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Improper use of the products can cause severe injury or death,
and may result in damage to the products and other property.
Please read the instruction manual before installing or using the products.



Mitsubishi Electric's thyristor static excitation systems are used extensively for medium- and large-capacity hydroelectric and steam-turbine generators. They offer excellent performance, high reliability, quick response, easy maintenance and a simple structure.

Since completion of the first system in 1968, we have delivered more than 500 thyristor static excitation systems.



System Configurations

The voltage regulator and potential source static excitation system functions to control the voltage of an AC generator by directly controlling the generator's DC field current. The static excitation system is composed of the following:

Thyristor rectifier bridge and thyristor elements

The 3-phase, full-bridge rectifier circuit has fast response characteristics. A compact cubicle design is realized with the large on-state current, high reversed voltage flat-pack thyristor elements, and forced air cooling. The thyristor elements are installed in a tray, and can be exchanged during operation. For better cost performance, trayless units are also manufactured.

Field flashing

The field flashing circuit is necessary when a generator is started, because of the self-excitation system. A DC battery is usually used as the initial excitation power supply. An AC power supply can also be adopted with the incorporations of rectifiers and a transformer.

Field suppression

Immediate de-excitation is necessary when generator trouble occurs. Generally, DC field circuit breakers are used, but a static-field circuit breaker system can be used for better cost-performance. These systems reduce the field energy by reversing the excitation voltage at the rectifier gate controls, realizing rapid de-excitation.

Over-voltage protection

C-R absorbers and varistors are installed in each AC and DC circuit to protect the thyristor elements from over-voltage. In large-capacity systems, a crowbar circuit is adapted for the DC circuit.

Excitation transformer

The excitation transformer reduces the supply voltage to the level required for excitation. Generally, a dry-type transformer is used for small-capacity requirements and an oil-type transformer for large-capacity requirements.

Monitoring and measurement devices

Alarm systems that warn of blown thyristor fuses, cooling-fan failure and high air temperature are available. Additionally, a rotor temperature converter and magnetic-field earth detector are optionally available.

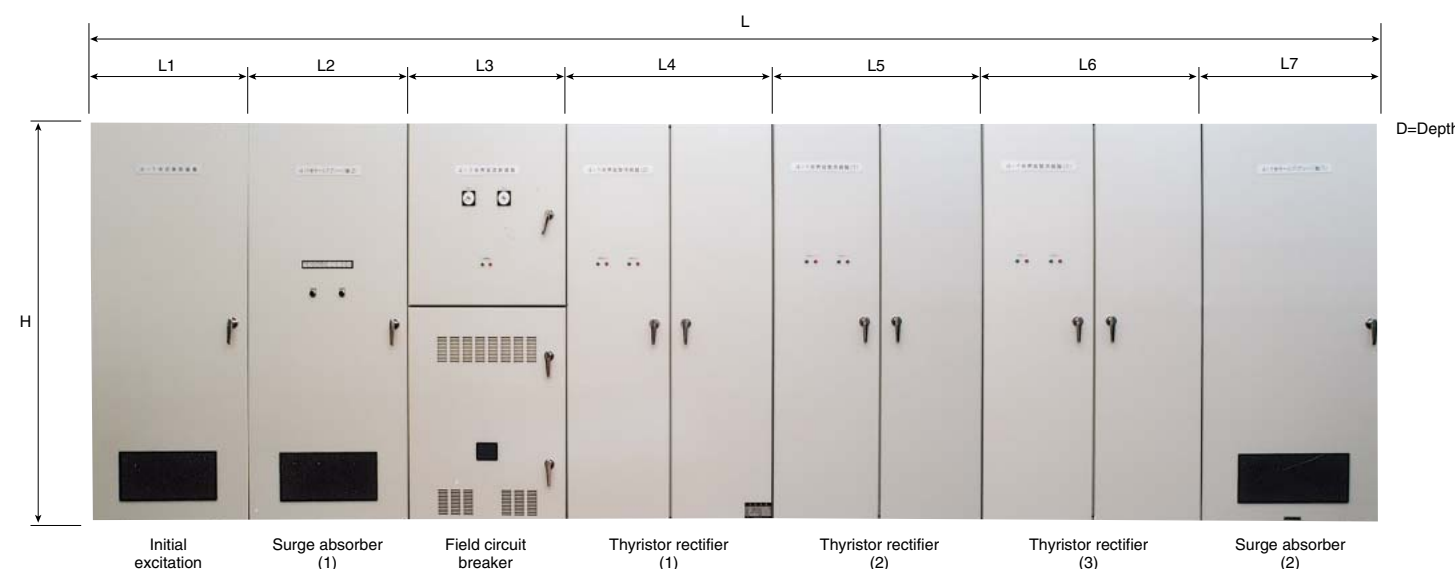


Ratings and Dimensions

The ratings of a static exciter are principally defined by the rating current and peak voltage. The typical ratings and cubicle dimensions are as follows:

Ratings		Dimensions (mm)									
Maximum current (A)	Maximum peak voltage (V)	L	D	H	L1	L2	L3	L4	L5	L6	L7
1350	460	2900	2000	2300	0	0	900	1000	0	0	1000
1100	1000	3000	2000	2300	0	0	1000	1000	0	0	1000
3509	1100	3200	2000	2300	0	0	1000	1200	0	0	1000
2422	1480	3400	2000	2300	0	0	1200	1200	0	0	1000
8000	1100	6000	2500	2600	0	1200	1200	1200	1200	0	1200
8000	1480	8700	2500	2600	1200	1200	1500	1200	1200	1200	1200
8566	1100	4900	2500	2600	0	1200	1000	1500	0	0	1200
9462	1600	6400	2500	2600	0	1200	1000	1500	1500	0	1200

Remarks: The * mark indicates the dimensions of the trayless and static field circuit breaker system. The above dimensions are subject to change by detail and design progress.



Thyristor Static Excitation System Configuration

