

# VIZIMAX SynchroTeq®

## Controlled Switching Devices for High Voltage Circuit Breakers



Product	SynchroTeq® Plus	SynchroTeq® Lite
Part Number	STP030000	STL010000
Place of manufacture	VIZIMAX Factory, Montreal, Canada	
<b>Switching Transient Mitigation - For Shunt Reactors</b>		
Breaking	Prevent re-ignition	
Making	Prevent DC current asymmetry, voltage step on winding insulation	
<b>Switching Transient Mitigation - For Capacitor Banks, Harmonic Filters</b>		
Breaking	Prevent re-strikes	
Making (fully discharged)	Mitigate inrush current, high frequency voltage transients	
Fast Switching (partially charged capacitors, for hybrid FACTS or motor starting)	Mitigate inrush current, high frequency voltage transients	N/A
<b>Switching Transient Mitigation - For Power Transformers, Non-ZigZag Grounding Transformers, Parallel Transformers</b>		
Making, with Independent (single) Pole Operated (IPO) circuit breaker	Mitigate Inrush current, voltage dips: - Peak voltage strategy (efficient when breaking is controlled, otherwise partial mitigation) - Delayed control strategy taking into account the residual flux (optimal) - Option STP03010x	Mitigate Inrush current, voltage dips: - Peak voltage strategy (efficient when breaking is controlled, otherwise partial mitigation)
Making, with three-pole (gang) operated circuit breaker	Mitigate inrush current, voltage dips (option STP03010x)	N/A
<b>Switching Transient Mitigation - For Non-Shunt-Compensated Transmission Lines (Series-Compensated or Not)</b>		
Breaking	Prevent re-strikes	
Making (discharged line)	Mitigate inrush current, high frequency voltage transients, travelling wave line over-voltages	
Reclosing (after single-phase or 3-phase trip)	Mitigate inrush current, high frequency voltage transients, travelling wave line over-voltages	N/A
<b>Switching Transient Mitigation - For Shunt-Compensated Transmission Lines (Series-Compensated or Not), Underground Cables, Subsea Cables</b>		
Breaking	Prevent re-ignition	
Making (discharged line)	Avoid current zero missing, DC current asymmetry Mitigate inrush currents, high frequency voltage transients, travelling wave line over-voltages	
Reclosing (after single-phase or 3-phase trip)	Mitigate inrush currents, high frequency voltage transients, travelling wave line over-voltages (option STP03010x)	N/A
<b>Monitoring Function</b>		
Switching Instant	Yes	
Detection re-ignitions	Yes	
Recording Time	Up to 3,000 ms including pre-trigger	
Sampling rate	167 samples / cycle	80 samples / cycle
Memory capacity	2,000 events with COMTRADE waveforms	500 events with COMTRADE waveforms
Electr. wear Monitor (i²t)	Yes	
Mechanical wear Monitor	Yes	
Coil Circuit Supervision	Yes (can be disabled by configuration)	No
<b>Substation Topology</b>		
Stand-Alone CB	One SynchroTeq unit per CB	
Double Busbar	One SynchroTeq unit per CB, voltage source selection managed internally	One SynchroTeq unit per CB, an external voltage selector is required
CB 1 ½ or Ring	One SynchroTeq unit per CB, automatic application selection for middle CB	One SynchroTeq unit per main CB Two SynchroTeq units required on middle CB
<b>Circuit Breaker Requirements</b>		
Make and Brand	Any	
Voltage Rating	HV, EHV, UHV	Designed for HV breakers
Mechanism	Spring, hydraulic, pneumatic, electric actuator	Spring-Spring (O + C)
Pole Operation	Independent (Single) Pole Operated - IPO Three-Pole (Gang) Operated : Transformer application only	Independent (Single) Pole Operated - IPO
Grading Capacitors	Taken into account (HV/EHV/UHV transformers)	
Coil commands	6 x 48 Vdc, 110 Vdc, 125 Vdc, 220 Vdc	6 x 24V dc to 280 Vdc max.
<b>Compensation</b>		
Ambient Temperature	Yes, 1 x 4-20mA input	Yes, 1 x 4-20mA or 100Ohm RTD
Drive Pressure	Yes, 3 x 4-20mA	N/A
DC control voltage	Yes, up to 300Vdc	
Idle Time	Yes	
Adaptive	Yes	

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<b>AC Inputs</b>		
CT Inputs	3x1A or 3x5A	
Hot unplugging of CT loops	Yes	No
PT/VT Inputs	4 (base) 7 (option STP03010x) (one of which can be converted into one additional 4-20 mA compensation input)	1
<b>Digitals</b>		
Digital Inputs	12 (3x52a, 3x52b, 2xOpnClsCmd, 1xOutOfSvc, 3xCBMon)	10 (3x52a, 2xOpnClsCmd, 1xOutofSvc, 1xLoc/Remote, 3xCBMon)
Power Outputs (C/B coils)	6, solid state (SSR), SBO, high current	
Floating power circuits (C/B coils)	Yes via option STP030304 (free of charge)	Yes
Signalling	11 relays (incl. Watchdog relay output)	4 relays (incl. Watchdog relay output)
<b>Time Synchronization</b>		
Manual/voluntary	Yes via VIZIMAX Commissioning Tool (VCT) for PC computer	
IEEE 1588 (PTP)	Yes	
NTP, SNTP	Yes	
IRIG-B	Optional Plug-in (RWC0Y0000)	Optional - Installs in factory (RWC0Y0001)
<b>Bypass</b>		
Bypass solution	Embedded bypass module in option (STP030302) (Automatic, Timed or Memorized mode) Also allows for redundant (hot-standby) configurations	No
<b>Connectivity and Communication Protocols</b>		
Comm ports	1 x RS485 - 2 x 100BASE-TX - 1 x USB-A	1 x RS485 - 2 x 100BASE-TX - 1 x USB-B
Additional comm ports	2 extra max. via 100BASE-TX, FX, LX plug-ins (RWC0x0000)	No
Other SCADA protocols	DNP3.0, MODBUS, OPC-UA available in option, please inquire	
IEC 61850 Ed.2 - MMS Server	Q3/2020	Yes
VIZIMAX Unified Communication Services	VUCS Option (RWS055000) : event/waveform collection, OPC UA interface for SCADA/DCS, CB control	
VIZIMAX CB Angel Web Portal	SaaS or On-premise, Asset Health Management System, Predictive Maintenance, CB Ranking, Reporting	
<b>Simulation Libraries</b>		
EMTP-RV Model	Yes	
PSCAD Model	Please inquire	
Matlab Simulink Model	R2017a, R2017b, R2017b Update 9, R2019b	
<b>Operation, Configuration and Commissioning</b>		
Display on Front Panel	English, French, Chinese (simplified)	N/A
Web Interface	English, French, Chinese (simplified)	
Web browser	Google Chrome (recommended) or other	
VIZIMAX Tool Suite	VIZIMAX Commissioning Tool / VCT for PC computer (MS Win. OS) includes VIZIMAX Waveform Analyzer, online contextual help, documentation and manuals	
<b>Power Supply and Housing</b>		
Voltage Rating	48 Vdc, 110 Vdc, 125 Vdc, 220 Vdc	24 Vdc, 48 Vdc, 110 Vdc, 125 Vdc, 220 Vdc
Power Consumption	27 W (without options)	15 W max.
Mounting	Rackmounted, Stand-Alone	
Weight	Max 7.5 kg (incl. all options)	3.6 kg
<b>Compliance</b>		
Markings	c-UL-us, CE, RoHS, Conflicts Free	
Operating Temperature	-50°C, +70°C -40°C, +55°C for UL applications	-50°C, +75°C -40°C, +70°C for UL applications
RF Emissions	CISPR 11, 22 - Class A	
Other EMC	Various IEC standards - Level 3 or 4	
Impulse Voltage	5 kV	
Safety	IEC 61010-1 3rd Edition	