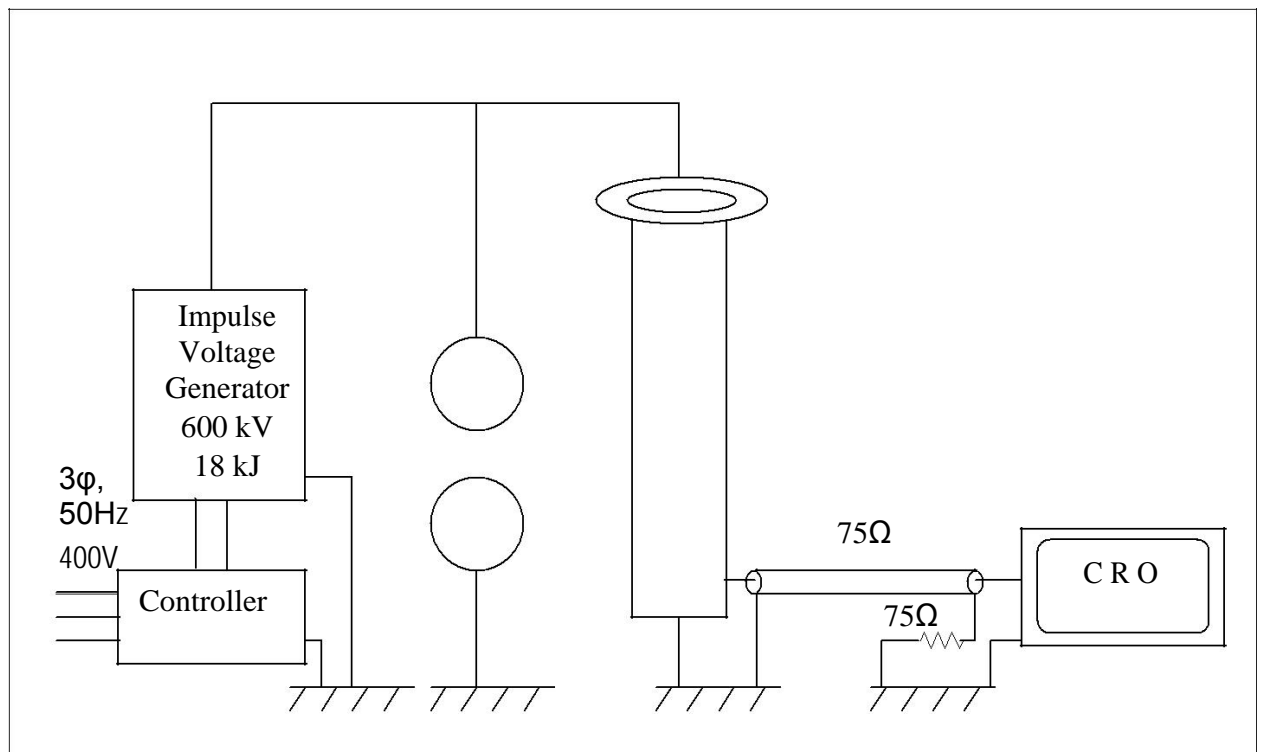


IMPULSE GENERATOR

Objectives:

Study of Impulse Generator and determination of Critical Flashover Voltage of a sphere-gap



Procedure:

1. Study the manual (attached) of the Impulse Voltage Generator (IVG) carefully
2. Adjust the gap distance of the sphere (500 mm diameter) at 70 mm
3. Chose the Impulse Generator level (say) 17 kV/ Stage. Set the Gap distance and voltage control on the controller at this level.
4. Close the circuit breaker and slowly rise the voltage
5. Form a table for recording the events. (As shown in the table I)
6. Trigger the generator and note if it is causes a flashover across the main sphere gap. If is causes the Flashover then note it is a Flashover or 'F'. Otherwise note it as a withstand or 'W'

7. Repeat step 5 till ten impulses are applied with an interval of 5 min. Each time note the outcome. If there are 'n' Flashover out of 10 pulses then the probability of Flashover associated with the voltage is $n/10$
8. Increase the voltage level by 0.2 kV/stage and repeat stapes 4,5, & 6
9. Repeat step 7 for at least 5 voltage levels
10. Reduce the voltage fully and open the circuit breaker 11.
Ground the Generator
12. Plot the voltage vs probability of Flashover curve. From this estimate the 50 % Probability point, which is the critical Flashover voltages
13. Correct the value obtained for Air density effects with the help of instructions given below.
14. Observe one full impulse wave and one chopped impulse on the oscilloscope and read waveform parameters.

Instructions for correction:

1. Use Table 1.3 to decide on corrections to be applied for any gap.
2. Obtain k_d and k_h from page 23 attached.
3. Since gap distance is less than 1m, so from fig 1.4, m, n and w are unity.
4. Humidity Correction can be obtained from fig 1.3.

Table I

Record of Flashover

Voltage Level/ Stage kV	Pulse No.										Probability of Flashover
	1	2	3	4	5	6	7	8	9	10	

F - Flashover W- Withstand

Find Out:

1. Why the Impulse testing?
2. How is the wave shape controlled?
3. Why is the Impulse breakdown of a sphere Gap statistical?
4. Why Capacitive storage not Inductive storage for Impulse Generator?

Further Reading:

1. Kuffel & Zaengel: High voltage engineering, Pergamom press
2. M. Khalifa : High Voltage Engineering, Marcel Dekker
3. Naidu & Kamaraju: High Voltage Engineering, Tata McGraw Hill
4. Dieter Kind & Feser : High voltage Test Techniques, SBA Publications