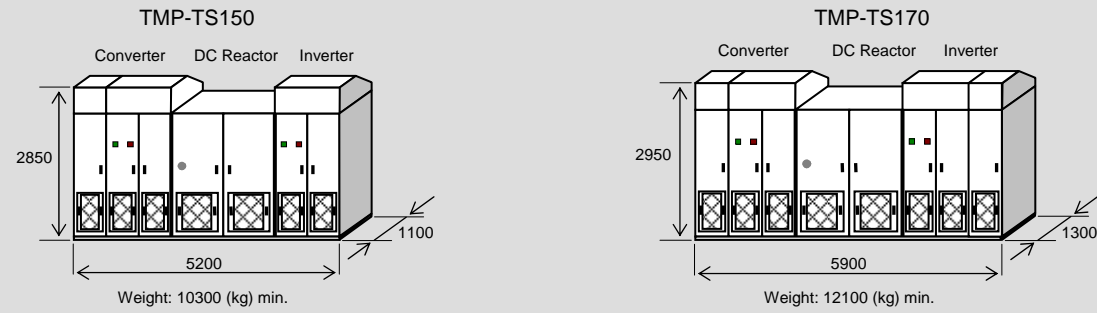


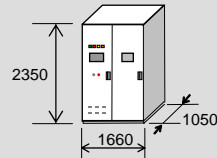
Dimensions



Weight: 10300 (kg) min.

Weight: 12100 (kg) min.

SFC control panel
(Common to series)



Weight: 1100 (kg)

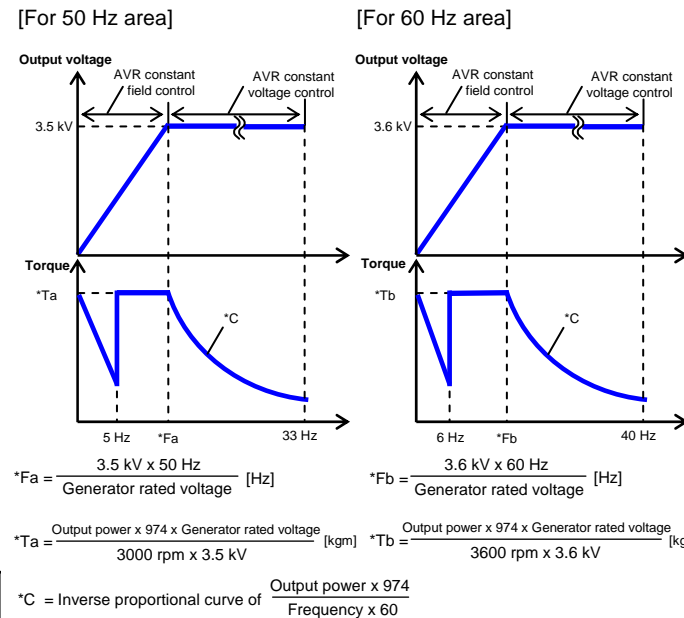
* The dimensions and weight of SFC Transformer depend on the capacity.

Specifications

Standard Model	TMP-TS150-35 TMP-TS170-35	TMP-TS150-40 TMP-TS170-40	TMP-TS150-50 TMP-TS170-50	TMP-TS170-60	TMP-TS170-70
System Rating					
Output power (MW)	3.5	4	5	6	7
DC voltage (kV)	4				
DC current (A)	875	1,000	1,250	1,500	1,750
Output voltage (kV)	3.5 (50 Hz area) / 3.6 (60 Hz area)				
Output voltage variation (%)	+/-2				
Output current (Arms)	714	816	1,021	1,225	1,429
Output frequency (Hz)	0.05 to 33 (50 Hz area) / 0.05 to 40 (60 Hz area)				
Input frequency (Hz)	50 / 60				
Incoming voltage variation (%)	+/-10				
Converter/Inverter Cubicle					
Thyristor configuration	2S1P6A				
Pulse number	6				
DC Reactor					
Inductance (mH)	12	11	9	7	6
Insulation class	Class H				
Temperature rise class	Class H				
Core	Silicon steel sheet				
Type	Dry				
Other					
Total loss (kW) (Converter Cubicle + Inverter Cubicle + DC Reactor Cubicle)	100	110	130	150	180
Cooling method	Forced air cooling (self-cooling for oil-immersed transformer)				
Protection class	IP41 (IP20 for terminals and inlet/outlet) (except oil-immersed transformer)				
Time rating	100% continuous				
Conforming standard	IEC-60146-1-1				
Installation location	Indoors (outdoors for oil-immersed transformer), altitude 1,000 m max.				
Ambient temperature (°C)	0 to 40				

*1 RMS value including a harmonic component equivalent to 6-pulse converter.

Output voltage/torque characteristics



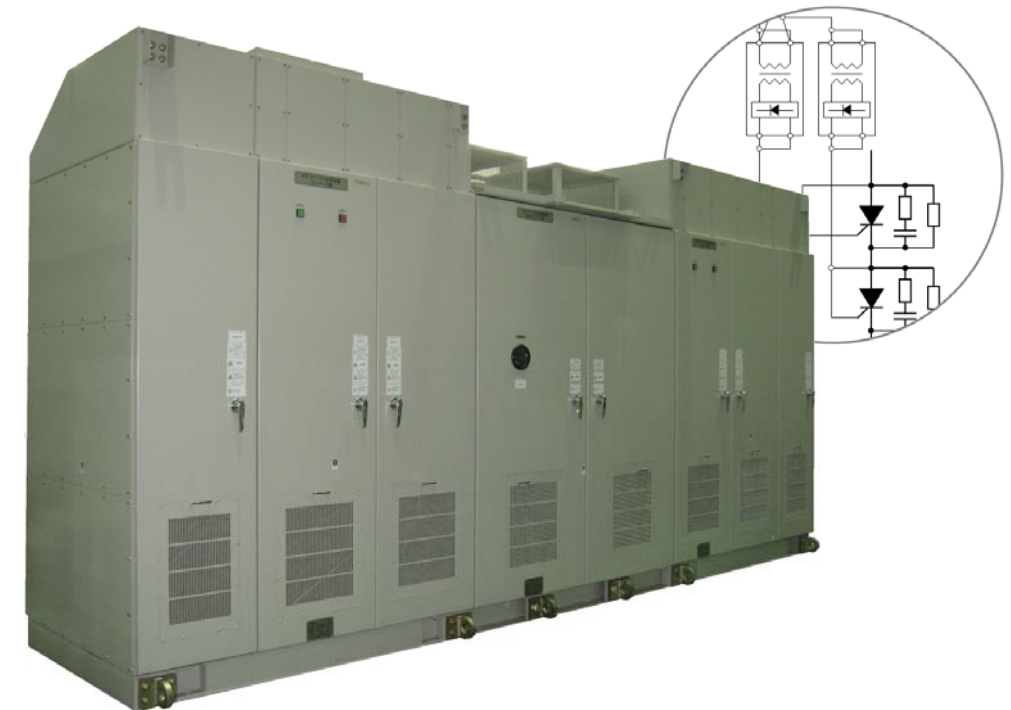
Typical Requirement for Input Transformer

Standard Model	TMP-TS150-35 TMP-TS170-35	TMP-TS150-40 TMP-TS170-40	TMP-TS150-50 TMP-TS170-50	TMP-TS170-60	TMP-TS170-70
Capacity (kVA)	4,700	5,400	6,800	8,200	9,700
Secondary voltage (kV)	3.75	3.75	3.80	3.85	3.90
% x (%)	8	10	12	14	16

Static Frequency Converter

SFC

TMP-TS150/170 Series

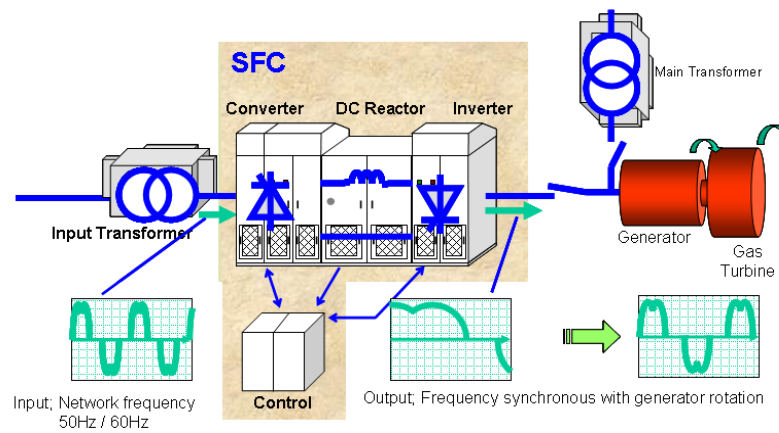


Static Frequency Converter

TMP-TS150/TMP-TS170 Series

System/cubicle configuration

SFC roughly consists of four cubicles.



Converter

Controls the DC current by phase control of the thyristor.

DC Reactor

Smooths the DC current.

Inverter

Converts the DC to AC in accordance with the rotational speed of the generator by phase control of the thyristor.

Control panel

Controls and monitors the devices.

Operation patterns

SFC starts/stops by external requests.

(1) GT/SFC SELECTED REQUEST

Activates the cooling fan to stand by for a start.

(2) SFC START REQUEST

Starts in the constant current control pulse mode. Switches to the load commutation mode when the rotational speed and the generator voltage have increased.

(3) SFC HIGH SPEED KEEP REQUEST

Switches to the speed control and maintains a constant rotational speed of the generator (at the purge speed).

(4) SFC HIGH SPEED SPIN REQUEST OFF

Gradually reduces the rotational speed of the generator.

(5) SFC LOW SPEED KEEP REQUEST

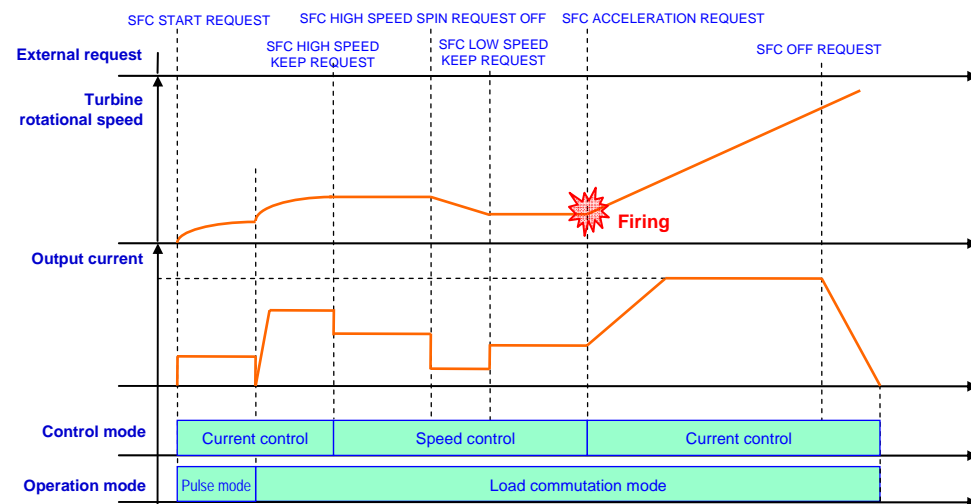
Maintains a constant rotational speed of the generator (at firing speed).

(6) SFC ACCELERATION REQUEST

Reaccelerates the gas turbine when firing has been completed. Increases the output current to the current setting.

(7) SFC OFF REQUEST

Gradually reduces the output current to zero. SFC stops when the output current has been reduced to zero.



A Static Frequency Converter (SFC) converts with an inverter the DC current of converter output to the frequency synchronized with the rotation of the generator, which is in turn output to rotate a turbine generator in the same way as a synchronous motor and accelerate until the gas turbine can independently rotate.

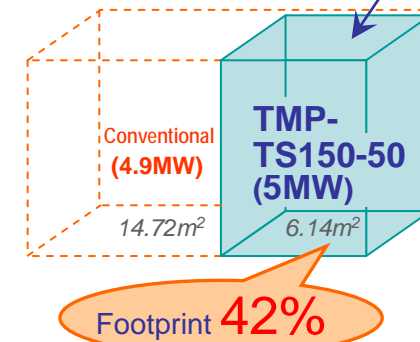
The TMP-TS Series SFCs are designed and built to best suit the standard series of gas turbines offered by Mitsubishi Heavy Industries, Ltd. and turbine generators by Mitsubishi Electric Corporation and serve as their starters.

Features

Space-saving

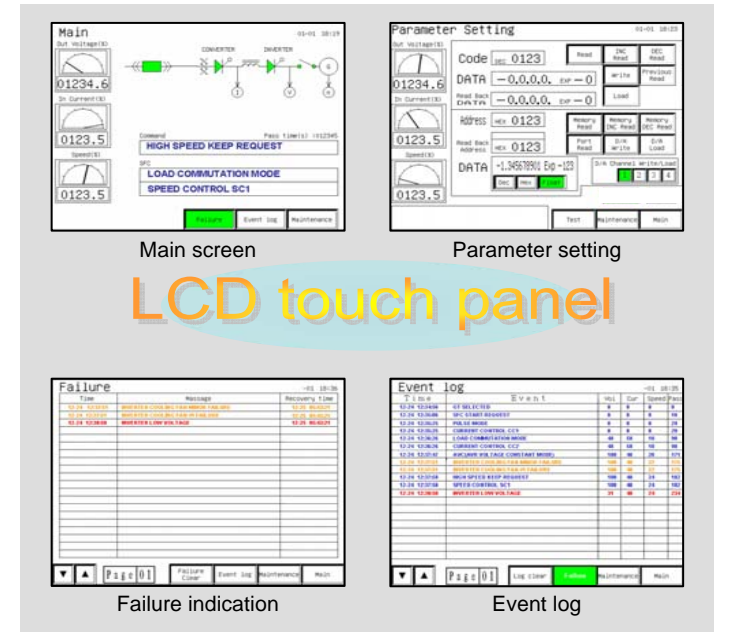
Space reduction to 42% of the conventional model achieved (with 5 MW model).

Improved inductance of DC Reactor
Use of new low-loss element
Optimized cooling structure



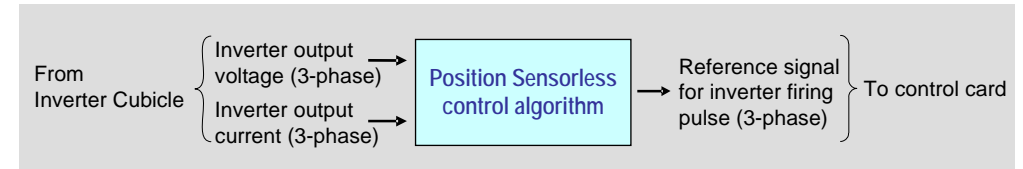
Man-machine interface

Large LCD touch panel (10-inch) provided for excellent operability and maintainability.



Position Sensorless

The capability of detection and operation of the inverter output voltage/current has achieved Position Sensorless control equivalent to that with a Position Sensor. Eliminated need for a Position Sensor saves the trouble of mounting and maintenance of a Position Sensor, which was traditionally required for the device installation.



Wide system variation

◆ The TMP-TS170 Series allows redundancy of fans. Operation can continue even if one fan per cubicle fails.

◆ The TMP-TS170 Series allows routing of cables on the top or bottom side.

*With the TMP-TS150 Series, the main circuit cables can only be routed on the top side and fan redundancy is not allowed.

Circuit configuration

