Synchronous Switching GCB

Changes for the Better

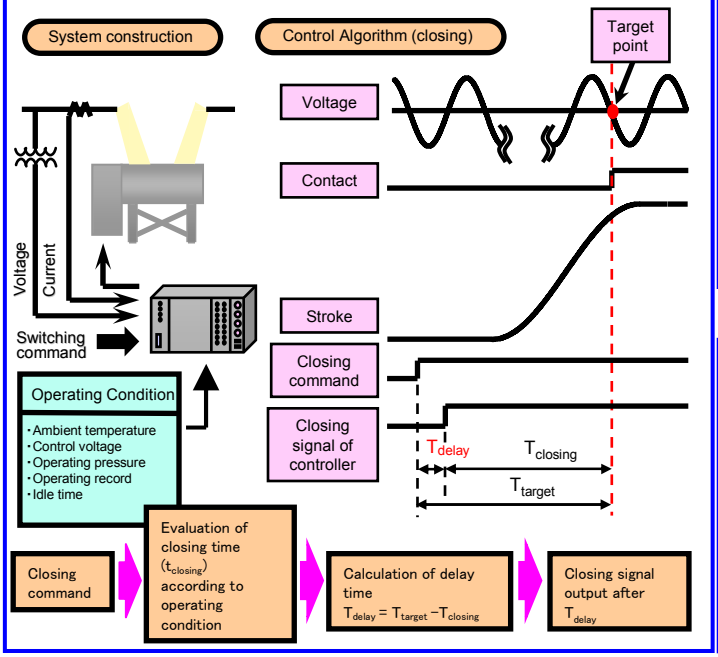
Solutions of Surge Elimination by Conventional GCB and Synchronous Switching GCB

Technique of controlling the switching point of GCB with respect to voltage or current phase in order to minimize electrical transients

- Cost Reduction and Reliability Enhancement
  ;Elimination of Closing Resistor, Surge Arresters
- Maintenance Benefits
  ;Extension of Replace Interval for Nozzle and Contacts
- Operation Benefits
  ;Reduction of Overvoltage, Improving the Power Quality, and Prevention of Protection Relay Maloperation

Load	Target	Conventional practice	Synchronous switching
・Transformer	・Elimination of high inrush current (High stress on winding, voltage disturbance)	・Closing resistor	・Synchronous closing (Accounting residual flux)
・Line	・Elimination of switching overvoltage (Harmful to system insulation)	・Closing resistor ・Surge arrester	・Synchronous closing (Voltage zero point)
・Shunt capacitor	・Elimination of high inrush current (Erosion of contacts, voltage disturbance)	・Closing resistor ・Series reactor	・Synchronous closing (Voltage zero point)
	・Ensure re-strike free performance (Harmful to system insulation)	・Surge arrester	・Synchronous opening (Maximum arcing time)
・Shunt reactor	・Elimination of re-ignition (Harmful to system insulation, erosion of contacts)	・Opening resistor ・Surge arrester	・Synchronous opening (Maximum arcing time)

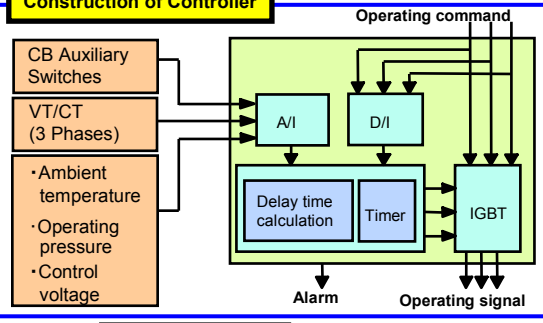
Controlling Algorithm (Closing)



Features of Mitsubishi Controller

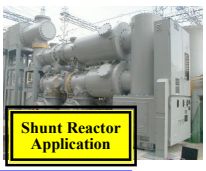
- **Highly reliable CPU used widely for monitoring systems in high-voltage switchgears**
- **Memory storage to record the ambient temperature, hydraulic pressure, opening/closing time, current and voltage waveform and travel signal for past 100 switching operations**
- **Self-monitoring function of a failure of the controller itself**
- **Function for a judgement for the success or failure of controlled switching and the occurrence of re-ignition**
- **Proved to withstand under different environmental stress such as fast transient serge, high and low temperature and mechanical vibration**

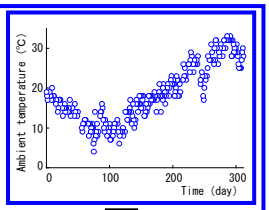
Construction of Controller

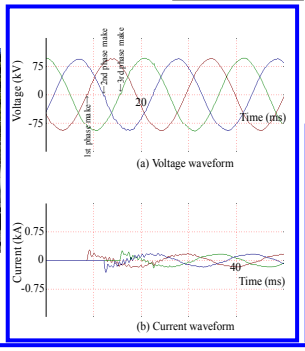


Type: SSC-SP1 for Capacitor Bank / Shunt Reactor

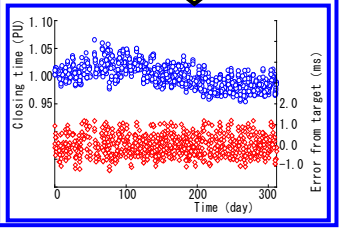
・Standard model with full compen-sation functions







High accuracy with compensation of various operating condition



Type: SSC-TR for Transformer

・Added residual flux measuring function to SSC-SP1

Significantly reduction of inrush current and voltage disturbance