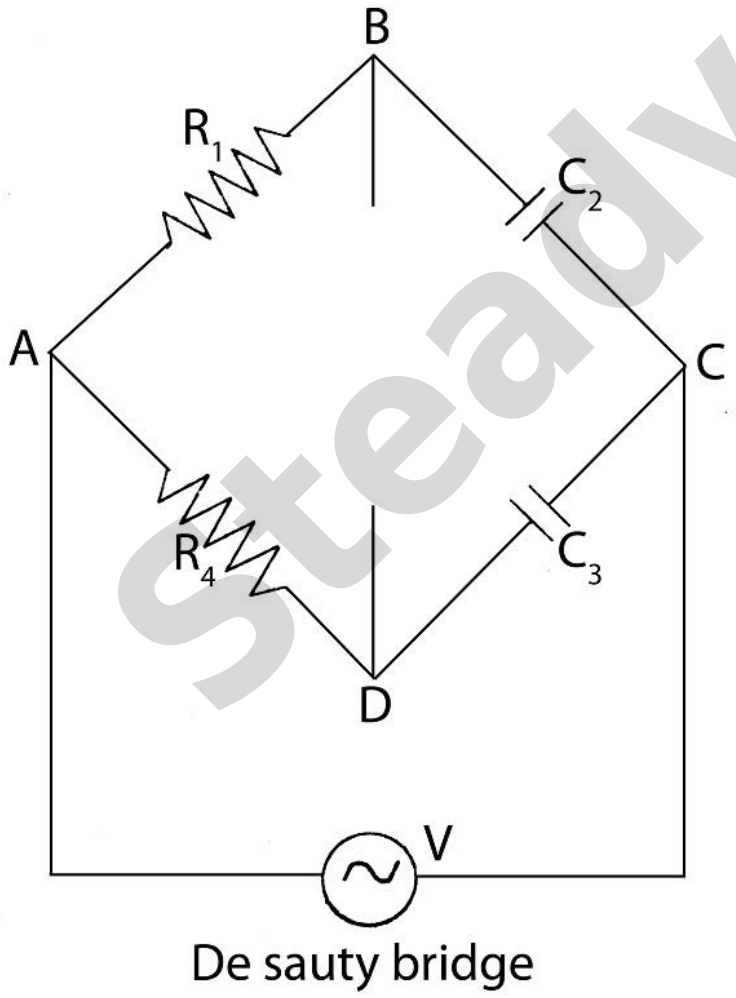
De Sautys Bridge Experiment Setup & Schearing Bridge Experiment Apparatus Setup is useful for measuring a very small value of Capacitance. By setting the null point, we can evaluate the unknown capacitance. To set this point, a null detector with amplifier circuit is implemented on trainer board. It is based on the principle of Wheatstone Bridge. A Function Generator is provided for Frequency and Amplitude variation. Null detector section includes the differential amplifier, audio amplifier, and speaker.
Bridges are some of the most accurate measuring devices for measuring impedance, capacitance, resistance, etc. For measuring Capacitance, using a De Sautys or Sobering Bridge is best. They are based on the principle of Wheatstone bridge that they have two arms. One of which has the unknown parameter. By getting the bridge balanced using the Null detector we can find this value.

De Sautys Bridge Experiment Board and Trainer Kit Working

De Sautys Bridge Trainer Features

1. On board test points to observe signals
2. On board schematic diagram
3. Flexibility of making circuit connections
4. Lightweight & compact

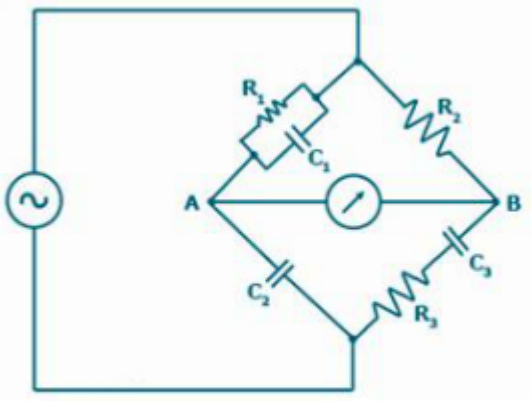


The De sautys bridge experiment is a direct carryover of the Wheatstone bridge with the DC source replaced by an AC source. The null detector we will be using also has an amplifier where the gain can be adjusted. This is connected to DMM which is used for getting the null point. The bridge is as follows. We can use the principle of a wheat stone bridge to calculate Cx as:

$$Cx = R2 \times (C2 / R1)$$

A Schering bridge is an alternating-current bridge used to measure capacitance and dissipation factor. It is an

improvement over the De SautysÂ Bridge experiment. It enables an accurate measurement of very low capacitance too due to the parallel capacitor element. This is useful in getting the sensitivity for a better balance. Though the bridge takes longer for the balancing. The bridge setup is as follows:



Schearing's bridge

Objective of De Sautys Bridge Experiment

To determine the unknown capacitance using De Sautys Bridge method.

Items Required

1. De Sautys Bridge Experiment Trainer
2. Multimeter
3. 2mm Patch Cords

Procedure of De Sautys Bridge Experiment

i) Connect mains cord to the Trainer. 2. Connect terminal 0004 Â (for evaluating unknown capacitance
ii) Connect terminal 0004 Â (for evaluating unknown capacitance Cxt).
iii) Rotate variable resistance RI towards the anticlockwise direction.
iv) Connect null detector (I.e. terminal 5 to 10 and Ft to 9)
v) Keep toggle of Null Detector towards off condition.
vi) Select Frequency Selector for any desired range of frequency. 100 no to 1 kHz 1 kHz to 10 kHz 10 kHz t0 60 kHz
vii) For example, 2 kHz frequency, select frequency selector between the ranges 1 kHz-10 kHz. Â Choose any ambient frequency (let it be 500 Hz)
viii) Use Frequency Variable knob to set 2 kHz frequency on display screen.
ix) Connect terminal 19 to 6 and 20 to 7

Final Steps

i) Now switch On the power supply.
ii) Set toggle of null detector towards on condition.
iii) Vary Amplitude Variable for enough sound of the speaker.
iv) Vary resistance Ri towards clockwise direction slowly. (Sound diminishes).
v) Keep varying Ri until you get very low sound or null sound (null condition). Further varying Ri in same direction speaker starts sounding.
vi) Finally, adjust the value of Ri to get a null point. (Where sound completely diminishes)
vii) Now remove the patch cord between terminal 1 & 4. Record the value of Ri in the observation table using multi-meter.
viii) Repeat the above procedure for different value of frequency and a different value of unknown capacitors. (i.e. Cot and Cx3).
ix) Tabulate all the retrieved data in the observation table below.

Observation Table:

S.No.	Unknown Capacitance	Frequency	Resistance R1	Resistance R2	Capacitance C2
		f1			
1	Cx1	f2			
		f3			
		f1			
2	Cx2	f2			
		f3			
		f1			
3	Cx3	f2			
		f3			

Calculations:

1. For unknown Capacitance Cx1 on frequency f1; Cx1= R2 x C2/R1.
Similarly, calculate Capacitance Cx1 on frequency f2 and f3 and take the mean value.
2. For unknown Capacitance Cx2 on frequency f1; Cx2= R2 x C2/R1.
Similarly, calculate Capacitance Cx2 on frequency f2 and f3 and take the mean value.
3. For unknown Capacitance Cx3 on frequency f1; Cx3= R2 x C2/R1.
Similarly, calculate Capacitance Cx3 on frequency f2 and f3 and take the mean value.

De Sauty Bridge Experiment Viva Questions

Que.1: What are the limitation of this bridge?
Que.2: Can Dissipation factor be measured by this bridge?