

Specification of Energy Storage Capacitor*

	Parameters	Item 1	Item 2	Item 3
1	Rated Capacitance	60 $\mu\text{F} \pm 10\%$ (Non-Polarized)	600 $\mu\text{F} \pm 10\%$ (Non-Polarized)	1000 $\mu\text{F} \pm 10\%$ (Non-Polarized)
2	Rated Voltage	10 kV	8 kV	6 kV
3	Peak Discharge Current	5 kA	5 kA	5 kA
4	Life Expectancy Pulse Discharges Shelf Life	50000 Discharges Atleast 10 years	50000 Discharges Atleast 10 years	50000 Discharges Atleast 10 years
5	ESL	< 250 nH	< 250 nH	< 250 nH
6	ESR	< 33 m Ω	< 100 m Ω	< 125 m Ω
7	Voltage Reversals	100 %	100 %	100 %
8	Charging Time	1-3 mins	1-3 mins	1-3 mins
9	Hold Time	10 mins	10 mins	10 mins
10	Discharge Time	100 μs	100 μs	100 μs
11	Pulse Repetition rate	Every 10 mins	Every 10 mins	Every 10 mins
12	Temperature	A.C lab Environment	A.C lab Environment	A.C lab Environment
13	Ringing Frequency	100-300 μs	100-300 μs	100-300 μs
14	Connection Terminals	Double bushing preferably with M-10 bolting	Double bushing preferably with M-10 bolting	Double bushing preferably with M-10 bolting
15	Warranty	1 year	1 year	1 year
16	Quantity Required	15 units	20 units	25 units

Terminals on the Capacitor body are required for connecting Hooks, for lifting and moving the Capacitors and for the earthing purpose.

*Mentioned Values are for the Single Capacitor Unit.

PRE DISPATCH INSPECTION:

- Pre-Dispatch Inspection of all the Capacitors required be done at the factory in the presence of IPR personnel. The required list of testing's has been mentioned below which shall be performed during Pre Dispatch Inspection:

	TESTS	IPR Requirement		
		Item 1	Item 2	Item 3
1	Capacitance Values	60 $\mu\text{F} \pm 10\%$	600 $\mu\text{F} \pm 10\%$	1000 $\mu\text{F} \pm 10\%$
2	Charging upto Rated Voltage (With Terminal Reversal)	± 10 kV	± 8 kV	± 6 kV
3	Tan Delta	Less than 3%		
4	Voltage Hold time	10 mins		
5	Peak Discharge current	5 kA		

Tender No: IPR/TN/PUR/TPT/ET/34/17-18 dated 09/01/2018

- Vendor has to arrange for testing of all the Capacitors individually as well as batch wise at vendor site in presence of IPR personnel. Repeatability of any Capacitor can be checked for desired charging Voltage.
- All tests and their results have to be documented in presence of IPR personnel.
- The vendor must have the facility to perform all the testing mentioned above or they need to arrange for the same and they need to arrange the testing facility at their own cost.
- Certificate of Expected Life of the Capacitors from the vendor side.

ACCEPTANCE CRITERIA:

Physical Inspection and Testing of all the Capacitors will be done at IPR site by the IPR personnel, then only acceptance will be given to the Capacitors. Required list of testing's to be performed at IPR is mentioned below:

	TESTS	IPR Requirement		
		Item 1	Item 2	Item 3
1	Parameters Capacitance Values	60 μ F \pm 10 %	600 μ F \pm 10 %	1000 μ F \pm 10 %
2	Charging upto Rated Voltage (With Terminal Reversal)	\pm 10 kV	\pm 8 kV	\pm 6 kV
3	Voltage Hold time	10 mins		
4	Peak Discharge current	5 kA		

Technical Compliance for Energy Storage Capacitor 60uF 10kV*

		IPR's Specification	Vendor's Specification
1	Rated Capacitance	60 μ F \pm 10 % (Non-Polarized)	
2	Rated Voltage	10 kV	
3	Peak Discharge Current	5 kA	
4	Life Expectancy Pulse Discharges Shelf Life	50000 Discharges Atleast 10 years	
5	ESL	< 250 nH	
6	ESR	< 33 m Ω	
7	Voltage Reversals	100 %	
8	Charging Time	1-3 mins	
9	Hold Time	10 mins	
10	Discharge Time	100 μ s	
11	Pulse Repetition rate	Every 10 mins	
12	Temperature	A.C lab Environment	
13	Connection Terminals	Double bushing preferably with M-10 bolting	
14	Ringing Frequency	100-300 μ s	
15	Warranty	1 year	
16	Quantity Required	15 units	
17	Pre Despatch Inspection Tests	As mentioned in tender Specifications	
18	Acceptance Tests at IPR	As mentioned in tender Specifications	

Terminals on the Capacitor body are required for connecting Hooks, for lifting and moving the Capacitors and for the earthing purpose.

*Mentioned Values are for the Single Capacitor Unit.

Technical Compliance for Energy Storage Capacitor 600uF 8kV*

		IPR's Specification	Vendor's Specification
1	Rated Capacitance	600 μ F \pm 10 % (Non-Polarized)	
2	Rated Voltage	8 kV	
3	Peak Discharge Current	5 kA	
4	Life Expectancy Pulse Discharges Shelf Life	50000 Discharges Atleast 10 years	
5	ESL	< 250 nH	
6	ESR	< 100 m Ω	
7	Voltage Reversals	100 %	
8	Charging Time	1-3 mins	
9	Hold Time	10 mins	
10	Discharge Time	100 μ s	
11	Pulse Repetition rate	Every 10 mins	
12	Temperature	A.C lab Environment	
13	Ringing Frequency	100-300 μ s	
14	Connection Terminals	Double bushing preferably with M- 10 bolting	
15	Warranty	1 year	
16	Quantity Required	20 units	
17	Pre Despatch Inspection Tests	As mentioned in tender Specifications	
18	Acceptance Tests at IPR	As mentioned in tender Specifications	

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*Mentioned Values are for the Single Capacitor Unit.

Technical Compliance for Energy Storage Capacitor 1000uF 6kV*

		IPR's Specification	Vendor's Specification
1	Rated Capacitance	1000 μ F \pm 10 % (Non-Polarized)	
2	Rated Voltage	6 kV	
3	Peak Discharge Current	5 kA	
4	Life Expectancy Pulse Discharges Shelf Life	50000 Discharges Atleast 10 years	
5	ESL	< 250 nH	
6	ESR	< 125 m Ω	
7	Voltage Reversals	100 %	
8	Charging Time	1-3 mins	
9	Hold Time	10 mins	
10	Discharge Time	100 μ s	
11	Pulse Repetition rate	Every 10 mins	
12	Temperature	A.C lab Environment	
13	Ringing Frequency	100-300 μ s	
14	Connection Terminals	Double bushing preferably with M-10 bolting	
15	Warranty	1 year	
16	Quantity Required	25 units	
17	Pre Despatch Inspection Tests	As mentioned in tender Specifications	
18	Acceptance Tests at IPR	As mentioned in tender Specifications	

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