

# Systems for Accelerated Aging of Dielectrics



Phenix Technologies provides a variety of Accelerated Aging Test Systems. These tests are used to accelerate the aging of dielectrics under electrical stress. Applicable standards are HD 605 S2 and ICEA S-94-649-2004. Systems are typically 500 Hz or 1000 Hz with smaller systems successfully implemented up to 3000 Hz. Two types are available; low power systems up to 50 kVA which can be implemented as resonant type systems or conventional transformer type systems which are implemented in conjunction with high voltage compensating reactors. This significantly extends the power rating.

All systems are fully computer controlled and feature automated voltage control with data acquisition. The large industrial HMI with Ethernet and remote-control capability via Ethernet. Optionally, a LabVIEW interface is available to integrate with laboratory SCADA systems or data bases.

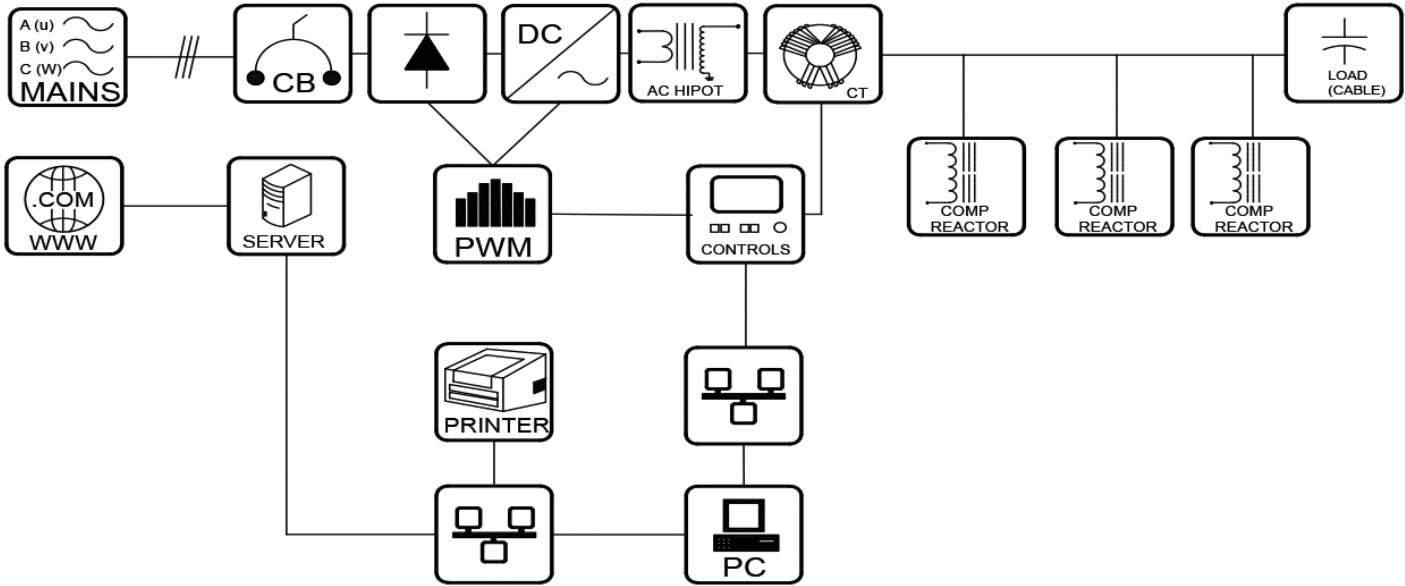
At the core of the accelerated aging system is a state of the art solid state frequency inverter purpose built for high voltage testing. The system has 3 phase mains input service to balance the power draw over the 3 phases. The proprietary inverter design uses high speed interlaced switching of water cooled IGBTs to provide a very high switching frequency which produces a very low distortion sinewave. This topology produces a very high output power to test a large number

of samples. It is also possible to use the same inverter for 500 or 1000 Hz with some derating to provide additional flexibility with the test process. The output of the inverter is further refined by a high quality low loss sine filter. The filter is connected to the output of the inverter and before the step-up transformer.

The high voltage compensating reactors are constructed out of high quality grain-oriented steel surrounded by copper windings. A distributed air gap and optimally sized copper windings ensure low loss with high Q reactors. With the closed magnetic circuit, flux fringing is kept to a minimum. This closed gap also minimizes inductive heating of nearby metallic structures or objects which is an undesired and often a problem with open core/air core reactors. The oil insulated design utilizes stainless steel construction which allows the system to be deployed indoors or outdoors. An all-weather version is available. The reactors may be equipped with multiple taps. The multiple taps allow testing multiple voltage classes and to also optimize the system compensation. Multiple reactors may be connected in parallel to extend the testing capability of the system. This ability allows the expansion of systems already in service. Reactors may also be connected in series with insulated standoffs to double the testing voltage range.



## System Diagram Accelerated Aging



### Test Systems for 500 Hz

Model	Type	Voltage (kV)	Power (kVA)	Compensation Reactors	Number of Reactors	Load (nF)
RTS8TC35-50-500X	Resonant	35	50	No	0	13
6TC55-250-500X	Transformer	55	250	No	0	26
6TC110-250-500X	Transformer	110	250	No	0	6.7
6TC55-450-500X	Transformer	55	450	Yes	1	47
6TC110-450-500X	Transformer	110	450	Yes	1	12
6TC55-650-500X	Transformer	55	650	Yes	2	68
6TC110-650-500X	Transformer	110	650	Yes	2	17
6TC55-850-500X	Transformer	55	850	Yes	3	89
6TC110-850-500X	Transformer	110	850	Yes	3	22
6TC55-1050-500X	Transformer	55	1050	Yes	4	110
6TC110-1050-500X	Transformer	110	1050	Yes	4	27

Other Voltages and Configurations available upon request



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