH : S4

Measurement of Level in a Tank using Capacitive Type Level Probe

AIM : To measure tank level using capacitance level probe.

OBJECTIVES :

1. Review various methods of level measurement.
2. Understand working of capacitance level transmitter.

A) CHANGE IN RADIUS (R2)

Selected values :

Height of Tank: 1500 cm

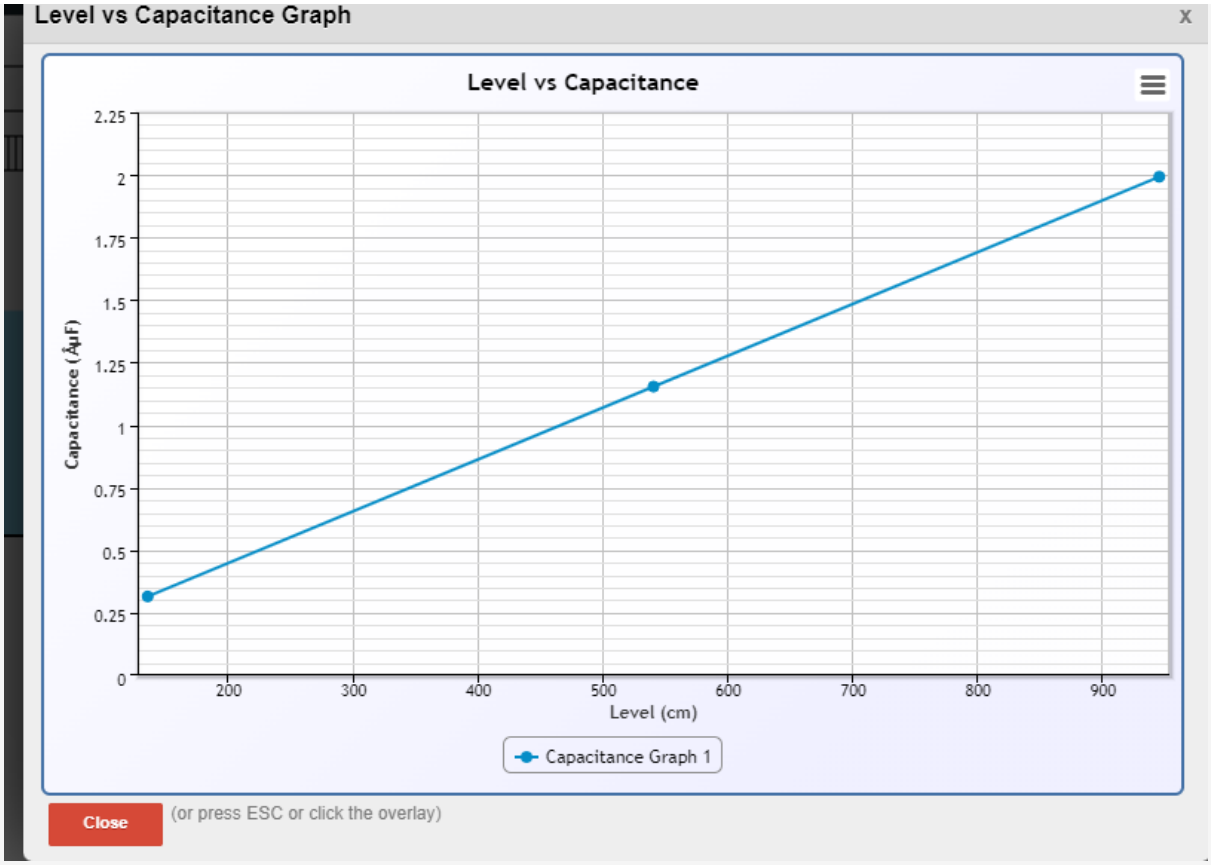
Outer radius(r2): 2.5cm

Span Value: 1345

Inner radius(r1): 0.3cm

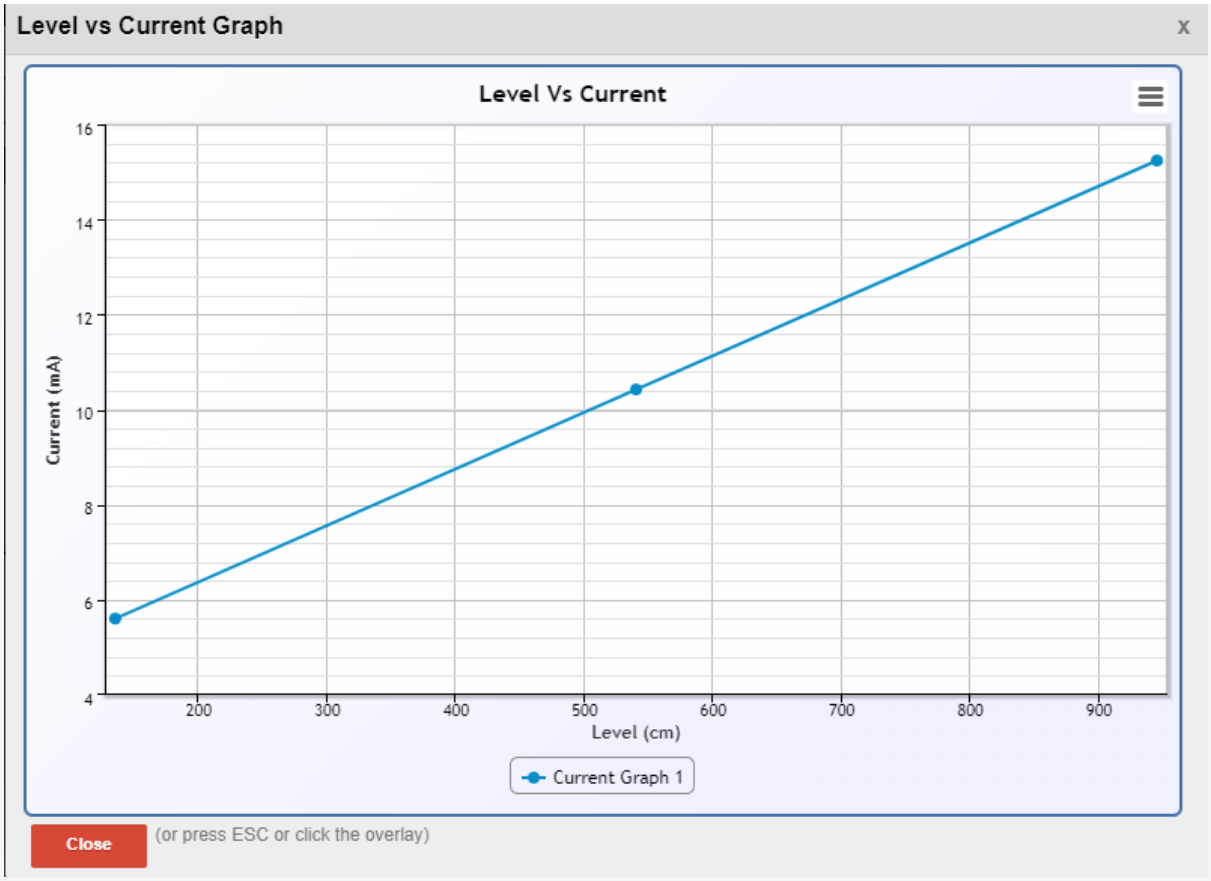
Service: Water

CAPACITANCE GRAPH:



1. It is the graph of level of ware vs the capacitance at r1=0.3cm.
2. At level 135cm the capacitance is 0.32uF.
3. At the level 540cm the capacitance is 1.15uF.
4. At the level 945cm the capacitance is 1.99uF.

CURRENT GRAPH:



1.It is the graph of level of ware vs the current at r1=0.3cm

2.At the level 135 cm the current is 5.61mA.

3. At the level 540 cm the current is 10.42mA.

4. At the level 945 cm the current is 15.24mA.

Selected values :

Height of Tank: 1500 cm

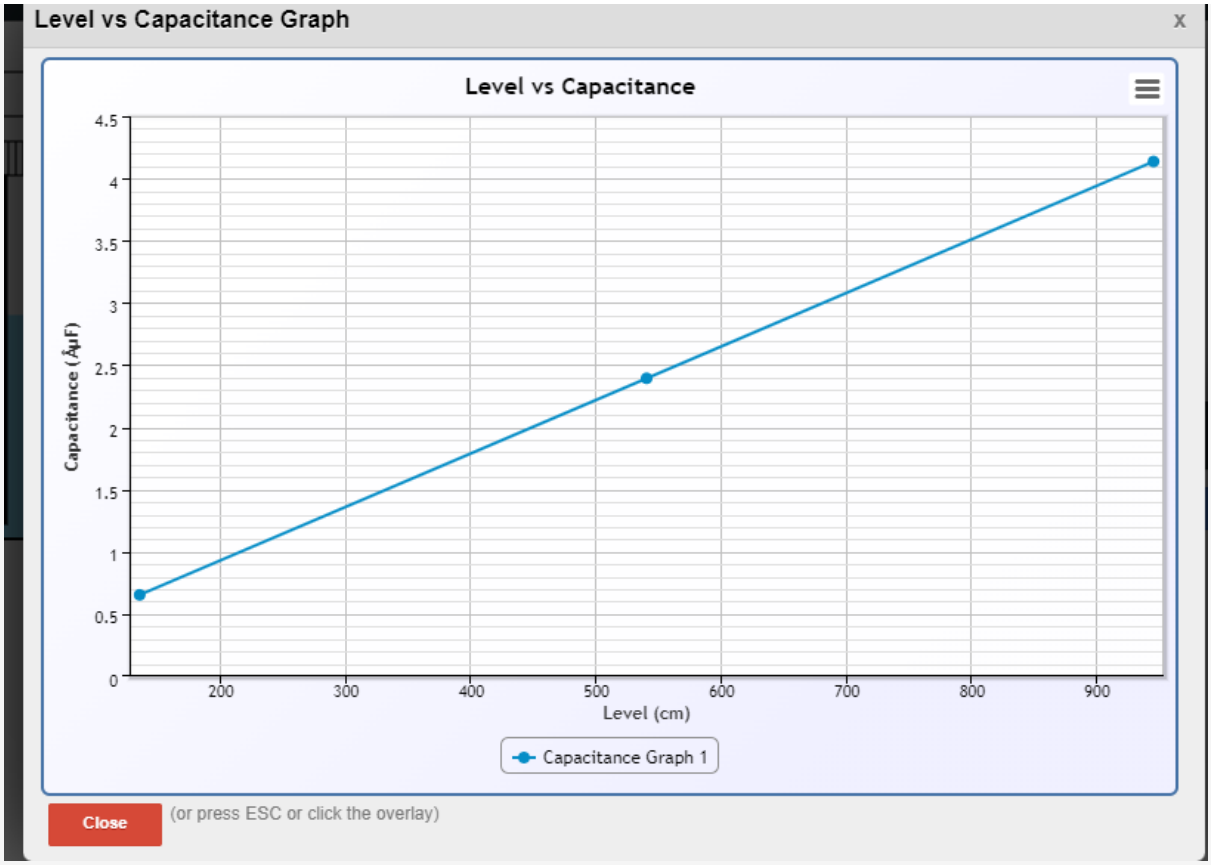
Outer radius(r2): 2.5cm

Span Value: 1345

Inner radius(r1): 0.9cm

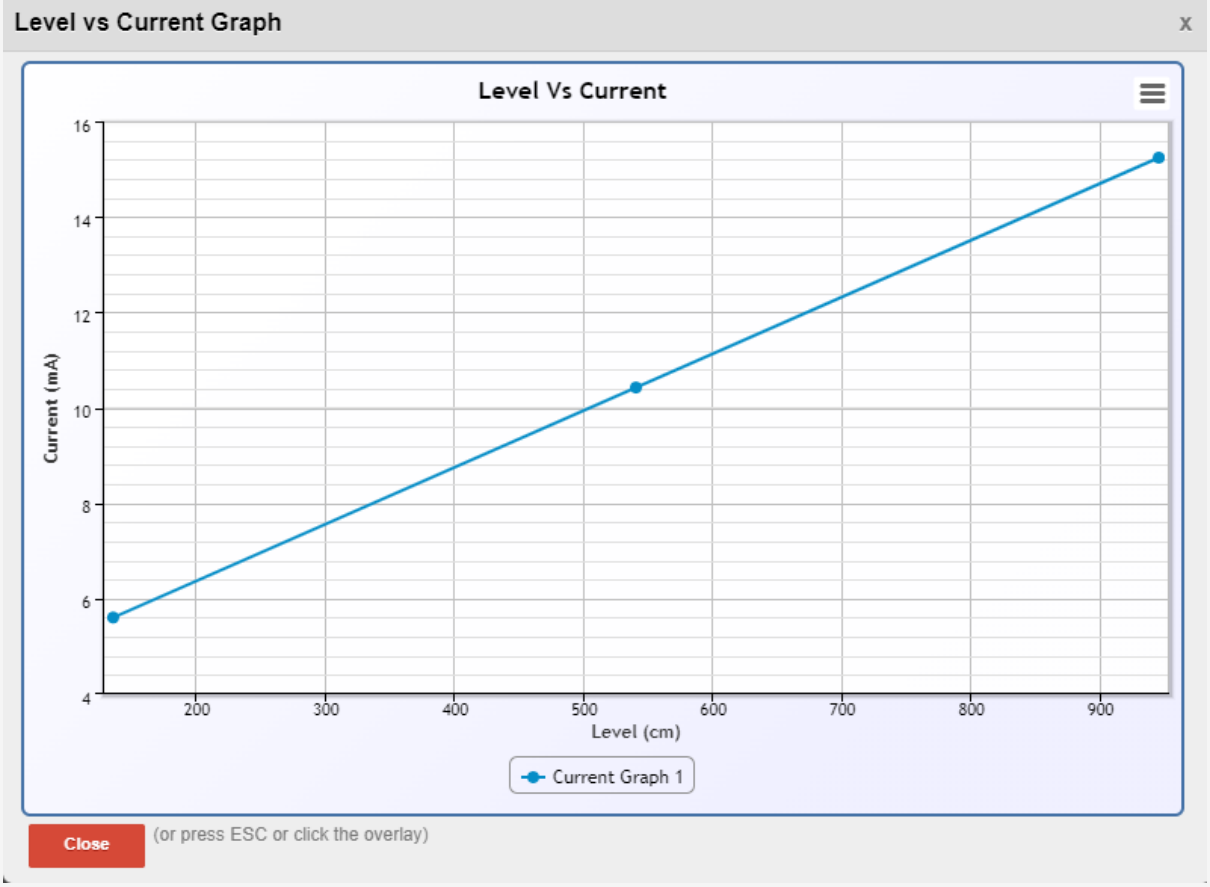
Service: Water

CAPACITANCE GRAPH :



1. It is the graph of level of ware vs the capacitance at **r1=0.9cm**.
2. At level 135cm the capacitance is 0.65uF.
3. At the level 540cm the capacitance is 2.40uF.
4. At the level 945cm the capacitance is 4.41uF.

CURRENT GRAPH:



1.It is the graph of level of ware vs the current at **r1=0.9cm**

2.At the level 135 cm the current is 5.61mA.

3. At the level 540 cm the current is 10.42mA.

4. At the level 945 cm the current is 15.24mA.

B)CHANGE IN SERVICE

Selected values :

Height of Tank: 1500 cm

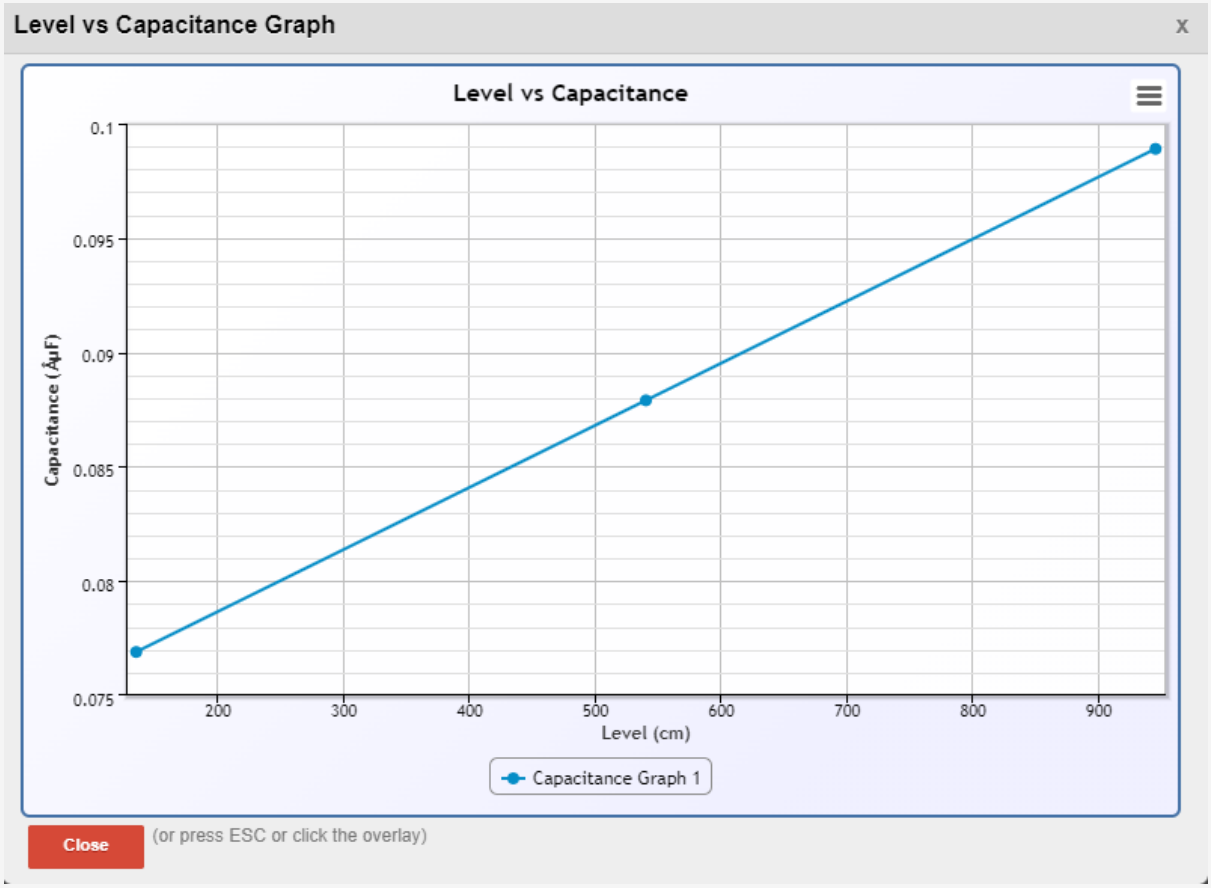
Outer radius(r2): 2.5cm

Span Value: 1345

Inner radius(r1): 0.9cm

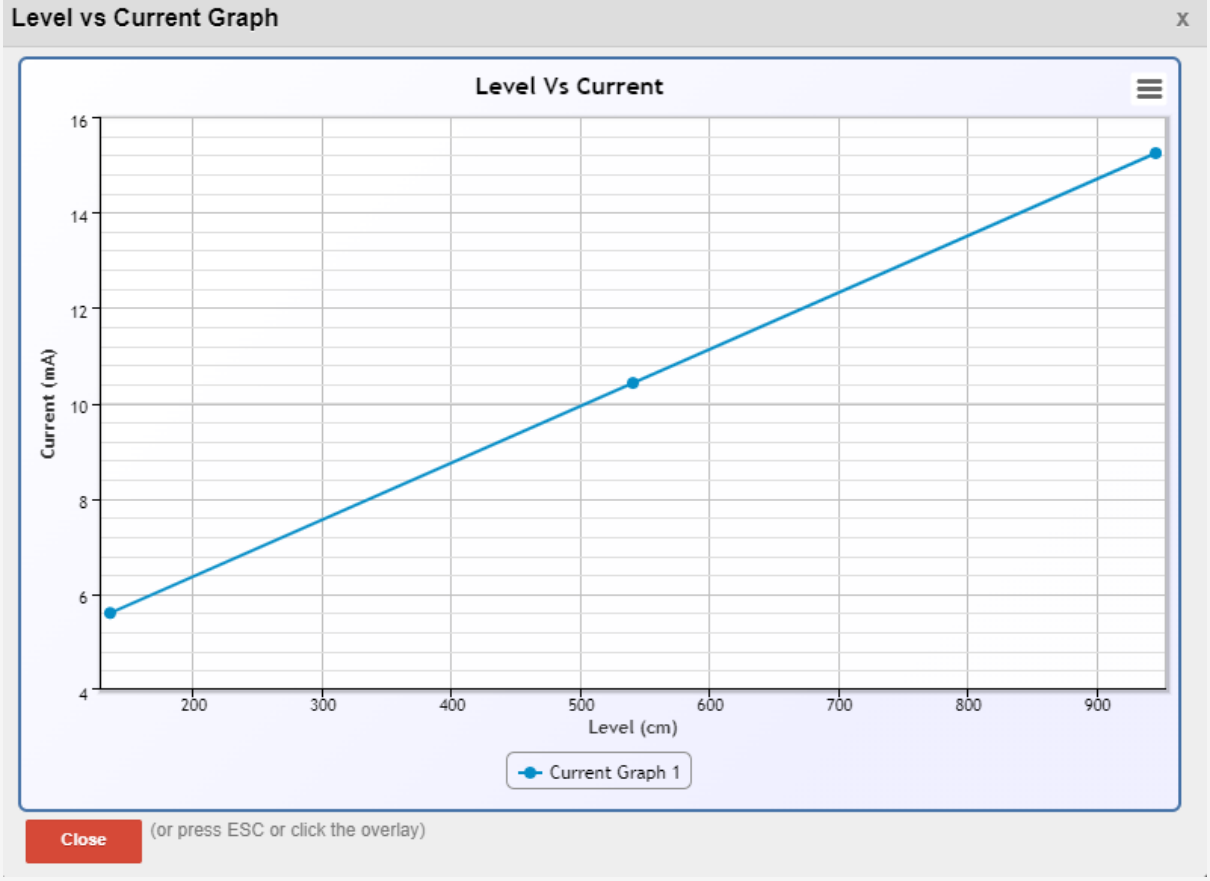
Service: Coffee Beans

CAPACITANCE GRAPH :



1. It is the graph of level of ware vs the capacitance for **coffee beans service**.
2. At level 135cm the capacitance is 0.08uF.
3. At the level 540cm the capacitance is 0.09uF.
4. At the level 945cm the capacitance is 0.1uF.

CURRENT GRAPH:



1.It is the graph of level of ware vs the current for **coffee beans service**.

2.At the level 135 cm the current is 5.61mA.

3. At the level 540 cm the current is 10.42mA.

4. At the level 945 cm the current is 15.24mA.

Selected values :

Height of Tank: 1500 cm

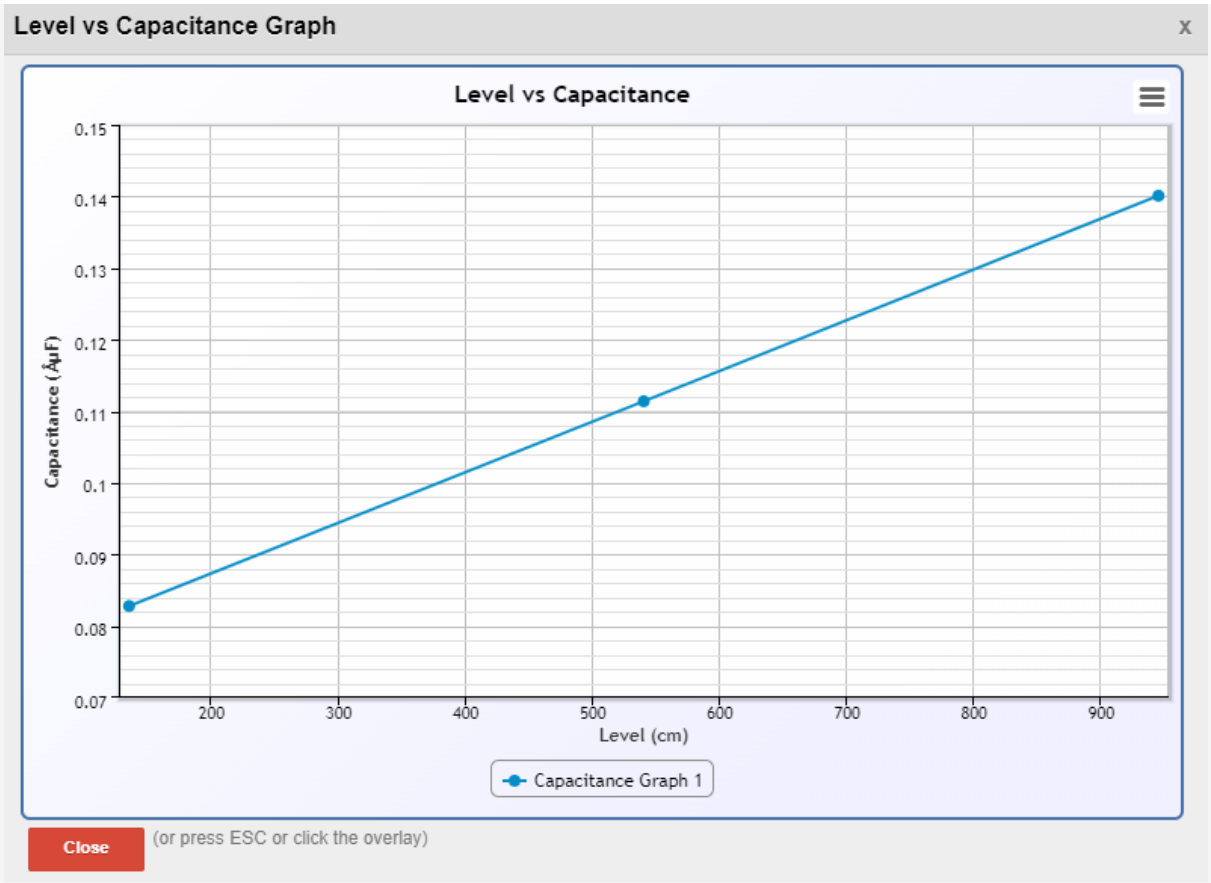
Outer radius(r2): 2.5cm

Span Value: 1345

Inner radius(r1): 0.9cm

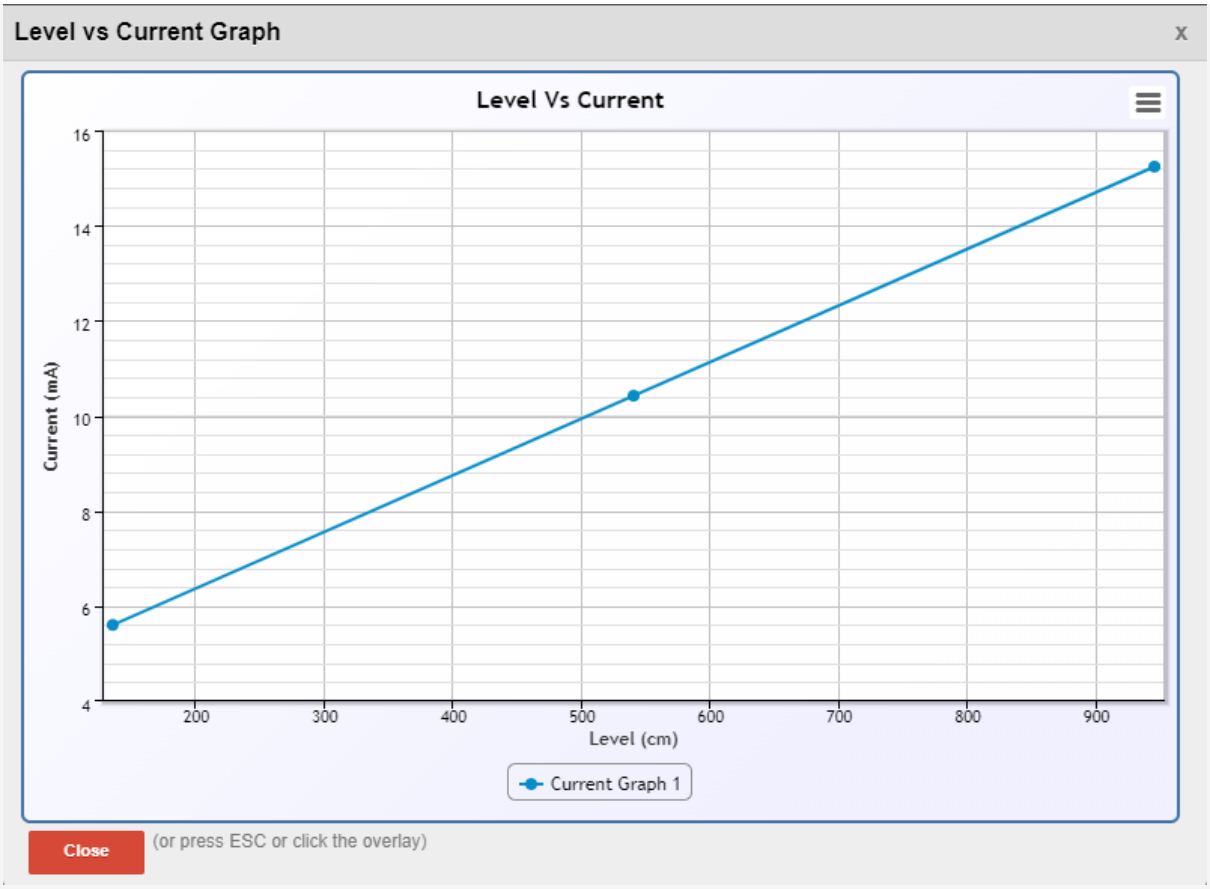
Service: Skimmed milk powder

CAPACITANCE GRAPH :



1. It is the graph of level of ware vs the capacitance for **Skimmed milk powder**.
2. At level 135cm the capacitance is 0.08uF.
3. At the level 540cm the capacitance is 0.11uF.
4. At the level 945cm the capacitance is 0.14uF.

CURRENT GRAPH:



1.It is the graph of level of ware vs the current for **Skimmed milk powder**.

2.At the level 135 cm the current is 5.61mA.

3. At the level 540 cm the current is 10.42mA.

4. At the level 945 cm the current is 15.24mA.

CONCLUSION:

1. As the level of water increases capacitance also increases**.**
2. As the level of water increases current also increases.
3. Current is same for all, it does not affected by changing the service(material) or changing the inner radius.
4. Current only changes when the level of the service changes.
5. As we change the inner radius (r2) capacitance also changes, as we increase the r2 the capacitance also increases and vice versa.
6. As we change the service from water to coffee beans (Liquid to solid) the capacitance decreases.